REDACTED VERSION

C.E.S

Project

9542954

EPAPA008000440

SPILL KIT

EPAPA00800441

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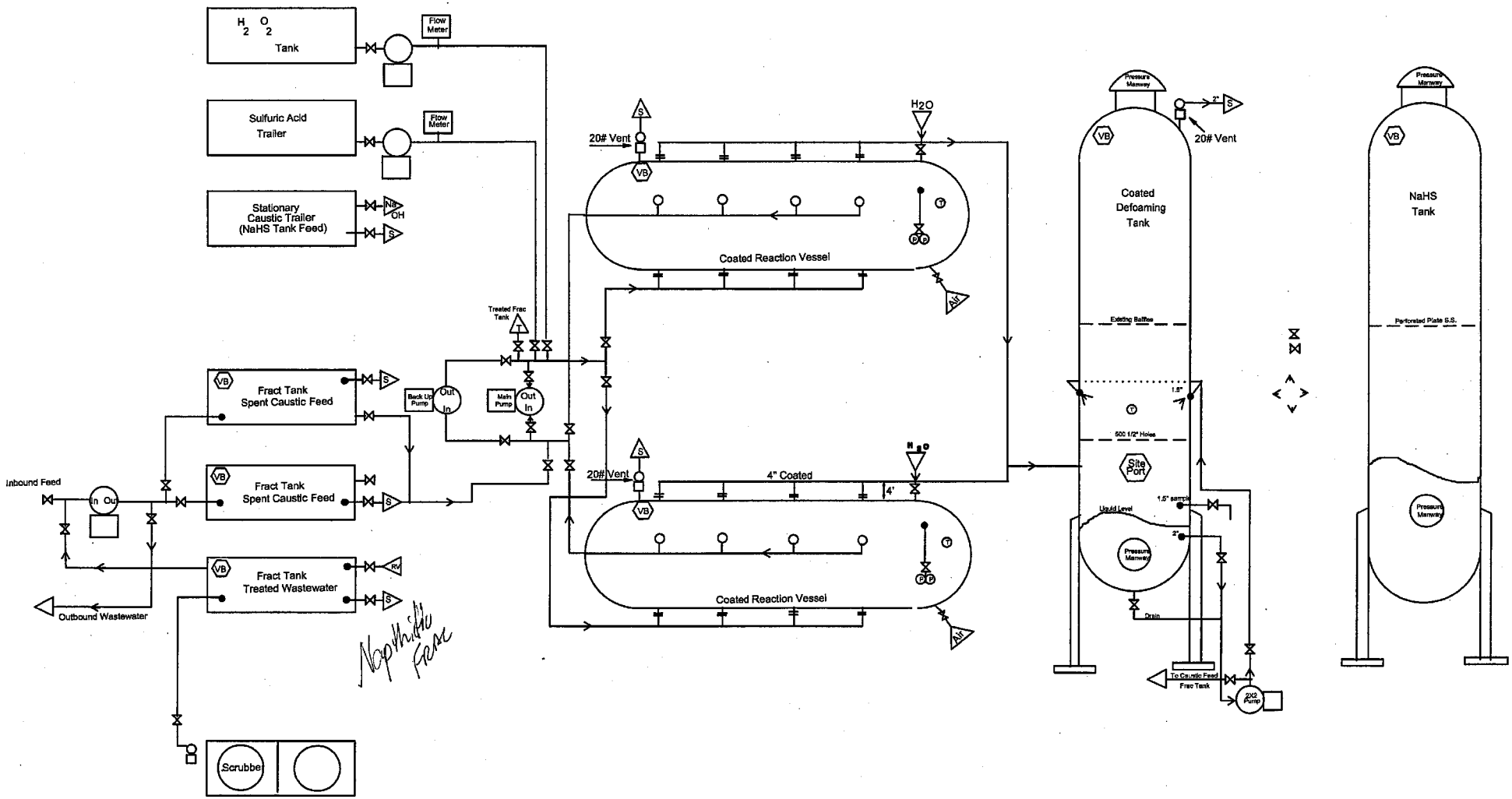

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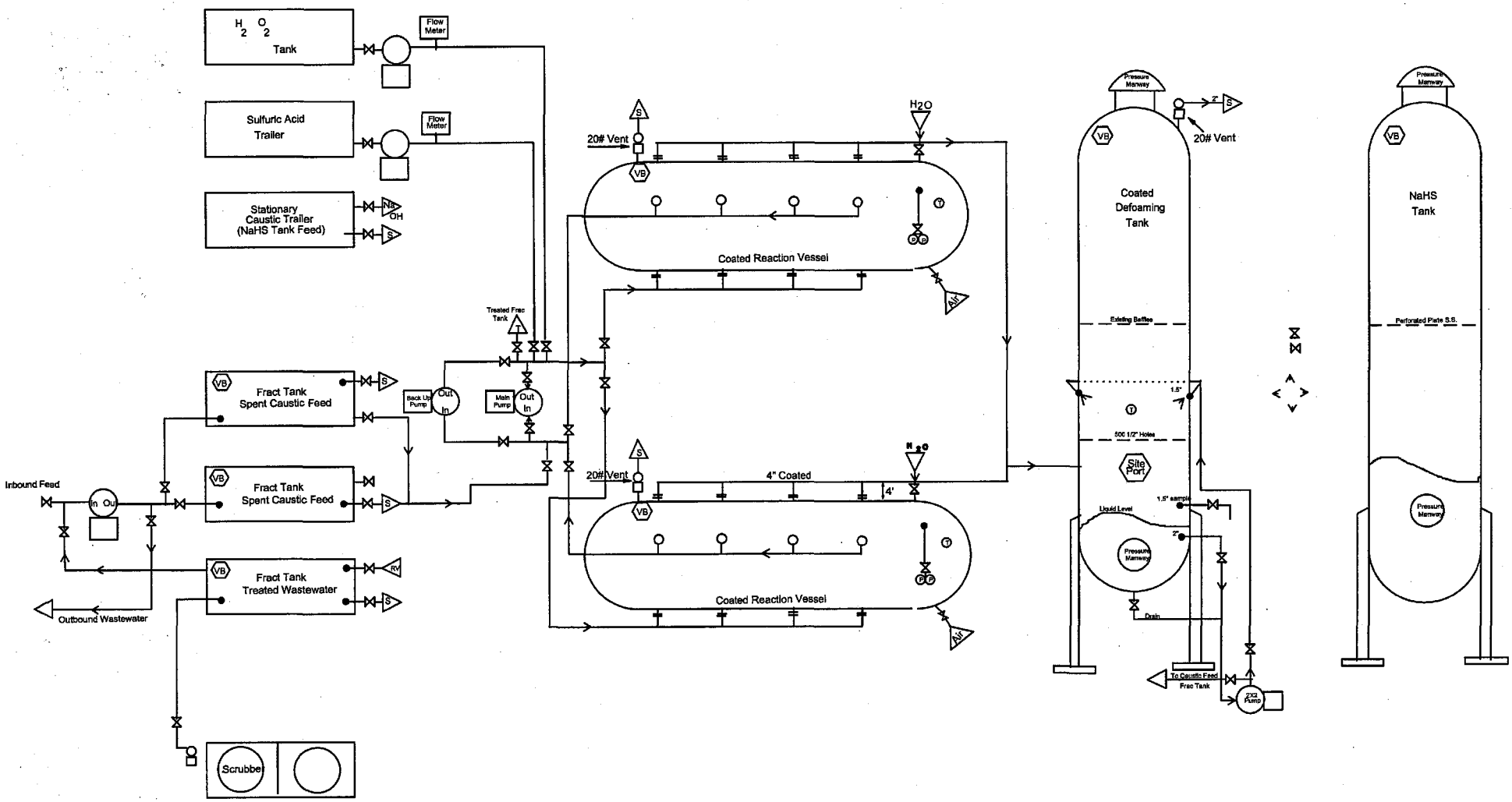

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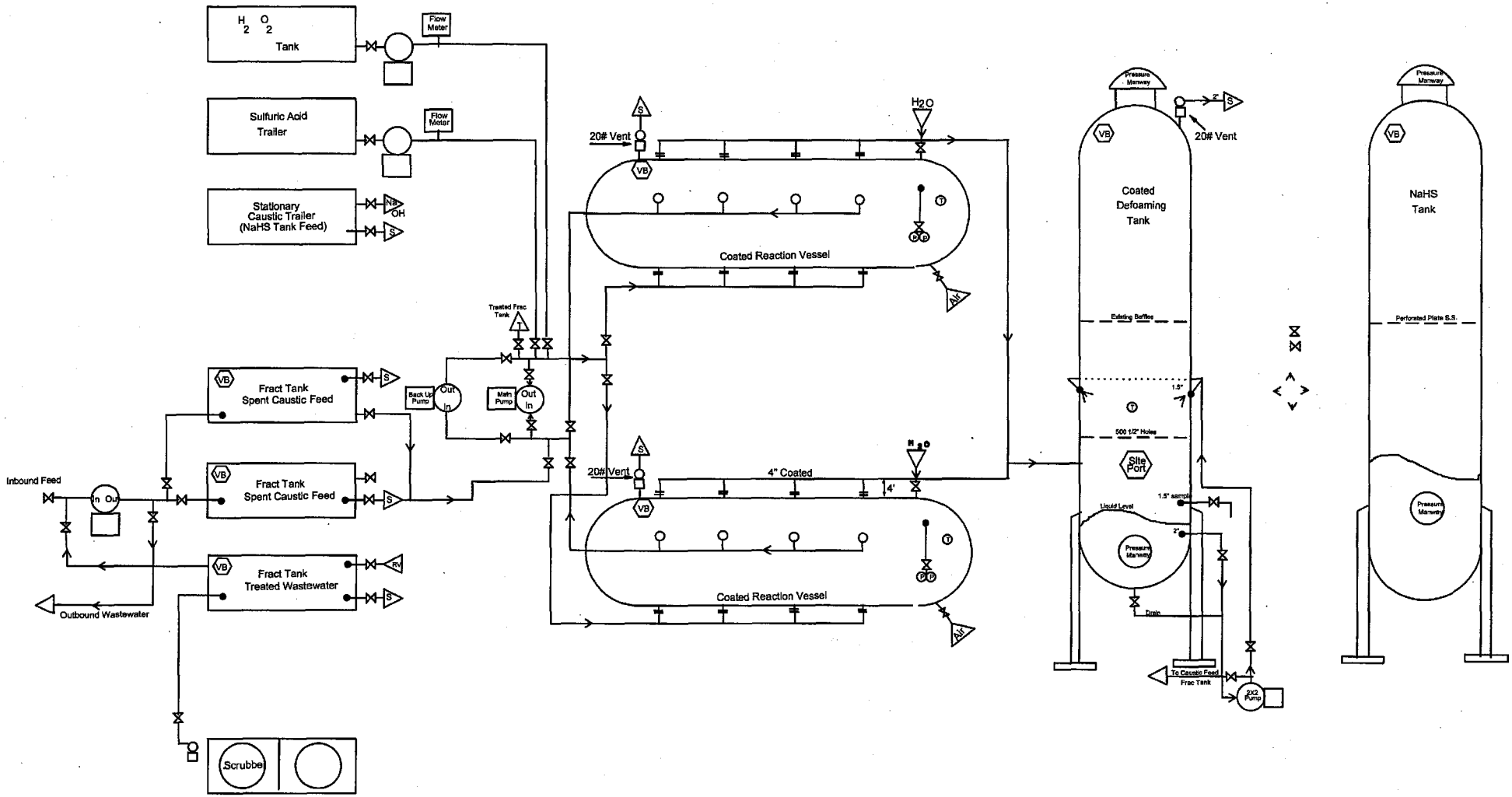

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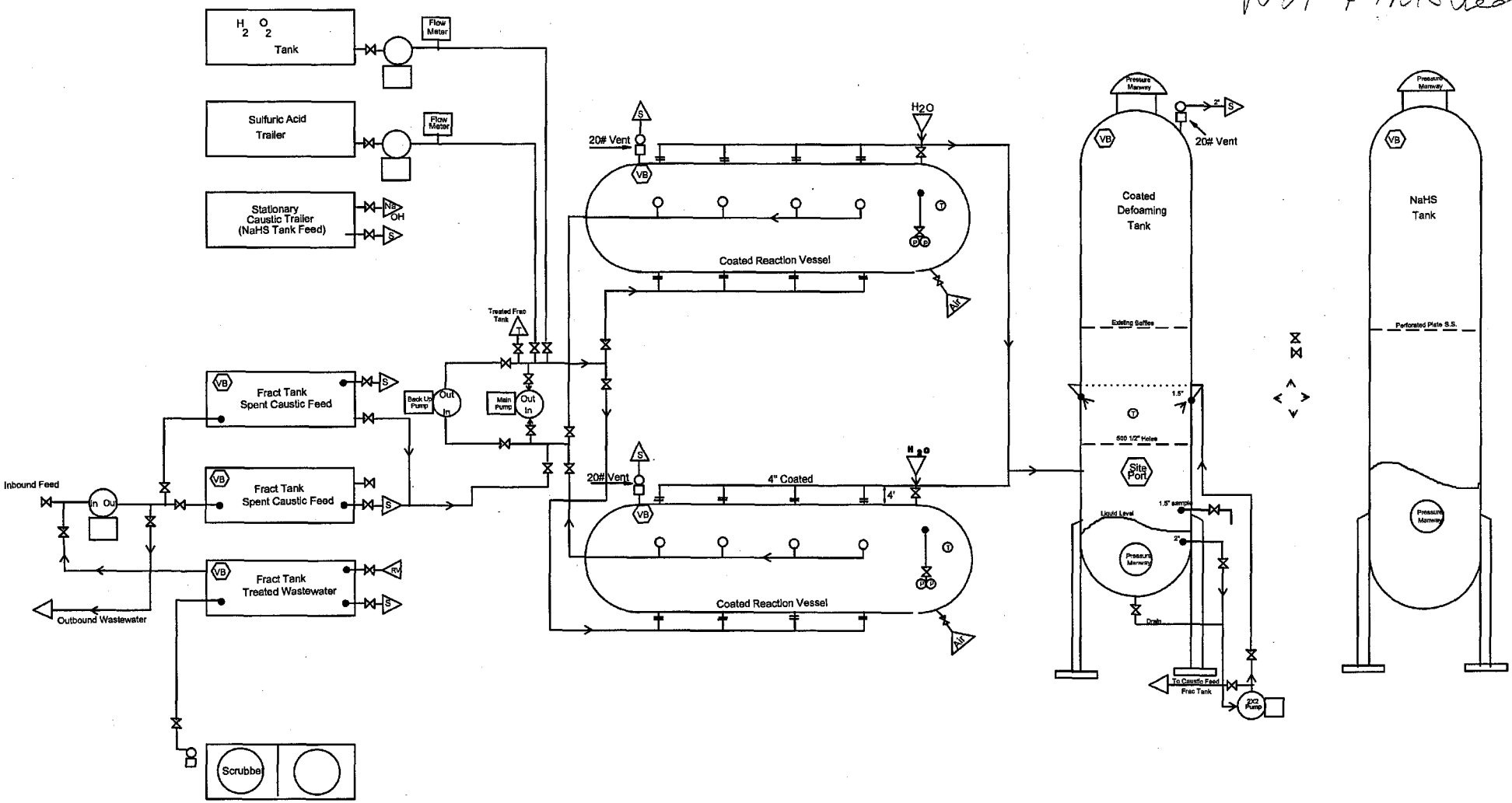


EPAPA00800445

location	tanks in gals.	cost	vendor	cost	pipe size		
Sulfidic Caustic Sig treatment tanks	Hercules 130"x71' 2- 45's		Hercules		6" flanges, 4" sch 80 pipe, 4" ball valves , 10 manways		
knock out pot	5K partial Amerigas 12		Amerigas		2" pipe, fittings, 3/4" pipe and fittings, 2 manways		
nash tank	2.6k's 12		Amerigas				
scrubber							
acid tank							
caustic tank							
Wastewater	39K ~~[illegible]~~ 2FRACS		~~Hercules~~				

Phenolic 22.5 Process | Hercules

Napthinic 30K processing | Hoot

Napthinic 30K processing | Hoot

~~[illegible]~~ 2 FRACS → - blend Evedale High Strength caustic ~~[illegible]~~ - HERCULES

8K - Napthinic oil ??

C

~~50,000~~

50,000.00

3.14

9

PAL Lets

2,200

~~2,000.00~~

2-12 - Austin

2

5000

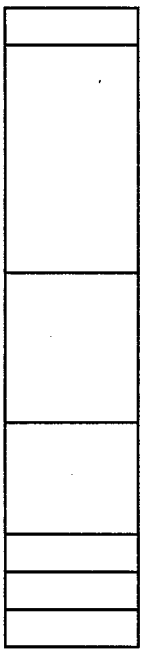
55K

location	Pumps	cost	vendor	cost
treatment tanks	2 4 x 6 treatment tank pumps	20,000.00	mcgraw	7,000
knock out pot	knock out pot recirc pump 2"	2,000	mcgraw	
nash tank	offload 3" caustic pump			
scrubber				
acid tank	small injection pump stainless	1,500.00		
caustic tank				
peroxide	use existing pump	0		
Napthini	Recirc Pump			

Napthini Recirc pump

pipe size		

location	instrumentation	cost	vendor	cost	pipe size	
treatment tanks	6 probes, 4 monitors, 2 temp gages, 6 vacuum, 6 pressure, 100# releif vent		chem aqua, grainger			
knock out pot	temp gages, 2 pressure, 2 vacuum, mag float		grainger			
nash tank	temp gages, 2 pressure, 2 vacuum,		grainger			
scrubber						
acid tank						
caustic tank						



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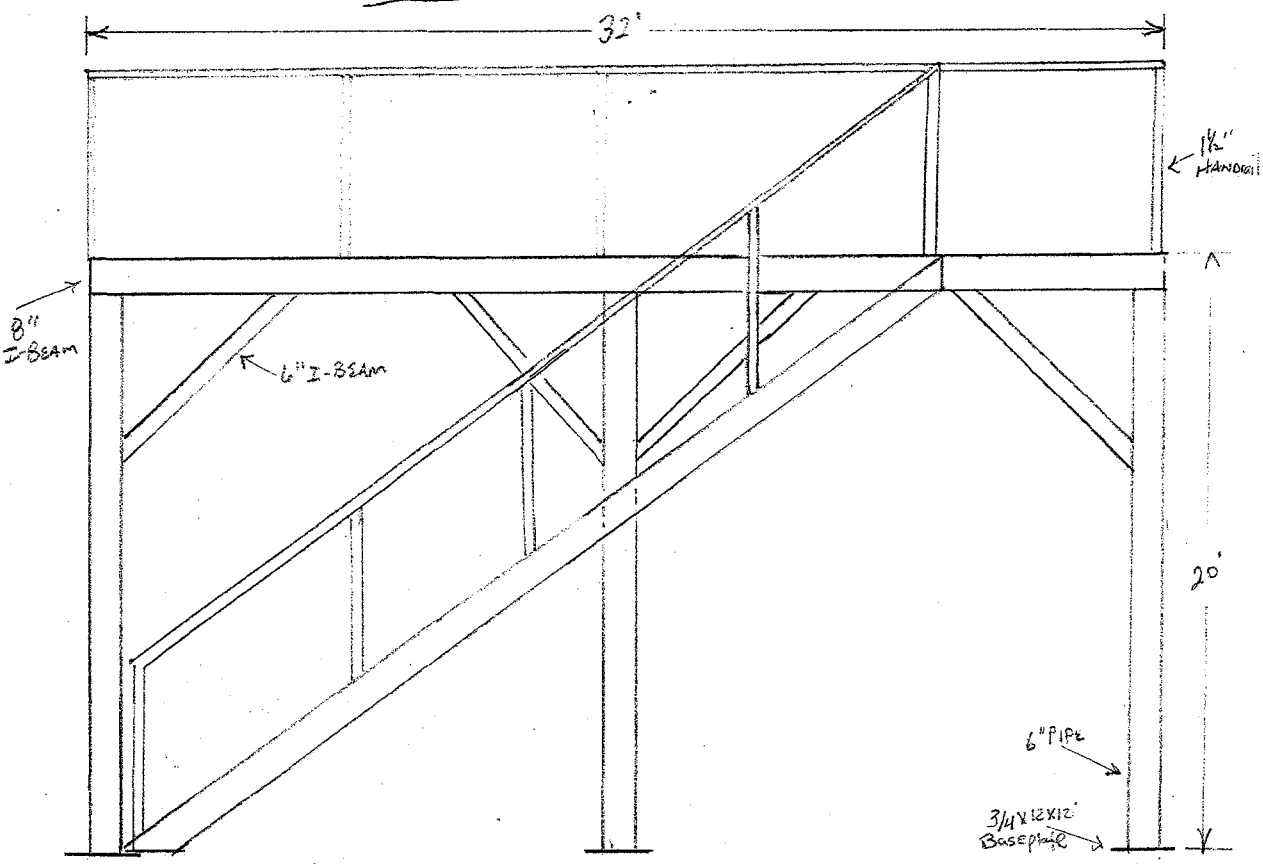

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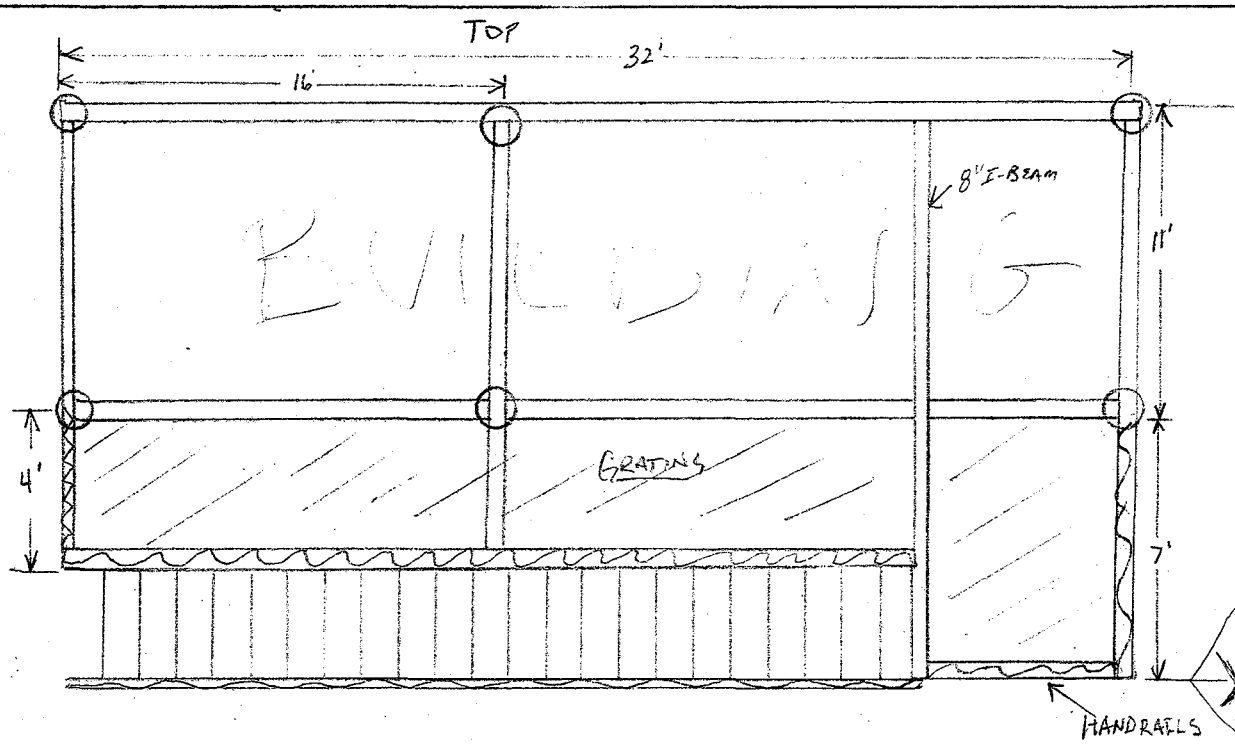

DRAWING NOT TO SCALE
FOR LABOR ESTIMATE ONLY
FINAL PRINT WILL BE PROVIDED

BW 5/20/08

EPAPA008000451

Construction Meeting

Key topics to review

- Control Room installation
  1. Construct platform and install ----------7,500.00
  2. Electrical hook up ----------2,000.00

     Total: 9,500.00

  Alternative – set up temporary Total: 2,000 (electrical)
- Centrifuge
  1. Purchase RA and have installed ---------- 60,000.00
  2. Install vfd and new motor ---------- 12,000.00
  3. Send RA to repair for back up ---------- 6,000.00
     (waiting on exact info and terms)

     Total: 80,000.00

  Alternative -----

  Shut down centrifuge for 2-3 weeks to repair 6,000.00
- Thermal Oxidizer
  1. rent 5,000cfm unit and scrub vital areas in back -- ?
  2. complete scrubber piping in warehouse -- 20,000.00 BEGIN CAVC credit card
  3. run duct work to back area from warehouse -- 15,000.00
  4. install gas meter and run gas to rental unit ---- 2,500.00

     total: 37,500.00

  Alternative ---- none

- Alternate site

1. Purchase tanks ----------180,000.00 terms
2. Vendors (pay off to receive 60 day terms) 50,000.00 cash
3. Weekly labor payout for 2 months ----------120,000.00 cash
4. Office/ lab ---------- 25,000.00 terms
5. Electrical ---------- 50,000.00 terms
6. Forklift ---------- 12,000.00 terms
7. Crane ---------- 10,000.00 terms
8. Water/sewer ---------- 3,000.00 cash
9. Tank and line coating ---------- 50,000.00
10. Clean up/vac trucks ---------- 5,000.00

11. Pumps Total: 505,000.00

QUOTE MATERIALS - FOR MONDAY

Construction Meeting

Key topics to review

- Control Room installation
  1. Construct platform and install ----------7,500.00 BEGIN
  2. Electrical hook up ----------2,000.00

  Total: 9,500.00

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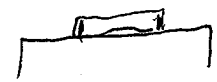
  6. Forklift ---------- 12,000.00 terms
  7. Crane ---------- 10,000.00 terms
  8. Water/sewer ---------- 3,000.00 cash
  9. Tank and line coating ---------- 50,000.00
  10. Clean up/vac trucks ---------- 5,000.00

  Total: 505,000.00

7K Each



~~- Caustic Treatment Unit — 40,000~~

- Boiler Install — 13,000 Complete
- Air Compressors Installs — 50,000 — Contractor
- SIB upgrades — 10,000 ← Maintain 5K
- Motor Oil Control Room — 30,000 — Contractor $
- Tank wash Tank — 3,000 — 2 Days

~~- Bulk Chemical storage tank — 15,000~~

#1 — SCRUBBER PIPING — 10K

— THERMAL OXIDIZERS — 5K

LAYOUT & PRICE - P.A. SIB Equipment

160,000

$ 210,000

OP CESSITE

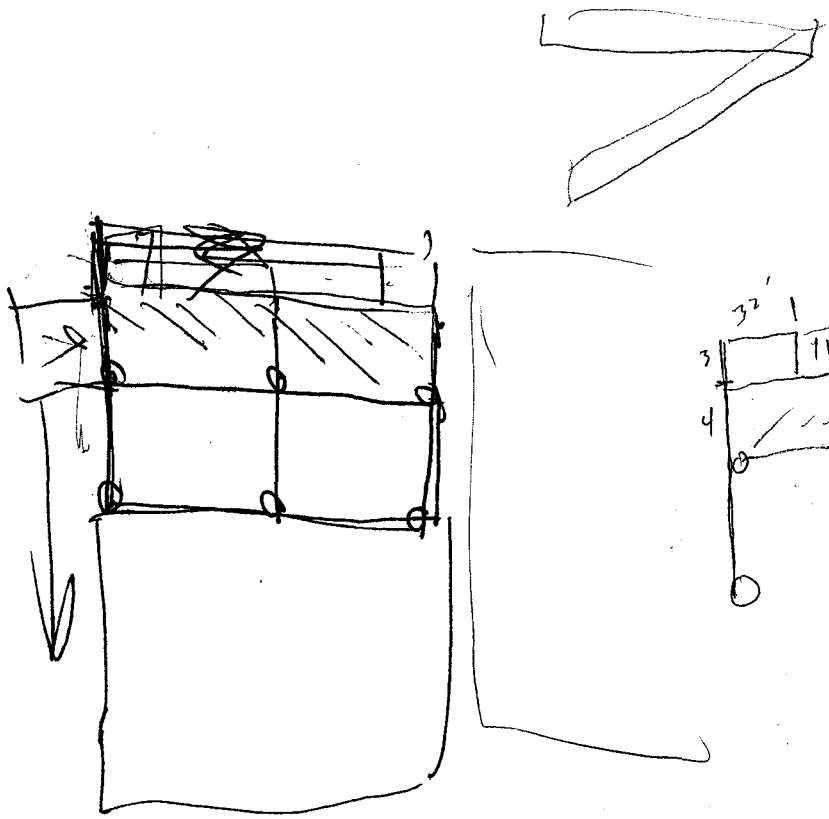
Brian 75/25

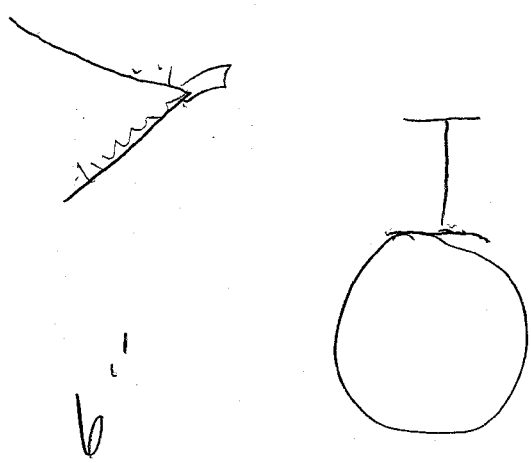
Rick 75/25

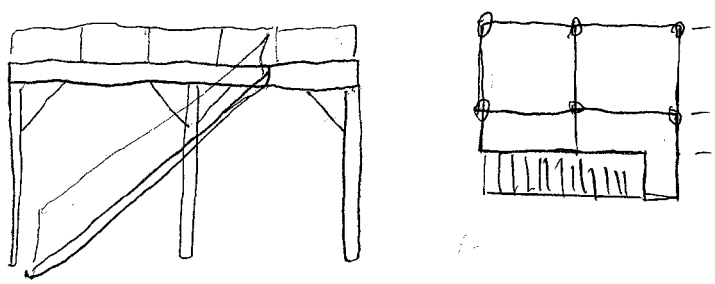
Steve 50 — 50% New CESite

Clint — 50% New CESSite
50% CESSite Houston

Brian Steve me Setup Labor For Projects
Meeting with Matt


3'
2'
3
4





date

project

page

CES Project Workforce Arrangements

CES Workforce	CESub Houston	CESOil Project	CESub PA
Clark			
Brian	25%	75%	
Steve		50%	50%
Rick	25%	75%	
Chad	50%		50%

task list:

DOYLE & ROTH MANUFACTURING CO. INC.
90 Broad Street 14th Floor
New York, NY 10004

PHONE: (212) 269 7840 FAX: (212) 248 4780
E-MAIL ADDRESS: DOYLEROTH@AOL.COM
WWW.DOYLEROTH.COM

Attn: James Pauley Jr.
LCI Corporation
Tel: (704) 398-7882
Email: JPauley@lcicorp.com

Quotation No: ME-4568
April 23, 2008

Ref: Email

We are pleased to offer the following for your approval:

Description

Equipment No: "Bayonet Heater"

One (1) D&R LL206U2-6H horizontal U-tube bundle with bonnet single pass shell Two (2) pass tubeside 304LSS tubeside construction with 304LSS baffle assembly suitable for a 20" O.D. X 3/8" thick shell containing 120-3/4" O.D. X #16 BWG SA-249 304LSS welded U-tubes 6'-0" straight length 253 sq. ft. surface 1" square pitch, design shell FV & 30 PSI @ 600°F, design tubes FV & 100 PSI @ 350°F tubeside connections Two (2) 3"-150# ANSI flanges complete with ASME stamp and partial U2 TEMA "C" configuration B-U.

QUOTATION

Price $21,257.00 NET FOB our plant, Simpson PA

Approximate shipping weight: 1,400 lbs

Drawing: 1-2 weeks after receipt of purchase order
Delivery: 10-12 weeks after receipt of approved drawings

Notes:

1. Outline drawing will be emailed shortly.
2. Bundle is designed suitable for 20"-150 ANSI bolting.
3. Due to extreme volatility of current metal markets, prices must be confirmed at time of order and delivery.
4. Unless otherwise requested hard copies will not be mailed.

Rohit V.Patel/jp
Vice President

This quotation is subject to the terms and conditions
Terms: ½%-10 Days, Net 30

PRICES QUOTED ARE FIRM FOR 30 DAYS and do not include any Municipal, County, State or Federal Sales, Excise or Use Taxes

DOYLE & ROTH MANUFACTURING CO. INC.
90 Broad Street 14th Floor
New York, NY 10004

PHONE: (212) 269 7840 FAX: (212) 248 4780
E-MAIL ADDRESS: DOYLEROTH@AOL.COM
WWW.DOYLEROTH.COM

5. Visit with us on the Internet @ www.DoyleRoth.com

CC: Fred Diestmann

QUOTATION

Rohit V.Patel/jp
Vice President

This quotation is subject to the terms and conditions
Terms: ½%-10 Days, Net 30

PRICES QUOTED ARE FIRM FOR 30 DAYS and do not include any Municipal, County, State or Federal Sales, Excise or Use Taxes

SUMMARY

Scrubber Pipe in Warehouse - 22,500 Materials
SIB Mixer TODAY —
Tankwash Tank —
Centrifuge —
P.A — LASER 15K wk
Thermal oxidizer —

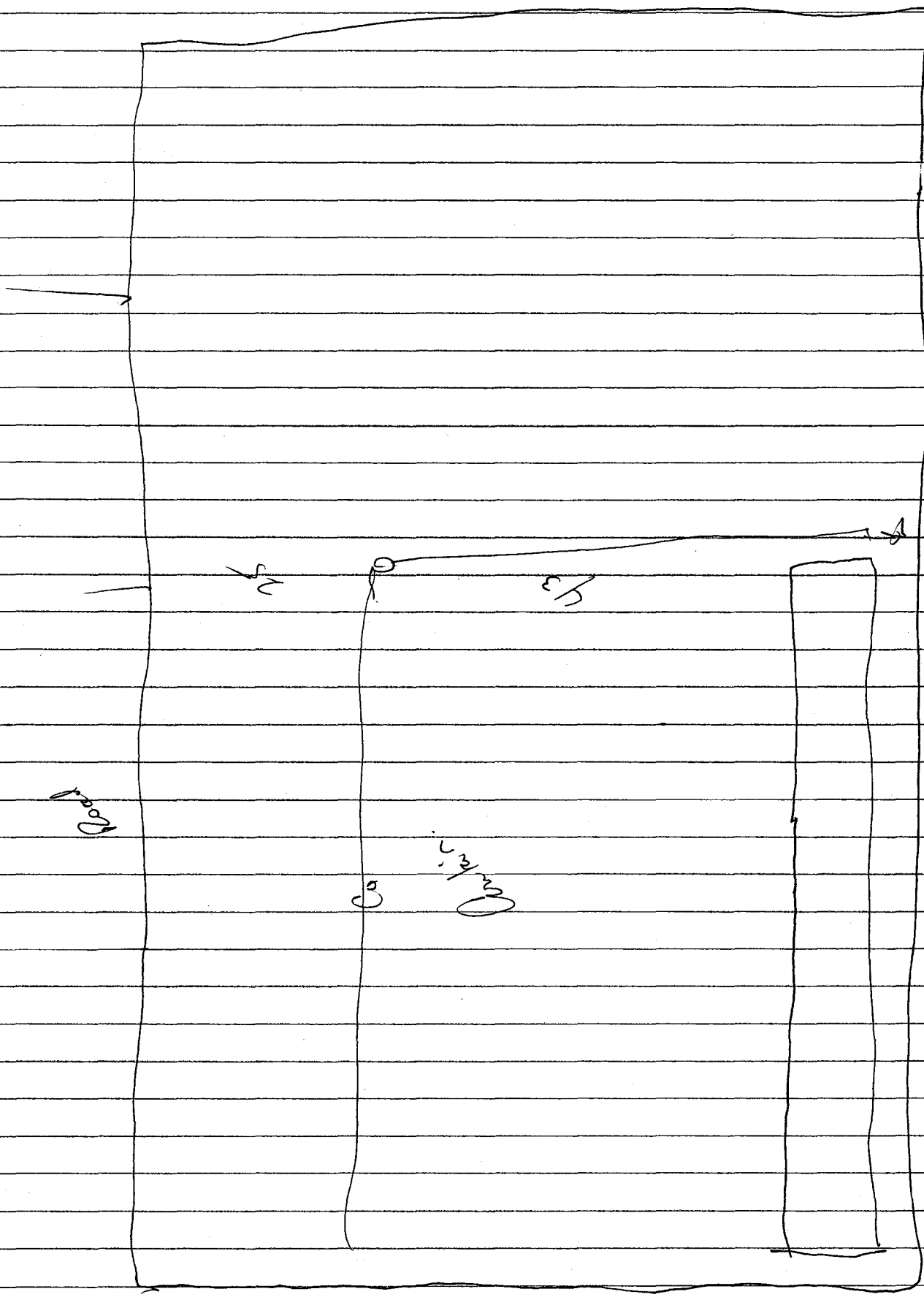
START Control Room 6/3/08 → Complete 6/9
FIND Nash tank & Knockout Pot 14K
Bullet Marks - Nash tank →
Knock-out Pot 6000 gal. 7,500
START Work on Warehouse piping -

46 -
39 -
39 -
41 -
41 -
25 -
25 -
25 - 281

60,68
37

11,240
480 -
976

12,696 lbs
3075



PRICE ALL PIPING & MAKE-READY FOR THERMAL OXIDIZER

Electrical - Overhead

PIPING for Thermal Oxidizer

TIMES - DATES - Budgetary #'s

RECIRC System

EPAPA008000464

Caustic Treatment System

Nash Tank

- Install legs
- Install manway on side
- Install manway on top
- Install stainless 2" diffuser piping inside
- Install 3 2" couplings on top – Scrubber/caustic loading/water addition
- Scrubber is 2" cpvc/caustic is 2" cpvc/water is 1" carbon steel
- Install ¾" vac/pressure piping, valve, and gages
- Install 4" bottom flange with 90 and carbon steel valve
- Install sample port
- Install flow meter on water inlet
- Install thermowell and thermocouple and temp gage 3/4" coupling
- Install 2" carbon steel valves on each diffuser lines
- Install y-strainers and unions on each diffuser lines
- Run 2" carbon steel lines to pumps
- Install valves at discharge of pumps
- Plumb pumps into filter box (2 part-divided)
- Plumb out of box with valves and tee into existing 3" line
- Pipe in ¾" air line and add regulators and control valves for pumps
- Install piping for caustic discharge from both nash tanks
- Install diffuser plates

Treatment tank

- Install pump and 440 3ph power under tank 11
- Saddle bottom discharge, valve, and plumb to suction side of pump 3"
- Plumb discharge valve of pump and saddle to existing fill line of tank
- Install (3) 1" injection couplings on discharge piping
- Install flow probes in couplings-acid ½"/peroxide 1/2"/ Ferric Chloride 1"
- All 3 lines to be cpvc and run under catwalk to pump area
- Lines will plumb to discharge side of new pumps and pumps will suction from existing discharge piping. Check valves will be installed on discharge side of pumps
- ¾" air line to be supplied from plant air to regulators on tank
- Tubing to be ran from regulators to pump area
- All piping needs to have valves at tie in
- Flow meters are to be calibrated and installed on tank
- Ph probes to be installed with freshwater flushes. ¾" water line will need to be installed
- Ph monitors to be installed on tank
- ¾ " carbon steel line to be installed for vacuum/pressure gages
- ¾" thermocouple installed with temp gage
- Manway to be installed on side and on top
- Install conservation bleeder vent with 4" flange on top of tank. This will be plumbed to the existing sib scrubber line using 2" cpvc
- Evaluate bottom sludge piping for possible modification

Pump area

- install new acid, ferric, and peroxide pumps
- plumb as explained above

Main components to purchase immediately

- conservation bleeder vent
- diffusers
- 4 flowmeters 1",1",1/2", ½"
- 2 ph monitors and probes
- 3 x 3 pump with 7.5 hp motor
- 3 regulators
- 2- ½" pumps aod
- 1- 1" pump aod
- Nash tank and diffuser plates
- 2 vapor pumps 2" flap aod

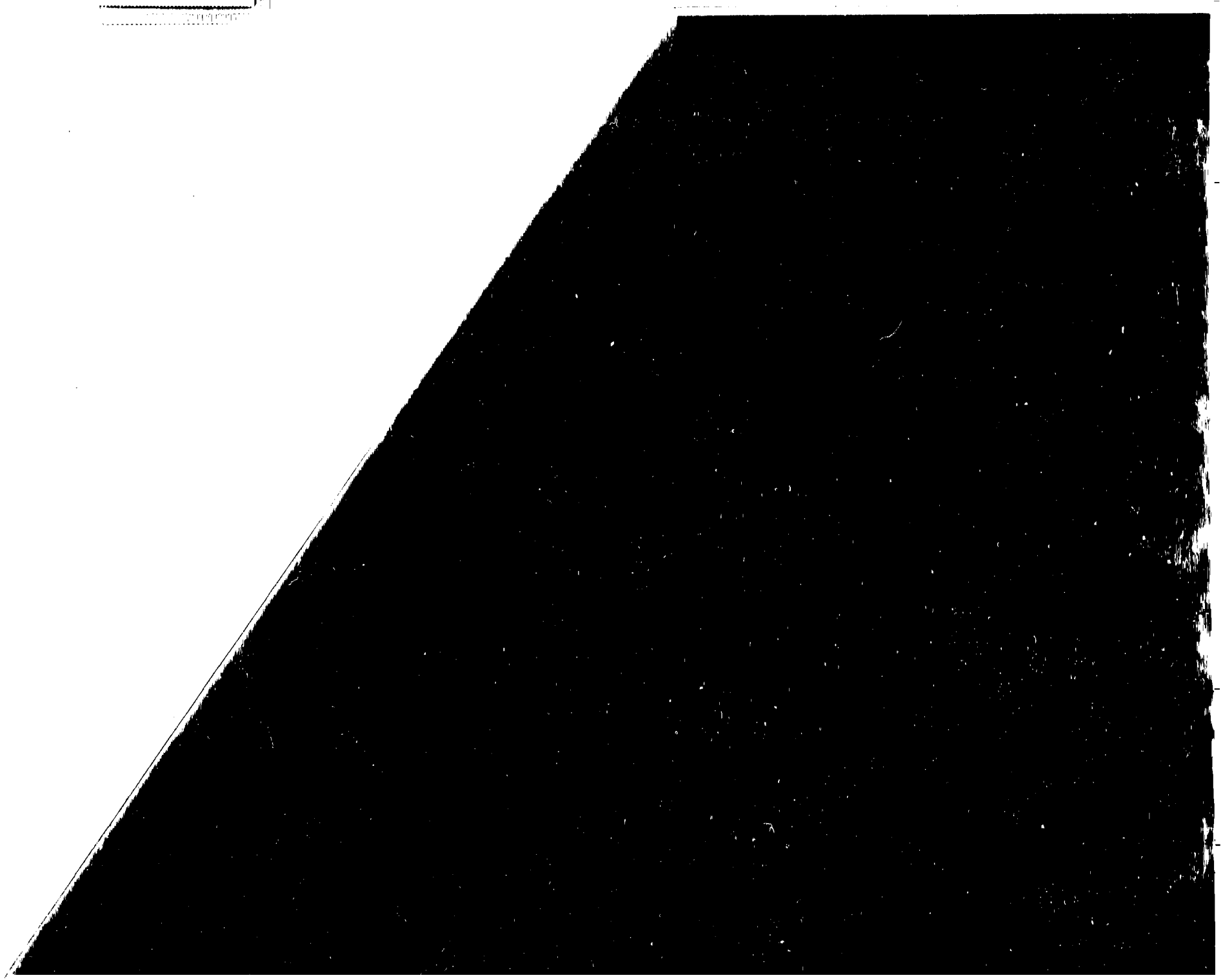
CAUSTIC
TREATMENT
TANK

EPAPA008000468

~~ORDER PH PROBES~~ – RECIRC System

Wilden
~~ARO~~ A2P
1/2" –
1/4" –
Air Lines
Sygef Pipe
Welding Machine
~~Gas~~ Regulators

WAREHOUSE
SCRUBBER PIPE



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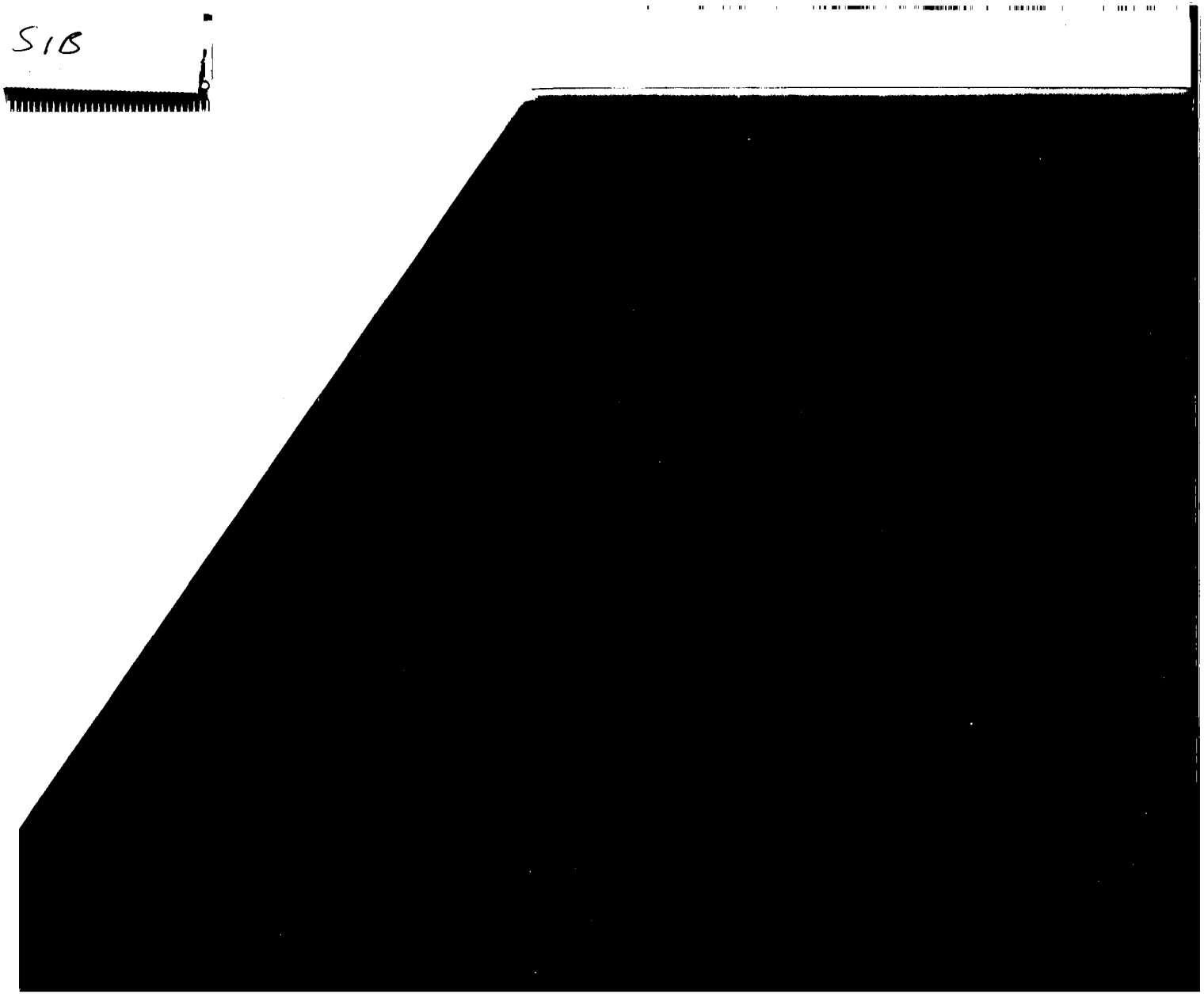
WARE HOUSE
SCRUBBER PIPE

EPAPA008000471

S16



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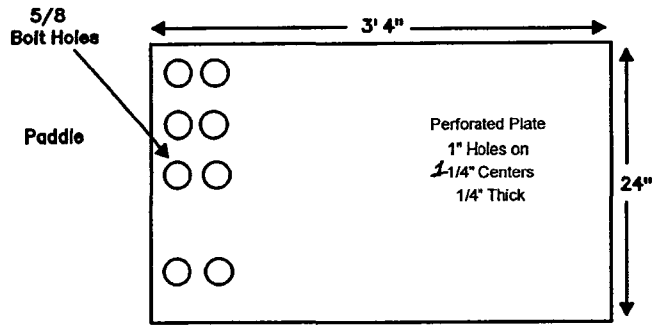
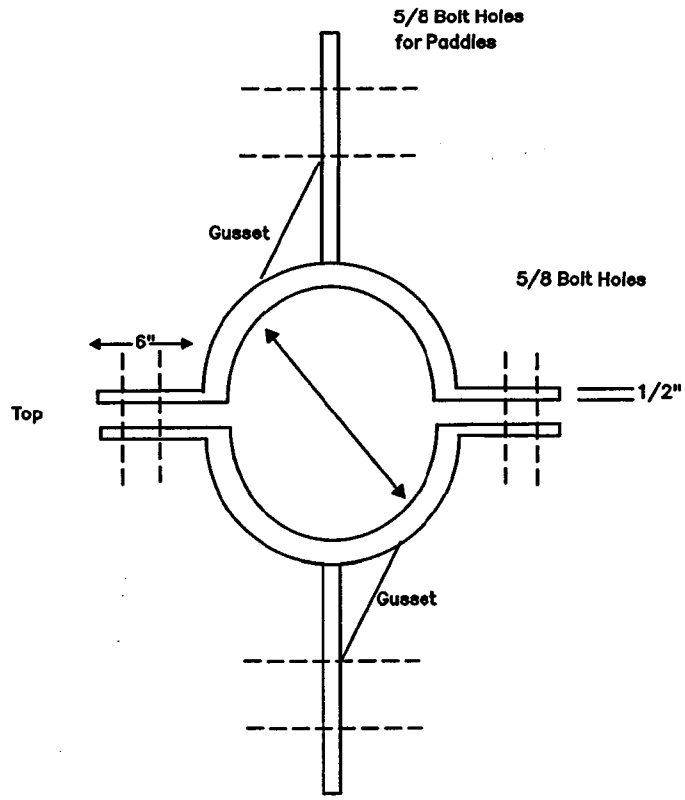
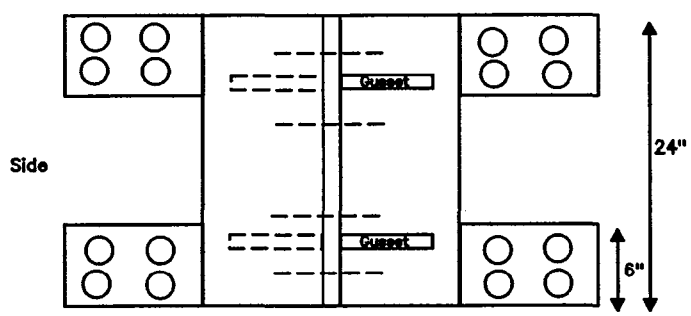




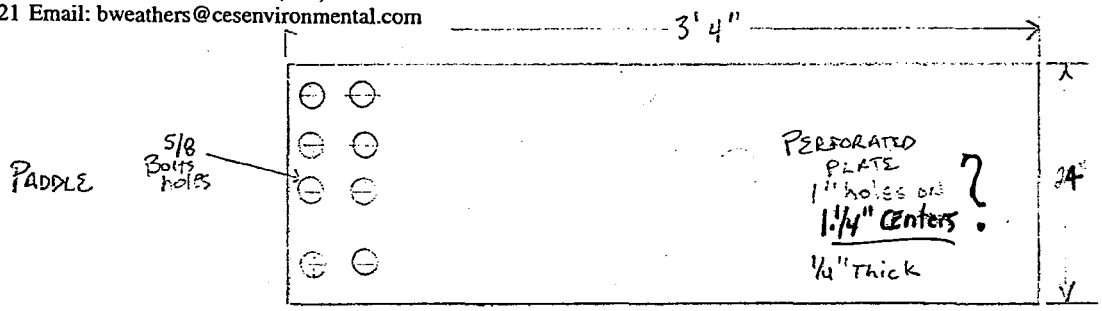


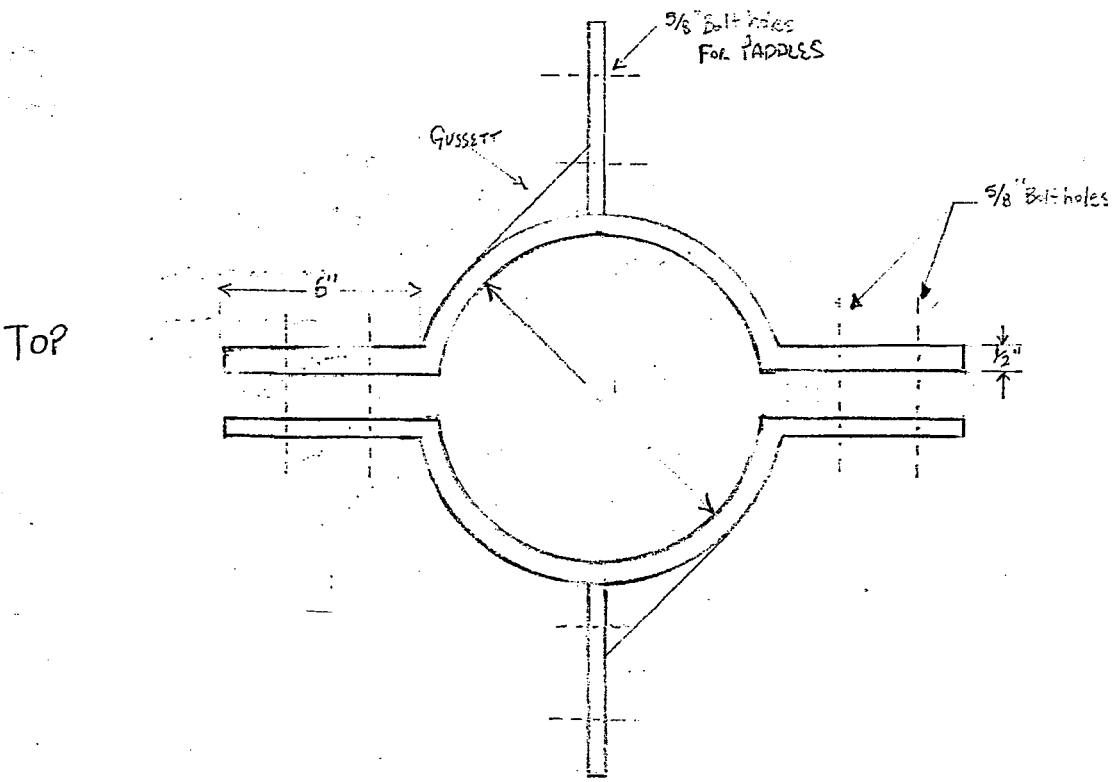
CES Environmental Services, Inc
SIB Caustic Mixer Paddle
BW/cm
May 20, 2008

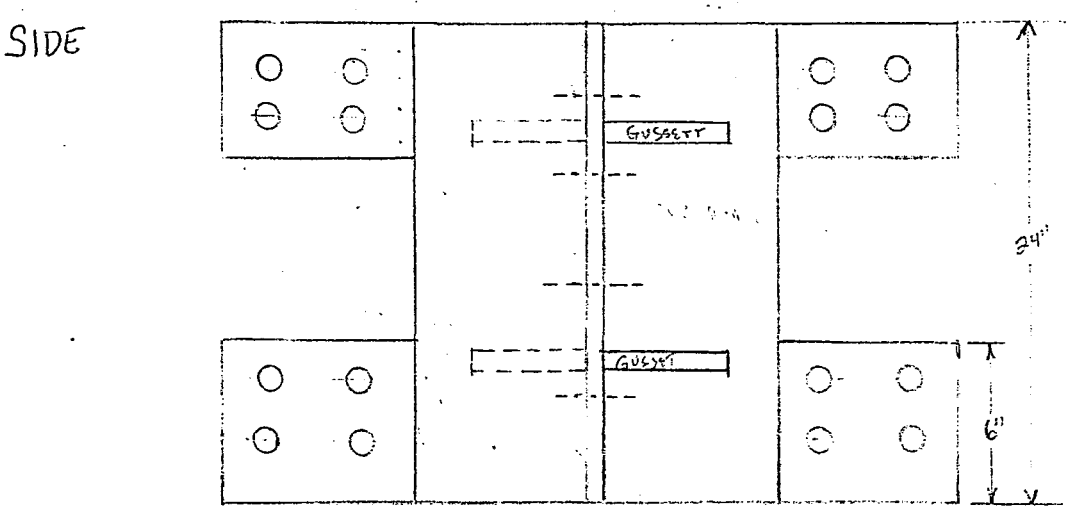
CES Environmental Services, Inc.

Brian Weathers
Maintenance and Inventory Supervisor

Office: (713) 676-1460
Fax: (713) 676-1676
Mobile: (713) 306-9804
4 Griggs Rd.
ıston, TX 77021 Email: bweathers@cesenvironmental.com

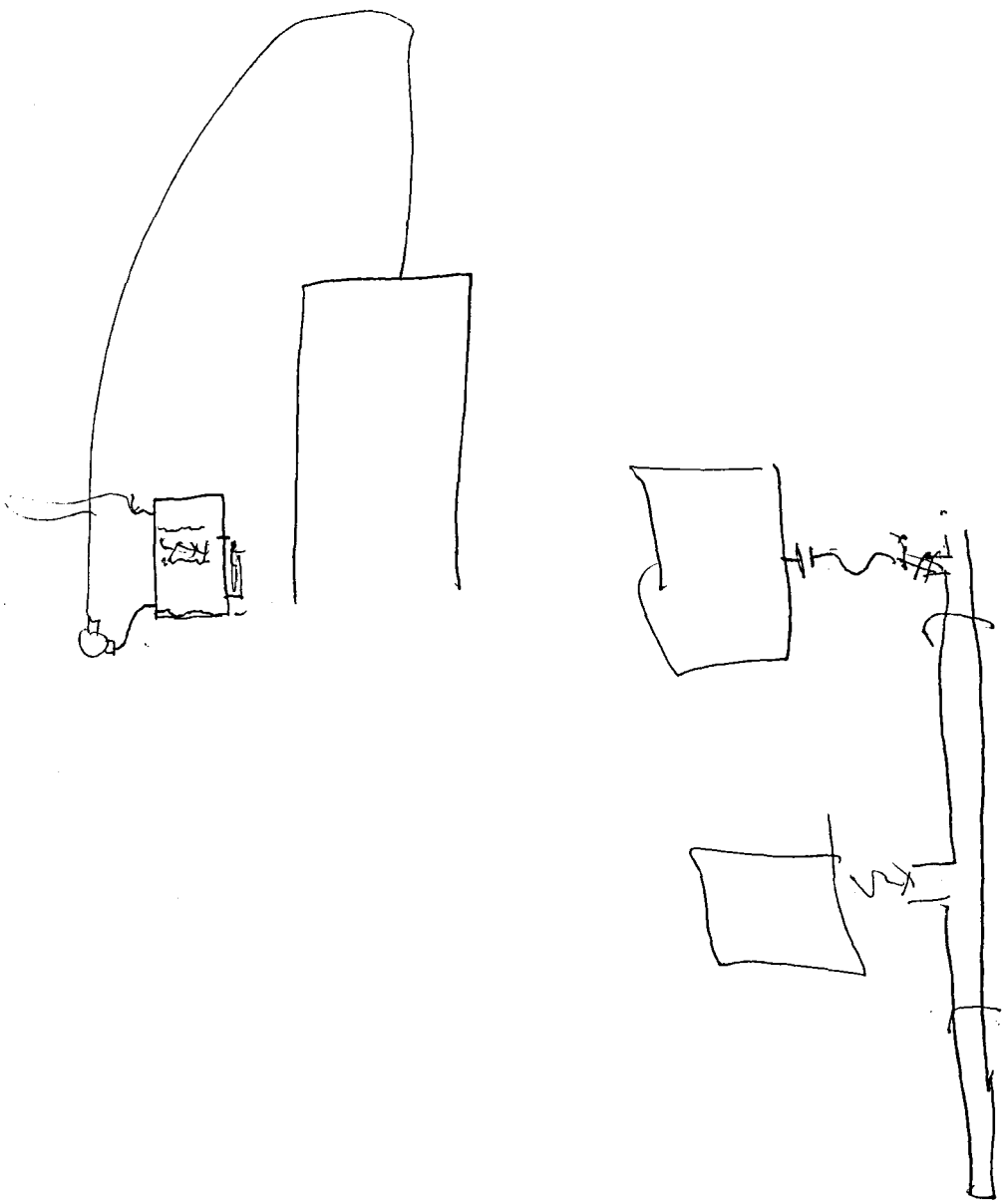






5% Hydrochloric solution
ask Miles

JAMES - SOLVENT



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Delivering Solutions You Trust
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Chemical Compatability

Revise original search

Chemical Compatibility
Conversion Factors and Tech Data
Technical Glossary
Reference Sites
Regulatory Agencies and Approvals

Top 5 Tech Tools:

- Conductivity Theory and Technical Tips
- Flowmeter FAQs
- High Viscosity Flowmeters: Solution to a Sticky Problem
- Peristaltic Pumps—Matching the Tubing to the Fluid
- pH Measurement FAQs

Chemical Selected **Hydrogen Sulfide (aqua)**

See our selection of Hydrogen Sulfide (aqua)

Materials and their compatibility with your selected chemical are listed below:

Material	Compatibility
304 stainless steel	C-Fair
316 stainless steel	A-Excellent
ABS plastic	B-Good
Acetal (Delrinr)	C-Fair
Aluminum	B-Good
Brass	N/A
Bronze	A-Excellent
Buna N (Nitrile)	D-Severe Effect
Carbon graphite	A-Excellent
Carbon Steel	D-Severe Effect
Carpenter 20	D-Severe Effect
Cast iron	D-Severe Effect
Ceramic Al203	A-Excellent
Ceramic magnet	A-Excellent
ChemRaz (FFKM)	A-Excellent
Copper	N/A
CPVC	A-Excellent
EPDM	B-Good
Epoxy	A-Excellent
Fluorocarbon (FKM)	D-Severe Effect
Hastelloy-Cr	A-Excellent
Hypalonr	D-Severe Effect
Hytrelr	N/A
Kalrez	A-Excellent
Kel-Fr	A-Excellent
LDPE	A-Excellent
Natural rubber	C-Fair
Neoprene	A-Excellent
NORYLr	A-Excellent
Nylon	C-Fair
Polycarbonate	A-Excellent

Polycarbonate	A-Excellent
Polyetherether Ketone (PEEK)	A-Excellent
Polypropylene	A-Excellent
Polyurethane	D-Severe Effect
PPS (Ryton®)	A-Excellent
PTFE	A-Excellent
PVC	B-Good
PVDF (Kynar®)	A-Excellent
Silicone	C-Fair
Titanium	B-Good
Tygonr	A-Excellent
Vitonr	D-Severe Effect

Explanation of Footnotes
1. Satisfactory to 72°F (22° C)
2. Satisfactory to 120°F (48° C)

Ratings -- Chemical Effect
A = Excellent.
B = Good -- Minor Effect, slight corrosion or discoloration.
C = Fair -- Moderate Effect, not recommended
for continuous use. Softening, loss of strength,
swelling may occur.
D = Severe Effect, not recommended for **ANY** use.
N/A = Information Not Available.

Find the
perfect product
and
chemical compatibility

Try these Parametric searches:

- Flowmeter
- Tubing
- Masterflex Tubing
- Masterflex Pump
- Positive displacement Pumps
- Centrifuge Pump
- Valve

DANGER!

Variations in chemical behavior during handling due to factors such as temperature, pressure, and concentration can cause equipment to fail,
even though it passed an initial test.
SERIOUS INJURY MAY RESULT
Use suitable guards and/or personal protection when handling chemicals

WARNING!

The information in this chart has been supplied to Cole-Parmer by other reputable sources and is to be used **ONLY** as a guide in selecting equipment for appropriate chemical compatibility.
Before permanent installation, test the equipment with the chemicals and under the specific conditions of your application.

Ratings of chemical behavior listed in this chart apply to a 48-hr exposure period; Cole-Parmer has no knowledge of possible effects beyond this period.
Cole-Parmer does not warrant (neither express or implied) that the information in this chart is accurate or complete or that any material is suitable for any purpose.

Search Again

EPAPA008000477

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Chemical Compatibility
Conversion Factors and Tech Data
Technical Glossary
Reference Sites
Regulatory Agencies and Approvals

Top 5 Tech Tools:

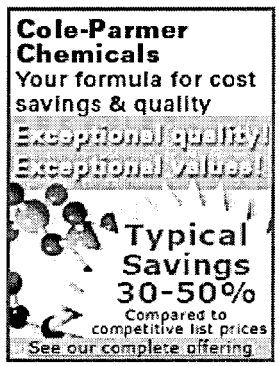
- Conductivity Theory and Technical Tips
- Flowmeter FAQs
- High Viscosity Flowmeters: Solution to a Sticky Problem
- Peristaltic Pumps—Matching the Tubing to the Fluid
- pH Measurement FAQs

Chemical Selected **Hydrogen Sulfide (dry)**

See our selection of Hydrogen Sulfide (dry)

Materials and their compatibility with your selected chemical are listed below:

Material	Compatibility
304 stainless steel	C-Fair
316 stainless steel	A-Excellent
ABS plastic	N/A
Acetal (Delrinr)	N/A
Aluminum	B-Good
Brass	D-Severe Effect
Bronze	B-Good
Buna N (Nitrile)	D-Severe Effect
Carbon graphite	A-Excellent
Carbon Steel	D-Severe Effect
Carpenter 20	D-Severe Effect
Cast iron	D-Severe Effect
Ceramic Al203	N/A
Ceramic magnet	N/A
ChemRaz (FFKM)	A-Excellent
Copper	D-Severe Effect
CPVC	A-Excellent
EPDM	B-Good
Epoxy	A-Excellent
Fluorocarbon (FKM)	D-Severe Effect
Hastelloy-Cr	A-Excellent
Hypalonr	B-Good
Hytrelr	A-Excellent
Kalrez	A-Excellent
Kel-Fr	B-Good
LDPE	A-Excellent
Natural rubber	C-Fair
Neoprene	A-Excellent
NORYLr	N/A
Nylon	C-Fair
Polycarbonate	N/A



EPAPA008000478

Polycarbonate	N/A
Polyetherether Ketone (PEEK)	A-Excellent
Polypropylene	A-Excellent
Polyurethane	A-Excellent
PPS (Ryton®)	A-Excellent
PTFE	A-Excellent
PVC	A-Excellent
PVDF (Kynar®)	A-Excellent
Silicone	C-Fair
Titanium	A-Excellent
Tygonr	D-Severe Effect
Vitonr	D-Severe Effect

Explanation of Footnotes
1. Satisfactory to 72°F (22° C)
2. Satisfactory to 120°F (48° C)

Ratings -- Chemical Effect
A = Excellent.
B = Good -- Minor Effect, slight corrosion or discoloration.
C = Fair -- Moderate Effect, not recommended for continuous use. Softening, loss of strength, swelling may occur.
D = Severe Effect, not recommended for **ANY** use.
N/A = Information Not Available.

Find the **perfect product** and **chemical compatibility**

Try these Parametric searches:

- Flowmeter
- Tubing
- Masterflex Tubing
- Masterflex Pump
- Positive displacement Pumps
- Centrifuge Pump
- Valve

DANGER!

Variations in chemical behavior during handling due to factors such as temperature, pressure, and concentration can cause equipment to fail, even though it passed an initial test.
SERIOUS INJURY MAY RESULT
Use suitable guards and/or personal protection when handling chemicals

WARNING!

The information in this chart has been supplied to Cole-Parmer by other reputable sources and is to be used **ONLY** as a guide in selecting equipment for appropriate chemical compatibility.
Before permanent installation, test the equipment with the chemicals and under the specific conditions of your application.

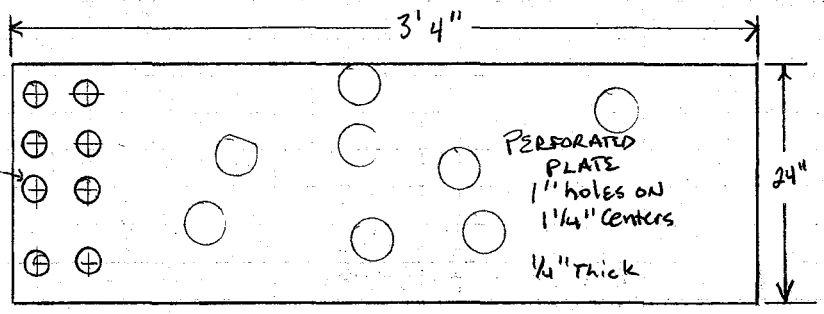
Ratings of chemical behavior listed in this chart apply to a 48-hr exposure period; Cole-Parmer has no knowledge of possible effects beyond this period.
Cole-Parmer does not warrant (neither express or implied) that the information in this chart is accurate or complete or that any material is suitable for any purpose.

Search Again

EPAPA008000479

BRIAN WEATHERS

PADDLE



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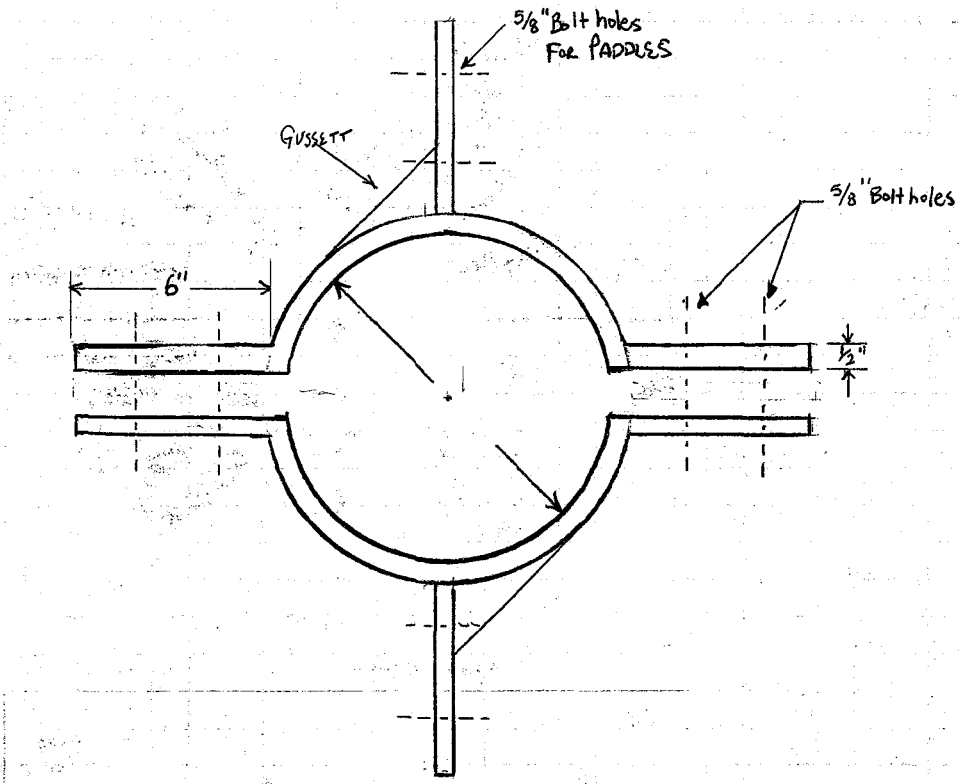

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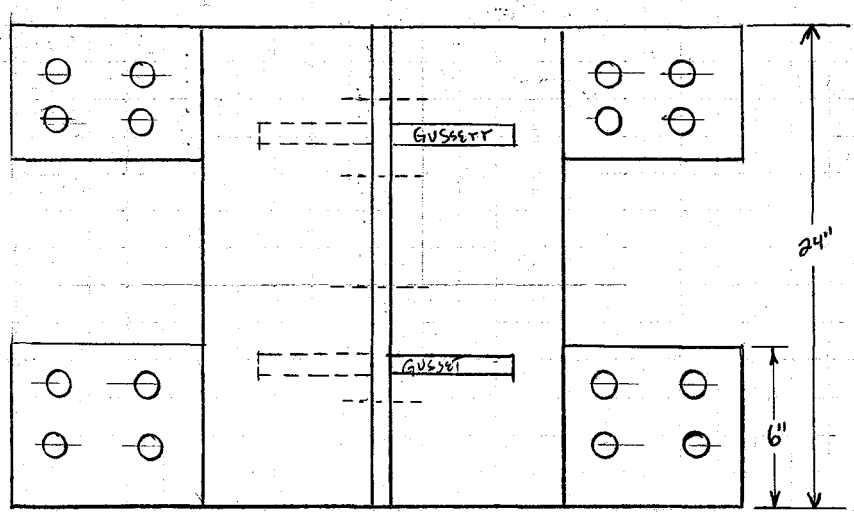
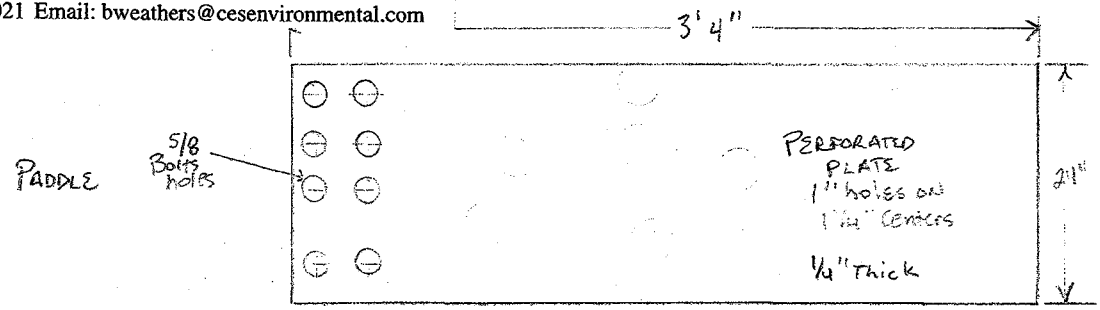


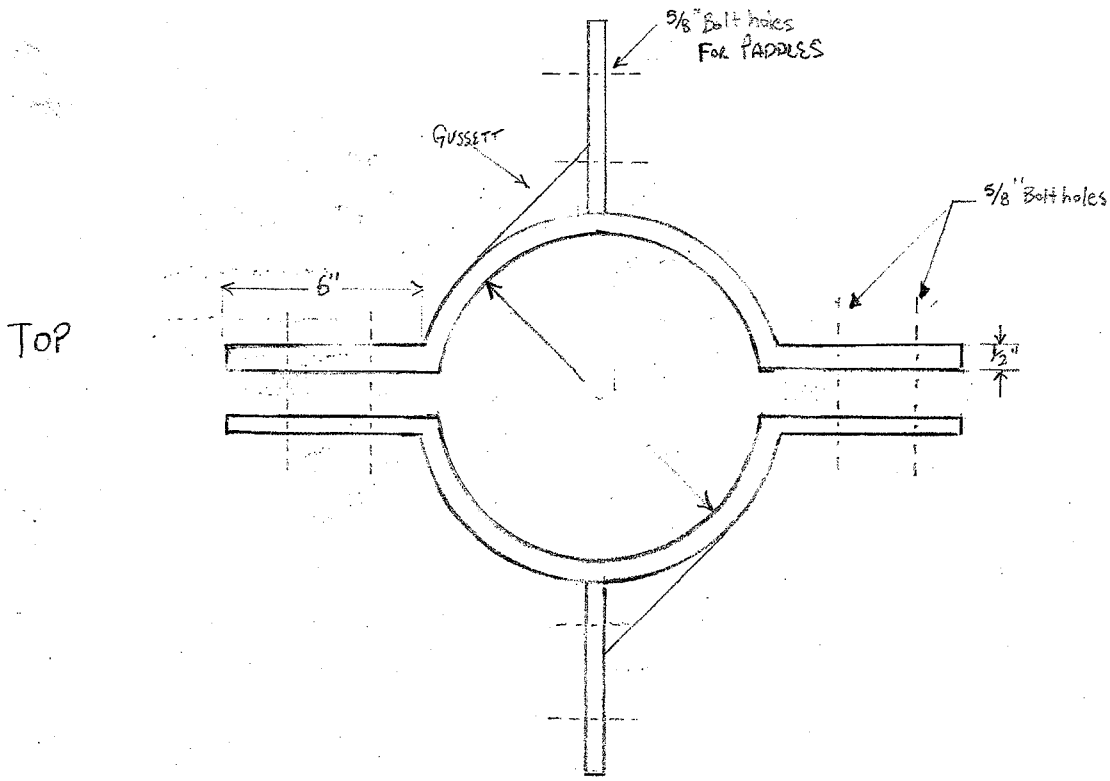
CES Environmental Services, Inc.

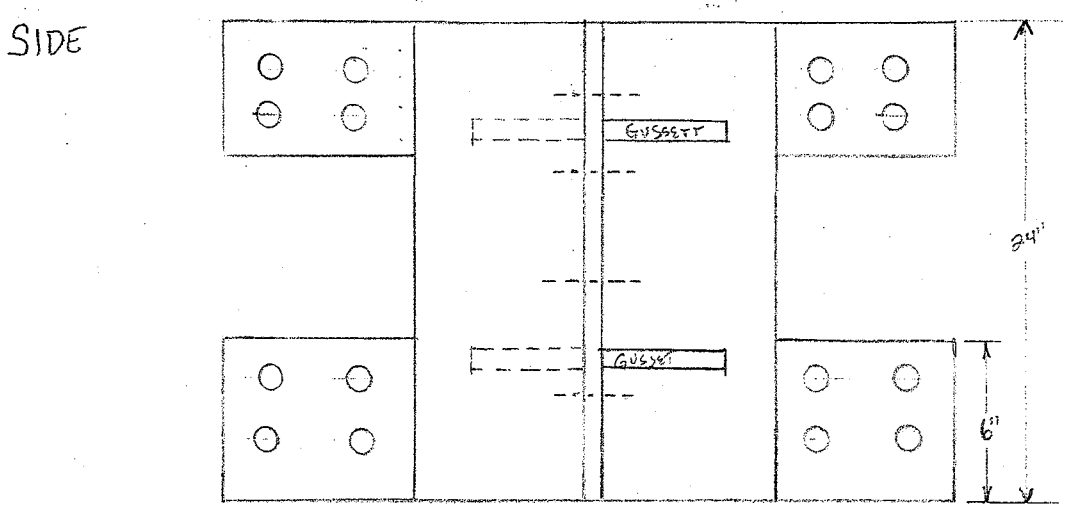
Brian Weathers
Maintenance and Inventory Supervisor

4904 Griggs Rd.
Houston, TX 77021

Office: (713) 676-1460
Fax: (713) 676-1676
Mobile: (713) 306-9804
Email: bweathers@cesenvironmental.com







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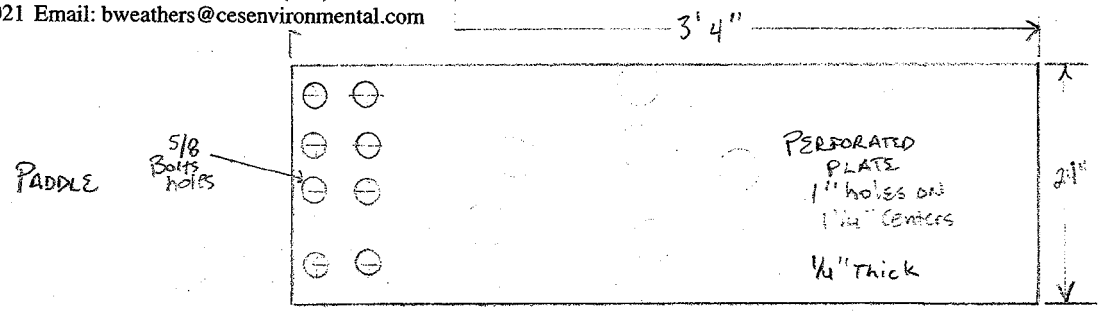
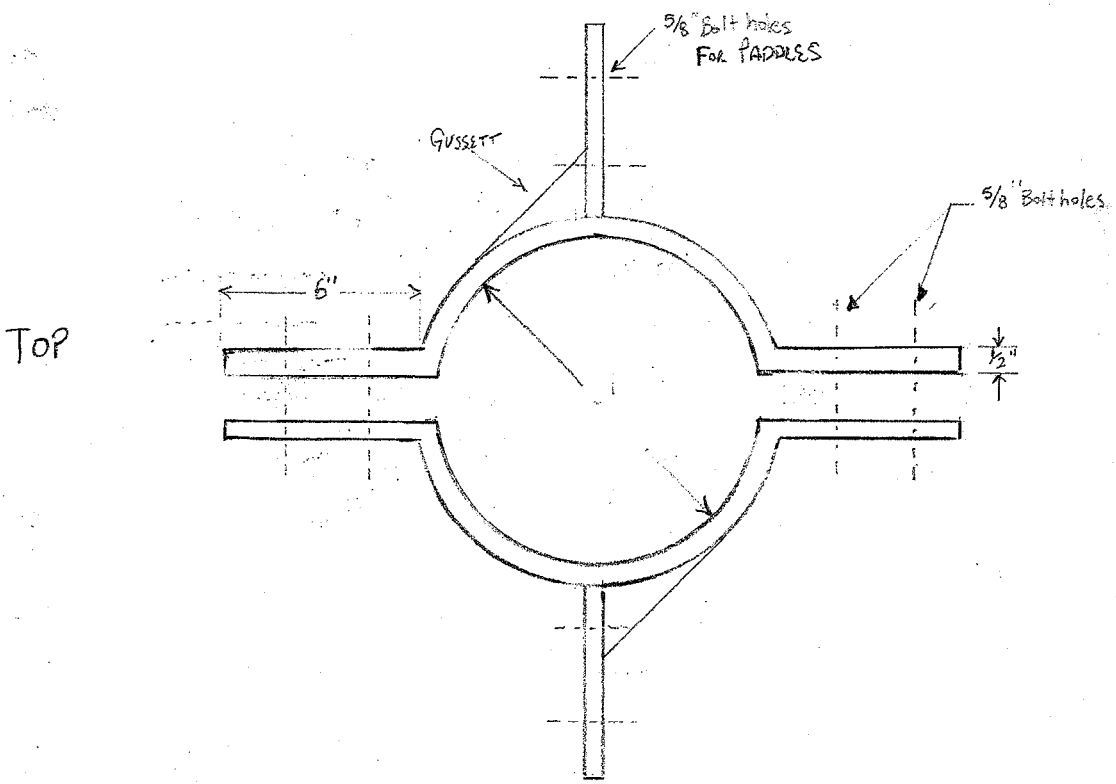
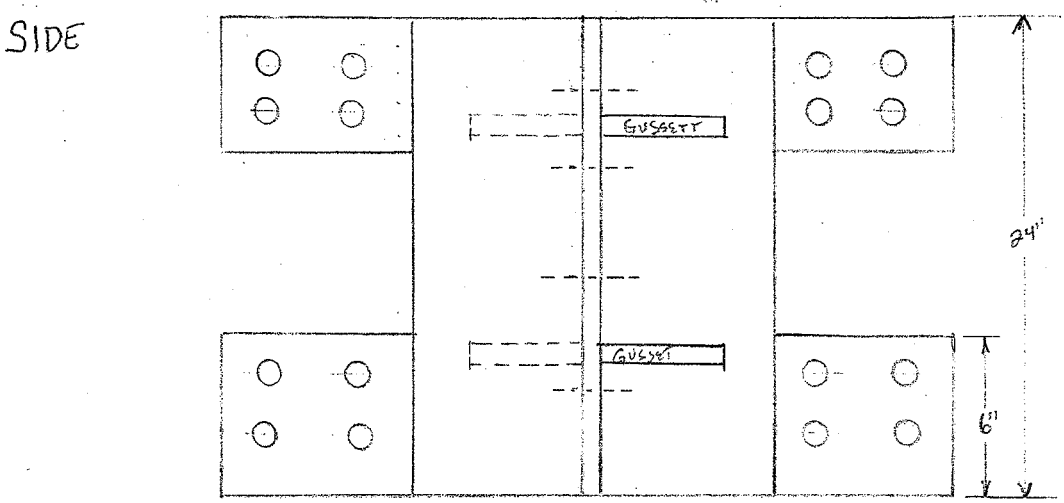






CONTROL ROOM

EPAPA008000483

RE: control room metal quote

coral@primarysteelproducts.com [coral@primarysteelproducts.com]

Sent: Tuesday, May 27, 2008 8:04 AM

To: Brian Weathers

$7592.90 total

Brian Weathers <bweathers@cesenvironmental.com> wrote:

> Coral, I can't remember if you gave me a quote on this. I think we talked about it, but I'm blank after that.
>
> **From:** Brian Weathers
> **Sent:** Friday, May 23, 2008 1:45 PM
> **To:** coral@primarysteelproducts.com
> **Subject:** control room metal quote
>
> 8- 8 x 8 wide flange I-beam
> 4- 10" c-purlin
> 3- grating 3' wide 1" serrated
> 2- 4" i-beam standard
> 10- 1 1/4" pipe sch 40
> 4- 2" angle iron

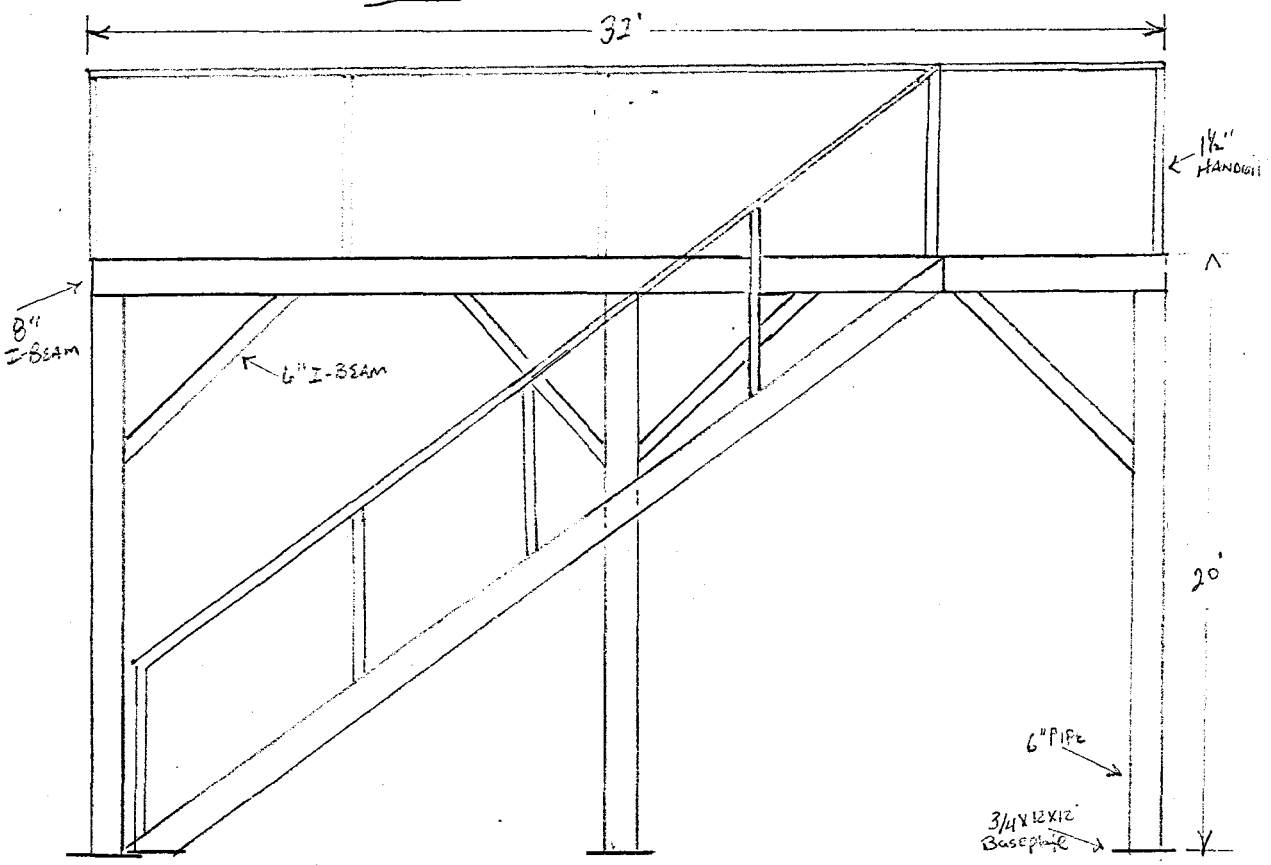
LABOR - 8,000.00

VALLEJO

Thank you,

Coral Moreno
Primary Steel Products
281-476-1718 Phone
281-476-1749 Fax

FRONT



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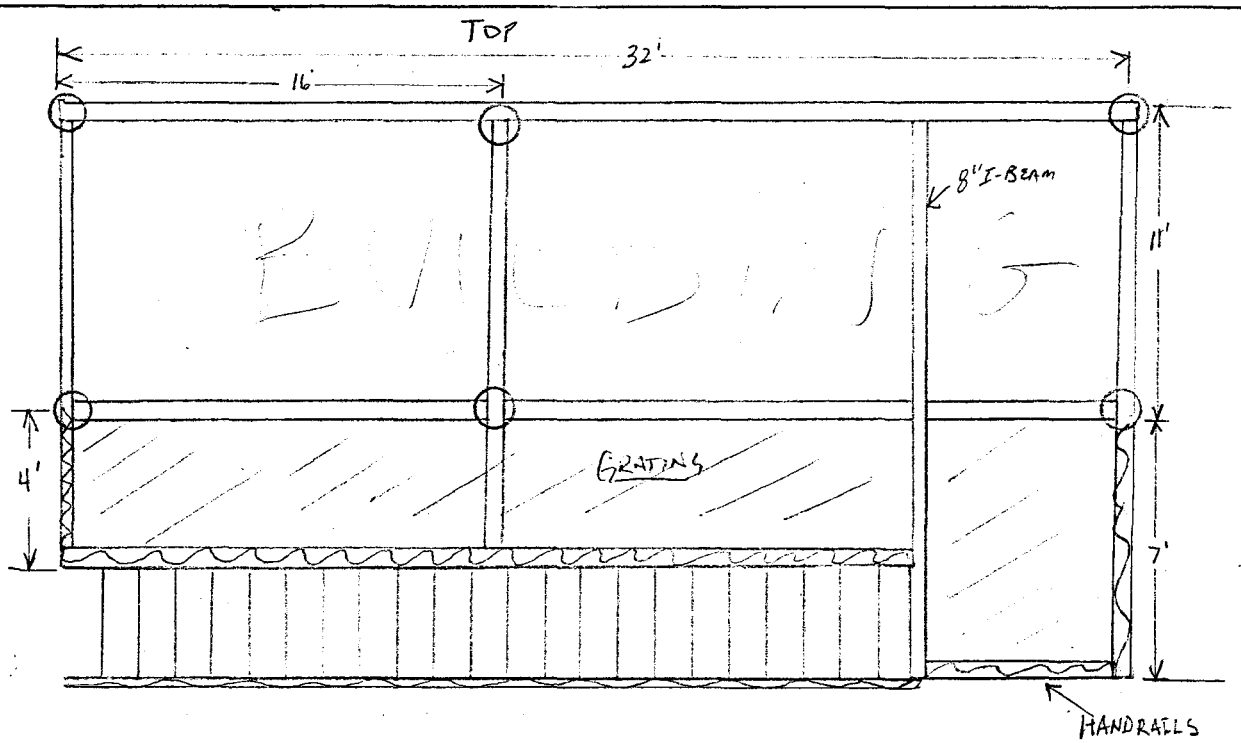


DRAWING NOT TO SCALE
FOR LABOR ESTIMATE ONLY
FINAL PRINT WILL BE PROVIDED

BW 5/20/08

EPAPA008000485

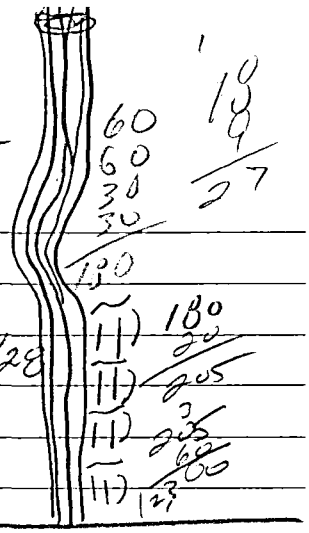
CSI → ~~201-430~~ - 9085

~~Ray Boyski~~ →

~~Boyski~~

TRACY - 145
Vallejo - 6,500
HOOT -

MATERIALS Delivered 5/28



60
60
30
30
180

18
9
27

180
20
205

205
60
00
123

OFFICE -	CASH -	20,000	
LAB -	CREDIT -	6,000	15K LABOR
ELECTRIC - LIGHTS & POWER	CREDIT/CASH -	50,000	LABOR -
Forklift -	—		
Crane -	Cash -	3,000	
TANKS -	CASH -	50,000	
Welding -	WEEKLY	15,000	WEEK 120k TOTAL
Pumps -	CREDIT w/20k cash PAID -	20,000	- FINANCE Rest
Material -	Credit w/20k cash paid -	15,000	Finance Rest
Water -		1,000	
Sewer -		1,000	
VAC trucks to clean -			
COAT TANKS		50,000	
		181,000	

Cash OFFICE/LAB -	26,000
Credit ELECTRIC -	50,000
Credit FORKLIFT -	12,000
Crane -	
Tanks -	
Welding -	
Pumps -	
Material -	
Water -	2K
Sewer -	2k
Vac truck -	
Tanks -	180K
Coating -	

Konokogs.com
Megtech
MEGTEC Millennium
6,000 RTO
info@konokogs.com
VOC pollution control.com

2 WELDERS — 35 EA. 70 — 145
1 FITTER — 35 — 09
1 HELPER — 40 — 174 (175)
145

Control Room - 6500 plus any add-ons -

900 10,500

175 per hour — All Equipment & Consumables / Insurance Safety

8 clause - 8 non compete clause

~~5,000~~ 3,500 per man to hire out from client

WASTE MANAGEMENT

EPAPA008000488

Waste Management

Box inspection/ repair/ make-ready

- Shop set-up and cost
- Man-power
- Paperflow
- Box storage
- Labor rates
- Inventory
- Billing
- Profits

Shop set-up and cost

- Clean side bay on Wayland street annex
- Set up off site storage area (locks, keys,access)talk with owner
- Remove fence and back wall in old tankwash
- Install racks for inventory
- Purchase welding machine and torches
- Install overhead winch on trolley
- Set up circus tent and purchase airless paint gun

Cost

- Winch and I-beam ---------- 6,000.00
- Welding machine and torches ---------- 4,000.00
- Racks ---------- 600.00
- Tent and airless ---------- 3,000.00

Man Power

- 2 welder/fitters (14.00 ea)
- 1 helper testing and box movement (12.00)
- 1 painter/ helper (14.00)
- 1 supervisor—inventory, inspection, customer interaction, qc,(17.00)
- 1 admin. Assistant- part time- in-house

Crew will work approx. 60 hrs per week

30% added to hourly pay per each employee

Average cost per week for man power is 5,538.00 CES cost

Will evaluate need for more help as project develops

Paper Flow

- Boxes will be dropped off and checked in on sign in form
- Supervisor will evaluate the repair cost on standardized form and contact the customer for approval and PO. The supervisor will e-mail or fax the estimate to the customer for their records.
- Once the po is received, the supervisor will schedule in the box to repair.
- The supervisor will personally inspect the water test, the repairs, the paint, and the proper numbering and initial on a CES work ticket.
- The supervisor will then contact the customer that the box is ready and turn the work ticket in to the admin. Assistant along with the standardized contract form attached.
- The A.A. will make copies of the forms, file in a dedicated file cabinet labeled Completed customer box repairs, and turn originals into the billing department.
- The supervisor will be responsible for managing the inventory, purchasing inventory, and tracking where inventory is being used.
- The supervisor will send monthly statements to the customer on box inventory and storage fee status.
- The supervisor will turn this in to the AA as well so that it can go to the billing department.

Paper work

- Sign in/sign out sheet
- Evaluation form (estimate, po's etc.)
- Work ticket (work performed, parts, inspections, etc.)
- Inventory tracking form
- Storage log and fees

Box storage

- Boxes will be stored @ CES yard and alternate yard on OST
- Boxes will be checked in and out
- Boxes left for more than 30 days will be billed at a monthly rate of 10.00 per box. This includes boxes waiting on approval to be repaired, or boxes that are going to be destroyed due to cost.
- Completed boxes ready for pick up will be stored for 30 days after completion at no cost to customer. After 30 days, the box storage will be billed at 10.00 per month
- CES will send customer a monthly statement of inventory and charges.
- The storage fee will be initiated on the first of every month. There are no pro-rated fees.
- Boxes that are repaired and awaiting pick-up will be billed on the 1st of the month after the 30 day grace period has expired.

Labor rates

- clean outs/washes ---------- 125.00
- heel disposal ---------- 35.00 yd.
- water test ---------- 65.00
- gasket replacement and retest ---------- 160.00
- chains/binders/latch repairs ---------- 42.00 hr
- bow hooks ---------- 15.00 ea.
- tarp replacement ---------- 120.00
- tarp hardware replacement (rods,handles,ratchets,stops) ---- 42.00 hr
- plate replacement(floors, sides) ---------- 42.00 hr
- paint/ numbering ---------- 200.00
- wheel replacement ---------- 125.00

Standard box repair

clean out ---------- 125.00
heel disposal ----- 35.00
water test --------- 65.00
paint and number -- 200.00

for standard in/out job 420.00 per box (no welding or repairs)

Ratchet - 48 →
TARP -
TARP Ratchet -

Waste Management Box Management Program

Procedure

1. Boxes will be checked into the Tankwash office.
2. A Waste Management Representative will be called for work requested.
   -Current contact is Roger Lara- 281-504-1532
3. A Waste Management Equipment Work Request form will be filled out, estimates will be performed based on requested work. These will be carbon copy forms (4). The first 2 copies will be put in the Waste Management container service (incomplete) smoke trey by date order. 4th copy will go with the container in a water tight tube.
4. An estimate via e-mail will be sent and approved by Waste Management personnel. Any other work performed due to discovery by CES will be approved and resubmitted prior to work performed. (Example: Bad gaskets for replacement and retest). Resubmit requests will be marked as such on the original form. 3rd copy after resubmitted work is requested on the original will be
5. A PO Number will be assigned and sent via e-mail or fax. PO Numbers will be put on the work request form. All containers with heel and surcharges for heel will be sent via e-mail to Roger
6. Boxes will be washed and leak tested. Any additional work needed will be communicated and approved by Waste Management and PO number adjustment confirmed via e-mail or fax.
7. Associate initials will be put next to area on work performed on the Waste Management Work Request form.
8. All forms will be attached by a water proof container for the request form.
9. All forms travel with the box until requested work is complete.
10. After a successful washout and leak test- boxes will go to maintenance for repairs (if Requested). After final repairs are made, maintenance will inform the tank wash manager that the container is complete and verify against original that all work was completed. Waste Management will be notified and date of notification will be documented via e-mail or fax and confirmation page.
11. After completion the carbon copy form or forms will be attached to the original and brought up to the billing department for invoicing.
12. Daily yard check and the Waste Management incomplete trey will reviewed daily and a yard check will be sent to Waste Management with asset status updated.
13. All boxes picked-up by Waste Management will be signed after driver inspection of the box. Any boxes left for more than 15 days after completion will be billed for a monthly fee of $25/box and the beginning of each month after that.

4 carbon copy forms
1st original- original plus resubmitted requests and corresponding approval/PO number (s)-will be sent to customer with invoice
2nd billing- for CES files
3rd copy- copy for resubmit requests- only needed if more work was required than originally requested. If so, this form will be attached with the 4th form after work is approved.
4th form this form goes with the box.

Tank Wash Manager or Lead Man
-must make sure that the original and all carbons show through.
-Make initial requests and mark on the form. Bring to Donna.
-Check seals on boxes prior to wash to see if gaskets are obviously worn out. This way the customer is not double charged (Quick Rinse, then Detergent Wash because gaskets are missing upon arrival)
-make sure to communicate with Maintenance (Donna) crew/welders when their part (Tankwash) is complete.

Maintenance (Dona)
-Contact Roger to verify what is needed for the equipment.
-Responsible for finding parts, tracking boxes through the system, and making sure all work on the box was completed as per original form.
-Communication with the customer and tank wash, getting pricing to WM, POs from WM, and attachment of forms to the asset.
-Parts Inventory responsibilities (If Required).
-Communication and daily checking of WM assets through the system and follow-up with appropriate areas.
-Call customer when asset is complete.
-Attachment of original to carbon copies and bring to billing.

CES Environmental Services, Inc.
4904 Griggs Rd.
Houston, TX 77021
Phone: (713) 676-1460
Fax: (713) 676-1676

Quotation

For: Waste Management **Date:** 06/02/08
Attn: Ted Tate
Phone: 281-487-5003
Fax: 281-998-1580

Description of Work to be Performed:

Container services for Waste Management.

Costs for Completion of Work:

WASHOUTS/ROLL-OFF (STANDARD)	
Quick Rinse	$95/box
Detergent Wash	$125/box
-Other washes will be quoted when requested	
WASHOUT/VACUUM BOX (STANDARD)	
Quick Rinse	$175/box
Detergent Wash	$325/box
Water Tests	$65/box
HEEL CHARGES	
Non-Hazardous	$3/gal
Hazardous (May not include all Haz Wastes)	$10/gal
-Heel charges for greater than 75 gals may be negotiated	

**Estimate may not contain all services requested by the customer.
***Thank you for your interest in CES Environmental Services.

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Optional container services for Waste Management.

Labor Rates:

Gasket Replacement and Retest	$165/box
Tarp Replacement	$35.00
Tarp Hardware Replacements	$42/hr
-Rods, Handles, Ratchets, Stops, etc.	
Plate Replacements (Floors and Sides)	$42/hr
Paint and Numbering	$200.00
Wheel Replacement	$125.00
Paint and Number	$200.00

Material Rates-Current (Price subject to change)

22 Foot Tarp	$140.00
Bows	$ 17.00
Tarp Strap	$ 5.50
Tarp Ratchet	$ 9.50
Tarp Stop	$ 8.10
Bungee	$ 1.25
Roll Pipe	$ 61.00
Fixed Pipe	$ 42.50
Eye to Hook Ratchets	$ 46.50
Liners	$ 15.00
Carbon Steel Plates	Market Rates

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Non-Hazardous	$3/gal
Hazardous (May not include all Haz Wastes)	$10/gal
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Paint and Numbering	$200.00
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Material Rates-Current (Price subject to change)

22 Foot Tarp	$140.00
Bows	$ 17.00
Tarp Strap	$ 5.50
Tarp Ratchet	$ 9.50
Tarp Stop	$ 8.10
Bungee	$ 1.25
Roll Pipe	$ 61.00
Fixed Pipe	$ 42.50
Eye to Hook Ratchets	$ 46.50
Liners	$ 15.00
Carbon Steel Plates	Market Rates

***Thank you for your interest in CES Environmental Services.

Rod buckets
Rod oven
Rods 1/8 5pt 1/8 LH 5/32 6pt
Ice
Water
Keys
Time for Alex & Jose

LH - Arrow Arc E 1/8 / 5/32
5pt - 1/8 5/32

Steel Supply Company

60
~~25~~
85

119K

50K – Treat Recirc

120 + Coating

~~24~~

~~55~~

Treat 80 K

Nash 27,150

Pumps 20 K

KO 27

π

10 K Chem Pumps Pump

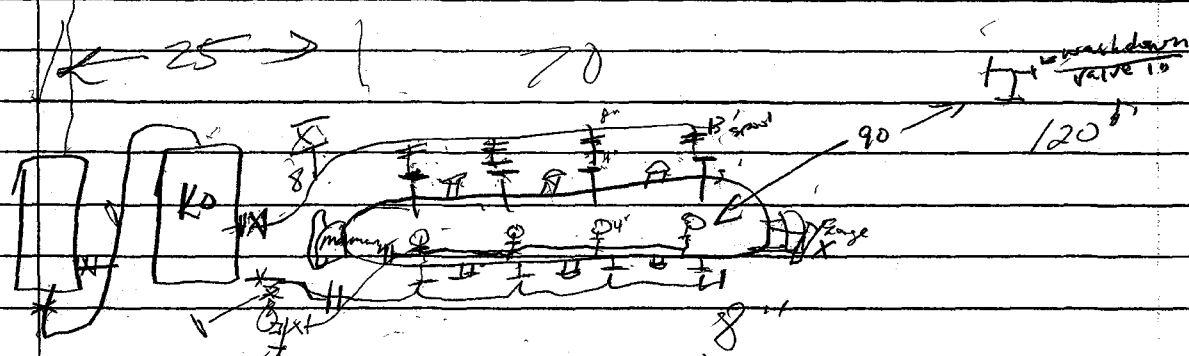
Offload Pump 10,600 X

Filter Pot 6,250

~~#~~ H_2O_2 6K

TREATMENT TANK 60 LABOR 90 PUMPS

MATERIALS?



90°s 6
Tee's 6
Flanges - 14
Pipe - 6 joints sch 80
Valves - 6

200

50 welds @ 200

121

200 WELD 40 WO

50 welds @ 200

4" 18 FLANGES, 16 -
4" Pipe 5 JOINTS -
4" 10 Valves -
20 1" sch 80 weld olets
1" Pipe 1" sch 80
40 - 1" flanges
20 - 1" FLANGED valves -
8 Manways high pressure

40

4-

57,200

3" Flanges 34
3" Pipe 5 joints
3" Valves 10 FLANGED

5 gwo

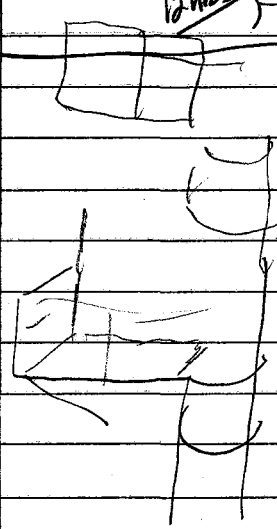
Manways
6 wo

2
65
40
260

30
65
0

Knock out Pot

		Labor	MH
	Cut Bottom & weld out Bottom add I-Beam	2,600	
	Plate — 8 x 20 — 3,500 ,		3,500
40 hrs	I-Beam — 2-4x4 Wide Flange		1,000
	Install Pump and Recirc Piping	1,950	
	2x2 Pump		2,500
	4-2" sch 80 Pipe —		
30 hrs	10-2" Flanges —		
	10 - 2" Nipples sch 80 —		
	8 - Valves —		
	Fasteners 1/2" Studs / Nuts		
	20 Gaskets —		
12 hrs	T V P 1/2" Pipe & Fittings	1,000	
	3 Manways / Install	1,050	600
	Labor Ins		
Double order for Mann	Ladder & Catwalks to Manways —	3,250	
	4 — 5/8" Round Stock —		
50 hrs	8 3x1/4 Flat Bar —		
	20 2x3 1/16 Cage —		
	10 - 2x2x3/16 Catwalk ∡ —		
24	Demister Plate 1/4" plate 6' 2-4x8	1,560	
12 hrs	Demister Pad — & Frame	780	
50			
24 hrs	8" Inlet & Outlet		
	Flanges, Pipe, 2 Valves —	1,560	
	50# Relief vent & Various nozzles		



192 hours

384 total = (192x2) 13,750

1375

Total 15,125

EPAPA008000507

3.14

πd

Nash

TANK - SIMILAR to ko w/ LABOR

NOZZLES 15,125

25 200 holes → Will need Pipe drilled on bottom Double order ladder

50# Relief

LABOR

90 hrs - Peroxide Tank 6,000

160' 1" 316 SS

40 welds @ 150 10 SW Couplings

10 flanges

2 SS Flanged Ball valves

FLOWMETER 1,500

24 hrs Acid TANK 1,560

1" SS Pump

1" CPVC LINE 120'

3 Valves

FLOW METER

Waste water tank -

Inlet port -

Discharge Port -

Pump - 3X3

2 3X4 ANSI

Treatment → Discharge ~~Suction~~ 70' Long 10' TALL
Suction 4' 6' TALL

WW → 3x3 Wastewater pump — Gorman Rupp

Acid → 1" close Couple SS pump Ac

Knock out → 2" KO ~~Pump~~ 2" ~~E~~ 75 gpm slightly acidic

Nash tank ~~[illegible]~~ 1 ~~[illegible]~~ Caustic Pump & SULFIDES → 25' head tall

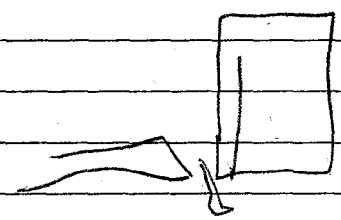
7 Pumps

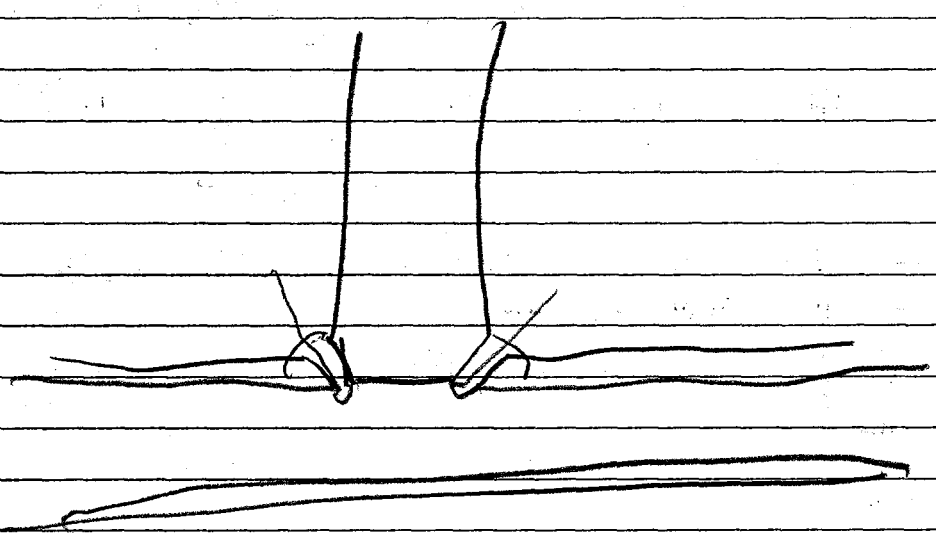
Treatment tank — 2 — 3X4 — ANSI SS 75' Long pipe 3" — 4' discharge 4" — 6 - Suction

Wastewater Tank — 1 — 3X3 Gorman 1

Acid — 1" close Coupled SS pump — Low flow

4





	Primary Steel	Service Steel		
8" Pipe -	6,955	6,120.24	1835	23,168 TOTAL
4" Pipe -	2,103	1849.26	254	23,168

3" 955.00
2" 367
401
1064
933
937 FLANGED
596
794
203 6250

TEES
363
227 Tees
211
136
26
96 1059

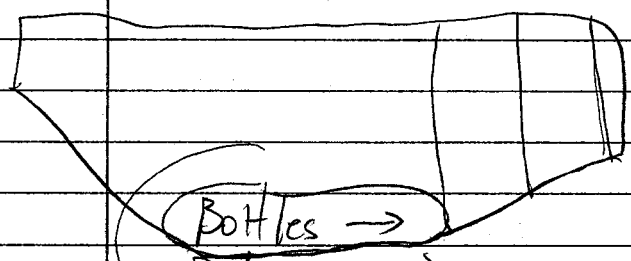
misc.
205
34
110.52 349

782
217
164 90's
181
27
108
1,479

values
2918
837
1236
1220
2979
260
23,168 9,450

Structural
347
70
802
524
359
790
2894

gaskets
576
512
356
144
99
1687



Bottles → CES

Rods →

Gouging Rods → 1/4" Rods → CES

Wire → CES

Grinding Disks → 7" Grinding Disks

Safety Supplies P.P.E.

Rod oven —

Rods

4" Grinding Disks —

ALL Safety & P.P.E.

A.S.A.P.

ELECTRICAL
NASH — Perf plate
K.O. —
(2) Trusses — 12" I-Beam, 6" Tube
Mid PLATFORM — Remove & Remove 1 ~~Plats~~ Column

JOB Schedule 6/24/08

54" gal —

Truss - (1) 49'4", (1) 39'3 1/2"
Platform
Nash
KO

8" Pipe
4" Pipe
4" H-BEAM
GREATING

HOTEL 6-24-08

Sheryl

Southwinds
1,352 Month 333.10 week for Double
1 mth ~~TX~~ exempt

Single → 297 85 week

120

Per diem ~ 403.20 mths

Modify KO (2) Print
Modify Treat Print

Wastewater Print — (1)
Nash PRINT — (3)
PROCESS FLOW PRINT — (4) Color Coordinated
SUFFIDIC CAUSTIC TANK — (5)
CAUSTIC OIL WATER SEPARATOR — (6) Will Flange Pump for Later / 2 Sample points 2" / 1 on bottom 1 4' / 4 1" Taps for Sample
PROCESS Schematic (7)
UTILITY Schematic Schematic AIR, water, electrical 1 plumbing (8) Color Coordinated

6/24/08 AGENDA
PRINT Completion

T

PRIMARY - 23K → NEW PO
SERVICE Steel Warehouse - 8 - 8" sch 80 -
7 - 4" sch 80 -
1 - 3/16 X 1" X 3' Serrated GRATING -
6 - 4" I-BEAM WIDE FLANGE -

200' - 12" I-BEAM - 23 26#
270
470 - 8 - 6" sq. tube X 3/16 -

1 5/8" 8 X 20 plate -

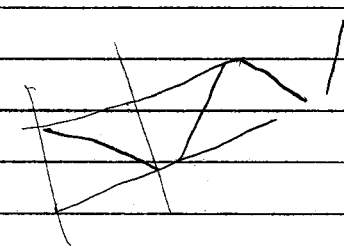
23
470

30

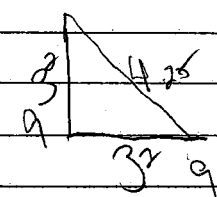
90

20 5
100

20
23
60
400
460



18



108 $\frac{8}{12} - \frac{2}{3}$

10.67 δf — $2\pi(5.33)(5.33+71)$

$\frac{1}{4}\pi D^2 = \frac{10.67^2\pi}{4}$ $2\pi\, 5.33\,(76.33)$

$\times 2$

$\pi D \times L$

10.67

$\pi D \times L$ (Rth)

160 - 8" - 335 sq Ft
160 - 3" 125 sq Ft
160 - 4" 167 sq Ft

2 TANKS 71 x 10' 8" 255# EA. Sq. Ft SA
1 K.O. POT 6 x 24 508 sq Ft.

17

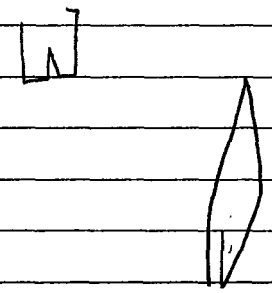
76

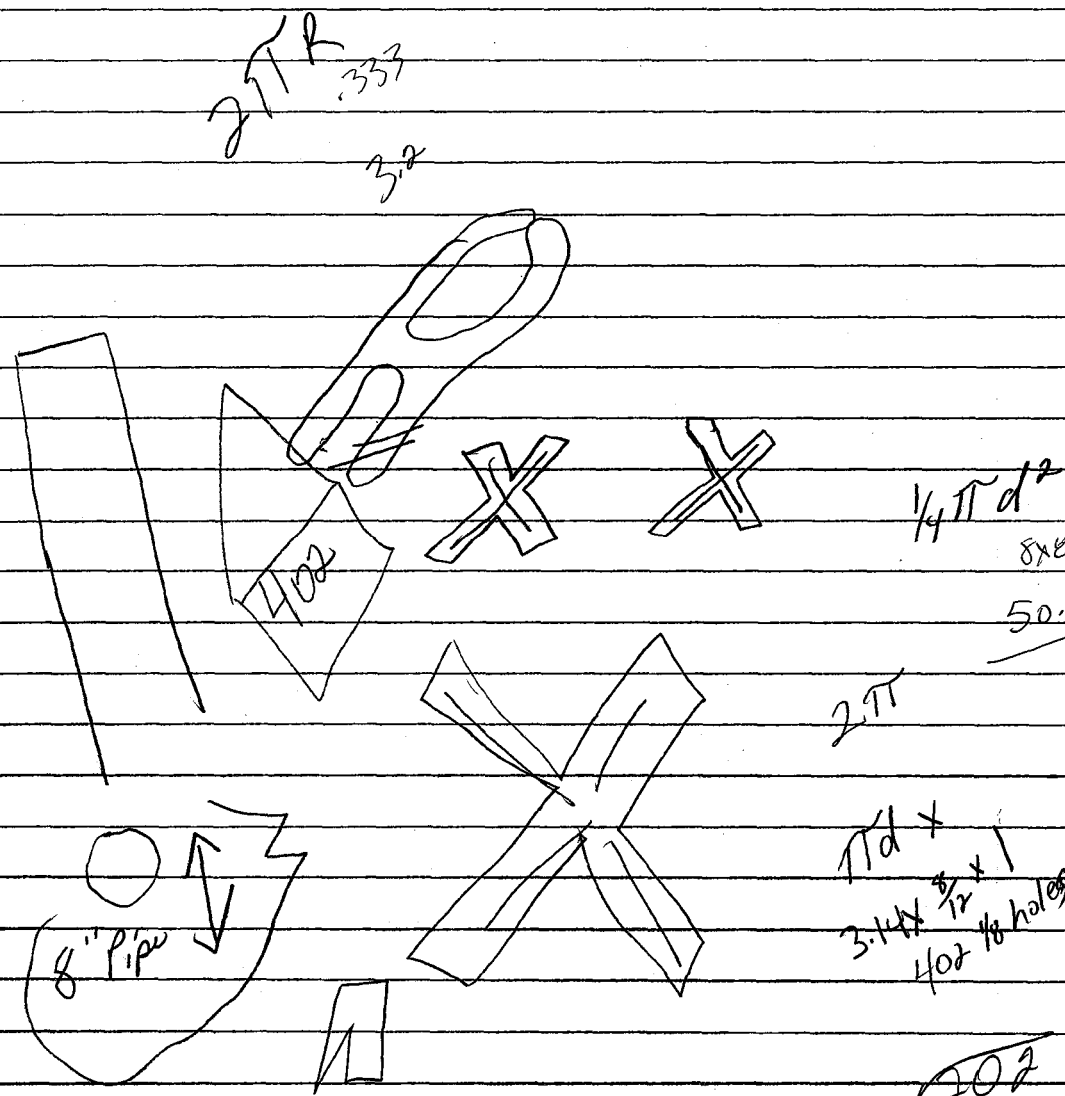
2050

2555

WEN

2 WELDERS =
2 HELPERS =
1 FITTER =
1 LABOR =





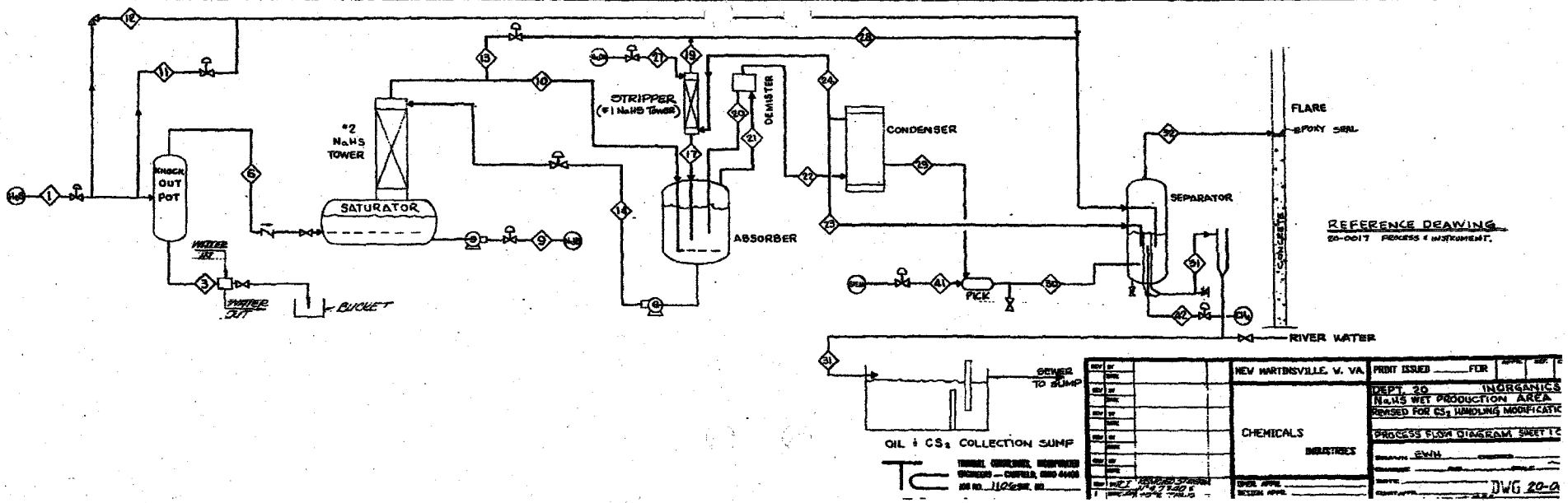
14.11

4:45
16:56

4:45
4:45
6:56

Koren - 6' Demister Pad.

STREAM NUMBER & DESCRIPTION	1 H2S FEED		3 OIL DRAIN			6 GAS TO SATURATOR			9 NaHS PRODUCT		10 SATURATOR OFF GAS		11 SATURATOR BY PASS		12 SAFETY RELIEF		13 ABSORBER BY PASS		14 ABSORBER LIQUOR		17 STRIPPER LIQUOR		19 NORMAL VENT GAS		20 DEMISTER LIQUOR		21 ABSORBER GAS		22 CONDENSER FEED		23 SEAL LEG		24 CONDENSER OFF GAS	
TEMPERATURE (°F)	60		60			60			175		210		210		60		210		270		163		163		200		260		260		260		35	
PRESSURE - (PSIG)	22		85			85			52		63		1		85		63		2.2		0.44		0.4		2.5		3.1		1.7		0.45		0.45	
VAPOR / LIQUID	V		L			V			L		V		V		V		V		L		L		V		L		V		V		V		V	
SPECFIC GRAVITY			0.9						1.3										1.4		1.5				1.1									
COMPONENT	MOLS/HR	LBS/HR	MOLS/HR	LBS/HR	MOLS/HR	LBS/HR	MOLS/HR	LBS/HR	MOLS/HR	LBS/HR	MOLS/HR	LBS/HR	MOLS/HR	LBS/HR	MOLS/HR	LBS/HR	MOLS/HR	LBS/HR	MOLS/HR	LBS/HR	MOLS/HR	LBS/HR	MOLS/HR	LBS/HR	MOLS/HR	LBS/HR	MOLS/HR	LBS/HR	MOLS/HR	LBS/HR	MOLS/HR	LBS/HR	MOLS/HR	LBS/HR
Na_2HS									198.2	11111									3.7	205.1														
Na_2CO_3									0.4	42.4																								
H_2O									412.7	14357	213.1	3838.3							431.3	7769.2	431.3	7770.8	3.5	63.1	3.5	63.1	220.2	3967.3	216.7	3904.3			0.1	1.2
NaOH																			194.5	7781.4	198.2	7927.8	0.2	9.0	0.2	8.0	0.2	8.0						
H_2S	197.8	6740.5					197.8	6740.5			3.7	124.3																						
CS_2	4.0	301.2					4.0	301.2			4.0	301.2											1.9	148.4			4.0	301.2	4.0	301.2			1.9	148.4
N_2	1.8	50.4					1.8	50.4			1.8	50.4											1.8	50.4			1.8	50.4	1.8	50.4			1.8	50.4
COS	0.4	24.0					0.4	24.0																										
H_2	4.0	8.0					4.0	8.0			4.0	8.0											4.0	8.0			4.0	8.0	4.0	8.0			4.0	8.0
OIL		2.5		2.5																														
NAT. GAS	2.0	32.4					2.0	32.4			2.0	32.4											2.0	32.4			2.0	32.4	2.0	32.4			2.0	32.4
TOTAL	209.9	7159		2.5			209.9	7156.5	611.4	16589.2	228.4	4355.1							629.5	15755.7	629.6	15698.5	13.4	311.3	3.7	71.1	232.1	4367.3	228.4	4296.3			9.7	240.4
GPM/ACFM NORMAL	531.2 ACFM		8 GAL/DAY			899.2 ACFM			28.4 GPM		1388.7 ACFM		899.2 ACFM		899.2 ACFM		1388.7 ACFM		22.4 GPM		21.3 GPM		99.0 ACFM		0.1 GPM		1697.5 ACFM		1729.4 ACFM				55.2 ACFM	
GPM/ACFM DESIGN	531.2 ACFM		500 GAL/DAY			899.2 ACFM			28.4 GPM		1388.7 ACFM		899.2 ACFM		899.2 ACFM		1388.7 ACFM		22.4 GPM		21.3 GPM		99.0 ACFM		5.0 GPM		1697.5 ACFM		1729.4 ACFM		1388.7 ACFM		1729.4 ACFM	



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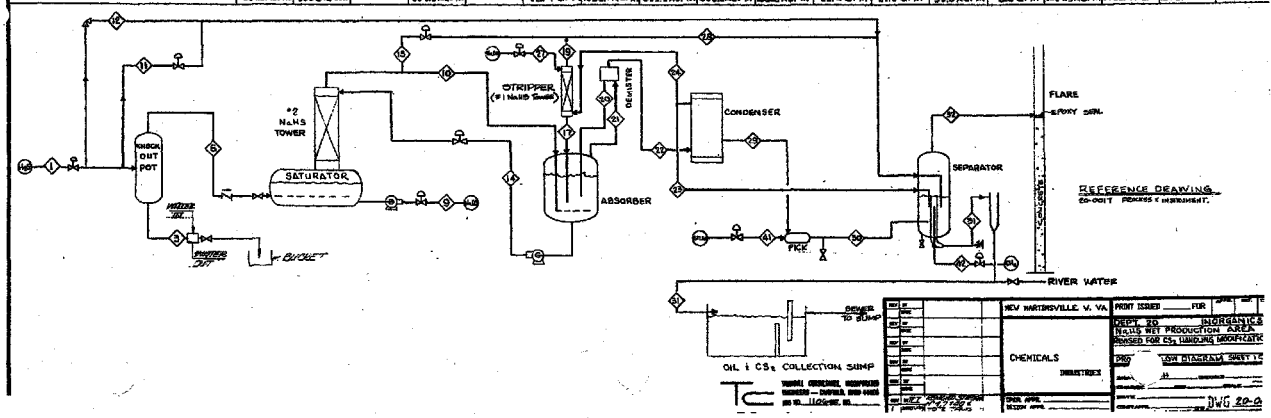
STREAM NUMBER / DESCRIPTION	1 H2S FEED	3 OIL DRAIN	6 GAS TO SATURATOR	9 Na HS PRODUCT	10 SATURATOR OFF GAS	11 SATURATOR BY PASS	12 SAFETY RELIEF	13 ABSORBER BY PASS	14 ABSORBER LIQUOR	17 STRIPPER LIQUOR	19 NORMAL VENT GAS	20 DEMISTER LIQUOR	21 ABSORBER GAS	22 CONDENSER FEED	23 SEAL LEG	24 CONDENSER OFF GAS
TEMPERATURE (°F)	60	60	60	175	210	60	60	210	270	163	163	200	260	260	260	35
PRESSURE - (PSIG)	22	85	85	52	65	7	85	65	22	0.44	0.4	2.5	3.1	1.7	0.45	0.45
VAPOR / LIQUID	V	L	V	L	V	V	V	V	L	L	V	L	V	V	V	V
SPECFIC GRAVITY		0.9		1.3					1.4	1.5		1.1				

COMPONENT	1 MOLS/HR	1 LBS/HR	3 MOLS/HR	3 LBS/HR	6 MOLS/HR	6 LBS/HR	9 MOLS/HR	9 LBS/HR	10 MOLS/HR	10 LBS/HR	11 MOLS/HR	11 LBS/HR	12 MOLS/HR	12 LBS/HR	13 MOLS/HR	13 LBS/HR	14 MOLS/HR	14 LBS/HR	17 MOLS/HR	17 LBS/HR	19 MOLS/HR	19 LBS/HR	20 MOLS/HR	20 LBS/HR	21 MOLS/HR	21 LBS/HR	22 MOLS/HR	22 LBS/HR	23 MOLS/HR	23 LBS/HR	24 MOLS/HR	24 LBS/HR
Na_2HS							198.2	11111									3.7	205.1														
Na_2CO_3							0.4	42.4																								
H_2O							412.7	7445.7	213.1	3838.3							431.3	7769.2	431.3	7770.8	3.5	63.1	3.5	63.1	2200	39673	216.7	3904.3			0.1	1.2
NaOH																	194.5	7781.6	198.2	7927.8	0.2	9.0	0.2	8.0	0.2	8.0						
H_2S	197.8	6740.5				197.8	6740.5			3.7	124.3																					
CS_2	4.0	301.2				4.0	301.2			4.0	301.2										1.9	148.4			4.0	301.2	4.0	301.2			1.9	148.4
N_2	1.8	50.4				1.8	50.4			1.8	50.4										1.8	50.4			1.8	50.4	1.8	50.4			1.8	50.4
COS	0.4	24.0				0.4	24.0																									
H_2	4.0	8.0				4.0	8.0			4.0	8.0										4.0	8.0			4.0	8.0	4.0	8.0			4.0	8.0
OIL		2.5	2.5																													
NAT. GAS	2.0	32.4				2.0	32.4			2.0	32.4										2.0	32.4			2.0	32.4	2.0	32.4			2.0	32.4
TOTAL	2099	7159	2.5			2099	7166.5		611.4	16982	228.4	4359.1					629.5	15753.1	629.6	15698.5	13.4	311.3	3.7	71.1	232.1	43615	228.4	42943			9.7	240.4
GPM/ACFM NORMAL	531.2 ACFM		8 GAL/DAY		899.2 ACFM		28.4 GPM		1388.7 ACFM								22.4 GPM		21.8 GPM		99.0 ACFM		0.1 GPM		1697.5 ACFM		1729.4 ACFM			95.2 ACFM		
GPM/ACFM DESIGN	531.2 ACFM		500 GAL/DAY		899.2 ACFM		28.4 GPM		1388.7 ACFM		899.2 ACFM		899.2 ACFM		1388.7 ACFM		22.4 GPM		21.8 GPM		99.0 ACFM		5.0 GPM		1697.5 ACFM		1729.4 ACFM		1388.7 ACFM		1729.4 ACFM	



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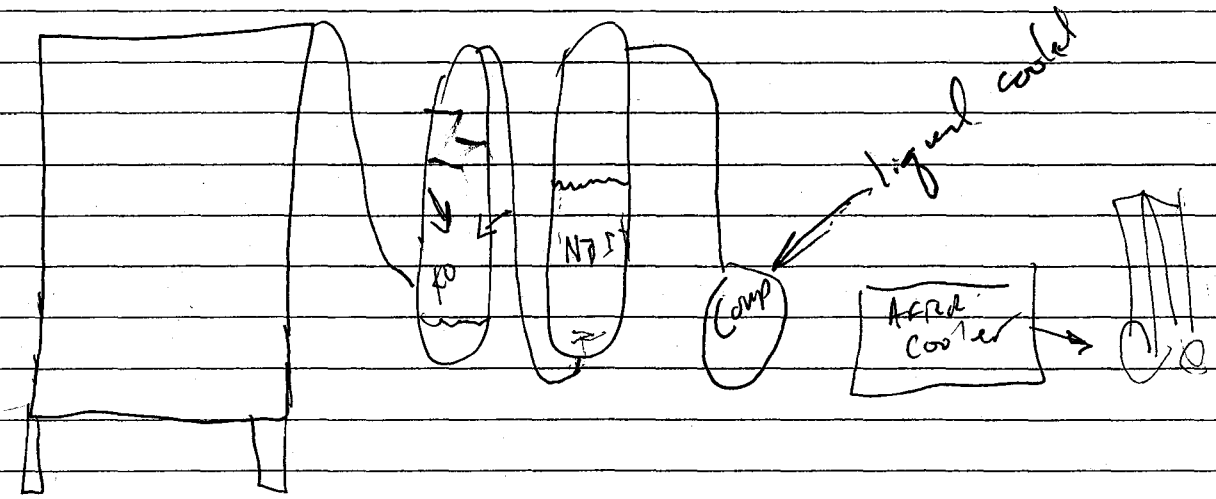
liquid cooled
Comp
After Cooler

MSDS

Honeywell

Material Safety Data Sheet

HYDROFLUORIC ACID, AQUEOUS (70%)

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Hydrofluoric Acid, Aqueous (70%)

OTHER/GENERIC NAMES: Aqueous HF, Hydrofluoric Acid Solution, 70% HF, HF Acid

PRODUCT USE: Metal Pickling, Glass Etching, Chemical Derivatives

MANUFACTURER: Honeywell International
Industrial Products
101 Columbia Road
Box 1053
Morristown, New Jersey 07962-1053

FOR MORE INFORMATION CALL:
(Monday-Friday, 8:00am-4:30pm EST)
HF Technical Service Department
800-622-5002
Or visit the Honeywell HF website:
http://www.HFacid.com

IN CASE OF EMERGENCY CALL:
(24 Hours/Day, 7 Days/Week)
800-707-4555 or 602-365-4980
For Transportation Emergencies:
800-424-9300 (CHEMTREC for US)
613-996-6666 (CANUTEC for Canada)

2. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME	CAS NUMBER	WEIGHT %
Hydrofluoric Acid	7664-39-3	70
Water	7732-18-5	30

Trace impurities and additional material names not listed above may also appear in the Regulatory Information Section 15 towards the end of the MSDS. These materials may be listed for local "Right-To-Know" compliance and for other reasons.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: **Clear, colorless, corrosive fuming liquid with an extremely acrid odor. Forms dense white vapor clouds if released. Both liquid and vapor can cause severe burns to all parts of the body. Specialized medical treatment is required for all exposures.**

EPAPA008000524

MATERIAL SAFETY DATA SHEET
Hydrofluoric Acid, Aqueous (70%)

POTENTIAL HEALTH HAZARDS

SKIN: Both liquid and vapor can cause severe burns, which may not be immediately painful or visible. HF will penetrate skin and attack underlying tissues. Large or multiple burns totaling over 25 square inches of body surface area may also cause hypocalcemia (depletion of calcium in the body) and other toxic effects which may be fatal. Prolonged contact with very dilute HF solutions will cause burns.

EYES: Both liquid and vapor can cause irritation or corneal burns.

INHALATION: **Mild exposure:** Can irritate nose, throat and respiratory system. Onset of symptoms may be delayed for several hours.

Severe exposure: Can cause nose and throat burns, lung inflammation and pulmonary edema (fluid in the lungs). Also results in other toxic effects including hypocalcemia (depletion of calcium in the body) which if not properly treated can result in death.

INGESTION: Can cause severe mouth, throat and stomach burns and may be fatal if swallowed. Even with small amounts of dilute solutions, profound and possibly fatal hypocalcemia (depletion of calcium in body) and systematic toxicity is likely to occur unless medical treatment is promptly initiated

DELAYED EFFECTS: The effects of contact with dilute solutions of hydrofluoric acid or its vapors may be delayed. The potential delay in clinical signs or symptoms for dilute solutions is given below. Symptoms might include pain, redness of the skin and possible tissue destruction.

HF Concentration	Delay in Symptoms
>50%	Immediately Apparent
20%-50%	1-8 hours
0%-20%	Up to 24 hours

Can also cause bone and joint changes in humans (Fluorosis).

Carcinogenicity: Hydrofluoric Acid is not listed by NTP, IARC, OSHA, US EPA, ACGIH or Health Canada as a carcinogen.

4. FIRST AID MEASURES

SKIN: Remove the victim from the contaminated area and immediately wash the burned area with plenty of water for a minimum of 15 minutes. Limit washing to 5 minutes if treatment specific for HF exposure is available. Remove all contaminated clothing while washing continuously. After thorough washing for at least 5 minutes, the burned area should be immersed in a solution of 0.13% iced aqueous Zephiran® Chloride until pain is relieved. As an alternate first aid treatment, 2.5% calcium gluconate gel may be continuously massaged into the burn area until the pain is relieved. For larger burns or burns treated with calcium gluconate gel (in which pain is present longer than 30 minutes), a physician should inject 5% aqueous calcium gluconate beneath, around and in the burned area. Use of local anesthetics is not recommended, as reduction in pain is an indicator of effectiveness of treatment.

EPAPA008000525

EYES: Irrigate eyes for at least 15 minutes with copious quantities of water, keeping eyelids apart and away from eyeballs during irrigation. Get competent medical attention immediately, preferably an eye specialist. If a physician is not immediately available, apply one or two drops of 0.5% tetracaine hydrochloride solution, or other aqueous topical ophthalmic anesthetic and continue irrigation. Do not use the solution described for skin treatment. Use no oils or greases unless instructed to do so by a physician. Irrigate with 1% calcium gluconate in normal saline for 1 to 2 hours to prevent or lessen corneal damage.

INHALATION: Move to fresh air. Keep the victim lying down, quiet and warm. Get competent medical attention immediately. If breathing has stopped, start artificial respiration at once. An authorized person should administer oxygen to a victim who is having difficulty breathing, until the victim is able to breathe easily by himself. Calcium Gluconate, 2.5% in normal saline may be given by nebulizer with oxygen. Do not give stimulants unless instructed to do so by a physician. Victim should be examined by a physician and held under observation for at least 24 hours.

INGESTION: Drink large amounts of water to dilute. Do not induce vomiting. Several glasses of milk or several ounces of milk of magnesia may be given for their soothing effect. Take victim to a doctor.

ADVICE TO PHYSICIAN: For burns of large skin areas (greater than 25 square inches), for ingestion and for significant inhalation exposure, severe systemic effects may occur. Monitor and correct for hypocalcemia, cardiac arrhythmias, hypomagnesemia and hyperkalemia. In come cases hemodialysis may be indicated. For certain burns, especially of the digits, use of intra-arterial calcium gluconate may be indicated. For inhalation exposures, treat as chemical pneumonia. Monitor for hypocalcemia. 2.5% calcium gluconate in normal saline by nebulizer or by IPPB with 100% oxygen may decrease pulmonary damage. Bronchodilators may also be administered.
A booklet titled "Recommended Medical Treatment for Hydrofluoric Acid Exposure" is available from the Honeywell HF website: http://www.HFacid.com

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT:	Not flammable
FLASH POINT METHOD:	Closed cup
AUTOIGNITION TEMPERATURE:	Not applicable
UPPER FLAME LIMIT (volume % in air):	Not applicable
LOWER FLAME LIMIT (volume % in air):	Not applicable
FLAME PROPAGATION RATE (solids):	Not applicable
OSHA FLAMMABILITY CLASS:	Not applicable

EXTINGUISHING MEDIA:
Use water or suitable agent for fires adjacent to non-leaking tanks or containers of HF. Do not use solid water streams near ruptured tanks or spills of HF. Acid reacts with water and can splatter acid onto personnel.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
Reaction with certain metals generates flammable and potentially explosive hydrogen gas. Considerable heat is evolved when contacted with many substances. Heat increases pressure and may explode container. Will react violently with water.

SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS:
Wear self-contained breathing apparatus approved by NIOSH and full chemical protective clothing. Use water spray to keep containers cool.

EPAPA008000526

MATERIAL SAFETY DATA SHEET
Hydrofluoric Acid, Aqueous (70%)

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE: (Always wear recommended personal protective equipment.)
Good ventilation is necessary. Discharge will ordinarily be a vapor or a liquid that gives off fumes of HF gas. Those treating spills or repairing leaks must use full protective equipment. Take actions to minimize environmental impact. Try to contain spillage and avoid drainage to areas which cannot be treated. Rapid dilution of the spill with water to <50% will reduce the amount of fumes given off. Carefully neutralize the dilute liquid with lime slurry, soda ash, limestone, caustic soda or other alkaline material. (See Sections 10 and 13 for more information.)

Spills and releases may have to be reported to Federal and/or local authorities. See Section 15 regarding reporting requirements.

7. HANDLING AND STORAGE

NORMAL HANDLING: (Always wear recommended personal protective equipment.)
Do not breathe vapor or mist. Use only with adequate ventilation. Avoid all contact with skin, eyes and clothing, evacuate solutions. Do not add water to acid.

STORAGE RECOMMENDATIONS:
Store in approved containers only. Store in cool, well-ventilated area. Flammable hydrogen gas can be generated in metal storage containers. Diking of storage tanks is recommended. Carbon steel in HF service may be subject to hydrogen blistering and possibly other hydrogen related damage and should, therefore, be routinely inspected and repaired if needed. Non-destructive tank thickness testing (NDT) and other techniques should be utilized for periodic checks of tank wall thickness and to assure equipment integrity.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:
Sufficient to reduce vapor and acid mists below permissible TLV levels. Packaging and unloading areas and open processing equipment may require mechanical exhaust systems.

PERSONAL PROTECTIVE EQUIPMENT

SKIN PROTECTION:
For normal product use, wear hydrofluoric acid-resistant jacket, trousers, boots and gauntlet gloves. For increased protection, use air-supplied totally encapsulating HF resistant protective suit.

EYE PROTECTION:
Avoid mists or vapors, wear hard hat, chemical safety goggles (plastic lenses), and full face plastic shield. For increased protection, use air-supplied hydrofluoric acid resistant hood.

RESPIRATORY PROTECTION:
Where required, use a respirator approved by NIOSH for HF gas or mists, as applicable. Some exposures may require a NIOSH-approved, self-contained breathing apparatus or air supplied respirator.

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MATERIAL SAFETY DATA SHEET
Hydrofluoric Acid, Aqueous (70%)

ADDITIONAL RECOMMENDATIONS:
Eye wash and quick-drench shower facilities, protected from freezing, should be available where HF is used or handled.

EXPOSURE GUIDELINES **(Guidelines exist for the following ingredients)**

INGREDIENT NAME	ACGIH TLV	OSHA PEL	OTHER LIMIT
Hydrofluoric acid	3 ppm – CEILING	3 ppm (TWA)	3 mg(F)/g creatinine in urine pre-shift 10 mg(F)/g creatinine post-shift***

OSHA STEL	NIOSH IDLH
6 ppm (15 min.)	30 ppm (30 mins)

AIHA Emergency Response Planning Guideline

ERPG-1	ERPG-2	ERPG-3
2 ppm (60 mins)	20 ppm (60 mins)	50 ppm (60 mins)
2 ppm(10 mins)	50 ppm (10 mins)	170 ppm (10 mins)

*** – Biological Exposure Index

OTHER EXPOSURE LIMITS FOR POTENTIAL DECOMPOSITION PRODUCTS: None

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Colorless liquid, fumes in air
PHYSICAL STATE:	Liquid
MOLECULAR WEIGHT:	20.01 (HF)
CHEMICAL FORMULA:	70% HF in water by weight
ODOR:	Sharp pungent odor
SPECIFIC GRAVITY:	(Water = 1.0) 1.25 at 39°F (3.9°C) 1.225 at 70°F, (21.1°C)
SOLUBILITY IN WATER:	(Weight %) 100% by weight
pH:	Not applicable
BOILING POINT:	151°F (66.1°C)
MELTING POINT:	-95.8°F (-71.0°C)
VAPOR PRESSURE:	110 mm Hg at 70°F (21.1°C)
VAPOR DENSITY (Air = 1.0):	2.21 at 70°F, (21.1°C) 1.76 at 80°F, (26.7°C)
EVAPORATION RATE:	Not applicable
% VOLATILE:	100%
IONIZATION POTENTIAL:	15.98 eV
FLASH POINT:	Not flammable.

(Flash point method and additional flammability data are found in section 5.)

10. STABILITY AND REACTIVITY

NORMALLY STABLE? (CONDITIONS TO AVOID): Stable under normal conditions.

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MATERIAL SAFETY DATA SHEET
Hydrofluoric Acid, Aqueous (70%)

INCOMPATIBLE [illegible]:
Glass, concrete and other silicon bearing materials: yield silicon tetrafluoride gas. Pressure buildup from this process has been known to rupture glass containers. Carbonates, sulfides and cyanides: yield toxic gases: carbon dioxide, hydrogen sulfide and hydrogen cyanide. Alkalis, some oxides: cause strong violent exothermic reactions. Common metals: yield hydrogen gas, a fire and explosive reactive hazard. Corrosive to many materials including leather, natural rubber and many organics. Considerable heat is evolved and violent reaction can occur when water is added to HF.

HAZARDOUS DECOMPOSITION PRODUCTS:
Not applicable: boils away as hydrogen fluoride gas and water.

HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL INFORMATION

IMMEDIATE (ACUTE) EFFECTS:

Inhalation	LC_{50} (Rat)	=	5,100 ppm/5 min
	LC_{50} (Rat)	=	1,300 ppm/60 min
	LC_{50} (Mouse)	=	6,247 ppm/5 min

Skin: [illegible]ution of HF was corrosive to rabbit skin with 1hour exposure, but not with 1minute exposure.

DELAYED (CHRONIC AND CHRONIC) EFFECTS:
Prolonged exposure can cause bone and joint changes in humans. (Fluorosis – Increased bone density and [illegible] teeth)

OTHER DATA: None

12. ECOLOGICAL INFORMATION

Aquatic toxicity: 60 ppm/*/fish/lethal/fresh water. (*time period not specified).

13. DISPOSAL CONSIDERATIONS

RCRA

Is the waste product a RCRA **hazardous waste if discarded?** Yes
If yes, the RCRA ID number is: U134 (hydrofluoric acid) and D002 (Corrosive)

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MATERIAL SAFETY DATA SHEET
Hydrofluoric Acid, Aqueous (70%)

OTHER DISPOSAL CONSIDERATIONS: As waste disposal methods may vary, contact the supplier for specific recommendations. Treat small amounts by adding to an excess of water and neutralize with a lime slurry, soda ash, limestone, or soda or other alkali. Add to water and neutralize cautiously as reaction is immediate and can be violent. Consider amounts of harmful vapors may be released. Good ventilation is required. Dispose of residue (or slurry) by removal to an approved chemical waste landfill or by an approved waste contractor.

The information offered here is for the product as shipped. Use and/or alterations to the product such as mixing with other materials will significantly change the characteristics of the material and alter the RCRA classification and the proper disposal of such.

14. TRANSPORTATION INFORMATION

PROPER DOT SHIPPING DESCRIPTION:
(FOR QUANTITIES OF >143 LBS "AS IS" IN A SINGLE CONTAINER)
RQ Hydrofluoric Acid, *with more than 60% strength*, 8, UN1790, PG I, (6.1)

PLACARDS REQUIRED:
Primary – Class 8 – Corrosive
Subsidiary – Class 6 – Poison (optional)

EMERGENCY RESPONSE GUIDEBOOK (2000 EDITION): Guide No. 157

For additional information on shipping regulations affecting this material, contact the information number found in Section 1.

15. REGULATORY INFORMATION

TOXIC SUBSTANCES CONTROL ACT (TSCA)
TSCA INVENTORY STATUS: Hydrofluoric Acid, Aqueous is listed.

OTHER TSCA ISSUES: None

SARA TITLE III/CERCLA:
RQs and TPQs
"Reportable Quantities" (RQs) and/or "Threshold Planning Quantities" (TPQs) exist for the following ingredients.

INGREDIENT NAME	SARA/CERCLA RQ (lbs)	SARA EHS TPQ (lbs)
Hydrofluoric Acid	100 as 100% HF (Equal to 143 lbs. as 70% HF)	100 as 100% HF

Spills or releases resulting in the loss **of any ingredient at or above its RQ requires immediate notification to the National Response Center [(800) 424-8802] and to your Local Emergency Planning Committee.**
SECTION 311 HAZARD CLASS: Immediate. Delayed
SARA 313 CHEMICALS:

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MATERIAL SAFETY DATA SHEET
Hydrofluoric Acid, Aqueous (70%)

The following ingredients are SARA 313 "Toxic Chemicals". CAS numbers and weight percents are found in Section 2.

INGREDIENT NAME	COMMENT
Hydrofluoric Acid	None

STATE RIGHT-TO-KNOW

In addition to the ingredients found in Section 2, the following are listed for state right-to-know purposes.

INGREDIENT NAME	WEIGHT %	COMMENT
No ingredients in this section		

ADDITIONAL REGULATORY INFORMATION:

Storage or in process use greater than the specified threshold quantity of 1000 lbs. is subject to EPA 40 CFR Part 68, Section 112(r)7 Accidental Release Prevention Requirements: Risk Management Programs.

WHMIS CLASSIFICATION (CANADA):

Class D, Division 1, Subdivision A and
Class E
This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

FOREIGN INVENTORY STATUS:

Canadian DSL (Domestic Substances List)
EINECS (European Inventory of Existing Chemical Substances) (EINECS #:231-634-8)

16. OTHER INFORMATION

CURRENT ISSUE DATE: January, 2004
PREVIOUS ISSUE DATE: January, 2003

CHANGES TO MSDS FROM PREVIOUS ISSUE DATE ARE DUE TO THE FOLLOWING:

Minor wording changes for clarification made in Sections 1, 8, 14, 15.

OTHER INFORMATION: National Fire Prevention Association (NFPA) Rating
Health 4, Flammability 0, Reactivity 1, Special Instruction – None

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MSDS Number: **H3886** * * * * * *Effective Date:* ***10/16/08*** * * * * * *Supercedes:* ***04/22/08***

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Rod School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

HYDROCHLORIC ACID (10%-33%)

1. Product Identification

Synonyms: This MSDS applies to the concentrated standard used to make laboratory solutions and any solution that contains more than 10% but less than 33% Hydrochloric acid. For diluted product, see MSDS for Hydrochloric Acid (less than 10%).
CAS No.: 7647-01-0
Molecular Weight: 36.46
Chemical Formula: HCl in H2O
Product Codes:
J.T. Baker: 0323, 0327, 0365, 4654, 4657, 5618, 5619
Mallinckrodt: 2608, 2625, H151, H168, V035

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Hydrogen Chloride	7647-01-0	10 - 33%	Yes
Water	7732-18-5	67 - 90%	No

3. Hazards Identification

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Emergency Overview

POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR INHALED.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Poison)
Flammability Rating: 0 - None
Reactivity Rating: 2 - Moderate
Contact Rating: 4 - Extreme (Corrosive)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: White (Corrosive)

Potential Health Effects

Inhalation:
Corrosive! Inhalation of vapors can cause coughing, choking, inflammation of the nose, throat, and upper respiratory tract, and in severe cases, pulmonary edema, circulatory failure, and death.
Ingestion:
Corrosive! Swallowing hydrochloric acid can cause immediate pain and burns of the mouth, throat, esophagus and gastrointestinal tract. May cause nausea, vomiting, and diarrhea, and in severe cases, death.
Skin Contact:
Corrosive! Can cause redness, pain, and severe skin burns. Concentrated solutions cause deep ulcers and discolor skin.
Eye Contact:
Corrosive! Vapors are irritating and may cause damage to the eyes. Contact may cause severe burns and permanent eye damage.
Chronic Exposure:
Long-term exposure to concentrated vapors may cause erosion of teeth. Long term exposures seldom occur due to the corrosive properties of the acid.
Aggravation of Pre-existing Conditions:
Persons with pre-existing skin disorders or eye disease may be more susceptible to the effects of this substance.

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4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
Ingestion:
DO NOT INDUCE VOMITING! Give large quantities of water or milk if available. Never give anything by mouth to an unconscious person. Get medical attention immediately.

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Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

---

5. Fire Fighting Measures

Fire:
Not considered to be a fire hazard. May react with metals or heat to release flammable hydrogen gas.
Explosion:
Not considered to be an explosion hazard.
Fire Extinguishing Media:
Water or water spray. Neutralize with soda ash or slaked lime.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Structural firefighter's protective clothing is ineffective for fires involving hydrochloric acid. Stay away from ends of tanks. Cool tanks with water spray until well after fire is out.

---

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker NEUTRASORB® acid neutralizers are recommended for spills of this product.

---

7. Handling and Storage

Store in a cool, dry, ventilated storage area with acid resistant floors and good drainage. Protect from physical damage. Keep out of direct sunlight and away from heat, water, and incompatible materials. Do not wash out container and use it for other purposes. When

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diluting, the acid should always be added slowly to water and in small amounts. Never use hot water and never add water to the acid. Water added to acid can cause uncontrolled boiling and splashing. When opening metal containers, use non-sparking tools because of the possibility of hydrogen gas being present. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

---

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
For Hydrochloric acid:
- OSHA Permissible Exposure Limit (PEL):
5 ppm (Ceiling)
- ACGIH Threshold Limit Value (TLV):
2 ppm (Ceiling), A4 Not classifiable as a human carcinogen

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, a full facepiece respirator with an acid gas cartridge may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres.
Skin Protection:
Rubber or neoprene gloves and additional protection including impervious boots, apron, or coveralls, as needed in areas of unusual exposure to prevent skin contact.
Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

---

9. Physical and Chemical Properties

Appearance:
Clear, colorless liquid.
Odor:
Pungent odor.
Solubility:
Infinitely soluble.
Density:

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1.05 @ 15 C (59 F)
pH:
For HCL solutions: 0.1 (1.0 N), 1.1 (0.1 N), 2.02 (0.01 N)
% Volatiles by volume @ 21C (70F):
100
Boiling Point:
101 - 103C (214 - 217F)
Melting Point:
No information found.
Vapor Density (Air=1):
No information found.
Vapor Pressure (mm Hg):
No information found.
Evaporation Rate (BuAc=1):
No information found.

---

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products:
When heated to decomposition, emits toxic hydrogen chloride fumes and will react with water or steam to produce heat and toxic and corrosive fumes. Thermal oxidative decomposition produces toxic chlorine fumes and explosive hydrogen gas.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
A strong mineral acid, concentrated hydrochloric acid is highly reactive with strong bases, metals, metal oxides, hydroxides, amines, carbonates and other alkaline materials. Incompatible with materials such as cyanides, sulfides, sulfites, and formaldehyde.
Conditions to Avoid:
Heat, direct sunlight.

---

11. Toxicological Information

Hydrochloric acid: Inhalation rat LC50: 3124 ppm/1H; Oral rabbit LD50: 900 mg/kg. Investigated as a tumorigen, mutagen, reproductive effector.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Hydrogen Chloride (7647-01-0)	No	No	3
Water (7732-18-5)	No	No	None

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12. Ecological Information

Environmental Fate:
When released into the soil, this material is not expected to biodegrade. When released into the soil, this material may leach into groundwater.
Environmental Toxicity:
This material is expected to be toxic to aquatic life.

---

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

---

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: HYDROCHLORIC ACID
Hazard Class: 8
UN/NA: UN1786
Packing Group: II
Information reported for product/size: 200L

International (Water, I.M.O.)

Proper Shipping Name: HYDROCHLORIC ACID
Hazard Class: 8
UN/NA: UN1789
Packing Group: II
Information reported for product/size: 200L

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15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

Ingredient	TSCA	EC	Japan	Australia
Hydrogen Chloride (7647-01-0)	Yes	Yes	Yes	Yes
Water (7732-18-5)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\---------------------------------

--Canada--

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Ingredient	Korea	DSL	NDSL	Phil.
Hydrogen Chloride (7647-01-0)	Yes	Yes	No	Yes
Water (7732-18-5)	Yes	Yes	No	Yes

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Hydrogen Chloride (7647-01-0)	5000	500*	Yes	No
Water (7732-18-5)	No	No	No	No

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Hydrogen Chloride (7647-01-0)	5000	No	No
Water (7732-18-5)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: Yes
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Mixture / Liquid)

Australian Hazchem Code: 2R
Poison Schedule: None allocated.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

16. Other Information

NFPA Ratings: Health: **3** Flammability: **0** Reactivity: **0**
Label Hazard Warning:
POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR INHALED.
Label Precautions:
Do not get in eyes, on skin, or on clothing.
Avoid breathing vapor or mist.
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.
Label First Aid:
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases call a physician.
Product Use:
Laboratory Reagent.

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Revision Information:
MSDS Section(s) changed since last revision of document include: 9.
Disclaimer:
****

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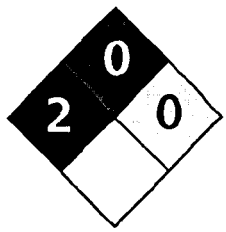
Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

EPAPA008000539

ScienceLab.com
Chemicals & Laboratory Equipment



Health	3
Fire	0
Reactivity	0
Personal Protection	J

Material Safety Data Sheet
Silver nitrate MSDS

Section 1: Chemical Product and Company Identification

Product Name: Silver nitrate

Catalog Codes: SLS2122, SLS1327

CAS#: 7761-88-8

RTECS: VW4725000

TSCA: TSCA 8(b) inventory: Silver nitrate

CI#: Not available.

Synonym: Lunar caustic; Silver (1+) nitrate; Nitric acid, silver (1+) salt

Chemical Name: Silver Nitrate

Chemical Formula: AgNO3

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Silver nitrate	7761-88-8	100

Toxicological Data on Ingredients: Silver nitrate: ORAL (LD50): Acute: 1173 mg/kg [Rat]. 50 mg/kg [Mouse]. 473 mg/kg [Guinea pig].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of skin contact (irritant), of ingestion. Hazardous in case of skin contact (permeator), of eye contact (irritant), of inhalation. Slightly hazardous in case of skin contact (corrosive). The amount of tissue damage depends on length of contact. Eye contact can result in corneal damage or blindness. Skin contact can produce inflammation and blistering. Inhalation of dust will produce irritation to gastro-intestinal or respiratory tract, characterized by burning, sneezing and coughing. Severe over-exposure can produce lung damage, choking, unconsciousness or death. Prolonged exposure may result in skin burns and ulcerations. Over-exposure by inhalation may cause respiratory irritation.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.

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DEVELOPMENTAL TOXICITY: Not available.
The substance is toxic to lungs.
The substance may be toxic to mucous membranes, skin, eyes.
Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure of the eyes to a low level of dust can produce eye irritation. Repeated skin exposure can produce local skin destruction, or dermatitis. Repeated inhalation of dust can produce varying degree of respiratory irritation or lung damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention.

Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: organic materials, combustible materials

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards: Contact with combustible or organic materials may cause fire.

Special Remarks on Explosion Hazards:
Silver nitrate mixed with dry powdered magnesium may ignite explosively on contact with a drop of water.
An explosive fulminate may be formed if silver nitrate is mixed with alcohols.
Highly explosive is formed by the addition of calcium carbide to silver nitrate solution.

Section 6: Accidental Release Measures

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container.

Large Spill:
Oxidizing material. Corrosive solid.
Stop leak if without risk. Do not get water inside container. Avoid contact with a combustible material (wood, paper, oil, clothing...). Keep substance damp using water spray. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep container dry. Keep away from heat. Keep away from sources of ignition. Keep away from combustible material.. Do not ingest. Do not breathe dust. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes.

Storage:
Keep container tightly closed. Keep container in a cool, well-ventilated area. Separate from acids, alkalies, reducing agents and combustibles. See NFPA 43A, Code for the Storage of Liquid and Solid Oxidizers. Sensitive to light. Store in light-resistant containers.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:
Splash goggles. Synthetic apron. Vapor and dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor and dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 0.01 (mg/m
Ag) from ACGIH (TLV) [United States]
TWA: 0.01 (mg/m
Ag) from OSHA (PEL) [United States]3
Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Crystals solid.)

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Odor: Not available.

Taste: Bitter. Metallic

Molecular Weight: 169.87 g/mole

Color: Colorless. White.

pH (1% soln/water): 6 - 7 [slightly acidic to neutral]

Boiling Point: Decomposition temperature: 440°C (824°F)

Melting Point: 212°C (413.6°F)

Critical Temperature: Not available.

Specific Gravity: 4.35 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: 5.8 (Air = 1)

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, diethyl ether.

Solubility:
Easily soluble in cold water, hot water.
Soluble in diethyl ether.
Very slightly soluble in acetone.
Solubility in water: 122 g/100 ml water @ 0 deg. C.
Solubility in water: 952 g /100 ml water @ 190 deg. C
Solubility in alcohol: 1 g/30 ml alcohol; 1g/ 6.5 ml boiling alcohol.
Solubility in acetone: 1 g/ 253 ml acetone

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials, light

Incompatibility with various substances: Reactive with reducing agents, combustible materials, organic materials, alkalis.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Sensitive to light.
Incompatible with antimony salts, arsenites, bromides, carbonates, chloarides, iodides, thiocyanates, ferrous salts, hypophosphites, morphine salts, oils, creosote, phosphates, tannic acid, tartrates, vegetable decoctions, and extracts, sodium hydroxide, charcoal, thimerosal, benzalkonium chloride, halogenated acids and their salts.
alcohols.
Silver nitrate reacts with acetylene in presence of ammonia to form silver acetylide, a sensitive powerful detonator

when dry.
Reaction between silver nitrate and chlorosulfonic acid is violent.
Silver nitrate is reduced by hydrogen sulfide in the dark.
Silver nitrate is easily reduces to metallic silver by ferrous salts, arsenites, hypophosphites, tartrates, sugars, tannins, volatile oils.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals: Acute oral toxicity (LD50): 50 mg/kg [Mouse].

Chronic Effects on Humans:
Causes damage to the following organs: lungs.
May cause damage to the following organs: mucous membranes, skin, eyes.

Other Toxic Effects on Humans:
Very hazardous in case of skin contact (irritant), of ingestion.
Hazardous in case of skin contact (permeator), of inhalation.
Slightly hazardous in case of skin contact (corrosive).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:
May affect genetic material (mutagenic).
May cause cancer based on animal test data.
May cause adverse reproductive effects.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects:
Skin: Causes severe irritation and burns. It may cause dermatitis. It may be absorbed through the skin.
Eyes: Causes severe irritation, corneal opacification, bleeding conjunctiva, burns of conjunctiva, argyria, blindness
Inhalation: Causes irritaiton of the respiratory tract and mucous membranes with possible chemical burns. Symptoms may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, vomiting.
Ingestion: Severe gastrointestinal tract irritation and burns, pain and burning in the mouth, violent abdominal pain, argryia -grayish/blackening of skin and mucous membranes, throat and abdomen, salivation, vomiting of black material, diarrhea, hypermotility, ulcerative gingivitis . May affect kidneys (lesions of kidneys, anuria,), lungs

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 5.1: Oxidizing material.

Identification: : Silver nitrate UNNA: 1493 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Silver nitrate
Illinois chemical safety act: Silver nitrate
New York acutely hazardous substances: Silver nitrate
Rhode Island RTK hazardous substances: Silver nitrate
Pennsylvania RTK: Silver nitrate
Massachusetts RTK: Silver nitrate
Massachusetts spill list: Silver nitrate
New Jersey: Silver nitrate
New Jersey spill list: Silver nitrate
Louisiana spill reporting: Silver nitrate
California Director's List of Hazardous Substances: Silver nitrate
TSCA 8(b) inventory: Silver nitrate

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).
EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS C: Oxidizing material.
CLASS E: Corrosive solid.

DSCL (EEC):
R8- Contact with combustible material may cause fire.
R20/22- Harmful by inhalation and if swallowed.
R34- Causes burns.
R50/53- Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
S24/25- Avoid contact with skin and eyes.
S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S28- After contact with skin, wash immediately with plenty of water
S36/37/39- Wear suitable protective clothing, gloves and eye/face protection.
S45- In case of accident or if you feel unwell,

seek medical advice immediately (show the label where possible).
S46- If swallowed, seek medical advice immediately and show this container or label.
S60- This material and its container must be disposed of as hazardous waste.
S61- Avoid release to the environment. Refer to special instructions/Safety data sheets.

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 0

Reactivity: 0

Personal Protection: j

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves (impervious).
Synthetic apron.
Wear appropriate respirator when ventilation is inadequate.
Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:53 PM

Last Updated: 11/06/2008 12:00 PM

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Caustic Soda, Shipment Grade

Material Safety Data Sheet

Arkema Inc.

1 PRODUCT AND COMPANY IDENTIFICATION

Thio and Fine Chemicals
Arkema Inc.
2000 Market Street
Philadelphia, PA 19103

EMERGENCY PHONE NUMBERS:
Chemtrec: (800) 424-9300 (24hrs) or (703) 527-3887
Medical: Rocky Mountain Poison Control Center
(866) 767-5089 (24Hrs)

Information Telephone Numbers	Phone Number	Available Hrs
Customer Service	1-800-628-4453	8:30 to 5:30 EST

Product Name	Caustic Soda, Shipment Grade
Product Synonym(s)	
Chemical Family	Alkali
Chemical Formula	NAOH
Chemical Name	Sodium Hydroxide
EPA Reg Num	
Product Use	

2 COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient Name	CAS RegistryNumber	Typical %	OSHA
Carbon disulfide	75-15-0	<0.1%	Y
Sodium hydroxide	1310-73-2	10-15%	Y
Water	7732-18-5	85-90%	N

The substance(s) marked with a "Y" in the OSHA column, are identified as hazardous chemicals according to the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200)

This material is classified as hazardous under Federal OSHA regulation.

The components of this product are all on the TSCA Inventory list.

3 HAZARDS IDENTIFICATION

Emergency Overview

Orange slightly turbid liquid with foul odor.
DANGER!
FLAMMABLE LIQUID AND VAPOR.
CAUSES EYE, SKIN AND RESPIRATORY TRACT BURNS. MAY CAUSE BLINDNESS.
CAUSES SEVERE DIGESTIVE TRACT BURNS.
EVEN DILUTE SOLUTIONS MAY CAUSE BURNS.

Potential Health Effects

Inhalation and skin contact are expected to be the primary routes of occupational exposure to this material. This material is a strong alkali that can be destructive to tissue producing severe burns which are not immediately painful or visible. Contact with body tissues may produce deep ulceration, scarring or loss of sight. Concentrations as low as 2-3% can cause injury. Dermatitis (inflammation of the skin) and superficial skin damage can result from repeated or prolonged contact with very dilute solutions. High levels of dust or mist may be corrosive to mucous membranes producing eye or lung injury and chemical pneumonia. Lower concentrations may produce irritation of eyes, nose or upper respiratory tract with coughing, sore throat and shortness of breath. Prolonged exposure may result in ulceration of the nasal passages. If swallowed, this material may cause severe internal injury, characterized by pain in the mouth

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and stomach, vomiting, and breathing difficulties. Medical conditions which may be aggravated by exposure to this material include lung disease or limited respiratory capacity.

4 FIRST AID MEASURES

IF IN EYES, immediately flush with plenty of water for at least 15 minutes. Get medical attention immediately.

IF ON SKIN, immediately flush with plenty of water. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Destroy contaminated shoes.

IF SWALLOWED, do NOT induce vomiting. Give water to drink. Get medical attention immediately. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

IF INHALED, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

5 FIRE FIGHTING MEASURES

Fire and Explosive Properties

Auto-Ignition Temperature	NE	
Flash Point	70 F - >150 F	Flash Point Method
Flammable Limits- Upper	NE	
Lower	NE	

Extinguishing Media

Use water spray, carbon dioxide, foam or dry chemical.

Fire Fighting Instructions

Fire fighters and others who may be exposed to products of combustion should wear full fire fighting turn out gear (full Bunker Gear) and self-contained breathing apparatus (pressure demand NIOSH approved or equivalent). Fire fighting equipment should be thoroughly decontaminated after use.

Fire and Explosion Hazards

Contact with metal can form hydrogen gas. Hydrogen is extremely flammable and can form explosive mixtures with air. Closed containers may explode when heated or contents contaminated with water.

6 ACCIDENTAL RELEASE MEASURES

In Case of Spill or Leak

Stop the leak, if possible. Ventilate the space involved. Contain, vacuum up, place in non-sparking container for disposal. Prevent waterway contamination. Construct a dike to prevent spreading. Collect run-off and transfer to drums or tanks for later disposal. Consult a regulatory specialist to determine appropriate state or local reporting requirements, for assistance in waste characterization and/or hazardous waste disposal and other requirements listed in pertinent environmental permits.

7 HANDLING AND STORAGE

Handling

Do not get in eyes, on skin or clothing. Avoid breathing vapor or mist. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. To avoid rapid temperature rise, violent spattering, or explosive eruptions: always add caustic to water when mixing. Never add water to a caustic when mixing. Heat water to 80-100 F before adding product. Add small amounts of product slowly and evenly over surface of water with constant stirring. Never increase concentration of product by more than 5% with any single

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7 HANDLING AND STORAGE

addition. Water should not exceed 160 F during addition.

Storage

Do NOT store near strong acids.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls

Investigate engineering techniques to reduce exposures below airborne exposure limits. Provide ventilation if necessary to control exposure levels below airborne exposure limits (see below). If practical, use local mechanical exhaust ventilation at sources of air contamination such as open process equipment. Consult ACGIH ventilation manual or NFPA Standard 91 for design of exhaust systems. Monitor carbon monoxide and oxygen levels in tanks and enclosed spaces.

Eye / Face Protection

Where there is potential for eye contact, wear a face shield, chemical goggles, and have eye flushing equipment immediately available.

Skin Protection

Wear appropriate chemical resistant protective clothing and chemical resistant gloves to prevent skin contact. Consult glove manufacturer to determine appropriate type glove material for given application. Wear face shield and chemical resistant clothing such as a rubber apron when splashing may occur. Rinse contaminated skin promptly. Wash contaminated clothing and clean protective equipment before reuse. Wash skin thoroughly after handling.

Respiratory Protection

Avoid breathing vapor or mist. When airborne exposure limits are exceeded (see below), use NIOSH approved respiratory protection equipment appropriate to the material and/or its components. Consult respirator manufacturer to determine appropriate type equipment for given application. Observe respirator use limitations specified by NIOSH or the manufacturer. For emergency and other conditions where exposure limit may be significantly exceeded, use an approved full face positive-pressure, self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. Respiratory protection programs must comply with 29 CFR § 1910.134.

Airborne Exposure Guidelines for Ingredients

Exposure Limit		Value
Sodium hydroxide		
ACGIH CEILING	-	2 mg/m3
OSHA TWA PEL	-	2 mg/m3
Carbon disulfide		
ACGIH Skin designator	-	Y
ACGIH TWA	-	1 ppm
OSHA Ceiling PEL	-	30 ppm
OSHA TWA PEL	-	20 ppm

-Only those components with exposure limits are printed in this section.
-Skin contact limits designated with a "Y" above have skin contact effect. Air sampling alone is insufficient to accurately quantitate exposure. Measures to prevent significant cutaneous absorption may be required.
-ACGIH Sensitizer designator with a value of "Y" above means that exposure to this material may cause allergic reactions.
-WEEL-AIHA Sensitizer designator with a value of "Y" above means that exposure to this material may cause allergic skin reactions.

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9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance/Odor	Orange slightly turbid liquid with foul odor.
pH	NE
Specific Gravity	1.073 @ 15 C
Vapor Pressure	30 @ 100 F
Vapor Density	NA
Melting Point	NA
Freezing Point	NE
Boiling Point	NE
Solubility In Water	99.98%

10 STABILITY AND REACTIVITY

Stability

This material is chemically stable under normal and anticipated storage and handling conditions.

Incompatibility

Reacts violently or explosively with water, acids and organic materials such as chlorinated hydrocarbons. Toxic carbon monoxide gas can form upon contact with food or beverage products.

Hazardous Decomposition Products

Will react with some metals such as aluminum, tin or zinc to generate hydrogen gas. Hydrogen gas can result in explosive hazards in confined spaces.

11 TOXICOLOGICAL INFORMATION

Toxicological Information

Data on this material and/or its components are summarized below.

Sodium Hydroxide

Single exposure (acute) studies indicate that this material is slightly toxic if absorbed through the skin (rat LD50 1,350 mg/kg; dry sodium hydroxide) and corrosive to rabbit eyes and skin. Many publications in the scientific literature confirm that this material is corrosive to all tissues. Repeated inhalation resulted in lung damage in rats. No tumors were seen in long-term animal studies. No genetic changes were observed in tests using bacteria.

No significant increases in mortality in relation to duration or intensity of exposures were reported in an epidemiologic study of a small group of workers exposed to caustic dust for 30 years or more. Massive ingestion of this material has been implicated as causing esophageal cancer. Squamous cell carcinomas of the esophagus occurred approximately 12-42 years later in individuals who survived accidental childhood ingestion and are likely due to the tissue destruction and possible scarring of the esophagus rather than a direct effect of this material.

Carbon Disulfide

Single exposure (acute) studies indicate that this material is slightly toxic to rats if swallowed (LD50 3,188 mg/kg) or rabbits if absorbed through skin (LD50 2,025 mg/kg), practically non-toxic to rats if inhaled (1-hr LC50 40 mg/l), and severely irritating to rabbit skin and eyes. The neurological effects of long-term exposure have been documented in occupational populations who were generally exposed to levels of 20 ppm or more in viscose rayon production. Exposed workers have experienced headaches, nausea, dizziness, tiredness, memory loss, sleep disturbances, irritability and other psychological symptoms in the early stages of intoxication. Long- term exposure has resulted in decreased nerve conduction velocities, memory loss,

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11 TOXICOLOGICAL INFORMATION

peripheral neuropathy (numbness) in the lower legs and forearms, tremors, poor coordination and personality disorders. In addition, several studies have shown adverse effects on the heart including increases in atherosclerosis, death from coronary or ischemic heart disease and blood pressure. Other studies have indicated that long-term overexposure can cause adverse effects on the eyes including increased hemorrhages or microaneurysms of the retina. Studies of occupationally exposed workers have suggested that long-term exposure to higher levels may cause reproductive effects. Male workers had decreased libido, reduced sperm count and altered endocrine function and female workers reported menstrual irregularities. Sperm from exposed workers have shown alterations indicative of spermatogenic damage. There is conflicting evidence whether increased pregnancy complications and a higher frequency of spontaneous abortions are related to exposures in female workers.

Animal studies have confirmed neurological effects. Rats exposed for long periods to high levels showed decreased motor conduction velocity, hindlimb motor defects, peripheral nerve swelling and degeneration. Repeated exposure of monkeys has resulted in reduced visual acuity. Following inhalation exposure in male rats, minor reproductive effects such as decreased sperm counts and abnormal mating behavior, but no pathological changes were noted in testes. A two-generation reproduction study in exposed female rats showed no reduction in fertility, but mothers exposed to high dose levels had reduced pup viability. Multiple developmental toxicity studies in rats and rabbits have presented evidence of increased birth defects and embryotoxicity at high dose levels; however, exposures at levels that are not maternally toxic generally do not cause birth defects, although developmental effects have been observed. No genetic changes were observed in tests using bacteria, but have been observed in animal cells.

12 ECOLOGICAL INFORMATION

Ecotoxicological Information

Data on this material and/or its components are summarized below.

Sodium Hydroxide
Data from several species of fish showed a range of tolerance (brook trout > spotfin and Lake Emerald shiners > minnows > mosquitofish > goldfish) that was most likely related to changes in the pH produced by addition of sodium hydroxide to the water. The minimum lethal concentration for minnows, Mayfly larvae and Daphnia was 100 ppm and for Chironomus larvae, 700 ppm.

Carbon Disulfide
This material is moderately toxic to Daphnia magna (LC50 2.1 mg/l). It is moderately toxic to guppies (LC50 4 mg/l) and slightly toxic to green algae (LC50 21 mg/l). It is practically non-toxic to mosquitofish (LC50 135 mg/l) and bacteria (LC50 341 mg/l).

Chemical Fate Information

Data on this material and/or its components are summarized below.

Sodium Hydroxide
No data were available, but this material is a strong alkali that easily dissolves in water with resulting acid/base chemistry.

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13 DISPOSAL CONSIDERATIONS

Waste Disposal

Consult with environmental engineer or professional to determine if neutralization is appropriate and for handling procedures for residual materials. Note: Chemical additions to, processing of, or otherwise altering this material may make this waste management information incomplete, inaccurate, or otherwise inappropriate. Furthermore, state and local waste disposal requirements may be more restrictive or otherwise different from federal laws and regulations.

14 TRANSPORT INFORMATION

DOT Name	Flammable Liquid, Corrosive, NOS
DOT Technical Name	(Sodium Hydroxide; Carbon Disulfide)
DOT Hazard Class	3, 8
UN Number	UN 2924
DOT Packing Group	PG II
RQ	Sodium Hydroxide 1000# (dry basis); Carbon Disulfide 100#
DOT Special Information	Subsidiary hazard: 8 Corrosive On a waste manifest, add the word "Waste"

15 REGULATORY INFORMATION

Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370)

Immediate (Acute) Health	Y	Fire	Y
Delayed (Chronic) Health	N	Reactive	N
		Sudden Release of Pressure	N

The components of this product are all on the TSCA Inventory list.

Ingredient Related Regulatory Information:

SARA Reportable Quantities	CERCLA RQ	SARA TPQ
Sodium hydroxide	1000 LBS	
Water	NE	
Carbon disulfide	100 LBS	10000 LBS

SARA Title III, Section 313

This product does contain chemical(s) which are defined as toxic chemicals under and subject to the reporting requirements of, Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372. See Section 2

Carbon disulfide

SARA Title III, Section 302

This product does contain chemical(s), as indicated below, currently on the Extremly Hazardous Substance List, Section 302, SARA Title III. See Section 2 for further details regarding concentrations and registry numbers.

Carbon disulfide

California Prop 65 - Developmental Toxin

This product does contain the following chemical(s), as indicated below, currently on the California List of Developmental Toxins.

Carbon disulfide

Massachusetts Right to Know

This product does contain the following chemicals(s), as indicated below, currently on the Massachusetts Right to Know Substance List.

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Massachusetts Right to Know
This product does contain the following chemicals(s), as indicated below, currently on the Massachusetts Right to Know Substance List.

Carbon disulfide
Sodium hydroxide

New Jersey Right to Know
This product does contain the following chemical(s), as indicated below, currently on the New Jersey Right-to-Know Substances List.

Carbon disulfide
Sodium hydroxide

Pennsylvania Environmental Hazard
This product does contain the following chemical(s), as indicated below, currently on the Pennsylvania Environmental Hazard List.

Carbon disulfide
Sodium hydroxide

Pennsylvania Right to Know
This product does contain the following chemical(s), as indicated below, currently on the Pennsylvania Hazardous Substance List.

Carbon disulfide
Sodium hydroxide

16 OTHER INFORMATION

Revision Information

Revision Date	23 FEB 2007	Revision Number 6
Supercedes Revision Dated	07-NOV-2006	

Revision Summary
Moved from Retired to Active 03.

Key
NE= Not Established NA= Not Applicable (R) = Registered Trademark

Miscellaneous
NOTE: Toxic carbon monoxide gas can form upon contact with food and beverage products in enclosed spaces and cause death.

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Material Safety Data Sheet

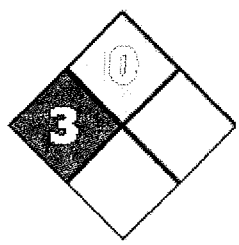
SOCHEM

PPE

HMIS

Health Hazard	3
Fire Hazard	0
Reactivity	1

NFPA



Preparation Date 03-Jun-2008 **Revision Date** **Revision Number** 0

1. PRODUCT AND COMPANY IDENTIFICATION

Product Code L-GR CAUSTIC 18-30%
Product Name Lo-Grade Caustic 18-30%
Contact Manufacturer
Sochem Solutions, Inc.
P. O. box 1912
Gonzales, LA 70707
225-644-3180
Emergency Telephone Number CHEMTREC: (call 24 Hours) 1-800-424-9300
or for International calls dial 703-527-3887 (collect calls accepted)

Application of Substance/the prepartion Industrial Cleaning Chemical

2. HAZARDS IDENTIFICATION

Emergency Overview
- The product causes burns of eyes, skin and mucous membranes

Eye contact
- Causes eye burns

Skin contact
- It will cause burns and irritation

Inhalation
- Avoid breathing vapors or mists

Ingestion
- Severe damage to the gastrointestinal tract

Principle Routes of Exposure Eye contact Skin contact Ingestion Inhalation

Aggravated Medical Conditions
- Existing dermatitis

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS-No	Weight %	EINECS
50% Liquid caustic soda	1310-73-2	18-30	-

29CFR Part 1910, Subpart Z (OSHA) Toxic and Hazardous Substances
Part 355, Appendix A (Extermly Hazardous Substances) EPA
TLV for Chemcial Substances
Annual Report on Carcinogens
Supplier: Material Safety Data Sheets

4. FIRST AID MEASURES

Skin Contact
- Wash with Large amounts of water

Eye Contact
- Flush with water for 15 mintues
- Consult a physician

Inhalation
- Remove to fresh air
- If breathing has stopped, call a physician

Ingestion
- Do not induce vomiting
- Drink large quantity of water, and consult physician

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
- Use extinguishing measures that are appropriate to local circumstances and the surrounding environment

Special Protective Equipment
- None

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions
- Ensure adequate ventilation

Environmental Precautions
- Stop flow and contain spill
- Small spill: Pick up with absorbent material
- Neutralize before disposal

Methods for Clean-up
- Neutralized
- Flush with water to sewer.
- Follow Federal, State and Local regulations
- Large spill reclaim, put in containers

7. HANDLING AND STORAGE

Handling

Safe Handling Advice
- Handle in accordance with good industrial hygiene and safety practice

Storage
- Keep container tightly closed
- Do not store in aluminum containers or use with soft metal parts.

Incompatible products
- Strong Acid

Specific use(s)
- None

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Chemical Name	OSHA PEL	ACGIH TWA
50% Liquid caustic soda	2 mg/m^3	N/A

Personal Protective Equipment

Respiratory Protection
- In case of mist, spray or aerosol exposure wear suitable personal respiratory protection and protective suit

Hand Protection
- Rubber gloves
- Neoprene gloves
- Any chemical resistant gloves

Eye/face Protection
- Chemical goggles
- Face-shield

Skin Protection
- Wear protective gloves/clothing
- Rubber or plastic boots

General Hygiene Considerations
- Avoid breathing mist

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Semi viscous Clear Liquid	**Color**	• Clear
Physical State	• Semi viscous liquid	**pH**	14
Flash Point	N/A	**Autoignition Temperature**	
Boiling Point/Range	288°F		
Solubility	Complete in water	**Vapor Density**	Not est.
Bulk Density	10.60	**Viscosity**	Not available

10. STABILITY AND REACTIVITY

Chemical Stability
- Stable

Incompatible Materials
- Strong acids

Hazardous Decomposition Products
- None under normal use

Hazardous Polymerization
- Hazardous polymerisation does not occur

Possibility of Hazardous Reactions
None under normal processing

11. TOXICOLOGICAL INFORMATION

Local effects

cause irritation	Causes burns. Irritating to skin. dryness of skin.
Eye irritation	Corrosive to the eyes and may cause severe damage including blindness.
Inhalation	May cause irritation of respiratory tract.
Ingestion	Ingestion causes burns of the upper digestive and respiratory tracts.

Long term Effects

12. ECOLOGICAL INFORMATION

Ecotoxicity effects Contains no substances known to be hazardous to the environment or not degradable in waste water treatment plants

Additional ecological information No information available

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method Follow Federal, state and Local regulations.. Large Spill: Reclaim, put in containers. Neutralize before disposal. Flush spill area with water and neutralize with dilute acid if necessary. Do not use aluminum equipment.. Small Spill: Pick up with absorbent material.. Neutralize. Flush with water.

Contaminated Packaging Keep container closed when not in use.

Further information Wash contaminated clothing before reuse

14. TRANSPORT INFORMATION

DOT

Proper Shipping Name	HM-SODIUM HYDROXIDE, SOLUTION CORROSIVE LABEL
Hazard Class	8
UN-No	1824
Packing Group	II
ERG Code	ERG-154

15. REGULATORY INFORMATION

R -phrase(s)	None
S -phrase(s)	None
Symbol(s)	Not a hazardous substance or preparation according to EC-directives 67/548/EEC or 99/45/EC
EU Labeling	None
Contains	None

U.S. Inventories

Chemical Name	TSCA	NJRTK	MRTKL	PARTK
50% Liquid caustic soda		N/A		

International Inventories

Chemical Name	TSCA	DSL	EINECS	ENCS	IECSC	KECL	PICCS	AICS
50% Liquid caustic soda	-	-	-	-	-	-	-	-

16. OTHER INFORMATION

Prepared By Sochem Solutions, Inc.

End of MSDS

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1 PRODUCT AND COMPANY IDENTIFICATION

Thio and Fine Chemicals
Arkema Inc.
2000 Market Street
Philadelphia, PA 19103

EMERGENCY PHONE NUMBERS:
Chemtrec: (800) 424-9300 (24hrs) or (703) 527-3887
Medical: Rocky Mountain Poison Control Center
(866) 767-5089 (24Hrs)

Information Telephone Numbers	Phone Number	Available Hrs
Customer Service	1-800-628-4453	8:30 to 5:30 EST

Product Name	Caustic Soda, Shipment Grade
Product Synonym(s)	
Chemical Family	Alkali
Chemical Formula	NAOH
Chemical Name	Sodium Hydroxide
EPA Reg Num	
Product Use	

2 COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient Name	CAS RegistryNumber	Typical %	OSHA
Carbon disulfide	75-15-0	<0.1%	Y
Sodium hydroxide	1310-73-2	10-15%	Y
Water	7732-18-5	85-90%	N

The substance(s) marked with a "Y" in the OSHA column, are identified as hazardous chemicals according to the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200)

This material is classified as hazardous under Federal OSHA regulation.

The components of this product are all on the TSCA Inventory list.

3 HAZARDS IDENTIFICATION

Emergency Overview

Orange slightly turbid liquid with foul odor.
DANGER!
FLAMMABLE LIQUID AND VAPOR.
CAUSES EYE, SKIN AND RESPIRATORY TRACT BURNS. MAY CAUSE BLINDNESS.
CAUSES SEVERE DIGESTIVE TRACT BURNS.
EVEN DILUTE SOLUTIONS MAY CAUSE BURNS.

Potential Health Effects

Inhalation and skin contact are expected to be the primary routes of occupational exposure to this material. This material is a strong alkali that can be destructive to tissue producing severe burns which are not immediately painful or visible. Contact with body tissues may produce deep ulceration, scarring or loss of sight. Concentrations as low as 2-3% can cause injury. Dermatitis (inflammation of the skin) and superficial skin damage can result from repeated or prolonged contact with very dilute solutions. High levels of dust or mist may be corrosive to mucous membranes producing eye or lung injury and chemical pneumonia. Lower concentrations may produce irritation of eyes, nose or upper respiratory tract with coughing, sore throat and shortness of breath. Prolonged exposure may result in ulceration of the nasal passages. If swallowed, this material may cause severe internal injury, characterized by pain in the mouth

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and stomach, vomiting, and breathing difficulties. Medical conditions which may be aggravated by exposure to this material include lung disease or limited respiratory capacity.

4 FIRST AID MEASURES

IF IN EYES, immediately flush with plenty of water for at least 15 minutes. Get medical attention immediately.

IF ON SKIN, immediately flush with plenty of water. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Destroy contaminated shoes.

IF SWALLOWED, do NOT induce vomiting. Give water to drink. Get medical attention immediately. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

IF INHALED, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

5 FIRE FIGHTING MEASURES

Fire and Explosive Properties

Auto-Ignition Temperature	NE	
Flash Point	70 F - >150 F	Flash Point Method
Flammable Limits- Upper	NE	
Lower	NE	

Extinguishing Media

Use water spray, carbon dioxide, foam or dry chemical.

Fire Fighting Instructions

Fire fighters and others who may be exposed to products of combustion should wear full fire fighting turn out gear (full Bunker Gear) and self-contained breathing apparatus (pressure demand NIOSH approved or equivalent). Fire fighting equipment should be thoroughly decontaminated after use.

Fire and Explosion Hazards

Contact with metal can form hydrogen gas. Hydrogen is extremely flammable and can form explosive mixtures with air. Closed containers may explode when heated or contents contaminated with water.

6 ACCIDENTAL RELEASE MEASURES

In Case of Spill or Leak

Stop the leak, if possible. Ventilate the space involved. Contain, vacuum up, place in non-sparking container for disposal. Prevent waterway contamination. Construct a dike to prevent spreading. Collect run-off and transfer to drums or tanks for later disposal. Consult a regulatory specialist to determine appropriate state or local reporting requirements, for assistance in waste characterization and/or hazardous waste disposal and other requirements listed in pertinent environmental permits.

7 HANDLING AND STORAGE

Handling

Do not get in eyes, on skin or clothing. Avoid breathing vapor or mist. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. To avoid rapid temperature rise, violent spattering, or explosive eruptions: always add caustic to water when mixing. Never add water to a caustic when mixing. Heat water to 80-100 F before adding product. Add small amounts of product slowly and evenly over surface of water with constant stirring. Never increase concentration of product by more than 5% with any single

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7 HANDLING AND STORAGE

addition. Water should not exceed 160 F during addition.

Storage

Do NOT store near strong acids.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls

Investigate engineering techniques to reduce exposures below airborne exposure limits. Provide ventilation if necessary to control exposure levels below airborne exposure limits (see below). If practical, use local mechanical exhaust ventilation at sources of air contamination such as open process equipment. Consult ACGIH ventilation manual or NFPA Standard 91 for design of exhaust systems. Monitor carbon monoxide and oxygen levels in tanks and enclosed spaces.

Eye / Face Protection

Where there is potential for eye contact, wear a face shield, chemical goggles, and have eye flushing equipment immediately available.

Skin Protection

Wear appropriate chemical resistant protective clothing and chemical resistant gloves to prevent skin contact. Consult glove manufacturer to determine appropriate type glove material for given application. Wear face shield and chemical resistant clothing such as a rubber apron when splashing may occur. Rinse contaminated skin promptly. Wash contaminated clothing and clean protective equipment before reuse. Wash skin thoroughly after handling.

Respiratory Protection

Avoid breathing vapor or mist. When airborne exposure limits are exceeded (see below), use NIOSH approved respiratory protection equipment appropriate to the material and/or its components. Consult respirator manufacturer to determine appropriate type equipment for given application. Observe respirator use limitations specified by NIOSH or the manufacturer. For emergency and other conditions where exposure limit may be significantly exceeded, use an approved full face positive-pressure, self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. Respiratory protection programs must comply with 29 CFR § 1910.134.

Airborne Exposure Guidelines for Ingredients

Exposure Limit		Value
Sodium hydroxide		
ACGIH CEILING	-	2 mg/m3
OSHA TWA PEL	-	2 mg/m3
Carbon disulfide		
ACGIH Skin designator	-	Y
ACGIH TWA	-	1 ppm
OSHA Ceiling PEL	-	30 ppm
OSHA TWA PEL	-	20 ppm

-Only those components with exposure limits are printed in this section.
-Skin contact limits designated with a "Y" above have skin contact effect. Air sampling alone is insufficient to accurately quantitate exposure. Measures to prevent significant cutaneous absorption may be required.
-ACGIH Sensitizer designator with a value of "Y" above means that exposure to this material may cause allergic reactions.
-WEEL-AIHA Sensitizer designator with a value of "Y" above means that exposure to this material may cause allergic skin reactions.

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9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance/Odor	Orange slightly turbid liquid with foul odor.
pH	NE
Specific Gravity	1.073 @ 15 C
Vapor Pressure	30 @ 100 F
Vapor Density	NA
Melting Point	NA
Freezing Point	NE
Boiling Point	NE
Solubility In Water	99.98%

10 STABILITY AND REACTIVITY

Stability

This material is chemically stable under normal and anticipated storage and handling conditions.

Incompatibility

Reacts violently or explosively with water, acids and organic materials such as chlorinated hydrocarbons. Toxic carbon monoxide gas can form upon contact with food or beverage products.

Hazardous Decomposition Products

Will react with some metals such as aluminum, tin or zinc to generate hydrogen gas. Hydrogen gas can result in explosive hazards in confined spaces.

11 TOXICOLOGICAL INFORMATION

Toxicological Information

Data on this material and/or its components are summarized below.

Sodium Hydroxide

Single exposure (acute) studies indicate that this material is slightly toxic if absorbed through the skin (rat LD50 1,350 mg/kg; dry sodium hydroxide) and corrosive to rabbit eyes and skin. Many publications in the scientific literature confirm that this material is corrosive to all tissues. Repeated inhalation resulted in lung damage in rats. No tumors were seen in long-term animal studies. No genetic changes were observed in tests using bacteria.

No significant increases in mortality in relation to duration or intensity of exposures were reported in an epidemiologic study of a small group of workers exposed to caustic dust for 30 years or more. Massive ingestion of this material has been implicated as causing esophageal cancer. Squamous cell carcinomas of the esophagus occurred approximately 12-42 years later in individuals who survived accidental childhood ingestion and are likely due to the tissue destruction and possible scarring of the esophagus rather than a direct effect of this material.

Carbon Disulfide

Single exposure (acute) studies indicate that this material is slightly toxic to rats if swallowed (LD50 3,188 mg/kg) or rabbits if absorbed through skin (LD50 2,025 mg/kg), practically non-toxic to rats if inhaled (1-hr LC50 40 mg/l), and severely irritating to rabbit skin and eyes. The neurological effects of long-term exposure have been documented in occupational populations who were generally exposed to levels of 20 ppm or more in viscose rayon production. Exposed workers have experienced headaches, nausea, dizziness, tiredness, memory loss, sleep disturbances, irritability and other psychological symptoms in the early stages of intoxication. Long- term exposure has resulted in decreased nerve conduction velocities, memory loss,

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11 TOXICOLOGICAL INFORMATION

peripheral neuropathy (numbness) in the lower legs and forearms, tremors, poor coordination and personality disorders. In addition, several studies have shown adverse effects on the heart including increases in atherosclerosis, death from coronary or ischemic heart disease and blood pressure. Other studies have indicated that long-term overexposure can cause adverse effects on the eyes including increased hemorrhages or microaneurysms of the retina. Studies of occupationally exposed workers have suggested that long-term exposure to higher levels may cause reproductive effects. Male workers had decreased libido, reduced sperm count and altered endocrine function and female workers reported menstrual irregularities. Sperm from exposed workers have shown alterations indicative of spermatogenic damage. There is conflicting evidence whether increased pregnancy complications and a higher frequency of spontaneous abortions are related to exposures in female workers.

Animal studies have confirmed neurological effects. Rats exposed for long periods to high levels showed decreased motor conduction velocity, hindlimb motor defects, peripheral nerve swelling and degeneration. Repeated exposure of monkeys has resulted in reduced visual acuity. Following inhalation exposure in male rats, minor reproductive effects such as decreased sperm counts and abnormal mating behavior, but no pathological changes were noted in testes. A two-generation reproduction study in exposed female rats showed no reduction in fertility, but mothers exposed to high dose levels had reduced pup viability. Multiple developmental toxicity studies in rats and rabbits have presented evidence of increased birth defects and embryotoxicity at high dose levels; however, exposures at levels that are not maternally toxic generally do not cause birth defects, although developmental effects have been observed. No genetic changes were observed in tests using bacteria, but have been observed in animal cells.

12 ECOLOGICAL INFORMATION

Ecotoxicological Information

Data on this material and/or its components are summarized below.

Sodium Hydroxide
Data from several species of fish showed a range of tolerance (brook trout > spotfin and Lake Emerald shiners > minnows > mosquitofish > goldfish) that was most likely related to changes in the pH produced by addition of sodium hydroxide to the water. The minimum lethal concentration for minnows, Mayfly larvae and Daphnia was 100 ppm and for Chironomus larvae, 700 ppm.

Carbon Disulfide
This material is moderately toxic to Daphnia magna (LC50 2.1 mg/l). It is moderately toxic to guppies (LC50 4 mg/l) and slightly toxic to green algae (LC50 21 mg/l). It is practically non-toxic to mosquitofish (LC50 135 mg/l) and bacteria (LC50 341 mg/l).

Chemical Fate Information

Data on this material and/or its components are summarized below.

Sodium Hydroxide
No data were available, but this material is a strong alkali that easily dissolves in water with resulting acid/base chemistry.

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13 DISPOSAL CONSIDERATIONS

Waste Disposal

Consult with environmental engineer or professional to determine if neutralization is appropriate and for handling procedures for residual materials. Note: Chemical additions to, processing of, or otherwise altering this material may make this waste management information incomplete, inaccurate, or otherwise inappropriate. Furthermore, state and local waste disposal requirements may be more restrictive or otherwise different from federal laws and regulations.

14 TRANSPORT INFORMATION

DOT Name	Flammable Liquid, Corrosive, NOS
DOT Technical Name	(Sodium Hydroxide; Carbon Disulfide)
DOT Hazard Class	3, 8
UN Number	UN 2924
DOT Packing Group	PG II
RQ	Sodium Hydroxide 1000# (dry basis); Carbon Disulfide 100#
DOT Special Information	Subsidiary hazard: 8 Corrosive On a waste manifest, add the word "Waste"

15 REGULATORY INFORMATION

Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370)

Immediate (Acute) Health	Y	Fire	Y
Delayed (Chronic) Health	N	Reactive	N
		Sudden Release of Pressure	N

The components of this product are all on the TSCA Inventory list.

Ingredient Related Regulatory Information:

SARA Reportable Quantities	CERCLA RQ	SARA TPQ
Sodium hydroxide	1000 LBS	
Water	NE	
Carbon disulfide	100 LBS	10000 LBS

SARA Title III, Section 313

This product does contain chemical(s) which are defined as toxic chemicals under and subject to the reporting requirements of, Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372. See Section 2

Carbon disulfide

SARA Title III, Section 302

This product does contain chemical(s), as indicated below, currently on the Extremly Hazardous Substance List, Section 302, SARA Title III. See Section 2 for further details regarding concentrations and registry numbers.

Carbon disulfide

California Prop 65 - Developmental Toxin

This product does contain the following chemical(s), as indicated below, currently on the California List of Developmental Toxins.

Carbon disulfide

Massachusetts Right to Know

This product does contain the following chemicals(s), as indicated below, currently on the Massachusetts Right to Know Substance List.

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Massachusetts Right to Know
This product does contain the following chemicals(s), as indicated below, currently on the Massachusetts Right to Know Substance List.

Carbon disulfide

Sodium hydroxide

New Jersey Right to Know
This product does contain the following chemical(s), as indicated below, currently on the New Jersey Right-to-Know Substances List.

Carbon disulfide

Sodium hydroxide

Pennsylvania Environmental Hazard
This product does contain the following chemical(s), as indicated below, currently on the Pennsylvania Environmental Hazard List.

Carbon disulfide

Sodium hydroxide

Pennsylvania Right to Know
This product does contain the following chemical(s), as indicated below, currently on the Pennsylvania Hazardous Substance List.

Carbon disulfide

Sodium hydroxide

16 OTHER INFORMATION

Revision Information

Revision Date	23 FEB 2007	Revision Number 6
Supercedes Revision Dated	07-NOV-2006	

Revision Summary
Moved from Retired to Active 03.

Key
NE= Not Established NA= Not Applicable (R) = Registered Trademark

Miscellaneous
NOTE: Toxic carbon monoxide gas can form upon contact with food and beverage products in enclosed spaces and cause death.

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Changes in information are as follows:
Section 1 (Product and Company Identification)
Section 3 (Composition / Information on Ingredients)
Section 15 (Regulatory Information)
Section 16 (Other Information)

Durox, Oxypure, Super D and FMC Logo - FMC Trademarks

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Material Safety Data Sheet

Section 1. Chemical Product and Company Identification

Product Name/Trade Name	**10% Bleach** Ref#40000020
Manufacturer:	KIK CUSTOM PRODUCTS 2921 Corder Street Houston Texas, 77054
Contact Number:	Tel: 713-747-8710
Emergency Contact:	Tel:1-800-255-3924
Prepared By:	KIK CUSTOM PRODUCTS Laboratory
Date Last Revised:	**October 31, 2007**
Replaces Date:	June 21, 2005

Section 2 Hazardous Ingredients

Name	%	CAS#	LD50/LC50
Sodium Hypochlorite	9 – 13	007681-52-9	N Av./N Av
Sodium Hydroxide	max 1.5%	001310-73-2	N Av./N Av

Section 3 Physical Data

State	Liquid	**pH**	12.3 – 12.9
Appearance	Clear Colorless	**% Volatile**	80% Approx.
Odour	Typical chlorine bleach	**Boiling Point**	105°C
Specific Gravity	1.15 min	**Vapour Pressure**	22mm Hg @ 20C
Solubility	100%		

Section 4 Fire & Explosion

Flammable: YES NO X
Means of Extinction: Water, Carbon Dioxide, Dry Chemical or Foam
Special Procedures: Fire fighters should wear self-contained breathing apparatus.
Flash Point: & Method: Not Applicable
Hazardous Combustion Products: Chlorine Gas.

Section 5 Reactivity Data

Chemical Stability: YES X NO
Conditions: Temperature above 40 °C, sunlight and metals, Incompatibility: YES X NO
What Substances: Acids, ammonia, urea, metals & oxidizers.
Reactivity / Conditions: Not Applicable
Hazardous Decomposition Products: Chlorine gas released by contact with acids. Contact with ammonia or urea produces nitrogen gas and chloramines. Oxygen is released on contact with metals.

10% Bleach

Section 6 Toxicological Properties

Route of Entry

Skin Contact	X	Skin Absorption		Eye Contact	X
Inhalation Acute	X	Inhalation Chronic		Ingestion	X

Effects of Acute Exposure: Inhalation of vapours will irritate breathing passages and may cause breathing difficulty. CORROSIVE will cause sever irritation to eyes and skin. May cause permanent damage if not treated properly. Ingestion will cause burning sensation in mouth, throat and stomach. Will cause membrane irritation and pain and inflammation to digestive tract, Could cause vomiting and shock
Effects of chronic exposure: None Known
Carcinogenicity Reproductive Effects, Teratogenicity, and Mutagenicity: no known effects

Section 7 Preventative Measures

Protective Equipment

Gloves: wear PVC or rubber gloves	Eyes: Eye goggles or shields
Respiratory: Not normally required	Footwear: regular footwear but rubber boots for spills

Clothing: wear a plastic jacket or apron; have safety shower and eye wash fountain available close by.
Leak and Spill: Leaking product may be transferred to clean plastic containers. Dilute small spills with water and add sodium sulfite or sodium metabisulfite and flush to sewer. Avoid runoff to ground water, surface water and sanitary sewers For major spills contain the spill and call supplier
Waste Disposal: Dispose of in accordance with local, state and federal regulations
Storage Requirements: Use polyethylene, polypropylene, FRP or PVC containers. Store product at –10C to 30C and away from sunlight or heat. Keep containers closed when not in use and keep out of reach of children

Section 8 First Aid Measures

Skin: Immediately wash with soap and water call physician if irritation develops

Eyes: Flush eyes with cool running water, holding eyelids apart to ensure thorough rinsing for 15 minutes. Remove contact lenses. See a doctor immediately.

Inhalation: Move to fresh air and restore breathing, if required. If symptoms persist call physician

Ingestion: DO NOT INDUCE VOMITING! Rinse mouth with water, then drink large amounts of water. Do not give anything by mouth to a convulsing or unconscious person. See a doctor immediately.

General Advice: If irritation persists see a doctor immediately.

Section 9 Regulatory Information

WHMIS Rating:	Health Hazard	3
	Fire Hazard	0
	Reactivity	2

DOT: Hypochlorite Solution 8, UN 1791 III

As the handling and use of products under user's conditions are beyond our control, no warranty, expressed or implied, is made concerning this product. The information contained herein is offered only as a guide to the handling of this specific material and is not intended to be all-inclusive in the manner and conditions of use and handling. The user

assumes all risks of use or handling, whether or not in accordance with any directions or suggestions of the manufacturer. Manufacturer shall not be liable to purchaser or any other person for loss or damages directly or indirectly arising from the use of our product.

MATERIAL SAFETY DATA SHEET

Hydrogen Peroxide (20 to 40%)

MSDS Ref. No.: 7722-84-1-3
Date Approved: 06/03/2008
Revision No.: 11

This document has been prepared to meet the requirements of the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200 and Canada's Workplace Hazardous Materials Information System (WHMIS) requirements.

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Hydrogen Peroxide (20 to 40%)

ALTERNATE PRODUCT NAME(S): Durox® Reg. & LR 35%, Oxypure® 35%, Standard 27.5 & 35%, Super D® 25 & 35, Technical 35%, HTP 35%, OHP 35%, Chlorate Grade, 20%, Semiconductor Reg, Seg, RGS, RGS 2, RGS 3, 31%

GENERAL USE:

Durox® 35% Reg. & LR - meets the Food Chemical Codex requirements for aseptic packaging and other food related applications.

Oxypure® 35% - certified by NSF to meet NSF/ANSI Standard 60 requirements for drinking water treatment.

Standard 27.5 and 35% - most suitable grade for industrial bleaching, processing, pollution abatement and general oxidation reactions.

Semiconductor Reg, Seg, RGS, RGS 2, RGS 3, 31% - conform to ACS and Semi Specs. for wafer etching and cleaning, and applications requiring low residues.

Super D® 25 and 35% - meets US Pharmacopoeia specifications for 3% topical solutions when diluted with proper quality water. While manufactured to the USP standards for purity and to FMC's demanding ISO 9002 quality standards, FMC does not claim that it's Hydrogen Peroxide is manufactured in accordance with all pharmaceutical cGMP conditions.

Technical 35% - essentially free of inorganic metals suitable for chemical synthesis.

HTP 35% - specially formulated for aerospace equipment conditioning.

OHP 35% - specially formulated for OHP process, advanced oxidation, and activated peroxide applications

Chlorate Grade 20% - specially formulated for use in chlorate manufacture or processing.

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MANUFACTURER

FMC CORPORATION
FMC Peroxygens
1735 Market Street
Philadelphia, PA 19103
(215) 299-6000 (General Information)
msdsinfo@fmc.com (Email - General Information)

FMC of Canada Ltd.
FMC Peroxygens
PG Pulp Mill Road
Prince George, BC V2N2S6
(250) 561-4200 (General Information)

EMERGENCY TELEPHONE NUMBERS

(281) 474-8750 (Plant: Pasadena, TX, US - Call Collect)
(250) 561-4221 (Plant: Prince George, BC, Canada - Call Collect)
(303) 595-9048 (Medical - U.S. - Call Collect)

For leak, fire, spill, or accident emergencies, call:
(800) 424-9300 (CHEMTREC - U.S.A.)
(613) 996-6666 (CANUTEC - Canada)

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

- Clear, colorless, odorless liquid
- Oxidizer.
- Contact with combustibles may cause fire.
- Decomposes yielding oxygen that supports combustion of organic matters and can cause overpressure if confined.
- Corrosive to eyes, nose, throat, lungs and gastrointestinal tract.

POTENTIAL HEALTH EFFECTS: Corrosive to eyes, nose, throat and lungs. May cause irreversible tissue damage to the eyes including blindness. May cause skin irritation.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	CAS#	Wt.%	EC No.	EC Class
Hydrogen Peroxide	7722-84-1	20 - 40	231-765-0	O, C, Xn; R5- R8-R35-R20/22
Water	7732-18-5	60 - 80	231-791-2	Not classified

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4. FIRST AID MEASURES

EYES: Immediately flush with water for at least 15 minutes, lifting the upper and lower eyelids intermittently. See a medical doctor or ophthalmologist immediately.

SKIN: Wash with plenty of soap and water. Get medical attention if irritation occurs and persists.

INGESTION: Rinse mouth with water. Dilute by giving 1 or 2 glasses of water. Do not induce vomiting. Never give anything by mouth to an unconscious person. See a medical doctor immediately.

INHALATION: Remove to fresh air. If breathing difficulty or discomfort occurs and persists, contact a medical doctor.

NOTES TO MEDICAL DOCTOR: Hydrogen peroxide at these concentrations is a strong oxidant. Direct contact with the eye is likely to cause corneal damage especially if not washed immediately. Careful ophthalmologic evaluation is recommended and the possibility of local corticosteroid therapy should be considered. Because of the likelihood of corrosive effects on the gastrointestinal tract after ingestion, and the unlikelihood of systemic effects, attempts at evacuating the stomach via emesis induction or gastric lavage should be avoided. There is a remote possibility, however, that a nasogastric or orogastric tube may be required for the reduction of severe distension due to gas formation.

5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Flood with water.

FIRE / EXPLOSION HAZARDS: Product is non-combustible. On decomposition releases oxygen which may intensify fire.

FIRE FIGHTING PROCEDURES: Any tank or container surrounded by fire should be flooded with water for cooling. Wear full protective clothing and self-contained breathing apparatus.

FLAMMABLE LIMITS: Non-combustible

SENSITIVITY TO IMPACT: No data available

SENSITIVITY TO STATIC DISCHARGE: No data available

6. ACCIDENTAL RELEASE MEASURES

RELEASE NOTES: Dilute with a large volume of water and hold in a pond or diked area until hydrogen peroxide decomposes. Hydrogen peroxide may be decomposed by adding sodium metabisulfite or sodium sulfite after diluting to about 5%. Dispose according to methods outlined for waste disposal.

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Combustible materials exposed to hydrogen peroxide should be immediately submerged in or rinsed with large amounts of water to ensure that all hydrogen peroxide is removed. Residual hydrogen peroxide that is allowed to dry (upon evaporation hydrogen peroxide can concentrate) on organic materials such as paper, fabrics, cotton, leather, wood or other combustibles can cause the material to ignite and result in a fire.

7. HANDLING AND STORAGE

HANDLING: Wear chemical splash-type monogoggles and full-face shield, impervious clothing, such as rubber, PVC, etc., and rubber or neoprene gloves and shoes. Avoid cotton, wool and leather. Avoid excessive heat and contamination. Contamination may cause decomposition and generation of oxygen gas which could result in high pressures and possible container rupture. Hydrogen peroxide should be stored only in vented containers and transferred only in a prescribed manner (see FMC Technical Bulletins). Never return unused hydrogen peroxide to original container, empty drums should be triple rinsed with water before discarding. Utensils used for handling hydrogen peroxide should only be made of glass, stainless steel, aluminum or plastic.

STORAGE: Store drums in cool areas out of direct sunlight and away from combustibles. For bulk storage refer to FMC Technical Bulletins.

COMMENTS: VENTILATION: Provide mechanical general and/or local exhaust ventilation to prevent release of vapor or mist into the work environment.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS

Chemical Name	ACGIH	OSHA	Supplier
Hydrogen Peroxide	1 ppm (TWA)	1 ppm (PEL) 1.4 mg/m^3 (PEL)	

ENGINEERING CONTROLS: Ventilation should be provided to minimize the release of hydrogen peroxide vapors and mists into the work environment. Spills should be minimized or confined immediately to prevent release into the work area. Remove contaminated clothing immediately and wash before reuse.

PERSONAL PROTECTIVE EQUIPMENT

EYES AND FACE: Use chemical splash-type monogoggles and a full-face shield made of polycarbonate, acetate, polycarbonate/acetate, PETG or thermoplastic.

RESPIRATORY: If concentrations in excess of 10 ppm are expected, use NIOSH/DHHS approved self-contained breathing apparatus (SCBA), or other approved atmospheric-supplied respirator (ASR) equipment (e.g., a full-face airline respirator (ALR)). DO NOT use any form of air-purifying respirator (APR) or filtering facepiece (AKA dust mask), especially those containing oxidizable sorbants such as activated carbon.

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PROTECTIVE CLOTHING: For body protection wear impervious clothing such as an approved splash protective suit made of SBR Rubber, PVC (PVC Outershell w/Polyester Substrate), Gore-Tex (Polyester trilaminate w/Gore-Tex), or a specialized HAZMAT Splash or Protective Suite (Level A, B, or C). For foot protection, wear approved boots made of NBR, PVC, Polyurethane, or neoprene. Overboots made of Latex or PVC, as well as firefighter boots or specialized HAZMAT boots are also permitted. DO NOT wear any form of boot or overboots made of nylon or nylon blends. DO NOT use cotton, wool or leather, as these materials react RAPIDLY with higher concentrations of hydrogen peroxide. Completely submerge hydrogen peroxide contaminated clothing or other materials in water prior to drying. Residual hydrogen peroxide, if allowed to dry on materials such as paper, fabrics, cotton, leather, wood or other combustibles can cause the material to ignite and result in a fire.

GLOVES: For hand protection, wear approved gloves made of nitrile, PVC, or neoprene. DO NOT use cotton, wool or leather for these materials react RAPIDLY with higher concentrations of hydrogen peroxide. Thoroughly rinse the outside of gloves with water prior to removal. Inspect regularly for leaks.

9. PHYSICAL AND CHEMICAL PROPERTIES

ODOR:	Odorless
APPEARANCE:	Clear, colorless liquid
AUTOIGNITION TEMPERATURE:	Non-combustible
BOILING POINT:	103°C/218°F (20%); 107°C/225°F (31%); 108°C/226°F (35%)
COEFFICIENT OF OIL / WATER:	Not available
DENSITY / WEIGHT PER VOLUME:	Not available
EVAPORATION RATE:	> 1 (Butyl Acetate = 1)
FLASH POINT:	Non-combustible
FREEZING POINT:	-15°C/6°F (20%); -26°C/-15°F (31%); -33°C/-27°F (35%)
ODOR THRESHOLD:	Not available
OXIDIZING PROPERTIES:	Strong oxidizer
PERCENT VOLATILE:	100
pH:	<= 3.7 5.0 - 6.0 @ 25 °C (1% solution)
SOLUBILITY IN WATER:	100 %
SPECIFIC GRAVITY:	1.07 @ 20°C/4°C (20%); 1.11 @ 20°C/4°C (31%); 1.13 @ 20°C/4°C (35%)
VAPOR DENSITY:	(Air = 1): Not available
VAPOR PRESSURE:	28 mmHg @ 30°C (20%); 24 mmHg @ 30°C (31%); 23 mmHg @ 30°C (35%)

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10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID:	Excessive heat or contamination could cause product to become unstable.
STABILITY:	Stable (heat and contamination could cause decomposition)
POLYMERIZATION:	Will not occur
INCOMPATIBLE MATERIALS:	Reducing agents, wood, paper and other combustibles, iron and other heavy metals, copper alloys and caustic.
HAZARDOUS DECOMPOSITION PRODUCTS:	Oxygen which supports combustion.

COMMENTS: Materials to Avoid : Dirt, organics, cyanides and combustibles such as wood, paper, oils, etc.

11. TOXICOLOGICAL INFORMATION

EYE EFFECTS: 35% hydrogen peroxide: Extremely irritating/corrosive (rabbit) [FMC Study Number: I83-748]

SKIN EFFECTS: 35% hydrogen peroxide: Mildly irritating after 4-hour exposure (rabbit) [FMC Study Number: I83-747]

DERMAL LD_{50}: 35% hydrogen peroxide: > 2,000 mg/kg (rabbit) [FMC Study Number: I83-746]

ORAL LD_{50}: 35% hydrogen peroxide: 1,193 mg/kg (rat) [FMC Study Number: I83-745]

INHALATION LC_{50}: 50% hydrogen peroxide: > 0.17 mg/l (rat) [FMC Study Number: I89-1080]

TARGET ORGANS: Eyes, nose, throat and lungs

ACUTE EFFECTS FROM OVEREXPOSURE: Extremely irritating/corrosive to eyes and gastrointestinal tract. May cause irreversible tissue damage to the eyes including blindness. Inhalation of mist or vapors may be severely irritating to nose, throat and lungs. May cause skin irritation.

CHRONIC EFFECTS FROM OVEREXPOSURE: The International Agency for Research on Cancer (IARC) has concluded that there is inadequate evidence for carcinogenicity of hydrogen peroxide in humans, but limited evidence in experimental animals (Group 3 - not classifiable as to its carcinogenicity to humans). The American Conference of Governmental Industrial Hygienists (ACGIH) has concluded that hydrogen peroxide is a 'Confirmed Animal Carcinogen with Unknown Relevance to Humans' (A3).

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CARCINOGENICITY:

Chemical Name	IARC	NTP	OSHA	Other
Hydrogen Peroxide	Not listed	Not listed	Not listed	(ACGIH) Listed (A3, Animal Carcinogen)

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION: Channel catfish 96-hour LC_{50} = 37.4 mg/L
Fathead minnow 96-hour LC_{50} = 16.4 mg/L
Daphnia magna 24-hour EC_{50} = 7.7 mg/L
Daphnia pulex 48-hour LC_{50} = 2.4 mg/L
Freshwater snail 96-hour LC_{50} = 17.7 mg/L
For more information refer to ECETOC "Joint Assessment of Commodity Chemicals No. 22, Hydrogen Peroxide." ISSN-0773-6339, January 1993

CHEMICAL FATE INFORMATION: Hydrogen peroxide in the aquatic environment is subject to various reduction or oxidation processes and decomposes into water and oxygen. Hydrogen peroxide half-life in freshwater ranged from 8 hours to 20 days, in air from 10-20 hrs. and in soils from minutes to hours depending upon microbiological activity and metal contaminants.

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: An acceptable method of disposal is to dilute with a large amount of water and allow the hydrogen peroxide to decompose followed by discharge into a suitable treatment system in accordance with all regulatory agencies. The appropriate regulatory agencies should be contacted prior to disposal.

14. TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION (DOT)

PROPER SHIPPING NAME:	Hydrogen peroxide, aqueous solutions with not less than 20% but not more than 40% hydrogen peroxide
PRIMARY HAZARD CLASS / DIVISION:	5.1 (Oxidizer)
UN/NA NUMBER:	UN 2014
PACKING GROUP:	II
LABEL(S):	Oxidizer, Corrosive
PLACARD(S):	5.1 (Oxidizer)

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ADDITIONAL INFORMATION:

DOT Marking: Hydrogen Peroxide, aqueous solution with not less than 20%, but not more than 40% Hydrogen Peroxide, UN 2014

Hazardous Substance/RQ: Not applicable

49 STCC Number: 4918775

DOT Spec: stainless steel/high purity aluminum cargo tanks and rail cars. UN Spec: HDPE drums. Contact FMC for specific details.

INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG)

PROPER SHIPPING NAME: Hydrogen peroxide, aqueous solutions with not less than 20%, but not more than 60% hydrogen peroxide.

INTERNATIONAL CIVIL AVIATION ORGANIZATION (ICAO) / INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA)

PROPER SHIPPING NAME: Hydrogen peroxide, aqueous solutions with not less than 20%, but not more than 40% hydrogen peroxide (*).

OTHER INFORMATION:

(*) Air regulations permit shipment of Hydrogen Peroxide (20 - 40%) in non-vented containers for Air Cargo Only aircraft, as well as for Passenger and Cargo aircraft. HOWEVER, all FMC Hydrogen Peroxide containers are vented and therefore, air shipments of FMC H_2O_2 is not permitted. IATA air regulations state that venting of packages containing oxidizing substances is not permitted for air transport.

Protect from physical damage. Keep drums in upright position. Drums should not be stacked in transit. Do not store drum on wooden pallets.

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15. REGULATORY INFORMATION

UNITED STATES

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)

SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355, APPENDIX A):
Not listed

SECTION 311 HAZARD CATEGORIES (40 CFR 370):
Fire Hazard, Immediate (Acute) Health Hazard

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SECTION 312 THRESHOLD PLANNING QUANTITY (40 CFR 370):
The Threshold Planning Quantity (TPQ) for this product, if treated as a mixture, is 10,000 lbs; however, this product contains the following ingredients with a TPQ of less than 10,000 lbs.: None, (conc. <52%)

SECTION 313 REPORTABLE INGREDIENTS (40 CFR 372):
Not listed

CERCLA (COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT)

CERCLA DESIGNATION & REPORTABLE QUANTITIES (RQ) (40 CFR 302.4):
Unlisted (Hydrogen Peroxide 20-40%); RQ = 100 lbs.; Ignitability, Corrosivity

TSCA (TOXIC SUBSTANCE CONTROL ACT)

TSCA INVENTORY STATUS (40 CFR 710):
Listed

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA)
RCRA IDENTIFICATION OF HAZARDOUS WASTE (40 CFR 261):
Waste Number: D001, D002

CANADA

WHMIS (WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM):

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

Hazard Classification / Division:	C E D2B
Product Identification Number:	2014
Ingredient Disclosure List:	Listed
Domestic Substance List:	All components listed

INTERNATIONAL LISTINGS

Hydrogen peroxide:

China: Listed
Japan (ENCS): (1)-419
Korea: KE-20204
Philippines (PICCS): Listed

HAZARD AND RISK PHRASE DESCRIPTIONS:

EC Symbols: O (Oxidizer)

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	C	(Corrosive)
	Xn	(Harmful)
EC Risk Phrases:	R5	(Heating may cause an explosion.)
	R8	(Contact with combustible material may cause fire)
	R35	(Causes severe burns.)
	R20/22	(Harmful by inhalation and if swallowed.)

16. OTHER INFORMATION

HMIS

Health	3
Flammability	0
Physical Hazard	1
Personal Protection (PPE)	H

Protection = H (Safety goggles, gloves, apron, the use of a supplied air or SCBA respirator is required in lieu of a vapor cartridge respirator)

HMIS = Hazardous Materials Identification System

Degree of Hazard Code:
4 = Severe
3 = Serious
2 = Moderate
1 = Slight
0 = Minimal

NFPA

Health	3
Flammability	0
Reactivity	1
Special	OX

SPECIAL = OX (Oxidizer)

NFPA (National Fire Protection Association)

Degree of Hazard Code:
4 = Extreme
3 = High
2 = Moderate
1 = Slight
0 = Insignificant

REVISION SUMMARY:
This MSDS replaces Revision #10, dated April 27, 2006.

EPAPA008000579

Conoco

Straight Bill Of Lading - Short Form
Original -- Not Negotiable

CES ENVIROMENTAL

Received Subject to the classifications and tariffs in effect on the date of the issue of this Bill of Lading.

From Conoco Inc.

the property described below in apparent good order except as noted# marked# and consigned and destined as indicated below which said carrier agrees to its usual place of delivery at said destination# if on its route# otherwise to deliver to another carrier on the route to said destination. It is mutually agreed# as to each carrier of all or any of said property over all or any portion of said route to destination# and as ti each party at any time interested in all or any of said property# that every service to be performed herunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in Uniform Freight Classifications in effect on the date hereof. If this is a rail or rail-water shipment

Shipper hereby certifies that he is familiarwith all the terms and conditions of the said bill of lading of this shipment# and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

Subject to Section 7 of Conditions of applicable bill of lading# if this shipment is to be delivered to the consignee without recourse on the consignor# the consignor shall sign the following statement:
The carrier shall not make delivery of this shipment without payment of frieght and all other lawful charges.
Conoco Inc.

Signature of Consignor
If charges are to be prepaid# write or stamp here
___Prepaid ___Collect*

Consignee CES ENVIROMENTAL/PORT ARTHUR

Destination PORT ARTHUR,TX/ CES ENVIRO

B112317

Date Shipped 03/12/2009
Arrival Time 08:55:13
Entry Time 09:09:36
Departure Time 10:00:43
Loading Order No 82692/ 01

Shipper of Consignor LAKE CHARLES REFINERY,WESTLAKE

Truck: 273
Trailer: 8177

D.O.T. Hazardous Material Description – Product	Product Code	Specific Gravity	% Purity	Tank No.	Weight In Pounds Gross	Tare	Net	Net Gallons
	8995	.	.	75700	31260	44440	0	

SULFURIC ACID (SPENT)
SULFURIC ACID, SPENT//8//UN 1832//PG II
RE (SULFURIC ACID, SPENT)// PLACARDED:
CORROSIVE//HAZMAT STCC=4930042
1 CARGO TANK

Carrier hereby certifies that the cargo tank used for this shipment is a proper container for the commodity loaded therein and complies with Department of Transportation specifications.

Per: CES ENVIROMENTAL Carrier

This is to certify that the above materials are properly classified# described# marked# and labeled# and are in proper condition for transportation# according to applicable regulations of the Department of Transportation.
Conoco Inc. Shipper

Per CES ENVIROMENTAL Carrier

Driver has been offered a copy of the D.O.T. emergency response guide.

Drivers Signature SITTIG, BRENT

* Any weights shown on this bill of lading by the shipper are for the convenience of the carrier# and can be verified at any time by an examination of the records on file in the shipper's office.

Security: KEN DUBOIS *WEIGHMASTER*

FOR CHEMICAL EMERGENCY Spill# Leak# Fire# Exposure or Accident Call:
CHEMTREC - Day or Night 800-424-9300 (Toll Free)
Arlington# Va. 527-3887. Outside Continental
U.S.A. (703) 527-3887 (Collect)

EPAPA00800580

Conoco

Straight Bill Of Lading - Short Form
Original -- Not Negotiable

CES ENVIROMENTAL

Received Subject to the classifications and tariffs in effect on the date of the issue of this Bill of Lading.

From Conoco Inc.

the property described below in apparent good order except as noted# marked# and consigned and destined as indicated below which said carrier agrees to its usual place of delivery at said destination# if on its route# otherwise to deliver to another carrier on the route to said destination. It is mutually agreed# as to each carrier of all or any of said property over all or any portion of said route to destination# and as to each party at any time interested in all or any of said property# that every service to be performed herunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in Uniform Freight Classifications in effect on the date hereof. If this is a rail or rail-water shipment
Shipper hereby certifies that he is familiarwith all the terms and conditions of the said bill of lading
of this shipment# and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

Subject to Section 7 of Conditions of applicable bill of lading# if this shipment is to be delivered to the consignee without recourse on the consignor# the consignor shall sign the following statement:
The carrier shall not make delivery of this shipment without payment of frieght and all other lawful charges.
Conoco Inc.

Signature of Consignor
If charges are to be prepaid# write or stamp here
___Prepaid ___Collect*

Consignee CES ENVIROMENTAL/PORT ARTHUR

B112317

Destination PORT ARTHUR,TX/ CES ENVIRO

Date Shipped 03/12/2009
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Shipper of Consignor LAKE CHARLES REFINERY,WESTLAKE

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Trailer: 8177

D.O.T. Hazardous Material Description – Product	Product Code	Specific Gravity	% Purity	Tank No.	Weight In Pounds Gross	Tare	Net	Net Gallons
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SULFURIC ACID (SPENT)
SULFURIC ACID, SPENT//8//UN 1832//PG II
RE (SULFURIC ACID, SPENT)// PLACARDED:
CORROSIVE//HAZMAT STCC=4930042
1 CARGO TANK

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Conoco Inc. Shipper

* Any weights shown on this bill of lading by the shipper are for the convenience of the carrier# and can be verified at any time by an examination of the records on file in the shipper's office.

Security: KEN DUBOIS *WEIGHMASTER*

Per CES ENVIROMENTAL Carrier

FOR CHEMICAL EMERGENCY Spill# Leak# Fire# Exposure or Accident Call:
CHEMTREC - Day or Night 800-424-9300 (Toll Free)
Arlington# Va. 527-3887. Outside Continental
U.S.A. (703) 527-3887 (Collect)

EPAPA00800581

ConocoPhillips

Spent/Fresh Acid

CAS No. 7664-93-9

Corrosive

Read ConocoPhillips MSDS before handling.

Avoid contact with eyes, skin, or clothing. Wash thoroughly after handling. Wash clothing after use. Store in accordance with NFPA recommendations. Wear protective clothing and gloves when skin contact may occur. Wear face shield and splash goggles where splashing may occur. Safety shower and eyewash facilities should be immediately accessible when handling.

Lake Charles Refinery
PO Box 37
Westlake, LA 70669

NCPA Hazard Rating:	
Health	3
Flammability	0
Reactivity	2
Personal protection to be supplied by user depending on use conditions.	

18-521 L, 10-03

20 MULE TEAM®

Borax

Material Safety Data Sheet

DATE OF ISSUE May 2000

Supersedes November 1999 Version

1 Chemical product and company identification

Product name: Borax
Grade: Technical, NF, SQ
Product use: Industrial manufacturing
Chemical formula: $Na_2B_4O_7 \cdot 10H_2O$
Chemical name/synonyms: Sodium tetraborate decahydrate, disodium tetraborate decahydrate, borax decahydrate, Borax 10 Mol
Chemical family: Inorganic borates
CAS registry number: 1303-96-4

MANUFACTURER:

U.S. Borax Inc.
26877 Tourney Road
Valencia, CA 91355-1847

EMERGENCY PHONE NUMBERS

24 Hr. Medical Info. Service: (661) 284-5200
Chemtrec (Spills): (800) 424-9300

(Refer to Section 15 for TSCA/DSL Chemical Inventory listing)

2 Composition/information on ingredients

This product contains greater than 99 percent (%) Sodium tetraborate decahydrate, $Na_2B_4O_7 \cdot 10H_2O$, which is hazardous under the OSHA Hazard Communication Standard and under the Canadian Controlled Products Regulations of the Hazardous Products Act (WHMIS), based on animal chronic toxicity studies. Refer to Sections 3 and 11 for details on hazards.

3 Hazard identification

Emergency overview

Borax is a white, odorless, powdered substance that is not flammable, combustible, or explosive and has low acute oral and dermal toxicity.

Potential ecological effects

Large amounts of Borax can be harmful to plants and other species. Therefore, releases to the environment should be minimized.

Potential health effects

Routes of exposure: Inhalation is the most significant route of exposure in occupational and other settings. Dermal exposure is not usually a concern because Borax is poorly absorbed through intact skin.

Inhalation: Occasional mild irritation effects to nose and throat may occur from inhalation of Borax dust at levels greater than 10 mg/m^3.

Eye contact: Borax is non-irritating to eyes in normal industrial use.

Skin contact: Borax does not cause irritation to intact skin.

Ingestion: Products containing Borax are <u>not</u> intended for ingestion. Borax has a low acute toxicity. Small amounts (e.g., a teaspoonful) swallowed accidentally are not likely to cause effects; swallowing amounts larger than that may cause gastrointestinal symptoms.

Cancer: Borax is not a known carcinogen.

Reproductive/developmental: Animal ingestion studies in several species, at high doses, indicate that borates cause reproductive and developmental effects. A human study of occupational exposure to borate dust showed no adverse effect on reproduction.

Target organs: No target organ has been identified in humans. High dose, animal ingestion studies indicate the testes are the target organs in male animals.

Signs and symptoms of exposure: Symptoms of accidental over-exposure to Borax might include nausea, vomiting and diarrhea, with delayed effects of skin redness and peeling. These symptoms have been associated with the accidental over-exposure to the chemically related substance boric acid.

Refer to Section 11 for details on Toxicological data.

4 First aid measures

Inhalation: If symptoms such as nose or throat irritation are observed, remove person to fresh air.

Eye contact: Use eye wash fountain or fresh water to cleanse eye. If irritation persists for more than 30 minutes, seek medical attention.

Skin contact: No treatment necessary because non-irritating.

Ingestion: Swallowing small quantities (one teaspoon) will cause no harm to healthy adults. If larger amounts are swallowed, give two glasses of water to drink and seek medical attention.

Note to physicians: Observation only is required for adult ingestion in the range of 4-8 grams of Borax. For ingestion of larger amounts, maintain adequate kidney function and force fluids. Gastric lavage is recommended for symptomatic patients only. Hemodialysis should be reserved for massive acute ingestion or patients with renal failure. Boron analyses of urine or blood are only useful for documenting exposure and should not be used to evaluate severity of poisoning or to guide treatment[1]. Refer to Section 11 for details.

BORAX™

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5 Fire fighting measures

General hazard: None, because Borax is not flammable, combustible or explosive. The product is itself a flame retardant.

Extinguishing media: Any fire extinguishing media may be used on nearby fires.

Flammability classification (29 CFR 1910.1200): Non-flammable solid.

6 Accidental release measures

General: Borax is a water-soluble white powder that may, at high concentrations, cause damage to trees or vegetation by root absorption. (Refer to Ecological information, Section 12, for specific information.)

Land spill: Vacuum, shovel or sweep up Borax and place in containers for disposal in accordance with applicable local regulations. Avoid contamination of water bodies during cleanup and disposal. No personal protective equipment is needed to cleanup land spills.

Spillage into water: Where possible, remove any intact containers from the water. Advise local water authority that none of the affected water should be used for irrigation or for the abstraction of potable water until natural dilution returns the boron value to its normal environmental background level. (Refer to Sections 12, 13 and 15 for additional information.) Borax is a non-hazardous waste when spilled or disposed of, as defined in the Resource Conservation and Recovery Act (RCRA) regulations (40 CFR 261). (Refer to Regulatory information, Section 15, for additional references.)

7 Handling and storage

General: No special handling precautions are required, but dry, indoor storage is recommended. To maintain package integrity and to minimize caking of the product, bags should be handled on a first-in, first-out basis. Good housekeeping procedures should be followed to minimize dust generation and accumulation.

Storage temperature: Ambient

Storage pressure: Atmospheric

Special sensitivity: Moisture (caking)

8 Exposure controls/personal protection

Engineering controls: Use local exhaust ventilation to keep airborne concentrations of Borax dust below permissible exposure levels.

Personal protection: Where airborne concentrations are expected to exceed exposure limits, NIOSH/MSHA certified respirators should be used. Eye goggles and gloves are not required for normal industrial exposures, but may be warranted if environment is excessively dusty.

Occupational exposure limits: Sodium tetraborate decahydrate (Borax) is regulated by OSHA, Cal OSHA and ACGIH. The OSHA/PEL (Permissible Exposure Level) is 10 mg/m^3 total dust. The Cal OSHA/PEL is 5 mg/m^3. The ACGIH/TLV (Threshold Limit Value) is 5 mg/m^3.

9 Physical and chemical properties

Appearance:	White, odorless, crystalline solid
Specific gravity:	1.71
Vapor pressure:	Negligible @ 20°C
Solubility in water:	4.71% @ 20°C; 65.64% @ 100°C
Melting point:	62°C (144°F) (heated in closed space)
pH @ 20°C:	9.3 (0.1% solution); 9.2 (1.0% solution); 9.3 (4.7% solution)
Molecular weight:	381.37

10 Stability and reactivity

General: Borax is a stable product, but when heated it loses water, eventually forming anhydrous borax ($Na_2B_4O_7$).

Incompatible materials and conditions to avoid: Reaction with strong reducing agents, such as metal hydrides or alkali metals, will generate hydrogen gas, which could create an explosive hazard.

Hazardous decomposition: None.

EPAPA008000584

11 Toxicological information

Acute toxicity

Ingestion: Low acute oral toxicity; LD_{50} in rats is 4,500 to 5,000 mg/kg of body weight.

Skin/dermal: Low acute dermal toxicity; LD_{50} in rabbits is greater than 10,000 mg/kg of body weight. Borax is poorly absorbed through intact skin.

Inhalation: Low acute inhalation toxicity; LC_{50} in rats is greater than 2.0 mg/L (or g/m^3).

Skin irritation: Non-irritant.

Eye irritation: Draize test in rabbits produced eye irritation effects. Fifty years of occupational exposure to Borax indicates no adverse effects on human eye. Therefore, Borax is not considered to be a human eye irritant in normal industrial use.

Sensitization: Borax is not a skin sensitizer.

Other

Reproductive/developmental toxicity: Animal feeding studies in rat, mouse and dog, at high doses, have demonstrated effects on fertility and testes[2]. Studies with the chemically related boric acid in the rat, mouse and rabbit, at high doses, demonstrate developmental effects on the fetus, including fetal weight loss and minor skeletal variations[3,4]. The doses administered were many times in excess of those to which humans would normally be exposed[5].

Carcinogenicity/mutagenicity: No evidence of carcinogenicity in mice[6]. No mutagenic activity was observed for boric acid in a battery of short-term mutagenicity assays.

Human data: Human epidemiological studies show no increase in pulmonary disease in occupational populations with chronic exposures to boric acid dust and sodium borate dust. A recent epidemiology study under the conditions of normal occupational exposure to borate dusts indicated no effect on fertility[7].

12 Ecological information

Ecotoxicity data

General: Boron (B) is the element in sodium tetraborate decahydrate (Borax) which is used by convention to report borate product ecological effects. It occurs naturally in sea-water at an average concentration of 5 mg B/L and generally occurs in fresh water at concentrations up to 1 mg B/L. In dilute aqueous solutions the predominant boron species present is undissociated boric acid. To convert sodium tetraborate decahydrate into the equivalent boron (B) content, multiply by 0.1134.

Phytotoxicity: Boron is an essential micronutrient for healthy growth of plants; however, it can be harmful to boron sensitive plants in high quantities. Care should be taken to minimize the amount of Borax released to the environment.

Algal toxicity:

Green algae, *Scenedesmus subspicatus*

96-hr EC_{10} = 24 mg B/L†

Invertebrate toxicity[8]:

Daphnids, *Daphnia magna straus*

24-hr EC_{50} = 242 mg B/L†

Fish toxicity:

Sea-water[9]:

Dab, *Limanda limanda*

96-hr LC_{50} = 74 mg B/L†

Fresh water[10]:

Rainbow trout, *S. gairdneri* (embryo-larval stage)

24-day LC_{50} = 88 mg B/L†

32-day LC_{50} = 54 mg B/L†

Goldfish, *Carassius auratus* (embryo-larval stage)

7-day LC_{50} = 65 mg B/L†

3-day LC_{50} = 71 mg B/L†

Environmental fate data

Persistence/degradation: Boron is naturally occurring and ubiquitous in the environment. Borax decomposes in the environment to natural borate.

Octanol/water partition coefficient: No value. In aqueous solution Sodium tetraborate decahydrate is converted substantially into undissociated boric acid.

Soil mobility: Borax is soluble in water and is leachable through normal soil.

Test substance: † sodium tetraborate

13 Disposal considerations

Disposal guidance: Small quantities of Borax can usually be disposed of at landfill sites. No special disposal treatment is required, but local authorities should be consulted about any specific local requirements. Tonnage quantities of product are not recommended to be sent to landfills. Such product should, if possible, be used for an appropriate application.

RCRA (40 CFR 261): Borax is not listed under any sections of the Federal Resource Conservation and Recovery Act (RCRA).

NPRI (Canada): Borax is not listed on the Canadian National Pollutant Release Inventory.

Refer to Section 15 for additional regulatory information.

14 Transport information

DOT hazardous classification: Sodium tetraborate decahydrate (Borax) is not regulated by the U.S. Department of Transportation (DOT) and is therefore not considered a hazardous material/substance.

TDG Canadian transportation: Sodium tetraborate decahydrate (Borax) is not regulated under Transportation of Dangerous Goods (TDG). **International transportation:** Sodium tetraborate decahydrate (Borax) has no UN Number, and is not regulated under international rail, road, water or air transport regulations.

EPAPA008000585

15 Regulatory information

OSHA/Cal OSHA: This MSDS document meets the requirements of both OSHA (29 CFR 1910.1200) and Cal OSHA (Title 8 CCR 5194 (g)) hazard communication standards. Refer to Section 8 for regulatory exposure limits.
WHMIS classification: Sodium tetraborate decahydrate (Borax) is classified as Class D- Division 2A under Canadian WHMIS guidelines.
Chemical inventory listing: Sodium tetraborate decahydrate (Borax). 1303-96-4. appears on several chemical inventory lists (including the EPA TSCA inventory, Canadian DSL, European EINECS, Japanese MITI, Australian and Korean lists) under the CAS No. representing this inorganic salt.

U.S. EPA TSCA Inventory	1303-96-4
Canadian DSL	1303-96-4
EINECS	215-540-4
South Korea	9212-848
Japanese MITI	(1)-69

RCRA: Sodium tetraborate decahydrate is not listed as a hazardous waste under any sections of the Resource Conservation and Recovery Act (RCRA) or regulations (40 CFR 261 *et seq*).
Superfund: CERCLA/SARA. Sodium tetraborate decahydrate is not listed under CERCLA or its 1986 amendments, SARA, including substances listed under Section 313 of SARA, Toxic Chemicals, 42 USC 11023, 40 CFR 372.65, Section 302 of SARA, Extremely Hazardous Substances, 42 USC 11002, 40 CFR 355, or the CERCLA Hazardous Substances list, 42 USC 9604, 40 CFR 302.
Safe Drinking Water Act (SDWA): Sodium tetraborate decahydrate is not regulated under the SDWA, 42 USC 300g-1, 40 CFR 141 *et seq*. Consult state and local regulations for possible water quality advisories regarding boron compounds.
Clean Water Act (CWA) (Federal Water Pollution Control Act): 33 USC 1251 *et seq*.

a) Sodium tetraborate decahydrate (Borax) is not itself a discharge covered by any water quality criteria of Section 304 of the CWA, 33 USC 1314.
b) It is not on the Section 307 List of Priority Pollutants, 33 USC 1317, 40 CFR 129.
c) It is not on the Section 311 List of Hazardous Substances, 33 USC 1321, 40 CFR 116.

Canadian drinking water guideline: An "Interim Maximum Acceptable Concentration" (IMAC) for boron is currently set at 5 mg B/L.
IARC: The International Agency for Research on Cancer (IARC) (a unit of the World Health Organization) does not list or categorize Sodium tetraborate decahydrate as a carcinogen.
NTP Biennial Report on Carcinogens: Sodium tetraborate decahydrate is not listed.
OSHA carcinogen: Sodium tetraborate decahydrate is not listed.
California Proposition 65: Sodium tetraborate decahydrate (Borax) is not listed on the Proposition 65 list of carcinogens or reproductive toxicants.
Federal Food, Drug and Cosmetic Act: Pursuant to 21 CFR 175.105, 176.180 and 181.30, Borax is approved by the FDA for use in adhesive components of packaging materials, as a component of paper coatings on such materials, or for use in the manufacture thereof, which materials are expected to come in contact with dry food products.
Clean Air Act (Montreal Protocol): Borax was not manufactured with and does not contain any Class I or Class II ozone depleting substances.

16 Other information

References

1) Litovitz T L, Norman S A, Veltri J C, Annual Report of the American Association of Poison Control Centers Data Collection System. Am. J. Emerg. Med. 4: 427-458 (1986).
2) Weir R J, Fisher R S, Toxicol. Appl. Pharmacol. **23**: 351-364 (1972).
3) Fail *et al.*, Fund. Appl. Toxicol. **17**: 225-239 (1991).
4) Price *et al.*, J. Am. Coll. Toxicol. **14**: (2), 173 (Abst. P-17) (1995).
5) Murray F J, Regul. Toxicol. Pharmacol. (Dec. 1995).
6) National Toxicology Program (NTP)–Toxicology and carcinogenesis studies of boric acid in B6C3F$_1$ mice, Tech. Report Ser. No. 324, U.S. Dept. of Health and Human Services. NIH Publ. No. 88-2580 (1987).
7) Whorton *et al.*, Occup. Environ. Med. **51**: 761-767 (1994).
8) Schöberl *et al.*, Tenside Surfactants Detergents **25**: 99-107 (1988).
9) Hugman S J, Mance G, Water Research Centre Report 616-M (1983).
10) Butterwick L, de Oude N, Raymond K, Ecotoxicol. Environ. Safety **17**: 339-371 (1989).

For general information on the toxicology of inorganic borates, see Patty's Industrial Hygiene and Toxicology, 4th Ed. Vol. II, (1994), Chap. 42, Boron; ECETOC Tech. Report No. 63 (1995).

Product label text hazard information*:

- Do not ingest.
- Ingestion may cause reproductive harm or birth defects based on animal data.
- Avoid contamination of food or feed.
- Not for use in food, drugs or pesticides†.
- Refer to MSDS.
- KEEP OUT OF REACH OF CHILDREN.

*The WHMIS panel format is used for Canadian product.
†Except for NF (pharmaceutical grade) products.

National Fire Protection Assoc. (NFPA) Classification:

Health	0
Flammability	0
Reactivity	0

Hazardous Materials Information Systems (HMIS):

Red: (Flammability)	0
Yellow: (Reactivity)	0
Blue: (Acute Health)	1*

*Chronic Effects

For further information contact:

U.S. Borax Inc.
Occupational Health & Product Safety Department
(661) 287-6050

EPAPA008000586

MATERIAL SAFETY DATA SHEET

MSDS

Chemtura

Date Issued: 09/27/1997
MSDS No: BIWT21000
Date-Revised: 05/30/2007
Revision No: 2

Dimethylhydantoin

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Dimethylhydantoin
GENERAL USE: Manufacturing Intermediate
CHEMICAL FAMILY: Hydantoin

MANUFACTURER

Bio-Lab, Inc., A Chemtura Company
Custom Products Division
P.O. Box 2456
Suwanee GA 30024-0980
Customer Care Number: (800) 600-4523

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

PHYSICAL APPEARANCE: White, odorless powder.

IMMEDIATE CONCERNS: CAUTION: Mildly irritating to skin, eyes, and mucous membranes. May be harmful if swallowed. Avoid contact with eyes, skin or clothing. Wear goggles or safety glasses and rubber gloves when handling this product. May be irritating to nose and throat. Avoid breathing dust. Remove and wash contaminated clothing before reuse.

POTENTIAL HEALTH EFFECTS

EYES: May cause eye irritation with reddness and swelling. Avoid contact with eyes.

SKIN: May cause skin irritation with itching, reddness or rash. Avoid contact with skin.

INGESTION: May be harmful if swallowed.

INHALATION: Irritating to nose and throat. Avoid breathing dust or vapors.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

CHRONIC EFFECTS: There are no known chronic hazards.

MEDICAL CONDITIONS AGGRAVATED: Existing dermatitis may be aggravated by exposure.

ROUTES OF ENTRY: Eye Contact, Inhalation, Ingestion.

SENSITIZATION: Potential skin sensitizer.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	Wt.%	CAS
Dimethylhydantoin	100	77-71-4

4. FIRST AID MEASURES

EYES: If contact with eyes occurs: Immediately flush with cold water for at least 15 minutes. Then get immediate medical attention.

SKIN: If contact with skin: Brush off excess chemical and wash skin with plenty of soap and water. If irritation persists, get medical attention.

INGESTION: If swallowed: Drink 1 or 2 glasses of water. Do not induce vomiting. Avoid alcohol. Never give anything by mouth to an unconscious person. Call a physician or a poison control center immediately.

INHALATION: If inhaled: Remove to fresh air. If breathing is difficult, have trained person administer oxygen. If not breathing, give artificial respiration. Call a physician immediately.

5. FIRE FIGHTING MEASURES

FLASHPOINT AND METHOD: Not Applicable

GENERAL HAZARD: There are no unusual fire and explosion hazards known.

EXTINGUISHING MEDIA: Appropriate to surrounding fire.

HAZARDOUS COMBUSTION PRODUCTS: Nitrogen containing compounds may be released during fire.

EXPLOSION HAZARDS: This product does not pose an immediate explosion hazard.

FIRE FIGHTING EQUIPMENT: Firefighters should wear full protective clothing and self contained breathing apparatus (SCBA). Thoroughly decontaminate fire fighting equipment including all fire fighting wearing apparel after the incident.

SENSITIVE TO STATIC DISCHARGE: None

SENSITIVITY TO IMPACT: None

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition products may include, but are not limited to, oxides of carbon or nitrogen and other organic substances.

6. ACCIDENTAL RELEASE MEASURES

GENERAL PROCEDURES: STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Utilizing appropriate protective clothing and safety equipment, contain spilled material. Keep spill out of sewers and open bodies of water. Using clean dedicated equipment, sweep and scoop all spilled material, contaminated soil, and other contaminated material and place in clean dry plastic containers for disposal. Dispose of according to local, municipal, state, provincial and federal regulations.

7. HANDLING AND STORAGE

GENERAL PROCEDURES: Avoid contact with eyes, skin or clothing. Avoid breathing dust.

HANDLING: Use safe chemical handling procedures for the hazards presented by this material.

STORAGE: Keep this product in original closed container when not in use. Store in a cool, dry, well ventilated area away from heat or open flame.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS: General room ventilation plus local exhaust should be used to minimize exposure to dust/vapors.

PERSONAL PROTECTIVE EQUIPMENT

EYES AND FACE: Wear goggles or safety glasses with side shields when handling this product.

SKIN: Wear rubber gloves when handling this product. Avoid contact with skin.

RESPIRATORY: A respiratory protection program that meets OSHA 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use.

PROTECTIVE CLOTHING: Use chemical protective clothing resistant to this material. Remove and wash contaminated clothing before reuse.

WORK HYGIENIC PRACTICES: Remove and wash contaminated clothing before reuse.

OTHER USE PRECAUTIONS: Facilities storing or utilizing this material should be equipped with an eyewash and safety shower.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: Solid

ODOR: Odorless

APPEARANCE: Crystalline

COLOR: White

pH: Not Established

VAPOR DENSITY: Not Established

BOILING POINT: Not Applicable

MELTING POINT: 178°C (352°F)

FLASHPOINT AND METHOD: Not Applicable

SOLUBILITY IN WATER: 13.5g/100g water at 20 C

DENSITY: Not Established

COEFF. OIL/WATER: Not Applicable

ODOR THRESHOLD: Not Available

OXIDIZING PROPERTIES: Not Applicable

10. STABILITY AND REACTIVITY

STABILITY: This product is stable under normal conditions.

POLYMERIZATION: Hazardous polymerization will not occur under normal conditions.

CONDITIONS TO AVOID: High temperature. Poor ventilation. Contamination. Moisture/high humidity.

HAZARDOUS DECOMPOSITION PRODUCTS: Nitrogen containing compounds may be released during combustion.

INCOMPATIBLE MATERIALS: None known

11. TOXICOLOGICAL INFORMATION

ACUTE

DERMAL LD_{50}: > 3000 mg/kg of body weight in rabbits.

ORAL LD_{50}: > 5000 mg/kg of body weight in rats
Notes: No-Observable-Effect-Level (NOEL): 2000 mg/kg/day - rats; 1000 mg/kg/day - beagle dogs.

NOTES: ACUTE EFFECTS FROM OVEREXPOSURE: Contact with dilute solutions is not irritating to the eyes or skin.

EYE EFFECTS: Mildly irritating to eyes.

SKIN EFFECTS: Mildly irritating to skin.

SUBCHRONIC: In a 90-day feeding study in rats at doses from 250 to 2,000 mg/kg, no compound-related toxicity was observed.

CARCINOGENICITY

IARC: This product is not listed as a carcinogen by IARC.

NTP: This product is not listed as a carcinogen by NTP.

OSHA: This product is not listed as a carcinogen by OSHA.

SENSITIZATION: In a guinea pig maximization study at a concentration of 10%, DMH is a mild skin sensitizer. In a guinea pig skin sensitization study by the Buehler method, sensitization was not observed.

REPRODUCTIVE EFFECTS: No data available for this product.

TERATOGENIC EFFECTS: No data available for this product.

MUTAGENICITY: No data available for this product.

SYNERGISTIC MATERIALS: None known.

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION: This product may be toxic to fish and aquatic organisms. Keep product from entering waterways and watersheds.

13. DISPOSAL CONSIDERATIONS

PRODUCT DISPOSAL: Dispose of unused, uncontaminated product in compliance with local, state and federal regulations.

EMPTY CONTAINER: Do not reuse container. Rinse thoroughly before discarding in trash.

14. TRANSPORT INFORMATION

DOT (DEPARTMENT OF TRANSPORTATION)

PROPER SHIPPING NAME: Not Regulated as a US DOT Hazardous Material

AIR (ICAO/IATA)

SHIPPING NAME: Not regulated as a ICAO hazardous material.

VESSEL (IMO/IMDG)

SHIPPING NAME: Not regulated as a IMDG hazardous material.

CANADA TRANSPORT OF DANGEROUS GOODS

SHIPPING NAME: Not Regulated as a TDG Hazardous Material

15. REGULATORY INFORMATION

UNITED STATES

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)

FIRE: No **PRESSURE GENERATING:** No **REACTIVITY:** No **ACUTE:** Yes **CHRONIC:** No

313 REPORTABLE INGREDIENTS: This product or its components are not listed.

CERCLA (COMPREHENSIVE RESPONSE, COMPENSATION, AND LIABILITY ACT)

CERCLA REGULATORY: This product or its components are not listed.

TSCA (TOXIC SUBSTANCE CONTROL ACT)

TSCA REGULATORY: This product or its components are not subject to export notification.

TSCA STATUS: This product or its components are listed on the TSCA Inventory.

CALIFORNIA PROPOSITION 65: This product does not contain any substance(s) which are defined by the state of California to cause cancer, birth defects, or other reproductive effects.

OSHA HAZARD COMM. RULE: Product is hazardous by definition of the Hazardous Communication Standard.

FIFRA (FEDERAL INSECTICIDE, FUNGICIDE, AND RODENTICIDE ACT): This product is not a registered pesticide.

CANADA

WHMIS CLASS: D2B - Minimal eye & skin irritant.

CANADA INGREDIENT DISCLOSURE LIST: Not Listed

DOMESTIC SUBSTANCE LIST (INVENTORY): Product is listed on DSL.

COMMENTS This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and this MSDS contains all the information required by the Controlled Products Regulations.

16. OTHER INFORMATION

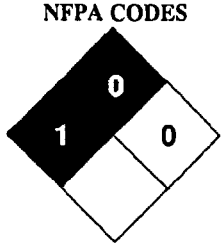
PREPARED BY: Regulatory Affairs Department

REVISION SUMMARY: Revision #: 2 This MSDS replaces the October 31, 2000 MSDS. Any changes in information are as follows: In Section 1 Prepared By In Section 5 Sensitivity to Impact Sensitive Static Discharge Explosion Hazards Hazardous Decomposition In Section 6 General Procedures In Section 8 Clothing Protection In Section 9 (Group Field) for Vapor Pressure Odor Threshold Coeff Oil/Water Oxidizing Properties In Section 11 Synergistic Materials Teratology Reproductive Effects Mutagenicity Acute In Section 14 IMO Proper Shipping Name AIR Proper Shipping Name TDG Proper Shipping Name In Section 15 Accute Proposition 65 Statement Comments WHMIS Class CANADA Ingredient Disclosure List In Section 16 Manufacturer Disclaimer Comments

HMIS RATING

HEALTH:	1
FLAMMABILITY:	0
PHYSICAL HAZARD:	0
PERSONAL PROTECTION:	B

NFPA CODES



COMMENTS: The contents and format of this MSDS are in accordance with OSHA Hazard Communication Standard, National Fire Protection Association (NFPA), Hazardous Materials Identification System (HMIS), and Canada's Worplace Hazardous Information System (WHMIS) and Environmental Protection Agency (CEPA).

MANUFACTURER DISCLAIMER: IMPORTANT: The information is given without a warranty or guarantee. No suggestions for use are intended or shall be construed as a recommendation to infringe any existing patents or violate any Federal, Provincial, State, Municipal, or local laws. Safe handling and use is the responsibility of the customer. Read the label before using this product. This information is true and accurate to the best of our knowledge.

#4 (5)

Houston, Dangerous Pradhan 2003

Mostly this in floor sweep: 75-98%

#3237

Trichloroisocyanuric acid

From Wikipedia, the free encyclopedia
(Redirected from Symclosene)

mtura

Michael Soileau
Environmental, Health, Safety & Security Manager

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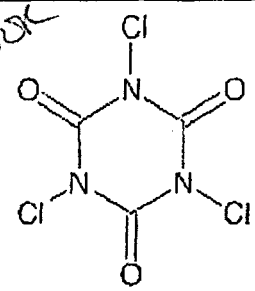
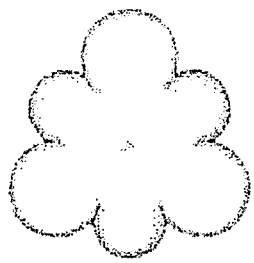
← creator

← generator

Trichloroisocyanuric acid





General	
Systematic name	1,3,5-trichloro-1,3,5-triazinane-2,4,6-trione
Other names	TCICA 1,3,5-trichloro-1,3,5-triazine-2,4,6(1H,3H,5H)-trione
Chemical formula	$C_3Cl_3N_3O_3$
SMILES	Cl(=O)N(C(=O)N(C(=O)N1Cl)Cl)Cl
Molecular mass	232.41 g/mol
Appearance	colourless solid
CAS number	87-90-1 (http://nlm.nih.gov/cgi/mesh/2006/MB_cgi?rn=1&term=87-90-1)
Properties	
Density	2.19 ± 0.1 g/cm³
Solubility in water	0.2%
Other solvents	chlorocarbons acetone acetonitrile
Melting point	249-51 °C
Boiling point	decomp.
Structure	
geometry	planar
Crystal structure	
Dipole moment	0 D
Hazards	
MSDS	External MSDS
Main hazards	lung irritant
NFPA 704	
Flash point	NA
R/S statement	R: 8-22-31-36/37-50/53 S: 8-26-41-60-61
RTECS number	XZ1925000
Supplementary data page	

Structure and properties	n, ε_r, etc.
Thermodynamic data	*Phase behaviour* Solid, liquid, gas
Spectral data	UV, IR, NMR, MS
Related compounds	
Related compounds	Cyanuric chloride dichloroisocyanuric acid

Except where noted otherwise, data are given for materials in their standard state (at 25 °C, 100 kPa)
Infobox disclaimer and references

Trichloroisocyanuric acid ($C_3Cl_3N_3O_3$), also known as Symclosene, trichloro-s-triazinetrione, TCICA, and trichlor, is a chemical compound used as an industrial disinfectant and a reagent in organic synthesis.[1] This white crystalline powder, which has a strong "chlorine odour," is sometimes sold in tablet or granule form for domestic use.

Use in water treatment

The compound is a disinfectant mainly for swimming pool water.

See also

- Dichlor

References and external links

1. ^ Hiegel, G. A. "Trichloroisocyanuric Acid" in Encyclopedia of Reagents for Organic Synthesis 2001, John Wiley & Sons: New York. DOI: 10.1002/047084289X.rt209

- Symclosene data page (http://toxnet.nlm.nih.gov/cgi-bin/sis/search/r?dbs+hsdb:@term+@rn+@rel+87-90-1)

Retrieved from "http://en.wikipedia.org/wiki/Trichloroisocyanuric_acid"

Categories: Antimicrobials | Ketones | Nitrogen heterocycles | Organic compound stubs

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EPAPA008000593

The following information was generated from the
Hazardous Substances Data Bank (HSDB),
a database of the National Library of Medicine's TOXNET system
(http://toxnet.nlm.nih.gov) on July 19, 2007.

Query: Records containing the term 87 90 1

1
NAME: TRICHLOROISOCYANURIC ACID

RN: 87-90-1

HUMAN HEALTH EFFECTS:

HUMAN TOXICITY EXCERPTS:

USE ... IN SWIMMING POOLS HAS NOT GIVEN RISE TO ADVERSE EFFECTS & THIS USE IS CONSIDERED SAFE. [Patty, F. (ed.). Industrial Hygiene and Toxicology: Volume II: Toxicology. 2nd ed. New York: Interscience Publishers, 1963., p. 2202]**PEER REVIEWED**

Trichloroisocyanuric acid solution (neutralized, 100 mg/l as available chlorine) was tested on 10 individuals by immersion of the entire forearms eight times a day for 7 days and after a 2 week rest repeated for 7 days. No skin irritation or sensitization was observed. [Clayton, G. D. and F. E. Clayton (eds.). Patty's Industrial Hygiene and Toxicology: Volume 2A, 2B, 2C: Toxicology. 3rd ed. New York: John Wiley Sons, 1981-1982., p. 2768]**PEER REVIEWED**

Possible health hazards due to worker exposure to chlorinated isocyanurates at Olin Chemical, Lake Charles Louisiana were investigated. At the time of the survey about 90 workers were employed in production activities associated with packaging trichloroisocyanuric acid and sodium dichloroisocyanurate. Personal breathing zone sampling and medical interviews were performed. Particulate concentrations ranged from 0.11 to 38 mg/cu m. About 60% of the dust near the packaging areas was within the respirable size range. No OSHA standards for exposure to any chlorinated isocyanurates have been developed. Workers used respirator facepieces with high efficiency particulate filters. All production workers reported one or more work related symptoms. The most common symptoms were eye irritation and cough. 78% of the women interviewed reported problems or changes in their menstrual cycle since beginning work in the packaging area. /It was/ concluded that workers are not adequately protected from the irritant effects of trichloroisocyanuric acid and sodium dichloroisocyanurate. Engineering controls medical surveillance respiratory protection and improved housekeeping procedures are recommended. [NIOSH; Hazard Evaluations and Technical Assistance Branch NIOSH Cincinati, Ohio, 27 pp (1982)]**PEER REVIEWED**

SKIN, EYE AND RESPIRATORY IRRITATIONS:

Skin, eye, and respiratory tract irritant. [Fire Protection Guide to Hazardous Materials. 12 ed. Quincy, MA: National Fire Protection Association, 1997., p. 49-131]**QC REVIEWED**

MINIMUM FATAL DOSE LEVEL:

3= MODERATELY TOXIC: PROBABLE ORAL LETHAL DOSE (HUMAN) 0.5-5 G/KG, BETWEEN 1 OZ & 1 PINT FOR 70 KG PERSON (150 LB). [Gosselin, R.E., R.P. Smith, H.C. Hodge. Clinical Toxicology of Commercial Products. 5th ed. Baltimore: Williams and Wilkins, 1984., p. II-111]**PEER REVIEWED**

EPAPA008000594

EMERGENCY MEDICAL TREATMENT:

EMERGENCY MEDICAL TREATMENT:

EMT COPYRIGHT DISCLAIMER:
Portions of the POISINDEX(R) and MEDITEXT(R) database have been provided here for general reference. THE COMPLETE POISINDEX(R) DATABASE OR MEDITEXT(R) DATABASE SHOULD BE CONSULTED FOR ASSISTANCE IN THE DIAGNOSIS OR TREATMENT OF SPECIFIC CASES. The use of the POISINDEX(R) and MEDITEXT(R) databases is at your sole risk. The POISINDEX(R) and MEDITEXT(R) databases are provided "AS IS" and "as available" for use, without warranties of any kind, either expressed or implied. Micromedex makes no representation or warranty as to the accuracy, reliability, timeliness, usefulness or completeness of any of the information contained in the POISINDEX(R) and MEDITEXT(R) databases. ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE OR USE ARE HEREBY EXCLUDED. Micromedex does not assume any responsibility or risk for your use of the POISINDEX(R) or MEDITEXT(R) databases. Copyright 1974-2007 Thomson MICROMEDEX. All Rights Reserved. Any duplication, replication, "downloading," sale, redistribution or other use for commercial purposes is a violation of Micromedex' rights and is strictly prohibited.<p>The following Overview, *** HYPOCHLORITES AND RELATED AGENTS ***, is relevant for this HSDB record chemical.

LIFE SUPPORT:

- This overview assumes that basic life support measures have been instituted.

CLINICAL EFFECTS:

0.2.1 SUMMARY OF EXPOSURE

0.2.1.1 ACUTE EXPOSURE

A) INGESTION - The vast majority of patients ingesting household bleach develop no symptoms or only minor gastrointestinal irritation. Sodium hypochlorite and related compounds such as chloramine may be mildly irritating to corrosive depending upon the physical form and duration of exposure. Ingestions of large quantities of household bleach (greater than or equal to 5 milliliters/kilogram) may cause corrosive damage to the oropharynx, esophagus or stomach. Hypernatremia, hyperchloremia, hypotension, and mental status changes may rarely develop after extremely large ingestions.

B) INHALATION - Sodium hypochlorite when combined with an acid or ammonia may produce chlorine and chloramine gas. Gas evolution may result in mucous membrane and respiratory tract irritation. In severe cases bronchospasm, pneumonitis, and upper airway edema may develop.

C) PARENTERAL - Chloramine, a disinfectant in over 30% of the municipal water supplies in the United States, may produce hemolysis in patients if used in hemodialysis solutions.

0.2.4 HEENT

0.2.4.1 ACUTE EXPOSURE

A) WITH POISONING/EXPOSURE

1) Chloramine has produced eye irritation, lacrimation and eyelid edema. Asymptomatic corneal edema and corneal epithelial erosions have developed in subjects swimming in chlorinated pools.

0.2.5 CARDIOVASCULAR

0.2.5.1 ACUTE EXPOSURE

A) WITH POISONING/EXPOSURE
1) Cardiovascular collapse is a rare occurrence following large ingestions.

0.2.6 RESPIRATORY
0.2.6.1 ACUTE EXPOSURE
A) WITH POISONING/EXPOSURE
1) Edema of the glottis as well as pulmonary edema may occur. CHLORAMINE AND CHLORINE gas inhalation result in coughing, choking, and dyspnea. Chemical pneumonitis, pulmonary edema and respiratory failure can occur following severe gas exposure. Mild exposures resolve with no therapy. Pneumomediastinum has been reported with chlorine gas inhalation.

0.2.7 NEUROLOGIC
0.2.7.1 ACUTE EXPOSURE
A) WITH POISONING/EXPOSURE
1) Lethargy may develop in patients with significant pulmonary injury after chlorine or chloramine inhalation. Coma is a rare finding after severe ingestion or inhalation. Injecting sodium hypochlorite beyond the root apex during root canal procedures has caused block of the mental nerve.

0.2.8 GASTROINTESTINAL
0.2.8.1 ACUTE EXPOSURE
A) WITH POISONING/EXPOSURE
1) Significant burns or strictures of the gastrointestinal tract are unusual following ingestion of household bleach. Vomiting is common after hypochlorite ingestions or inhalation of chlorine or chloramine gas. Hematemesis may develop after large ingestions.

0.2.11 ACID-BASE
0.2.11.1 ACUTE EXPOSURE
A) WITH POISONING/EXPOSURE
1) Metabolic acidosis is a rare finding after significant ingestions and inhalation.

0.2.12 FLUID-ELECTROLYTE
0.2.12.1 ACUTE EXPOSURE
A) WITH POISONING/EXPOSURE
1) Hypernatremia and hyperchloremia are rare findings with large ingestions. Hyperkalemia may result from hemolysis when dialysate is contaminated with chloramine.

0.2.13 HEMATOLOGIC
0.2.13.1 ACUTE EXPOSURE
A) WITH POISONING/EXPOSURE
1) Hemolysis may develop if dialysate is contaminated with chloramine. Hemodialysis-associated methemoglobinemia has been reported in two patients with acute renal failure.

0.2.14 DERMATOLOGIC
0.2.14.1 ACUTE EXPOSURE
A) WITH POISONING/EXPOSURE
1) Dermal irritation and hypersensitivity have been reported with chlorine active compounds. Small volumes of sodium hypochlorite injected IV have produced erythema at the site of injection.

LABORATORY:
A) Pulse oximetry or arterial blood gas monitoring, chest radiographs and pulmonary function testing are indicated

EPAPA008000596

in patients with significant pulmonary signs or symptoms.
B) Monitor electrolytes in patients with large ingestions of sodium hypochlorite.

TREATMENT OVERVIEW:

0.4.2 ORAL EXPOSURE

A) DECONTAMINATION - Induced emesis, gastric lavage, or gastric aspiration are NOT indicated in a household bleach ingestion.

B) ESOPHAGOSCOPY - Esophageal and gastric injury is unlikely following ingestion of liquid household bleach and esophagoscopy is not warranted unless symptoms (drooling, dysphagia, pain) are present or a large amount (generally more than 5 mg/kg) is ingested.

1) Ingestion of granular bleach or industrial strength products may necessitate endoscopic evaluation.

C) DILUTION: Immediately dilute with 4 to 8 ounces (120 to 240 mL) of water or milk (not to exceed 4 ounces/120 mL in a child).

D) Neutralization with acids is not indicated.

0.4.3 INHALATION EXPOSURE

A) INHALATION: Move patient to fresh air. Monitor for respiratory distress. If cough or difficulty breathing develops, evaluate for respiratory tract irritation, bronchitis, or pneumonitis. Administer oxygen and assist ventilation as required. Treat bronchospasm with inhaled beta2 agonist and oral or parenteral corticosteroids.

B) ACUTE LUNG INJURY: Maintain ventilation and oxygenation and evaluate with frequent arterial blood gas or pulse oximetry monitoring. Early use of PEEP and mechanical ventilation may be needed.

0.4.4 EYE EXPOSURE

A) DECONTAMINATION: Irrigate exposed eyes with copious amounts of room temperature water for at least 15 minutes. If irritation, pain, swelling, lacrimation, or photophobia persist, the patient should be seen in a health care facility.

0.4.5 DERMAL EXPOSURE

A) OVERVIEW

1) REMOVE ALL EXPOSED CLOTHING AND WASH EXPOSED AREAS of the body twice with soap and water. Wash all exposed clothes with soap and water. Complications are unlikely. A physician may need to examine the exposed area if pain or irritation persists after the area is washed.

RANGE OF TOXICITY:

A) Exposure to liquid household bleach rarely results in caustic injury. Some series describe caustic injury following ingestion of large amounts (greater than or equal to 5 milliliters/kilogram) or inhalation of chlorine or chloramine gases, usually in enclosed spaces.

ANIMAL TOXICITY STUDIES:

NON-HUMAN TOXICITY EXCERPTS:

When incubated at 4.4 ug/ml with Staphylococci for 35-120 min, trichloroisocyanuric acid caused vacuolization of the bacterial cells. After 120 min exposure the cell walls and cytoplasmic membranes were disrupted, and nucleic acids in the cells decr by 76-86%. [Bocharov DA,

EPAPA008000597

Kulikovskii AV; Tr Vses Nauch-Issled Inst Vet Sanit 38: 171-4 (1971)]**PEER REVIEWED**

Di-tribasic calcium hypochlorite mixture at 0.008-0.03% disrupted Escherichia coli nutrition and at higher concn decreased bacterial oxygen consumption and degraded the bacterial cytoplasm and cell walls to small granules. Trichloroisocyanuric acid was more effective than calcium hypochlorite in binding bacterial enzymes. [Bocharov DA; Tr Vses Nauch-Issled Inst Vet Sanit 35: 231-41 (1970)]**PEER REVIEWED**

... /The/ oral minimal lethal dose in rabbits ... /is/ 1500 to 1900 mg/kg. [Gosselin, R.E., R.P. Smith, H.C. Hodge. Clinical Toxicology of Commercial Products. 5th ed. Baltimore: Williams and Wilkins, 1984., p. II-111]**PEER REVIEWED**

Application of trichloroisocyanuric acid (dry powder) to rabbit skin for 24 hr produced no irritation. /From table/ [Clayton, G. D. and F. E. Clayton (eds.). Patty's Industrial Hygiene and Toxicology: Volume 2A, 2B, 2C: Toxicology. 3rd ed. New York: John Wiley Sons, 1981-1982., p. 2767]**PEER REVIEWED**

NON-HUMAN TOXICITY VALUES:

LD50 Rat oral 406 mg/kg [Sax, N.I. Dangerous Properties of Industrial Materials. 6th ed. New York, NY: Van Nostrand Reinhold, 1984., p. 2624]**PEER REVIEWED**

LD50 Rabbit skin 20,000 mg/kg [Sax, N.I. Dangerous Properties of Industrial Materials. 6th ed. New York, NY: Van Nostrand Reinhold, 1984., p. 2624]**PEER REVIEWED**

LD50 Rat oral 750 mg/kg [Gosselin, R.E., R.P. Smith, H.C. Hodge. Clinical Toxicology of Commercial Products. 5th ed. Baltimore: Williams and Wilkins, 1984., p. II-111]**PEER REVIEWED**

METABOLISM/PHARMACOKINETICS:

INTERACTIONS:

HALOGENATED ISOCYANURATES EXHIBIT BIOCIDAL SYNERGISM WHEN USED WITH 3-ISOTHIAZOLONE DERIVATIVES. [3-ISOTHIAZOLONE/HALOGEN SYNERGISM; RES DISCL 160: 28 (1977)]**PEER REVIEWED**

PHARMACOLOGY:

INTERACTIONS:

HALOGENATED ISOCYANURATES EXHIBIT BIOCIDAL SYNERGISM WHEN USED WITH 3-ISOTHIAZOLONE DERIVATIVES. [3-ISOTHIAZOLONE/HALOGEN SYNERGISM; RES DISCL 160: 28 (1977)]**PEER REVIEWED**

MINIMUM FATAL DOSE LEVEL:

3= MODERATELY TOXIC: PROBABLE ORAL LETHAL DOSE (HUMAN) 0.5-5 G/KG, BETWEEN 1 OZ & 1 PINT FOR 70 KG PERSON (150 LB). [Gosselin, R.E., R.P. Smith, H.C. Hodge. Clinical Toxicology of Commercial Products. 5th ed. Baltimore: Williams and Wilkins, 1984., p. II-111]**PEER REVIEWED**

ENVIRONMENTAL FATE & EXPOSURE:

ENVIRONMENTAL STANDARDS & REGULATIONS:

FIFRA REQUIREMENTS:
As the federal pesticide law FIFRA directs, EPA is conducting a comprehensive review of older pesticides to consider their health and environmental effects and make decisions about their future use. Under this pesticide reregistration program, EPA examines health and safety data for pesticide active ingredients initially registered before November 1, 1984, and determines whether they are eligible for reregistration. In addition, all pesticides must meet the new safety standard of the Food Quality Protection Act of 1996. Trichloroisocyanuric acid is found on List A, which contains most food use pesticides and consists of the 194 chemical cases (or 350 individual active ingredients) for which EPA issued registration standards prior to FIFRA, as amended in 1988. Case No: 0569; Pesticide type: antimicrobial; Registration Standard Date: 05/20/88; Case Status: RED Approved 09/92; OPP has made a decision that some/all uses of the pesticide are eligible for reregistration, as reflected in a Reregistration Eligibility Decision (RED) document.; Active ingredient (AI): Trichloroisocyanuric acid; AI Status: OPP has completed a Reregistration Eligibility Decision (RED) document for the case/AI. [USEPA/OPP; Status of Pesticides in Registration, Reregistration and Special Review p.97 (Spring, 1998) EPA 738-R-98-002]**QC REVIEWED**

CHEMICAL/PHYSICAL PROPERTIES:

MOLECULAR FORMULA:
C3-Cl3-N3-O3 **PEER REVIEWED**

MOLECULAR WEIGHT:
232.42 [Budavari, S. (ed.). The Merck Index - Encyclopedia of Chemicals, Drugs and Biologicals. Rahway, NJ: Merck and Co., Inc., 1989., p. 1425]**PEER REVIEWED**

COLOR/FORM:
NEEDLES FROM ETHYLENE CHLORIDE [Budavari, S. (ed.). The Merck Index - Encyclopedia of Chemicals, Drugs and Biologicals. Rahway, NJ: Merck and Co., Inc., 1989., p. 1425]**PEER REVIEWED**

WHITE CRYSTALLINE POWDER OR GRANULES [Sax, N.I. and R.J. Lewis, Sr. (eds.). Hawley's Condensed Chemical Dictionary. 11th ed. New York: Van Nostrand Reinhold Co., 1987., p. 1176]**PEER REVIEWED**

ODOR:
Strong chlorine odor [Fire Protection Guide to Hazardous Materials. 12 ed. Quincy, MA: National Fire Protection Association, 1997., p. 49-131]**QC REVIEWED**

MELTING POINT:
246-47 deg C (decomp) [Budavari, S. (ed.). The Merck Index - Encyclopedia of Chemicals, Drugs and Biologicals. Rahway, NJ: Merck and Co., Inc., 1989., p. 1425]**PEER REVIEWED**

DENSITY/SPECIFIC GRAVITY:
Greater than 1 at 20 deg C (solid) [U.S. Coast Guard, Department of

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Transportation. CHRIS - Hazardous Chemical Data. Manual Two. Washington, DC: U.S. Government Printing Office, Oct., 1978., p.]**PEER REVIEWED**

PH:

pH (1% aqueous solution) = 2.7-3.3 [Gerhartz, W. (exec ed.). Ullmann's Encyclopedia of Industrial Chemistry. 5th ed.Vol A1: Deerfield Beach, FL: VCH Publishers, 1985 to Present., p. VA6 555]**PEER REVIEWED**

SOLUBILITIES:

SOL IN CHLORINATED & HIGHLY POLAR SOLVENTS [Budavari, S. (ed.). The Merck Index - Encyclopedia of Chemicals, Drugs and Biologicals. Rahway, NJ: Merck and Co., Inc., 1989., p. 1425]**PEER REVIEWED**

Solubility in water at 25 deg C = 1 g/100 g; Solubility in acetone at 30 deg C = 35.0 g/100 g [Gerhartz, W. (exec ed.). Ullmann's Encyclopedia of Industrial Chemistry. 5th ed.Vol A1: Deerfield Beach, FL: VCH Publishers, 1985 to Present., p. VA6 555]**PEER REVIEWED**

Burakevich JV; Cyanuric and Isocyanuric Acids.; In: Kirk-Othmer Encyclopedia of Chemical Technology. 3rd ed. Volume 7: 397-410. New York, NY: John Wiley and Sons (1979) water solubility = 12,000 mg/l @ 25 deg C **QC REVIEWED**

SPECTRAL PROPERTIES:

IR: 3:482H (Aldrich Library of Infrared Spectra, Aldrich Chemical Co, Milwaukee, WI) [Weast, R.C. and M.J. Astle. CRC Handbook of Data on Organic Compounds. Volumes I and II. Boca Raton, FL: CRC Press Inc. 1985., p. V1 790]**PEER REVIEWED**

OTHER CHEMICAL/PHYSICAL PROPERTIES:

SLIGHTLY HYGROSCOPIC; LOOSE BULK DENSITY (APPROX) POWDER 31 LB/CU FT, GRANULAR 60 LB/CU FT [Sax, N.I. and R.J. Lewis, Sr. (eds.). Hawley's Condensed Chemical Dictionary. 11th ed. New York: Van Nostrand Reinhold Co., 1987., p. 1176]**PEER REVIEWED**

DECOMPOSES AT 225 DEG C [Sax, N.I. and R.J. Lewis, Sr. (eds.). Hawley's Condensed Chemical Dictionary. 11th ed. New York: Van Nostrand Reinhold Co., 1987., p. 1176]**PEER REVIEWED**

CHEMICAL SAFETY & HANDLING:

DOT EMERGENCY GUIDELINES:

/GUIDE 140: OXIDIZERS/ Fire or Explosion: These substances will accelerate burning when involved in a fire. Some may decompose explosively when heated or involved in a fire. May explode from heat or contamination. Some will react explosively with hydrocarbons (fuels). May ignite combustibles (wood, paper, oil, clothing, etc.). Containers may explode when heated. Runoff may create fire or explosion hazard. /Trichloroisocyanuric acid, dry/ [U.S. Department of Transportation. 2004 Emergency Response Guidebook. A Guide book for First Responders During the Initial Phase of a Dangerous Goods/Hazardous Materials Incident. Washington, D.C. 2004]**QC REVIEWED**

/GUIDE 140: OXIDIZERS/ Health: Inhalation, ingestion or contact (skin, eyes) with vapors or substance may cause severe injury, burns or death. Fire may produce irritating, corrosive and/or toxic gases. Runoff from fire control or dilution water may cause pollution. /Trichloroisocyanuric acid, dry/ [U.S. Department of Transportation. 2004 Emergency Response

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Guidebook. A Guide book for First Responders During the Initial Phase of a Dangerous Goods/Hazardous Materials Incident. Washington, D.C. 2004]**QC REVIEWED**

/GUIDE 140: OXIDIZERS/ Public Safety: CALL Emergency Response Telephone Number ... . As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids. Keep unauthorized personnel away. Stay upwind. Keep out of low areas. Ventilate closed spaces before entering. /Trichloroisocyanuric acid, dry/ [U.S. Department of Transportation. 2004 Emergency Response Guidebook. A Guide book for First Responders During the Initial Phase of a Dangerous Goods/Hazardous Materials Incident. Washington, D.C. 2004]**QC REVIEWED**

/GUIDE 140: OXIDIZERS/ Protective Clothing: Wear positive pressure self-contained breathing apparatus (SCBA). Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection. Structural firefighters' protective clothing will only provide limited protection. /Trichloroisocyanuric acid, dry/ [U.S. Department of Transportation. 2004 Emergency Response Guidebook. A Guide book for First Responders During the Initial Phase of a Dangerous Goods/Hazardous Materials Incident. Washington, D.C. 2004]**QC REVIEWED**

/GUIDE 140: OXIDIZERS/ Evacuation: Large spill: Consider initial downwind evacuation for at least 100 meters (330 feet). Fire: If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions. /Trichloroisocyanuric acid, dry/ [U.S. Department of Transportation. 2004 Emergency Response Guidebook. A Guide book for First Responders During the Initial Phase of a Dangerous Goods/Hazardous Materials Incident. Washington, D.C. 2004]**QC REVIEWED**

/GUIDE 140: OXIDIZERS/ Fire: Small fires: Use water. Do not use dry chemicals or foams. CO2, or Halon may provide limited control. Large fires: Flood fire area with water from a distance. Move containers from fire area if you can do it without risk. Do not move cargo or vehicle if cargo has been exposed to heat. Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. ALWAYS stay away from tanks engulfed in fire. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn. /Trichloroisocyanuric acid, dry/ [U.S. Department of Transportation. 2004 Emergency Response Guidebook. A Guide book for First Responders During the Initial Phase of a Dangerous Goods/Hazardous Materials Incident. Washington, D.C. 2004]**QC REVIEWED**

/GUIDE 140: OXIDIZERS/ Spill or Leak: Keep combustibles (wood, paper, oil, etc.) away from spilled material. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Stop leak if you can do it without risk. Do not get water inside containers. Small dry spills: With clean shovel place material into clean, dry container and cover loosely; move containers from spill area. Small liquid spills: Use a non-combustible material like vermiculite or sand to soak up the product and place into a container for later disposal. Large spills: Dike far ahead of liquid spill for later disposal. Following product recovery, flush area with water. /Trichloroisocyanuric acid, dry/ [U.S. Department of Transportation. 2004 Emergency Response Guidebook. A Guide book for First Responders During the Initial Phase of a Dangerous Goods/Hazardous Materials Incident. Washington, D.C. 2004]**QC REVIEWED**

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/GUIDE 140: OXIDIZERS/ First Aid: Move victim to fresh air. Call 911 or emergency medical service. Give artificial respiration if victim is not breathing. Administer oxygen if breathing is difficult. Remove and isolate contaminated clothing and shoes. Contaminated clothing may be a fire risk when dry. In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes. Keep victim warm and quiet. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. /Trichloroisocyanuric acid, dry/ [U.S. Department of Transportation. 2004 Emergency Response Guidebook. A Guide book for First Responders During the Initial Phase of a Dangerous Goods/Hazardous Materials Incident. Washington, D.C. 2004]**QC REVIEWED**

SKIN, EYE AND RESPIRATORY IRRITATIONS:

Skin, eye, and respiratory tract irritant. [Fire Protection Guide to Hazardous Materials. 12 ed. Quincy, MA: National Fire Protection Association, 1997., p. 49-131]**QC REVIEWED**

FIRE POTENTIAL:

Noncombustible, but due to high reactivity (chlorination, oxidation), may cause ignition by contact with many substances, organic substances easily chlorinated or oxidizeD. [ITII. Toxic and Hazardous Industrial Chemicals Safety Manual. Tokyo, Japan: The International Technical Information Institute, 1988., p. 538]**PEER REVIEWED**

NFPA HAZARD CLASSIFICATION:

Health: 2. 2= Materials that, on intense or continued (but not chronic) exposure, could cause temporary incapacitation or possible residual injury, including those requiring the use of respiratory protective equipment that has an independent air supply. These materials are hazardous to health, but areas may be entered freely if personnel are provided with full-face mask self-contained breathing apparatus that provides complete eye protection. [Fire Protection Guide to Hazardous Materials. 12 ed. Quincy, MA: National Fire Protection Association, 1997., p. 49-131]**QC REVIEWED**

Flammability: 0. 0= This degree includes any material that will not burn. [Fire Protection Guide to Hazardous Materials. 12 ed. Quincy, MA: National Fire Protection Association, 1997., p. 49-131]**QC REVIEWED**

Reactivity: 2. 2= This degree includes materials that are normally unstable and readily undergo violent chemical change, but are not capable of detonation. This includes materials that can undergo chemical change with rapid release of energy at normal temperatures and pressures and materials that can undergo violent chemical changes at elevated temperatures and pressures. This also includes materials that may react violently with water or that may form potentially explosive mixtures with water. In advanced or massive fires involving these materials, fire fighting should be done from a safe distance or from a protected location. [Fire Protection Guide to Hazardous Materials. 12 ed. Quincy, MA: National Fire Protection Association, 1997., p. 49-131]**QC REVIEWED**

FIRE FIGHTING PROCEDURES:

Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Fight fire from protected location or maximum possible distance. Use flooding quantities of water on fire-involved containers. If necessary use water spray to keep fire-exposed containers cool. Avoid use of water on non-involved material wherever possible. [Mackison, F.W., R.S. Stricoff, L.J. Partridge, Jr. (eds.). NIOSH/OSHA

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Pocket Guide to Chemical Hazards. DHEW (NIOSH). Publication No. 78-210. Washington, DC: U.S. Government Printing Office, 1980., p. 49-131]**QC REVIEWED**

If material involved in fire: Cool all affected containers with flooding quantities of water. Use water in flooding quantities as fog. Apply water from as far a distance as possible. Extinguish fire using agent suitable for type of surrounding fire. (Material itself does not burn or burns with difficulty.) [Association of American Railroads. Emergency Handling of Hazardous Materials in Surface Transportation. Washington, DC: Association of American Railroads, Bureau of Explosives, 1992., p. 920]**PEER REVIEWED**

TOXIC COMBUSTION PRODUCTS:

Toxic chlorine or nitrogen trichloride may be formed in fires. [U.S. Coast Guard, Department of Transportation. CHRIS - Hazardous Chemical Data. Volume II. Washington, D.C.: U.S. Government Printing Office, 1984-5., p.]**PEER REVIEWED**

Products of combustion may be more hazardous than the material itself. [Fire Protection Guide to Hazardous Materials. 12 ed. Quincy, MA: National Fire Protection Association, 1997., p. 49-131]**QC REVIEWED**

FIREFIGHTING HAZARDS:

Closed containers may rupture violently when heated. Thermally unstable. [Fire Protection Guide to Hazardous Materials. 12 ed. Quincy, MA: National Fire Protection Association, 1997., p. 49-131]**QC REVIEWED**

EXPLOSIVE LIMITS & POTENTIAL:

Containers may explode when heated. [U.S. Coast Guard, Department of Transportation. CHRIS - Hazardous Chemical Data. Volume II. Washington, D.C.: U.S. Government Printing Office, 1984-5., p.]**PEER REVIEWED**

HAZARDOUS REACTIVITIES & INCOMPATIBILITIES:

Water reactive. Produces chlorine and nitrogen trichloride liquid. Reaction with ammonia or amines produces nitrogen trichloride. Reacts with most reducing agents. Reacts explosively with calcium hypochlorite. [Fire Protection Guide to Hazardous Materials. 12 ed. Quincy, MA: National Fire Protection Association, 1997., p. 49-131]**QC REVIEWED**

Contact with most foreign material, organic matter, or easily chlorinated or oxidized materials may result in fire. Avoid oil, grease, sawdust, floor sweepings, other easily oxidized organic compounds. [U.S. Coast Guard, Department of Transportation. CHRIS - Hazardous Chemical Data. Volume II. Washington, D.C.: U.S. Government Printing Office, 1984-5., p.]**PEER REVIEWED**

If mixed with a small amount of water, the concentrated solution (with pH around 2) may explode, owing to evolution of nitrogen trichloride. It is believed that hydrolysis leads to formation of hypochlorous acid and dichloro-s-triazinetrione, and the protonated acid then attacks the C=N bonds in the triazine ring leading to formation of chloramines and nitrogen trichloride. [Bretherick, L. Handbook of Reactive Chemical Hazards. 4th ed. Boston, MA: Butterworth-Heinemann Ltd., 1990, p. 334]**PEER REVIEWED**

PROTECTIVE EQUIPMENT & CLOTHING:

/NIOSH approved respirator/ or chlorine canister mask; goggles; rubber gloves [U.S. Coast Guard, Department of Transportation. CHRIS - Hazardous Chemical Data. Volume II. Washington, D.C.: U.S. Government Printing

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Office, 1984-5., p.]**PEER REVIEWED**

PREVENTIVE MEASURES:

SRP: The scientific literature for the use of contact lenses in industry is conflicting. The benefit or detrimental effects of wearing contact lenses depend not only upon the substance, but also on factors including the form of the substance, characteristics and duration of the exposure, the uses of other eye protection equipment, and the hygiene of the lenses. However, there may be individual substances whose irritating or corrosive properties are such that the wearing of contact lenses would be harmful to the eye. In those specific cases, contact lenses should not be worn. In any event, the usual eye protection equipment should be worn even when contact lenses are in place. **PEER REVIEWED**

If material not involved in fire: Keep material out of water sources and sewers. Build dikes to contain flow as necessary. [Association of American Railroads. Emergency Handling of Hazardous Materials in Surface Transportation. Washington, DC: Association of American Railroads, Bureau of Explosives, 1992., p. 920]**PEER REVIEWED**

Personnel protection: Avoid breathing vapors or dusts. ... Avoid bodily contact with the material. Wash away any material which may have contacted the body with copious amounts of water or soap and water. [Association of American Railroads. Emergency Handling of Hazardous Materials in Surface Transportation. Washington, DC: Association of American Railroads, Bureau of Explosives, 1992., p. 920]**PEER REVIEWED**

STABILITY/SHELF LIFE:

Thermally unstable. [Fire Protection Guide to Hazardous Materials. 12 ed. Quincy, MA: National Fire Protection Association, 1997., p. 49-131]**QC REVIEWED**

MAY BE STORED IN DRY STATE FOR AT LEAST 1 YEAR. [The Merck Index. 10th ed. Rahway, New Jersey: Merck Co., Inc., 1983., p. 1295]**PEER REVIEWED**

SHIPMENT METHODS AND REGULATIONS:

No person may /transport,/ offer or accept a hazardous material for transportation in commerce unless that person is registered in conformance ... and the hazardous material is properly classed, described, packaged, marked, labeled, and in condition for shipment as required or authorized by ... /the hazardous materials regulations (49 CFR 171-177)./ [49 CFR 171.2 (7/1/96)]**QC REVIEWED**

The International Air Transport Association (IATA) Dangerous Goods Regulations are published by the IATA Dangerous Goods Board pursuant to IATA Resolutions 618 and 619 and constitute a manual of industry carrier regulations to be followed by all IATA Member airlines when transporting hazardous materials. [IATA. Dangerous Goods Regulations. 38th ed. Montreal, Canada and Geneva, Switzerland: International Air Transport Association, Dangerous Goods Board, January, 1997., p. 224]**QC REVIEWED**

The International Maritime Dangerous Goods Code lays down basic principles for transporting hazardous chemicals. Detailed recommendations for individual substances and a number of recommendations for good practice are included in the classes dealing with such substances. A general index of technical names has also been compiled. This index should always be consulted when attempting to locate the appropriate procedures to be used when shipping any substance or article. [IMDG; International Maritime Dangerous Goods Code; International Maritime Organization p.5086-2 (1988)]**QC REVIEWED**

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STORAGE CONDITIONS:

Store in a cool, dry, well-ventilated location. Outside or detached storage is preferred. Must be stored in a dry location on pallets arranged according to NFPA 43A, Code for Storage of Liquids and Solid Oxidizers. Separate from combustibles, oxidizables, ammonia, sodium carbonate (soda ash), calcium hypochlorite, hydrogen peroxide. [Fire Protection Guide to Hazardous Materials. 12 ed. Quincy, MA: National Fire Protection Association, 1997., p. 49-131]**QC REVIEWED**

Protect container against physical damage. Store in a cool, dark room well-ventilated, and keep away from flammable and oxidizable substances. Drums may explode by heating or contact with water. Therefore, place drums on a palette to protect from washing water, drainage, etc. on the floor. Should not be kept long under insufficient ventilation in summer. [ITII. Toxic and Hazardous Industrial Chemicals Safety Manual. Tokyo, Japan: The International Technical Information Institute, 1988., p. 538]**PEER REVIEWED**

CLEANUP METHODS:

Cover with weak reducing agent such as hypo, bisulfites or ferrous salts. Bisulfites or ferrous salts need additional promoter of some 3M-H2SO4 for rapid reaction. Transfer the slurry (or sludge) into a large container of water and neutralize with soda ash. Drain into the sewer with abundant water. [ITII. Toxic and Hazardous Industrial Chemicals Safety Manual. Tokyo, Japan: The International Technical Information Institute, 1988., p. 539]**PEER REVIEWED**

DISPOSAL METHODS:

SRP: At the time of review, criteria for land treatment or burial (sanitary landfill) disposal practices are subject to significant revision. Prior to implementing land disposal of waste residue (including waste sludge), consult with environmental regulatory agencies for guidance on acceptable disposal practices. **PEER REVIEWED**

Use vast volume of concentrated solution of reducing agent (bisulfites or ferrous salts with 3M-H2SO4 or hypo). Neutralize with soda ash or dilute hydrochloric acid. Drain into the sewer with abundant water. [ITII. Toxic and Hazardous Industrial Chemicals Safety Manual. Tokyo, Japan: The International Technical Information Institute, 1988., p. 539]**PEER REVIEWED**

OCCUPATIONAL EXPOSURE STANDARDS:

MANUFACTURING/USE INFORMATION:

MAJOR USES:

SWIMMING POOL SANITIZER TO REDUCE BACTERIA COUNT; ACTIVE INGREDIENT IN INDUST DEODORANTS **PEER REVIEWED**

USED AS SOURCE OF AVAILABLE CHLORINE IN "DRY TYPE" BLEACHES, SCOURING POWDERS, DISHWASHING CMPD, & SANITIZING CMPD. [Gosselin, R.E., H.C. Hodge, R.P. Smith, and M.N. Gleason. Clinical Toxicology of Commercial Products. 4th ed. Baltimore: Williams and Wilkins, 1976., p. II-77]**PEER REVIEWED**

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MANUFACTURERS:

Monsanto Co, Hq, 800 N Lindbergh Blvd, St Louis, MO 63167, (314) 694-1000; Chemical Group; Production site: Sauget, IL 62201 [SRI. 1994 Directory of Chemical Producers -United States of America. Menlo Park, CA: SRI International, 1994., p. 978]**PEER REVIEWED**

Olin Corporation, Hq, 120 Long Ridge Road, Stamford, CT 06904, (203) 356-2000; Production site: Lake Charles, LA 70602 [SRI. 1994 Directory of Chemical Producers -United States of America. Menlo Park, CA: SRI International, 1994., p. 978]**PEER REVIEWED**

METHODS OF MANUFACTURING:

CHLORINATION OF TRISODIUM CYANURATE **PEER REVIEWED**

... BY CHLORINATING CYANURIC ACID IN SODIUM HYDROXIDE SOLN. PURIFICATION BY DISSOLVING IN CONCN SULFURIC ACID & DILUTING WITH ICE WATER. [Budavari, S. (ed.). The Merck Index - Encyclopedia of Chemicals, Drugs and Biologicals. Rahway, NJ: Merck and Co., Inc., 1989., p. 1425]**PEER REVIEWED**

... Can be prepared by reaction of preformed or in situ generated HOCl with cyanuric acid slurry. Chlorine monoxide can also be used to prepare trichloroisocyanuric acid from finely powdered /Cyanuric acid/. [Kirk-Othmer Encyclopedia of Chemical Technology. 4th ed. Volumes 1: New York, NY. John Wiley and Sons, 1991-Present., p. V7 837]**PEER REVIEWED**

GENERAL MANUFACTURING INFORMATION:

POWD MIXT CONTAINING CYANURIC ACID, TRICHLOROISOCYANURIC ACID, AND X2CO3 (X= NA,K) IN DEFINED MOLAR RATIOS HAVE OPTIMUM STABILITY AND SOLUBILITY IN WATER. [KALINA O ET AL; CZECH PATENT NUMBER 166427 12/15/76]**PEER REVIEWED**

TRICHLOROISOCYANURIC ACID WAS MORE EFFECTIVE IN VITRO AGAINST PSEUDOMONAS AERUGINOSA, STAPHYLOCOCCUS AUREUS, AND SPORULATING BACILLUS SUBTILIS AND CANDIDA ALBICANS THAN AGAINST SHIGELLA FLEXNERI OR ESCHERICHIA COLI. [MERKA V; CESK EPIDEMIOL, MIKROBIOL, IMUNOL 24 (3): 148-54 (1975)]**PEER REVIEWED**

USED AS SOURCE OF AVAILABLE CHLORINE IN "DRY TYPE" BLEACHES, SCOURING POWDERS, DISHWASHING CMPD, & SANITIZING CMPD. ORG OXIDANT WHICH CAN SLOWLY OXIDIZE ALMOST ITS OWN WT OF CHLORIDE IONS TO CHLORINE GAS (ABOUT 90% AVAILABLE CHLORINE). [Gosselin, R.E., H.C. Hodge, R.P. Smith, and M.N. Gleason. Clinical Toxicology of Commercial Products. 4th ed. Baltimore: Williams and Wilkins, 1976., p. II-77]**PEER REVIEWED**

FORMULATIONS/PREPARATIONS:

Grades or purity: 39-90% available chlorine [U.S. Coast Guard, Department of Transportation. CHRIS - Hazardous Chemical Data. Manual Two. Washington, DC: U.S. Government Printing Office, Oct., 1978., p.]**PEER REVIEWED**

Olin Corp, OCI 90, Granular grade [CHEMCYCLOPEDIA 94, p 199]**PEER REVIEWED**

Theoretical available chlorine = 91.5%; Typical available chlorine = 90.0% [Gerhartz, W. (exec ed.). Ullmann's Encyclopedia of Industrial Chemistry. 5th ed.Vol A1: Deerfield Beach, FL: VCH Publishers, 1985 to Present., p. VA6 555]**PEER REVIEWED**

CONSUMPTION PATTERNS:

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(FOR ALL CHLORINATED ISOCYANURATES-TRICHLOROISOCYANURIC ACID, SODIUM DICHLOROISOCYANURATE & POTASSIUM DICHLOROISOCYANURATE) 53% AS SWIMMING POOL SANITIZER; 19.6% IN COMMERCIAL BLEACH; 7.6% IN HOUSEHOLD BLEACH; 7.6% IN DISHWASHER COMPOUNDS; 6.1% IN SCOURING POWDERS; 6.1% IN CHLORINATED CLEANERS & SANITIZERS (1974) **PEER REVIEWED**

U. S. PRODUCTION:
(1972) 2.87X10+10 GRAMS (DI & TRI & SALTS) **PEER REVIEWED**

(1974) 3.63X10+10 G -CHLORINATED ISOCYANURATES **PEER REVIEWED**

U. S. EXPORTS:
(1974) 6.36X10+9 GRAMS (DICHLORO & TRICHLORO & SALTS) **PEER REVIEWED**

LABORATORY METHODS:

ANALYTIC LABORATORY METHODS:
Matrix: Air. Procedure: Filter collection, extraction. Range: 0.29-5.23 mg/cu m for a 400-l sample [U.S. Department of Health, Education Welfare, Public Health Service. Center for Disease Control, National Institute for Occupational Safety Health. NIOSH Manual of Analytical Methods. 2nd ed. Volumes 1-7. Washington, DC: U.S. Government Printing Office, 1977-present., p. V5 314-1]**PEER REVIEWED**

Sodium dichloroisocyanurate dihydrate in air is collected on DM-5000 filters and extracted with water for determination by titration against sodium thiosulfate using constant-current potentiometry. The method is applicable to trichloroisocyanuric acid. [Palassis J, Kominsky JR; ACS Symp Ser 149 (Chem Hazards Workplace): 123-35 (1981)]**PEER REVIEWED**

New chlorine-released disinfectants: trichloroisocyanuric acid and its salts. Determination by HPLC; High performance liquid chromatography [Bianco L, Marucchi M; Ind Aliment 32: 817-24 (1993)]**PEER REVIEWED**

Determination of cyanuric acid or trichloroisocyanuric acid in air; High performance liquid chromatography [Tucker SP, Blade LM; Anal Lett 25: 2265-77 (1992)]**PEER REVIEWED**

SYNONYMS AND IDENTIFIERS:

SYNONYMS:
ACL 85 **PEER REVIEWED**

CDB 90 **PEER REVIEWED**

CHLOREAL [The Merck Index. 10th ed. Rahway, New Jersey: Merck Co., Inc., 1983., p. 1295]**PEER REVIEWED**

FICHLOR 91 **PEER REVIEWED**

FI CLOR 91 **PEER REVIEWED**

ISOCYANURIC CHLORIDE **PEER REVIEWED**

KYSELINA TRICHLOISOKYANUROVA (CZECH) **PEER REVIEWED**

EPAPA008000607

NEOCHLOR 90 **PEER REVIEWED**

NSC-405124 **PEER REVIEWED**

SYMCLOSEN **PEER REVIEWED**

SYMCLOSENE **PEER REVIEWED**

S-TRIAZINE-2,4,6(1H,3H,5H)-TRIONE, 1,3,5-TRICHLORO- **PEER REVIEWED**

1,3,5-TRIAZINE-2,4,6(1H,3H,5H)-TRIONE, 1,3,5-TRICHLORO- **PEER REVIEWED**

TRICHLORINATED ISOCYANURIC ACID **PEER REVIEWED**

TRICHLOROCYANURIC ACID **PEER REVIEWED**

TRICHLOROIMINOCYANURIC ACID [The Merck Index. 10th ed. Rahway, New Jersey: Merck Co., Inc., 1983., p. 1295]**PEER REVIEWED**

TRICHLOROISOCYANIC ACID **PEER REVIEWED**

N,N',N''-TRICHLOROISOCYANURIC ACID **PEER REVIEWED**

1,3,5-TRICHLOROISOCYANURIC ACID **PEER REVIEWED**

TRICHLORO-S-TRIAZINETRIONE **PEER REVIEWED**

1,3,5-TRICHLORO-S-TRIAZINE-2,4,6(1H,3H,5H)-TRIONE [U.S. Department of Health and Human Services, Public Health Service, Center for Disease Control, National Institute for Occupational Safety Health. Registry of Toxic Effects of Chemical Substances (RTECS). National Library of Medicine's current MEDLARS file., p. 84/8312]**PEER REVIEWED**

TRICHLORO-S-TRIAZINE-2,4,6(1H,3H,5H)-TRIONE **PEER REVIEWED**

1,3,5-TRICHLORO-2,4,6-TRIOXOHEXAHYDRO-S-TRIAZINE **PEER REVIEWED**

FORMULATIONS/PREPARATIONS:

Grades or purity: 39-90% available chlorine [U.S. Coast Guard, Department of Transportation. CHRIS - Hazardous Chemical Data. Manual Two. Washington, DC: U.S. Government Printing Office, Oct., 1978., p.]**PEER REVIEWED**

Olin Corp, OCI 90, Granular grade [CHEMCYCLOPEDIA 94, p 199]**PEER REVIEWED**

Theoretical available chlorine = 91.5%; Typical available chlorine = 90.0% [Gerhartz, W. (exec ed.). Ullmann's Encyclopedia of Industrial Chemistry. 5th ed.Vol A1: Deerfield Beach, FL: VCH Publishers, 1985 to Present., p. VA6 555]**PEER REVIEWED**

SHIPPING NAME/ NUMBER DOT/UN/NA/IMO:

UN 2468; Trichloroisocyanuric acid, dry

IMO 5.1; Trichloroisocyanuric acid, dry

STANDARD TRANSPORTATION NUMBER:

49 184 48; Trichloroisocyanuric acid, dry

EPAPA008000608

SIGMA-ALDRICH

MATERIAL SAFETY DATA SHEET

Date Printed: 07/13/2006
Date Updated: 02/05/2006
Version 1.5

Section 1 - Product and Company Information

Product Name	ACETAL, 99%
Product Number	A902
Brand	ALDRICH
Company	Sigma-Aldrich
Address	3050 Spruce Street SAINT LOUIS MO 63103 US
Technical Phone:	800-325-5832
Fax:	800-325-5052
Emergency Phone:	314-776-6555

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
ACETAL	105-57-7	No

Formula	C6H14O2
Synonyms	Acetaal (Dutch) * Acetal * Acetal diethylique (French) * Acetale (Italian) * 1,1-Diaethoxy-aethan (German) * Diaethylacetal (German) * 1,1-Diethoxy-ethaan (Dutch) * 1,1-Diethoxyethane * Diethyl acetal * 1,1-Dietossietano (Italian) * Ethane, 1,1-diethoxy- * Ethylidene diethyl ether * USAF DO-45
RTECS Number:	AB2800000

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Flammable (USA) Highly Flammable (EU). Irritant. May form explosive peroxides. Irritating to eyes and skin.

HMIS RATING

HEALTH: 2
FLAMMABILITY: 3
REACTIVITY: 1

NFPA RATING

HEALTH: 2
FLAMMABILITY: 3
REACTIVITY: 1

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is conscious. Call a physician.

INHALATION EXPOSURE
If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

DERMAL EXPOSURE
In case of contact, immediately wash skin with soap and copious amounts of water.

EYE EXPOSURE
In case of contact, immediately flush eyes with copious amounts of water for at least 15 minutes.

Section 5 - Fire Fighting Measures

FLAMMABLE HAZARDS
Flammable Hazards: Yes
Peroxide Former: Yes

EXPLOSION HAZARDS
Vapor may travel considerable distance to source of ignition and flash back. Container explosion may occur under fire conditions.

FLASH POINT
- 5.8 °F - 21.0 °C Method: closed cup

EXPLOSION LIMITS
Lower: 1.65 % Upper: 10.4 %

AUTOIGNITION TEMP
230 °C

FLAMMABILITY
N/A

EXTINGUISHING MEDIA
Suitable: Carbon dioxide, dry chemical powder, or appropriate foam.
Unsuitable: Do not use water.

FIREFIGHTING
Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Specific Hazard(s): Flammable liquid. Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL
Evacuate area. Shut off all sources of ignition.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)
Wear respirator, chemical safety goggles, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP
Cover with dry-lime, sand, or soda ash. Place in covered containers using non-sparking tools and transport outdoors. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

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HANDLING
User Exposure: Avoid breathing vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

STORAGE
Suitable: Keep container closed. Keep away from heat, sparks, and open flame.

SPECIAL REQUIREMENTS
Heat-, light-, and moisture-sensitive. Do not distill to dryness.

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS
Safety shower and eye bath. Use nonsparking tools. Mechanical exhaust required.

PERSONAL PROTECTIVE EQUIPMENT
Respiratory: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator.
Hand: Compatible chemical-resistant gloves.
Eye: Chemical safety goggles.

GENERAL HYGIENE MEASURES
Wash thoroughly after handling. Wash contaminated clothing before reuse.

Section 9 - Physical/Chemical Properties

Appearance	Physical State: Clear liquid Color: Colorless	
Property	Value	At Temperature or Pressure
Molecular Weight	118.18 AMU	
pH	N/A	
BP/BP Range	100.0 - 103.0 °C	
MP/MP Range	N/A	
Freezing Point	N/A	
Vapor Pressure	20 mmHg	20 °C
Vapor Density	4.1 g/l	
Saturated Vapor Conc.	N/A	
SG/Density	0.826 g/cm3	
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	N/A	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	N/A	
Surface Tension	N/A	
Partition Coefficient	N/A	
Decomposition Temp.	N/A	
Flash Point	- 5.8 °F - 21.0 °C	Method: closed cup
Explosion Limits	Lower: 1.65 %	

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	Upper: 10.4 %
Flammability	N/A
Autoignition Temp	230 °C
Refractive Index	1.381
Optical Rotation	N/A
Miscellaneous Data	N/A
Solubility	N/A

N/A = not available

Section 10 - Stability and Reactivity

STABILITY

Stable: Stable.
Conditions of Instability: May form peroxides on prolonged storage. Date container and periodically test for peroxides.
Conditions to Avoid: Light. Heat. Moisture.
Materials to Avoid: Strong oxidizing agents, Strong reducing agents, Strong bases.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

ROUTE OF EXPOSURE

Skin Contact: Causes skin irritation.
Skin Absorption: May be harmful if absorbed through the skin.
Eye Contact: Causes eye irritation.
Inhalation: May be harmful if inhaled. Material is irritating to mucous membranes and upper respiratory tract. Material may be irritating to mucous membranes and upper respiratory tract.
Ingestion: May be harmful if swallowed.

SIGNS AND SYMPTOMS OF EXPOSURE

Exposure can cause: CNS depression. Gastrointestinal disturbances. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

TOXICITY DATA

Oral
Rat
4600 mg/kg
LD50

Intraperitoneal
Rat
900 MG/KG
LD50

Oral
Mouse
3500 mg/kg
LD50

Intraperitoneal
Mouse

EPAPA008000613

500 MG/KG
LD50

Oral
Rabbit
3545 mg/kg
LD50

IRRITATION DATA

Skin
Rabbit
500 mg
24H
Remarks: Mild irritation effect

Section 12 - Ecological Information

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION
Contact a licensed professional waste disposal service to dispose of this material. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT
Proper Shipping Name: Acetal
UN#: 1088
Class: 3
Packing Group: Packing Group II
Hazard Label: Flammable liquid
PIH: Not PIH

IATA
Proper Shipping Name: Acetal
IATA UN Number: 1088
Hazard Class: 3
Packing Group: II

Section 15 - Regulatory Information

EU DIRECTIVES CLASSIFICATION
Symbol of Danger: F-Xi
Indication of Danger: Highly Flammable. Irritant.
R: 11-36/38
Risk Statements: Highly flammable. Irritating to eyes and skin.
S: 9-16-33
Safety Statements: Keep container in a well-ventilated place. Keep away from sources of ignition - no smoking. Take precautionary measures against static discharges.

US CLASSIFICATION AND LABEL TEXT
Indication of Danger: Flammable (USA) Highly Flammable (EU). Irritant.
Risk Statements: May form explosive peroxides. Irritating to eyes and skin.
Safety Statements: Keep away from sources of ignition - no

EPAPA008000614

smoking. Do not empty into drains. Take precautionary measures against static discharges. Keep container tightly closed in a cool well-ventilated place.

UNITED STATES REGULATORY INFORMATION

SARA LISTED: No
TSCA INVENTORY ITEM: Yes

CANADA REGULATORY INFORMATION

WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.
DSL: Yes
NDSL: No

Section 16 - Other Information

DISCLAIMER

For R&D use only. Not for drug, household or other uses.

WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.
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EPAPA008000615

G-4001

For Emergency Assistance involving chemicals call - CHEMTREC (800) 424-9300

The Version Date and Number for this MSDS is : 04/13/2007 - #008

PRODUCT NAME:	ACETONE
MSDS NUMBER:	MZA0446
DATE ISSUED:	04/11/2007
SUPERSEDES:	08/04/2004
ISSUED BY:	008614

PRODUCT NAME:
ACETONE

Distributed by:
Univar USA Inc.
17425 NE Union Hill Road
Redmond, WA 98052
425-889-3400

ACETONE

1. PRODUCT IDENTIFICATION

SYNONYMS:	DIMETHYLKETONE; 2-PROPANONE; DIMETHYLKETAL
CAS NO:	67-64-1
MOLECULAR WEIGHT:	58.08
CHEMICAL FORMULA:	(CH3)2CO

Distributed by:
Univar USA Inc.
17425 NE Union Hill Road
Redmond, WA 98052
425-889-3400

2. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT	CAS NO	PERCENT	HAZARDOUS
ACETONE	67-64-1	99 - 100%	YES

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

DANGER! EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE. HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM.

POTENTIAL HEALTH EFFECTS

INHALATION:
INHALATION OF VAPORS IRRITATES THE RESPIRATORY TRACT. MAY CAUSE COUGHING, DIZZINESS, DULLNESS, AND HEADACHE. HIGHER CONCENTRATIONS CAN PRODUCE CENTRAL NERVOUS SYSTEM DEPRESSION, NARCOSIS, AND UNCONSCIOUSNESS.

INGESTION:
SWALLOWING SMALL AMOUNTS IS NOT LIKELY TO PRODUCE HARMFUL EFFECTS. INGESTION OF LARGER AMOUNTS MAY PRODUCE ABDOMINAL PAIN, NAUSEA AND VOMITING. ASPIRATION INTO LUNGS CAN PRODUCE SEVERE LUNG DAMAGE AND IS A MEDICAL EMERGENCY. OTHER SYMPTOMS ARE EXPECTED TO PARALLEL INHALATION.

SKIN CONTACT:
IRRITATING DUE TO DEFATTING ACTION ON SKIN. CAUSES REDNESS, PAIN, DRYING AND CRACKING OF THE SKIN.

EYE CONTACT:
VAPORS ARE IRRITATING TO THE EYES. SPLASHES MAY CAUSE SEVERE IRRITATION, WITH STINGING, TEARING, REDNESS AND PAIN.

CHRONIC EXPOSURE:
PROLONGED OR REPEATED SKIN CONTACT MAY PRODUCE SEVERE IRRITATION OR DERMATITIS.

AGGRAVATION OF PRE-EXISTING CONDITIONS:
USE OF ALCOHOLIC BEVERAGES ENHANCES TOXIC EFFECTS. EXPOSURE MAY INCREASE THE TOXIC POTENTIAL OF CHLORINATED HYDROCARBONS, SUCH AS CHLOROFORM, TRICHLOROETHANE.

4. FIRST AID MEASURES

INHALATION:
REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. GET MEDICAL ATTENTION.

INGESTION:
ASPIRATION HAZARD. IF SWALLOWED, VOMITING MAY OCCUR SPONTANEOUSLY, BUT DO NOT INDUCE. IF VOMITING OCCURS, KEEP HEAD BELOW HIPS TO PREVENT ASPIRATION INTO LUNGS. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. CALL A PHYSICIAN IMMEDIATELY.

SKIN CONTACT:
IMMEDIATELY FLUSH SKIN WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. REMOVE

CONTAMINATED CLOTHING AND SHOES. GET MEDICAL ATTENTION. WASH CLOTHING BEFORE REUSE. THOROUGHLY CLEAN SHOES BEFORE REUSE.

EYE CONTACT:
IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES, LIFTING UPPER AND LOWER EYELIDS OCCASIONALLY. GET MEDICAL ATTENTION.

==========

5. FIRE FIGHTING MEASURES

FIRE:
FLASH POINT: -20C (-4F) CC
AUTOIGNITION TEMPERATURE: 465C (869F)
FLAMMABLE LIMITS IN AIR % BY VOLUME:
LEL: 2.5; UEL: 12.8
EXTREMELY FLAMMABLE LIQUID AND VAPOR! VAPOR MAY CAUSE FLASH FIRE.

EXPLOSION:
ABOVE FLASH POINT, VAPOR-AIR MIXTURES ARE EXPLOSIVE WITHIN FLAMMABLE LIMITS NOTED ABOVE. VAPORS CAN FLOW ALONG SURFACES TO DISTANT IGNITION SOURCE AND FLASH BACK. CONTACT WITH STRONG OXIDIZERS MAY CAUSE FIRE. SEALED CONTAINERS MAY RUPTURE WHEN HEATED. THIS MATERIAL MAY PRODUCE A FLOATING FIRE HAZARD. SENSITIVE TO STATIC DISCHARGE.

FIRE EXTINGUISHING MEDIA:
DRY CHEMICAL, ALCOHOL FOAM OR CARBON DIOXIDE. WATER MAY BE INEFFECTIVE. WATER SPRAY MAY BE USED TO KEEP FIRE EXPOSED CONTAINERS COOL, DILUTE SPILLS TO NONFLAMMABLE MIXTURES, PROTECT PERSONNEL ATTEMPTING TO STOP LEAK AND DISPERSE VAPORS.

SPECIAL INFORMATION:
IN THE EVENT OF A FIRE, WEAR FULL PROTECTIVE CLOTHING AND NIOSH-APPROVED SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN THE PRESSURE DEMAND OR OTHER POSITIVE PRESSURE MODE.

==========

6. ACCIDENTAL RELEASE MEASURES

VENTILATE AREA OF LEAK OR SPILL. REMOVE ALL SOURCES OF IGNITION. WEAR APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT AS SPECIFIED IN SECTION 8. ISOLATE HAZARD AREA. KEEP UNNECESSARY AND UNPROTECTED PERSONNEL FROM ENTERING. CONTAIN AND RECOVER LIQUID WHEN POSSIBLE. USE NON-SPARKING TOOLS AND EQUIPMENT. COLLECT LIQUID IN AN APPROPRIATE CONTAINER OR ABSORB WITH AN INERT MATERIAL (E. G., VERMICULITE, DRY SAND, EARTH), AND PLACE IN A CHEMICAL WASTE CONTAINER. DO NOT USE COMBUSTIBLE MATERIALS, SUCH AS SAW DUST. DO NOT FLUSH TO SEWER! IF A LEAK OR SPILL HAS NOT IGNITED, USE WATER SPRAY TO DISPERSE THE VAPORS, TO PROTECT PERSONNEL ATTEMPTING TO STOP LEAK, AND TO FLUSH SPILLS AWAY FROM EXPOSURES. US REGULATIONS (CERCLA) REQUIRE REPORTING SPILLS AND RELEASES TO SOIL, WATER AND AIR IN EXCESS OF REPORTABLE QUANTITIES. THE TOLL FREE NUMBER FOR THE US COAST GUARD NATIONAL RESPONSE CENTER IS (800) 424-8802.
J. T. BAKER SOLUSORB(R) SOLVENT ADSORBENT IS RECOMMENDED FOR SPILLS OF THIS PRODUCT.

==========

7. HANDLING AND STORAGE

PROTECT AGAINST PHYSICAL DAMAGE. STORE IN A COOL, DRY WELL-VENTILATED LOCATION, AWAY FROM ANY AREA WHERE THE FIRE HAZARD MAY BE ACUTE. OUTSIDE OR DETACHED STORAGE IS PREFERRED. SEPARATE FROM INCOMPATIBLES. CONTAINERS SHOULD BE BONDED AND GROUNDED FOR TRANSFERS TO AVOID STATIC SPARKS. STORAGE AND USE AREAS SHOULD BE NO SMOKING AREAS. USE NON-SPARKING TYPE TOOLS AND EQUIPMENT, INCLUDING EXPLOSION PROOF VENTILATION. CONTAINERS OF THIS MATERIAL MAY BE HAZARDOUS WHEN EMPTY SINCE THEY RETAIN PRODUCT RESIDUES (VAPORS, LIQUID); OBSERVE ALL WARNINGS AND PRECAUTIONS LISTED FOR THE PRODUCT.

==========

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

AIRBORNE EXPOSURE LIMITS:
ACETONE:
-OSHA PERMISSIBLE EXPOSURE LIMIT (PEL):
1000 PPM (TWA)

-ACGIH THRESHOLD LIMIT VALUE (TLV):
500 PPM (TWA), 750 PPM (STEL) A4 - NOT CLASSIFIABLE AS A HUMAN CARCINOGEN

VENTILATION SYSTEM:
A SYSTEM OF LOCAL AND/OR GENERAL EXHAUST IS RECOMMENDED TO KEEP EMPLOYEE EXPOSURES BELOW THE AIRBORNE EXPOSURE LIMITS. LOCAL EXHAUST VENTILATION IS GENERALLY PREFERRED BECAUSE IT CAN CONTROL THE EMISSIONS OF THE CONTAMINANT AT ITS SOURCE, PREVENTING DISPERSION OF IT INTO THE GENERAL WORK AREA. PLEASE REFER TO THE ACGIH DOCUMENT, "INDUSTRIAL VENTILATION, A MANUAL OF RECOMMENDED PRACTICES", MOST RECENT EDITION, FOR DETAILS.

PERSONAL RESPIRATORS (NIOSH APPROVED):
IF THE EXPOSURE LIMIT IS EXCEEDED AND ENGINEERING CONTROLS ARE NOT FEASIBLE, A HALF-FACE ORGANIC VAPOR RESPIRATOR MAY BE WORN FOR UP TO TEN TIMES THE EXPOSURE LIMIT, OR THE MAXIMUM USE CONCENTRATION SPECIFIED BY THE APPROPRIATE REGULATORY AGENCY OR RESPIRATOR SUPPLIER, WHICHEVER IS LOWEST. A FULL-FACE PIECE ORGANIC VAPOR RESPIRATOR MAY BE WORN UP TO 50 TIMES THE EXPOSURE LIMIT, OR THE MAXIMUM USE CONCENTRATION SPECIFIED BY THE APPROPRIATE REGULATORY AGENCY OR RESPIRATOR SUPPLIER, WHICHEVER IS LOWEST. FOR EMERGENCIES OR INSTANCES WHERE THE EXPOSURE LEVELS ARE NOT KNOWN, USE A FULL-FACE PIECE POSITIVE-PRESSURE, AIR-SUPPLIED RESPIRATOR. WARNING: AIR-PURIFYING RESPIRATORS DO NOT PROTECT WORKERS IN OXYGEN-DEFICIENT ATMOSPHERES.

SKIN PROTECTION:
WEAR IMPERVIOUS PROTECTIVE CLOTHING, INCLUDING BOOTS, GLOVES, LAB COAT, APRON OR COVERALLS, AS APPROPRIATE, TO PREVENT SKIN CONTACT.

EYE PROTECTION:
USE CHEMICAL SAFETY GOGGLES AND/OR A FULL FACE SHIELD WHERE SPLASHING IS POSSIBLE. MAINTAIN EYE WASH FOUNTAIN AND QUICK-DRENCH FACILITIES IN WORK AREA.

==========

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:
CLEAR, COLORLESS, VOLATILE LIQUID.

ODOR:

BOILING POINT:
56.5C (133F) @ 760 MM HG

MELTING POINT:

FRAGRANT, MINT-LIKE

-95C (-139F)

SOLUBILITY:
MISCIBLE IN ALL PROPORTIONS IN WATER.

VAPOR DENSITY (AIR=1):
2.0

SPECIFIC GRAVITY:
0.79 @ 20C/4C

VAPOR PRESSURE (MM HG):
400 @ 39.5C (104F)

PH:
NO INFORMATION FOUND.

EVAPORATION RATE (BUAC=1):
CA. 7.7

% VOLATILES BY VOLUME @ 21C (70F):
100

==========

10. STABILITY AND REACTIVITY

STABILITY:
STABLE UNDER ORDINARY CONDITIONS OF USE AND STORAGE.

HAZARDOUS DECOMPOSITION PRODUCTS:
CARBON DIOXIDE AND CARBON MONOXIDE MAY FORM WHEN HEATED TO DECOMPOSITION.

HAZARDOUS POLYMERIZATION:
WILL NOT OCCUR.

INCOMPATIBILITIES:
CONCENTRATED NITRIC AND SULFURIC ACID MIXTURES, OXIDIZING MATERIALS, CHLOROFORM, ALKALIS, CHLORINE COMPOUNDS, ACIDS, POTASSIUM T-BUTOXIDE.

CONDITIONS TO AVOID:
HEAT, FLAMES, IGNITION SOURCES AND INCOMPATIBLES.

==========

11. TOXICOLOGICAL INFORMATION

ORAL RAT LD50: 5800 MG/KG; INHALATION RAT LC50: 50,100MG/M3; IRRITATION EYE RABBIT, STANDARD DRAIZE, 20 MG SEVERE; INVESTIGATED AS A TUMORIGEN, MUTAGEN, REPRODUCTIVE EFFECTOR.

--------/CANCER LISTS/----------

INGREDIENT	---NTP CARCINOGEN--- KNOWN	ANTICIPATED	IARC CATEGORY
ACETONE (67-64-1)	NO	NO	NONE

==========

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE:
WHEN RELEASED INTO THE SOIL, THIS MATERIAL IS EXPECTED TO READILY BIODEGRADE. WHEN RELEASED INTO THE SOIL, THIS MATERIAL IS EXPECTED TO LEACH INTO GROUNDWATER. WHEN RELEASED INTO THE SOIL, THIS MATERIAL IS EXPECTED TO QUICKLY EVAPORATE. WHEN RELEASED INTO WATER, THIS MATERIAL IS EXPECTED TO READILY BIODEGRADE. WHEN RELEASED TO WATER, THIS MATERIAL IS EXPECTED TO QUICKLY EVAPORATE. THIS MATERIAL HAS A LOG OCTANOL-WATER PARTITION

CHEMICAL WEAPONS CONVENTION: NO TSCA 12(B): NO CDTA: YES
SARA 311/312: ACUTE: YES CHRONIC: NO FIRE: YES PRESSURE: NO
REACTIVITY: NO (PURE / LIQUID)

AUSTRALIAN HAZCHEM CODE: 2ÍYûE
POISON SCHEDULE: NONE ALLOCATED.

WHMIS: THIS MSDS HAS BEEN PREPARED ACCORDING TO THE HAZARD CRITERIA OF THE CONTROLLED PRODUCTS REGULATIONS (CPR) AND THE MSDS CONTAINS ALL OF THE INFORMATION REQUIRED BY THE CPR.

==========

16. OTHER INFORMATION

NFPA RATINGS:
HEALTH: 1 FLAMMABILITY: 3 REACTIVITY: 0

For Additional Information:
Contact: MSDS Coordinator - Univar USA
During business hours, Pacific Time - (425) 889-3400

NOTICE
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Do not use ingredient information and/or ingredient percentages in this MSDS as a product specification. For product specification information refer to a Product Specification Sheet and/or a Certificate of Analysis. These can be obtained from your local Univar USA Sales Office.

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END OF MSDS

SIGMA-ALDRICH

MATERIAL SAFETY DATA SHEET

Date Printed: 04/03/2007
Date Updated: 08/22/2006
Version 1.1

Section 1 - Product and Company Information

Product Name	ACETONE-2,4-DNPH, 50MG, NEAT
Product Number	442436
Brand	SUPELCO
Company	Sigma-Aldrich
Address	3050 Spruce Street SAINT LOUIS MO 63103 US
Technical Phone:	800-325-5832
Fax:	800-325-5052
Emergency Phone:	314-776-6555

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
ACETONE 2,4-DINITROPHENYLHYDRAZONE,ENVIRONM ENTAL STANDARD	1567-89-1	No

Formula C9H10N4O4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Irritant.
Irritating to eyes, respiratory system and skin.
Possible sensitizer.

HMIS RATING

HEALTH: 2
FLAMMABILITY: 0
REACTIVITY: 0

NFPA RATING

HEALTH: 2
FLAMMABILITY: 0
REACTIVITY: 0

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is conscious. Call a physician.

INHALATION EXPOSURE

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

DERMAL EXPOSURE

In case of contact, immediately wash skin with soap and copious

amounts of water.

EYE EXPOSURE
In case of contact, immediately flush eyes with copious amounts of water for at least 15 minutes.

Section 5 - Fire Fighting Measures

FLASH POINT
N/A

AUTOIGNITION TEMP
N/A

FLAMMABILITY
N/A

EXTINGUISHING MEDIA
Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

FIREFIGHTING
Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Specific Hazard(s): Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

PROCEDURE(S) OF PERSONAL PRECAUTION(S)
Wear respirator, chemical safety goggles, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP
Sweep up, place in a bag and hold for waste disposal. Avoid raising dust. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

HANDLING
User Exposure: Do not breathe dust. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

STORAGE
Suitable: Keep tightly closed.

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS
Safety shower and eye bath. Mechanical exhaust required.

PERSONAL PROTECTIVE EQUIPMENT
Respiratory: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a dust mask type N95 (US) or type P1 (EN 143) respirator.
Hand: Compatible chemical-resistant gloves.
Eye: Chemical safety goggles.

GENERAL HYGIENE MEASURES
Wash thoroughly after handling.

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Section 9 - Physical/Chemical Properties

Appearance — Physical State: Solid

Property	Value	At Temperature or Pressure
Molecular Weight	238.21 AMU	
pH	N/A	
BP/BP Range	N/A	
MP/MP Range	126.0 - 128.0 °C	
Freezing Point	N/A	
Vapor Pressure	N/A	
Vapor Density	N/A	
Saturated Vapor Conc.	N/A	
SG/Density	N/A	
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	N/A	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	N/A	
Surface Tension	N/A	
Partition Coefficient	Log Kow: 1.51	
Decomposition Temp.	N/A	
Flash Point	N/A	
Explosion Limits	N/A	
Flammability	N/A	
Autoignition Temp	N/A	
Refractive Index	N/A	
Optical Rotation	N/A	
Miscellaneous Data	N/A	
Solubility	N/A	

N/A = not available

Section 10 - Stability and Reactivity

STABILITY
Stable: Stable.
Materials to Avoid: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS
Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide, Nitrogen oxides.

HAZARDOUS POLYMERIZATION
Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

ROUTE OF EXPOSURE
Skin Contact: Causes skin irritation.
Skin Absorption: May be harmful if absorbed through the skin.
Eye Contact: Causes eye irritation.
Inhalation: May be harmful if inhaled. Material is irritating to mucous membranes and upper respiratory tract.
Ingestion: May be harmful if swallowed.

SIGNS AND SYMPTOMS OF EXPOSURE

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To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Section 12 - Ecological Information

No data available.

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION
Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT
Proper Shipping Name: None
Non-Hazardous for Transport: This substance is considered to be non-hazardous for transport.

IATA
Non-Hazardous for Air Transport: Non-hazardous for air transport.

Section 15 - Regulatory Information

EU ADDITIONAL CLASSIFICATION
Symbol of Danger: Xi
Indication of Danger: Irritant.
R: 36/37/38
Risk Statements: Irritating to eyes, respiratory system and skin.
S: 26
Safety Statements: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

US CLASSIFICATION AND LABEL TEXT
Indication of Danger: Irritant.
Risk Statements: Irritating to eyes, respiratory system and skin.
Safety Statements: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
US Statements: Possible sensitizer.

UNITED STATES REGULATORY INFORMATION
SARA LISTED: No

CANADA REGULATORY INFORMATION
WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.
DSL: No
NDSL: Yes

Section 16 - Other Information

DISCLAIMER
For R&D use only. Not for drug, household or other uses.

WARRANTY
The above information is believed to be correct but does not

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purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.
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ADVANCED AROMATICS, L.P.
5501 Baker Road Baytown, Texas 77520
P O Box 1516 Baytown, Texas 77522 281/424-4505 FAX 281/424-3532

MATERIAL SAFETY DATA SHEET

ADVASOL Solvent

PRODUCT IDENTIFICATION

Chemical Name: Petroleum Distillates

Chemical Family: Petroleum Hydrocarbon

Trade Name: **ADVASOL 150** and **ADVASOL 150E** (7% max. naphthalene)

Synonyms: Aromatics Solvent, Wash Oil

Revision Date: September 18, 2001

Manufacturer /Distributor: Advanced Aromatics, L.P. 5501 Baker Road Baytown, TX 77520

EMERGENCY CONTACT: (281) 424-4505 24 hour number: (281)424-9566 Chemtrec: (800) 424-9300

HAZARDOUS COMPONENTS

The following chemical components have been determined to be hazardous under OSHA's Hazard Communication Std. 29 CFR 1910.1200, and are listed in Table Z-1 1910.1000 (Toxic and Hazardous Substances).

CAS No.	Material or Component	Percentage
91-20-3	Naphthalene	14% Maximum
64742-94-5	Heavy aromatic petroleum naptha	84% - 94%

PHYSICAL DATA (TYPICAL)

Specific Gravity: .95-.98 @ 60°F	Boiling Point: 400°F
Vapor Density (Air=1): 4.9	Freezing Point: -35°F
Vapor Pressure (PSIA): <1 @ 100°F	Evaporation Rate (Butyl Acetate =1):<1.0
Solubility In Water at 1ATM & 25°C: NEGLIGIBLE	Viscosity: 2cst @ 100°F

Physical Description: Dark brown/green liquid with an aromatic odor.

FIRE AND EXPLOSION DATA

Flash Point: >150 °F (PMCC)

Flammable Limits in Air % by Volume: Lower: 1.9 Upper: 6.8

ACCEPTED SUBJECT TO SUBSEQUENT VERIFICATION OF QUANTITY AND QUALITY

Extinguishing Media: Use water, foam, carbon dioxide or dry chemical.

Special Fire Fighting Procedures: Wear complete personal protective equipment. SCBA required.

Unusual Fire and Explosion Hazard: None Known.

"Disclaimer of Liability", see the statement on Page 5.

T. depart - CES #1085
Detergent - Hot wash
Cold Rinse

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REACTIVITY DATA

Stability: Product is stable under normal storage conditions.

Conditions to Avoid: Extreme heat. Avoid contact with strong oxidizers (e.g. Chlorine, Peroxides, etc.) Toxic fumes and heat can be generated.

Incompatibility: Strong Oxidizers

Hazardous Polymerization: Will not occur.

Hazardous Decomposition Products When Heated: CO and CO2 may be formed in the event of combustion. Toxic fumes may be formed during combustion.

HMIS RATING

NFPA 704 Rating: 0 – Insignificant 1 – Slight 2 - Moderate 3 - High 4 – Extreme

Health: 2 Flammability: 2 Reactivity: 1 Special Hazard: None Personal Protection: B

HEALTH HAZARD INFORMATION

Symptoms of Exposure:
This is a combustible liquid that should be kept away from ignition sources. The product may cause skin irritation from prolonged exposure. Avoid breathing vapors, prolonged exposure could cause irritation to the respiratory system. Avoid contact when possible and use personnel equipment while handling this material. Use only in properly ventilated areas. Keep all containers closed when not in use. Empty containers will still contain residue, and should not be reused.

Health Effects:
ACUTE – Inhalation of high concentrations can cause nausea, dizziness, vomiting, disorientation, or unconsciousness.
CHRONIC – Prolonged skin contact can cause dry skin and defatting, resulting in irritation or dermatitis.

Ingestion: Do not take internally. Seek medical attention if exposure occurs.

Skin: Exposure may irritate skin. Wash skin thoroughly for 15 minutes if contact occurs.

Inhalation: Inhalation of vapors may cause irritation to lungs.

Eyes: May cause eye irritation. Seek medical attention if exposure occurs.

Special Medical Conditions Aggravated by Exposure: None known.

Primary Route of Entry: Skin contact.

Exposure Limits: None Established
Petroleum Distillate TLV = 500PPM (2000 mg/m3) / Naphthalene TLV = 10 ppm (50 mg/m3)

Carcinogen Status: Not listed on (NTP) National Toxicology Program "Annual Report on Carcinogens", or (IARC) Intl. Agency for Research on Cancer "Monographs", and is not classified by OSHA as a carcinogen. NTP studies TR-410 and TR-500 show evidence of increased tumor growth in rodents based upon exposure to Naphthalene.

Toxicity: At this time there are no toxicity studies that exist for this product.

FIRST AID

Ingestion: Do not induce vomiting. Contact physician.

Remove soiled clothing and wash with soap and water. Contact physician. If irritation persists, contact physician.

Inhalation: Remove from area. If breathing irregular, administer oxygen.

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Eyes: Flush eyes with water for at least 15 minutes. Contact physician.

SPILL OR LEAK PROCEDURES / WASTE DISPOSAL

In Case of a Transportation Accident, Contact CHEMTREC at 1-800/424-9300.

IN CASE OF SPILLS OR RELEASE: For small spill, use solid absorbent and shovel into disposal into disposal container. For large spills, dike the area to facilitate salvage or disposal. Shut off ignition sources and avoid breathing vapors. Avoid runoff into sewers and advise authorities.

Refer to DOT NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK for handling information.

Waste Disposal Method: Waste material should be disposed of consistent with federal, state, and local regulations. See Regulatory information below.

Disposal: If this product becomes a waste, it does not meet the criteria of a hazardous waste as defined under the RCRA 40 CFR 261, since it does not have the characteristics of Subpart C, nor is listed under Subpart D.

As a non-hazardous liquid waste, it should be solidified with stabilizing agents (sand, fly ash, or cement), so that no free standing liquids remain before disposal into an industrial landfill. A non-hazardous liquid waste can also be incinerated in accordance with local, state and federal regulations.

SPECIAL PROTECTION INFORMATION

Respiratory Protection: Have appropriate NIOSH approved respirator available. Organic cartridge respirator recommended.

Gloves: Impermeable gloves such as rubber, neoprene, PVC, viton, etc.

Eyes: Chemical splash goggles or faceshield. Eyewash facilities should be available in the area.

ntilation: General use of local exhaust as required to control exposure.

SPECIAL PRECAUTIONS

Storage and Handling: Product should be stored away from source of ignition, or oxidizing agents. Prevent skin contact.

TRANSPORTATION INFORMATION

The proper shipping name / hazard class may vary by packaging, properties, and mode of transportation.

roper shipping names are:

LL TRANSPORTATION MODES: (nless Specified Below)	Petroleum Distillates, N.O. S.
N/ID No.:	UN 1268
ZARD CLASS :	3 – Combustible liquid
CKING GROUP:	III
RGO AIRCRAFT LIMIT:	220L
SSENGER AIRCRAFT LIMIT:	60L
HNICAL NAME(s):	Naphthalene, Methylnaphthalene(s)
LBS. (Per pkg.):	700 Lbs. (at 14% Naphthalene in Advasol 150)
OMPONENTS (s):	Naphthalene (100 lbs. Require reporting)
SH POINT:	150 Deg F
RANSPORATION: AO)	Petroleum Distillates, N.O. S

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UN/ID No.:	UN1268
HAZARD CLASS :	9
PACKING GROUP:	III
CARGO AIRCRAFT LIMIT:	No Limit
ASSENGER AIRCRAFT LIMIT:	No Limit
MARINE TRANSPORTATION: (IMDG / IMO)	Environmentally Hazardous Substances, Liquid N.O.S
UN/ID No.:	UN 3082
HAZARD CLASS :	9
PACKING GROUP:	III
MARINE POLLUTANT (s):	None

REGULATORY INFORMATION RIGHT-TO-KNOW PROGRAM

This product contains the following toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and 40CRF372.

CAS No.	Material or Component	% by Weight
91-20-3	Naphthalene	14% maximum
64742-94-5	Heavy aromatic petroleum naphtha	84%-94%

THE FOLLOWING FEDERAL REGULATIONS APPLY TO THIS PRODUCT:

OSHA HAZARD COMMUNICATION STD: 29 CFR 1910.1200 and 29 CFR 1910.1000 Table Z-1, Z-2, and Z-3.

sed on our hazard evaluation, the following components in this product are hazardous and the reasons are listed.

Y AROMATIC NAPHTHA – Combustible, skin irritant.

HTHALENE – Eye irritant

NAPHTHALENE – OSHA – 10ppm (50mg/m3) TWA for 8 hour workday, STEL = 15ppm (75 mg/m3).
ACGIH – 10ppm (52mg/m3) TWA for 8 hour workday, STEL = 15ppm (79 mg/m3).

ERCLA, 40 CFR 117,302:This product contains naphthalene, a reportable quantity (RQ) substance. The RQ for Naphthalene is 100 lbs. If a spill of Advasol 150 contains 100 or more pounds of Naphthalene, it requires notification to the National Response Center, Washington D.C. (1-800-424-8802). There may also be state and local requirements to report spills.

ARA TITLE III Section 302 - This product does not contain any components regulated under SARA TITLE III, Section 302 (Extremely Hazardous Substance).

Section 311, 312 - (MSDS Information) 40 CFR 370, This product has been determined to be hazardous, and should be reported under the following EPA hazard categories:

--xx--immediate (acute) health hazard
-------Delayed (chronic) health hazard
--xx--Fire Hazard
-------Sudden release of pressure hazard
-------Reactive hazard

r SARA Sections 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are 500 pounds for the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

n 313 -This product contains the following component subject to regulation under SARA TITLE III, Section 313: Naphthalene

C SUBSTANCE CONTROL ACT (TSCA): The components in this product are on the TSCA inventory.

E CONSERVATION and RECOVERY ACT (RCRA): Naphthalene is subject to regulation under 40 CFR 261

r or Liability", see the statement on Page 5.

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40 CFR 261 Subpart C & D. The hazardous waste code for naphthalene is U165.

CLEAN WATER ACT (CWA): Naphthalene is subject to regulation under sections 307 and 311 of the CWA.

CLEAN AIR ACT (CAA): Naphthalene is a listed "Hazardous air pollutant (HAP)" under Section 112 of the CAA.

STATE REGULATIONS:

California Proposition 65: Benzene, known to California to cause cancer, may be present as an impurity or residue.

Michigan Critical Materials : This product contains the following ingredient(s) identified on the Michigan Critical Materials Register:

Naphthalene

State Right to Know Laws: The following ingredient(s) are disclosed for compliance with state right to know laws:

METHYLNAPHTHALENE(S)	91-12-0
NAPHTHALENE(S)	91-20-3

INTERNATIONAL REGULATIONS: This product is a WHMIS controlled product under the House of Commons of Canada Bill C-70 (class B3 and class D2A). The product contains the following substance(s), from the Ingredient Disclosure List or has been evaluated based on it's toxicological properties, to contain the following hazardous ingredient(s):

HEAVY AROMATIC PETROLEUM NAPTHA	64742-94-5	84%-94%
NAPHTHALENE	91-20-3	14% maximum

ALL INFORMATION ON THIS MSDS MUST BE INCLUDED IN ALL MSDS THAT ARE COPIED AND DISTRIBUTED FOR THIS MATERIAL.

ıformation is provided for the customers of Advanced Aromatics; however, it does not address in detail the use, storage or handling c . product. Users of the product, considering their use, storage or handling of the product, may need to develop additional procedures. The information should not be relied on to insure compliance by the customer with any federal, state or local legal requirements. Information provided herein, are not product specifications.

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Material Safety Data Sheet

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

Trade name	ALFOL® 6 Alcohol	
Synonyms	1-Hexanol, Hexyl Alcohol	
Manufacturer/Supplier	Sasol North America Inc.	
Address	900 Threadneedle, Houston, TX 77079	
Telephone	CHEMTREC North America Transportation Emergency (24-hr)	(800) 424-9300
	CHEMTREC World Wide	(703) 527-3887
	Other Emergencies (24-hr)	(337) 494-5142
	MSDS and Product Information (8:00am-4:30pm CST)	(281) 588-3491
	Health and Safety Information (8:00am-4:00pm CST)	(281) 588-3492

SECTION 2 COMPOSITION AND INFORMATION ON INGREDIENTS

Components	CAS-No.	Weight %
1-Hexanol	111-27-3	99.5

See Section 8 for Exposure Guidelines and Section 15 for Regulatory Classifications.

SECTION 3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Appearance Colorless Liquid

Odor Sweet, pungent

Precautions **WARNING!** COMBUSTIBLE LIQUID AND VAPOR. CAUSES EYE AND SKIN IRRITATION. Avoid contact with skin, eyes and clothing. Wash thoroughly after handling. Keep away from heat and flame.

Environmental precautions Do not flush into surface water or sanitary sewer system. Low toxicity to aquatic organisms such as bacteria, algae, protozoa and fish. Rapidly, readily and extensively biodegradable.

POTENTIAL HEALTH EFFECTS

Eyes Irritating to eyes. May cause corneal inflammation.

Skin Prolonged skin contact may cause skin irritation and/or dermatitis. Normal care and personal hygiene should prevent skin effects.

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SECTION VI – HEALTH HAZARD DATA
ROUTE(S) OF ENTRY: INHALATION?: yes **SKIN?**: yes **INGESTION?**: yes **DERMAL CONTACT?:** yes
HEALTH HAZARDS (*Acute and Chronic*): N/A
CARCINOGENICITY: Not identified as a carcinogen by the NTP Annual Report on Carcinogens, IARC Monographs or by OSHA.
SIGNS AND SYMPTOMS OF OVEREXPOSURE: Inhalation: Mild irritation of eyes, nose and throat.
Ingestion: Drowsiness, headache **Dermal contact:** Dry, cracking skin **Acute Effects**: Irritation of skin and/or upper respiratory tract as noted above. Acute CNS depression may be manifested as giddiness, headache, dizziness and/or nausea. **Chronic Effects:** Chronic exposure can result in skin irritation and contact dermititus. Pre-existing disorders of the skin, eyes, and respiratory tract may be exacerbated by exposure to isopropyl alcohol.
EMERGENCY AND FIRST AID PROCEDURES: Inhalation: Remove victim to fresh air and provide oxygen if breathing is difficult. Seek medical attention if breathing continues to be difficult. **Eye:** Flush eyes with copious amount of water for a least 15 minutes. **Skin:** Flush with water. If irritation persists, seek medical attention.
Ingestion: Do not induce vomiting if victim is unconscious or drowsy. Seek medical attention or contact the poison control center.

SECTION VII – SPILL OR LEAK PROCEDURES
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Large Spills: Eliminate all ignition sources. Equipment must be grounded to prevent sparking. Evacuate the area of unprotected personnel. Contain source of spill. Dike or otherwise confine spilled product. Uncontrolled releases to air, land or water may be reportable to the National Response Center (1-800-424-8802.) **Small Spills:** Take up with absorbent material and placed in non-leaking container; seal tightly. Dispose of absorbent.
DISPOSAL CONSIDERATIONS: Contact your supplier or a licensed contractor for detailed recommendations.
DISPOSAL REGULATORY REQUIREMENTS: Follow applicable Federal, state, and local regulations. Consider fuel blending as an alternative to incineration. **ENVIRONMENTAL DEGRADATION:** Should be removed readily from soils and water by volatilization and biodegradation.

SECTION VIII – SPECIAL PROTECTION INFORMATION		
VENTILATION:	LOCAL EXHAUST: √	SPECIAL: None
	MECHANICAL (*General*): None	OTHER: None
Engineering measures: Use explosion-proof ventilation equipment as necessary to maintain airborne concentrations below the PEL. Ground all containers to prevent static sparks during fluid transfers.		
PROTECTIVE GLOVE: Gloves		**EYE PROTECTION:** Goggles
OTHER PROTECTIVE EQUIPMENT: NIOSH approved respiratory protection required when above PEL/TWA.		

SECTION IX – SPECIAL PRECAUTIONS
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Handling Use non-sparking tools to open containers. Maintain appropriate class of fire extinguishers nearby in case of fire.
Storage: Store in tightly closed containers in a cool, dry area away from heat and other possible ignition sources.
Recommended Hygiene Practices: Clean PPE and work clothing contaminated prior to reuse. After working with this product, be sure to wash before eating, smoking, drinking or applying cosmetics.

THIS INFORMATION AND RECOMMENDATIONS HEREIN ARE TAKEN FROM SOURCES BELIEVED TO BE ACCURATE AS OF THE DATE, HOWEVER CERTIFIED SAFETY MAKES NO WARRANTY WITH RESPECT TO THE ACCURACY OF THIS INFORMATION OR THE SUITABILITY OF THE RECOMMENDATIONS, AND ASSUMES NO LIABILITY TO ANY USE THEREOF.....

U.S. DEPARTMENT OF LABOR

Occupational Safety and Health Administration

MATERIAL SAFETY DATA SHEET

May be used to comply with OSHA's Hazard Communications Standard.
29CFR 1910.1200. Standard must be consulted for specific requirements.

SECTION I		
MANUFACTURER'S NAME/REPACKAGED BY: **Certified Safety Manufacturing Company, Inc.**	TELEPHONE NO. **(816) 483-9090**	
ADDRESS: **1400 Chestnut Avenue Kansas City, Missouri 64127**		
IDENTITY (AS USED ON LABEL): ***Alcohol (IPA) 99%***	DATE PREPARED: 07/25/06	DATE REVIEWED: 09/25/06

SECTION II – HAZARDOUS INGREDIENTS/IDENTITY INFORMATION					
HAZARDOUS COMPONENTS (Specific Chemical Identity; Common Name(s)):					
		%	OSHA PEL	ACGIH TLV	OTHER LIMITS RECOMMENDED
Isopropyl Alcohol (IPA)	CAS# 67-63-0	99%	400 ppm		OSHA STEL=500ppm
(Isopropanol, 2-Propanol, Dimethyl Carbinol)					
THIS PRODUCT IS PRODUCED AS A HEALTH CARE ITEM "FOOD, DRUG OR COSMETIC, INTENDED FOR PERSONAL CONSUMPTION BY EMPLOYEES WHILE IN THE WORKPLACE" TO WHICH THE HAZARDOUS COMMUNICATIONS REQUIREMENTS OF; 29CFR1910.1200 (A) & (B) DO NOT APPLY, AS SPECIFICALLY STATED IN 29CFR 1910.1200 (B) (5) (V)					

SECTION III – PHYSICAL DATA			
BOILING POINT (°F):	181°F	**SPECIFIC GRAVITY (H_20= 1):**	.878
VAPOR PRESSURE (mm Hg.):	33 mm 20 °C (68°F)	**MELTING POINT:**	No Data
SOLUBILITY IN WATER:	Miscible	**% volatiles by Vol.:**	No Data
PH:	No Data	**FREEZING POINT:**	-127°F
APPEARANCE AND ODOR: Colorless, volatile liquid with the odor of rubbing alcohol			

SECTION IV – FIRE AND EXPLOSION HAZARD DATA	
FLASH POINT (Method used): 53° F (TAG Open Cup)	**FLAMMABLE LIMITS:** **LEL: 2%** **UEL: 12%**
EXTINGUISHING MEDIA: Use water fog, alcohol foam, dry chemical or CO_2	
SPECIAL FIRE FIGHTING PROCEDURES: Special protective equipment for fire-fighters: Clear area of unprotected personnel. Wear complete turnout gear. Cool containers exposed to fire with water.	
UNUSUAL FIRE AND EXPLOSION HAZARDS: Containers exposed to intense heat from fires should be cooled with large amounts of water to prevent buildup of internal pressure due to vapor generation which could result in container rupture.	

SECTION V – REACTIVITY DATA				
STABILITY:	STABLE	√	**CONDITIONS TO AVOID:** None known	
INCOMPATABILITY (*Materials to avoid*): Strong oxidizers, acetaldehyde, chlorine, ethylene oxide, acid, isocyanates				
HAZARDOUS POLYMERIZATION:	**MAY OCCUR**		**CONDITIONS TO AVOID:** Heat, sparks, and open flame	
	WILL NOT OCCUR	√	Do NOT store in aluminum >120° F	
HAZARDOUS PRODUCTS: CO_2 and unidentified organic compounds may be formed of decomposition.				

Inhalation Irritation of the nose and throat, dizziness, and headache.

Ingestion Depression of central nervous system can occur. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. Aspiration (breathing) into lungs, caused while vomiting, may result in severe pulmonary injury.

(See Section 11 for Toxicological Information)

SECTION 4 FIRST AID MEASURES

Eye contact Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

Skin contact Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. When symptoms persist or in all cases of doubt seek medical advice. Wash contaminated clothing before re-use.

Inhalation Remove to fresh air. If breathing is irregular or stopped, administer artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately.

Ingestion If swallowed, call a physician or poison control center immediately. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person.

SECTION 5 FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

Flash point 58 - 61 °C 136 - 142 °F

Autoignition temperature 290 °C 554 °F

Flammable limits in air % by volume **Lower explosion limit:** Approximately 1.2 %(V)
Upper explosion limit: Approximately 8.0 %(V)

Fire and explosion Flash back possible over considerable distance. NFPA Class II combustible liquid.

Extinguishing media Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Fire fighting instructions Wear self-contained breathing apparatus and protective suit. Keep containers and surroundings cool with water spray.

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SECTION 6 ACCIDENTAL RELEASE MEASURES

Steps to be taken in case of spill or leak Evacuate personnel to safe areas. Remove all sources of ignition. Contain and collect spillage with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see Section 13). Do not flush into surface water or sanitary sewer system.

Spill precautions Material can create slippery conditions.

SECTION 7 HANDLING AND STORAGE

Safe handling advice Ensure all equipment is electrically grounded before beginning transfer operations.

Storage/Transport pressure Ambient.

Load/Unload temperature Ambient.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING MEASURES

Mechanical ventilation may be necessary if working with this product in enclosed areas and/or at elevated temperatures.

PERSONAL PROTECTIVE EQUIPMENT

Eyes When contact with liquid is possible, use a face shield and/or chemical splash goggles. Otherwise use safety glasses with side shields or goggles.

Skin Wear suitable protective clothing, gloves and eye/face protection.

Inhalation Respiratory protection is normally not required except in emergencies or when conditions cause excessive airborne levels of mists or vapors. NIOSH-approved organic vapor air-purifying respirator, self-contained breathing apparatus, or air-supplied respirators where there may be potential for overexposure.

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EXPOSURE GUIDELINES

Components	Exposure limit(s)
	No exposure limits have been established for this product.

PEL=	Permissible Exposure Limits	TWA=	Time Weighted Average (8 hr.)
TLV=	Threshold Limit Value	STEL=	Short Term Exposure Limit (15 min.)
EL=	Excursion Limit	WEEL=	Workplace Environmental Exposure Level

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Liquid
Colour	Colorless
Odour	Sweet, pungent
Form	Liquid
Boiling point/range	156 - 158 °C 313 - 316 °F
Vapour pressure	0.5 mm Hg @ 21 °C
Vapor density	4.5
Solubility (water)	0.59 g/100gNil.
Viscosity	5.5 cSt @ 21 °C
Melting point/range	-45 °C -49 °F
Density	0.820 g/cm3 @ 15.5 °C

SECTION 10 STABILITY AND REACTIVITY

Conditions to avoid	Keep away from heat and sources of ignition.
Hazardous decomposition products	Combustion products include carbon dioxide, carbon monoxide and possibly other unidentified organic compounds.
Incompatability with other materials	Can react with strong oxidizers, inorganic acids, and halogens.
Hazardous polymerization	None.

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SECTION 11 TOXICOLOGICAL INFORMATION

Eyes Primary irritation index (rabbit): 26.8 (Maximum score is 110.) (unwashed eyes)
Primary irritation index (rabbit): 32.6 (Maximum score is 110.) (washed eyes)
Irreversible corneal damage at day 3, the last day of observation.

Skin Primary irritation index (rabbit): 5.1 (Maximum score is 8.0.)
Acute dermal LD50 (rabbit): 1,500 - 2,300 mg/kg

Inhalation Acute 1 hours (rat): > 21 mg/l All rats survived at indicated concentration.

Ingestion Acute oral LD50(rat): 3,100 - 4,900 mg/kg

CARCINOGENICITY

This product contains no carcinogenic substances.

SECTION 12 ECOLOGICAL INFORMATION

Aquatic toxicity Low toxicity to aquatic organisms such as bacteria, algae, protozoa and fish.

LC50 (P. Promelas (fathead minnow)) 96 hours 97.2 mg/l
Test Substance: 1-Hexanol

Biodegradation Rapidly, readily and extensively biodegradable.

SECTION 13 DISPOSAL CONSIDERATIONS

Waste code D001 - Ignitability (RQ 100 LB) Re-evaluation of the product may be required by the user at the time of disposal, since the product uses, transformations, mixtures, contamination, and spillage may change the classification.

Disposal methods Land disposal of this product is restricted. Dispose of only in accordance with local, state, and federal regulations. Do not contaminate any lakes, streams, ponds, groundwater or soil.

Empty containers Empty containers retain product residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Empty drums should be completely drained, triple-rinsed, properly bunged and promptly returned to a drum reconditioner, or properly disposed.

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SECTION 14 TRANSPORT INFORMATION

DOT description Hexanols, 3, UN 2282, III This product is regulated as a hazardous material as defined by the Department of Transportation (DOT).

IATA description Hexanols, 3, UN 2282, III This product is regulated as a dangerous good as defined by ICAO/IATA for air transportation.

IMDG description Hexanols, 3, UN 2282, III This product is regulated as a dangerous good as defined by the IMDG Code for marine transport.

SECTION 15 REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS

OSHA classification
Combustible liquid, eye irritant and skin irritant.

TSCA Inventory Listing

Components	CAS-No.
1-Hexanol	111-27-3

SARA 302 Status

Components	CAS-No.	Weight %
Contains no chemicals subject to SARA 302 reporting.		

SARA 311/312 Classification
"Immediate (acute) health hazard", "Fire hazard"

SARA 313 Chemical

Components	CAS-No.	Weight %
Contains no chemicals subject to SARA 313 reporting.		

CERCLA Hazardous Substance

Components	CERCLA RQ	Weight %
Contains no chemicals subject to CERCLA.		

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INTERNATIONAL REGULATIONS

Workplace Hazardous Materials Information System (WHMIS) Classification
Class B, Division 3: Combustible liquid.
Class D, Division 2, Subdivision B: Toxic material.

Australian Inventory of Chemical Substances (AICS) Listing
Listed on the AICS.

Japanese Minister of International Trade and Industry (MITI) Inventory Listing
Listed on MITI.

Canadian Domestic Substance List (DSL) Inventory Listing
Listed on the DSL.

European Inventory of Existing Commercial Chemical Substances (EINECS) Listing
Listed on EINECS.

Phillipines Inventory List (PICCS)
Listed on PICCS.

Korean Inventory List
Listed on the ECL.

China Inventory List
Listed on the China inventory.

STATE REGULATIONS

California Safe Drinking Water Act (Prop 65) Listing

Components	CAS-No.

Contains no chemical subject to California Prop 65.

SECTION 16 OTHER INFORMATION

HAZARD RATINGS

	Health	Flammability	Reactivity
HMIS	2	2	0
NFPA	1	2	0

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ALFOL® 6 Alcohol

THE DATA AND INFORMATION CONTAINED HEREIN ARE BEING FURNISHED FOR INFORMATIONAL PURPOSES ONLY, UPON THE EXPRESS CONDITION THAT EACH CUSTOMER SHALL MAKE ITS OWN ASSESSMENT OF APPROPRIATE USE AND APPROPRIATE SHIPPING, TRANSFER AND STORAGE MATERIALS AND PROCEDURES FOR SASOL NORTH AMERICA'S PRODUCTS. ALTHOUGH BASED ON INFORMATION SOURCES WHICH SASOL NORTH AMERICA CONSIDERS ACCURATE AND RELIABLE, SASOL NORTH AMERICA MAKES NO WARRANTY, EITHER EXPRESS OR IMPLIED, INCLUDING ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, REGARDING THE VALIDITY OF THIS INFORMATION, THE INFORMATION SOURCES UPON WHICH THE SAME ARE BASED, OR THE RESULTS TO BE OBTAINED, AND EXPRESSLY DISCLAIMS LIABILITIES FOR DAMAGES OR INJURIES RESULTING FROM THE USE THEREOF.

HALLIBURTON

MATERIAL SAFETY DATA SHEET

Product Trade Name: **ALUMINUM SULFATE**

Revision Date: 02-Jan-2007

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Trade Name: ALUMINUM SULFATE
Synonyms: None
Chemical Family: Sulfate
Application: Additive

Manufacturer/Supplier
Halliburton Energy Services
P.O. Box 1431
Duncan, Oklahoma 73536-0431
Emergency Telephone: (281) 575-5000

Prepared By
Chemical Compliance
Telephone: 1-580-251-4335

2. COMPOSITION/INFORMATION ON INGREDIENTS

SUBSTANCE	CAS Number	PERCENT	ACGIH TLV-TWA	OSHA PEL-TWA
Aluminum sulfate	10043-01-3	60 - 100%	2 mg/m^3	2 mg/m^3

3. HAZARDS IDENTIFICATION

Hazard Overview May cause eye, skin, and respiratory irritation.

4. FIRST AID MEASURES

Inhalation If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

Skin Wash with soap and water. Get medical attention if irritation persists.

Eyes In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

Ingestion Do not induce vomiting. Slowly dilute with 1-2 glasses of water or milk and seek medical attention. Never give anything by mouth to an unconscious person.

Notes to Physician Not Applicable

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5. FIRE FIGHTING MEASURES

Flash Point/Range (F):	Not Determined
Flash Point/Range (C):	Not Determined
Flash Point Method:	Not Determined
Autoignition Temperature (F):	Not Determined
Autoignition Temperature (C):	Not Determined
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Upper (%):	Not Determined

Fire Extinguishing Media	Water fog, carbon dioxide, foam, dry chemical.
Special Exposure Hazards	Decomposition in fire may produce toxic gases.
Special Protective Equipment for Fire-Fighters	Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.
NFPA Ratings:	Health 2, Flammability 0, Reactivity 0
HMIS Ratings:	Flammability 0, Reactivity 0, Health 2

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures	Use appropriate protective equipment. Avoid creating and breathing dust.
Environmental Precautionary Measures	Prevent from entering sewers, waterways, or low areas.
Procedure for Cleaning / Absorption	Scoop up and remove.

7. HANDLING AND STORAGE

Handling Precautions	Avoid contact with eyes, skin, or clothing. Avoid creating or inhaling dust.
Storage Information	Store in a cool, dry location.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls	Use in a well ventilated area.
Respiratory Protection	Not normally needed. But if significant exposures are possible then the following respirator is recommended: Dust/mist respirator. (95%)
Hand Protection	Normal work gloves.
Skin Protection	Normal work coveralls.
Eye Protection	Wear safety glasses or goggles to protect against exposure.
Other Precautions	Eyewash fountains and safety showers must be easily accessible.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Solid
Color:	White
Odor:	Odorless
pH:	3.5
Specific Gravity @ 20 C (Water=1):	1.61
Density @ 20 C (lbs./gallon):	Not Determined

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9. PHYSICAL AND CHEMICAL PROPERTIES

Bulk Density @ 20 C (lbs/ft3):	Not Determined
Boiling Point/Range (F):	Not Determined
Boiling Point/Range (C):	Not Determined
Freezing Point/Range (F):	Not Determined
Freezing Point/Range (C):	Not Determined
Vapor Pressure @ 20 C (mmHg):	Not Determined
Vapor Density (Air=1):	Not Determined
Percent Volatiles:	Not Determined
Evaporation Rate (Butyl Acetate=1):	Not Determined
Solubility in Water (g/100ml):	Soluble
Solubility in Solvents (g/100ml):	Not Determined
VOCs (lbs./gallon):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined
Viscosity, Kinematic @ 20 C (centistrokes):	Not Determined
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	342.18

10. STABILITY AND REACTIVITY

Stability Data:	Stable
Hazardous Polymerization:	Will Not Occur
Conditions to Avoid	None anticipated
Incompatibility (Materials to Avoid)	None known.
Hazardous Decomposition Products	Oxides of sulfur.
Additional Guidelines	Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure	Eye or skin contact, inhalation.
Inhalation	May cause respiratory irritation.
Skin Contact	May cause skin irritation.
Eye Contact	May cause eye irritation.
Ingestion	Irritation of the mouth, throat, and stomach.
Aggravated Medical Conditions	None known.
Chronic Effects/Carcinogenicity	No data available to indicate product or components present at greater than 1% are chronic health hazards.
Other Information	None known.
Toxicity Tests	
Oral Toxicity:	LD50: 6200 mg/kg (Rat)
Dermal Toxicity:	Not determined
Inhalation Toxicity:	Not determined

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Primary Irritation Effect:	Not determined
Carcinogenicity	Not determined
Genotoxicity:	Not determined
Reproductive / Developmental Toxicity:	Not determined

12. ECOLOGICAL INFORMATION

Mobility (Water/Soil/Air)	Not determined
Persistence/Degradability	Not applicable
Bio-accumulation	Not Determined

Ecotoxicological Information

Acute Fish Toxicity:	Not determined
Acute Crustaceans Toxicity:	Not determined
Acute Algae Toxicity:	Not determined
Chemical Fate Information	Not determined
Other Information	Not applicable

13. DISPOSAL CONSIDERATIONS

Disposal Method	Bury in a licensed landfill according to federal, state, and local regulations.
Contaminated Packaging	Follow all applicable national or local regulations.

14. TRANSPORT INFORMATION

Land Transportation

DOT
Not restricted

Canadian TDG
Not restricted

ADR Not restricted

Air Transportation

ICAO/IATA Not restricted

Sea Transportation

IMDG Not restricted

Other Shipping Information

Labels: None

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15. REGULATORY INFORMATION

US Regulations

US TSCA Inventory	All components listed on inventory.
EPA SARA Title III Extremely Hazardous Substances	Not applicable
EPA SARA (311,312) Hazard Class	Acute Health Hazard
EPA SARA (313) Chemicals	This product does not contain a toxic chemical for routine annual "Toxic Chemical Release Reporting" under Section 313 (40 CFR 372).
EPA CERCLA/Superfund Reportable Spill Quantity For This Product	Not applicable.
EPA RCRA Hazardous Waste Classification	If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.
California Proposition 65	All components listed do not apply to the California Proposition 65 Regulation.
MA Right-to-Know Law	One or more components listed.
NJ Right-to-Know Law	One or more components listed.
PA Right-to-Know Law	One or more components listed.

Canadian Regulations

Canadian DSL Inventory	All components listed on inventory.
WHMIS Hazard Class	D2B Toxic Materials

16. OTHER INFORMATION

The following sections have been revised since the last issue of this MSDS
Not applicable

Additional Information	For additional information on the use of this product, contact your local Halliburton representative. For questions about the Material Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.
Disclaimer Statement	This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

*****END OF MSDS*****

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Material Safety Data Sheet

Catalog Number: 227822
Revision date: 25-Apr-2006

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY INFORMATION

Catalog Number: 227822

Product name: ALUMINUM CHLORIDE

Synonyms: Aluminiumchlorid-hexahydrat; Aluminum chlorohydrate; Aluminum trichloride hexahydrate; Alluminio(cloruro di); Aluminico clorido; Chlorure d'aluminium; Trichloroaluminum
Supplier:
MP Biomedicals, LLC
29525 Fountain Parkway
Solon, OH 44139
tel: 440-337-1200

Emergency telephone number: CHEMTREC: 1-800-424-9300 (1-703-527-3887)

2. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	Weight %	ACGIH Exposure Limits:	OSHA Exposure Limits:
ALUMINIUM CHLORIDE HEXAHYDRATE	7784-13-6	90 - 100%	10 mg/m³ TWA (metal dust)	15 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable fraction)

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: The product causes burns of eyes, skin and mucous membranes

Category of Danger:
Corrosive

Principle routes of exposure: Skin
Inhalation: Vapors or dusts will cause burns of respiratory passages.
Ingestion: Can burn mouth, throat, and stomach
Skin contact: Causes skin burns
Eye contact: Risk of serious damage to eyes

ANSI Classification Corrosive
Statements of hazard CAUSES BURNS TO SKIN AND EYES
VAPORS OR MISTS CAN IRRITATE OR BURN THE RESPIRATORY TRACT.
Statement of Spill or Leak - ANSI Label Eliminate all ignition sources. Absorb and/or contain spill with inert materials (e.g., sand, vermiculite). Then place in appropriate container. For large spills, use water spray to disperse vapors, flush spill area. Prevent runoff from entering waterways or sewers.

4. FIRST AID MEASURES

General advice: In the case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
Inhalation: Move to fresh air. Call a physician immediately.

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Skin contact: Rinse immediately with plenty of water and seek medical advice
Ingestion: Do not induce vomiting without medical advice.
Eye contact: In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Protection of first-aiders: No information available
Medical conditions aggravated by exposure: None known

5. FIRE FIGHTING MEASURES

Suitable extinguishing media:	Use dry chemical, CO2, water spray or "alcohol" foam
Specific hazards:	Burning produces irritant fumes.
Unusual hazards:	None known
Special protective equipment for firefighters:	As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear
Specific methods:	Water mist may be used to cool closed containers.
Flash point:	Not determined
Autoignition temperature:	Not determined

NFPA rating:

NFPA Health:	3
NFPA Flammability:	0
NFPA Reactivity:	2
NFPA Special Note:	w

6. ACCIDENTAL RELEASE MEASURES

Personal precautions:	Use personal protective equipment.
Environmental precautions:	Prevent product from entering drains.
Methods for cleaning up:	Sweep up and shovel into suitable containers for disposal.

7. HANDLING AND STORAGE

Storage:
ROOM TEMPERATURE

Handling:	Use only in area provided with appropriate exhaust ventilation.
Safe handling advice:	Wear personal protective equipment.
Incompatible products:	Oxidising and spontaneously flammable products

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures: Ensure adequate ventilation.
PERSONAL PROTECTIVE EQUIPMENT
Respiratory protection: Breathing apparatus only if aerosol or dust is formed.
Hand protection: Pvc or other plastic material gloves
Skin and body protection: Usual safety precautions while handling the product will provide adequate protection against this potential effect.
Eye protection: Safety glasses with side-shields
Hygiene measures: Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

pearance and Odor	White crystalline

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Physical state:	Powder
Formula:	AlCl3 - 6H2O
Molecular weight:	241.4
Melting point/range:	> 285°C
Boiling point/range:	No Data available at this time.
Density:	2.4 g/ml
Vapor pressure:	1 hPa (at 20 C)
Evaporation rate:	No data available
Vapor density:	No data available
Solubility (in water):	Soluble Reacts with water
Flash point:	Not determined
Autoignition temperature:	Not determined

10. STABILITY AND REACTIVITY

Stability:	Stable under recommended storage conditions.
Polymerization:	Polymerization can occur.
Hazardous decomposition products:	Chloride/Hydrochloric acid
Materials to avoid:	Strong oxidising agents

Contact with air or water produces hydrochloric acid. Water, alcohol, alkenes cause polymerization. Incompatible with nitrobenzene, organic material, bases. Attacks metal in presence of moisture.

Conditions to avoid: Exposure to air or moisture over prolonged periods.

11. TOXICOLOGICAL INFORMATION

Product Information

Acute toxicity

Components	RTECS Number:	Selected LD50s and LC50s
ALUMINIUM CHLORIDE HEXAHYDRATE	BD0530000	Oral LD50 Rat : 3311 mg/kg Oral LD50 Mouse : 1990 mg/kg

Chronic toxicity:	Chronic exposure may cause nausea and vomiting, higher exposure causes unconsciousness.
Local effects:	Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting.
Specific effects:	May include moderate to severe erythema (redness) and moderate edema (raised skin), nausea, vomiting, headache.
Primary irritation:	No data is available on the product itself.
Carcinogenic effects:	No data is available on the product itself.
Mutagenic effects:	No data is available on the product itself.
Reproductive toxicity:	No data is available on the product itself.

Components	NIOSH - Health Effects	NIOSH - Target Organs
ALUMINIUM CHLORIDE HEXAHYDRATE	Lung changes that may lead to pulmonary fibrosis; respiratory and skin irritation	respiratory system, skin, eyes; (for pyro powders, welding fumes, soluble salts and alkyls: respiratory system, skin)

12. ECOLOGICAL INFORMATION

Mobility:	No data available
Bioaccumulation:	No data available
Ecotoxicity effects:	No data available
Aquatic toxicity:	May cause long-term adverse effects in the aquatic environment.

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Components	U.S. DOT - Appendix B - Marine Pollutan	U.S. DOT - Appendix B - Severe Marine Pollutants	United Kingdom - The Red List:
ALUMINIUM CHLORIDE HEXAHYDRATE	Not Listed	Not Listed	Not Listed

Components	Germany VCI (WGK)	World Health Organization (WHO) - Drinking Water	Ecotoxicity - Fish Species Data
ALUMINIUM CHLORIDE HEXAHYDRATE	Not Listed	Not Listed	Not Listed

Components	Ecotoxicity - Freshwater Algae Data	Ecotoxicity - Microtox Data	Ecotoxicity - Water Flea Data
ALUMINIUM CHLORIDE HEXAHYDRATE	Not Listed	Not Listed	Not Listed

Components	EPA - ATSDR Priority List	EPA - HPV Challenge Program Chemical List	California - Priority Toxic Pollutants
ALUMINIUM CHLORIDE HEXAHYDRATE	Rank (of 275): 193	Not Listed	Not Listed

Components	California - Priority Toxic Pollutants	California - Priority Toxic Pollutants
ALUMINIUM CHLORIDE HEXAHYDRATE	Not Listed	Not Listed

13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. This product, if unaltered by use, may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority. Residue from fires extinguished with this material may be hazardous.

Contaminated packaging: Do not re-use empty containers

14. TRANSPORT INFORMATION

UN/Id No: 3260

DOT:

Proper shipping name: Corrosive solid, acidic, inorganic, n.o.s.
IATA Hazard Label(s): Corrosive
Hazard Class 8 - Corrosive materials
Packing group: III

Emergency Response Guide Number (ERG): 154

Components	U.S. DOT - Appendix A Table 1 - Reportable Quantities
ALUMINIUM CHLORIDE HEXAHYDRATE	Not Listed

TDG (Canada):

WHMIS hazard class: E corrosive material

:

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IMDG/IMO

Proper shipping name:	Corrosive solid, acidic, inorganic, n.o.s.
IMDG - Hazard Classifications	IMDG class or division = 8
IMDG - Regulated Substances	UN3260

Components	U.S. DOT - Appendix B - Marine Pollutan	U.S. DOT - Appendix B - Severe Marine Pollutants
ALUMINIUM CHLORIDE HEXAHYDRATE	Not Listed	Not Listed

IMO-labels:

15. REGULATORY INFORMATION

International Inventories

Components	
ALUMINIUM CHLORIDE HEXAHYDRATE	
Inventory - United States TSCA - Sect. 8(b)	Present
Canada DSL Inventory List -	Present
Australia (AICS):	Present
Inventory - China:	Present
EU EINECS List -	231-208-1 (anhydrous)
Inventory - Japan:	1-12
Korean KECL:	KE-01045
Philippines PICCS:	Present

U.S. regulations:

Components	California Proposition 65 -	Massachusetts Right to Know List:	New Jersey Right to Know List:	Pennsylvania Right to Know List:
ALUMINIUM CHLORIDE HEXAHYDRATE	Not Listed	[present]	sn 0057	[present]

Components	Florida substance List:	Rhode Island Right to Know List:	Illinois - Toxic Air Contaminants	Connecticut - Hazardous Air Pollutants
ALUMINIUM CHLORIDE HEXAHYDRATE	[present] (as Al)	Not Listed	Not Listed	Not Listed

Components	SARA 313 Emission reporting/Toxic Release of Chemicals	CERCLA/SARA - Section 302 Extremely Haz	NTP:	IARC:
ALUMINIUM CHLORIDE HEXAHYDRATE	form R reporting required for 1.0% de minimis concentration (as Al) (fume or dust only)	Not Listed	None	None

SARA 313 Notification:

The above is your notification as to the SARA 313 listing for this product(s) pursuant to Section 313 of Title III of the Superfund Ammendments and Reauthorization Act of 1986 and 40 CFR Part 372.

If you are unsure if you are subject to the reporting requirements of Section 313, or need more information, please call the EPA Emergency Planning and Community Right-To-Know Information Hotline: (800) 535-0202 or (202) 479-2499 (in Washington, DC or Alaska).

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State Notification: The above information is your notice as to the Right-to-Know listings of the stated product(s). Individual states will list chemicals for a variety of reasons including, but not limited to, the compounds toxicity; carcinogenic, tumorigenic and/or reproductive hazards; and the compounds environmental impact if accidentally released.

16. OTHER INFORMATION

Prepared by: Health & Safety
Disclaimer: The information and recommendations contained herein are based upon tests believed to be reliable. However, MP Biomedicals does not guarantee the accuracy or completeness NOR SHALL ANY OF THIS INFORMATION CONSTITUTE A WARRANTY, WHETHER EXPRESSED OR IMPLIED, AS TO THE SAFETY OF THE GOODS, THE MERCHANTABILITY OF THE GOODS, OR THE FITNESS OF THE GOODS FOR A PARTICULAR PURPOSE. Adjustment to conform to actual conditions of usage maybe required. MP Biomedicals assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied.

End of Safety Data Sheet

EPAPA008000652

Material Safety Data Sheet
The Dow Chemical Company

Product Name: AMINOETHYLETHANOLAMINE.

Issue Date: 08/02/2006
Print Date: 05 Aug 2006

The Dow Chemical Company encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. Product and Company Identification

Product Name
AMINOETHYLETHANOLAMINE.

COMPANY IDENTIFICATION
The Dow Chemical Company
2030 Willard H. Dow Center
Midland, MI 48674
USA

Customer Information Number: 800-258-2436

EMERGENCY TELEPHONE NUMBER
24-Hour Emergency Contact: 989-636-4400
Local Emergency Contact: 989-636-4400

2. Hazards Identification

Emergency Overview
Color: Colorless
Physical State: Liquid
Odor: Slightly ammoniacal
Hazards of product:

DANGER! Causes severe eye burns. Causes severe skin burns. Causes burns of the mouth and throat. May cause allergic skin reaction. Aspiration hazard. Can enter lungs and cause damage. Keep upwind of spill.

OSHA Hazard Communication Standard
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Potential Health Effects
Eye Contact: May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur.
Skin Contact: Brief contact may cause skin burns. Symptoms may include pain, severe local redness and tissue damage. May cause more severe response on covered skin (under clothing, gloves). Classified as corrosive to the skin according to DOT guidelines.

* Indicates a Trademark

Skin Absorption: Prolonged skin contact is unlikely to result in absorption of harmful amounts.
Skin Sensitization: Skin contact may cause an allergic skin reaction. Individuals who have had an allergic skin reaction to similar materials may have an allergic skin reaction to this product. The similar material(s) is/are: Triethylenetetramine (TETA). Has caused allergic skin reactions when tested in mice. Has caused allergic skin reactions when tested in guinea pigs.
Inhalation: At room temperature, exposure to vapor is minimal due to low volatility; vapor from heated material may cause respiratory irritation.
Ingestion: Low toxicity if swallowed. Swallowing may result in gastrointestinal irritation or ulceration. Swallowing may result in burns of the mouth and throat. Aspiration into the lungs may occur during ingestion or vomiting, causing tissue damage or lung injury.
Effects of Repeated Exposure: In animals, effects have been reported on the following organs: Gastrointestinal tract. Kidney.
Birth Defects/Developmental Effects: Has caused birth defects in laboratory animals.
Reproductive Effects: Has been toxic to the fetus in laboratory animal tests. Dose levels producing these effects were many times higher than any dose levels expected from exposure due to use.

3. Composition Information

Component	CAS #	Amount
Aminoethylethanolamine	111-41-1	> 99.5 %
Triethylenetetramine mixture	112-24-3	> 0.1 %

4. First-aid measures

Eye Contact: Wash immediately and continuously with flowing water for at least 30 minutes. Remove contact lenses after the first 5 minutes and continue washing. Obtain prompt medical consultation, preferably from an ophthalmologist.
Skin Contact: Immediately wash thoroughly any size exposure with non-abrasive soap and large quantities of water for 30 minutes while removing contaminated clothing and shoes. Destroy contaminated leather items such as shoes, belts, and watchbands. Wash contaminated clothing before reuse.
Inhalation: Move person to fresh air; if effects occur, consult a physician.
Ingestion: Do not induce vomiting. Give one cup (8 ounces or 240 ml) of water or milk if available and transport to a medical facility. Do not give anything by mouth to an unconscious person.
Notes to Physician: Due to irritant properties, swallowing may result in burns/ulceration of mouth, stomach and lower gastrointestinal tract with subsequent stricture. Aspiration of vomitus may cause lung injury. Suggest endotracheal/esophageal control if lavage is done. Chemical eye burns may require extended irrigation. Obtain prompt consultation, preferably from an ophthalmologist. If burn is present, treat as any thermal burn, after decontamination. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. Fire Fighting Measures

Extinguishing Media: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Do not use direct water stream. May spread fire. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.
Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Burning liquids may be extinguished by dilution with water. Do not use direct water stream. May spread fire. Move container from fire area if

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this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage.
Special Protective Equipment for Firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.
Unusual Fire and Explosion Hazards: Container may rupture from gas generation in a fire situation. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.
Hazardous Combustion Products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Nitrogen oxides. Carbon monoxide. Carbon dioxide.

6. Accidental Release Measures

Steps to be Taken if Material is Released or Spilled: Contain spilled material if possible. Small spills: Absorb with materials such as: Clay. Dirt. Milsorb®. Sand. Do NOT use absorbent materials such as: Cellulose. Sawdust. Collect in suitable and properly labeled containers. Large spills: Dike area to contain spill. Dilute with large quantities of water. Pump into suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.
Personal Precautions: Evacuate area. Only trained and properly protected personnel must be involved in clean-up operations. Keep unnecessary and unprotected personnel from entering the area. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection. Refer to Section 7, Handling, for additional precautionary measures.
Environmental Precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

7. Handling and Storage

Handling
General Handling: Do not get in eyes, on skin, on clothing. Do not swallow. Avoid prolonged or repeated contact with skin. Wash thoroughly after handling. Keep container closed. Use with adequate ventilation. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION. Do not use sodium nitrite or other nitrosating agents in formulations containing this product. Suspected cancer-causing nitrosamines could be formed.
Other Precautions: Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion.

Storage
Store in a dry place. Do not store in: Zinc. Copper. Galvanized containers. Copper alloys. Additional storage and handling information on this product may be obtained by calling your Dow sales or customer service contact.

8. Exposure Controls / Personal Protection

Exposure Limits

Component	List	Type	Value
Aminoethylethanolamine	Dow IHG	TWA	0.5 mg/m3 SKIN, D-SEN
Triethylenetetramine mixture	WEEL	TWA	6 mg/m3 1 ppm SKIN

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A "skin" notation following the exposure guideline refers to the potential for dermal absorption of the material including mucous membranes and the eyes either by contact with vapors or by direct skin contact.
It is intended to alert the reader that inhalation may not be the only route of exposure and that measures to minimize dermal exposures should be considered.
A D-SEN notation following the exposure guideline refers to the potential to produce dermal sensitization, as confirmed by human or animal data.

Personal Protection

Eye/Face Protection: Use chemical goggles. Eye wash fountain should be located in immediate work area.
Skin Protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task. Safety shower should be located in immediate work area. Remove contaminated clothing immediately, wash skin area with soap and water, and launder clothing before reuse or dispose of properly. Items which cannot be decontaminated, such as shoes, belts and watchbands, should be removed and disposed of properly.

Hand protection: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Polyethylene. Chlorinated polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Butyl rubber. Natural rubber ("latex"). Polyvinyl chloride ("PVC" or "vinyl"). Viton. Avoid gloves made of: Polyvinyl alcohol ("PVA"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Respiratory Protection: Atmospheric levels should be maintained below the exposure guideline. For most conditions, no respiratory protection should be needed; however, if handling at elevated temperatures without sufficient ventilation, use an approved air-purifying respirator. The following should be effective types of air-purifying respirators: Organic vapor cartridge.
Ingestion: Avoid ingestion of even very small amounts; do not consume or store food or tobacco in the work area; wash hands and face before smoking or eating.

Engineering Controls

Ventilation: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.

9. Physical and Chemical Properties

Physical State	Liquid
Color	Colorless
Odor	Slightly ammoniacal
Flash Point - Closed Cup	127 °C (261 °F) *ASTM D93*
Flammable Limits In Air	**Lower:** No test data available **Upper:** No test data available
Autoignition Temperature	No test data available
Vapor Pressure	< 0.01 mmHg @ 20 °C *Literature*
Boiling Point (760 mmHg)	242.8 °C (469.0 °F) *Literature* .
Vapor Density (air = 1)	3.6 *Literature*
Specific Gravity (H2O = 1)	1.030 20 °C/20 °C *Literature*
Liquid Density	1.030 g/ml @ 15.56 °C *Literature* 1.027 g/ml @ 20 °C *Literature* 1.035 g/ml @ -45 °C *Literature* @ freezing pt.
Freezing Point	-45 °C (-49 °F) *Literature*
Melting Point	not applicable to liquids
Solubility in Water (by weight)	100 % *Literature*
pH	No test data available
Molecular Weight	104.15 g/mol
Octanol/Water Partition Coefficient	-1.46 *Measured*

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Evaporation Rate (Butyl Acetate = 1)	0.01
Kinematic Viscosity	98 mm2/s @ 25 °C *Literature*

10. Stability and Reactivity

Stability/Instability
Stable under recommended storage conditions. See Storage, Section 7. Hygroscopic.
Conditions to Avoid: Exposure to elevated temperatures can cause product to decompose. Generation of gas during decomposition can cause pressure in closed systems. Avoid moisture.

Incompatible Materials: Avoid contact with: Nitrites. Strong acids. Strong oxidizers. Product may potentially react with various halogenated organic solvents, resulting in temperature and/or pressure increases Corrosive when wet. Heating above 60°C in the presence of aluminum can result in corrosion and generation of flammable hydrogen gas. Avoid unintended contact with: Halogenated hydrocarbons.

Hazardous Polymerization
Will not occur.

Thermal Decomposition
Decomposition products depend upon temperature, air supply and the presence of other materials.

11. Toxicological Information

Acute Toxicity
Ingestion
LD50, Rat 2,000 - 4,000 mg/kg
Skin Absorption
LD50, Rabbit 3,266 mg/kg
LD50, Rat 2,250 mg/kg
Sensitization
Skin
Skin contact may cause an allergic skin reaction. Individuals who have had an allergic skin reaction to similar materials may have an allergic skin reaction to this product. The similar material(s) is/are: Triethylenetetramine (TETA). Has caused allergic skin reactions when tested in mice. Has caused allergic skin reactions when tested in guinea pigs.
Repeated Dose Toxicity
In animals, effects have been reported on the following organs: Gastrointestinal tract. Kidney. Repeated skin application to laboratory animals did not produce systemic toxicity.
Developmental Toxicity
Has caused birth defects in laboratory animals. However, the route(s) of exposure were not relevant for industrial hazard evaluation.
Reproductive Toxicity
Has been toxic to the fetus in laboratory animal tests. Dose levels producing these effects were many times higher than any dose levels expected from exposure due to use.
Genetic Toxicology
In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

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12. Ecological Information

CHEMICAL FATE

Movement & Partitioning

Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is very high (Koc between 0 and 50). Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.
Henry's Law Constant (H): 8.8E-10 atm*m3/mole; 25 °C Estimated
Partition coefficient, n-octanol/water (log Pow): -1.46 Measured
Partition coefficient, soil organic carbon/water (Koc): 3.5 Estimated
Bioconcentration Factor (BCF): < 3.7; common carp (Cyprinus carpio);Measured

Persistence and Degradability

Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Material is inherently biodegradable (reaches > 20% biodegradation in OECD test(s) for inherent biodegradability).
Indirect Photodegradation with OH Radicals

Rate Constant	Atmospheric Half-life	Method
1.20E-10 cm3/s	1.1 h	Estimated

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method
> 97 %	28 d	OECD 301F Test
30 - 50 %	37 d	OECD 302B Test

Biological oxygen demand (BOD):

BOD 5	BOD 10	BOD 20	BOD 28
2 %	64 %	90 %	

Theoretical Oxygen Demand: 2.77 mg/mg

ECOTOXICITY

Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested).

Fish Acute & Prolonged Toxicity
LC50, fathead minnow (Pimephales promelas), 96 h: 520 - 728 mg/l
Aquatic Invertebrate Acute Toxicity
EC50, water flea Daphnia magna, 48 h, immobilization: 65 mg/l
Aquatic Plant Toxicity
EC50, alga Scenedesmus sp., biomass growth inhibition, 72 h: 210 mg/l
Toxicity to Micro-organisms
EC50; bacteria, Growth inhibition, 16 h: > 5,000 mg/l

13. Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. DOW HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Recycler. Incinerator or other thermal destruction device. As a service to its customers, Dow can provide names of information resources to help identify waste management companies and other facilities which recycle, reprocess or manage chemicals or plastics, and that manage used drums. Telephone Dow's Customer Information Group at 1-800-258-2436 or 1-989-832-1556 (U.S.), or 1-800-331-6451 (Canada) for further details.

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14. Transport Information

DOT Non-Bulk
Proper Shipping Name: POLYAMINES, LIQUID, CORROSIVE, NOS
Technical Name: AMINOETHYLETHANOLAMINE
Hazard Class: 8 **ID Number:** UN2735 **Packing Group:** PG II

DOT Bulk
Proper Shipping Name: POLYAMINES, LIQUID, CORROSIVE, NOS
Technical Name: AMINOETHYLETHANOLAMINE
Hazard Class: 8 **ID Number:** UN2735 **Packing Group:** PG II

IMDG
Proper Shipping Name: POLYAMINES, LIQUID, CORROSIVE, NOS
Technical Name: AMINOETHYLETHANOLAMINE
Hazard Class: 8 **ID Number:** UN2735 **Packing Group:** PG II
EMS Number: F-A,S-B

ICAO/IATA
Proper Shipping Name: POLYAMINES, LIQUID, CORROSIVE, NOS
Technical Name: AMINOETHYLETHANOLAMINE
Hazard Class: 8 **ID Number:** UN2735 **Packing Group:** PG II
Cargo Packing Instruction: 812
Passenger Packing Instruction: 808

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. Regulatory Information

OSHA Hazard Communication Standard
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Immediate (Acute) Health Hazard	Yes
Delayed (Chronic) Health Hazard	Yes
Fire Hazard	No
Reactive Hazard	No
Sudden Release of Pressure Hazard	No

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313
To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:
The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Component	CAS #	Amount
Aminoethylethanolamine	111-41-1	> 99.5 %

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Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Special Hazardous Substances List:
To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)
This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

US. Toxic Substances Control Act
All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30
CEPA - Domestic Substances List (DSL)
All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

16. Other Information

Product Literature
Additional information on this product may be obtained by calling your Dow Chemical Company sales or customer service contact.

Recommended Uses and Restrictions
Fabric softeners. Surfactants. Others.

Revision
Identification Number: 467 / 1001 / Issue Date 08/02/2006 / Version: 2.1
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

N/A	Not available
W/W	Weight/Weight
OEL	Occupational Exposure Limit
STEL	Short Term Exposure Limit
TWA	Time Weighted Average
ACGIH	American Conference of Governmental Industrial Hygienists, Inc.
DOW IHG	Dow Industrial Hygiene Guideline
WEEL	Workplace Environmental Exposure Level
HAZ_DES	Hazard Designation

The Dow Chemical Company urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.

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MATERIAL SAFETY DATA SHEET

PPG Kansai AUTOMOTIVE FINISHES

SECTION 1 - PRODUCT AND COMPANY INFORMATION

PPG Kansai Automotive Finishes (PKAF)
5875 New King Court
Troy, MI 48098

EMERGENCY PHONE NUMBERS (412) 434-4515 (U.S.) (24 hours/day):
(514) 645-1320 (Canada)
01-800-00-21-400 (Mexico)
0532-3889090 (China)

TECHNICAL INFORMATION: 1-800-245-2590 (CLEVELAND, OH) 8:00 a.m. - 5:00 p.m. EST

PRODUCT SAFETY/MSDS INFORMATION: (412) 492-5555 7:00 a.m. - 4:30 p.m. EST

Product ID: CMS1009 (0019)
PRODUCT NAME: AMYL ALCOHOL
SYNONYMS: None
ISSUE DATE: 08/16/2005
EDITION NO.: 1
CHEMICAL FAMILY: SOLVENT

EMERGENCY OVERVIEW:
Combustible. Keep away from heat, sparks, flames, and other sources of ignition. Do not smoke.CAUSES IRREVERSIBLE EYE DAMAGE. MAY CAUSE SKIN BURNS. VAPOR AND/OR SPRAY MIST MAY BE HARMFUL IF INHALED. VAPOR IRRITATES EYES, NOSE, AND THROAT.HARMFUL IF SWALLOWED.

SECTION 2 - COMPOSITION INFORMATION

The following ingredient(s) marked with an "x" are considered hazardous under applicable U.S. OSHA and/or Canadian WHMIS regulations. If no ingredients are listed, then there are no U.S. OSHA and/or Canadian WHMIS hazardous ingredients in this product.

Material/ CAS Number	Percent	Hazardous
AMYL ALCOHOL 71-41-0	40 - 70	X
2-METHYLBUTYL ALCOHOL 137-32-6	15 - 40	X

SECTION 3 - HAZARDS IDENTIFICATION

ACUTE OVEREXPOSURE EFFECTS

EYE CONTACT:
This product contains a material which causes irreversible eye damage. Redness, itching, burning sensation and visual disturbances may indicate excessive eye contact.

SKIN CONTACT:
May cause skin burns. Dryness, itching, cracking, burning, redness, and swelling are conditions associated with excessive skin contact.

SKIN ABSORPTION:
Skin absorption not expected to occur.

INHALATION:
Vapor and/or spray mist may be harmful if inhaled. Vapor irritates eyes, nose, and throat.

INGESTION:
Harmful if swallowed.

SIGNS & SYMPTOMS OF OVEREXPOSURE:
Repeated exposure to high vapor concentrations may cause irritation of the respiratory system and permanent brain and nervous system damage. Eye watering, headaches, nausea, dizziness and loss of coordination are indications that solvent levels are too high. Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal. Dryness, itching, cracking, burning, redness, and swelling are conditions associated with excessive skin contact.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Not applicable.

CHRONIC OVEREXPOSURE EFFECTS
Avoid long-term and repeated contact.
Repeated exposure to vapors above recommended exposure limits (see Section 8) may cause irritation of the respiratory system and permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.
Prolonged exposure to an ingredient(s) in this product may cause kidney and/or liver damage. Prolonged inhalation of an ingredient(s) in this product may cause edema of the lungs and/or lung damage.
The effects of long-term, low level exposures to this product have not been determined. Safe handling of this material on a long-term basis should emphasize the prevention of all contact with this material to avoid any effects from repetitive acute exposures. See Section 11, of this MSDS for a detailed list of chronic health effects information available on individual ingredients in this product.

SECTION 4 - FIRST AID MEASURES

If ingestion, irritation, any type of overexposure or symptoms of overexposure occur during or persists after use of this product, contact a POISON CONTROL CENTER, EMERGENCY ROOM OR PHYSICIAN immediately; have Material Safety Data Sheet information available.

EYE CONTACT:
Remove contact lens and pour a gentle stream of warm water through the affected eye for at least 15 minutes. Contact a poison control center, emergency room or physician right away as further treatment will be necessary.

SKIN CONTACT:
Run a gentle stream of water over the affected area for 15 minutes. A mild soap may be used if available. Contact a poison control center, emergency room or physician right away as further treatment will be necessary.

INHALATION:
Remove from area to fresh air. If symptomatic, contact a poison control center, emergency room or physician for treatment information.

INGESTION:
Gently wipe or rinse the inside of the mouth with water. Sips of water may be given if person is fully conscious. Never give anything by mouth to an unconscious or convulsing person. Do Not induce vomiting. Contact a poison control center, emergency room or physician right away as further treatment will be necessary.

SECTION 5 - FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES
FLASHPOINT: 113 Degrees F (45 Degrees C)
FLASHPOINT TEST METHOD:
Pensky-Martens Closed Cup
UEL: Not Available.
LEL: 1.2
AUTOIGNITION TEMPERATURE:
Not Available.

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EXTINGUISHING MEDIA:
Use National Fire Protection Association (NFPA) Class B extinguishers (carbon dioxide, dry chemical, or universal aqueous film forming foam) designed to extinguish NFPA Class II combustible liquid fires. Water spray may be ineffective. Water spray may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

PROTECTION OF FIREFIGHTERS:
Fire-fighters should wear self-contained breathing apparatus and full protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
Keep this product away from heat, sparks, flame, and other sources of ignition (i.e., pilot lights, electric motors, static electricity). Invisible vapors can travel to a source of ignition and flash back. Do not smoke while using this product. Keep containers tightly closed when not in use. Closed containers may explode when overheated. Do not apply to hot surfaces. Toxic gases may form when this product comes in contact with extreme heat. May produce hazardous decomposition products when exposed to extreme heat. Extreme heat includes, but is not limited to, flame cutting, brazing, and welding.

SECTION 6 - ACCIDENTAL RELEASE MEASURE

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:
Provide maximum ventilation. Only personnel equipped with proper respiratory, skin, and eye protection should be permitted in the area. Remove all sources of ignition. Take up spilled material with sand, vermiculite, or other noncombustible absorbent material and place in clean, empty containers for disposal. Only the spilled material and the absorbant should be placed in this container.

SECTION 7 - HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN DURING HANDLING AND STORAGE:
Vapors may collect in low areas. If this material is part of a multiple component system, read the Material Safety Data Sheet(s) for the other component or components before blending as the resulting mixture may have the hazards of all of its parts. Containers should be grounded when pouring. Avoid free fall of liquids in excess of a few inches.

STORAGE:
Do not store above 120 degrees F.(48 degrees C.). Store large quantities in buildings designed and protected for storage of NFPA Class II combustible liquids.

SECTION 8 - EXPOSURE CONTROLS & PERSONAL PROTECTION

ENGINEERING CONTROLS:
Provide general dilution or local exhaust ventilation in volume and pattern to keep the concentration of ingredients listed in Section 8 below the lowest suggested exposure limits, the LEL below the stated limit, and to remove decomposition products during welding or flame cutting.

PERSONAL PROTECTIVE EQUIPMENT

EYES:
Wear chemical-type splash goggles and full face shield when possibility exists for eye contact due to splashing or spraying liquid, airborne particles, or vapors.

SKIN/GLOVES:
Wear protective clothing sufficient to cover exposed skin surfaces. For applications where skin contact is likely and impermeable clothing is necessary, select clothing constructed of: butyl rubber. No specific permeation/degradation testing have been done on protective clothing for this product. Recommendations for skin protection are based on infrequent contact with this product. For frequent contact or total immersion, contact a manufacturer of protective clothing for appropriate chemical impervious equipment. Clean contaminated clothing and shoes.

RESPIRATOR:
Overexposure to vapors may be prevented by ensuring proper ventilation controls, vapor exhaust or fresh air entry. A NIOSH- approved air purifying respirator with the appropriate chemical cartridges or a positive-pressure, air-supplied respirator may also reduce exposure. Read the respirator manufacturer's instructions and literature carefully to determine the type of airborne contaminants against which the respirator is effective, its limitations, and how it is to be properly fitted and used. Provide general dilution or local exhaust ventilation in volume and pattern to keep the concentration of ingredients listed in Section 2 below the lowest suggested exposure limits, the LEL below the stated limit, and to remove decomposition products during welding or flame cutting.

GENERAL HYGIENE - ESTABLISHED EXPOSURE LIMITS
If Threshold Limit Values (TLVs) have been established by ACGIH, OSHA, Ontario or PPG, they will be listed below. These limits are intended for use in the practice of industrial hygiene as guidelines or recommendations in the control of potential workplace health hazards. These limits are not a relative index of toxicity and should not be used by anyone without industrial hygiene training.

Key: OSHA=Occupational Safety and Health Administration; PEL=Permissable Exposure Limit; Ceiling=PEL Ceiling Limit; STEL=PEL Short-Term Exposure Limit; Skin=OSHA Skin Designation.
Key: ACGIH=American Conference of Governmental Industrial Hygienists; OSHA=Occupational Safety and Health Administration; TLV=Threshold Limit Value; TWA=Time Weighted Average; PEL=Permissible Exposure Limit; IPEL=Internal Permissible Exposure Limit; Ceiling=TLV or PEL Ceiling Limit; STEL=TLV or PEL Short-Term Exposure Limit; Skin= Skin Absorption Designation. [C- Ceiling Limit; S-Potential Skin Aborption; R-Respirable Dust]
Additional Information Not applicable.

SECTION 9 - PHYSICAL & CHEMICAL PROPERTIES

(FORMULA VALUES, NOT SALES SPECIFICATIONS)

SPECIFIC GRAVITY:	.817
PHYSICAL STATE:	Liquid
Percent Solids:	.00
Percent Volatile by Volume:	100.000
pH:	Not available.
ODOR THRESHOLD:	Not available.
Vapour Pressure:	2.0 mmHg
ODOR/APPEARANCE:	Non-viscous liquid with an odor characteristic of the ingredients listed in Section 2.
VAPOR DENSITY:	HEAVIER THAN AIR
Evaporation Rate:	17
BOILING POINT OR RANGE:	271 - 280Degrees F
Freezing Point or Range:	Not Applicable.
Melting Point or Range(°C):	Not Applicable.
Partition coefficient (n-octanol/water):	Not Applicable.
WEIGHT PER GALLON:	6.8 (U.S.) / 8.17 (IMPERIAL)

SECTION 10 - STABILITY AND REACTIVITY

STABILITY:
This product is normally stable and will not undergo hazardous reactions.

CONDITIONS TO AVOID:
None Known.

INCOMPATIBLE MATERIALS:
Avoid contact with strong alkalies, strong mineral acids, or strong oxidizing agents.

HAZARDOUS POLYMERIZATION:
None Known.

HAZARDOUS DECOMPOSITION PRODUCTS:
- Carbon monoxide - Carbon dioxide

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SECTION 11 - TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Material/ CAS Number	Percent	ORAL LD50 (g/kg)	DERMAL LD50 (g/kg)	INHALATION LC50 (mg/l)
AMYL ALCOHOL 71-41-0	40 - 70	2.20 g/kg	3.60 g/kg	Not Available
2-METHYLBUTYL ALCOHOL 137-32-6	15 - 40	4.92 g/kg	3.54 g/kg	Not Available

CHRONIC TOXICITY
Target Organs:
- Kidney - Liver - Lung - Brain - Central nervous system

Mutagenicity Toxicity:
This has not been tested for this product.
Reproductive Toxicity:
This has not been tested for this product.

SUPPLEMENTAL HEALTH INFORMATION:

SECTION 12 - ECOLOGICAL INFORMATION

POTENTIAL ENVIRONMENTAL EFFECTS
Ecotoxicity: No Information Available.

ENVIRONMENTAL FATE
Mobility: No information available.
Biodegradation: No information available.
Bioaccumulation: No Information Available.

PHYSICAL/CHEMICAL

Hydrolysis: No information available.
Photolysis: No information available.

SECTION 13 - DISPOSAL CONSIDERATIONS

Provide maximum ventilation, only personnel equipped with proper respiratory and skin and eye protection should be permitted in the area. Take up spilled material with sawdust, vermiculite, or other absorbent material and place in containers for disposal.
Waste material must be disposed of in accordance with federal, state, provincial and local environmental control regulations. Empty containers should be recycled by an appropriately licensed reconditioner/salvager or disposed of through a permitted waste management facility. Additional disposal information is contained on the Environmental Data Sheet for this product, which can be obtained from your PPG representative.

SECTION 14 - TRANSPORTATION INFORMATION

Proper Shipping Name: NOT AVAILABLE
NOS Technical Name: NOT AVAILABLE
Hazard Class: N.A.
Subsidiary Class(es): N.A.
UN Number: N.A.
Packing Group: N.A.

USA - RQ Hazardous Substances: NOT AVAILABLE
USA-RQ Hazardous Substance NOT AVAILABLE
Threshold Ship Weight:
Marine Pollutant Name: NOT AVAILABLE

SECTION 15 - REGULATORY INFORMATION

INVENTORY STATUS
U.S. TSCA: This product and/or all of its components are listed on the U.S. TSCA Inventory or is otherwise exempt from TSCA Inventory reporting requirements.
FEDERAL REGULATIONS
US Regulations

Material/ CAS Number	Percent	CERCLA HS - RQ (LBS)	SARA EHS- TPQ (LBS)	SARA 313
AMYL ALCOHOL 71-41-0	40 - 70	Not Listed	Not Listed	Not Listed
2-METHYLBUTYL ALCOHOL 137-32-6	15 - 40	Not Listed	Not Listed	Not Listed

SARA 311/312
Health (acute): Yes
Health (chronic): Yes
Fire (flammable): Yes
Pressure: No
Reactivity: No
WHMIS HAZARD CLASS: - Class B, Division 3 - Class D, Division 2, Subdivision A - Class D, Division 2, Subdivision B

STATE/PROVINCIAL REGULATIONS
Additional Information
Key: IARC- International Agency on the Research of Cancer; ACGIH- American Conference of Governmental Industrial Hygienists; NTP- National Toxicology Program *Denotes chemical as NTP Known Carcinogen; + Denotes NTP Possible Carcinogen; OSHA- Occupational Safety and Health Administration.

SECTION 16 - OTHER INFORMATION

Hazard Rating Systems
NFPA Rating: 3 20
HMIS Rating: 3*20

Rating System: 0=Minimal, 1=Slight, 2=Moderate, 3=Serious, 4=Severe, *=Chronic Effects.

HMIS=Hazardous Materials Identification System; NFPA=National Fire Protection Association;

Safe handling of this product requires that all of the information on the MSDS be evaluated for specific work environments and conditions of use.

PREPARED BY: Product Safety Department
REASON FOR REVISION: Date. Edition.
Updated MSDS
format.

This Material Safety Data Sheet has been prepared in accordance with Canada's Workplace Hazardous Materials Information System (WHMIS) and the OSHA Hazard Communication Standard (29 CFR 1910.1200), the supplier notification requirements of SARA Title III, Section 313 and other applicable right-to-know regulations.
Additional environmental information is contained on the Environmental Data Sheet for this product, which can be obtained from your PPG representative.
CMS1009 000001 (00231145.002)(08/16/05)
020327, 000, 0019

*** END OF MSDS ***

EPAPA008000663

BASF
The Chemical Company

Safety data sheet
1,2-Pentanediol (Amylene Glycol)

1. Substance/preparation and company identification

Company
BASF CORPORATION
100 Campus Drive
Florham Park, NJ 07932

24 Hour Emergency Response Information
CHEMTREC: 1-800-424-9300
BASF HOTLINE: 1-800-832-HELP

2. Composition/information on ingredients

CAS Number	Content (W/W)	Chemical name
5343-92-0	80.0 - 100.0 %	pentane-1,2-diol
41051-72-3	1.0 - 5.0 %	1,2-Butanediol, 2-methyl-

3. Hazard identification

Emergency overview

DANGER: CAUSES EYE IRRITATION.
RISK OF SERIOUS DAMAGE TO EYES.
INGESTION MAY CAUSE GASTRIC DISTURBANCES.
Avoid contact with the skin, eyes and clothing.
Avoid inhalation of mists/vapours.
Use with local exhaust ventilation.
Wear appropriate respiratory protection.
Wear NIOSH-certified chemical goggles.
Wear full face shield if splashing hazard exists.
Wear chemical resistant protective gloves.
Wear protective clothing.
Eye wash fountains and safety showers must be easily accessible.

Potential health effects

Primary routes of exposure
Routes of entry for solids and liquids include eye and skin contact, ingestion and inhalation. Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquified gases.

4. First-aid measures

General advice:
Remove contaminated clothing.

If inhaled:
If difficulties occur after vapour/aerosol has been inhaled, remove to fresh air and seek medical attention.

If on skin:
Wash thoroughly with soap and water.

If irritation develops, seek medical attention.

If in eyes:
Wash affected eyes for at least 15 minutes under running water with eyelids held open. Seek medical attention.

If swallowed:
Rinse mouth immediately and then drink plenty of water, seek medical attention.

5. Fire-fighting measures

Flash point:	110 °C	(DIN 51758)
Autoignition:	380 °C	(DIN 51794)
Lower explosion limit:	1.7 %(V)	
Upper explosion limit:	9.3 %(V)	

Suitable extinguishing media:
water, alcohol-resistant foam, dry extinguishing media, carbon dioxide

Protective equipment for fire-fighting:
Wear self-contained breathing apparatus and chemical-protective clothing.

Further information:
Collect contaminated extinguishing water separately, do not allow to reach sewage or effluent systems.

NFPA Hazard codes:
Health : 3 Fire: 1 Reactivity: 0 Special:

6. Accidental release measures

Personal precautions:
Handle in accordance with good industrial hygiene and safety practice.

Environmental precautions:
Discharge into the environment must be avoided.

Cleanup:

For large amounts: Pump off product.
For residues: Pick up with suitable absorbent material (e.g. sand, sawdust, general-purpose binder, kieselguhr). Dispose of absorbed material in accordance with regulations.

7. Handling and storage

Handling

General advice:
Ensure thorough ventilation of stores and work areas.

Protection against fire and explosion:
Take precautionary measures against static discharges. Sources of ignition should be kept well clear.

Storage

Storage stability:
Storage duration: 24 Months

8. Exposure controls and personal protection

Advice on system design:
Provide local exhaust ventilation to control vapours/mists.

Personal protective equipment

Respiratory protection:
Wear respiratory protection if ventilation is inadequate.

Hand protection:
Wear chemical resistant protective gloves., Consult with glove manufacturer for testing data.

Eye protection:
Tightly fitting safety goggles (chemical goggles). Wear face shield if splashing hazard exists.

Body protection:
Body protection must be chosen based on level of activity and exposure.

General safety and hygiene measures:
Avoid contact with the skin, eyes and clothing. Wearing of closed work clothing is required additionally to the stated personal protection equipment.

9. Physical and chemical properties

Form:	liquid	
Odour:	odourless	
Colour:	colourless to yellowish	
pH value:	7 - 8	(500 g/l, 20 °C)
Melting point:	< -40 °C	
Boiling point:	208 - 210 °C	
Vapour pressure:	< 1 mbar	(20 °C)
Density:	0.97 g/cm3	(20 °C)
Solubility in water:		(20 °C) miscible

10. Stability and reactivity

Hazardous reactions:
No hazardous reactions if stored and handled as prescribed/indicated.

11. Toxicological information

Acute toxicity

Oral:
LD50/rat: > 12,000 mg/kg

Skin irritation:
rabbit: non-irritant (OECD Guideline 404)

Eye irritation :
rabbit: Irritant. (OECD Guideline 405)

Risk of serious damage to eyes.

Chronic toxicity

Other information:
No experimental evidence available for genotoxicity in vitro (Ames test negative).

12. Ecological information

Environmental fate and transport

Biodegradation:

Test method:	OECD 302B; ISO 9888; 88/302/EEC,part C
Method of analysis:	DOC reduction
Degree of elimination:	> 90 %
Evaluation:	Easily eliminated from water.

Chemical oxygen demand (COD):
2,070 mg/g

Biochemical oxygen demand (BOD):
: 1,070 mg/g

Adsorbable organically-bound halogen (AOX):

This product contains no organically-bound halogen.
Acute and prolonged toxicity to fish:
OECD 203; ISO 7346; 84/449/EEC, C.1 static
zebra fish/LC50 (96 h): > 1,000 mg/l

Acute toxicity to aquatic invertebrates:
Directive 79/831/EEC Daphnia magna/EC50 (48 h): > 500 mg/l

Toxicity to aquatic plants:
DIN 38412 Part 9 EC50 (72 h): > 500 mg/l

Toxicity to microorganisms:
DIN 38412 Part 8 bacterium/EC50 (17 h): > 10,000 mg/l

13. Disposal considerations

Waste disposal of substance:
Do not discharge into waterways or sewer systems without proper authorization.
Dispose of in accordance with national, state and local regulations.

Container disposal:
Dispose of container and any rinsate in an environmentally safe manner. Recommend crushing, puncturing or other means to prevent unauthorized use of used containers.

14. Transport information

Land transport
USDOT

Not classified as a dangerous good under transport regulations

Sea transport
IMDG

Not classified as a dangerous good under transport regulations

Air transport
IATA/ICAO

Not classified as a dangerous good under transport regulations

15. Regulatory information

Federal Regulations

Registration status:
TSCA, US released / listed

OSHA hazard category: Skin and/or eye irritant

SARA hazard categories (EPCRA 311/312): Acute

16. Other information

HMIS III rating
Health: 3 Flammability: 1 Physical hazard: 0

HMIS uses a numbering scale ranging from 0 to 4 to indicate the degree of hazard. A value of zero means that the substance possesses essentially no hazard; a rating of four indicates high hazard.

Local contact information
prod_reg@basf.com

IMPORTANT: WHILE THE DESCRIPTIONS, DESIGNS, DATA AND INFORMATION CONTAINED HEREIN ARE PRESENTED IN GOOD FAITH AND BELIEVED TO BE ACCURATE , IT IS PROVIDED FOR YOUR GUIDANCE ONLY. BECAUSE MANY FACTORS MAY AFFECT PROCESSING OR APPLICATION/USE, WE RECOMMEND THAT YOU MAKE TESTS TO DETERMINE THE SUITABILITY OF A PRODUCT FOR YOUR PARTICULAR PURPOSE PRIOR TO USE. NO WARRANTIES OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE MADE REGARDING PRODUCTS DESCRIBED OR DESIGNS, DATA OR INFORMATION SET FORTH, OR THAT THE PRODUCTS, DESIGNS, DATA OR INFORMATION MAY BE USED WITHOUT INFRINGING THE INTELLECTUAL PROPERTY RIGHTS OF OTHERS. IN NO CASE SHALL THE DESCRIPTIONS, INFORMATION, DATA OR DESIGNS PROVIDED BE CONSIDERED A PART OF OUR TERMS AND CONDITIONS OF SALE. FURTHER, YOU EXPRESSLY UNDERSTAND AND AGREE THAT THE DESCRIPTIONS, DESIGNS, DATA, AND INFORMATION FURNISHED BY BASF HEREUNDER ARE GIVEN GRATIS AND BASF ASSUMES NO OBLIGATION OR LIABILITY FOR THE DESCRIPTION, DESIGNS, DATA AND INFORMATION GIVEN OR RESULTS OBTAINED, ALL SUCH BEING GIVEN AND ACCEPTED AT YOUR RISK.
END OF DATA SHEET

Asphalt Cement, All Grades

Material Safety Data Sheet

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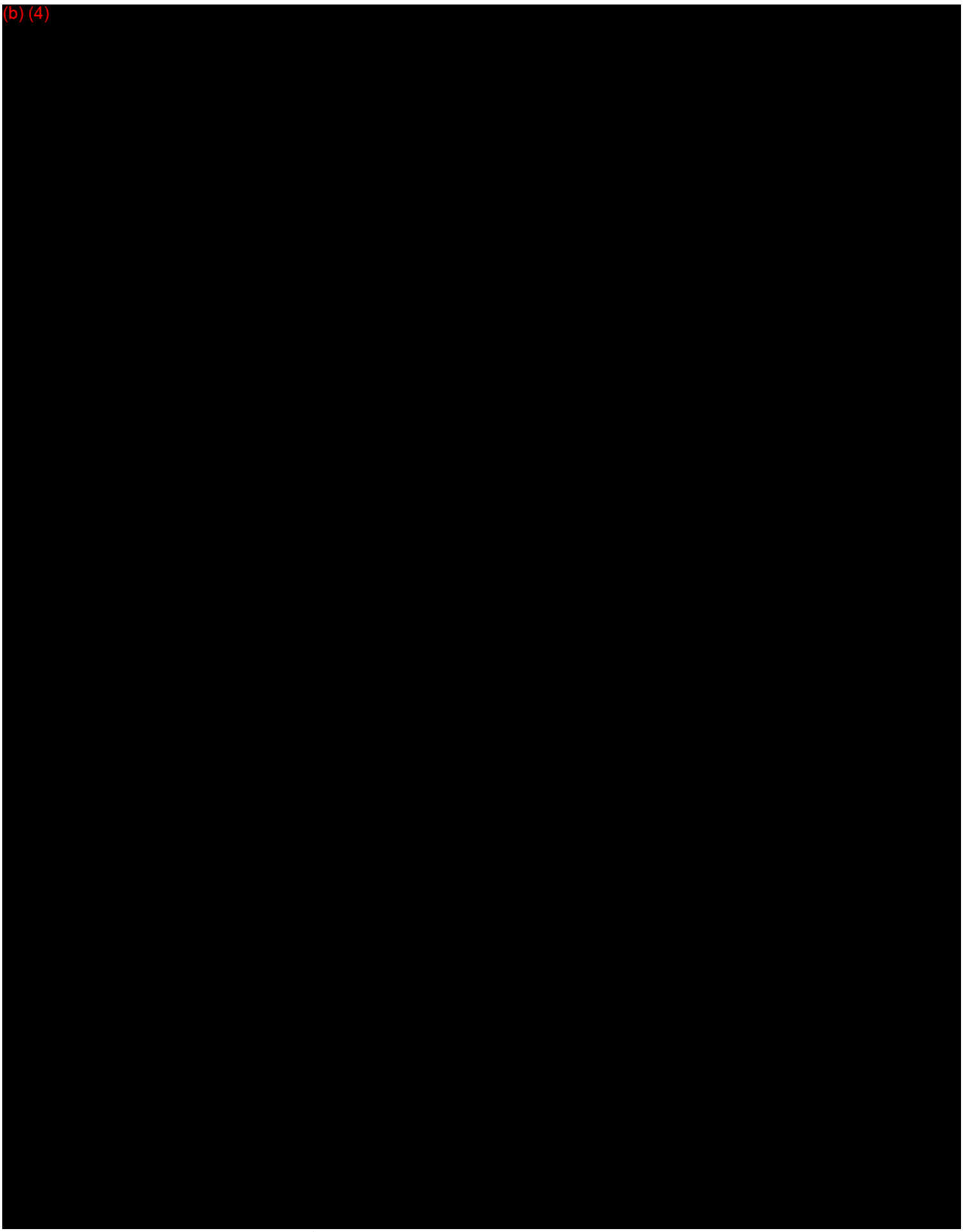
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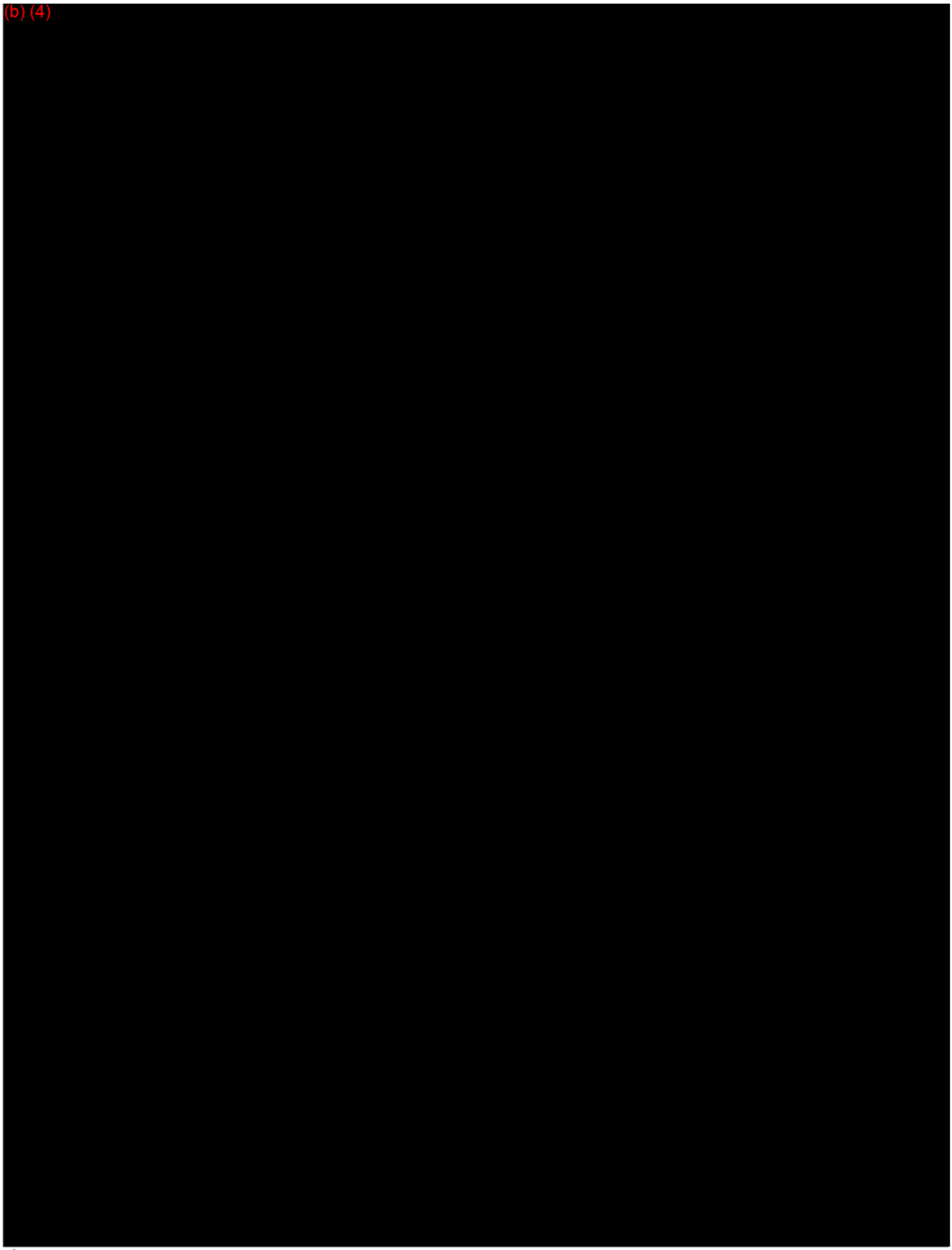
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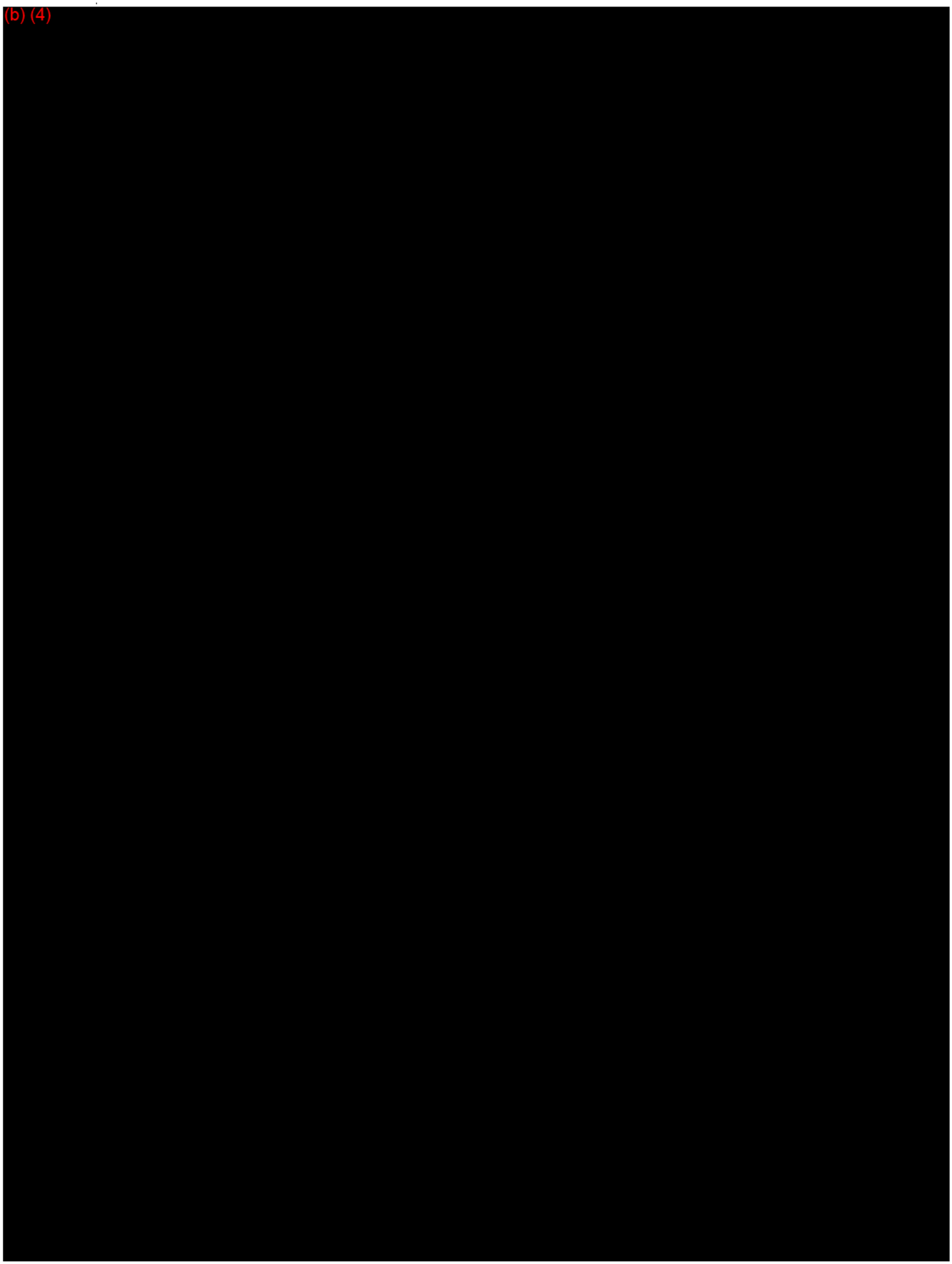
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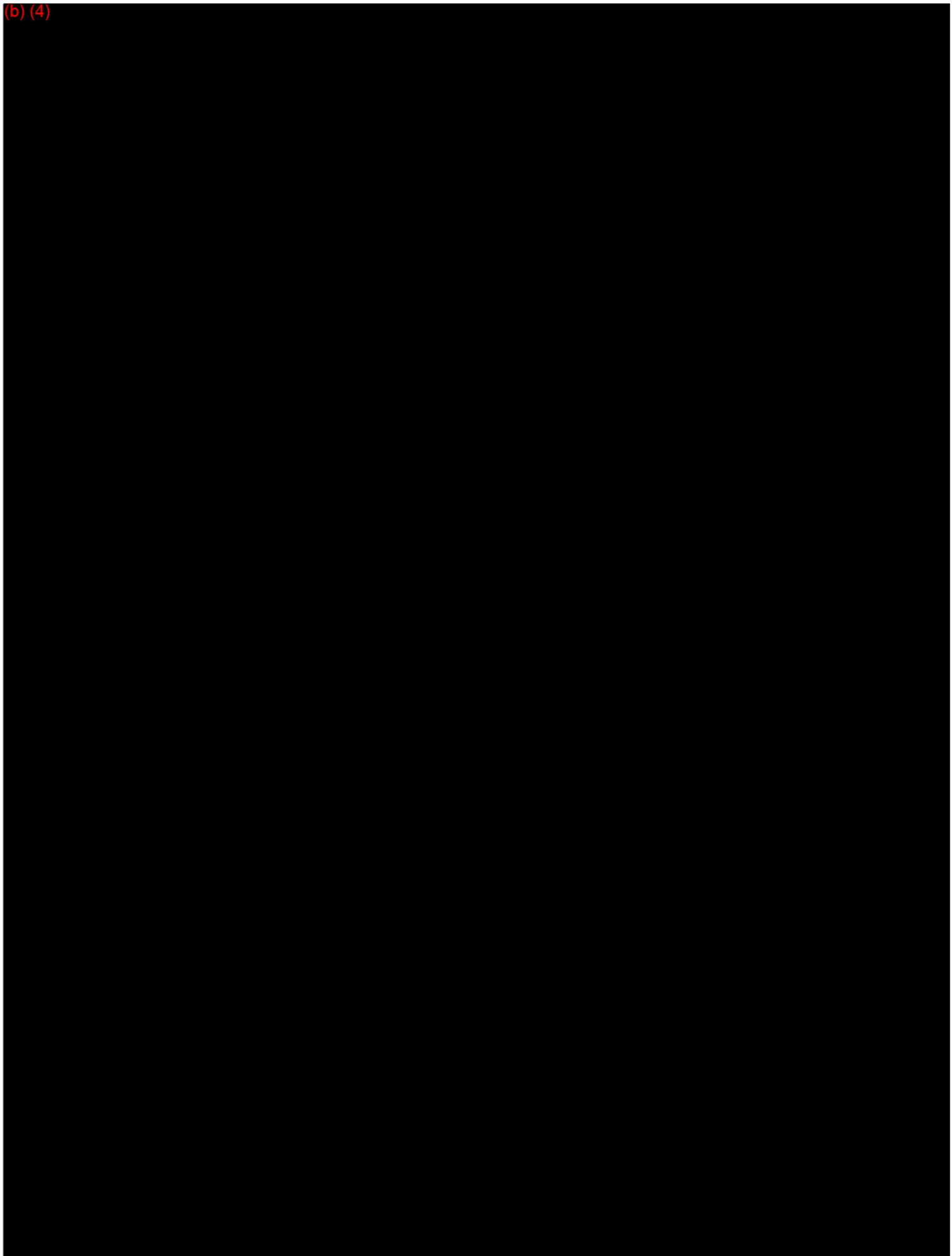
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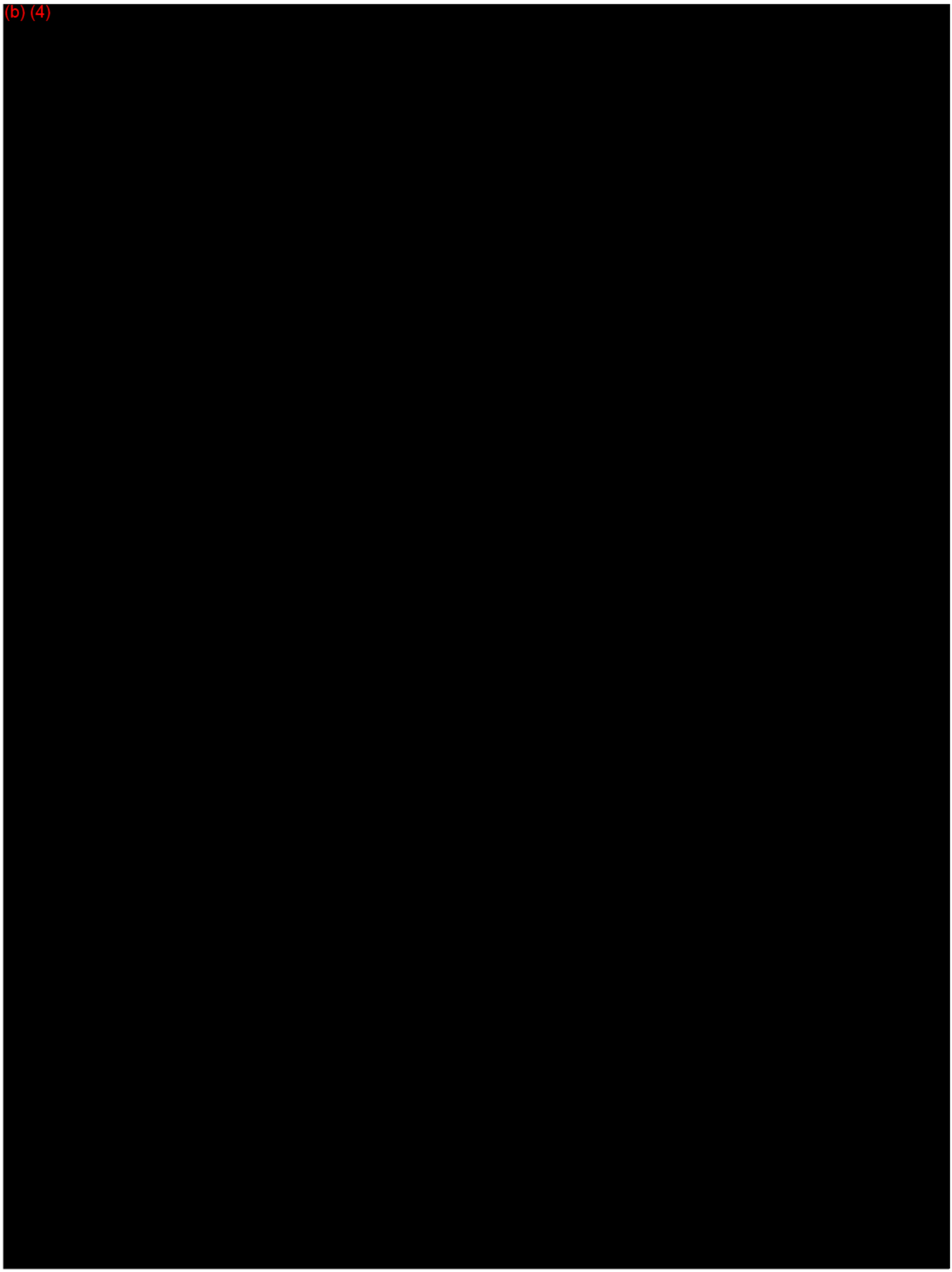
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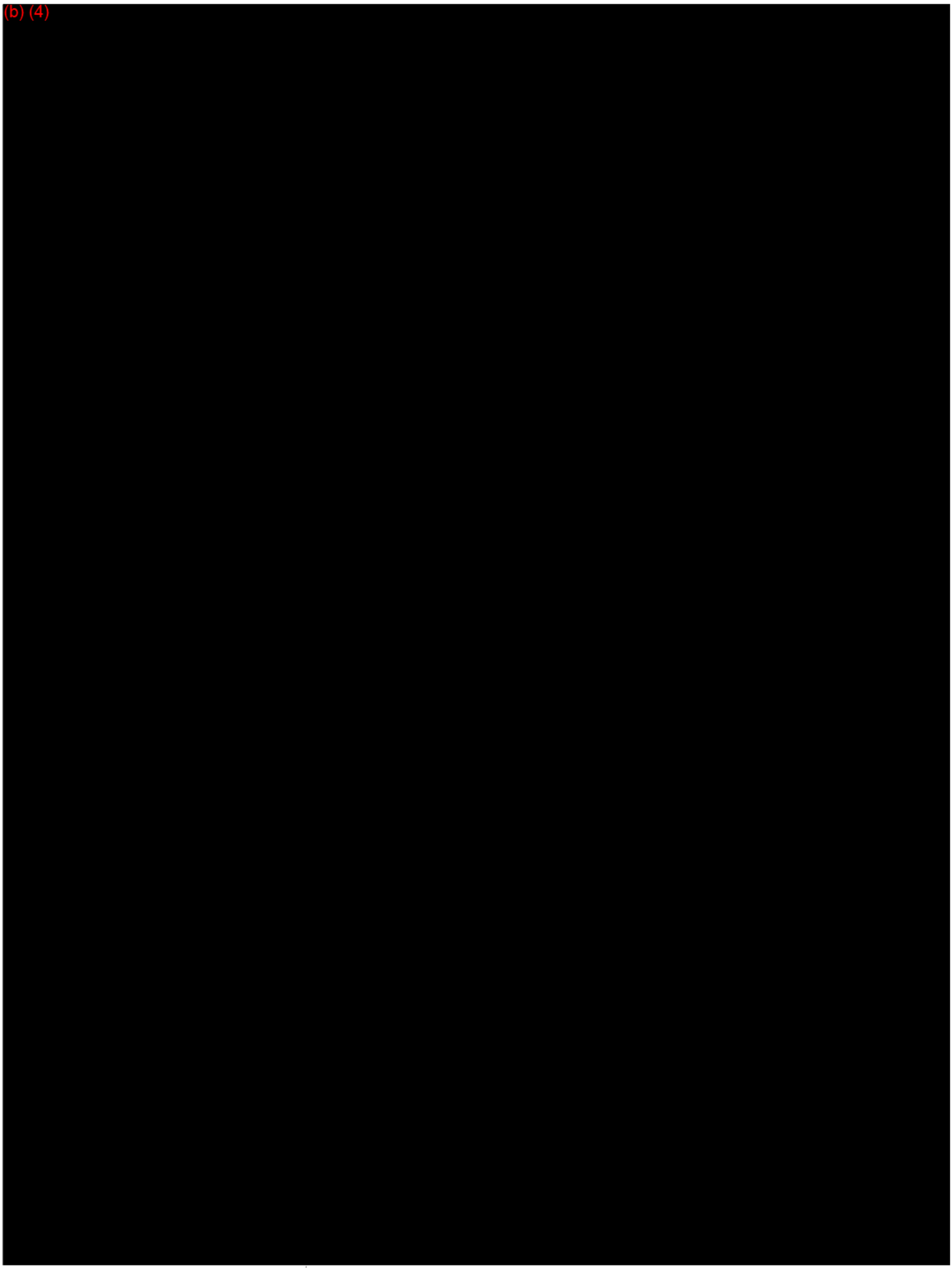
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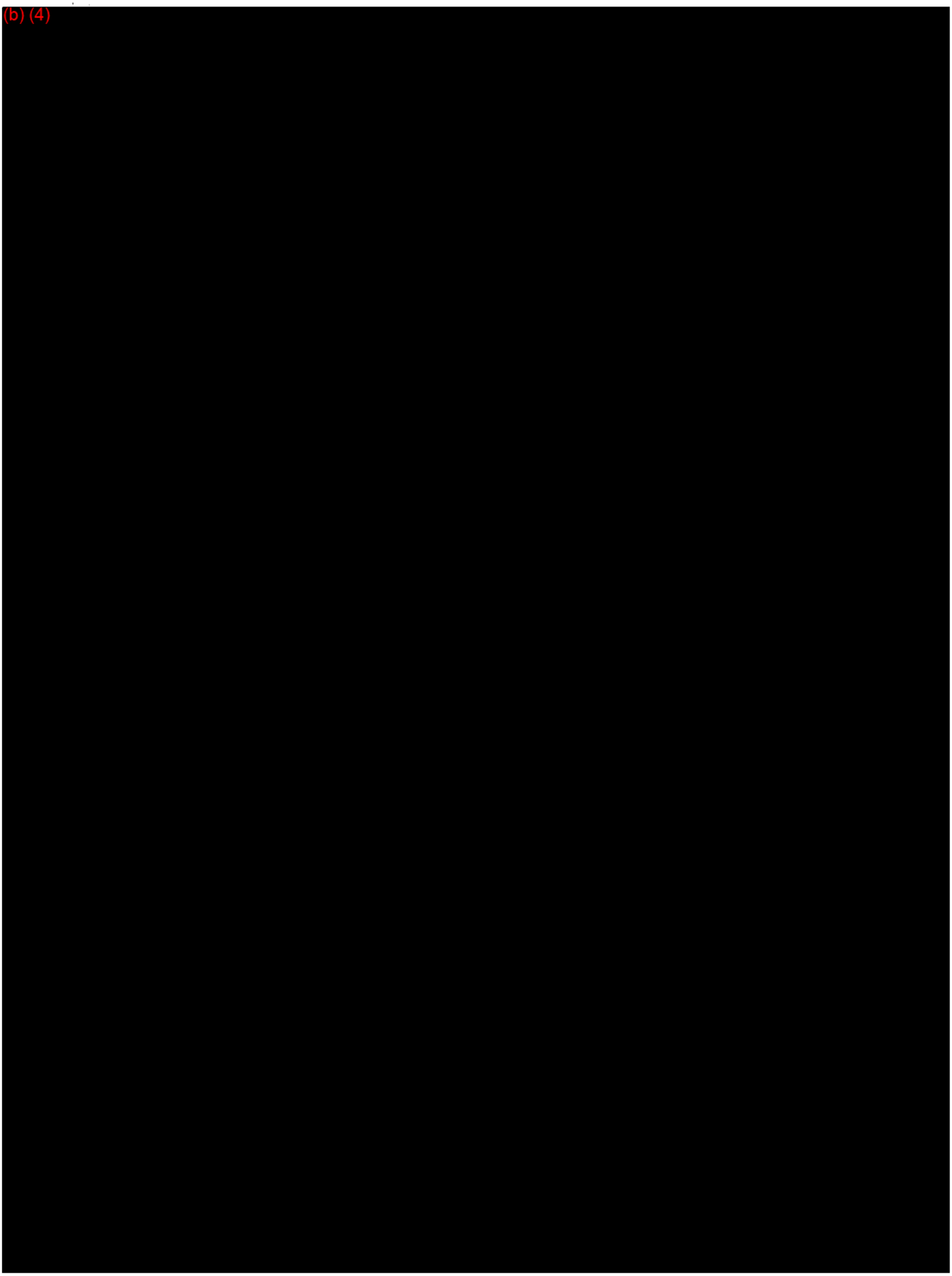
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***** END OF MSDS *****

Material Safety Data Sheet

(complies with OSHA's Hazard Communication Standard)
(29 CFR 1910.1200)

Date Prepared:
8/6/02

Section I

Manufacturer's Name:
Hormel Foods Corporation
1 Hormel Place
Austin, MN 55912

Emergency Telephone Number:
507-437-5264
Telephone Number for Information:
507-437-5264

Section II

Hazardous Ingredients/Identity Information:
Porcine Choice White Grease - Animal Fats
NOTE: According to OSHA regulation 29 CFR 1910.1200, appendixes A and B, animal fats are not considered hazardous.

Section III

Physical/Chemical Characteristics:

Boiling Point	N/A	Specific Gravity (H_20=1)	0.88
Vapor Pressure	N/A	Melting Point	105^{0}F
Vapor Density	N/A	Evaporation Rate	N/A
Solubility in Water	Not Soluble		
Appearance and Odor	amber to brown liquid when heated, white to brown when solid, fatty odor.		

Section IV

Fire and Explosion Hazard Data:

Flash Point:
450^{0}F
Flammable Limits:
530^{0}F
LEL:
N/A
UEL:
N/A
Extinguishing Media:
Dry chemical, carbon dioxide, water spray, or regular foam.
Special Fire Fighting Procedures:
For larger fires, use water spray, fog or regular foam.
(See 1990 Emergency Response Guidebook, DOT P5800.5)
Unusual Fire and Explosion Hazards:
No acute hazard.

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Section V

Reactivity Data:

Stability:

Stable

Incompatibility (Materials to Avoid):

Oxidizers (strong)

Hazardous Decomposition or Byproducts:

Thermal decomposition products may include toxic oxides of carbon.

Hazardous Polymerization:

Not reported to occur.

Section VI

Health Hazard Data:

Route(s) of Entry:

Inhalation	N/A	Skin	N/A
Ingestion	N/A		

Health Hazards:

According to OSHA regulation 29 CFR 1910.1200 Appendixes A and B, feed Fats are not considered hazardous.

Carcinogenicity?	N/A	NTP?	N/A
IARC Monographs?	N/A	OSHA regulated?	N/A

Signs and Symptoms of Exposure N/A

Medical Conditions Generally Aggravated by Exposure N/A

Exposure and First Aid Procedures

Hot liquid fat may cause burns

Section VII

Precautions for Safe Handling and Use:

Steps to be taken in case material is released or spilled:

Take steps to contain material, let harden, then remove.

May use suitable absorbent.

Waste Disposal Method:

Rendering company or landfill. May be subject to Federal, State or Local Laws.

Precautions to be taken in handling and storage:

N/A

Other Precautions:

N/A

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Section VIII

Control Measures:

Respiratory Protection	N/A		
Ventilation:			
Local Exhaust	N/A	Special	N/A
Mechanical	N/A	Other	N/A
Protective Gloves	N/A	Eye Protection	N/A
Other Protective Clothing Or Equipment	N/A		
Work/Hygienic Practices	N/A		

Section IX

Special Precautions and Comments:

Precautions to be taken in handling and storage:	None
Other Precautions:	None
Effective Date:	August 8, 2001
Phone Number:	507-437-5264

IMPORTANT:

The information and data herein are believed to be accurate and have been compiled from sources believed to be reliable. It is offered for your consideration, investigation and verification. Buyer assumes all risk of use, storage and handling of the product in compliance with applicable federal, state and local laws and regulations. Hormel Foods Corporation makes no warranty of any kind, express or implied, concerning the completeness of the information and data herein. Hormel Foods Corporation will not be liable for claims relating to any party's use of, or reliance on, information and data contained herein regardless of whether it is claimed that the information and data are inaccurate, incomplete or otherwise misleading. This information relates to the material designated and may not be valid for such material used in combination with any other materials nor in any process.

EPAPA008000680

B

Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 08/28/2006 Reviewed on 08/25/2006

1 Identification of substance:

Product details:

Product name: Barium hydroxide

Stock number: 14499

Manufacturer/Supplier:
Alfa Aesar, A Johnson Matthey Company
Johnson Matthey Catalog Company, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Emergency Phone: (978) 521-6300
CHEMTREC: (800) 424-9300
Web Site: www.alfa.com

Information Department: Health, Safety and Environmental Department
Emergency information:
During normal hours the Health, Safety and Environmental Department.
After normal hours call Chemtrec at (800) 424-9300.

2 Composition/Data on components:

Chemical characterization:
Description: (CAS#)
Barium hydroxide, octahydrate (CAS# 12230-71-6): 100%
Identification number(s):
EINECS Number: 241-234-5
EU Number: 056-002-00-7

3 Hazards identification

Hazard description:

Xn Harmful

Information pertaining to particular dangers for man and environment
R 20/22 Harmful by inhalation and if swallowed.
Classification system
HMIS ratings (scale 0-4)
(Hazardous Materials Identification System)

Health (acute effects) = 2
Flammability = 0
Reactivity = 1

4 First aid measures

After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm.
Seek immediate medical advice.
After skin contact
Immediately wash with water and soap and rinse thoroughly.
Seek immediate medical advice.
After eye contact
Rinse opened eye for several minutes under running water. Then consult a doctor.

(Contd. on page 2)

EPAPA008000682

Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 08/28/2006 Reviewed on 08/25/2006

Product name: Barium hydroxide

(Contd. of page 1)

After swallowing Seek immediate medical advice.

5 Fire fighting measures

Suitable extinguishing agents
Product is not flammable. Use fire fighting measures that suit the surrounding fire.
Special hazards caused by the material, its products of combustion or resulting gases:
In case of fire, the following can be released:
Barium oxide
Protective equipment:
Wear self-contained respirator.
Wear fully protective impervious suit.

6 Accidental release measures

Person-related safety precautions:
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation
Measures for environmental protection:
Do not allow material to be released to the environment without proper governmental permits.
Measures for cleaning/collecting:
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
Additional information:
See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

Handling
Information for safe handling:
Handle under dry protective gas.
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation at the workplace.
Information about protection against explosions and fires:
The product is not flammable

Storage
Requirements to be met by storerooms and receptacles:
No special requirements.
Information about storage in one common storage facility:
Store away from air.
Do not store together with acids.
Further information about storage conditions:
Store under dry inert gas.
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.
This product is air sensitive.

(Contd. on page 3)

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Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 08/28/2006 Reviewed on 08/25/2006

Product name: Barium hydroxide

(Contd. of page 2)

8 Exposure controls and personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Components with limit values that require monitoring at the workplace:

Barium, and soluble compounds, as Ba

	mg/m3
ACGIH TLV	0.5; Not classified as a human carcinogen
Austria MAK	0.5
Belgium TWA	0.5
Denmark TWA	0.5
Finland TWA	0.5
Germany MAK	0.5 (total dust)
Hungary	0.5-STEL
Ireland TWA	0.5
Korea TLV	0.5
Netherlands MAC-TGG	0.5
Norway TWA	0.5
Poland TWA	0.5; 1.5-STEL
Sweden TWA	0.5
Switzerland MAK-W	0.5
United Kingdom LTEL	0.5
USA PEL	0.5

Additional information: No data

Personal protective equipment
General protective and hygienic measures
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Breathing equipment:
Use suitable respirator when high concentrations are present.
Protection of hands:
Check protective gloves prior to each use for their proper condition.
Impervious gloves
Material of gloves
The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.
Eye protection: Safety glasses
Body protection: Protective work clothing.

9 Physical and chemical properties:

General Information	
Form:	Crystalline
Color:	White
Odor:	Odorless
Change in condition	
Melting point/Melting range:	78°C (172°F)
Boiling point/Boiling range:	Not determined
Sublimation temperature / start:	Not determined

(Contd. on page 4)

EPAPA008000684

Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 08/28/2006 Reviewed on 08/25/2006

Product name: Barium hydroxide

(Contd. of page 3)

Flash point:	Not applicable
Ignition temperature:	Not determined
Decomposition temperature:	Not determined
Danger of explosion:	Product does not present an explosion hazard.
Explosion limits:	
Lower:	Not determined
Upper:	Not determined
Vapor pressure:	Not determined
Density at 20°C (68°F):	2.18 g/cm³
Solubility in / Miscibility with	
Water:	Soluble

10 Stability and reactivity

Thermal decomposition / conditions to be avoided:
Decomposition will not occur if used and stored according to specifications.
Materials to be avoided:
Air
Acids
Dangerous reactions No dangerous reactions known
Dangerous products of decomposition: Barium oxide

11 Toxicological information

Acute toxicity:
Primary irritant effect:
on the skin: Irritant to skin and mucous membranes.
on the eye: Irritating effect.
Sensitization: No sensitizing effects known.
Subacute to chronic toxicity:
Barium compounds may cause severe gastroenteritis, including abdominal pain, vomiting and diarrhea, tremors, faintness, paralysis of the arms and legs, and slow or irregular heartbeat. Severe cases may produce collapse and death due to respiratory failure. Soluble barium compounds are more likely to cause these effects than insoluble compounds. Inhalation of fumes may cause sore throat, coughing, labored breathing, and irritation of the respiratory tract as well as the above symptoms.
Subacute to chronic toxicity:
Corrosive materials are acutely destructive to the respiratory tract, eyes, skin and digestive tract. Eye contact may result in permanent damage and complete vision loss. Inhalation may result in respiratory effects such as inflammation, edema, and chemical pneumonitis. May cause coughing, wheezing, laryngitis, shortness of breath, headache, nausea and vomiting. Ingestion may cause damage to the mouth, throat and esophagus. May cause skin burns or irritation depending on the severity of the exposure.
Additional toxicological information:
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

(Contd. on page 5)

EPAPA008000685

Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 08/28/2006 Reviewed on 08/25/2006

Product name: Barium hydroxide

(Contd. of page 4)

EPA-NL: Not likely to be carcinogenic to humans.
EPA-D: Not classifiable as to human carcinogenicity: inadequate human and animal evidence of carcinogenicity or no data are available.
ACGIH A4: Not classifiable as a human carcinogen: Inadequate data on which to classify the agent in terms of its carcinogenicity in humans and/or animals.

12 Ecological information:

General notes:
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
Do not allow material to be released to the environment without proper governmental permits.

13 Disposal considerations

Product:
Recommendation
Consult state, local or national regulations to ensure proper disposal.

Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.
Recommended cleansing agent: Water, if necessary with cleansing agents.

14 Transport information

DOT regulations:

Hazard class:	8
Identification number:	UN3262
Packing group:	III
Proper shipping name (technical name):	CORROSIVE SOLID, BASIC, INORGANIC, N.O.S. (Barium hydroxide)
Label	8

Land transport ADR/RID (cross-border)

ADR/RID class:	8 (C6) Corrosive substances
Danger code (Kemler):	80
UN-Number:	3262
Packaging group:	III

(Contd. on page 6)

EPAPA008000686

Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 08/28/2006 Reviewed on 08/25/2006

Product name: Barium hydroxide

(Contd. of page 5)

Description of goods:	3262 CORROSIVE SOLID, BASIC, INORGANIC, N.O.S. (Barium hydroxide)

Maritime transport IMDG:

IMDG Class:	8
UN Number:	3262
Label	8
Packaging group:	III
Proper shipping name:	CORROSIVE SOLID, BASIC, INORGANIC, N.O.S. (Barium hydroxide)

Air transport ICAO-TI and IATA-DGR:

ICAO/IATA Class:	8
UN/ID Number:	3262
Label	8
Packaging group:	III
Proper shipping name:	CORROSIVE SOLID, BASIC, INORGANIC, N.O.S. (Barium hydroxide)

15 Regulations

Product related hazard informations:

Hazard symbols:
Xn Harmful

Risk phrases:
20/22 Harmful by inhalation and if swallowed.

Safety phrases:
28 After contact with skin, wash immediately with plenty of water

National regulations
All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.
All components of this product are listed on the Canadian Domestic Substances List (DSL).

Information about limitation of use:
For use only by technically qualified individuals.
This product contains barium and is subject to the reporting requirements of section 313 of the Emergency Planning and Community Right to Know Act of 1986 and 40CFR372.

USA

(Contd. on page 7)

Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 08/28/2006 Reviewed on 08/25/2006

Product name: Barium hydroxide

(Contd. of page 6)

16 Other information:

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing MSDS: Health, Safety and Environmental Department.
Contact: Darrell R. Sanders

USA

BIODIESEL
INDUSTRIES

MATERIAL SAFETY DATA SHEET

SECTION 1 – PRODUCT IDENTIFICATION

Common Name: Biodiesel
Chemical Name: Fatty Acid Methyl Ester
Formula: C14-C24 Methyl Esters
Chemical Family: CAS No. 67784-80-9

SECTION 2 – INGREDIENTS AND HAZARDOUS CLASSIFICATION

Typical Composition:

	OSHA PEL	ACGH/TLV	Percent
Alkyl C14-C24 Methyl Esters	none	none	99

This product contains no hazardous materials.
SARA Title III, Section 313: Not Listed

SECTION 3 – PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point: >400° F
Vapor Pressure (mm Hg): <5 mm Hg @ 72° F
Evaporation Rate: less than .005 versus (Butyl Acetate = 1)
Solubility in Water: insoluble
Appearance and Odor: light to dark yellow clear liquid / light musty odor

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

Flash Point (method used): 321° F PMCC
Flammable Limits: N/A
HMIS Rating: Health: 0 Fire: 1 Reactivity: 0
Extinguishing Media: Use water spray, dry chemical, foam or carbon dioxide.
Special Fire Fighting Procedures: Treat as oil fire.
Unusual Fire and Explosion hazards: Rags soaked with any solvent present a fire hazard and should be stored in an approved UL listed covered container.

PAGE 01
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SECTION 5 – REACTIVITY DATA

Reactivity: Stable
Conditions to Avoid: Non Known
Incompatibility (materials to avoid): Strong oxidizing agents
Hazardous Decomposition or By-products: Carbon monoxide, carbon dioxide
Hazardous Polymerization: Will not occur

SECTION 6 – HEALTH HAZARD DATA

Emergency First Aid Procedures:

Ingestion: Rinse mouth with water, contact physician
Eyes: Rinse with water 15 minutes, contact physician
Skin: Rinse with soap and water

SECTION 7 – PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be taken in case material is released or spilled:

Avoid uncontrolled releases. Contain spilled material. Transfer to secure containers. Use absorbent material if necessary.

Disposal: Dispose of according to Federal, state and/or local regulations
Precautions to be Taken in Handling and Storing: Avoid open flames
Other Precautions: None

SECTION 8 – CONTROL MEASURES

Respiratory Protection: None required
Ventilation: mechanical
Protective Gloves: Rubber
Eye Protection: Safety glasses / splash goggles
Other Protective Clothing or Equipment: None required

SECTION 9 – TRANSPORTATION

DOT Code: N/A
DOT Shipping Name: Fatty acid esters
Other Regulatory: Listed in TSCA inventory

The information provided is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability, or suitability for an intended use, or any other warranty, expressed or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes

BIODIESEL INDUSTRIES, INC.
111 SAGUARO LANE, MARATHON, FL 33050 • 305-743-3942 • FAX 305-743-3943
ON-LINE AT HTTP://WWW.PIPELINE.TO/BIODIESEL • EMAIL RTEALL@AOL.COM

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Documents

	Document Title	Category	Document Date	Document Type	Action Type
1.	MSDS Sheet for Biodiesel				

EPAPA008000691

MATERIAL SAFETY DATA SHEET

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

Manufacturer: AccuStandard, Inc.
125 Market Street
New Haven, CT 06513

Date MSDS Printed: 6/20/2007
Preparation Date: 2/10/2006
Information Phone Number: 203-786-5290
Emergency Phone Number: 203-786-5290
Hours: Mon. to Fri. 8am-5pm

Catalog Number: PS-151C-04
Product Name: 1,3-Butanediol
Synonyms: 1,3-Butanediol; Butane-1,3-diol; Butylene glycol; 1,3-Dihydroxybutane; Methyltrimethylene glycol
Formula: $C_4H_{10}O_2$ Molecular Weight: 90.12

SECTION 2 - COMPOSITION / INFORMATION ON INGREDIENTS

Component(s) (1)	CAS #	Appr. %	ACGIH-TLV (mg/m3) TWA	ACGIH-TLV (mg/m3) STEL skin	OSHA-PEL (mg/m3) TWA	OSHA-PEL (mg/m3) STEL skin
1,3-Butanediol	107-88-0	100				

SECTION 3 - HAZARDS IDENTIFICATION

Symptoms of Exposure:

May be irritating to eyes, skin, mucous membranes and upper respiratory system.

To the best of our knowledge the chemical, physical and toxicological properties of the component ingredients have not been thoroughly investigated.

Potential Health Effects:

May be harmful if inhaled, absorbed through the skin, or swallowed.

Routes of Entry:

Inhalation, ingestion or skin contact.

For full page MSDS please visit www.accustandard.com

Carcinogenicity:

This product is or contains a component that is not listed (ACGIH, IARC, NTP, OSHA) as a cancer causing agent.

SECTION 4 - FIRST AID MEASURES

Emergency First Aid:

Get medical assistance for all cases of overexposure.

Skin contact: Immediately wash skin with soap and plenty of water. Remove contaminated clothing. Get medical attention if symptoms occur. Wash clothing before reuse.

Eye contact: Immediately flush with plenty of water. After initial flushing, remove and contact lenses and continue flushing for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers.

Inhalation: Remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Seek immediate medical attention.

Ingestion: Drink water and induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

SECTION 5 - FIRE FIGHTING MEASURES

Flammable Properties:

Flash Point: 226.4 °F (108 °C)
Flammable Limits LEL (%): 1.9
Flammable Limits UEL (%): N/A
Autoignition Temperature: 394 °C
During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media:

Use alcohol foam, carbon dioxide, dry chemical, or water spray when fighting fires involving this material.

Fire Fighting Procedures:

As in any fire, wear self-contained breathing apparatus pressure demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Spill Response:

Wear a self-contained breathing apparatus and appropriate Personal protection. Prevent contact with skin or eyes. Ventilate area. Stop leak if you can do so without risk. Absorb on sand or vermiculite, take up and containerize for proper disposal. Flush spill area with water. Comply with Federal, State, and local regulations.

SECTION 7 - HANDLING AND STORAGE

Store in a tighly closed container.
Store in a cool area away from ignition sources and oxidizers.
Material is hygroscopic.
Do not breathe vapor.
Do not get in eyes, on skin or clothing.
Avoid prolonged or repeated exposure.
This product should only by used by persons trained in the safe handling of hazardous chemicals.

For full page MSDS please visit www.accustandard.com

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SECTION 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls and Personal Protection Equipment (PPE):

Respiratory Protection: *If workplace exposure limit(s) of product or any component is exceeded (see TLV/PEL), a NIOSH/MSHA approved air supplied respirator is advised in absence of proper environmental control.* OSHA regulations also permit other NIOSH/MSHA respirators (negative pressure type) under specified conditions (see your safety equipment supplier). Engineering and/or administrative controls should be implemented to reduce exposure.

Material should be handled or transferred in an approved fume hood or with adequate ventilation.

Compatible chemical-resistant protective gloves must be worn to prevent skin contact.

Safety glasses with side shields must be worn at all times.

General Hygiene Considerations:

Wash thoroughly after handling. Do not take internally. Eye wash and safety equipment should be readily available.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Liquid
Odor: N/A
pH: 6.0 - 7.0 (20 °C)
Vapor Pressure: 0.06 mmHg (20 °C)
Vapor Density (Air = 1): 3.1 g/l
Boiling Point: 204 - 207 °C
Melting Point: N/A
Solubility in Water (%): N/A
Specific Gravity (H_2O = 1): 1.004 g/cm3
Flash Point: 226.4 °F (108 °C) (cc)
Explosion Limits (%): 1.9 to N/A
Autoignition Temperature: 394 °C
Percent Volatile: N/A
Evaporation Rate (BuAc = 1): N/A
Molecular Weight: 90.12
Molecular Formula: $C_nH_{2n}O_2$

SECTION 10 - STABILITY AND REACTIVITY

Stability: Stable
Conditions To Avoid: Moisture
Materials To Avoid: Oxidizers

Acid chlorides; Acid anhydrides; Chloroformates; Reducing agents

Hazardous Decomposition: Carbon oxides
Hazardous Polymerization:

For full page MSDS please visit www.accustandard.com

SECTION 11 - TOXICOLOGICAL INFORMATION

See section 3 for specific toxicological information for the ingredients of this product.

SECTION 12 - ECOLOGICAL INFORMATION

By complying with sections 6 and 7 there will be no release to the environment.

SECTION 13 - DISPOSAL CONSIDERATIONS

Recycle or incinerate at any EPA approved facility or dispose in compliance with Federal, State and local regulations. Empty containers must be triple-rinsed prior to disposal.

SECTION 14 - TRANSPORT INFORMATION

DOT UN Number: NR Shipping Class: NR Packing Group: NR IRRITANT

SECTION 15 - REGULATORY INFORMATION

In addition to Federal and state regulations, local regulations may apply. Check with your local regulatory authorities.

SECTION 16 - OTHER INFORMATION

This document has been designed to meet the requirements of OSHA, ANSI and CHIPs regulations.

The statements contained herein are offered for informational purposes only and are based on technical data that we believe to be accurate. It is intended for use only by persons having the necessary technical skill and at their own discretion and risk. Since conditions and manner of use are outside our control, we make
NO WARRANTY, EXPRESSED OR IMPLIED, OF MERCHANTABILITY, FITNESS OR OTHERWISE.

Legend : N/A = Not Available ND = Not Determined NR = Not regulated

* * * End of Document * * *

For full page MSDS please visit www.accustandard.com

EPAPA00800693

Material Safety Data Sheet

Responsible Care® A Public Commitment

MSDS DATE: February 22, 2000

PRODUCT NAME: BRINE SOLUTION

24-Hour Emergency Phone Number: 713-433-4595

I. PRODUCT IDENTIFICATION

HMIS HAZARD RATING: HEALTH = 1 FIRE = 0 REACTIVITY = 0

MANUFACTURER: Texas Brine Company, L.L.C.
Pierce Junction
3000 Feldmon Road
Houston, Texas 77045

Corporate
4800 San Felipe
Houston, Texas 77056
1-800-554-8689

Chemical name: Sodium Chloride
CAS: 7647-14-5
Synonyms: Sodium Chloride solution, brine
Chemical Formula: NaCl

II. HEALH HAZARD INFORMATION

Emergency and First Aid

EYES: Immediately flush eyes with direct stream of water for at least 20 minutes holding the eyelids open. If irritation occurs, seek medical attention.

SKIN: Wash with soap and water.

INHALATION: If symptoms develop, remove person to fresh air.

INGESTION: Never give anything by mouth to an unconscious person. Have person drink several glasses of water then induce vomiting. Seek medical attention immediately.

ROUTES OF EXPOSURE

Inhalation – None expected
Skin – Exposure to spray or liquid may cause irritation of skin.
Eye contact – Exposure to spray or liquid may cause irritation of eyes.

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BRINE SOLUTION

Ingestion – Ingestion of large amounts may cause irritation of the stomach vomiting and diarrhea. Serious salt poisoning in humans has occurred from both accidental and deliberate ingestion.

Effects of Overexposure

Acute: May cause irritation to skin eyes and digestive tract.
Chronic: Not determined

III. HAZARDOUS COMPONENTS

Component	CAS	OSHA-PEL	ACGIH-TLV	%
Sodium Chloride	7647-14-5	Not established	Not established	24 - 26

This product may contain trace concentrations of petroleum hydrocarbon constituents, including benzene. Laboratory analysis is available upon request.

IV. FIRE & EXPLOSION DATA

Flash point: Not applicable
Autoignition temperature: Not applicable

Flammable limits:
Upper Not applicable
Lower Not applicable

Extinguishing Media: Use agent suitable for surrounding fire. Water, water fog, dry chemical, CO2, sand or dirt may be used where this product is stored.

Special Fire Fighting Procedures: Non-flammable.

Unusual fire and explosion hazard: Not combustible. No unusual hazards.

V. SPECIAL PROTECTION

Ventilation Requirements: Ventilation is not normally required for salt solutions. Avoid creation of mist or spray. If present, wear appropriate safety clothing and provide local exhaust systems.

Respiratory: Provide mist protection where applicable. Use NIOSH/MSHA approved respirators. Follow requirements of 29 CFR 1910.134.

BRINE SOLUTION

Eye: Wear safety glasses with side shields or chemical goggles where splash hazard exists.

Gloves: Use rubber, vinyl, or neoprene gloves.

Other equipment: Eyewash facility and emergency shower should be in close proximity.

VI. PHYSICAL DATA

Boiling point:	~218 ° F
Freezing point::	Not determined
Vapor pressure:	Not determined
Specific gravity:	1.19 – 1.20
Solubility in water:	26 %
Vapor density:	Not determined
Appearance and odor:	Clear to hazy liquid with a salty odor
pH:	7.2 – 7.5

VII. REACTIVITY DATA

Conditions contributing to Instability: Under normal conditions, the material is stable.

Incompatibility: Avoid contact with strong concentrations of mineral acids; sulfuric acid, nitric acid.

Hazardous decomposition products: Hydrogen chloride gas is released on contact with strong mineral acids.

Hazardous polymerization: Will not occur.

VIII. HANDLING & STORING

Precautions: Store in an area that is separate from strong mineral acids. Dike and vent storage tank. Use protective safety equipment as appropriate.

IX. ENVIRONMENTAL PROCEDURES

Spill or release: Contain spill to prevent flow to sewers and streams. Pump into marked container for disposal or reclamation. Brine solutions (salt water) may be fatal to fresh water species. Brine may cause corrosion of metal components.

Waste disposal method: Dispose of spilled material in licensed landfill or as appropriate in accordance with federal, state, and local regulations.

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BRINE SOLUTION

X. REGULATORY

All components listed on TSCA: Yes
DOT Proper shipping name: Not regulated
SARA /Title III: Not listed

OSHA regulation 29 CFR 1910.1200 requires that information be provided to employees regarding the hazards of chemicals by means of as hazard communication program including labeling, material safety data sheets, and training.

XI. REVISION

February 22, 2000

1. Update of site specific information
2. Supersedes 1997 Version

The information herein is given in good faith but no warranty expressed or implied is made.

Material Safety Data Sheet

Section 1. Product and Company Identification

Product Name Butyl Alcohol **Product Code** B10061

Manufacturer EMD Chemicals Inc.
P.O. Box 70
480 Democrat Road
Gibbstown, NJ 08027
Prior to January 1, 2003 EMD Chemicals Inc. was EM Industries, Inc. or EM Science, Division of EM Industries, Inc.

Effective Date 2/22/2005

For More Information Call
856-423-6300 Technical Service
Monday-Friday: 8:00 AM - 5:00 PM

In Case of Emergency Call
800-424-9300 CHEMTREC (USA)
613-996-6666 CANUTEC (Canada)
24 Hours/Day: 7 Days/Week

Synonym N-1-BUTANOL
Material Uses Analytical reagent.
Chemical Family Aliphatic alcohol.

Section 2. Composition and Information on Ingredients

Component	CAS #	% by Weight
1-Butanol	71-36-3	100

Section 3. Hazards Identification

Physical State and Appearance Liquid. (Colorless.)

Emergency Overview	WARNING! FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE. HARMFUL IF INHALED OR SWALLOWED. CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. CAUSES DAMAGE TO THE FOLLOWING ORGANS: MUCOUS MEMBRANES, RESPIRATORY TRACT, SKIN, CENTRAL NERVOUS SYSTEM, EYE, LENS OR CORNEA.
Routes of Entry	Inhalation. Ingestion.

Potential Acute Health Effects

Eyes Hazardous in case of eye contact (irritant). Inflammation of the eye is characterized by redness, watering, and itching.

Skin Hazardous in case of skin contact (irritant). Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering. Non-permeator by skin.

Inhalation Hazardous in case of inhalation (lung irritant).

Ingestion Hazardous in case of ingestion.

Potential Chronic Health Effects

Carcinogenic Effects This material is not known to cause cancer in animals or humans.

Additional information See Toxicological Information (section 11)

Medical Conditions Aggravated by Overexposure:	Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4. First Aid Measures

Eye Contact	Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.
Skin Contact	In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.
Inhalation	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
Ingestion	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5. Fire Fighting Measures

Flammability of the Product	Product will burn.
Auto-ignition Temperature	342.9°C (649.2°F)
Flash Points	Closed cup: 28.9°C (84°F).
Flammable Limits	LOWER: 1.4% UPPER: 11.2%

Products of Combustion	These products are carbon oxides (CO, CO2).
Fire Hazards in Presence of Various Substances	Flammable in presence of open flames, sparks and static discharge, of heat, of oxidizing materials.
Explosion Hazards in Presence of Various Substances	**Risks of explosion of the product in presence of static discharge:** Flammable in presence of open flames, sparks and static discharge. **Risks of explosion of the product in presence of mechanical impact:** No.
Fire Fighting Media and Instructions	SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.
Protective Clothing (Fire)	Be sure to use an approved/certified respirator or equivalent.
Special Remarks on Fire Hazards	Vapor may travel considerable distance to source of ignition and flash back.
Special Remarks on Explosion Hazards	Not available.

Section 6. Accidental Release Measures

Small Spill and Leak	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill and Leak	Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.
Spill Kit Information	The following EMD Chemicals Inc. SpillSolv ® absorbent is recommended for this product: SX1330 Solvent Treatment Kit

Section 7. Handling and Storage

Handling	Keep away from heat, sparks and flame. Keep container closed. Use only with adequate ventilation. Do not ingest. Do not get in eyes, on skin, or on clothing.
Storage	Keep container in a cool, well-ventilated area.

Section 8. Exposure Controls/Personal Protection

Engineering Controls	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective occupational exposure limits. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection

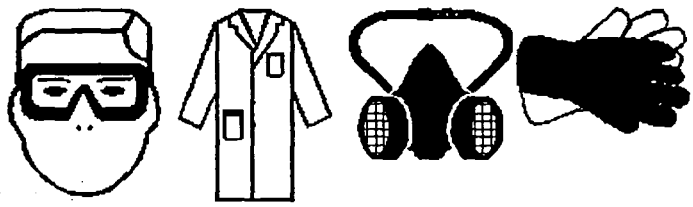
Eyes	Splash goggles.
Body	Lab coat.

Respiratory Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.

Hands Gloves.

Feet Not applicable.

Protective Clothing (Pictograms)



Personal Protection in Case of a Large Spill Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Product Name	Exposure Limits
1-Butanol	**BAUA (Germany, 1997).** Spitzenbegrenzung: 1200 mg/m3 Spitzenbegrenzung: 400 ppm TWA: 300 mg/m3 8 hour(s). TWA: 100 ppm 8 hour(s). **DK-Arbejdstylsinet (Denmark, 1996). Skin** Loftværdi: 150 mg/m3 Loftværdi: 50 ppm GV: 150 mg/m3 8 hour(s). GV: 50 ppm 8 hour(s). **National Authority for Occupational Safety/Health (Ireland, 1999). Skin** STEL: 150 mg/m3 15 minute(s). STEL: 50 ppm 15 minute(s). **EH40-OES (United Kingdom (UK), 1997). Skin** STEL: 154 mg/m3 15 minute(s). STEL: 50 ppm 15 minute(s). **ACGIH (United States, 1994). Skin** CEIL: 152 mg/m3 CEIL: 50 ppm **NIOSH REL (United States, 1994). Skin** CEIL: 150 mg/m3 CEIL: 50 ppm **OSHA Final Rule (United States, 1989). Skin** CEIL: 150 mg/m3 CEIL: 50 ppm

Section 9. Physical and Chemical Properties

Odor	Alcohol like.
Color	Colorless. Clear.
Physical State and Appearance	Liquid. (Colorless.)
Molecular Weight	74.14 g/mole
Molecular Formula	C4-H10-O

pH	Not available.
Boiling/Condensation Point	117.83°C (244.1°F)
Melting/Freezing Point	-88.83°C (-127.9°F)
Critical Temperature	289.9°C (553.8°F)
Specific Gravity	0.81 (Water = 1)
Vapor Pressure	Not available.
Vapor Density	2.6 (Air = 1)
Odor Threshold	25 ppm
Evaporation Rate	0.44 compared to(n-BUTYL ACETATE=1)
LogKow	Not available.
Solubility	Partially soluble in water.

Section 10. Stability and Reactivity

Stability and Reactivity	The product is stable.
Conditions of Instability	Not available.
Incompatibility with Various Substances	Reactive with metals, acids, alkalis.
Rem/Incompatibility	Not available.
Hazardous Decomposition Products	carbon oxides (CO, CO2)
Hazardous Polymerization	Will not occur.

Section 11. Toxicological Information

	Butyl Alcohol	EO1400000
RTECS Number:		
Toxicity	Acute oral toxicity (LD50): 790 mg/kg [Rat]. Acute dermal toxicity (LD50): 3400 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 8000 ppm 4 hour(s) [Rat].	
Chronic Effects on Humans	Not available.	
Acute Effects on Humans	Hazardous in case of eye contact (irritant). Inflammation of the eye is characterized by redness, watering, and itching. Hazardous in case of skin contact (irritant). Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering. Non-permeator by skin. Hazardous in case of inhalation (lung irritant). Hazardous in case of ingestion.	
Synergetic Products Toxicologically)	Not available.	

Irritancy	Draize Test (Rabbit): Skin: 20mg/24h. Reaction: Moderate. Eye: 2 mg/24H Severe
ensitization	Not available.
Carcinogenic Effects	This material is not known to cause cancer in animals or humans.
Toxicity to Reproductive System	Tests on laboratory animals for reproductive effects are cited in Registry of Toxic Effects on Chemical Substances (RTECS).
Teratogenic Effects	Not available.
Mutagenic Effects	Tests on laboratory animals for mutagenic effects are cited in Registry of Toxic Effects of Chemical Substances (RTECS).

Section 12. Ecological Information

Ecotoxicity	Not available.
BOD5 and COD	Not available.
Toxicity of the Products of Biodegradation	The products of degradation are less toxic than the product itself.

Section 13. Disposal Considerations

EPA Waste Number	U031 D001
'reatment	Incineration, fuels blending or recycle. Contact your local permitted waste disposal site (TSD) for permissible treatment sites. Always contact a permitted waste disposal (TSD) to assure compliance with all current local, state, and Federal Regulations.

Section 14. Transport Information

DOT Classification	Proper Shipping Name: BUTANOL Hazard Class: 3 UN number: UN1120 Packing Group: III RQ: 5000 lbs. (2268 kg)
TDG Classification	Not available.
IMO/IMDG Classification	Not available.
ICAO/IATA Classification	Not available.

Section 15. Regulatory Information

I.S. Federal Regulations	TSCA 4(a) final test rules: 1-Butanol TSCA 8(b) inventory: 1-Butanol TSCA 12(b) one time export: 1-Butanol

SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: 1-Butanol
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: 1-Butanol: Fire Hazard, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard
SARA 313 toxic chemical notification and release reporting: 1-Butanol
Clean Water Act (CWA) 307: No products were found.
Clean Water Act (CWA) 311: No products were found.
Clean air act (CAA) 112 accidental release prevention: No products were found.
Clean air act (CAA) 112 regulated flammable substances: No products were found.
Clean air act (CAA) 112 regulated toxic substances: No products were found.

WHMIS (Canada) CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F).
Class D-2B: Material causing other toxic effects (TOXIC).
CEPA DSL: 1-Butanol
This product has been classifed in accordance with the hazard criteria of the Controlled Product Regulations and the MSDS contains all required information.

International Regulations

EINECS 1-Butanol 200-751-6

DSCL (EEC) R10- Flammable.
R22- Harmful if swallowed.
R37/38- Irritating to respiratory system and skin.
R41- Risk of serious damage to eyes.

International Lists Australia (NICNAS): 1-Butanol

Japan (MITI): 1-Butanol

Japan (MOL): 1-Butanol

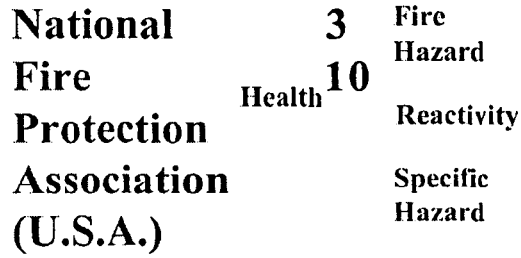
Korea (TCCL): 1-Butanol

Philippines (RA6969): 1-Butanol
China: No products were found.

State Regulations Pennsylvania RTK: 1-Butanol: (environmental hazard, generic environmental hazard)
Massachusetts RTK: 1-Butanol
New Jersey: 1-Butanol
California prop. 65: No products were found.

Section 16. Other Information

National Fire Protection Association (U.S.A.)



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Notice to Reader

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MATERIAL SAFETY DATA SHEET

R6K25
06 00

Section 1 -- PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER

R6K25

HMIS CODES

Health	2
Flammability	2
Reactivity	0

PRODUCT NAME
Butyl Cellosolve

MANUFACTURER'S NAME
THE SHERWIN-WILLIAMS COMPANY
101 Prospect Avenue N.W.
Cleveland, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917

DATE OF PREPARATION
02-JUL-06

INFORMATION TELEPHONE NO.
(216) 566-2902

Section 2 -- COMPOSITION/INFORMATION ON INGREDIENTS

% by WT	CAS No.	INGREDIENT		UNITS	VAPOR PRESSURE
100	111-76-2	2-Butoxyethanol			
		ACGIH TLV	20	ppm	0.88 mm
		OSHA PEL	25	ppm	

Section 3 -- HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE
INHALATION of vapor or spray mist.
EYE or SKIN contact with the product, vapor or spray mist.
Contains alcohols and acetates which can be absorbed through the skin.

EFFECTS OF OVEREXPOSURE
EYES: Irritation.
SKIN: Prolonged or repeated exposure may cause irritation.
INHALATION: Irritation of the upper respiratory system.
May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.

SIGNS AND SYMPTOMS OF OVEREXPOSURE
Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.
Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
None generally recognized.

CANCER INFORMATION
For complete discussion of toxicology data refer to Section 11.

Continued on page 2

Section 4 -- FIRST AID MEASURES

EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.
SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.
INHALATION: If affected, remove from exposure. Restore breathing. Keep warm and quiet.
INGESTION: Do not induce vomiting. Get medical attention immediately.

Section 5 -- FIRE FIGHTING MEASURES

FLASH POINT	LEL	UEL
143 F PMCC	1.1	10.6

FLAMMABILITY CLASSIFICATION
Combustible, Flash above 99 and below 200 F
EXTINGUISHING MEDIA
Carbon Dioxide, Dry Chemical, Foam
UNUSUAL FIRE AND EXPLOSION HAZARDS
Closed containers may explode when exposed to extreme heat.
Application to hot surfaces requires special precautions.
During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.
SPECIAL FIRE FIGHTING PROCEDURES
Full protective equipment including self-contained breathing apparatus should be used.
Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

Section 6 -- ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Remove all sources of ignition. Ventilate the area.
Remove with inert absorbent.

Section 7 -- HANDLING AND STORAGE

STORAGE CATEGORY
DOL Storage Class IIIA
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Contents are COMBUSTIBLE. Keep away from heat and open flame.
Consult NFPA Code. Use approved Bonding and Grounding procedures.
Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.

Continued on page 3

Section 8 -- EXPOSURE CONTROLS/PERSONAL PROTECTION

PRECAUTIONS TO BE TAKEN IN USE
Use only with adequate ventilation.
Avoid contact with skin and eyes. Avoid breathing vapor and spray mist.
Wash hands after using.

VENTILATION
Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION
If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section 2.

PROTECTIVE GLOVES
Wear gloves which are recommended by glove supplier for protection against materials in Section 2.

EYE PROTECTION
Wear safety spectacles with unperforated sideshields.

OTHER PROTECTIVE EQUIPMENT
Use of barrier cream on exposed skin is recommended.

OTHER PRECAUTIONS
Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

Section 9 -- PHYSICAL AND CHEMICAL PROPERTIES

PRODUCT WEIGHT	7.49 lb/gal	897 g/l
SPECIFIC GRAVITY	0.90	
BOILING POINT	325 - 343 F	162 - 172 C
MELTING POINT	Not Available	
VOLATILE VOLUME	100 %	
EVAPORATION RATE	Slower than ether	
VAPOR DENSITY	Heavier than air	
SOLUBILITY IN WATER	N.A.	

VOLATILE ORGANIC COMPOUNDS (VOC Theoretical - As Packaged)

7.49 lb/gal	897 g/l	Less Water and Federally Exempt Solvents
7.49 lb/gal	897 g/l	Emitted VOC

Section 10 -- STABILITY AND REACTIVITY

STABILITY -- Stable

CONDITIONS TO AVOID
None known.

INCOMPATIBILITY
None known.

HAZARDOUS DECOMPOSITION PRODUCTS
By fire: Carbon Dioxide, Carbon Monoxide

HAZARDOUS POLYMERIZATION
Will not occur

Continued on page 4

Section 11 -- TOXICOLOGICAL INFORMATION

CHRONIC HEALTH HAZARDS

No ingredient in this product is an IARC, NTP or OSHA listed carcinogen.

Prolonged overexposure to solvent ingredients in Section 2 may cause adverse effects to the liver, urinary and blood forming systems.

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

TOXICOLOGY DATA

CAS No.	Ingredient Name				
111-76-2	2-Butoxyethanol	LC50	RAT	4HR	Not Available
		LD50	RAT		470 mg/kg

Section 12 -- ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

No data available.

Section 13 -- DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD

Waste from this product is not hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.

Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State/Provincial, and Local regulations regarding pollution.

Section 14 -- TRANSPORT INFORMATION

No data available.

Section 15 -- REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

CAS No.	CHEMICAL/COMPOUND	% by WT	% Element
	Glycol Ethers	100	

TSCA CERTIFICATION

All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory.

Section 16 -- OTHER INFORMATION

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

Continued on page 5

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

999-001455

THE DOW CHEMICAL COMPANY
MATERIAL SAFETY DATA SHEET

Dow (hereinafter, and for purposes of this MSDS only, refers to The Dow Chemical Company and to Dow Chemical Canada Inc.) encourages and expects you to read and understand the entire MSDS, as there is important information throughout the document. Dow expects you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

1.1 IDENTIFICATION

Product Name BUTYL CELLOSOLVE(TM) ACETATE

1.2 COMPANY IDENTIFICATION

The Dow Chemical Company
Midland, MI 48674

1.3 EMERGENCY TELEPHONE NUMBER

24-HOUR EMERGENCY TELEPHONE NUMBER: (989)636-4400.
Customer Information Number: 1-800-258-2436.

* or ® Indicates a Trademark of The Dow Chemical Company.

2. COMPOSITION INFORMATION

Component	CAS #	Amount (%W/W)
Ethylene glycol butyl ether acetate	112-07-2	>= 99 <= 100%

3. HAZARDS IDENTIFICATION

3.1 EMERGENCY OVERVIEW

Appearance Colorless

Physical State Liquid

Odor Ethereal, Fruity

Hazards of product

COMBUSTIBLE LIQUID AND VAPOR.
MAY CAUSE EYE IRRITATION.
MAY BE HARMFUL IF ABSORBED THROUGH SKIN.

ISOLATE AREA.

3.2 POTENTIAL HEALTH EFFECTS

Effects of Single Acute Overexposure

Inhalation Excessive exposure may cause irritation to upper respiratory tract (nose and throat). Prolonged excessive exposure to mist may cause serious adverse effects, even death.

Eye Contact May cause slight eye irritation. Effects may include discomfort and redness. Vapor or mist may cause eye irritation.

Skin Contact Prolonged contact is essentially nonirritating to skin.

Skin Absorption Prolonged or widespread skin contact may result in absorption of potentially harmful amounts.

Swallowing Low toxicity if swallowed. Small amounts swallowed incidental to normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.

Chronic, Prolonged or Repeated Overexposure

Other Effects of Overexposure No information available.

See Section 11 for toxicological information and additional information about potential health effects.

3.3 POTENTIAL ENVIRONMENTAL EFFECTS

See Section 12 for Ecological Information.

4. FIRST AID PROCEDURES

4.1 INHALATION

Move person to fresh air; if effects occur, consult a physician.

4.2 EYE CONTACT

Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.

4.3 SKIN CONTACT

Immediately flush skin with water while removing contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Discard contaminated articles including leather items such as shoes.

4.4 SWALLOWING

If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

4.5 NOTES TO PHYSICIAN

Respiratory symptoms, including pulmonary edema, may be delayed. Persons receiving significant exposure should be observed 24-48 hours for signs of respiratory distress.

No specific antidote.
Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIRE FIGHTING MEASURES

5.1 FLAMMABLE PROPERTIES - REFER TO SECTION 9, PHYSICAL AND CHEMICAL PROPERTIES

5.2 EXTINGUISHING MEDIA

Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.

5.3 FIRE FIGHTING PROCEDURES

Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Do not use direct water stream. May spread fire. Move container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage.

5.4 SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS

Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, pants, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

5.5 UNUSUAL FIRE AND EXPLOSION HAZARDS

Container may rupture from gas generation in a fire situation.
Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.

5.6 HAZARDOUS COMBUSTION PRODUCTS

During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon monoxide. Carbon dioxide.

6. ACCIDENTAL RELEASE MEASURES

Steps to be Taken if Material is Released or Spilled:

Contain spilled material if possible. Collect in suitable and properly labeled containers. Dilute with large quantities of water. See Section 13, Disposal Considerations, for additional information.

Personal Precautions: Isolate area. Keep unnecessary and unprotected personnel from entering the area. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection. Refer to Section 7, Handling for additional precautionary measures.

Environmental Precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

7. HANDLING AND STORAGE

7.1 HANDLING

General Handling
Keep away from heat, sparks and flame.
Avoid prolonged contact with eyes, skin and clothing.
Wash thoroughly after handling.
Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers.

Ventilation
Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines. Use only with adequate ventilation.

Other Precautions
Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion.

7.2 STORAGE

Store in the following material(s): carbon steel, stainless steel, high-baked, phenolic-lined tanks. Do not store in: Aluminum, Copper, galvanized iron, galvanized steel, Viton, neoprene, nitrile, natural rubber.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

8.1 EXPOSURE LIMITS

Component	Exposure Limits	Skin	Form

Ethylene glycol butyl ether acetate	20 ppm TWA8 ACGIH

In the Exposure Limits Chart above, if there is no specific qualifier (i.e., Aerosol) listed in the Form Column for a particular limit, the listed limit includes all airborne forms of the substance that can be inhaled.

A "Yes" in the Skin Column indicates a potential significant contribution to overall exposure by the cutaneous (skin) route, including mucous membranes and the eyes, either by contact with vapors or by direct skin contact with the substance. A "Blank" in the Skin Column indicates that exposure by the cutaneous (skin) route is not a potential significant contributor to overall exposure.

8.2 PERSONAL PROTECTION

Respiratory Protection:
Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required, use an approved air-purifying or positive-pressure supplied-air respirator depending on the potential airborne concentration.
For emergency and other conditions where the exposure guideline may be exceeded, use an approved positive-pressure self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply.
In confined or poorly ventilated areas, use an approved self-contained breathing apparatus or positive pressure airline with auxiliary self-contained air supply.

Ventilation:
Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.
Use only with adequate ventilation.

Eye Protection:
Use safety glasses.
If exposure causes eye discomfort, use a full-face respirator.

Other Protective Equipment:
Use protective clothing chemically resistant to this material. Selection of specific items such as faceshield, gloves, boots, apron, or full body suit will depend on operation.
Remove contaminated clothing immediately, wash skin area with soap and water, and launder clothing before reuse or dispose of properly. Items which cannot be decontaminated, such as shoes, belts and watchbands, should be removed and disposed of properly.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid

Appearance: Colorless

Odor: Ethereal, Fruity

Flash Point - Closed Cup: **74 °C 165 °F** , *Tag Closed Cup ASTM D 56*

Flammable Limits In Air:
Lower **0.5 %(V)**
Upper **8.54 %(V)** *135 °C, 275 °F*

Autoignition Temperature: *No test data available.*

Vapor Pressure: **0.2 mmHg** *20 °C*

Boiling Point (760 mmHg): **192 °C 377 °F**

Vapor Density (air = 1): **6**

Specific Gravity (H2O = 1): **0.972** *20 °C / 20 °C*

Freezing Point: **-64 °C -83 °F**

Melting Point: *Not applicable.*

Solubility in Water (by weight): **2 %** *20 °C*

pH: *No test data available.*

Molecular Weight: **160 g/mol**

Octanol/Water Partition Coefficient - Measured: , **1.51 - 1.79**
Octanol/Water Partition Coefficient - Calculated by Structural Fragment Method: **1.57**

Evaporation Rate (Butyl Acetate = 1): **0.04**

Percent Volatiles: **100 Wt%**

10. STABILITY AND REACTIVITY

10.1 STABILITY/INSTABILITY Thermally stable at typical use temperatures.

Conditions to Avoid: Product can oxidize at elevated temperatures. Generation of gas during decomposition can cause pressure in closed systems.

Incompatible Materials: Avoid contact with: Strong acids. Strong bases. Strong oxidizers.

Thermal Decomposition: Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Aldehydes. Ketones. Organic acids.

10.2 HAZARDOUS POLYMERIZATION Will not occur.

11. TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Peroral

Rat; LD50 = 7250 mg/kg

Percutaneous

Rabbit; LD50 = 1540 mg/kg

CHRONIC TOXICITY AND CARCINOGENICITY

CARCINOGENICITY CLASSIFICATIONS

Component	Agency	Classification

Ethylene glycol butyl ether acetate	ACGIH	A3: Confirmed Animal Carcinogen with Unknown Relevance to Humans

12. ECOLOGICAL INFORMATION

12.1 ENVIRONMENTAL FATE

Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. The rate constant for the vapor phase reaction with photochemically produced hydroxyl radicals at 25C is estimated to be: 2.12E-11 cm3/molecule-sec. at 25°C Material is ultimately biodegradable. Reaches > 70% mineralization in OECD test(s) for inherent biodegradability. Biodegradation reached in Modified Zahn-Wellens/EMPA Test (OECD Test No. 302 B) after 28 days: 77 - 90%. Mean degradation reached in Continuous Activated Sludge assay (OECD Test No. 303 A): 96.7% in 3 hr. Biodegradation reached in Modified MITI Test (I) (OECD Test No. 301 C) after 28 days: 88%.

BOD (% Oxygen consumption)

	Day 5	Day 10	Day 15	Day 20	Day 28/30
	53 %	69 - 80 %		72 - 80 %	

12.2 ECOTOXICITY

Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested)., Inhibitory concentration (IC50) in OECD Activated Sludge Respiration Inhibition Test (OECD Test No. 209) is:, 900 mg/L in 30 min., The 16-h growth inhibition EC50 in bacteria is:, 2800 mg/L.

Toxicity to Aquatic Invertebrates
water flea (Daphnia magna); Acute LC50
Result value: 140 mg/L

Toxicity to Aquatic Invertebrates
water flea (Daphnia magna); Acute immobilization EC50
Result value: (37 - 180) mg/L

Toxicity to Aquatic Plants
alga (Scenedesmus sp.); Growth inhibition; EC50
Result value: > 500 mg/L

Toxicity to Fish
fathead minnow (Pimephales promelas); Acute LC50
Result value: 22 - 31 mg/L

Toxicity to Fish
golden orfe (Leuciscus idus); Acute LC50
Result value: 80 mg/L

12.3 FURTHER INFORMATION

Bioconcentration potential is low (BCF < 100 or Log Pow < 3). Potential for mobility in soil is very high (Koc between 0 and 50). Soil organic carbon/water partition coefficient (Koc) is estimated to be: 26-224 Henry's Law Constant (H) is estimated to be: 5.27 E-06 atm-m3/mole at 25°C.
Theoretical Oxygen Demand (THOD) - calculated:: 2.10 mg/mg

Octanol/Water Partition Coefficient - Measured: , 1.51 - 1.79
Octanol/Water Partition Coefficient - Calculated by Structural Fragment Method: 1.57

13. DISPOSAL CONSIDERATIONS

13.1 DISPOSAL

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. DOW HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION 2 (Composition/ Information on Ingredients). FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device. As a service to its customers, Dow can provide names of information resources to help identify waste management companies and other facilities which recycle, reprocess or manage chemicals or plastics, and that manage used drums. Telephone Dow's Customer Information Group at 1-800-258-2436 or 1-989-832-1556 (U.S.), or 1-800-331-6451 (Canada) for further details .

14. TRANSPORT INFORMATION

14.1 U.S. D.O.T.

NON-BULK
Proper Shipping Name : NOT REGULATED

BULK
Proper Shipping Name : COMBUSTIBLE LIQUID, NOS
Technical Name : ETHYLENE GLYCOL MONOBUTYL ETHER ACETATE
Hazard Class : COMBUSTIBLE LIQUID
ID Number : NA1993
Packing Group : PG III

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

15.1 FEDERAL/NATIONAL

OSHA HAZARD COMMUNICATION:

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 TITLE III (EMERGENCY PLANNING AND COMMUNITY RIGHT TO KNOW ACT) SECTION 313

This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act 1986 and 40 CFR Part 372.

Component	CAS #	Amount
Glycol Ethers	Not available	<= 100.0000%

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 (CERCLA) SECTION 103

This product contains the following substances subject to CERCLA Section 103 reporting requirements and are listed in 40 CFR Part 302.4.

Component	CAS #	Amount
Ethylene glycol monoethyl ether	110-80-5	<= 0.0100%
Acetic acid	64-19-7	<= 0.0006%

In addition, this product contains other Glycol Ether(s) which, although included as a broad category on the CERCLA hazardous substance list, has not been assigned a reportable quantity.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 TITLE III (EMERGENCY PLANNING AND COMMUNITY RIGHT TO KNOW ACT) SECTION 302

To the best of our knowledge this product does not contain chemicals at levels which require reporting under this statute.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 TITLE III (EMERGENCY PLANNING AND COMMUNITY RIGHT TO KNOW ACT) SECTIONS 311 AND 312

Delayed (Chronic) Health Hazard : No
Fire Hazard : Yes
Immediate (Acute) Health Hazard : Yes
Reactive Hazard : No
Sudden Release of Pressure Hazard : No

TOXIC SUBSTANCES CONTROL ACT (TSCA)

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements.

EUROPEAN INVENTORY OF EXISTING COMMERCIAL CHEMICAL SUBSTANCES (EINECS)

The components of this product are on the EINECS inventory or are exempt from EINECS inventory requirements.

CEPA - DOMESTIC SUBSTANCES LIST (DSL)

All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

15.2 STATE/LOCAL

PENNSYLVANIA (WORKER AND COMMUNITY RIGHT TO KNOW ACT): PENNSYLVANIA HAZARDOUS SUBSTANCES LIST AND/OR PENNSYLVANIA ENVIRONMENTAL HAZARDOUS SUBSTANCE LIST:

The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Component	CAS #	Amount
Glycol Ethers	Not available	<= 100.0000%

PENNSYLVANIA (WORKER AND COMMUNITY RIGHT TO KNOW ACT): PENNSYLVANIA SPECIAL HAZARDOUS SUBSTANCES LIST:

To the best of our knowledge this product does not contain chemicals at levels which require reporting under this statute.

CALIFORNIA PROPOSITION 65 (SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986)

WARNING: This product contains a chemical(s) known to the State of California to cause birth defects or other reproductive harm.

Component	CAS #	Amount
Ethylene glycol monoethyl ether	110-80-5	<= 0.0100%
Ethylene glycol monoethyl ether acetate	111-15-9	<= 0.0060%

CALIFORNIA SCAQMD RULE 443.1 (SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT RULE 443.1, LABELING OF MATERIALS CONTAINING ORGANIC SOLVENTS)

VOC: Vapor pressure 0.2 mmHg @ 20° C
953 g/l
953 g/l less water and less exempted solvents

This section provides selected regulatory information on this product including its components. This is not intended to include all regulations. It is the responsibility of the user to know and comply with all applicable rules, regulations and laws relating to the product being used.

16. OTHER INFORMATION

16.1 ADDITIONAL INFORMATION

Additional information on this and other Dow products may be obtained by visiting our web page at www.dow.com.
Additional information on this product may be obtained by calling Dow's Customer Information Group at 1-800-258-2436 (U.S.) or 1-800-331-6451 (Canada).

16.2 HAZARD RATING SYSTEM

NFPA ratings for this product are: H - 2 F - 2 R - 0

These ratings are part of a specific hazard communication program and should be disregarded where individuals are not trained in the use of this hazard rating system. You should be familiar with the hazard communication programs applicable to your workplace.

16.3 RECOMMENDED USES AND RESTRICTIONS

An oxygenated solvent-
For industrial consumption as a process raw material.
For industrial consumption as a component of a reaction system.
For industrial formulation for inclusion in a final product.
For industrial use as a process aid.
For industrial formulation as a process control material.
For industrial conversion as a raw material for manufacture of articles or goods.
For industrial use.

Dow recommends that you use this product in a manner consistent with the listed use. If your intended use is not consistent with Dow's stated use, please contact Dow's Customer Information Group at 1-800-258-2436 (U.S.) or 1-800-331-6451 (Canada) for more information.

16.4 REVISION

Version: 6.
Revision: 07/15/2003
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

16.5 LEGEND

Bacterial/NA	Non Acclimated Bacteria
F	Fire
H	Health
IHG	Industrial Hygiene Guideline
N/A	Not available
NFPA	National Fire Protection Association
O	Oxidizer
R	Reactivity
TS	Trade secret
VOL/VOL	Volume/Volume
W	Water Reactive
W/W	Weight/Weight

NOTICE: Dow urges each customer or recipient of this MSDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this MSDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given., Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that its activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of Dow, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product., Due to the proliferation of sources for information such as manufacturer-specific MSDSs, Dow is not and cannot be responsible for MSDSs obtained from any source other than Dow. If you have obtained a Dow MSDS from a non-Dow source or if you are not sure that a Dow MSDS is current, please contact Dow for the most current version.

MATERIAL SAFETY DATA SHEET

Date Printed: 07/12/2006
Date Updated: 02/06/2006
Version 1.4

Section 1 - Product and Company Information

Product Name	BUTYL ETHER
Product Number	34460
Brand	FLUKA
Company	Sigma-Aldrich
Address	3050 Spruce Street SAINT LOUIS MO 63103 US
Technical Phone:	800-325-5832
Fax:	800-325-5052
Emergency Phone:	314-776-6555

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
BUTYL ETHER	142-96-1	No

Formula C8H18O
Synonyms 1-Butoxybutane * Butyl ether * n-Butyl ether * Dibutyl ether * Di-n-butyl ether * n-Dibutyl ether * Dibutyl oxide * Ether butylique (French) * 1,1'-Oxybis(butane)
RTECS Number: EK5425000

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Flammable. Irritant.
Irritating to eyes, respiratory system and skin. Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

HMIS RATING
HEALTH: 2
FLAMMABILITY: 3
REACTIVITY: 1

NFPA RATING
HEALTH: 2
FLAMMABILITY: 3
REACTIVITY: 1

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is conscious. Call a physician.

INHALATION EXPOSURE

If inhaled, remove to fresh air. If not breathing give

artificial respiration. If breathing is difficult, give oxygen.

DERMAL EXPOSURE
In case of contact, immediately wash skin with soap and copious amounts of water.

EYE EXPOSURE
In case of contact, immediately flush eyes with copious amounts of water for at least 15 minutes.

Section 5 - Fire Fighting Measures

FLAMMABLE HAZARDS
Flammable Hazards: Yes
Peroxide Former: Yes

EXPLOSION HAZARDS
Vapor may travel considerable distance to source of ignition and flash back. Container explosion may occur under fire conditions.

FLASH POINT
77 °F 25 °C Method: closed cup

EXPLOSION LIMITS
Lower: 0.9 % Upper: 8.5 %

AUTOIGNITION TEMP
185 °C

FLAMMABILITY
N/A

EXTINGUISHING MEDIA
Suitable: For small (incipient) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water.

FIREFIGHTING
Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Specific Hazard(s): Flammable liquid. Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL
Evacuate area. Shut off all sources of ignition.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)
Wear respirator, chemical safety goggles, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP
Cover with dry-lime, sand, or soda ash. Place in covered containers using non-sparking tools and transport outdoors. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

EPAPA008000727

HANDLING
User Exposure: Avoid breathing vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

STORAGE
Suitable: Keep container closed. Keep away from heat, sparks, and open flame.

SPECIAL REQUIREMENTS
Store under inert gas. Air and light sensitive.

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS
Safety shower and eye bath. Use nonsparking tools. Mechanical exhaust required.

PERSONAL PROTECTIVE EQUIPMENT
Respiratory: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator.
Hand: Compatible chemical-resistant gloves.
Eye: Chemical safety goggles.

GENERAL HYGIENE MEASURES
Wash thoroughly after handling. Wash contaminated clothing before reuse.

Section 9 - Physical/Chemical Properties

Appearance — Physical State: Liquid

Property	Value	At Temperature or Pressure
Molecular Weight	130.23 AMU	
pH	5.2	
BP/BP Range	140.0 - 142.0 °C	
MP/MP Range	- 98.0 °C	
Freezing Point	N/A	
Vapor Pressure	4.8 mmHg	20 °C
Vapor Density	4.48 g/l	
Saturated Vapor Conc.	N/A	
SG/Density	0.764 g/cm3	
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	N/A	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	N/A	
Surface Tension	N/A	
Partition Coefficient	N/A	
Decomposition Temp.	N/A	
Flash Point	77 °F 25 °C	Method: closed cup
Explosion Limits	Lower: 0.9 % Upper: 8.5 %	

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Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 08/29/2006 Reviewed on 08/14/2006

1 Identification of substance:

Product details:

Product name: n-Butyl acetate

Stock number: A19412

Manufacturer/Supplier:
Alfa Aesar, A Johnson Matthey Company
Johnson Matthey Catalog Company, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Emergency Phone: (978) 521-6300
CHEMTREC: (800) 424-9300
Web Site: www.alfa.com

Information Department: Health, Safety and Environmental Department
Emergency information:
During normal hours the Health, Safety and Environmental Department.
After normal hours call Chemtrec at (800) 424-9300.

2 Composition/Data on components:

Chemical characterization:
Description: (CAS#)
n-Butyl acetate (CAS# 123-86-4): 100%
Identification number(s):
EINECS Number: 204-658-1
EU Number: 607-025-00-1

3 Hazards identification

Hazard description: Not applicable
Information pertaining to particular dangers for man and environment
At long or repeated contact with skin it may cause dermatitis due to the degreasing effect of the solvent.
Causes a narcotic effect.
R 10 Flammable.
R 66 Repeated exposure may cause skin dryness or cracking
R 67 Vapours may cause drowsiness and dizziness
Classification system
HMIS ratings (scale 0-4)
(Hazardous Materials Identification System)

Health (acute effects) = 1
Flammability = 3
Reactivity = 1

4 First aid measures

After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm.
Seek immediate medical advice.
After skin contact
Immediately wash with water and soap and rinse thoroughly.
Seek immediate medical advice.

(Contd. on page 2)

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Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 08/29/2006 Reviewed on 08/14/2006

Product name: n-Butyl acetate

(Contd. of page 1)

After eye contact
Rinse opened eye for several minutes under running water. Then consult a doctor.
After swallowing Seek immediate medical advice.

5 Fire fighting measures

Suitable extinguishing agents
Use carbon dioxide, extinguishing powder or foam. Water may be ineffective but may be used for cooling exposed containers.
Special hazards caused by the material, its products of combustion or resulting gases:
In case of fire, the following can be released:
Carbon monoxide and carbon dioxide
Protective equipment:
Wear self-contained respirator.
Wear fully protective impervious suit.

6 Accidental release measures

Person-related safety precautions:
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation
Keep away from ignition sources
Measures for environmental protection:
Do not allow material to be released to the environment without proper governmental permits.
Measures for cleaning/collecting:
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Keep away from ignition sources.
Additional information:
See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

Handling
Information for safe handling:
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation at the workplace.
Information about protection against explosions and fires:
Keep ignition sources away.
Protect against electrostatic charges.
Fumes can combine with air to form an explosive mixture.

Storage
Requirements to be met by storerooms and receptacles:
No special requirements.
Information about storage in one common storage facility:
Store away from oxidizing agents.
Further information about storage conditions:
Keep container tightly sealed.

(Contd. on page 3)

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Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 08/29/2006 Reviewed on 08/14/2006

Product name: n-Butyl acetate

(Contd. of page 2)

Store in cool, dry conditions in well sealed containers.

8 Exposure controls and personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Components with limit values that require monitoring at the workplace:

n-Butyl acetate

	ppm
ACGIH TLV	150; 200-STEL
Austria TWA	200
Belgium TWA	150; 200-STEL
Denmark TWA	150
Finland TWA	150; 200-STEL
France TWA	150; 200-STEL
Germany TWA	100
Hungary TWA	200; 600-STEL
Ireland TWA	150; 200-STEL
Netherlands TWA	150
Poland TWA	200
Russia TWA	200; 200-STEL
Sweden TWA	100; 150-STEL
Switzerland TWA	150; 300-STEL
United Kingdom TWA	150; 200-STEL
USA PEL	150

Additional information: No data

Personal protective equipment
General protective and hygienic measures
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Breathing equipment:
Use suitable respirator when high concentrations are present.
Protection of hands:
Impervious gloves
Check protective gloves prior to each use for their proper condition.
Material of gloves
The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.
Eye protection: Safety glasses
Body protection: Protective work clothing.

9 Physical and chemical properties:

General Information

Form:	Liquid
Color:	Colorless
Odor:	Fruit-like

(Contd. on page 4)

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Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 08/29/2006 Reviewed on 08/14/2006

Product name: n-Butyl acetate

(Contd. of page 3)

Change in condition	
Melting point/Melting range:	-73.5°C (-100°F)
Boiling point/Boiling range:	126.5°C (260°F)
Sublimation temperature / start:	Not determined
Flash point:	22°C (72°F)
Ignition temperature:	421°C (790°F)
Decomposition temperature:	Not determined
Danger of explosion:	Product is not explosive. However, formation of explosive air/vapor mixtures is possible.
Explosion limits:	
Lower:	1.4 Vol %
Upper:	7.6 Vol %
Vapor pressure at 20°C (68°F):	11 hPa (8 mm Hg)
Density at 20°C (68°F):	0.882 g/cm³

10 Stability and reactivity

Thermal decomposition / conditions to be avoided:
Decomposition will not occur if used and stored according to specifications.
Materials to be avoided: Oxidizing agents
Dangerous reactions No dangerous reactions known
Dangerous products of decomposition: Carbon monoxide and carbon dioxide

11 Toxicological information

Acute toxicity:

LD/LC50 values that are relevant for classification:		
Oral	LD50	4700 mg/kg (gpg)
		4300 mg/kg (mam)
		6000 mg/kg (mus)
		10768 mg/kg (rat)
		3200 mg/kg (rbt)
Dermal	LD50	>17600 mg/kg (rbt)
Inhalative	LC50/2H	6000 mg/m3/2H (mus)
	LC50/4H	390 ppm/4H (rat)
Irritation of skin	moderate	500 mg/24H (rbt)

Primary irritant effect:
on the skin: Irritant to skin and mucous membranes.
on the eye: Irritating effect.
Sensitization: No sensitizing effects known.
Other information (about experimental toxicology):
Reproductive effects have been observed on tests with laboratory animals.
Subacute to chronic toxicity:
Subacute to chronic toxicity:
The Registry of Toxic Effects of Chemical Substances (RTECS) reports the following effects in laboratory animals:

(Contd. on page 5)

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Printing date 08/29/2006 Reviewed on 08/14/2006

Product name: n-Butyl acetate

(Contd. of page 4)

Sense Organs and Special Senses (Olfaction) - effect, not otherwise specified.
Sense Organs and Special Senses (Eye) - effect, not otherwise specified.
Sense Organs and Special Senses (Eye) - conjunctive irritation.
Lungs, Thorax, or Respiration - other changes.
Lungs, Thorax, or Respiration - acute pulmonary edema.
Lungs, Thorax, or Respiration - emphysema.
Blood - hemorrhage.
Blood - changes in erythrocyte (RBC) count.
Blood - changes in serum composition (e.g. TP, bilirubin, cholesterol).
Behavioral - somnolence (general depressed activity).
Behavioral - antipsychotic.
Behavioral - changes in motor activity (specific assay).
Behavioral - general anesthetic.
Behavioral - muscle weakness.
Nutritional and Gross Metabolic - weight loss or decreased weight gain.
Nutritional and Gross Metabolic - changes in sodium.
Nutritional and Gross Metabolic - changes in chlorine.
Related to Chronic Data - changes in testicular weight.
Endocrine - changes in adrenal weight.
Endocrine - changes in spleen weight.
Brain and Coverings - changes in brain weight.
Gastrointestinal - changes in structure or function of salivary glands.
Liver - other changes.
Liver - fatty liver degeneration.
Biochemical - Enzyme inhibition, induction, or change in blood or tissue levels - other transferases.
Biochemical - Enzyme inhibition, induction, or change in blood or tissue levels - dehydrogenases.
Reproductive - Effects on Embryo or Fetus - fetotoxicity (except death, e.g., stunted fetus).
Reproductive - Specific Developmental Abnormalities - musculoskeletal system.

Subacute to chronic toxicity:
Inhalation of n-butyl acetate causes conjunctiva irritation and unspecified nasal and respiratory system effects. High concentrations may cause narcosis. Teratogenic effects in laboratory animals have been reported. May cause liver damage.

Additional toxicological information:
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
Carcinogen as defined by OSHA.
No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.

12 Ecological information:

General notes:
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
Do not allow material to be released to the environment without proper governmental permits.

USA

(Contd. on page 6)

Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 08/29/2006 Reviewed on 08/14/2006

Product name: n-Butyl acetate

(Contd. of page 5)

13 Disposal considerations

Product:
Recommendation
Consult state, local or national regulations to ensure proper disposal.

Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.

14 Transport information

DOT regulations:

Hazard class:	3
Identification number:	UN1123
Packing group:	III
Proper shipping name (technical name):	BUTYL ACETATES
Label	3

Land transport ADR/RID (cross-border)

ADR/RID class:	3 (F1) Flammable liquids
Danger code (Kemler):	30
UN-Number:	1123
Packaging group:	III
Description of goods:	1123 BUTYL ACETATES

Maritime transport IMDG:

IMDG Class:	3
UN Number:	1123
Label	3
Packaging group:	III
Proper shipping name:	BUTYL ACETATES

Air transport ICAO-TI and IATA-DGR:

ICAO/IATA Class:	3
UN/ID Number:	1123
Label	3
Packaging group:	III

(Contd. on page 7)

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Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 08/29/2006 Reviewed on 08/14/2006

Product name: n-Butyl acetate

(Contd. of page 6)

Proper shipping name: BUTYL ACETATES

15 Regulations

Product related hazard informations:

Risk phrases:
10 Flammable.
66 Repeated exposure may cause skin dryness or cracking
67 Vapours may cause drowsiness and dizziness

Safety phrases:
25 Avoid contact with eyes.
60 This material and its container must be disposed of as hazardous waste.

National regulations
All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.
All components of this product are listed on the Canadian Domestic Substances List (DSL).

Information about limitation of use:
For use only by technically qualified individuals.
This product is subject to the reporting requirements of section 313 of the Emergency Planning and Community Right to Know Act of 1986 and 40CFR372.

16 Other information:
Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing MSDS: Health, Safety and Environmental Department.
Contact: Darrell R. Sanders

pharmco-AAPER
SUBSIDIARIES OF COMMERCIAL ALCOHOLS, INC.
The Power of Three®

An ISO 9001:2000 Certified Company

Product Information (203) 740-3471 / Emergency Assistance CHEMTREC 1-800-424-9300 or 202-483-7616

MATERIAL SAFETY DATA SHEETS

Part Number/Trade Name: N Butyl alcohol
This MSDS is valid for all grades that start with catalog number 331

General Information

Company's Name: PHARMCO PRODUCTS, INC.
Company's Street: 58 VALE RD.
Company's City: BROOKFIELD
Company's State: CT
Company's Zip Code: 06804
Company's Emerg Ph #: (203) 740-3471
Company's Info Ph #: (203) 740-3471
Date MSDS Revised: Nishant-8/23/99

Safety Data Review Date: 8/23/99
Preparer's Company: PHARMCO PRODUCTS, INC.
Preparer's St Or P. O. Box: 58 VALE RD.
Preparer's City: BROOKFIELD
Preparer's State: CT
Preparer's Zip Code: 06804

Ingredients/Identity Information

Ingredient: BUTANOL, N-BUTYL ALCOHOL, PROPYL CARBINOL, BUTYL ALCOHOL
Ingredient Sequence Number: 01
Percent: 100
NIOSH (RTECS) Number: EO1400000
CAS Number: 71-36-3
OSHA PEL: 100 PPM
ACGIH TLV: C 152 MG/CUM
Other Recommended Limit: 300 MG/CUM

Physical/Chemical Characteristics

Appearance And Odor: CLEAR, COLORLESS LIQUID W/A SHARP ALCOHOLIC ODOR
Boiling Point: 243.5F
Melting Point: -130F
Vapor Pressure (MM Hg/70 F): 4.4
Vapor Density (Air=1): 2.55
Specific Gravity: 0.807
Evaporation Rate And Ref: (BU AC=1): 0.5
Solubility In Water: 7.8%
Percent Volatiles By Volume: 100

Fire and Explosion Hazard Data

Flash Point: 84.2F
Flash Point Method: TCC
Lower Explosive Limit: 1.4
Upper Explosive Limit: 11.2
Extinguishing Media: CO2, DRY CHEMICAL/ALCOHOL FOAM
Special Fire Fighting Proc: WEAR FULL PROTECTIVE CLOTHING & SELF CONTAINED

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BREATHING APPARATUS. KEEP FIRE EXPOSED CONTAINERS COOL W/WATER SPRAY.
Unusual Fire And Expl Hazrds: FLAMMABLE. HEAT WILL BUILD PRESSURE & MAY RUPTURE CLOSED STORAGE CONTAINERS. AUTO-IGNITION TEMP: 649.4F.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): HEAT, SPARKS, OPEN FLAME, OPEN CONTAINERS, POOR VENTILATION & DIRECT SUNLIGHT.
Materials To Avoid: STRONG OXIDIZING AGENTS, STRONG ACIDS & BASES.
Hazardous Decomp Products: CO & OTHER TOXIC VAPORS.
Hazardous Poly Occur: NO

Health Hazard Data

Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: INHALATION: IRRITATION TO THE MUCOUS MEMBRANES. EYES: IRRITATION. SKIN: IRRITAITON/DERMATITIS/TOXIC EFFECTS THROUGH ABSORPTION. INGESTION: GASTROINTESTINAL TRACT IRRITATION. PRODUCT IS A MUCOUS MEMBRANE IRRITANT & CNS DEPRESSANT.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE
Signs/Symptoms Of Overexp: IRRITATION, LACHRYMATION, PHOTOPHOBIA, HEADACHE, DIZZINESS, NAUSEA, INCOORDINATION, DROWSINESS, BLURRING OF VISION, DEFATTING, GI DISCOMFORT.
Med Cond Aggravated By Exp: INDIVIDUALS SUSCEPTIBLE TO DERMATITIS. SIMULTANEOUS EXPOSURE TO N-BUTYL ALCOHOL & EHTYL ALCOHOL CAN INCREASE THE TOXIC HAZARDS OF N-BUTYL ALCOHOL.
Emergency/First Aid Proc: INHALATION: REMOVE TO FRESH AIR. ADMINISTER CPR FLUSH THOROUGHLY FOR 15 MINS. WASH W/SOAP & WATER. INGESTION: ASPIRATION HAZARD-DON'T INDUCE VOMITING. OBTAIN MEDICAL ATTENTION IN ALL CASES.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: PROTECT FROM IGNITION. WEAR PROTECTIVE CLOTHING & USE APPROVED RESPIRATOR EQUIPMENT. ABSORB MATERIAL IN AN ABSORBENT RECOMMENDED FOR SOLVENT SPILLS & REMOVE TO A SAFE LOCATION FOR DISPOSAL BY APPROVED METHODS.
Waste Disposal Method: DISPOSE OF AS AN EPA HAZARDOUS WASTE IN ACCORDANCE W/LOCAL, STATE & FEDERAL REGULATIONS. FLAMMABLE LIQUID NA1120. HAZARDOUS WASTE NO: U031 (IGNITABLE); D001 (IGNITABLE).
Precautions-Handling/Storing: PROTECT FROM EXTREME TEMPS & DIRECT SUNLIGHT. STORE IN AN ACCEPTABLY PROTECTED & SECURE FLAMMABLE LIQUID STORAGE ROOM.
Other Precautions: GROUND & BOND METAL CONTAINERS TO MINIMIZE STATIC SPARKS.

Control Measures

Respiratory Protection: USE APPROVED RESPIRATOR EQUIPMENT (AIR-PURIFYING, AIR-SUPPLIED/SELF CONTAINED BREATHING APPARATUS).
Ventilation: LOCAL/GENERAL DEPENDING ON THE CONDITIONS OF USE, QUANTITY OF MATERIAL & OTHER OPERATING PARAMETERS.
Protective Gloves: NEOPRENE/RUBBER/NITRILE RUBBER

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Eye Protection: SAFETY GLASSES, GOGGLES/FACE SHIELD.
Other Protective Equipment: CHEMICAL RESISTANT CLOTHING, EYE WASH FOUNTAINS & SAFETY SHOWERS
Work Hygienic Practices: REMOVE/LAUNDER CONTAMINATED CLOTHING BEFORE REUSE. REMOVE/DISCARD CONTAMINATED SHOES.

Transportation Data

DOT: Butanol, 3, UN1120, PG III

Disposal Data

Refer to applicable regional, state and federal codes.

Label Data

Common Name: N-BUTYL ALCOHOL
Special Hazard Precautions: INHALATION: IRRITATION TO THE MUCOUS MEMBRANES. EYES: IRRITATION. SKIN: IRRITAITON/DERMATITIS/TOXIC EFFECTS THROUGH ABSORPTION. INGESTION: GASTROINTESTINAL TRACT IRRITATION. PRODUCT IS A MUCOUS MEMBRANE IRRITANT & CNS DEPRESSANT. IRRITATION, LACHRYMATION, PHOTOPHOBIA, HEADACHE, DIZZINESS, NAUSEA, INCOORDINATION, DROWSINESS, BLURRING OF VISION, DEFATTING, GI DISCOMFORT.

The information contained herein is based on data considered to be accurate. However, no warranty is expressed regarding the accuracy of these data or the results to be obtained from the use thereof. It is the user's obligation to determine the conditions of safe use of the product.

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HALLIBURTON

MATERIAL SAFETY DATA SHEET

Product Trade Name: **CALCIUM BROMIDE**

Revision Date: 02-Jan-2007

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Trade Name: CALCIUM BROMIDE
Synonyms: None
Chemical Family: Inorganic Salt
Application: Additive

Manufacturer/Supplier
Baroid Drilling Fluids
a Product Service Line of Halliburton Energy Services, Inc.
P.O. Box 1675
Houston, TX 77251
Telephone: (281) 871-4000
Emergency Telephone: (281) 575-5000

Prepared By
Chemical Compliance
Telephone: 1-580-251-4335

2. COMPOSITION/INFORMATION ON INGREDIENTS

SUBSTANCE	CAS Number	PERCENT	ACGIH TLV-TWA	OSHA PEL-TWA
Calcium bromide	7789-41-5	60 - 100%	Not applicable	Not applicable

3. HAZARDS IDENTIFICATION

Hazard Overview May cause eye, skin, and respiratory irritation.

4. FIRST AID MEASURES

Inhalation If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

Skin Wash with soap and water. Get medical attention if irritation persists. Remove contaminated clothing and launder before reuse.

Eyes In case of contact, or suspected contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention immediately after flushing.

Ingestion Do not induce vomiting. Slowly dilute with 1-2 glasses of water or milk and seek medical attention. Never give anything by mouth to an unconscious person.

Notes to Physician Not Applicable

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5. FIRE FIGHTING MEASURES

Flash Point/Range (F):	Not Determined
Flash Point/Range (C):	Not Determined
Flash Point Method:	Not Determined
Autoignition Temperature (F):	Not Determined
Autoignition Temperature (C):	Not Determined
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Upper (%):	Not Determined

Fire Extinguishing Media	Water fog, carbon dioxide, foam, dry chemical.
Special Exposure Hazards	Decomposition in fire may produce toxic gases.
Special Protective Equipment for Fire-Fighters	Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.
NFPA Ratings:	Health 1, Flammability 0, Reactivity 0
HMIS Ratings:	Flammability 0, Reactivity 0, Health 1

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures	Use appropriate protective equipment. Avoid creating and breathing dust.
Environmental Precautionary Measures	None known.
Procedure for Cleaning / Absorption	Scoop up and remove.

7. HANDLING AND STORAGE

Handling Precautions	Avoid contact with eyes, skin, or clothing. Avoid creating or inhaling dust. Wash hands after use.
Storage Information	Store in a cool, dry location.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls	A well ventilated area to control dust levels.
Respiratory Protection	Dust/mist respirator. (95%)
Hand Protection	Impervious rubber gloves.
Skin Protection	Normal work coveralls.
Eye Protection	Wear safety glasses or goggles to protect against exposure.
Other Precautions	Eyewash fountains and safety showers must be easily accessible.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Solid
Color:	White
Odor:	Odorless
pH:	Not Determined
Specific Gravity @ 20 C (Water=1):	3.35
Density @ 20 C (lbs./gallon):	Not Determined
Bulk Density @ 20 C (lbs/ft3):	Not Determined

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9. PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point/Range (F):	1490
Boiling Point/Range (C):	810
Freezing Point/Range (F):	Not Determined
Freezing Point/Range (C):	Not Determined
Vapor Pressure @ 20 C (mmHg):	Not Determined
Vapor Density (Air=1):	Not Determined
Percent Volatiles:	0
Evaporation Rate (Butyl Acetate=1):	Not Determined
Solubility in Water (g/100ml):	15
Solubility in Solvents (g/100ml):	Not Determined
VOCs (lbs./gallon):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined
Viscosity, Kinematic @ 20 C (centistrokes):	Not Determined
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	Not Determined

10. STABILITY AND REACTIVITY

Stability Data:	Stable
Hazardous Polymerization:	Will Not Occur
Conditions to Avoid	None known.
Incompatibility (Materials to Avoid)	Contact with water. Potassium.
Hazardous Decomposition Products	Hydrogen bromide.
Additional Guidelines	Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure	Eye or skin contact, inhalation.
Inhalation	May cause respiratory irritation.
Skin Contact	May cause skin irritation.
Eye Contact	May cause severe eye irritation.
Ingestion	Irritation of the mouth, throat, and stomach. May cause abdominal pain, vomiting, nausea, and diarrhea.
Aggravated Medical Conditions	Skin disorders.
Chronic Effects/Carcinogenicity	Repeated excessive ingestion may cause central nervous system effects.
Other Information	None known.

Toxicity Tests

Oral Toxicity:	LD50: 4000 mg/kg (Rat)
Dermal Toxicity:	Not determined
Inhalation Toxicity:	Not determined
Primary Irritation Effect:	Not determined

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Carcinogenicity	Not determined
Genotoxicity:	Not determined
Reproductive / Developmental Toxicity:	Ames Test: Negative

12. ECOLOGICAL INFORMATION

Mobility (Water/Soil/Air)	Not determined
Persistence/Degradability	Not determined
Bio-accumulation	Not Determined

Ecotoxicological Information

Acute Fish Toxicity:	Not determined
Acute Crustaceans Toxicity:	Not determined
Acute Algae Toxicity:	Not determined
Chemical Fate Information	Not determined
Other Information	Not applicable

13. DISPOSAL CONSIDERATIONS

Disposal Method	Disposal should be made in accordance with federal, state, and local regulations.
Contaminated Packaging	Follow all applicable national or local regulations.

14. TRANSPORT INFORMATION

Land Transportation

DOT
Not restricted

Canadian TDG
Not restricted

ADR Not restricted

Air Transportation

ICAO/IATA Not restricted

Sea Transportation

IMDG Not restricted

Other Shipping Information

Labels: None

15. REGULATORY INFORMATION

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15. REGULATORY INFORMATION

US Regulations

US TSCA Inventory	All components listed on inventory.
EPA SARA Title III Extremely Hazardous Substances	Not applicable
EPA SARA (311,312) Hazard Class	Acute Health Hazard
EPA SARA (313) Chemicals	This product does not contain a toxic chemical for routine annual "Toxic Chemical Release Reporting" under Section 313 (40 CFR 372).
EPA CERCLA/Superfund Reportable Spill Quantity For This Product	Not applicable.
EPA RCRA Hazardous Waste Classification	If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.
California Proposition 65	All components listed do not apply to the California Proposition 65 Regulation.
MA Right-to-Know Law	Does not apply.
NJ Right-to-Know Law	Does not apply.
PA Right-to-Know Law	Does not apply.

Canadian Regulations

Canadian DSL Inventory	All components listed on inventory.
WHMIS Hazard Class	D2B Toxic Materials

16. OTHER INFORMATION

The following sections have been revised since the last issue of this MSDS
Not applicable

Additional Information	For additional information on the use of this product, contact your local Halliburton representative. For questions about the Material Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.
Disclaimer Statement	This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

*****END OF MSDS*****

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T. deport 1049

MSDS 242-7

TEXAS AROMATICS, LP
MATERIAL SAFETY DATA SHEET
C12 DISTILLATE BLENDSTOCK
SEPTEMBER 14, 2007

SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: C12 DISTILLATE BLENDSTOCK

CHEMICAL NAME:
Alkenes, C11-13, C12 Rich CAS# 68526-58-9

CHEMICAL FAMILY:
Higher Olefins, Dodecene. Petroleum hydrocarbon

PRODUCT DESCRIPTION:
Liquid with characteristic odor containing predominantly C12 olefin isomers.

Emergency Phone Number: **CHEMTREC (800) 424-9300**
Texas Aromatics, LP (713)520-2900
3555 Timmons Lane, Suite 700
Houston, TX 77027

SECTION 2 COMPOSITION/INFORMATION ON INGREDIENTS

The composition of this mixture may be proprietary information. In the event of a medical emergency, compositional information will be provided to a physician or nurse.
This product is hazardous as defined in 29 CFR1910.1200, based on the following compositional information:

OSHA HAZARD	COMPONENT
Combustible	

SECTION 3 HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS

EYE CONTACT:
Slightly irritating but does not injure eye tissue.

SKIN CONTACT:
Occasional brief contact with the liquid will not result in significant irritation unless evaporation is impeded.
Frequent or prolonged contact may irritate.
Low order of toxicity.

INHALATION:
Low order of toxicity.
Vapor concentrations above recommended exposure levels are irritating to the eyes and the respiratory tract, may cause headaches and dizziness, are anesthetic and may have other central nervous system effects.

INGESTION:
Small amounts of the liquid aspirated into the respiratory system during ingestion, or from vomiting, may cause bronchiopneumonia or pulmonary edema.
Minimal toxicity.

SECTION 4 FIRST AID MEASURES

EYE CONTACT:
Flush eyes with large amounts of water until irritation subsides. If irritation persists, get medical attention.

SKIN CONTACT:
Flush with large amounts of water; use soap if available.

INHALATION:
Using proper respiratory protection, immediately remove the affected victim from exposure. Administer artificial respiration if breathing is stopped. Keep at rest. Call for prompt medical attention.

INGESTION:
If swallowed, DO NOT induce vomiting. Keep at rest. Get prompt medical attention.

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SECTION 5 FIRE-FIGHTING MEASURES

FLASH POINT:	39 Deg C. METHOD: ASTM D-93, PMCC, Procedure A
FLAMMABLE LIMITS:	NOTE: Not Available
AUTOIGNITION TEMP.:	NOTE: Not Available

GENERAL HAZARD

Combustible Liquid, can form combustible mixtures at temperatures at or above the flashpoint.
Static Discharge, material can accumulate static charges which can cause an incendiary electrical discharge .
"Empty" containers retain product residue (liquid and/or vapor) and can be dangerous. DO NOT pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner, or properly disposed of.

FIRE FIGHTING

Use water spray to cool fire exposed surfaces and to protect personnel.
Isolate "fuel" supply from fire.
Use foam, dry chemical, or water spray to extinguish fire.
Avoid spraying water directly into storage containers due to danger of boilover.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS

No unusual

SECTION 6 ACCIDENTAL RELEASE MEASURES

LAND SPILL

Eliminate sources of ignition. Prevent additional discharge of material, if possible to do so without hazard. For small spills implement cleanup procedures; for large spills implement cleanup procedures and, if in public area, keep public away and advise authorities. Also, if this product is subject to CERCLA reporting (see Section 15 REGULATORY INFORMATION) notify the National Response Center.
Prevent liquid from entering sewers, watercourses, or low areas. Contain spilled liquid with sand or earth. Do not use combustible materials such as sawdust.

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Recover by pumping (use an explosion proof or hand pump) or with a suitable absorbent.
Consult an expert on disposal of recovered material and ensure conformity to local disposal regulations.

WATER SPILL

Eliminate sources of ignition. Warn occupants and shipping in surrounding and downwind areas of fire and explosion hazard and request all to stay clear.
Remove from surface with suitable adsorbents. If allowed by local authorities and environmental agencies, sinking and/or suitable dispersants may be used in non-confined waters.
Consult an expert on disposal of recovered material and ensure conformity to local disposal regulations.

SECTION 7 STORAGE AND HANDLING

ELECTROSTATIC ACCUMULATION HAZARD

Yes, use proper bonding and/or grounding procedure.
Additional information regarding safe handling of products with static accumulation potential can be ordered by contacting the American Petroleum Institute (API) for API Recommended Practice 2003, entitled "Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents" (American Petroleum Institute, 1220 L Street Northwest, Washington, DC 20005), or the National Fire Protection Association (NFPA) for NFPA 77 entitled "Static Electricity" (National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101).

STORAGE TEMPERATURE Deg F:
Ambient

LOADING/UNLOADING TEMPERATURE Deg F:
Ambient

STORAGE/TRANSPORT PRESSURE mmHg:
Atmospheric

LOADING/UNLOADING VISCOSITY cSt:
1.9

STORAGE AND HANDLING:

Keep container closed. Handle and open containers with care. Store in a cool, well ventilated place away from incompatible materials.
Do NOT handle or store near an open flame, heat or other sources of ignition. Protect material from direct sunlight.
Material will accumulate static charges which may cause an electrical spark (ignition source). Use proper bonding and/or grounding procedures.

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Do NOT pressurize, cut, heat, or weld containers. Empty product containers may contain product residue. Do NOT reuse empty containers without commercial cleaning or reconditioning.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE CONTROLS

The use of mechanical dilution ventilation is recommended whenever this product is used in a confined space, is heated above ambient temperatures, or is agitated.

PERSONAL PROTECTION

For open systems where contact is likely, wear safety glasses with side shields, long sleeves, and chemical resistant gloves.
Where contact may occur, wear safety glasses with side shields.
Where concentrations in air may exceed the limits given in this Section and engineering, work practice or other means of exposure reduction are not adequate, NIOSH approved respirators may be necessary to prevent overexposure by inhalation.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

SPECIFIC GRAVITY at Deg F:	0.77 at 68
VAPOR PRESSURE, mmHg at Deg F:	< 51.68 at 100
SOLUBILITY IN WATER, wt. % at Deg F:	Insoluble
VISCOSITY OF LIQUID, cSt at Deg F:	1.9 at 68
SP. GRAV. OF VAPOR, at 1 atm (Air=1):	5.81
FREEZING/MELTING POINT, Deg F:	-148
EVAPORATION RATE, n-Bu Acetate=1:	Less Than 0.1
BOILING POINT, Deg F:	356 to 424

SECTION 10 STABILITY AND REACTIVITY

STABILITY:

Stable

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HAZARDOUS POLYMERIZATION:
Will not occur

CONDITIONS TO AVOID HAZARDOUS POLYMERIZATION:
Not Applicable

MATERIALS AND CONDITIONS TO AVOID INCOMPATIBILITY:
Strong oxidizing agents, inorganic acids, halogenated compounds, halogens, molten sulfur.

HAZARDOUS DECOMPOSITION PRODUCTS:
None

SECTION 11 TOXICOLOGICAL INFORMATION

Please refer to Section 3 for available information on potential health effects.

SECTION 12 ECOLOGICAL INFORMATION

No specific ecological data are available for this product. Please refer to Section 6 for information regarding accidental releases and Section 15 for regulatory reporting information.

SECTION 13 DISPOSAL CONSIDERATIONS

Please refer to Sections 5, 6 and 15 for disposal and regulatory information.

SECTION 14 TRANSPORT INFORMATION

DEPARTMENT OF TRANSPORTATION (DOT):

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DOT SHIPPING DESCRIPTION: Combustible liquid, N.O.S., (C12 olefins), Combustible liquid, NA 1993, PG III.
International shipping: Flammable liquid, N.O.S., (C12 olefins), 3, NA 1993, PG III (for all sizes of containers).

SECTION 15 REGULATORY INFORMATION

TSCA:
This product is listed on the TSCA Inventory as a UVCB (Unknown, Variable Composition or Biological) Chemical at CAS Registry Number 68526-58-9

CERCLA:
If this product is accidentally spilled, it is not subject to any special reporting under the requirements of the Comprehensive Environmental Response, Compensation and Liability Act. We recommend you contact local authorities to determine if there may be other local reporting requirements.

SARA TITLE III:
Under the provisions of Title III, Sections 311/312 of the Superfund Amendments and Reauthorization Act, this product is classified into the following hazard categories:
Fire.
This information may be subject to the provisions of the Community Right-to-Know Reporting Requirements (40 CFR 370) if threshold quantity criteria are met.
This product does not contain Section 313 Reportable Ingredients.

SECTION 16 OTHER INFORMATION

NOTES:
1. Air exposure must be minimized to limit build up of peroxides which will concentrate in bottoms if product is distilled.
Product must not be distilled to dryness if peroxide concentration is substantially above 10 ppm as active oxygen since explosive decomposition may occur. Distillate must be immediately inhibited in line from condenser to minimize peroxide formation.

If product is to be distilled washing with aqueous ferrous ammonium sulphate will destroy peroxides but the product must be immediately re-inhibited.

INTERNATIONAL PACKAGE CLASSIFICATION: Flammable liquid, N.O.S., (C12

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olefins), 3, NA 1993, PG III (for all sizes of containers).

HAZARD RATING SYSTEMS:

This information is for people trained in:
National Paint & Coatings Association's (NPCA)
Hazardous Materials Identification System (HMIS)
National Fire Protection Association (NFPA 704)
Identification of the Fire Hazards of Materials

	NPCA-HMIS	NFPA 704	KEY
HEALTH	2	1	4 = Severe
FLAMMABILITY	2	2	3 = Serious
REACTIVITY	1	1	2 = Moderate
			1 = Slight
			0 = Minimal

CAUTION: HMIS ratings are based on a 0-4 rating scale with 1 representing minimal hazards or risks, and 4 representing significant hazards or risks. Recommended HMIS ratings should not be used in the absence of a fully implemented HMIS hazard communication program.

This information relates to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is to the best of our knowledge and belief, accurate and reliable as of the date compiled. However, no representation, warranty or guarantee is made as to its accuracy, reliability or completeness. It is the users responsibility to satisfy himself as to the suitability and completeness of such information for his own particular use. We do not accept liability for any loss or damage that may occur from the use of this information nor do we offer warranty against patent infringement.

This information is to the best of our knowledge and belief, accurate and reliable as of the date compiled. However, no representation, warranty or guarantee is made as to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability and completeness of such information for his own particular use. We do not accept liability for any loss or damage that may occur from the use of this information nor do we offer warranty against patent infringement.

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Material Safety Data Sheet
Calcium chloride

ACC# 03900

Section 1 - Chemical Product and Company Identification

MSDS Name: Calcium chloride
Catalog Numbers: AC219170000, AC219170010, AC219170025, AC219170250, AC219175000, AC297150000, AC297150250, AC297155000, AC300380000, AC300380010, AC300380025, AC300382500, AC349610000, AC349610250, AC349615000, S71923, S71924, S73000, S73046, S799422, S93162, C614-10, C614-3, C614-500, C77-212, C77-500, NC9297837, NC9830185
Synonyms: Calpus; Caltac; Dowflake; Liquidow; Peladow; Snowmelt; Superflake anhydrous.
Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100
Emergency Number: 201-796-7100
For CHEMTREC assistance, call: 800-424-9300
For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10043-52-4	Calcium chloride	>96	233-140-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.
Warning! May be harmful if swallowed. May cause severe respiratory and digestive tract irritation with possible burns. May cause severe eye and skin irritation with possible burns. May cause cardiac disturbances. Hygroscopic (absorbs moisture from the air).
Target Organs: Eyes.

Potential Health Effects
Eye: Contact with eyes may cause severe irritation, and possible eye burns.

Skin: Contact with skin causes irritation and possible burns, especially if the skin is wet noist.
igestion: May cause severe gastrointestinal tract irritation with nausea, vomiting and possible burns. May cause cardiac disturbances. May be harmful if swallowed. In very severe cases, seizures, rapid respiration, slow heartbeat, or death, may
Inhalation: May cause severe irritation of the upper respiratory tract with pain, burns, and inflammation.
Chronic: Effects may be delayed.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.
Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.
Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. Do NOT ·se mouth-to-mouth resuscitation.
otes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.
Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.
Flash Point: Not applicable.
Autoignition Temperature: Not applicable.
Explosion Limits, Lower: Not available.
Upper: Not available.
NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

eneral Information: Use proper personal protective equipment as indicated in Section

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Keep container tightly closed. Do not get on skin or in eyes. Do not ingest or inhale. Wash clothing before reuse. Always use cool water when dissolving calcium chloride. Heat evolved is significant.
Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Calcium chloride	none listed	none listed	none listed

OSHA Vacated PELs: Calcium chloride: No OSHA Vacated PELs are listed for this chemical.
Personal Protective Equipment
Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin: Wear impervious gloves.
Clothing: Wear appropriate protective clothing to minimize contact with skin.
Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: white
Odor: odorless
pH: Not available.

Vapor Pressure: Not available.
por Density: Not available.
/aporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 1600 deg C @ 760 mmHg
Freezing/Melting Point:782 deg C
Decomposition Temperature: Not available.
Solubility: Soluble.
Specific Gravity/Density:2.1500 g/cm3
Molecular Formula: CaCl2
Molecular Weight:110.99

Section 10 - Stability and Reactivity

Chemical Stability: Stable.
Conditions to Avoid: Dust generation, excess heat, exposure to moist air or water.
Incompatibilities with Other Materials: Bromine trifluoride, Furan-2-peroxycarboxylic acid, Solutions attack some metals..
Hazardous Decomposition Products: Hydrogen chloride, calcium oxide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 10043-52-4: EV9800000
LD50/LC50:
CAS# 10043-52-4:
Oral, mouse: LD50 = 1940 mg/kg;
Oral, rabbit: LD50 = 1384 mg/kg;
Oral, rat: LD50 = 1 gm/kg;

Carcinogenicity:
CAS# 10043-52-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: Mutagenic effects have occurred in experimental animals.
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 10043-52-4 is listed on the TSCA inventory.
Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
CERCLA Hazardous Substances and corresponding RQs
None of the chemicals in this material have an RQ.
SARA Section 302 Extremely Hazardous Substances
None of the chemicals in this product have a TPQ.
SARA Codes

CAS # 10043-52-4: immediate, delayed, reactive.

Section 313 No chemicals are reportable under Section 313.

'ean Air Act:

This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10043-52-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

;k Phrases:

R 36 Irritating to eyes.

Safety Phrases:

S 22 Do not breathe dust.
S 24 Avoid contact with skin.

WGK (Water Danger/Protection)

CAS# 10043-52-4: 0

Canada - DSL/NDSL

CAS# 10043-52-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Section 16 - Additional Information

)S Creation Date: 12/12/1997
Revision #7 Date: 6/06/2006

The information above is believed to be accurate and represents the best information currently available to . However, we make no warranty of merchantability or any other warranty, express or implied, with spect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Material Safety Data Sheet

acc. to OSHA and ANSI

Printing date 08/28/2006 Reviewed on 08/25/2006

1 Identification of substance:

Product details:

Product name: Calcium hydroxide

Stock number: 14662

Manufacturer/Supplier:
Alfa Aesar, A Johnson Matthey Company
Johnson Matthey Catalog Company, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Emergency Phone: (978) 521-6300
CHEMTREC: (800) 424-9300
Web Site: www.alfa.com

Information Department: Health, Safety and Environmental Department
Emergency information:
During normal hours the Health, Safety and Environmental Department.
After normal hours call Chemtrec at (800) 424-9300.

2 Composition/Data on components:

Chemical characterization:
Description: (CAS#)
Calcium hydroxide (CAS# 1305-62-0): 100%
Identification number(s):
EINECS Number: 215-137-3

3 Hazards identification

Hazard description:

C Corrosive

Information pertaining to particular dangers for man and environment
R 34 Causes burns.
Classification system
HMIS ratings (scale 0-4)
(Hazardous Materials Identification System)

Health (acute effects) = 2
Flammability = 0
Reactivity = 1

4 First aid measures

General information
Immediately remove any clothing soiled by the product.
After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm.
Seek immediate medical advice.
After skin contact
Immediately wash with water and soap and rinse thoroughly.
Seek immediate medical advice.

(Contd. on page 2)

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Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 08/28/2006 Reviewed on 08/25/2006

Product name: Calcium hydroxide

(Contd. of page 1)

After eye contact
Rinse opened eye for several minutes under running water. Then consult a doctor.
After swallowing Seek immediate medical advice.

5 Fire fighting measures

Suitable extinguishing agents
CO2, sand, extinguishing powder. Do not use water.
For safety reasons unsuitable extinguishing agents Water
Special hazards caused by the material, its products of combustion or resulting gases:
In case of fire, the following can be released:
Metal oxide fume
Protective equipment:
Wear self-contained respirator.
Wear fully protective impervious suit.

6 Accidental release measures

Person-related safety precautions:
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation
Measures for environmental protection:
Do not allow material to be released to the environment without proper governmental permits.
Measures for cleaning/collecting:
Use neutralizing agent.
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
Additional information:
See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

Handling
Information for safe handling:
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation at the workplace.
Information about protection against explosions and fires:
The product is not flammable

Storage
Requirements to be met by storerooms and receptacles:
No special requirements.
Information about storage in one common storage facility:
Do not store together with acids.
Further information about storage conditions:
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.

(Contd. on page 3)

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Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 08/28/2006 Reviewed on 08/25/2006

Product name: Calcium hydroxide

(Contd. of page 2)

8 Exposure controls and personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Components with limit values that require monitoring at the workplace:

Calcium hydroxide

	mg/m3	
ACGIH TLV	5	
Austria MAK	5	
Belgium TWA	5	
Denmark TWA	5	
Finland TWA	5	
France VME	5	
Korea TLV	5	
Norway TWA	5	
Poland TWA	2	
Switzerland MAK-W	5	
United Kingdom	5	-LTEL
USA PEL	5	(respirable fraction)
	15	(total dust)

Additional information: No data

Personal protective equipment
General protective and hygienic measures
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.
Breathing equipment:
Use suitable respirator when high concentrations are present.
Protection of hands:
Check protective gloves prior to each use for their proper condition.
Impervious gloves
Material of gloves
The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.
Eye protection:
Safety glasses
Tightly sealed goggles
Full face protection
Body protection: Protective work clothing.

9 Physical and chemical properties:

General Information	
Form:	Powder
Color:	White
Odor:	Odorless
Change in condition	
Melting point/Melting range:	580°C (1076°F)
Boiling point/Boiling range:	Not determined

(Contd. on page 4)

EPAPA008000762

Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 08/28/2006 Reviewed on 08/25/2006

Product name: Calcium hydroxide

(Contd. of page 3)

Sublimation temperature / start:	Not determined
Flash point:	Not applicable
Ignition temperature:	Not determined
Decomposition temperature:	Not determined
Danger of explosion:	Product does not present an explosion hazard.
Explosion limits:	
Lower:	Not determined
Upper:	Not determined
Vapor pressure:	Not determined
Density at 20°C (68°F):	2.24 g/cm³

10 Stability and reactivity

Thermal decomposition / conditions to be avoided:
Decomposition will not occur if used and stored according to specifications.
Materials to be avoided: Acids
Dangerous reactions No dangerous reactions known
Dangerous products of decomposition: Metal oxide fume

11 Toxicological information

Acute toxicity:

LD/LC50 values that are relevant for classification:		
Oral	LD50	7300 mg/kg (mus)
		7340 mg/kg (rat)
Irritation of eyes	severe	10 mg (rbt)

Primary irritant effect:
on the skin:
Corrosive effect on skin and mucous membranes.
Irritant to skin and mucous membranes.
on the eye:
Strong corrosive effect.
Irritating effect.
Sensitization: No sensitizing effects known.
Other information (about experimental toxicology):
Mutagenic effects have been observed on tests with laboratory animals.
Subacute to chronic toxicity:
Corrosive materials are acutely destructive to the respiratory tract, eyes, skin and digestive tract. Eye contact may result in permanent damage and complete vision loss. Inhalation may result in respiratory effects such as inflammation, edema, and chemical pneumonitis. May cause coughing, wheezing, laryngitis, shortness of breath, headache, nausea and vomiting. Ingestion may cause damage to the mouth, throat and esophagus. May cause skin burns or irritation depending on the severity of the exposure.

(Contd. on page 5)

EPAPA008000763

Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 08/28/2006 Reviewed on 08/25/2006

Product name: Calcium hydroxide

(Contd. of page 4)

Additional toxicological information:
Swallowing will lead to a strong corrosive effect on mouth and throat and to the danger of perforation of esophagus and stomach.
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.

12 Ecological information:

General notes:
Do not allow material to be released to the environment without proper governmental permits.

13 Disposal considerations

Product:
Recommendation
Consult state, local or national regulations to ensure proper disposal.

Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.

14 Transport information

DOT regulations:

Hazard class:	8
Identification number:	UN3262
Packing group:	III
Proper shipping name (technical name):	CORROSIVE SOLID, BASIC, INORGANIC, N.O.S. (calcium hydroxide)
Label	8

Land transport ADR/RID (cross-border)

ADR/RID class:	8 (C6) Corrosive substances
Danger code (Kemler):	80
UN-Number:	3262
Packaging group:	III
Description of goods:	3262 CORROSIVE SOLID, BASIC, INORGANIC, N.O.S. (calcium hydroxide)

(Contd. on page 6)

EPAPA008000764

Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 08/28/2006 Reviewed on 08/25/2006

Product name: Calcium hydroxide

(Contd. of page 5)

Maritime transport IMDG:

IMDG Class:	8
UN Number:	3262
Label	8
Packaging group:	III
Proper shipping name:	CORROSIVE SOLID, BASIC, INORGANIC, N.O.S. (calcium hydroxide)

Air transport ICAO-TI and IATA-DGR:

ICAO/IATA Class:	8
UN/ID Number:	3262
Label	8
Packaging group:	III
Proper shipping name:	CORROSIVE SOLID, BASIC, INORGANIC, N.O.S. (calcium hydroxide)

15 Regulations

Product related hazard informations:

Hazard symbols:
C Corrosive

Risk phrases:
34 Causes burns.

Safety phrases:
20 When using do not eat or drink.
26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
45 In case of accident or if you feel unwell, seek medical advice immediately.
60 This material and its container must be disposed of as hazardous waste.

National regulations
All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.
All components of this product are listed on the Canadian Domestic Substances List (DSL).

Information about limitation of use:
For use only by technically qualified individuals.

(Contd. on page 7)

EPAPA008000765

Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 08/28/2006 Reviewed on 08/25/2006

Product name: Calcium hydroxide

(Contd. of page 6)

16 Other information:

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing MSDS: Health, Safety and Environmental Department.
Contact: Darrell R. Sanders

USA

Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 03/26/2007 Reviewed on 01/26/2007

1 Identification of substance:

Product details:

Product name: Calcium stearate

Stock number: 39423

Manufacturer/Supplier:
Alfa Aesar, A Johnson Matthey Company
Johnson Matthey Catalog Company, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Emergency Phone: (978) 521-6300
CHEMTREC: (800) 424-9300
Web Site: www.alfa.com

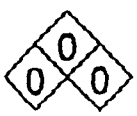
Information Department: Health, Safety and Environmental Department
Emergency information:
During normal hours the Health, Safety and Environmental Department.
After normal hours call Chemtrec at (800) 424-9300.

2 Composition/Data on components:

Chemical characterization:
Description: (CAS#)
calcium stearate (CAS# 1592-23-0); 100%
Identification number(s):
EINECS Number: 216-472-8

3 Hazards identification

Hazard description: Not applicable
Information pertaining to particular dangers for man and environment
Not applicable
Classification system
NFPA Ratings (scale 0-4)



Health = 0
Fire = 0
Reactivity = 0

HMIS ratings (scale 0-4)
(Hazardous Materials Identification System)

HEALTH	1
FIRE	1
REACTIVITY	1

Health (acute effects) = 1
Flammability = 1
Reactivity = 1

4 First aid measures

After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm.
Seek immediate medical advice.
After skin contact
Immediately wash with water and soap and rinse thoroughly.
Seek immediate medical advice.
After eye contact
Rinse opened eye for several minutes under running water. Then consult a doctor.

(Contd. on page 2)

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Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 03/26/2007 Reviewed on 01/26/2007

Product name: Calcium stearate

(Contd. of page 1)

After swallowing Seek medical treatment.

5 Fire fighting measures

Suitable extinguishing agents
Product is not flammable. Use fire fighting measures that suit the surrounding fire.
Protective equipment:
Wear self-contained respirator.
Wear fully protective impervious suit.

6 Accidental release measures

Person-related safety precautions:
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation
Measures for environmental protection:
Do not allow material to be released to the environment without proper governmental permits.
Measures for cleaning/collecting: Pick up mechanically.
Additional information:
See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

Handling
Information for safe handling:
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.
No special precautions are necessary if used correctly.
Information about protection against explosions and fires:
No special measures required.

Storage
Requirements to be met by storerooms and receptacles:
No special requirements.
Information about storage in one common storage facility:
Store away from oxidizing agents.
Further information about storage conditions:
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.

8 Exposure controls and personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Components with limit values that require monitoring at the workplace:

Stearates

	mg/m3
ACGIH TLV	10
Ireland TWA	10
Netherlands TWA	10

(Contd. on page 3)

Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 03/26/2007 Reviewed on 01/26/2007

Product name: Calcium stearate

(Contd. of page 2)

Additional information: No data

Personal protective equipment
General protective and hygienic measures
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Breathing equipment:
Use suitable respirator when high concentrations are present.
Protection of hands: Impervious gloves
Eye protection: Safety glasses
Body protection: Protective work clothing.

9 Physical and chemical properties:

General Information	
Form:	Powder
Color:	White
Odor:	Odorless
Change in condition	
Melting point/Melting range:	179-180°C (354-356°F)
Boiling point/Boiling range:	Not determined
Sublimation temperature / start:	Not determined
Flash point:	Not applicable
Flammability (solid, gaseous)	Product is not flammable.
Ignition temperature:	Not determined
Decomposition temperature:	Not determined
Danger of explosion:	Product does not present an explosion hazard.
Explosion limits:	
Lower:	Not determined
Upper:	Not determined
Vapor pressure:	Not determined
Density:	Not determined
Solubility in / Miscibility with	
Water:	Insoluble

10 Stability and reactivity

Thermal decomposition / conditions to be avoided:
Decomposition will not occur if used and stored according to specifications.
Materials to be avoided: Oxidizing agents
Dangerous reactions Reacts with oxidizing agents
Dangerous products of decomposition: Carbon monoxide and carbon dioxide

USA

(Contd. on page 4)

Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 03/26/2007 Reviewed on 01/26/2007

Product name: Calcium stearate

(Contd. of page 3)

11 Toxicological information

Acute toxicity:

LD/LC50 values that are relevant for classification:		
Oral	LD50	>10000 mg/kg (mus) >10000 mg/kg (rat)
Inhalative	LC50/4H	>1241 mg/m3/4H (mam)

Primary irritant effect:
on the skin: May cause irritation
on the eye: Powder: irritant effect
Sensitization: No sensitizing effects known.
Subacute to chronic toxicity:
The toxicity of calcium compounds is generally due to the anion. Toxicity, as indicated by the LC50 and LD50 data is low. Product may have irritating effects at lower exposure levels.
Additional toxicological information:
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
ACGIH A4: Not classifiable as a human carcinogen: Inadequate data on which to classify the agent in terms of its carcinogenicity in humans and/or animals.

12 Ecological information:

General notes:
Do not allow material to be released to the environment without proper governmental permits.

13 Disposal considerations

Product:
Recommendation
Consult state, local or national regulations to ensure proper disposal.

Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.

14 Transport information

Not a hazardous material for transportation.

DOT regulations:
Hazard class: None

Land transport ADR/RID (cross-border)
ADR/RID class: None

Maritime transport IMDG:
IMDG Class: None

Air transport ICAO-TI and IATA-DGR:
ICAO/IATA Class: None

Transport/Additional information:
Not dangerous according to the above specifications.

USA

(Contd. on page 5)

Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 03/26/2007 Reviewed on 01/26/2007

Product name: Calcium stearate

(Contd. of page 4)

15 Regulations

Product related hazard informations:
Observe the general safety regulations when handling chemicals

National regulations
All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.
All components of this product are listed on the Canadian Domestic Substances List (DSL).

Information about limitation of use:
For use only by technically qualified individuals.

16 Other information:
Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing MSDS: Health, Safety and Environmental Department.
Contact: Darrell R. Sanders

USA

MATERIAL SAFETY DATA SHEET

Bayer MaterialScience

Bayer MaterialScience LLC
Product Safety & Regulatory Affairs
100 Bayer Road
Pittsburgh, PA 15205-9741
USA

TRANSPORTATION EMERGENCY

CALL CHEMTREC:	(800) 424-9300
INTERNATIONAL:	(703) 527-3887

NON-TRANSPORTATION

Bayer Emergency Phone:	(412) 923-1800
Bayer Information Phone:	(800) 662-2927

1. Product and Company Identification

Product Name:	CARADOL SC 56-20
Material Number:	3606612
Chemical Family:	Polyether Polyol
Chemical Name:	Poly (Oxyalkylene) Polymer

2. Hazards Identification

Emergency Overview

Color: Clear **Form:** liquid viscous **Odor:** Mild.
Product poses little or no hazard if spilled. Use cold water spray to cool fire-exposed containers to minimize the risk of rupture. Irritating gases/fumes may be given off during burning or thermal decomposition.

Potential Health Effects

Primary Routes of Entry: Skin Contact, Eye Contact

Medical Conditions Aggravated by Exposure: None known.

HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE

General Effects of Exposure
Acute Effects of Exposure
For Product: CARADOL SC 56-20
Not expected to cause any adverse acute health effects.

Chronic Effects of Exposure
For Product: CARADOL SC 56-20
Not expected to cause any adverse chronic health effects.

Carcinogenicity:
No Carcinogenic substances as defined by IARC, NTP and/or OSHA

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3. Composition/Information on Ingredients

Hazardous Components
This material is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200.

4. First Aid Measures

Eye Contact
In case of contact, flush eyes with plenty of lukewarm water. Get medical attention if irritation develops.

Skin Contact
In case of skin contact, wash affected areas with soap and water. Thoroughly clean shoes before reuse. Wash clothing before reuse. Get medical attention if irritation develops and persists.

Inhalation
If inhaled, remove to fresh air. If breathing is difficult, give oxygen. Get medical attention if irritation develops.

Ingestion
If ingested, do not induce vomiting unless directed to do so by medical personnel. Get medical attention.

5. Fire-Fighting Measures

Suitable Extinguishing Media: carbon dioxide (CO2), dry chemical, foam, water spray for large fires.

Special Fire Fighting Procedures
Firefighters should be equipped with self-contained breathing apparatus to protect against potentially toxic and irritating fumes. Use cold water spray to cool fire-exposed containers to minimize risk of rupture. Toxic and irritating gases/fumes may be given off during burning or thermal decomposition.

6. Accidental release measures

Spill and Leak Procedures
Dike or dam spilled material and control further spillage, if possible. Cover spill with inert material (e. g., dry sand or earth) and collect for proper disposal. Collect and place in appropriately marked sealable containers for disposal. Wash spill area with soap and water.

7. Handling and Storage

Storage Temperature:

minimum:	20 °C (68 °F)
maximum:	60 °C (140 °F)

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Storage Period
36 Months

Handling/Storage Precautions
Handle in accordance with good industrial hygiene and safety practices. Wash thoroughly after handling. Keep container closed when not in use. Material is hygroscopic and may absorb small amounts of atmospheric moisture. If contamination with isocyanates is suspected, do not reseal containers. Avoid inhalation of vapour or mist.

8. Exposure Controls / Personal Protection

Country specific exposure limits have not been established or are not applicable

Industrial Hygiene/Ventilation Measures
Under normal conditions of use, special ventilation is not required.

Respiratory Protection
None required under normal conditions of use., NIOSH approved air-supplied respirator during die cleaning, high temperature processing or when thermal decomposition is suspected.

Hand Protection
Permeation resistant gloves., Butyl rubber gloves., Nitrile rubber gloves., Neoprene gloves

Eye Protection
safety glasses with side-shields.

Skin and body protection
No special skin protection requirements during normal handling and use.

Additional Protective Measures
Employees should wash their hands and face before eating, drinking, or using tobacco products. Educate and train employees in the safe use and handling of this product.

9. Physical and chemical properties

Form:	liquid
Appearance:	viscous
Color:	Clear
Odor:	Mild
pH:	Approximately 7
Freezing Point:	< -8.89 °C (< 16 °F)
Boiling Point/Range:	No Data Available
Flash Point:	> 93.33 °C (> 200 °F)
Vapor Pressure:	< 0.001 mmHg @ 25 °C (77 °F)
Specific Gravity:	Approximately 1.01 - 1.05
Solubility in Water:	Slightly Soluble
Viscosity, Dynamic:	Approximately 540 - 1,233 cP @ 20 °C (68 °F)
Bulk Density:	8.428 - 8.762 lb/gal
Molecular Weight:	2,000
Hygroscopicity:	hygroscopic

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10. Stability and Reactivity

Hazardous Reactions
Hazardous polymerization does not occur.

Stability
Stable

Materials to avoid
oxidizing agents, Isocyanates

Hazardous decomposition products
By Fire and Thermal Decomposition: Carbon dioxide (CO2), carbon monoxide (CO), oxides of nitrogen (NOx), dense black smoke, Other undetermined compounds

11. Toxicological Information

No information available.

12. Ecological Information

No information available.

13. Disposal considerations

Waste Disposal Method
Waste disposal should be in accordance with existing federal, state and local environmental control laws.

Empty Container Precautions
Recondition or dispose of empty container in accordance with governmental regulations. Empty containers retain product residue; observe all precautions for product. Do not heat or cut container with electric or gas torch.

14. Transportation information

Land transport (DOT)
Non-Regulated

Sea transport (IMDG)
Non-Regulated

Air transport (ICAO/IATA)
Non-Regulated

15. Regulatory Information

United States Federal Regulations

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OSHA Hazcom Standard Rating: Non-Hazardous

US. Toxic Substances Control Act: Listed on the TSCA Inventory.

US. EPA CERCLA Hazardous Substances (40 CFR 302):
Components
None

SARA Section 311/312 Hazard Categories:
Non-hazardous under Section 311/312

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A):
Components
None

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required:
Components
None

US. EPA Resource Conservation and Recovery Act (RCRA) Composite List of Hazardous Wastes and Appendix VIII Hazardous Constituents (40 CFR 261):
If discarded in its purchased form, this product would not be a hazardous waste either by listing or by characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste. (40 CFR 261.20-24)

State Right-To-Know Information
The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

Massachusetts, New Jersey or Pennsylvania Right to Know Substance Lists:

Weight %	Components	CAS-No.
99 - 100%	Polyether Polyol	9082-00-2

California Prop. 65:
To the best of our knowledge, this product does not contain any of the listed chemicals, which the state of California has found to cause cancer, birth defects or other reproductive harm.

16. Other Information

NFPA 704M Rating

Health	0
Flammability	1
Reactivity	0
Other	

0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

HMIS Rating

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Health	0
Flammability	1
Physical Hazard	0

0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe
* = Chronic Health Hazard

The method of hazard communication for Bayer MaterialScience LLC is comprised of Product Labels and Material Safety Data Sheets. HMIS and NFPA ratings are provided by Bayer MaterialScience LLC as a customer service.

Contact Person:	Product Safety Department
Telephone:	(412) 777-2835
MSDS Number:	R302460
Version Date:	02/10/2007
Report Version:	1.8

This information is furnished without warranty, express or implied. This information is believed to be accurate to the best knowledge of Bayer MaterialScience LLC. The information in this MSDS relates only to the specific material designated herein. Bayer MaterialScience LLC assumes no legal responsibility for use of or reliance upon the information in this MSDS.

EPAPA008000777

LAST CONTAINED LT 791

HEXION
Specialty Chemicals

MATERIAL SAFETY DATA SHEET

FOR INDUSTRIAL USE ONLY

DESCRIPTION: Cascophen SP-741HE.1, SP-741HE.2, SP-743

1. Chemical Product and Company Identification

DESCRIPTION:	**Cascophen SP-741HE.1, SP-741HE.2, SP-743**
PRODUCT CODE:	357677GEN
PRODUCT TYPE:	Liquid PF Resin
APPLICATION:	Southern Pine Plywood

This MSDS covers the following product trade names: Cascophen SP-741HE.1, SP-741HE.2, SP-743HE, SP-741HE.3, SP-741HE.4, SP-741HE.2DIB, SP-743HEW, SP-741HE.5

The MSDS is not to be used as a specification sheet. For Specific technical information on any of the above products, a sales specification sheet should be obtained from your Hexion representative.

Part of the CASCO® Brand of Adhesives and Resins from Hexion

Manufacturer/Supplier Information

MSDS prepared by:
Hexion Specialty Chemicals, Inc.
155 West A Street, Bldg. A-1
Springfield, Oregon
97477

For Emergency Medical Assistance
Call Health & Safety Information Services
1-866-303-6949

For additional health and safety or regulatory information, call (541)744-3256.

2. Hazards Identification

2.1 Emergency Overview

Appearance	Clear, reddish-brown liquid
Odor	Slight aromatic

CAUTION!
Will polymerize at high temperatures with some evolution of heat.
Hazardous polymerization may occur.
Causes eye irritation.
May cause allergic skin reaction.

HMIS Rating

HEALTH	=	2 (moderate)
FLAMMABILITY	=	0 (minimal)
REACTIVITY	=	1 (slight)

HMIS® ratings involve data interpretations that may vary from company to company. They are intended only for the rapid, general identification of the magnitude of the specific hazard. To deal adequately with the safe handling of this

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material, all the information contained in this MSDS must be considered.

2.2 Potential Health Effects

Immediate Hazards

INGESTION:	Not expected to be harmful under normal conditions of use. If accidentally swallowed, burns or irritation to mucous membranes, esophagus or GI tract can result.
INHALATION:	Not expected to be harmful under normal conditions of use. However, if allowed to become airborne, may cause irritation of nose, throat and lungs.
SKIN:	May cause irritation on prolonged or repeated contact.
EYES:	Causes irritation.

Delayed Hazards

None of the components present in this product at concentrations equal to or greater than 0.1% have been listed by NTP, classified by IARC, nor regulated by OSHA as a carcinogen.

Note: Residual formaldehyde gas may be released from this product during processing. The amount and level will depend on local conditions of use. Formaldehyde gas is irritating to the eyes and upper respiratory tract and may aggravate existing respiratory conditions or allergies. OSHA has listed formaldehyde as a probable human carcinogen. See the OSHA formaldehyde standard 29 CFR 1910.1048 for further details. The International Agency for Research on Cancer (IARC) has classified formaldehyde as carcinogenic to humans.

3. Composition, Information on Ingredients

The ingredients listed below have been associated with one or more immediate and/or delayed(*) health hazards. Risk of damage and effects depends upon duration and level of exposure. BEFORE USING, HANDLING, OR EXPOSURE TO THESE INGREDIENTS, READ AND UNDERSTAND THE MSDS.

		% by weight
40798-65-0	**Phenol-Formaldehyde Polymer Sodium Salt**	**10.0 - 30.0**
120712-84-7	**Formaldehyde, Polymer With Phenol, Potassium Salt**	**10.0 - 30.0**

Any applicable Canadian trade secret numbers will be listed in Section 15.2.

4. First Aid Measures

INGESTION:	If accidentally swallowed, do not induce vomiting. If the individual is rapidly losing consciousness, unconscious or convulsing, do not give anything by mouth. Immediately contact poison control center or hospital emergency room for any other additional treatment directions.
INHALATION:	If inhaled, remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. Call a physician.
SKIN:	Flush with plenty of water. Remove contaminated clothing. Call a physician if irritation persists.
EYES:	Immediately flush eyes with plenty of water for at least 15 minutes. Eyelids should be held apart during irrigation to ensure water contact

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with entire surface of eyes and lids. Call a physician.

5. Fire Fighting Measures

Suitable Extinguishing Media: In case of fire, water should be used to keep fire-exposed containers cool. Combustion products may include oxides of carbon and nitrogen.

Will not burn unless water has evaporated. Dried material may burn.

6. Accidental Release Measures

Contain and/or absorb spill with inert material (e.g. sand, vermiculite), then place in a suitable container. For large spills, use water spray to disperse vapors and flush spill area. Prevent runoff from entering waterways or sewers. Use appropriate Personal Protective Equipment (PPE).

7. Handling and Storage

7.1 Handling

Handle in accordance with good industrial hygiene and safety practices. These practices include avoiding unnecessary exposure and removal of the material from eyes, skin and clothing. Wash thoroughly after handling. Always use appropriate Personal Protective Equipment (PPE).

INHALATION:	Avoid prolonged or repeated breathing of vapor.
SKIN:	Avoid prolonged or repeated contact with skin and clothing.
EYES:	Avoid contact with eyes.

7.2 Storage

Store at 20°C (68°F) or lower. Keep tightly closed.

8. Exposure Controls/Personal Protection

8.1 Exposure Guidelines

40798-65-0	**Phenol-Formaldehyde Polymer Sodium Salt**
ACGIH TLV	None established
OSHA PEL	None established

120712-84-7	**Formaldehyde, Polymer With Phenol, Potassium Salt**
ACGIH TLV	None established
OSHA PEL	None established

8.2 Exposure Controls

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ENGINEERING CONTROLS: The following exposure control techniques may be used to effectively minimize employee exposure: local exhaust ventilation, enclosed system design, process isolation and remote control in combination with appropriate use of personal protective equipment and prudent work practices. These techniques may not necessarily address all issues pertaining to your operations. We, therefore, recommend that you consult with experts of your choice to determine whether or not your programs are adequate.

If airborne contaminants are generated when the material is heated or handled, sufficient ventilation in volume and air flow patterns should be provided to keep air contaminant concentration levels below acceptable criteria.

8.3 Personal Protection

Use goggles if contact is likely. Wear impervious gloves as required to prevent skin contact.

9. Physical and Chemical Properties

Appearance	Clear, reddish-brown liquid
Odor	Slight aromatic
Odor threshold	Not available
pH	11.0 - 12.0
Freezing point	Less than 0 °C (32 °F)
Boiling point, 760 mm Hg	Approx. 102 °C (216 °F)
Flash point	Not applicable
Evaporation rate	Approx. 0.4 (Butyl Acetate = 1)
Lower explosion limit	Not applicable
Upper explosion limit	Not applicable
Vapor pressure	Approx. 22 mm Hg @25 °C (77 °F)
Vapor density	Not available
Specific gravity	1.1800 - 1.1940
Solubility in water	Infinite
Octanol/water partition coefficient	Not available
Autoignition temperature	Not applicable
Viscosity	400 - 1,000 cPs Brookfield

10. Stability and Reactivity

Chemical Stability

Normally stable, but will polymerize at high temperatures with some evolution of heat.

Incompatible Materials

Oxidizers, acids

Hazardous Decomposition Products

CO, CO2, aldehydes (including formaldehyde), oxides of nitrogen, particulate matter and other organic compounds.

Possibility of Hazardous Reactions

Hazardous polymerization may occur.

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11. Toxicological Information

INHALATION: A similar product was found to be non-toxic by inhalation when tested as described in 16 CFR Part 1500.3 (c)(1) and (2).

SKIN: A similar product was not a primary irritant (primary skin irritation index less than 5.0/8.0) when tested as described in 16 CFR Part 1500.41.

EYES: A similar product was severely irritating when tested as described in 16 CFR Part 1500.42.

40798-65-0 Phenol-Formaldehyde Polymer Sodium Salt
LC50: Not available
LD50: Not available
120712-84-7 Formaldehyde, Polymer With Phenol, Potassium Salt
LC50: Not available
LD50: Not available

12. Ecological Information

No data for ecotoxicity has been found. Effects are expected to be minimal. Phenol-formaldehyde polymers have a very low rate of biodegradation. Bioaccumulation is expected to be minimal. Product is initially a mobile liquid which will solidify on aging. Unreacted monomer may be leached into ground water even after normal curing has occurred.

13. Disposal Considerations

Recover free liquid. Absorb residue and dispose of according to local, state/provincial, and federal requirements.

14. Transport Information

14.1 U.S. Department of Transportation (DOT)

The data provided in this section is for information only and may not be specific to your package size or mode of transport. You will need to apply the appropriate regulations to properly classify your shipment for transportation.

Regulation: Non regulated

14.2 Canadian Transportation of Dangerous Goods (TDG)

Regulation: Non regulated

14.3 Other Regulations

- ***ADR/RID***
  Regulation: Non regulated
- ***IMO/IMDG***
  Regulation: Non regulated
- ***IATA* (Commercial)**
  Regulation: Non regulated
- ***IATA* (Passenger)**

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Regulation: Non regulated

- *ADNR*

Regulation: Non regulated

15. Regulatory Information (Selected Regulations)

15.1 U.S. Federal Regulations

OSHA Hazards Communication Standard 29CFR1910.1200

This material is a "health hazard" and/or a "physical hazard" as determined when reviewed according to the requirements of the Occupational Safety and Health Administration 29 CFR Part 1910.1200 "Hazard Communication" Standard.

SARA Title III: Section 311/312

Reactivity hazard

SARA Title III: Section 313 and 40 CFR Part 372

This product contains the following toxic chemical(s) subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986, and Subpart C-Supplier Notification Requirement of 40 CFR Part 372.

None required per SARA TITLE III SECTION 313.

TSCA Section 8(b) Inventory

All reportable chemical substances are listed on the TSCA Inventory. We rely on certifications of compliance from our suppliers for chemical substances not manufactured by us.

15.2 Canadian Regulations

Workplace Hazardous Materials Information System (WHMIS)

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulation (CPR) and the MSDS contains all the information required by the CPR.

Class D2B

Canadian Environmental Protection Act (CEPA)

All reportable chemical substances are listed on the Domestic Substances List (DSL) or otherwise comply with CEPA new substance notification requirements.

National Pollutant Release Inventory (NPRI)

This product contains the following chemical(s) subject to the reporting requirements of the Canadian Environmental Protection Act (CEPA) subsection 16(1), National Pollutant Release Inventory.

None required.

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16. Other Information

User's Responsibility

The OSHA Hazard Communication Standard 29CFR 1910.1200 and the Workplace Hazardous Materials Information System (WHMIS) require that the information contained on these sheets be made available to your workers. Educate and train your workers regarding OSHA and WHMIS precautions. Instruct your workers to handle this product properly. Consult with appropriate experts to guard against hazards associated with use of this product and its ingredients.

Disclaimer

The information provided herein was believed by Hexion Specialty Chemicals ("Hexion") to be accurate at the time of preparation or prepared from sources believed to be reliable, but it is the responsibility of the user to investigate and understand other pertinent sources of information, to comply with all laws and procedures applicable to the safe handling and use of the product and to determine the suitability of the product for its intended use. All products supplied by Hexion are subject to Hexion's terms and conditions of sale. HEXION MAKES NO WARRANTY, EXPRESS OR IMPLIED, CONCERNING THE PRODUCT OR THE MERCHANTABILITY OR FITNESS THEREOF FOR ANY PURPOSE OR CONCERNING THE ACCURACY OF ANY INFORMATION PROVIDED BY HEXION, except that the product shall conform to Hexion's specifications. Nothing contained herein constitutes an offer for the sale of any product.

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1 PRODUCT AND COMPANY IDENTIFICATION

Thio and Fine Chemicals
Arkema Inc.
2000 Market Street
Philadelphia, PA 19103

EMERGENCY PHONE NUMBERS:
Chemtrec: (800) 424-9300 (24hrs) or (703) 527-3887
Medical: Rocky Mountain Poison Control Center
(866) 767-5089 (24Hrs)

Information Telephone Numbers	Phone Number	Available Hrs
Customer Service	1-800-628-4453	8:30 to 5:30 EST

Product Name	Caustic Soda, Shipment Grade
Product Synonym(s)	
Chemical Family	Alkali
Chemical Formula	NAOH
Chemical Name	Sodium Hydroxide
EPA Reg Num	
Product Use	

2 COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient Name	CAS RegistryNumber	Typical %	OSHA
Carbon disulfide	75-15-0	<0.1%	Y
Sodium hydroxide	1310-73-2	10-15%	Y
Water	7732-18-5	85-90%	N

The substance(s) marked with a "Y" in the OSHA column, are identified as hazardous chemicals according to the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200)

This material is classified as hazardous under Federal OSHA regulation.

The components of this product are all on the TSCA Inventory list.

3 HAZARDS IDENTIFICATION

Emergency Overview
Orange slightly turbid liquid with foul odor.
DANGER!
FLAMMABLE LIQUID AND VAPOR.
CAUSES EYE, SKIN AND RESPIRATORY TRACT BURNS. MAY CAUSE BLINDNESS.
CAUSES SEVERE DIGESTIVE TRACT BURNS.
EVEN DILUTE SOLUTIONS MAY CAUSE BURNS.

Potential Health Effects

Inhalation and skin contact are expected to be the primary routes of occupational exposure to this material. This material is a strong alkali that can be destructive to tissue producing severe burns which are not immediately painful or visible. Contact with body tissues may produce deep ulceration, scarring or loss of sight. Concentrations as low as 2-3% can cause injury. Dermatitis (inflammation of the skin) and superficial skin damage can result from repeated or prolonged contact with very dilute solutions. High levels of dust or mist may be corrosive to mucous membranes producing eye or lung injury and chemical pneumonia. Lower concentrations may produce irritation of eyes, nose or upper respiratory tract with coughing, sore throat and shortness of breath. Prolonged exposure may result in ulceration of the nasal passages. If swallowed, this material may cause severe internal injury, characterized by pain in the mouth

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and stomach, vomiting, and breathing difficulties. Medical conditions which may be aggravated by exposure to this material include lung disease or limited respiratory capacity.

4 FIRST AID MEASURES

IF IN EYES, immediately flush with plenty of water for at least 15 minutes. Get medical attention immediately.

IF ON SKIN, immediately flush with plenty of water. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Destroy contaminated shoes.

IF SWALLOWED, do NOT induce vomiting. Give water to drink. Get medical attention immediately. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

IF INHALED, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

5 FIRE FIGHTING MEASURES

Fire and Explosive Properties

Auto-Ignition Temperature	NE	
Flash Point	70 F - >150 F	Flash Point Method
Flammable Limits- Upper	NE	
Lower	NE	

Extinguishing Media

Use water spray, carbon dioxide, foam or dry chemical.

Fire Fighting Instructions

Fire fighters and others who may be exposed to products of combustion should wear full fire fighting turn out gear (full Bunker Gear) and self-contained breathing apparatus (pressure demand NIOSH approved or equivalent). Fire fighting equipment should be thoroughly decontaminated after use.

Fire and Explosion Hazards

Contact with metal can form hydrogen gas. Hydrogen is extremely flammable and can form explosive mixtures with air. Closed containers may explode when heated or contents contaminated with water.

6 ACCIDENTAL RELEASE MEASURES

In Case of Spill or Leak

Stop the leak, if possible. Ventilate the space involved. Contain, vacuum up, place in non-sparking container for disposal. Prevent waterway contamination. Construct a dike to prevent spreading. Collect run-off and transfer to drums or tanks for later disposal. Consult a regulatory specialist to determine appropriate state or local reporting requirements, for assistance in waste characterization and/or hazardous waste disposal and other requirements listed in pertinent environmental permits.

7 HANDLING AND STORAGE

Handling

Do not get in eyes, on skin or clothing. Avoid breathing vapor or mist. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. To avoid rapid temperature rise, violent spattering, or explosive eruptions: always add caustic to water when mixing. Never add water to a caustic when mixing. Heat water to 80-100 F before adding product. Add small amounts of product slowly and evenly over surface of water with constant stirring. Never increase concentration of product by more than 5% with any single

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7 HANDLING AND STORAGE

addition. Water should not exceed 160 F during addition.

Storage

Do NOT store near strong acids.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls

Investigate engineering techniques to reduce exposures below airborne exposure limits. Provide ventilation if necessary to control exposure levels below airborne exposure limits (see below). If practical, use local mechanical exhaust ventilation at sources of air contamination such as open process equipment. Consult ACGIH ventilation manual or NFPA Standard 91 for design of exhaust systems. Monitor carbon monoxide and oxygen levels in tanks and enclosed spaces.

Eye / Face Protection

Where there is potential for eye contact, wear a face shield, chemical goggles, and have eye flushing equipment immediately available.

Skin Protection

Wear appropriate chemical resistant protective clothing and chemical resistant gloves to prevent skin contact. Consult glove manufacturer to determine appropriate type glove material for given application. Wear face shield and chemical resistant clothing such as a rubber apron when splashing may occur. Rinse contaminated skin promptly. Wash contaminated clothing and clean protective equipment before reuse. Wash skin thoroughly after handling.

Respiratory Protection

Avoid breathing vapor or mist. When airborne exposure limits are exceeded (see below), use NIOSH approved respiratory protection equipment appropriate to the material and/or its components. Consult respirator manufacturer to determine appropriate type equipment for given application. Observe respirator use limitations specified by NIOSH or the manufacturer. For emergency and other conditions where exposure limit may be significantly exceeded, use an approved full face positive-pressure, self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. Respiratory protection programs must comply with 29 CFR § 1910.134.

Airborne Exposure Guidelines for Ingredients

Exposure Limit		Value
Sodium hydroxide		
ACGIH CEILING	-	2 mg/m3
OSHA TWA PEL	-	2 mg/m3
Carbon disulfide		
ACGIH Skin designator	-	Y
ACGIH TWA	-	1 ppm
OSHA Ceiling PEL	-	30 ppm
OSHA TWA PEL	-	20 ppm

-Only those components with exposure limits are printed in this section.
-Skin contact limits designated with a "Y" above have skin contact effect. Air sampling alone is insufficient to accurately quantitate exposure. Measures to prevent significant cutaneous absorption may be required.
-ACGIH Sensitizer designator with a value of "Y" above means that exposure to this material may cause allergic reactions.
-WEEL-AIHA Sensitizer designator with a value of "Y" above means that exposure to this material may cause allergic skin reactions.

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9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance/Odor	Orange slightly turbid liquid with foul odor.
pH	NE
Specific Gravity	1.073 @ 15 C
Vapor Pressure	30 @ 100 F
Vapor Density	NA
Melting Point	NA
Freezing Point	NE
Boiling Point	NE
Solubility In Water	99.98%

10 STABILITY AND REACTIVITY

Stability

This material is chemically stable under normal and anticipated storage and handling conditions.

Incompatibility

Reacts violently or explosively with water, acids and organic materials such as chlorinated hydrocarbons. Toxic carbon monoxide gas can form upon contact with food or beverage products.

Hazardous Decomposition Products

Will react with some metals such as aluminum, tin or zinc to generate hydrogen gas. Hydrogen gas can result in explosive hazards in confined spaces.

11 TOXICOLOGICAL INFORMATION

Toxicological Information

Data on this material and/or its components are summarized below.

Sodium Hydroxide

Single exposure (acute) studies indicate that this material is slightly toxic if absorbed through the skin (rat LD50 1,350 mg/kg; dry sodium hydroxide) and corrosive to rabbit eyes and skin. Many publications in the scientific literature confirm that this material is corrosive to all tissues. Repeated inhalation resulted in lung damage in rats. No tumors were seen in long-term animal studies. No genetic changes were observed in tests using bacteria.

No significant increases in mortality in relation to duration or intensity of exposures were reported in an epidemiologic study of a small group of workers exposed to caustic dust for 30 years or more. Massive ingestion of this material has been implicated as causing esophageal cancer. Squamous cell carcinomas of the esophagus occurred approximately 12-42 years later in individuals who survived accidental childhood ingestion and are likely due to the tissue destruction and possible scarring of the esophagus rather than a direct effect of this material.

Carbon Disulfide

Single exposure (acute) studies indicate that this material is slightly toxic to rats if swallowed (LD50 3,188 mg/kg) or rabbits if absorbed through skin (LD50 2,025 mg/kg), practically non-toxic to rats if inhaled (1-hr LC50 40 mg/l), and severely irritating to rabbit skin and eyes. The neurological effects of long-term exposure have been documented in occupational populations who were generally exposed to levels of 20 ppm or more in viscose rayon production. Exposed workers have experienced headaches, nausea, dizziness, tiredness, memory loss, sleep disturbances, irritability and other psychological symptoms in the early stages of intoxication. Long- term exposure has resulted in decreased nerve conduction velocities, memory loss,

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11 TOXICOLOGICAL INFORMATION

peripheral neuropathy (numbness) in the lower legs and forearms, tremors, poor coordination and personality disorders. In addition, several studies have shown adverse effects on the heart including increases in atherosclerosis, death from coronary or ischemic heart disease and blood pressure. Other studies have indicated that long-term overexposure can cause adverse effects on the eyes including increased hemorrhages or microaneurysms of the retina. Studies of occupationally exposed workers have suggested that long-term exposure to higher levels may cause reproductive effects. Male workers had decreased libido, reduced sperm count and altered endocrine function and female workers reported menstrual irregularities. Sperm from exposed workers have shown alterations indicative of spermatogenic damage. There is conflicting evidence whether increased pregnancy complications and a higher frequency of spontaneous abortions are related to exposures in female workers.

Animal studies have confirmed neurological effects. Rats exposed for long periods to high levels showed decreased motor conduction velocity, hindlimb motor defects, peripheral nerve swelling and degeneration. Repeated exposure of monkeys has resulted in reduced visual acuity. Following inhalation exposure in male rats, minor reproductive effects such as decreased sperm counts and abnormal mating behavior, but no pathological changes were noted in testes. A two-generation reproduction study in exposed female rats showed no reduction in fertility, but mothers exposed to high dose levels had reduced pup viability. Multiple developmental toxicity studies in rats and rabbits have presented evidence of increased birth defects and embryotoxicity at high dose levels; however, exposures at levels that are not maternally toxic generally do not cause birth defects, although developmental effects have been observed. No genetic changes were observed in tests using bacteria, but have been observed in animal cells.

12 ECOLOGICAL INFORMATION

Ecotoxicological Information

Data on this material and/or its components are summarized below.

Sodium Hydroxide
Data from several species of fish showed a range of tolerance (brook trout > spotfin and Lake Emerald shiners > minnows > mosquitofish > goldfish) that was most likely related to changes in the pH produced by addition of sodium hydroxide to the water. The minimum lethal concentration for minnows, Mayfly larvae and Daphnia was 100 ppm and for Chironomus larvae, 700 ppm.

Carbon Disulfide
This material is moderately toxic to Daphnia magna (LC50 2.1 mg/l). It is moderately toxic to guppies (LC50 4 mg/l) and slightly toxic to green algae (LC50 21 mg/l). It is practically non-toxic to mosquitofish (LC50 135 mg/l) and bacteria (LC50 341 mg/l).

Chemical Fate Information

Data on this material and/or its components are summarized below.

Sodium Hydroxide
No data were available, but this material is a strong alkali that easily dissolves in water with resulting acid/base chemistry.

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13 DISPOSAL CONSIDERATIONS

Waste Disposal

Consult with environmental engineer or professional to determine if neutralization is appropriate and for handling procedures for residual materials. Note: Chemical additions to, processing of, or otherwise altering this material may make this waste management information incomplete, inaccurate, or otherwise inappropriate. Furthermore, state and local waste disposal requirements may be more restrictive or otherwise different from federal laws and regulations.

14 TRANSPORT INFORMATION

DOT Name	Flammable Liquid, Corrosive, NOS
DOT Technical Name	(Sodium Hydroxide; Carbon Disulfide)
DOT Hazard Class	3, 8
UN Number	UN 2924
DOT Packing Group	PG II
RQ	Sodium Hydroxide 1000# (dry basis); Carbon Disulfide 100#
DOT Special Information	Subsidiary hazard: 8 Corrosive On a waste manifest, add the word "Waste"

15 REGULATORY INFORMATION

Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370)

Immediate (Acute) Health	Y	Fire	Y
Delayed (Chronic) Health	N	Reactive	N
		Sudden Release of Pressure	N

The components of this product are all on the TSCA Inventory list.

Ingredient Related Regulatory Information:

SARA Reportable Quantities	CERCLA RQ	SARA TPQ
Sodium hydroxide	1000 LBS	
Water	NE	
Carbon disulfide	100 LBS	10000 LBS

SARA Title III, Section 313

This product does contain chemical(s) which are defined as toxic chemicals under and subject to the reporting requirements of. Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372. See Section 2

Carbon disulfide

SARA Title III, Section 302

This product does contain chemical(s). as indicated below, currently on the Extremly Hazardous Substance List, Section 302, SARA Title III. See Section 2 for further details regarding concentrations and registry numbers.

Carbon disulfide

California Prop 65 - Developmental Toxin

This product does contain the following chemical(s), as indicated below, currently on the California List of Developmental Toxins.

Carbon disulfide

Massachusetts Right to Know

This product does contain the following chemicals(s), as indicated below, currently on the Massachusetts Right to Know Substance List.

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Massachusetts Right to Know
This product does contain the following chemicals(s), as indicated below, currently on the Massachusetts Right to Know Substance List.

Carbon disulfide
Sodium hydroxide

New Jersey Right to Know
This product does contain the following chemical(s), as indicated below, currently on the New Jersey Right-to-Know Substances List.

Carbon disulfide
Sodium hydroxide

Pennsylvania Environmental Hazard
This product does contain the following chemical(s), as indicated below, currently on the Pennsylvania Environmental Hazard List.

Carbon disulfide
Sodium hydroxide

Pennsylvania Right to Know
This product does contain the following chemical(s), as indicated below, currently on the Pennsylvania Hazardous Substance List.

Carbon disulfide
Sodium hydroxide

16 OTHER INFORMATION

Revision Information

Revision Date	23 FEB 2007	Revision Number 6
Supercedes Revision Dated	07-NOV-2006	

Revision Summary
Moved from Retired to Active 03.

Key
NE= Not Established NA= Not Applicable (R) = Registered Trademark

Miscellaneous
NOTE: Toxic carbon monoxide gas can form upon contact with food and beverage products in enclosed spaces and cause death.

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Material Safety Data Sheet

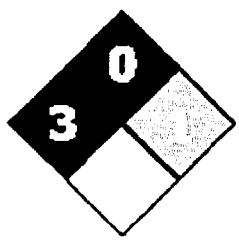
SOCHEM

PPE

HMIS

	3
	0
Reactivity	1

NFPA



Preparation Date 03-Jun-2008 **Revision Date** **Revision Number** 0

1. PRODUCT AND COMPANY IDENTIFICATION

Product Code L-GR CAUSTIC 18-30%
Product Name Lo-Grade Caustic 18-30%
Contact Manufacturer
Sochem Solutions, Inc.
P. O. box 1912
Gonzales, LA 70707
225-644-3180
Emergency Telephone Number CHEMTREC: (call 24 Hours) 1-800-424-9300
or for International calls dial 703-527-3887 (collect calls accepted)

Application of Substance/the prepartion Industrial Cleaning Chemical

2. HAZARDS IDENTIFICATION

Emergency Overview
- The product causes burns of eyes, skin and mucous membranes

Eye contact	• Causes eye burns
Skin contact	• It will cause burns and irritation
Inhalation	• Avoid breathing vapors or mists
Ingestion	• Severe damage to the gastrointestinal tract
Principle Routes of Exposure	Eye contact Skin contact Ingestion Inhalation
Aggravated Medical Conditions	• Existing dermatitis

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS-No	Weight %	EINECS
50% Liquid caustic soda	1310-73-2	18-30	-

29CFR Part 1910, Subpart Z (OSHA) Toxic and Hazardous Substances
Part 355, Appendix A (Extermly Hazardous Substances) EPA
TLV for Chemcial Substances
Annual Report on Carcinogens
Supplier: Material Safety Data Sheets

4. FIRST AID MEASURES

Skin Contact
- Wash with Large amounts of water

Eye Contact
- Flush with water for 15 mintues
- Consult a physician

Inhalation
- Remove to fresh air
- If breathing has stopped, call a physician

Ingestion
- Do not induce vomiting
- Drink large quantity of water, and consult physician

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
- Use extinguishing measures that are appropriate to local circumstances and the surrounding environment

Special Protective Equipment
- None

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions
- Ensure adequate ventilation

Environmental Precautions
- Stop flow and contain spill
- Small spill: Pick up with absorbent material
- Neutralize before disposal

Methods for Clean-up
- Neutralized
- Flush with water to sewer.
- Follow Federal, State and Local regulations
- Large spill reclaim, put in containers

7. HANDLING AND STORAGE

Handling

Safe Handling Advice
- Handle in accordance with good industrial hygiene and safety practice

Storage
- Keep container tightly closed
- Do not store in aluminum containers or use with soft metal parts.

Incompatible products
- Strong Acid

Specific use(s)
- None

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Chemical Name	OSHA PEL	ACGIH TWA
50% Liquid caustic soda	2 mg/m^3	N/A

Personal Protective Equipment

Respiratory Protection
- In case of mist, spray or aerosol exposure wear suitable personal respiratory protection and protective suit

Hand Protection
- Rubber gloves
- Neoprene gloves
- Any chemical resistant gloves

Eye/face Protection
- Chemical goggles
- Face-shield

Skin Protection
- Wear protective gloves/clothing
- Rubber or plastic boots

General Hygiene Considerations
- Avoid breathing mist

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Semi viscous Clear Liquid	**Color**	• Clear
Physical State	• Semi viscous liquid	**pH**	14
Flash Point	N/A	**Autoignition Temperature**	
Boiling Point/Range	288°F		
Solubility	Complete in water	**Vapor Density**	Not est.
Bulk Density	10.60	**Viscosity**	Not available

10. STABILITY AND REACTIVITY

Chemical Stability
- Stable

Incompatible Materials
- Strong acids

Hazardous Decomposition Products
- None under normal use

Hazardous Polymerization
- Hazardous polymerisation does not occur

Possibility of Hazardous Reactions
None under normal processing

11. TOXICOLOGICAL INFORMATION

Local effects

cause irritation	Causes burns. Irritating to skin. dryness of skin.
Eye irritation	Corrosive to the eyes and may cause severe damage including blindness.
Inhalation	May cause irritation of respiratory tract.
Ingestion	Ingestion causes burns of the upper digestive and respiratory tracts.

Long term Effects

12. ECOLOGICAL INFORMATION

Ecotoxicity effects	Contains no substances known to be hazardous to the environment or not degradable in waste water treatment plants
Additional ecological information	No information available

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method	Follow Federal, state and Local regulations.. Large Spill: Reclaim, put in containers. Neutralize before disposal. Flush spill area with water and neutralize with dilute acid if necessary. Do not use aluminum equipment.. Small Spill: Pick up with absorbent material.. Neutralize. Flush with water.
Contaminated Packaging	Keep container closed when not in use.
Further information	Wash contaminated clothing before reuse

14. TRANSPORT INFORMATION

DOT

Proper Shipping Name	HM-SODIUM HYDROXIDE, SOLUTION CORROSIVE LABEL
Hazard Class	8
UN-No	1824
Packing Group	II
ERG Code	ERG-154

15. REGULATORY INFORMATION

R -phrase(s)	None
S -phrase(s)	None
Symbol(s)	Not a hazardous substance or preparation according to EC-directives 67/548/EEC or 99/45/EC
EU Labeling	None
Contains	None

U.S. Inventories

Chemical Name	TSCA	NJRTK	MRTKL	PARTK
50% Liquid caustic soda		N/A		

International Inventories

Chemical Name	TSCA	DSL	EINECS	ENCS	IECSC	KECL	PICCS	AICS
50% Liquid caustic soda	-	-	-	-	-	-	-	-

16. OTHER INFORMATION

Prepared By Sochem Solutions, Inc.

End of MSDS

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MATERIAL SAFETY DATA SHEET

PPG Kansai AUTOMOTIVE FINISHES

SECTION 1 - PRODUCT AND COMPANY INFORMATION

PPG Kansai Automotive Finishes (PKAF)
5875 New King Court
Troy, MI 48098

EMERGENCY PHONE NUMBERS (24 hours/day): (412) 434-4515 (U.S.)
(514) 645-1320 (Canada)
01-800-00-21-400 (Mexico)
0532-3889090 (China)

TECHNICAL INFORMATION: 1-800-245-2590 (CLEVELAND, OH) 8:00 a.m. - 5:00 p.m. EST

PRODUCT SAFETY/MSDS INFORMATION: (412) 492-5555 7:00 a.m. - 4:30 p.m. EST

Product ID: CMS611 (0019-F1)
PRODUCT NAME: CELLOSOLVE ACETATE
SYNONYMS: None
ISSUE DATE: 05/26/2005
EDITION NO.: 1
CHEMICAL FAMILY: SOLVENT

EMERGENCY OVERVIEW:
Combustible. Keep away from heat, sparks, flames, and other sources of ignition. Do not smoke.CAUSES EYE IRRITATION. MAY CAUSE SLIGHT SKIN IRRITATION. MAY BE HARMFUL IF ABSORBED THROUGH THE SKIN.VAPOR AND/OR SPRAY MIST HARMFUL IF INHALED.HARMFUL IF SWALLOWED.

SECTION 2 - COMPOSITION INFORMATION

The following ingredient(s) marked with an "x" are considered hazardous under applicable U.S. OSHA and/or Canadian WHMIS regulations. If no ingredients are listed, then there are no U.S. OSHA and/or Canadian WHMIS hazardous ingredients in this product.

Material/ CAS Number	Percent	Hazardous
2-ETHOXYETHYLACETATE 111-15-9	60- 100	X

SECTION 3 - HAZARDS IDENTIFICATION

ACUTE OVEREXPOSURE EFFECTS

EYE CONTACT:
Causes eye irritation. Redness, itching, burning sensation and visual disturbances may indicate excessive eye contact.

SKIN CONTACT:
May cause slight skin irritation. Dryness, itching, cracking, burning, redness, and swelling are conditions associated with excessive skin contact.

SKIN ABSORPTION:
May be harmful if absorbed through the skin.

INHALATION:
Vapor and/or spray mist harmful if inhaled.

INGESTION:
Harmful if swallowed.

SIGNS & SYMPTOMS OF OVEREXPOSURE:
Repeated exposure to high vapor concentrations may cause irritation of the respiratory system and permanent brain and nervous system damage. Eye watering, headaches, nausea, dizziness and loss of coordination are indications that solvent levels are too high. Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal. Dryness, itching, cracking, burning, redness, and swelling are conditions associated with excessive skin contact.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Not applicable.

CHRONIC OVEREXPOSURE EFFECTS
Avoid long-term and repeated contact.
Repeated exposure to vapors above recommended exposure limits (see Section 8) may cause irritation of the respiratory system and permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal. This product contains an ethyl and/or methyl derivative of an ethylene series glycol ether and/or acetate which has been shown to cause adverse effects on the kidneys, liver, blood and/or blood-forming tissues, birth defects, and reproductive organ damage.
The effects of long-term, low level exposures to this product have not been determined. Safe handling of this material on a long-term basis should emphasize the prevention of all contact with this material to avoid any effects from repetitive acute exposures. See Section 11, of this MSDS for a detailed list of chronic health effects information available on individual ingredients in this product.

SECTION 4 - FIRST AID MEASURES

If ingestion, irritation, any type of overexposure or symptoms of overexposure occur during or persists after use of this product, contact a POISON CONTROL CENTER, EMERGENCY ROOM OR PHYSICIAN immediately; have Material Safety Data Sheet information available.

EYE CONTACT:
Remove contact lens and pour a gentle stream of warm water through the affected eye for at least 15 minutes. If irritation persists, contact a poison control center, emergency room, or physician as further treatment may be necessary.

SKIN CONTACT:
Run a gentle stream of water over the affected area for 15 minutes. A mild soap may be used if available. If any symptoms persist, contact a poison control center, emergency room, or physician as further treatment may be necessary.

INHALATION:
Remove from area to fresh air. If symptomatic, contact a poison control center, emergency room or physician for treatment information.

INGESTION:
Gently wipe or rinse the inside of the mouth with water. Sips of water may be given if person is fully conscious. Never give anything by mouth to an unconscious or convulsing person. Do Not induce vomiting. Contact a poison control center, emergency room or physician right away as further treatment will be necessary.

SECTION 5 - FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES
FLASHPOINT: 125 Degrees F (52 Degrees C)
FLASHPOINT TEST METHOD:
Pensky-Martens Closed Cup
UEL: Not Available.
LEL: 1.8
AUTOIGNITION TEMPERATURE:
Not Available.

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EXTINGUISHING MEDIA:
Use National Fire Protection Association (NFPA) Class B extinguishers (carbon dioxide, dry chemical, or universal aqueous film forming foam) designed to extinguish NFPA Class II combustible liquid fires. Water spray may be ineffective. Water spray may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

PROTECTION OF FIREFIGHTERS:
Fire-fighters should wear self-contained breathing apparatus and full protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
Keep this product away from heat, sparks, flame, and other sources of ignition (i.e., pilot lights, electric motors, static electricity). Invisible vapors can travel to a source of ignition and flash back. Do not smoke while using this product. Keep containers tightly closed when not in use. Closed containers may explode when overheated. Do not apply to hot surfaces. Toxic gases may form when this product comes in contact with extreme heat. May produce hazardous decomposition products when exposed to extreme heat. Extreme heat includes, but is not limited to, flame cutting, brazing, and welding.

SECTION 6 - ACCIDENTAL RELEASE MEASURE

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:
Provide maximum ventilation. Only personnel equipped with proper respiratory, skin, and eye protection should be permitted in the area. Remove all sources of ignition. Take up spilled material with sand, vermiculite, or other noncombustible absorbent material and place in clean, empty containers for disposal. Only the spilled material and the absorbant should be placed in this container.

SECTION 7 - HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN DURING HANDLING AND STORAGE:
Vapors may collect in low areas. If this material is part of a multiple component system, read the Material Safety Data Sheet(s) for the other component or components before blending as the resulting mixture may have the hazards of all of its parts. Containers should be grounded when pouring. Avoid free fall of liquids in excess of a few inches.

STORAGE:
Do not store above 120 degrees F.(48 degrees C.). Store large quantities in buildings designed and protected for storage of NFPA Class II combustible liquids.

SECTION 8 - EXPOSURE CONTROLS & PERSONAL PROTECTION

ENGINEERING CONTROLS:
Provide general dilution or local exhaust ventilation in volume and pattern to keep the concentration of ingredients listed in Section 8 below the lowest suggested exposure limits, the LEL below the stated limit, and to remove decomposition products during welding or flame cutting.

PERSONAL PROTECTIVE EQUIPMENT

EYES:
Wear chemical-type splash goggles when possibility exists for eye contact due to splashing or spraying liquid, airborne particles, or vapors.

SKIN/GLOVES:
Wear protective clothing to prevent skin contact. Apron and gloves should be constructed of: butyl rubber. No specific permeation/degradation testing have been done on protective clothing for this product. Recommendations for skin protection are based on infrequent contact with this product. For frequent contact or total immersion, contact a manufacturer of protective clothing for appropriate chemical impervious equipment. Clean contaminated clothing and shoes.

RESPIRATOR:
Overexposure to vapors may be prevented by ensuring proper ventilation controls, vapor exhaust or fresh air entry. A NIOSH- approved air purifying respirator with the appropriate chemical cartridges or a positive-pressure, air-supplied respirator may also reduce exposure. Read the respirator manufacturer's instructions and literature carefully to determine the type of airborne contaminants against which the respirator is effective, its limitations, and how it is to be properly fitted and used. Provide general dilution or local exhaust ventilation in volume and pattern to keep the concentration of ingredients listed in Section 2 below the lowest suggested exposure limits, the LEL below the stated limit, and to remove decomposition products during welding or flame cutting.

GENERAL HYGIENE - ESTABLISHED EXPOSURE LIMITS
If Threshold Limit Values (TLVs) have been established by ACGIH, OSHA, Ontario or PPG, they will be listed below. These limits are intended for use in the practice of industrial hygiene as guidelines or recommendations in the control of potential workplace health hazards. These limits are not a relative index of toxicity and should not be used by anyone without industrial hygiene training.

Material/ CAS Number	Percent	ACGIH TLV	ACGIH STEL	OSHA PEL	OSHA STEL
2-ETHOXYETHYLACETATE 111-15-9	60- 100	S- 5 ppm	Not established	S- 100 ppm	Not established

Key: OSHA=Occupational Safety and Health Administration; PEL=Permissable Exposure Limit; Ceiling=PEL Ceiling Limit; STEL=PEL Short-Term Exposure Limit; Skin=OSHA Skin Designation.

Material/ CAS Number	Percent	Ontario TWA	Ontario STEL	PPG IPEL	PPG STEL
2-ETHOXYETHYLACETATE 111-15-9	60- 100	S- 5 ppm	Not established	Not established	10 PPM

Key: ACGIH=American Conference of Governmental Industrial Hygienists; OSHA=Occupational Safety and Health Administration; TLV=Threshold Limit Value; TWA=Time Weighted Average; PEL=Permissible Exposure Limit; IPEL=Internal Permissible Exposure Limit; Ceiling=TLV or PEL Ceiling Limit; STEL=TLV or PEL Short-Term Exposure Limit; Skin= Skin Absorption Designation. [C- Ceiling Limit; S- Potential Skin Aborption; R-Respirable Dust]
Additional Information Not applicable.

SECTION 9 - PHYSICAL & CHEMICAL PROPERTIES

(FORMULA VALUES, NOT SALES SPECIFICATIONS)

SPECIFIC GRAVITY:	.975
PHYSICAL STATE:	Liquid
Percent Solids:	.00
Percent Volatile by Volume:	100.000
pH:	Not available.
ODOR THRESHOLD:	Not available.
Vapour Pressure:	1.2 mmHg
ODOR/APPEARANCE:	Non-viscous liquid with an odor characteristic of the ingredients listed in Section 2.
VAPOR DENSITY:	HEAVIER THAN AIR
Evaporation Rate:	21
BOILING POINT OR RANGE:	313 - 320Degrees F
Freezing Point or Range:	Not Applicable.
Melting Point or Range(°C):	Not Applicable.
Octanol/Water Partition Coefficient:	Not Applicable.
WEIGHT PER GALLON:	8.1 (U.S.) / 9.75 (IMPERIAL)

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SECTION 10 - STABILITY AND REACTIVITY

STABILITY:
This product is normally stable and will not undergo hazardous reactions.
CONDITIONS TO AVOID:
None Known.
INCOMPATIBLE MATERIALS:
Avoid contact with strong alkalies, strong mineral acids, or strong oxidizing agents.
HAZARDOUS POLYMERIZATION:
None Known.
HAZARDOUS DECOMPOSITION PRODUCTS:
- Carbon monoxide - Carbon dioxide

SECTION 11 - TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Material/ CAS Number	Percent	ORAL LD50 (g/kg)	DERMAL LD50 (g/kg)	INHALATION LC50 (mg/l)
2-ETHOXYETHYLACETATE 111-15-9	60- 100	3.90 g/kg	Not Available	16.23 mg/L. 4 h

CHRONIC TOXICITY
Target Organs:
- Bone marrow and blood tissues - Blood - Kidney - Liver - Reproductive - Teratogen - Brain - Central nervous system - Lung

Mutagenicity Toxicity:
This has not been tested for this product.
Reproductive Toxicity:
This has not been tested for this product.

SUPPLEMENTAL HEALTH INFORMATION:

Material/ CAS Number	Percent	Ingredient Specific Animal Data:
2-ETHOXYETHYLACETATE 111-15-9	60- 100	This product contains an ethylene series glycol ether and/or acetate which has been shown to cause adverse effects on the kidneys, liver, blood and/or blood-forming tissue.

SECTION 12 - ECOLOGICAL INFORMATION

POTENTIAL ENVIRONMENTAL EFFECTS
Ecotoxicity: No Information Available.

ENVIRONMENTAL FATE
Mobility: No Information Available.
Biodegradation: No Information Available.
Bioaccumulation: No Information Available.

PHYSICAL/CHEMICAL

Hydrolysis: No Information Available.
Photolysis: No Information Available.

SECTION 13 - DISPOSAL CONSIDERATIONS

Provide maximum ventilation, only personnel equipped with proper respiratory and skin and eye protection should be permitted in the area. Take up spilled material with sawdust, vermiculite, or other absorbent material and place in containers for disposal.

Waste material must be disposed of in accordance with federal, state, provincial and local environmental control regulations. Empty containers should be recycled by an appropriately licensed reconditioner/salvager or disposed of through a permitted waste management facility. Additional disposal information is contained on the Environmental Data Sheet for this product, which can be obtained from your PPG representative.

SECTION 14 - TRANSPORTATION INFORMATION

Proper Shipping Name: NOT AVAILABLE
NOS Technical Name: NOT AVAILABLE
Hazard Class: N.A.
Subsidiary Class(es): N.A.
UN Number: N.A.
Packing Group: N.A.

USA - RQ Hazardous Substances: NOT AVAILABLE
USA-RQ Hazardous Substance NOT AVAILABLE
Threshold Ship Weight:
Marine Pollutant Name: NOT AVAILABLE

SECTION 15 - REGULATORY INFORMATION

INVENTORY STATUS
U.S. TSCA: This product and/or all of its components are listed on the U.S. TSCA Inventory or is otherwise exempt from TSCA Inventory reporting requirements.
FEDERAL REGULATIONS
US Regulations

Material/ CAS Number	Percent	CERCLA HS - RQ (LBS)	SARA EHS- TPQ (LBS)	SARA 313
2-ETHOXYETHYLACETATE 111-15-9	60- 100	Not Listed	Not Listed	Not Listed

SARA 311/312
Health (acute): Yes
Health (chronic): Yes
Fire (flammable): Yes
Pressure: No
Reactivity: No
WHMIS HAZARD CLASS: - Class B, Division 3 - Class D, Division 2, Subdivision A

STATE/PROVINCIAL REGULATIONS
CALIFORNIA PROP. 65: WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.
Additional Information
Key: IARC- International Agency on the Research of Cancer; ACGIH- American Conference of Governmental Industrial Hygienists; NTP- National Toxicology Program *Denotes chemical as NTP Known Carcinogen; + Denotes NTP Possible Carcinogen; OSHA- Occupational Safety and Health Administration.

SECTION 16 - OTHER INFORMATION

Hazard Rating Systems
NFPA Rating: 2 20
HMIS Rating: 2*20

Rating System: 0=Minimal, 1=Slight, 2=Moderate, 3=Serious, 4=Severe, *=Chronic Effects.

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HMIS=Hazardous Materials Identification System; NFPA=National Fire Protection Association;

Safe handling of this product requires that all of the information on the MSDS be evaluated for specific work environments and conditions of use.

PREPARED BY: Product Safety Department
REASON FOR REVISION: Date. Edition.
Updated MSDS
format.

This Material Safety Data Sheet has been prepared in accordance with Canada's Workplace Hazardous Materials Information System (WHMIS) and the OSHA Hazard Communication Standard (29 CFR 1910.1200), the supplier notification requirements of SARA Title III, Section 313 and other applicable right-to-know regulations.
Additional environmental information is contained on the Environmental Data Sheet for this product, which can be obtained from your PPG representative.
CMS611 001001 (00168311.009)(05/31/05)
000315, 001, 0019

*** END OF MSDS ***

EPAPA008000800

Material Safety Data Sheet

Catalog Number: 204269
Revision date: 25-Apr-2006

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY INFORMATION

Catalog Number: 204269

Product name: CETYL ALCOHOL

Synonyms: 1-Hexadecanol; Adol; Alcohol C-16; Hexadecyl Alcohol; Palmityl Alcohol
Supplier:
MP Biomedicals, LLC
29525 Fountain Parkway
Solon, OH 44139
tel: 440-337-1200

Emergency telephone number: CHEMTREC: 1-800-424-9300 (1-703-527-3887)

2. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	Weight %	ACGIH Exposure Limits:	OSHA Exposure Limits:
CETYL ALCOHOL	36653-82-4	90 - 100%	None	None

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: May cause skin irritation and/or dermatitis

Principle routes of exposure: Skin
Inhalation: May cause irritation of respiratory tract
Ingestion: May be harmful if swallowed.
Skin contact: May cause allergic skin reaction
Eye contact: Avoid contact with eyes

Statements of hazard MAY CAUSE ALLERGIC SKIN REACTION.
Statement of Spill or Leak - ANSI Label Eliminate all ignition sources. Absorb and/or contain spill with inert materials (e.g., sand, vermiculite). Then place in appropriate container. For large spills, use water spray to disperse vapors, flush spill area. Prevent runoff from entering waterways or sewers.

4. FIRST AID MEASURES

General advice: In the case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
Inhalation: Move to fresh air. Call a physician immediately.
Skin contact: Rinse immediately with plenty of water and seek medical advice
Ingestion: Do not induce vomiting without medical advice.
Eye contact: In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Protection of first-aiders: No information available
Medical conditions aggravated by exposure: None known

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5. FIRE FIGHTING MEASURES

Suitable extinguishing media: Use dry chemical, CO2, water spray or "alcohol" foam
Specific hazards: Flammable
Unusual hazards: None known
Special protective equipment for firefighters: As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear
Specific methods: Water mist may be used to cool closed containers.
Flash point: Not determined
Autoignition temperature: Not determined
NFPA rating:

NFPA Health:	0
NFPA Flammability:	0
NFPA Reactivity:	0

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Use personal protective equipment.
Environmental precautions: Prevent product from entering drains.
Methods for cleaning up: Sweep up and shovel into suitable containers for disposal.

7. HANDLING AND STORAGE

Storage:
ROOM TEMPERATURE

Handling: Use only in area provided with appropriate exhaust ventilation.
Safe handling advice: Wear personal protective equipment.
Incompatible products: Oxidising and spontaneously flammable products

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures: Ensure adequate ventilation.
PERSONAL PROTECTIVE EQUIPMENT
Respiratory protection: Breathing apparatus only if aerosol or dust is formed.
Hand protection: Pvc or other plastic material gloves
Skin and body protection: Usual safety precautions while handling the product will provide adequate protection against this potential effect.
Eye protection: Safety glasses with side-shields
Hygiene measures: Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Solid
Formula: C16H34O
Melting point/range: 54-56°C
Boiling point/range: 179-181°C at 10 mm
Density: No data available
Vapor pressure: 3.06 x 10-6 mm Hg at 30 °C
Evaporation rate: No data available
Vapor density: No data available

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Solubility (in water):	Insoluble
Flash point:	Not determined
Autoignition temperature:	Not determined

10. STABILITY AND REACTIVITY

Stability:	*Stable under recommended storage conditions.*
Polymerization:	None under normal processing.
Hazardous decomposition products:	Thermal decomposition can lead to release of irritating gases and vapours such as carbon oxides.
Materials to avoid:	Strong oxidising agents Strong acids
Conditions to avoid:	*Exposure to air or moisture over prolonged periods.*

11. TOXICOLOGICAL INFORMATION

Product Information
Acute toxicity

Components	RTECS Number:	Selected LD50s and LC50s
CETYL ALCOHOL	MM0225000	Oral LD50 Rat : 5 gm/kg Oral LD50 Mouse : 3200 mg/kg Dermal LD50 Rabbit : >2600 mg/kg

Chronic toxicity:	Chronic exposure may cause nausea and vomiting, higher exposure causes unconsciousness.
Local effects:	Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting.
Specific effects:	May include moderate to severe erythema (redness) and moderate edema (raised skin), nausea, vomiting, headache.
Primary irritation:	No data is available on the product itself.
Carcinogenic effects:	No data is available on the product itself.
Mutagenic effects:	No data is available on the product itself.
Reproductive toxicity:	No data is available on the product itself.

12. ECOLOGICAL INFORMATION

Mobility:	No data available
Bioaccumulation:	No data available
Ecotoxicity effects:	No data available
Aquatic toxicity:	May cause long-term adverse effects in the aquatic environment.

Components	U.S. DOT - Appendix B - Marine Pollutan	U.S. DOT - Appendix B - Severe Marine Pollutants	United Kingdom - The Red List:
CETYL ALCOHOL	Not Listed	Not Listed	Not Listed

Components	Germany VCI (WGK)	World Health Organization (WHO) - Drinking Water	Ecotoxicity - Fish Species Data
CETYL ALCOHOL	Not Listed	Not Listed	Not Listed

Components	Ecotoxicity - Freshwater Algae Data	Ecotoxicity - Microtox Data	Ecotoxicity - Water Flea Data
CETYL ALCOHOL	Not Listed	Not Listed	Not Listed

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Components	EPA - ATSDR Priority List	EPA - HPV Challenge Program Chemical List	California - Priority Toxic Pollutants
CETYL ALCOHOL	Not Listed	indicator 4; Fully and ICCA sponsored	Not Listed

Components	California - Priority Toxic Pollutants	California - Priority Toxic Pollutants
CETYL ALCOHOL	Not Listed	Not Listed

13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. This product, if unaltered by use, may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority. Residue from fires extinguished with this material may be hazardous.

Contaminated packaging: Do not re-use empty containers

14. TRANSPORT INFORMATION

UN/Id No: Not regulated

DOT:

Proper shipping name: Not Regulated

Components	U.S. DOT - Appendix A Table 1 - Reportable Quantities
CETYL ALCOHOL	Not Listed

TDG (Canada):

WHMIS hazard class: Non-controlled

IMDG/IMO

IMDG - Hazard Classifications Not Applicable

Components	U.S. DOT - Appendix B - Marine Pollutan	U.S. DOT - Appendix B - Severe Marine Pollutants
CETYL ALCOHOL	Not Listed	Not Listed

IMO-labels:

15. REGULATORY INFORMATION

International Inventories

Components	
CETYL ALCOHOL	
Inventory - United States TSCA - Sect. 8(b)	Present
Canada DSL Inventory List -	Present
Australia (AICS):	Present

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Inventory - China:	Present
EU EINECS List -	253-149-0; C16H34O
Inventory - Japan:	2-217; 2-3704
Korean KECL:	KE-18460
Philippines PICCS:	Present

U.S. regulations:

Components	California Proposition 65 -	Massachusetts Right to Know List:	New Jersey Right to Know List:	Pennsylvania Right to Know List:
CETYL ALCOHOL	Not Listed	Not Listed	Not Listed	Not Listed

Components	Florida substance List:	Rhode Island Right to Know List:	Illinois - Toxic Air Contaminants	Connecticut - Hazardous Air Pollutants
CETYL ALCOHOL	Not Listed	Not Listed	Not Listed	Not Listed

Components	SARA 313 Emission reporting/Toxic Release of Chemicals	CERCLA/SARA - Section 302 Extremely Haz	NTP:	IARC:
CETYL ALCOHOL	Not Listed.	Not Listed	None	None

SARA 313 Notification: The above is your notification as to the SARA 313 listing for this product(s) pursuant to Section 313 of Title III of the Superfund Ammendments and Reauthorization Act of 1986 and 40 CFR Part 372.

If you are unsure if you are subject to the reporting requirements of Section 313, or need more information, please call the EPA Emergency Planning and Community Right-To-Know Information Hotline: (800) 535-0202 or (202) 479-2499 (in Washington, DC or Alaska).

State Notification: The above information is your notice as to the Right-to-Know listings of the stated product(s). Individual states will list chemicals for a variety of reasons including, but not limited to, the compounds toxicity; carcinogenic, tumorigenic and/or reproductive hazards; and the compounds environmental impact if accidentally released.

16. OTHER INFORMATION

Prepared by: Health & Safety

Disclaimer: The information and recommendations contained herein are based upon tests believed to be reliable. However, MP Biomedicals does not guarantee the accuracy or completeness NOR SHALL ANY OF THIS INFORMATION CONSTITUTE A WARRANTY, WHETHER EXPRESSED OR IMPLIED, AS TO THE SAFETY OF THE GOODS, THE MERCHANTABILITY OF THE GOODS, OR THE FITNESS OF THE GOODS FOR A PARTICULAR PURPOSE. Adjustment to conform to actual conditions of usage maybe required. MP Biomedicals assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied.

End of Safety Data Sheet

EPAPA008000805

MSDS Number: **C4092** * * * * * *Effective Date: 04/02/07* * * * * *Supercedes: 08/10/04*

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300
National Response in Canada
CANUTEC: 613-996-6666
Outside U.S. And Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

CHOLINE CHLORIDE

1. Product Identification

Synonyms: Ethanaminium, 2-hydroxy-N,N,N-trimethyl-, chloride; biocolina; Hepacholine; Lipotril; Choline Chlorhydrate.
CAS No.: 67-48-1
Molecular Weight: 139.63
Chemical Formula: HOCH2CH2N(CH3)3Cl
Product Codes: 1582

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Choline Chloride	67-48-1	98 - 100%	Yes

3. Hazards Identification

Emergency Overview

CAUTION! MAY BE HARMFUL IF SWALLOWED OR INHALED. MAY CAUSE

IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 1 - Slight
Flammability Rating: 1 - Slight
Reactivity Rating: 0 - None
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT; PROPER GLOVES
Storage Color Code: Green (General Storage)

Potential Health Effects

Information on the human health effects from exposure to this substance is limited.

Inhalation:
No information found, but compound should be handled as a potential health hazard.
Ingestion:
No information found, but compound should be handled as a potential health hazard.
Skin Contact:
May cause irritation with redness and pain.
Eye Contact:
May cause irritation, redness and pain.
Chronic Exposure:
No information found.
Aggravation of Pre-existing Conditions:
No information found.

---

4. First Aid Measures

Inhalation:
Remove to fresh air. Get medical attention for any breathing difficulty.
Ingestion:
Give several glasses of water to drink to dilute. If large amounts were swallowed, get medical advice.
Skin Contact:
Immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention if irritation develops.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention if irritation persists.

---

5. Fire Fighting Measures

Fire:
As with most organic solids, fire is possible at elevated temperatures or by contact with an ignition source.
Explosion:
Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.
Fire Extinguishing Media:
Water spray, dry chemical, alcohol foam, or carbon dioxide.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

---

6. Accidental Release Measures

Remove all sources of ignition. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Clean up spills in a manner that does not disperse dust into the air. Use non-sparking tools and equipment. Reduce airborne dust and prevent scattering by moistening with water. Pick up spill for recovery or disposal and place in a closed container.

---

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

---

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
None established.
Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
Personal Respirators (NIOSH Approved):
For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R

or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
Skin Protection:
Wear protective gloves and clean body-covering clothing.
Eye Protection:
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

---

9. Physical and Chemical Properties

Appearance:
White crystals.
Odor:
Slight amine odor.
Solubility:
Soluble in water.
Specific Gravity:
No information found.
pH:
Aqueous solution is neutral or slightly acid.
% Volatiles by volume @ 21C (70F):
0
Boiling Point:
No information found.
Melting Point:
244 - 247C (471 - 477F)
Vapor Density (Air=1):
No information found.
Vapor Pressure (mm Hg):
No information found.
Evaporation Rate (BuAc=1):
No information found.

---

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products:
May produce carbon monoxide, carbon dioxide, nitrogen oxides and hydrogen chloride when heated to decomposition.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Strong oxidizers.
Conditions to Avoid:

Heat, flames, ignition sources and incompatibles.

11. Toxicological Information

Oral rat LD50: 3400 mg/kg Investigated as a mutagen.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Choline Chloride (67-48-1)	No	No	None

12. Ecological Information

Environmental Fate:
No information found.
Environmental Toxicity:
No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Not regulated.

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

Ingredient	TSCA	EC	Japan	Australia
Choline Chloride (67-48-1)	Yes	Yes	Yes	Yes

```
--------\Chemical Inventory Status - Part 2\--------------------------------
                                                        --Canada--
Ingredient                                        Korea  DSL   NDSL  Phil.
----------------------------------------------  -----  ---   ----  -----
Choline Chloride (67-48-1)                        Yes   Yes   No     Yes

--------\Federal, State & International Regulations - Part 1\---------------
                                          -SARA 302-    ------SARA 313------
Ingredient                                RQ    TPQ     List  Chemical Catg.
----------------------------------------  ---   -----   ----  --------------
Choline Chloride (67-48-1)                No    No      No         No

--------\Federal, State & International Regulations - Part 2\---------------
                                                       -RCRA-    -TSCA-
Ingredient                                CERCLA      261.33     8(d)
----------------------------------------  ------      ------    ------
Choline Chloride (67-48-1)                No          No         No


Chemical Weapons Convention:  No     TSCA 12(b):  No     CDTA:  No
SARA 311/312:  Acute: Yes      Chronic: No   Fire: No  Pressure: No
Reactivity: No          (Pure / Solid)
```

Australian Hazchem Code: None allocated.
Poison Schedule: None allocated.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

16. Other Information

NFPA Ratings: Health: 1 Flammability: 1 Reactivity: 0
Label Hazard Warning:
CAUTION! MAY BE HARMFUL IF SWALLOWED OR INHALED. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.
Label Precautions:
Avoid breathing dust.
Avoid contact with eyes, skin and clothing.
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.
Label First Aid:
If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. If inhaled, remove to fresh air. Get medical attention for any breathing difficulty. Get medical attention if irritation develops or persists.
Product Use:
Laboratory Reagent.
Revision Information:
MSDS Section(s) changed since last revision of document include: 3.

Disclaimer:
****

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Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

SIGMA-ALDRICH

Material Safety Data Sheet

Version 3.0
Revision Date 07/14/2007
Print Date 09/06/2007

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : **Citric acid**

Product Number : 251275
Brand : Sigma-Aldrich

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA
Telephone : +1 800-325-5832
Fax : +1 800-325-5052
Emergency Phone # : (314) 776-6555

2. COMPOSITION/INFORMATION ON INGREDIENTS

Formula : C6H8O7
Molecular Weight : 192.12 g/mol

CAS-No.	EC-No.	Index-No.	Concentration [%]
Citric acid			
77-92-9	201-069-1	-	-

3. HAZARDS IDENTIFICATION

Emergency Overview

OSHA Hazards

Irritant

HMIS Classification

Health Hazard: 2
Flammability: 0
Physical hazards: 0

NFPA Rating

Health Hazard: 2
Fire 0
Reactivity Hazard 0

Potential Health Effects

Inhalation	May be harmful if inhaled. May cause respiratory tract irritation.
Skin	May be harmful if absorbed through skin. May cause skin irritation.
Eyes	May cause eye irritation.
Ingestion	May be harmful if swallowed.

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4. FIRST AID MEASURES

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing give artificial respiration Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIRE-FIGHTING MEASURES

Flammable properties

Flash point	no data available
Ignition temperature	no data available

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Special protective equipment for fire-fighters
Wear self contained breathing apparatus for fire fighting if necessary.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Use personal protective equipment. Avoid dust formation. Avoid breathing dust. Ensure adequate ventilation.

Environmental precautions
Do not let product enter drains.

Methods for cleaning up
Pick up and arrange disposal without creating dust. Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

Handling
Avoid formation of dust and aerosols.
Provide appropriate exhaust ventilation at places where dust is formed. Normal measures for preventive fire protection.

Storage
Keep container tightly closed in a dry and well-ventilated place.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Contains no substances with occupational exposure limit values.

Personal protective equipment

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a dust mask type N95 (US) or type P1 (EN 143) respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection
Handle with gloves.

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Eye protection
Safety glasses

Skin and body protection
Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Hygiene measures
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	solid
Colour	no data available

Safety data

pH	no data available
Melting point	155 - 157 °C (311 - 315 °F)
Boiling point	no data available
Flash point	no data available
Ignition temperature	no data available
Lower explosion limit	8 %(V)
Water solubility	no data available

10. STABILITY AND REACTIVITY

Storage stability
Stable under recommended storage conditions.

Materials to avoid
Oxidizing agents, Bases, Reducing agents, Nitrates

Hazardous decomposition products

Hazardous decomposition products formed under fire conditions.
Carbon oxides

11. TOXICOLOGICAL INFORMATION

Acute toxicity

LD50 Oral - rat - 3,000 mg/kg

Irritation and corrosion

Skin - rabbit - Mild skin irritation - 24 h

Eyes - rabbit - Severe eye irritation - 24 h

Sensitisation

Prolonged or repeated exposure may cause allergic reactions in certain sensitive individuals.

Chronic exposure

no data available

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Signs and Symptoms of Exposure

Vomiting, Diarrhoea, Damage to tooth enamel., Dermatitis, To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Potential Health Effects

Inhalation	May be harmful if inhaled. May cause respiratory tract irritation.
Skin	May be harmful if absorbed through skin. May cause skin irritation.
Eyes	May cause eye irritation.
Ingestion	May be harmful if swallowed.

12. ECOLOGICAL INFORMATION

Elimination information (persistence and degradability)

no data available

Ecotoxicity effects

Toxicity to fish	LC50 - Leuciscus idus melanotus - 440 mg/l - 48 h

Further information on ecology

no data available

13. DISPOSAL CONSIDERATIONS

Product
Observe all federal, state, and local environmental regulations.Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
Not dangerous goods

IMDG
Not dangerous goods

IATA
Not dangerous goods

15. REGULATORY INFORMATION

OSHA Hazards
Irritant

TSCA Status
On TSCA Inventory

DSL Status
All components of this product are on the Canadian DSL list.

SARA 302 Components
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

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SARA 311/312 Hazards
Acute Health Hazard

Massachusetts Right To Know Components
No Components Listed

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Citric acid	77-92-9	

New Jersey Right To Know Components

	CAS-No.	Revision Date
Citric acid	77-92-9	

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth, or any other reproductive defects.

16. OTHER INFORMATION

Further information
Copyright 2007 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only., The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Co., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.

EPAPA008000817

TP 4025

MATERIAL SAFETY DATA SHEET

HydroChem
INDUSTRIAL SERVICES, INC.

DATE PREPARED: 11/22/1999
MSDS No: L001
Citric Acid Crystal

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Identifier: Citric Acid Crystal
Product Code: L001
Product Name: Citric Acid, Anhydrous
Chemical Family: Organic acid, Chelant
Molecular Formula: $HOC(COOH)(CH_2COOH)_2$

MANUFACTURER:
HydroChem Industrial Services, Inc.
900 Georgia Ave.
Deer Park, TX 77536
Customer Service: (800) 934-9376

24 HR. EMERGENCY TELEPHONE NUMBERS:
Emergency Contact: HydroChem ER
Emergency Phone (800) 569-4889

COMMENTS:
EFFECTIVE DATE: 1/1/00

2. COMPOSITION/INFORMATION ON INGREDIENTS

	wt.%	CAS Registry #
Cirtic Acid, Anhydrous	100	77-92-9

COMMENTS:
Product Exposure Limits:
Nuisance Dust - OSHA PEL: 15 mg/m3 ACGIH TLV: 10 mg/m3
Respirable Fraction - OSHA PEL: 5 mg/m3

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
IMMEDIATE CONCERNS:
No hazard in normal industrial use.
Dust may be irritating to eyes and respiratory tracts.

4. FIRST AID MEASURES

EYES:
Immediately flush eyes with water for 30 minutes while holding eyelids open. Seek medical attention.

SKIN:
Immediately wash with soap and water. Rinse thoroughly. Seek medical attention if effects occur. Launder contaminated shoes and clothing before reuse.

INGESTION:
If swallowed, give 2 glasses of milk (preferred) or water and consult physician.

INHALATION:
Remove to fresh air. See a doctor if effects occur.

5. FIRE FIGHTING MEASURES

Flashpoint and Method: >200°F 93°C
Flammable Limits: Not determined
Autoignition Temperature: Not Determined

EXTINGUISHING MEDIA:
Use alcohol foam, carbon dioxide, dry chemical or water spray when fighting fires involving this material.

HAZARDOUS COMBUSTION PRODUCTS:
Oxides of carbon and harmful organic chemical fumes.

FIRE FIGHTING EQUIPMENT:
As in any fire, wear self-contained breathing apparatus pressure-demand, (MSHA/NIOSH approved or equivalent) and full protective clothing to prevent contact with skin and eyes.

6. ACCIDENTAL RELEASE MEASURES

GENERAL PROCEDURES:
Scoop into appropriate containers.
Flush residual with plenty of water.

7. HANDLING AND STORAGE

GENERAL PROCEDURES:
Refer to Section 8.

STORAGE:
No special precautions required.
Avoid wetting.
Store away from oxidizers.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:
Ventilation - General and local ventilation are required.

PERSONAL PROTECTION
EYES AND FACE:
Chemical goggles required and an eye wash in work area.

RESPIRATORY:
Use NIOSH approved respirator with dust and mist protection.

PROTECTIVE CLOTHING:
Clean body covering and chemical resistant gloves.

OTHER USE PRECAUTIONS:
Safety shower and eye wash in the work area.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Powder
Color: White
pH: 0.6
Percent Volatile: Not Established
Vapor Pressure: Not Available
Melting Point: 307°F 153°C
Solubility in Water: Soluble
Specific Gravity: 1.54

COMMENTS:
pH: pH listed above is for a 50% aqueous solution

10. STABILITY AND REACTIVITY

STABLE: Yes

HAZARDOUS POLYMERIZATION: No

HAZARDOUS DECOMPOSITION:
When heated strongly or burned, oxides of carbon and harmful organic chemical fumes are released.

INCOMPATIBLE MATERIALS:
Oxidizers, bases. Can be explosive with metal nitrates.

11. TOXICOLOGICAL INFORMATION

ACUTE
Eyes: Severe irritant. Causes pain and redness. Prolonged or repeated contact may cause mild burn.
Skin: Irritant. May cause pain, redness, dermatitis. Not likely to be absorbed in toxic amounts.
Ingestion: No effect expected. Swallowing large amounts may cause illness.
Inhalation: Irritant. May cause pain and coughing

TARGET ORGANS:
Skin

GENERAL COMMENTS:
Carcinogens: Not listed by IARC, USA NTP, or USA OSHA.

COMMENTS:
Only selected Registry of Toxic Effects of Chemical Substances (RTECS) data is presented in this document. See the actual entry in RTECS for complete information.

RTECS Number: GE730 000

LC(50) = 11.7 g/kg on rats (for anhydrous citric acid)

12. ECOLOGICAL INFORMATION

GENERAL COMMENTS:
Degradability: Biodegradable.
Fish Toxicity: LC50 (P. promelas) = 150 ppm

COMMENTS:
BOD = 0.48 p/p; COD = 0.70 p/p (68% degradation in 5 days)

13. DISPOSAL CONSIDERATIONS

PRODUCT DISPOSAL:
Dispose of in accordance with ALL applicable federal, state and local regulations.

EMPTY CONTAINER:
Send empty bags to sanitary landfill. Render other types of containers unuseable by puncturing or crushing and sanitary landfill unless prohibited by local regulations.

RCRA/USEPA WASTE INFORMATION:
This material is not a RCRA regulated material.

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COMMENTS:
Always follow ALL applicable federal, state and local regulations.

14. TRANSPORT INFORMATION

DOT (DEPARTMENT OF TRANSPORTATION)
Proper Shipping Name: Citric Acid, Anhydrous - Nonregulated
Reportable Quantity (RQ) Under CERCLA: None
Placards: None
Label: None

15. REGULATORY INFORMATION

UNITED STATES
SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)

Fire: No Pressure Generating: No Reactivity: No Acute: Yes Chronic: No

Title III Notes: This product contains no substances which are defined as toxic chemicals under the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (40 CFR Part 372).

TSCA (TOXIC SUBSTANCE CONTROL ACT)
TSCA Status: All components of this material are on the TSCA inventory.

STATE REGULATIONS
PROPOSITION 65 STATEMENT:
This product does not contain any substance(s) which are defined by the state of California to cause cancer, birth defects, or other reproductive effects.

16. OTHER INFORMATION

REASON FOR ISSUE:
Biannual review

Approved by: Charles M Maddin, PhD, FAIC
Approval date: 11/22/1999

EPAPA008000822

HydroChem®
INDUSTRIAL SERVICES, INC.

REVISION SUMMARY
Revision #: 5

This MSDS replaces the October 05, 1999 MSDS. Any changes in information are as follows:
In Section 1
Date Prepared Section 1 Footnotes

In Section 9
(pH) (from) (pH) Comments

In Section 15
TSCA Status

NFPA CODES
Fire: 1 Health: 1 Reactivity: 0

HMIS CODES
Fire: 1 Health: 1 Reactivity: 0

MANUFACTURER DISCLAIMER:
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The information herein is believed to be accurate and is presented in good faith; however, no warranties or representations are made by HydroChem Industrial Services, Inc. regarding the accuracy or completeness of the information.

HydroChem Industrial Services, Inc. shall not be held liable for any damage resulting from the handling, or from contact with the above product.

EPAPA008000823

MATERIAL SAFETY DATA SHEET

DATE PREPARED: 12/22/2000
MSDS No: M002
Caustic Soda, flake or bead

HydroChem®
INDUSTRIAL SERVICES, INC.

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Identifier: Caustic Soda, flake or bead
Product Code: M002
Product Name: Sodium Hydroxide
Chemical Family: Alkali
Molecular Formula: NaOH
Generic Name: Caustic Soda , Lye Soda, Lye

MANUFACTURER:
HydroChem Industrial Services, Inc.
900 Georgia Ave.
Deer Park, TX 77536
Customer Service: (800) 934-9376

24 HR. EMERGENCY TELEPHONE NUMBERS:
Emergency Contact: HydroChem ER
Emergency Phone (800) 569-4889

2. COMPOSITION/INFORMATION ON INGREDIENTS

	wt.%	CAS Registry #
Sodium Hydroxide	100	1310-73-2

OSHA HAZARDOUS COMPONENTS (29 CFR 1910.1200)

	EXPOSURE LIMITS		
	OSHA PEL	ACGIH TLV	Supplier
Sodium Hydroxide	2 mg/m3	2 mg/m3 - STEL/ceiling	

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
PHYSICAL APPEARANCE:
White powder

IMMEDIATE CONCERNS:
Corrosive.
May react violently with water.
Do not get in eyes, on skin or clothing.

MEDICAL CONDITIONS AGGRAVATED:
Persons with pre-existing skin disorders, eye problems or impaired pulmonary function may be at increased risk from exposure.

HYDROCHEM-DEX 015

EPAPA008000824

ROUTES OF ENTRY:
Ingestion, inhalation and eye or skin contact.

4. FIRST AID MEASURES

EYES:
Immediately flush eyes with water for 30 minutes while holding eyelids open. Seek medical attention.

SKIN:
Immediately wash with soap and water. Rinse for 30 minutes. See a doctor at once. Destroy contaminated shoes and clothing.

INGESTION:
DO NOT induce vomiting. Drink large quantities of milk (preferred) or water and give milk of magnesia. Take to hospital at once.

INHALATION:
If effects occur, remove to fresh air. See a doctor at once. If breathing has stopped, begin artificial respiration.

5. FIRE FIGHTING MEASURES

Flashpoint and Method: Not Applicable
Flammable Limits: Not applicable
Autoignition Temperature: None

EXTINGUISHING MEDIA:
Use alcohol foam, carbon dioxide, dry chemical or water spray when fighting fires involving this material.

OTHER CONSIDERATIONS:
Large amounts of heat generated when initially diluted with water.

EXPLOSION HAZARDS:
May release hydrogen gas (explosive) when in contact with aluminum and similar metals.

FIRE FIGHTING EQUIPMENT:
As in any fire, wear self-contained breathing apparatus pressure-demand, (MSHA/NIOSH approved or equivalent) and full protective clothing to prevent contact with skin and eyes.

EPAPA008000825

6. ACCIDENTAL RELEASE MEASURES

GENERAL PROCEDURES:
Scoop into appropriate containers.
Flush residual with plenty of water.

7. HANDLING AND STORAGE

GENERAL PROCEDURES:
Refer to Section 8.

STORAGE:
No special precautions required.
Avoid wetting.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:
Ventilation - General and local ventilation are required.

PERSONAL PROTECTION
EYES AND FACE:
Chemical goggles required and an eye wash in work area.

RESPIRATORY:
Use NIOSH approved respirator with dust and mist protection.

PROTECTIVE CLOTHING:
Face shield, boots, protective suit and impervious (neoprene) gloves.

OTHER USE PRECAUTIONS:
Safety shower and eye wash in the work area.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Powder
Color: White
pH: 13
Melting Point: 604°F 318°C
Solubility in Water: Soluble
Specific Gravity: 2.13 (water=1)

COMMENTS:
pH: pH listed above is for a 1% solution

10. STABILITY AND REACTIVITY

STABLE: Yes

HAZARDOUS POLYMERIZATION: No

HAZARDOUS DECOMPOSITION:
None

INCOMPATIBLE MATERIALS:
Aluminum, magnesium, water, organic materials, acids, copper, organic halogens, zinc, tin, bronze, brass

11. TOXICOLOGICAL INFORMATION

ACUTE
Eyes: Corrosive. Rapidly causes pain, burns, corneal injury. May cause permanent damage and blindness.
Skin: Corrosive. Rapidly causes pain, burns, redness, swelling and damage to tissue. Not likely to be absorbed in toxic amounts.
Ingestion: Corrosive. Causes pain and severe burns to mouth, throat and stomach.
Inhalation: Corrosive. Short exposure can injure lungs, throat, mucous membranes and reduce lung capacity. Causes pain, burns, choking, and coughing.

TARGET ORGANS:
Skin, Eyes

GENERAL COMMENTS:
Carcinogens: Not listed by IARC, USA NTP, or USA OSHA.

COMMENTS:
Only selected Registry of Toxic Effects of Chemical Substances (RTECS) data is presented in this document. See the actual entry in RTECS for complete information.

RTECS Number: WB4900000

12. ECOLOGICAL INFORMATION

GENERAL COMMENTS:
Degradability: Not biodegradable.
Fish Toxicity: Low toxicity to fish (when neutralized) .

13. DISPOSAL CONSIDERATIONS

PRODUCT DISPOSAL:
Ship via permitted waste hauler to permitted hazardous waste disposal facility for landfilling.

EMPTY CONTAINER:
Send empty bags to sanitary landfill. Render other types of containers unusable by puncturing or crushing and sending to a sanitary landfill unless prohibited by local regulations.

RCRA/USEPA WASTE INFORMATION:
RCRA Hazardous Waste Number: D002 (corrosive), D003 (reactive)

COMMENTS:
Always follow ALL applicable federal, state and local regulations.

14. TRANSPORT INFORMATION

DOT (DEPARTMENT OF TRANSPORTATION)
Proper Shipping Name: Sodium Hydroxide, solid
Hazard Class: 8
NA/UN Number: UN1823
Packing Group: II
Reportable Quantity (RQ) Under CERCLA: 1000 lb
Placards: Corrosive
Label: Corrosive - 8

SPECIAL SHIPPING NOTES:
Material is a HAZARDOUS MATERIAL AND HAZARDOUS SUBSTANCE. Add the letters RQ to the beginning of the shipping description if the RQ amount is met or exceeded in a single container.

15. REGULATORY INFORMATION

DOT Label Symbol and Statement of Hazard

DOT Corrosive

EPAPA008000828

UNITED STATES

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)

Fire: No Pressure Generating: No Reactivity: No Acute: Yes Chronic: No

Title III Notes: This product contains no substances which are defined as toxic chemicals under the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (40 CFR Part 372).

CERCLA (COMPREHENSIVE RESPONSE, COMPENSATION, AND LIABILITY ACT)
Reportable Spill Quantity: 1000 lb

TSCA (TOXIC SUBSTANCE CONTROL ACT)
TSCA Status: All components of this material are on the TSCA inventory.

STATE REGULATIONS

PROPOSITION 65 STATEMENT:
This product does not contain any substance(s) which are defined by the state of California to cause cancer, birth defects, or other reproductive effects.

16. OTHER INFORMATION

REASON FOR ISSUE:
Biannual review

Approved by: Charles M Maddin, PhD, FAIC
Approval date: 10/24/2000

REVISION SUMMARY
Revision #: 5

This MSDS replaces the October 19, 2000 MSDS. Any changes in information are as follows:
In Section 12
Ecological Comments

NFPA CODES
Fire: 0 Health: 3 Reactivity: 1

HMIS CODES
Fire: 0 Health: 3 Reactivity: 1 Protection: X

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EPAPA008000830

HALLIBURTON

MATERIAL SAFETY DATA SHEET

Product Trade Name: **CRUDE OIL**

Revision Date: 05-Jan-2006

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Trade Name: CRUDE OIL
Synonyms: None
Chemical Family: Organic hydrocarbon
Application: Sample Kit

Manufacturer/Supplier
Halliburton Energy Services
P.O. Box 1431
Duncan, Oklahoma 73536-0431
Emergency Telephone: (281) 575-5000

Prepared By
Chemical Compliance
Telephone: 1-580-251-4335

2. COMPOSITION/INFORMATION ON INGREDIENTS

SUBSTANCE	CAS Number	PERCENT	ACGIH TLV-TWA	OSHA PEL-TWA
Benzene	71-43-2	< 1	0.5 ppm	1 ppm
Hydrogen sulfide	7783-06-4	< 1	10 ppm	20 ppm
Aromatic solvent	8002-05-9	60 - 100%	Not applicable	500 ppm

3. HAZARDS IDENTIFICATION

Hazard Overview
May cause eye and skin irritation. May be harmful if swallowed. Potential carcinogen. May be harmful if inhaled. Flammable.

4. FIRST AID MEASURES

Inhalation
If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult give oxygen. Get medical attention.

Skin
Wash with soap and water. Get medical attention if irritation persists. Remove contaminated clothing and launder before reuse.

Eyes
In case of contact, or suspected contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention immediately after flushing.

Ingestion
Get medical attention! If vomiting occurs, keep head lower than hips to prevent aspiration.

Notes to Physician
Not Applicable

EPAPA008000831

5. FIRE FIGHTING MEASURES

Flash Point/Range (F):	20 - 72
Flash Point/Range (C):	-6.7 - 22.8
Flash Point Method:	TCC
Autoignition Temperature (F):	590
Autoignition Temperature (C):	310
Flammability Limits in Air - Lower (%):	1.1
Flammability Limits in Air - Upper (%):	6.0

Fire Extinguishing Media Carbon Dioxide, Dry Chemicals, Foam.

Special Exposure Hazards Decomposition in fire may produce toxic gases. Use water spray to cool fire exposed surfaces. Vapors are heavier than air and may accumulate in low areas. Vapors may travel along the ground to be ignited at distant locations.

Special Protective Equipment for Fire-Fighters Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

NFPA Ratings: Health 1, Flammability 3, Reactivity 0
HMIS Ratings: Flammability 3, Reactivity 0, Health 1

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures Use appropriate protective equipment.

Environmental Precautionary Measures Prevent from entering sewers, waterways, or low areas.

Procedure for Cleaning / Absorption Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Scoop up and remove.

7. HANDLING AND STORAGE

Handling Precautions Avoid contact with eyes, skin, or clothing. Avoid breathing vapors. Wash hands after use. Launder contaminated clothing before reuse.

Storage Information Store away from oxidizers. Store in a cool well ventilated area. Keep container closed when not in use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls Use in a well ventilated area. Local exhaust ventilation should be used in areas without good cross ventilation.

Respiratory Protection Not normally needed. But if significant exposures are possible then the following respirator is recommended:
Organic vapor respirator.
Acid gas respirator.

Hand Protection Nitrile gloves.

Skin Protection Rubber apron.

Eye Protection Chemical goggles; also wear a face shield if splashing hazard exists.

Other Precautions Eyewash fountains and safety showers must be easily accessible.

EPAPA008000832

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Color:	Yellow to Green or Black
Odor:	Rotten egg
pH:	Not Determined
Specific Gravity @ 20 C (Water=1):	0.78 - 0.97
Density @ 20 C (lbs./gallon):	Not Determined
Bulk Density @ 20 C (lbs/ft3):	Not Determined
Boiling Point/Range (F):	< 100
Boiling Point/Range (C):	< 38
Freezing Point/Range (F):	Not Determined
Freezing Point/Range (C):	-60 - -20
Vapor Pressure @ 20 C (mmHg):	100-500
Vapor Density (Air=1):	3 - 4
Percent Volatiles:	Not Determined
Evaporation Rate (Butyl Acetate=1):	Not Determined
Solubility in Water (g/100ml):	Insoluble
Solubility in Solvents (g/100ml):	Not Determined
VOCs (lbs./gallon):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined
Viscosity, Kinematic @ 20 C (centistrokes):	< 15
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	Not Determined

10. STABILITY AND REACTIVITY

Stability Data:	Stable
Hazardous Polymerization:	Will Not Occur
Conditions to Avoid	None anticipated
Incompatibility (Materials to Avoid)	Strong oxidizers.
Hazardous Decomposition Products	Carbon monoxide and carbon dioxide.
Additional Guidelines	Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure	Eye or skin contact, inhalation.
Inhalation	May cause respiratory irritation. May cause chemical pneumonia. Excessive inhalation causes headache, dizziness, nausea and incoordination.
Skin Contact	Causes drying of the skin. Prolonged or repeated contact may cause skin irritation.
Eye Contact	May cause eye irritation.
Ingestion	Aspiration into the lungs may cause chemical pneumonitis including coughing, difficulty breathing, wheezing, coughing up blood and pneumonia, which can be fatal.
Aggravated Medical Conditions	Skin disorders. Respiratory disorders.
Chronic Effects/Carcinogenicity	Contains petroleum distillates which have been shown to cause skin cancer in laboratory animals.
Other Information	None known.

Toxicity Tests

Oral Toxicity:	LD50: 4300 mg/kg (Rat)
Dermal Toxicity:	LD50: > 2000 mg/kg (Rabbit)
Inhalation Toxicity:	Not determined
Primary Irritation Effect:	Not determined
Carcinogenicity	Not determined
Genotoxicity:	Not determined
Reproductive / Developmental Toxicity:	Not determined

12. ECOLOGICAL INFORMATION

Mobility (Water/Soil/Air)	Not determined
Persistence/Degradability	Slowly biodegradable
Bio-accumulation	Not Determined

Ecotoxicological Information

Acute Fish Toxicity:	Not determined
Acute Crustaceans Toxicity:	Not determined
Acute Algae Toxicity:	Not determined
Chemical Fate Information	Not determined
Other Information	Not applicable

13. DISPOSAL CONSIDERATIONS

Disposal Method	Disposal should be made in accordance with federal, state, and local regulations.
Contaminated Packaging	If empty container retains product residues, all label precautions must be observed. Transport with all closures in place. Return for reuse or disposal according to national or local regulations.

14. TRANSPORT INFORMATION

Land Transportation

DOT
Petroleum Crude Oil, 3, UN1267, II, (-6.7 C minimum)
NAERG 128

Canadian TDG
Petroleum Crude Oil, 3, UN1267, II, (-6.7 C minimum)

ADR
UN1267, Petroleum Crude Oil, 3, II

EPAPA008000834

Air Transportation

ICAO/IATA
UN1267, Petroleum Crude Oil, 3, II

Sea Transportation

IMDG
Petroleum Crude Oil, 3, UN1267, II, (-6.7 C minimum)
EmS F-E, S-E

Other Shipping Information

Labels: Flammable Liquid

15. REGULATORY INFORMATION

US Regulations

US TSCA Inventory	All components listed on inventory.
EPA SARA Title III Extremely Hazardous Substances	Not applicable
EPA SARA (311,312) Hazard Class	Acute Health Hazard
EPA SARA (313) Chemicals	This product does not contain a toxic chemical for routine annual "Toxic Chemical Release Reporting" under Section 313 (40 CFR 372).
EPA CERCLA/Superfund Reportable Spill Quantity For This Product	Not applicable.
EPA RCRA Hazardous Waste Classification	If product becomes a waste, it does meet the criteria of a hazardous waste as defined by the US EPA, because of: Ignitability D001
California Proposition 65	The California Proposition 65 regulations apply to this product.
MA Right-to-Know Law	One or more components listed.
NJ Right-to-Know Law	One or more components listed.
PA Right-to-Know Law	One or more components listed.

Canadian Regulations

Canadian DSL Inventory	All components listed on inventory.
WHMIS Hazard Class	B2 Flammable Liquids D2B Toxic Materials

16. OTHER INFORMATION

The following sections have been revised since the last issue of this MSDS
Not applicable

EPAPA008000835

Additional Information

For additional information on the use of this product, contact your local Halliburton representative.

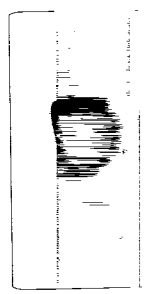
For questions about the Material Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.

Disclaimer Statement

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

*****END OF MSDS*****

EPAPA008000836



Anachemia

255 Norman.
Lachine (Montreal), Que
H8R 1A3

Material Safety Data Sheet

EMERGENCY NUMBERS:

(USA) CHEMTREC : 1(800) 424-9300 (24hrs)
(CAN) CANUTEC : 1(613) 996-6666 (24hrs)
(USA) Anachemia : 1(518) 297-4444
(CAN) Anachemia : 1(514) 489-5711

WHMIS	Protective Clothing	TDG Road/Rail
WHMIS CLASS: B-3 D-2B		Not controlled under TDG (Canada). PIN: Not applicable. PG: Not applicable.

Section I. Product Identification and Uses

Product name	**DECYL ALCOHOL**
Chemical formula	CH3(CH2)9OH
Synonyms	Agent 504, Alcohol C-10, Antak, Capric alcohol, Decanol, N-Decanol, 1-Decanol, Decylic alcohol, Dyto S-91, Epal 10, Lorol 22, AC-2825, 30820
Supplier	Anachemia Canada. 255 Norman. Lachine (Montreal), Que H8R 1A3
Material uses	For laboratory use only.

CI#	Not available.
CAS#	112-30-1
Code	AC-2825
Formula weight	158.29
Supersedes	

Section II. Ingredients

Name	CAS #	%	TLV
1) DECYL ALCOHOL	112-30-1	99	Not established by ACGIH

Toxicity values of the hazardous ingredients

DECYL ALCOHOL:
ORAL (LD50): Acute: 4720 mg/kg (Rat). 6500 mg/kg (Mouse).
DERMAL (LD50): Acute: 3560 mg/kg (Rabbit).
VAPOR (LC50): Acute: 4000 mg/m3 (Mouse) (2 hour(s)). 3000 mg/m3 (Mammal).

Section III. Physical Data

Physical state and appearance / Odor	Colorless liquid.
pH (1% soln/water)	Not applicable.
Odor threshold	Not available.
Percent volatile	Not available.
Freezing point	7°C
Boiling point	231°C
Specific gravity	0.829 (Water = 1)
Vapor density	5.5 (Air = 1)
Vapor pressure	8.25 mm of Hg (@ 100°C)
Water/oil dist. coeff.	Not available.
Evaporation rate	<0.2 (n-Butyl acetate = 1).
Solubility	Insoluble in cold water.

Section IV. Fire and Explosion Data

Flash point	OPEN CUP: 82°C
Flammable limits	Not available.
Auto-ignition temperature	265°C
Fire degradation products	Oxides of carbon (CO, CO2).
Fire extinguishing procedures	Use DRY chemical, carbon dioxide, foam or water spray. Wear adequate personal protection to prevent contact with material or its combustion products. Self contained breathing apparatus with a full facepiece operated in a pressure demand or other positive pressure mode.
Fire and Explosion Hazards	Combustible liquid. Vapor forms explosive mixture with air. Contact with oxidizers may cause fire and/or explosion. This material may produce a floating fire hazard. Emits toxic fumes under fire conditions.

Section V. Toxicological Properties

Routes of entry	Ingestion and inhalation. Eye contact. Skin contact. Skin absorption.
Effects of Acute Exposure	Harmful by ingestion, inhalation or skin absorption. Severe irritant. Prolonged exposure can cause narcotic effect.
Eye	Causes severe irritation. May cause severe burns and loss of vision. May cause permanent damage. IRRITATION: EYE-RABBIT 83 mg SEVERE.
Skin	Contact with liquid can cause severe irritation or burns. May cause defatting, drying, cracking, redness, itching, and scaling. The amount of tissue damage depends on lenght of contact.
Inhalation	Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract. Inhalation may be fatal as a result of spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis and pulmonary edema. Symptoms of exposure may include burning sensation, coughing, laryngitis, dyspnea, headache, nausea, and vomiting. Prolonged exposure can cause narcotic effect.
Ingestion	If a small amount of the liquid is aspirated into the lungs, very severe lung damage or death could result. May cause diarrhea, dyspnea, and death. See inhalation.

Section V. Toxicological Properties

Effects of Chronic Overexposure	See acute effects. Carcinogenic effects: Not available. Mutagenic effects: Not available. Teratogenic effects: Not available. Toxicity of the product to the reproductive system: Not available. To the best of our knowledge, the chemical, physical, and toxicity of this substance has not been fully investigated.

Section VI. First Aid Measures

Eye contact	Immediately flush eyes with copious quantities of water for at least 15 minutes holding lids apart to ensure flushing of the entire surface. Seek immediate medical attention.
Skin contact	Immediately flush skin with plenty of water and soap for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash contaminated clothing before reusing.
Inhalation	Remove patient to fresh air. Administer approved oxygen supply if breathing is difficult. Administer artificial respiration or CPR if breathing has ceased. Call a physician.
Ingestion	If conscious, wash out mouth with water. Never give anything by mouth to an unconscious or convulsing person. Seek immediate medical attention. Guard against aspiration into lungs.

Section VII. Reactivity Data

Stability	Stable. Conditions to avoid: High temperatures, sparks, open flames and all other sources of ignition, contamination.
Hazardous decomp. products	Not available.
Incompatibility	Oxidizing agents, acids, acid anhydrides, acid chlorides, halogens, acetaldehyde, ethylene oxide, hexamethylene diisocyanate, hydrogen peroxide, sulfuric acid, hypochlorous acid, diisocyanates, isocyanates, lithium aluminum hydride, nitrogen teroxide, perchloric acid, barium perchlorate, diethyl aluminum bromide, tri-isobutyl aluminum, aldehydes, monomers, polymerizable esters, alkylene oxides.
Reaction Products	Not available. Hazardous polymerization will not occur.

Section VIII. Preventive Measures

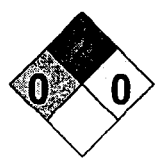
Protective Clothing in case of spill and leak	Wear self-contained breathing apparatus, rubber boots and heavy rubber gloves.
Spill and leak	Evacuate the area. Eliminate all sources of ignition. Absorb on sand or vermiculite and place in a closed container for disposal. Use non-sparking tools. Ventilate area and wash spill site after material pick up is complete. DO NOT empty into drains. DO NOT touch spilled material.
Waste disposal	Burn in a chemical incinerator equipped with an after burner and scrubber. According to all applicable regulations.
Storage and Handling	Store in a cool place away from heated areas, sparks, and flame. Store in a well ventilated area. Store away from incompatible materials. Do not add any other material to the container. Do not wash down the drain. Do not breathe gas/fumes/vapor/spray. In case of insufficient ventilation, wear suitable respiratory equipment. Keep container tightly closed and dry. Manipulate under an adequate fume hood. Take precautionary measures against electrostatic discharges. Ground the container while dispensing. Ground all equipment containing material. Use only explosion proof equipment. Use non-sparking tools. Watch for accumulation in low confined areas. Empty containers may contain a hazardous residue. Handle and open container with care. Take off immediately all contaminated clothing. This product must be manipulated by qualified personnel. Do not get in eyes, on skin, or on clothing. Wash well after use. In accordance with good storage and handling practices. Do not allow smoking and food consumption while handling. In case of accident or if you feel unwell, seek medical advice immediately (show the label when possible.).

Section IX. Protective Measures

Protective clothing	Splash goggles. Impervious rubber gloves, apron, coveralls, and/or other resistant protective clothing. Sufficient to protect skin. Have available and use as appropriate: face shields, rubber suits, aprons, and boots. A OSHA/MSHA jointly approved respirator is advised in the absence of proper environmental controls. Do not wear contact lenses. Make eye bath and emergency shower available. Ensure that eyewash station and safety shower is proximal to the work-station location.
Engineering controls	Use only in a chemical fume hood. Use adequate ventilation. Do not use in unventilated spaces.

Section X. Other Information

Special Precautions or comments Toxic! Combustible liquid! Severe irritant! May cause burns. Do not breathe vapor. Avoid all contact with the product. Avoid prolonged or repeated exposure. Use only in a chemical fume hood. Keep away from heat, sparks and flame. Handle and open container with care. Container should be opened only by a technically qualified person.
RTECS NO: HE4375000 (Decyl alcohol).



NFPA

Prepared by MSDS Department/Département de F.S..

Validated 20-Oct-2004

Telephone# (514) 489-5711

While the company believes the data set forth herein are accurate as of the date hereof, the company makes no warranty with respect thereto and expressly disclaims all liability for reliance thereon. Such data are offered solely for your consideration, investigation and verification.

Tk. # 1084
Detergent A
HOT Wash
Cold Rinse
Dry, Dry
ASAP

ADVANCED AROMATICS, L.P.

5501 Baker Road Baytown, Texas 77520
P O Box 1516 Baytown, Texas 77522
Telephone : 281/424-4505 Fax: 281/424-3532

MATERIAL SAFETY DATA SHEET

Decahydronaphthalene (DHN)

PRODUCT IDENTIFICATION

Chemical Name: Decahydronaphthalene

Chemical Family: Aromatic hydrocarbon, C10H18

Trade Name: DHN

Synonyms: Decalin

Revision Date: 04/16/03

Manufacturer /Distributor: Advanced Aromatics, L.P. 5501 Baker Road Baytown, TX 77520

EMERGENCY CONTACT: (281) 424-4505 24 hour number: (281) 424-9566 Chemtrec: (800) 424-9300

HAZARDOUS COMPONENTS

The following chemical components have been determined to be hazardous under OSHA's Hazard Communication Std. 29 CFR 1910.1200, and are listed in Table Z-1,Z-2,and/or Z-3 1910.1000 (Toxic and Hazardous Substances).

CAS No.	Material or Component	Percentage
91-17-8	Decahydronaphthalene, mixture of Cis and Trans	95 - 99%
119-64-2	1,2,3,4-Tetrahydronaphthalene	< 1 %

PHYSICAL DATA (TYPICAL)

Specific Gravity (Water = 1): 0.8927 - 0.87 @ 68 °F	Boiling Point: 368 °F
Vapor Density (Air=1): 4.55	Freezing Point: -46 °F
Vapor Pressure (PSIA): 1.0 mmHg @ 100 °F	Evaporation Rate (Butyl Acetate =1): < 1
Solubility In Water: insoluable in water, soluable in alcohol and ether	Viscosity: 1.348 cp @ 68 °F

Physical Description: clear colorless liquid with an aromatic odor.

FIRE AND EXPLOSION DATA

Flash Point: 136 °F Autoignition Temperature : 482 °F

Flammable Limits in Air % by Volume: Lower: 0.7 Upper: 4.9

Extinguishing Media: Use dry chemical, carbon dioxide, water spray and foam suitable for hydrocarbon use.

Special Fire Fighting Procedures: Flammable and toxic vapors given off in a fire. Wear complete personal protection equipment. SCBA required. Keep area controlled to prevent exposures to people downwind.

Unusual Fire and Explosion Hazard: explosive air mixtures are created in a fire situation

or "Disclaimer of Liability", see the statement on Page 5.

EPAPA008000842

REACTIVITY DATA

ıbility: Product is stable under normal storage conditions, however; prolonged exposure to oxygen can cause Hydroperoxide ırmation.

Conditions to Avoid: Extreme heat, sources of ignition, strong oxidizers, and long-term storage with oxygen in the vapor space.

Incompatibility: Strong Oxidizers.

Hazardous Polymerization: Will not occur.

Hazardous Decomposition Products When Heated: Flammable vapors are emitted creating carbon dioxide and toxic fumes of carbon monoxide.

HMIS RATING

NFPA 704 Rating: 0 – Insignificant 1 – Slight 2 – Moderate 3 - High 4 – Extreme

Health: 2 Flammability: 2 Reactivity: 0 Special Hazard: None Personal Protection: B

HEALTH HAZARD INFORMATION

Symptoms Of Exposure:

Symptoms of exposure to this product may include irritation to the skin, eyes, mucous membranes and respiratory tract, dizziness, narcosis, suffocation, lower blood pressure, CNS depression, nausea and headache. Prolonged skin contact may result in dermatitis. Eye contact may result in temporary corneal damage.

Health Effects:

ACUTE - Eye, skin, respiratory system, and mucous membrane irritation accompanied by headache and nausea. Liver and kidney damage caused by acute ingestion.

CHRONIC - Permanent damage to the skin, liver, kidneys due to overexposure.

estion: Do not take internally. Seek physician advice immediately.

Skin: Avoid prolonged or repeated skin contact.

Inhalation: Avoid inhalation of vapors. Use in well ventilated areas.

Eyes: Avoid chemical contact with the eyes.

Special Medical Conditions Aggravated by Exposure: None known.

Primary Route of Entry: Inhalation of vapors and skin contact.

Exposure Limits: None Established for this product

(*Naphthalene*) OSHA PEL– 10 ppm (50 mg/m3) TWA for 8-hour workday, STEL = 15 ppm (75 mg/m3).
ACGIH TLV- 10 ppm (52 mg/m3) TWA for 8-hour workday.

Carcinogen Status: Not listed on (NTP) National Toxicology Program Annual Report on Carcinogens or (IARC) International Agency for Research on Cancer " Monographs", and is not classified by OSHA as a carcinogen. .

NTP studies TR-410 and TR-500 show evidence of increased tumor growth in rodents after inhalation of *Naphthalene*.

Toxicity:
NIOSH REGISTRY NUMBER: QJ3150000

TOXICITY:

Dose	*mode*	*specie*	*amount / units*
Mild Irritant	Draize Test (eye)-	Rabbit	500 mg/24 hr.
Mild Irritant	Draize Test (skin)-	Rabbit	10 mg/24 hr.
LD50	Oral -	Rat	4170 mg/kg

EPAPA008000843

LC50	Inhalation -	Rat	710 ppm/4H
LC50	Inhalation -	mus	1085 ppm/4H
Irritant TCLo	Inhalation -	Human	100 ppm

ARCINOGENICITY:

Tumorigenic Data: No test data available

NTP carcinoginicity studies: No test data available for THN, but Naphthalene is studied in TR-410 and TR-500 by the NTP.

MUTATION DATA:

No test data available

TERATOGENICITY: No test data available

FIRST AID

Ingestion: Do not induce vomiting. Immediately seek medical attention.

Skin: Remove soiled clothing and wash with soap and water. Seek medical attention if irritation develops or persists.

Inhalation: Remove to fresh air. If breathing irregular, administer oxygen. Immediately seek medical attention.

Eyes: Flush eyes with water for at least 15 minutes. Immediately seek medical attention.

SPILL OR LEAK PROCEDURES / WASTE DISPOSAL

In Case of a Transportation Accident, Contact CHEMTREC at 1-800/424-9300.

IN CASE OF SPILLS OR RELEASE: Refer to DOT NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK for handling rmation. For small spill, use solid absorbent and shovel into disposal container. For large spills, dike the area to facilitate salvage or sposal. Shut off ignition sources and avoid breathing vapors. Avoid runoff into sewers and advise authorities.

Waste Disposal Method: Adhere to all local, state, and federal regulations. See regulatory information below.
Disposal: If this product becomes a waste, it must be disposed of as required by applicable state and federal laws.

SPECIAL PROTECTION INFORMATION

Respiratory Protection: Organic vapor cartridge respirator with particulate filter, or SCBA.

Gloves: Non-permeable Nitrile rubber with durable construction to match the task.

Eyes: Chemical splash goggles or face shield.

Ventilation: Use local exhaust as required to control exposure. Electrical classification of equipment should be considered.

SPECIAL PRECAUTIONS

Storage and Handling: Product should be stored in closed containers under nitrogen atmosphere and located in a cool dry location, away from source of ignition and oxidizing agents. Avoid breathing vapors and mists, along with prolonged skin contact.

or ...claimer of Liability", see the statement on Page 5.

EPAPA008000844

TRANSPORTATION INFORMATION

: proper shipping name / hazard class may vary by packaging, properties, and mode of transportation.

roper shipping names are:

ALL TRANSPORTATION MODES:	Decahydronaphthalene
AIR TRANSPOIRATION: (IATA / ICAO)	Decahydronaphthalene
MARINE TRANSPORTATION: (IMDG / IMO)	Decahydronaphthalene
UN/ID NO.:	UN1147
HAZARD CLASS - PRIMARY:	3 (Flammable Liquid)
PACKING GROUP:	III
CARGO AIRCRAFT LIMIT:	220 L
PASSENGER AIRCRAFT LIMIT:	60 L
FLASH POINT:	136 °F
TECHNICAL NAME(s):	Decahydronaphthalene, 1,2,3,4-Tetrahydronaphthalene
RQ LBS. (Per pkg.):	N/A
RQ COMPONENTS (s):	None
MARINE POLLUTANT (s):	None

REGULATORY INFORMATION RIGHT-TO-KNOW PROGRAM

This product contains the following toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and 40 CRF472.

CAS No.	Material or Component	% by Weight
91-17-8	Decahydronaphthalene, mixture of Cis and Trans	95 - 99%
119-64-2	1,2,3,4-Tetrahydronaphthalene	< 1 %

THE FOLLOWING FEDERAL REGULATIONS APPLY TO THIS PRODUCT:

OSHA HAZARD COMMUNICATION STD: 29CFR 1910.1200, 29 CFR 1910.1000 Table Z-1, Z-2, and/or Z-3.
None established for Decahydronaphthalene

Based on a hazard evaluation, the following components in this product are hazardous for the reasons listed below.

------Immediate (acute) health hazard
------Delayed (chronic) health hazard
--xx--Fire Hazard
-------Sudden release of pressure hazard
-------Reactive hazard

mer of Liability", see the statement on Page 5.

EPAPA008000845

ERCLA, 40 CFR 117,302:

This product contains no reportable quantity (RQ) substances, requiring reporting to the National Response Center, Washington D.C. (1-800-424-8802). There may also be other state and local requirements to report spills.

SARA TITLE III:

Section 302 - This product does not contain any components regulated under SARA TITLE III, Section 302 (Extremely Hazardous Substance).

TOXIC SUBSTANCE CONTROL ACT (TSCA): The component(s) in this product are on the TSCA Inventory.

ALL INFORMATION ON THIS MSDS MUST BE INCLUDED IN ALL MSDS THAT ARE COPIED AND DISTRIBUTED FOR THIS MATERIAL.

This information is provided for the customers of Advanced Aromatics; however, it does not address in detail the use, storage or handling of the product. Users of the product, considering their use, storage or handling of the product, may need to develop additional procedures. The information should not be relied on to insure compliance by the customer with any federal, state or local legal requirements. Information provided herein, are not product specifications.

...laimer of Liability", see the statement on Page 5.

EPAPA008000846

EVALUATION OF TNRCC PEMIT-BY-RULE (EXEMPTION)

Method of control: None
PRODUCT:

CONSTITUENTS	CAS NUMBER	MOLECULAR WEIGHT	VAPOR Pressure @ 100 F psia	LIQUID WT. %	LIQUID MOLES	LIQUID MOLE FRACTION	PART. PRESS psia	VAPOR WT.	VAPOR WT. FRAC.
decahydronaphthalene	91-17-8	138.3	0.0400	100.00	0.7233	1.0000	0.0400	138.2500	1.0000
0	0	0.0	0.000	0.00	0.0000	0.0000	0.0000	0.0000	0.0000
0	0	0.0	0.000	0.00	0.0000	0.0000	0.0000	0.0000	0.0000
0	0	0.0	0.000	0.00	0.0000	0.0000	0.0000	0.0000	0.0000
0	0	0.0	0.000	0.00	0.0000	0.0000	0.0000	0.0000	0.0000
0	0	0.0	0.000	0.00	0.0000	0.0000	0.0000	0.0000	0.0000
0	0	0.0	0.000	0.00	0.0000	0.0000	0.0000	0.0000	0.0000
0	0	0.0	0.000	0.00	0.0000	0.0000	0.0000	0.0000	0.0000
0	0	0.0	0.000	0.00	0.0000	0.0000	0.0000	0.0000	0.0000
0	0	0.0	0.000	0.00	0.0000	0.0000	0.0000	0.0000	0.0000
				100.00	0.7233	1.0000	0.0400	138.2500	1.0000

CONSTITUENTS	TLV mg / m3	VAPOR WEIGHT FRACTION	EMISSIONS lb/container	NUMBER OF CONTAINERS Z Per Hour	NUMBER OF CONTAINERS Z Per Year	ACTUAL EMISSIONS (1) HOURLY EMISSIONS lb/hr	ACTUAL EMISSIONS (1) ANNUAL EMISSIONS tpy	APPLICABLE EXEMPTION NO.	ALLOWABLE EMISSIONS (2) HOURLY lb/hr	ALLOWABLE EMISSIONS (2) ANNUAL tpy	EXCEEDS HOURLY ALLOWABLE EMISSIONS ? lb/hr	EXCEEDS ANNUAL ALLOWABLE EMISSIONS ? tpy
decahydronaphthalene	0	1.00000	0.98474	1	1000	0.9847	0.4924	-	-	-	-	-
0	0	0.00000	0.00000	1	1000	0.0000	0.0000	-	-	-	-	-
0	0	0.00000	0.00000	2	1000	0.0000	0.0000	-	-	-	-	-
0	0	0.00000	0.00000	2	1000	0.0000	0.0000	-	-	-	-	-
0	0	0.00000	0.00000	2	1000	0.0000	0.0000	-	-	-	-	-
0	0	0.00000	0.00000	2	1000	0.0000	0.0000	-	-	-	-	-
0	0	0.00000	0.00000	2	1000	0.0000	0.0000	-	-	-	-	-
0	0	0.00000	0.00000	2	1000	0.0000	0.0000	-	-	-	-	-
0	0	0.00000	0.00000	2	1000	0.0000	0.0000	-	-	-	-	-
0	0	0.00000	0.00000	2	1000	0.0000	0.0000	-	-	-	-	-

P - On Facility Appoved Permit List, or not a regulated pollutant
N/A - Not pulbished in ACGIH
N/A* - Published value in ACGIH is based on particulate. Due to the nature of the cleaning process, emission of particulate will not occur with this product.
Note: Water is not a regulated pollutant.

(1) Calculation Basis: [((MV * vol * VP) / (R * T)) * wt] * Z * (1-(e/100))

where:
MV = Vapor Molecular weight (lb / lb-moles)
VP = True Vapor pressure (psia)
vol. = Container Volume (ft3) = 1070 ft3 (8,000 gal)
R = Gas Constant = 10.73 psia ft3 / lb mole R
T = Temperature = 560 R
wt = Vapor weight fraction
Z = No. of trucks / year or trucks/hr
e = Control efficiency
Flare = 98 %
None = 0 %
Control efficiency: 0 %

(2) Exemption Allowables:

	lb/hr	ton/yr
106.261	1.0	10.0
106.262 E = L/K		5.0

L = TLV (mg/m^3)
K = 212.6 Extrapolated based on distance of 190 feet.

H:\client\hoyer\eval\^

2/27/2008

EPAPA00800847

(MSDS #830555 - RTF Format)

MATERIAL SAFETY DATA SHEET

SHELL MSDS: 830555-1 10/06/00

DEMINERALIZED WATER

TELEPHONE NUMBER:
24 HOUR EMERGENCY ASSISTANCE
CHEMTREC: 800-424-9300

GENERAL MSDS ASSISTANCE
SHELL: 713-241-4819

COMPANY NAME AND ADDRESS
SHELL CHEMICAL COMPANY
P.O. BOX 4320
HOUSTON, TX 77210-4320 USA

SECTION I NAME

PRODUCT: DEMINERALIZED WATER
CHEM NAME: --
CHEM FAMILY: NONE
SHELL CODE: SSSSS

HEALTH HAZARD: 3 **FIRE HAZARD:** 0 **REACTIVITY:** 0

SECTION II-A INGREDIENTS

NO.	COMPOSITION	CAS NO.	PERCENT
P	DEMINERALIZED WATER	7732-18-5	100
1	WATER	7732-18-5	100

SECTION II-B ACUTE TOXICITY DATA

NO.	ACUTE ORAL LD50	ACUTE DERMAL LD50	ACUTE INHALATION LD50
P	NO DATA AVAILABLE		

SECTION III HEALTH INFORMATION

THE HEALTH EFFECTS NOTED BELOW ARE CONSISTENT WITH REQUIREMENTS UNDER THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200).

EYE CONTACT:
MATERIAL IS PRESUMED TO BE NONIRRITATING TO MINIMALLY IRRITATING TO THE EYES. HOT MATERIAL MAY CAUSE THERMAL EYE BURNS.

SKIN CONTACT:
MATERIAL IS PRESUMED TO BE NONIRRITATING TO SLIGHTLY IRRITATING TO THE SKIN. HOT MATERIAL MAY CAUSE THERMAL BURNS.

INHALATION:

MATERIAL IS PRESUMED TO HAVE A LOW ORDER OF ACUTE TOXICITY UPON INHALATION OF MIST OR VAPORS. HOT MATERIAL MAY CAUSE THERMAL BURNS.

INGESTION:
MATERIAL IS PRESUMED TO HAVE A LOW ORDER OF ACUTE ORAL TOXICITY. HOT MATERIAL MAY CAUSE THERMAL BURNS.

SIGNS AND SYMPTOMS:
TISSUE DAMAGE AT ALL POINTS OF CONTACT WITH HOT MATERIAL.

AGGRAVATED MEDICAL CONDITIONS:
NONE.

OTHER HEALTH EFFECTS:

SECTION IV OCCUPATIONAL EXPOSURE LIMITS

COMP	OSHA		ACGIH		
NO.	PEL/TWA	PEL/CEILING	TLV/TWA	TLV/STEL	OTHER
P	NONE				

SECTION V EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT:
FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES WHILE HOLDING EYELIDS OPEN.

SKIN CONTACT:
FLUSH SKIN WITH WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. GET MEDICAL ATTENTION. DO NOT REUSE CLOTHING OR SHOES UNTIL CLEANED.

INHALATION:
REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GET MEDICAL ATTENTION.

INGESTION:
DO NOT INDUCE VOMITING. GET MEDICAL ATTENTION.

NOTE TO PHYSICIAN:

SECTION VI SUPPLEMENTAL HEALTH INFORMATION

NONE IDENTIFIED.

SECTION VII PHYSICAL DATA

BOILING POINT (DEG F): SPECFIC GRAVITY (H2O = 1): VAPOR PRESSURE (MM HG):

212 1.0 NOT APPLICABLE

MELTING POINT (DEG F): NOT APPLICABLE
SOLUBILITY IN WATER: NOT APPLICABLE
VAPOR DENSITY (AIR = 1): NOT APPLICABLE

PH: 7.0

EVAPORATION RATE (NORMAL BUTYL ACETATE = 1): NOT APPLICABLE

APPEARANCE AND ODOR:
WATER WHITE; ODORLESS.

SECTION VIII FIRE AND EXPLOSION HAZARDS

FLASH POINT AND METHOD: NOT APPLICABLE

FLAMMABLE LIMITS/PERCENT VOLUME IN AIR: LOWER: N/APP UPPER: N/APP

EXTINGUISHING MEDIA:
NOT APPLICABLE.

SPECIAL FIRE FIGHTING PROCEDURES AND PRECAUTIONS:

UNUSUAL FIRE AND EXPLOSION HAZARDS:

SECTION IX REACTIVITY

STABLITY: STABLE **HAZARDOUS POLYMERIZATION:** WILL NOT OCCUR

CONDITIONS AND MATERIALS TO AVOID:
AVOID CONTACT WITH STRONG OXIDIZING AGENTS.

HAZARDOUS DECOMPOSITION PRODUCTS:

SECTION X EMPLOYEE PROTECTION

RESPIRATORY PROTECTION:
DO NOT BREATHE STEAM OR MIST.

PROTECTIVE CLOTHING
DO NOT GET IN EYES. WEAR CHEMICAL GOGGLES IF THERE IS POTENTIAL CONTACT WITH EYES. DO NOT GET ON SKIN, ON CLOTHING. WEAR PROTECTIVE CLOTHING SUCH AS GLOVES, OUTER CLOTHING OR APRON, OVERSHOES AND A FACE-SHIELD SUITABLE TO POTENTIAL EXPOSURE.

ADDITIONAL PROTECTIVE MEASURES:

SECTION XI ENVIRONMENTAL PROTECTION

SPILL OR LEAK PROCEDURES:
*** LARGE SPILLS *** WEAR PROTECTIVE CLOTHING AS APPROPRIATE. SHUT OFF SOURCE OF LEAK IF SAFE TO DO SO. DIKE AND CONTAIN. REMOVE WITH VACUUM TRUCKS OR PUMP TO STORAGE/SALVAGE VESSELS. SOAK UP RESIDUE WITH AN ABSORBENT SUCH AS CLAY, SAND OR OTHER SUITABLE MATERIAL; DISPOSE OF PROPERLY. FLUSH AREA WITH WATER TO REMOVE TRACE RESIDUE. *** SMALL SPILLS *** TAKE UP WITH AN ABSORBENT MATEIRAL AND DISPOSE OF PROPERLY.

SECTION XII SPECIAL PRECAUTIONS

THOROUGHLY WASH UP WITH SOAP AND WATER BEFORE EATING, DRINKING, SMOKING OR USING TOILET FACILITIES.

SECTION XIII TRANSPORTATION REQUIREMENTS

DEPARTMENT OF TRANSPORTATION CLASSIFICATION:
TRANSPORTATION REQUIREMENTS DETERMINED ON A CASE BY CASE BASIS BY SHIPPING LOCATION.

DOT PROPER SHIPPING NAME:

OTHER REQUIREMENTS:
BULK, DRUM AND SAMPLE LABELS FOR THIS MATERIAL ARE AVAILABLE FROM THE COMPUTER LABEL SYSTEM (CLS); USE LABEL CODE 830555. THE CLS LABELS DO NOT MEET ANY D.O.T. REQUIREMENTS. THE SHIPPING LOCATION MUST EVALUATE EACH SHIPMENT AND COMPLY WITH D.O.T. MARKING AND LABEL REQUIREMENTS, AS APPROPRIATE.

SECTION XIV OTHER REGULATORY CONTROLS

THIS PRODUCT IS LISTED ON THE EPA/TSCA INVENTORY OF CHEMICAL SUBSTANCES.

IN ACCORDANCE WITH SARA TITLE III, SECTION 313, THE ATTACHED ENVIRONMENTAL DATA SHEET (EDS) SHOULD ALWAYS BE COPIED AND SENT WITH THE MSDS.

SECTION XV STATE REGULATORY INFORMATION

STATE LISTED COMPONENT	CAS NO.	PERCENT	STATE CODE

BASED ON INFORMATION AVAILABLE TO SHELL, THIS PRODUCT DOES NOT CONTAIN ANY CHEMICAL SUBSTANCE REGULATED BY A SPECIFIC STATE LIST.

SECTION XVI SPECIAL NOTES

ADDRESS CHANGED.

THE INFORMATION CONTAINED HEREIN IS BASED ON THE DATA AVAILABLE TO US AND IS BELIEVED TO BE CORRECT. HOWEVER, SHELL MAKES NO WARRANTY, EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF. SHELL ASSUMES NO RESPONSIBILITY FOR INJURY FROM THE USE OF THE PRODUCT DESCRIBED HEREIN.

WE ARE PROVIDING OUR MOST RECENT MATERIAL SAFETY DATA SHEET AND/OR ENVIRONMENTAL DATA SHEET. IF YOU WISH TO RECEIVE UPDATES TO THIS INFORMATION, PLEASE CALL SHELL'S GENERAL MSDS ASSISTANCE LINE (713-241-4819) TO ENSURE THAT YOU ARE ADDED TO SHELL'S REGULAR MSDS DISTRIBUTION SYSTEM.

BE SAFE. READ OUR PRODUCT SAFETY INFORMATION...AND PASS IT ON. (PRODUCT LIABILITY LAW REQUIRES IT)

SHELL CHEMICAL COMPANY
P.O. BOX 4320
HOUSTON, TX 77210-4320 USA

ENVIRONMENTAL DATA SHEET

SHELL EDS: 830555-00 10/06/00

DEMINERALIZED WATER

TELEPHONE NUMBER:

24 HOUR EMERGENCY ASSISTANCE
CHEMTREC: 800-424-9300

GENERAL MSDS ASSISTANCE
SHELL: 713-241-4819

COMPANY NAME AND ADDRESS

SHELL CHEMICAL COMPANY
P.O. BOX 4320
HOUSTON, TX 77210-4320 USA

PRODUCT CODE: SSSSS

SECTION I PRODUCT COMPOSITION

NO.	COMPOSITION	CAS	PERCENT
P	DEMINERALIZED WATER	7732-18-5	100
1	WATER	7732-18-5	100

SECTION II SARA TITLE III INFORMATION

NO.	EHS RQ (*1)	EHS TPQ (*2)	SEC-313 (*3)	313 CATEGORY (*4)	311/312 CATEGORY (*5)

*1 = REPORTABLE QUANTITY OF EXTREMELY HAZARDOUS SUBSTANCE, SEC 302
*2 = THRESHOLD PLANNING QUANTITY, EXTREMELY HAZARDOUS SUBSTANCE, SEC 302
*3 = TOXIC CHEMICAL, SEC 313
*4 = CATEGORY AS REQUIRED BY SEC 313 (40 CFR 372.65 C), MUST BE USED ON TOXIC RELEASE INVENTORY FORM
*5 = CATEGORY (FOR AGGREGATE REPORTING REQUIREMENTS UNDER SARA 311, 312)
HEALTH: H-1 = IMMEDIATE (ACUTE) HEALTH HAZARD
H-2 = DELAYED (CHRONIC) HEALTH HAZARD
PHYSICAL: P-3 = FIRE HAZARD
P-4 = SUDDEN RELEASE OF PRESSURE HAZARD
P-5 = REACTIVE HAZARD

SECTION III ENVIRONMENTAL RELEASE INFORMATION

NOT APPLICABLE

SECTION IV RCRA INFORMATION

PLACE IN AN APPROPRIATE DISPOSAL FACILITY IN COMPLIANCE WITH LOCAL REGULATIONS.

HALLIBURTON

MATERIAL SAFETY DATA SHEET

Product Trade Name: **DETERGENT**

Revision Date: 06-Jan-2005

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Trade Name: DETERGENT
Synonyms: None
Chemical Family: Anionic and Nonionic Surfactant
Application: Anionic Surfactant

Manufacturer/Supplier
Baroid Drilling Fluids
a Product Service Line of Halliburton Energy Services, Inc.
P.O. Box 1675
Houston, TX 77251
Telephone: (281) 871-4000
Emergency Telephone: (281) 575-5000

Prepared By
Chemical Compliance
Telephone: 1-580-251-4335

2. COMPOSITION/INFORMATION ON INGREDIENTS

SUBSTANCE	CAS Number	PERCENT	ACGIH TLV-TWA	OSHA PEL-TWA
Contains no hazardous substances	Mixture	60 - 100%	Not applicable	Not applicable

3. HAZARDS IDENTIFICATION

Hazard Overview May cause eye and skin irritation.

4. FIRST AID MEASURES

Inhalation If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

Skin Wash with soap and water.

Eyes In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

Ingestion Do not induce vomiting. Slowly dilute with 1-2 glasses of water or milk and seek medical attention. Never give anything by mouth to an unconscious person.

Notes to Physician Not Applicable

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5. FIRE FIGHTING MEASURES

Flash Point/Range (F):	> 210
Flash Point/Range (C):	> 99
Flash Point Method:	PMCC
Autoignition Temperature (F):	Not Determined
Autoignition Temperature (C):	Not Determined
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Upper (%):	Not Determined

Fire Extinguishing Media	Water fog, carbon dioxide, foam, dry chemical.
Special Exposure Hazards	Decomposition in fire may produce toxic gases.
Special Protective Equipment for Fire-Fighters	Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.
NFPA Ratings:	Health 1, Flammability 0, Reactivity 0
HMIS Ratings:	Flammability 0, Reactivity 0, Health 1

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures	Use appropriate protective equipment.
Environmental Precautionary Measures	Prevent from entering sewers, waterways, or low areas.
Procedure for Cleaning / Absorption	Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Scoop up and remove.

7. HANDLING AND STORAGE

Handling Precautions	Avoid contact with eyes, skin, or clothing. Avoid breathing vapors.
Storage Information	Keep container closed when not in use. Product has a shelf life of 36 months.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls	Use in a well ventilated area.
Respiratory Protection	Not normally needed. But if significant exposures are possible then the following respirator is recommended: Organic vapor respirator.
Hand Protection	Impervious rubber gloves.
Skin Protection	Normal work coveralls.
Eye Protection	Wear safety glasses or goggles to protect against exposure.
Other Precautions	None known.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Color:	Red
Odor:	Pleasant
pH:	9
Specific Gravity @ 20 C (Water=1):	1.01

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Density @ 20 C (lbs./gallon):	8.4
Bulk Density @ 20 C (lbs/ft3):	62.8
Boiling Point/Range (F):	215
Boiling Point/Range (C):	102
Freezing Point/Range (F):	30
Freezing Point/Range (C):	-1.11
Vapor Pressure @ 20 C (mmHg):	Not Determined
Vapor Density (Air=1):	Not Determined
Percent Volatiles:	2.0
Evaporation Rate (Butyl Acetate=1):	Not Determined
Solubility in Water (g/100ml):	Miscible
Solubility in Solvents (g/100ml):	Not Determined
VOCs (lbs./gallon):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined
Viscosity, Kinematic @ 20 C (centistrokes):	Not Determined
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	Not Determined

10. STABILITY AND REACTIVITY

Stability Data:	Stable
Hazardous Polymerization:	Will Not Occur
Conditions to Avoid	None anticipated
Incompatibility (Materials to Avoid)	Strong oxidizers.
Hazardous Decomposition Products	Carbon monoxide and carbon dioxide.
Additional Guidelines	Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure	Eye or skin contact, inhalation.
Inhalation	May cause central nervous system depression including headache, dizziness, drowsiness, incoordination, slowed reaction time, slurred speech, giddiness and unconsciousness.
Skin Contact	Causes drying of the skin. May cause mild skin irritation.
Eye Contact	May cause mild eye irritation.
Ingestion	May cause abdominal pain, vomiting, nausea, and diarrhea.
Aggravated Medical Conditions	None known.
Chronic Effects/Carcinogenicity	No data available to indicate product or components present at greater than 1% are chronic health hazards.
Other Information	None known.
Toxicity Tests	
Oral Toxicity:	Not determined
Dermal Toxicity:	Not determined
Inhalation Toxicity:	Not determined

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Primary Irritation Effect:	Not determined
Carcinogenicity	Not determined
Genotoxicity:	Not determined
Reproductive / Developmental Toxicity:	Not determined

12. ECOLOGICAL INFORMATION

Mobility (Water/Soil/Air)	Not determined
Persistence/Degradability	Not determined
Bio-accumulation	Not Determined

Ecotoxicological Information

Acute Fish Toxicity:	Not determined
Acute Crustaceans Toxicity:	Not determined
Acute Algae Toxicity:	Not determined
Chemical Fate Information	Not determined
Other Information	Not applicable

13. DISPOSAL CONSIDERATIONS

Disposal Method	Disposal should be made in accordance with federal, state, and local regulations.
Contaminated Packaging	If empty container retains product residues, all label precautions must be observed. Transport with all closures in place. Return for reuse or disposal according to national or local regulations.

14. TRANSPORT INFORMATION

Land Transportation

DOT
Not restricted

Canadian TDG
Not restricted

ADR Not restricted

Air Transportation

ICAO/IATA Not restricted

Sea Transportation

IMDG
Not restricted

Other Shipping Information

Labels:	None

15. REGULATORY INFORMATION

US Regulations

US TSCA Inventory	All components listed on inventory.
EPA SARA Title III Extremely Hazardous Substances	Not applicable
EPA SARA (311,312) Hazard Class	Acute Health Hazard
EPA SARA (313) Chemicals	This product does not contain a toxic chemical for routine annual "Toxic Chemical Release Reporting" under Section 313 (40 CFR 372).
EPA CERCLA/Superfund Reportable Spill Quantity For This Product	Not applicable.
EPA RCRA Hazardous Waste Classification	If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.
California Proposition 65	All components listed do not apply to the California Proposition 65 Regulation.
MA Right-to-Know Law	One or more components listed.
NJ Right-to-Know Law	One or more components listed.
PA Right-to-Know Law	One or more components listed.

Canadian Regulations

Canadian DSL Inventory	All components listed on inventory.
WHMIS Hazard Class	D2B Toxic Materials

16. OTHER INFORMATION

The following sections have been revised since the last issue of this MSDS
Not applicable

Additional Information	For additional information on the use of this product, contact your local Halliburton representative. For questions about the Material Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.
Disclaimer Statement	This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

*****END OF MSDS*****

EPAPA008000858

HALLIBURTON

MATERIAL SAFETY DATA SHEET

Product Trade Name: **DIESEL FUEL**

Revision Date: 02-Jan-2007

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Trade Name: DIESEL FUEL
Synonyms: None
Chemical Family: Organic hydrocarbon
Application: Fuel

Manufacturer/Supplier
Halliburton Energy Services
P.O. Box 1431
Duncan, Oklahoma 73536-0431
Emergency Telephone: (281) 575-5000

Prepared By
Chemical Compliance
Telephone: 1-580-251-4335

2. COMPOSITION/INFORMATION ON INGREDIENTS

SUBSTANCE	CAS Number	PERCENT	ACGIH TLV-TWA	OSHA PEL-TWA
Diesel	68476-34-6	60 - 100%	Not applicable	Not applicable

3. HAZARDS IDENTIFICATION

Hazard Overview
May cause eye, skin, and respiratory irritation. May cause headache, dizziness, and other central nervous system effects. May be harmful if swallowed. Potential carcinogen. Combustible.

4. FIRST AID MEASURES

Inhalation
If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult give oxygen. Get medical attention.

Skin
In case of contact, immediately flush skin with plenty of soap and water for at least 15 minutes. Get medical attention. Remove contaminated clothing and launder before reuse.

Eyes
In case of contact, or suspected contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention immediately after flushing.

Ingestion
Get medical attention! If vomiting occurs, keep head lower than hips to prevent aspiration.

Notes to Physician
Not Applicable

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5. FIRE FIGHTING MEASURES

Flash Point/Range (F):	Not Determined**Min:** > 150
Flash Point/Range (C):	Not Determined**Min:** > 65
Flash Point Method:	Not Determined
Autoignition Temperature (F):	495
Autoignition Temperature (C):	257
Flammability Limits in Air - Lower (%):	0.7
Flammability Limits in Air - Upper (%):	6

Fire Extinguishing Media	Water fog, carbon dioxide, foam, dry chemical.
Special Exposure Hazards	Use water spray to cool fire exposed surfaces. Closed containers may explode in fire. Decomposition in fire may produce toxic gases.
Special Protective Equipment for Fire-Fighters	Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.
NFPA Ratings:	Health 1, Flammability 2, Reactivity 0
HMIS Ratings:	Flammability 2, Reactivity 0, Health 1

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures	Use appropriate protective equipment. Wear self-contained breathing apparatus in enclosed areas.
Environmental Precautionary Measures	Prevent from entering sewers, waterways, or low areas.
Procedure for Cleaning / Absorption	Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Scoop up and remove.

7. HANDLING AND STORAGE

Handling Precautions	Avoid contact with eyes, skin, or clothing. Avoid breathing vapors. Wash hands after use. Launder contaminated clothing before reuse.
Storage Information	Store away from oxidizers. Keep from heat, sparks, and open flames. Keep container closed when not in use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls	Use in a well ventilated area. Local exhaust ventilation should be used in areas without good cross ventilation.
Respiratory Protection	Organic vapor respirator.
Hand Protection	Impervious rubber gloves.
Skin Protection	Rubber apron.
Eye Protection	Chemical goggles; also wear a face shield if splashing hazard exists.
Other Precautions	Eyewash fountains and safety showers must be easily accessible.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Color:	Clear colorless

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9. PHYSICAL AND CHEMICAL PROPERTIES

Odor:	Diesel
pH:	Not Determined
Specific Gravity @ 20 C (Water=1):	0.84
Density @ 20 C (lbs./gallon):	7.0
Bulk Density @ 20 C (lbs/ft3):	Not Determined
Boiling Point/Range (F):	300
Boiling Point/Range (C):	148
Freezing Point/Range (F):	Not Determined
Freezing Point/Range (C):	Not Determined
Vapor Pressure @ 20 C (mmHg):	1
Vapor Density (Air=1):	Not Determined
Percent Volatiles:	100
Evaporation Rate (Butyl Acetate=1):	Not Determined
Solubility in Water (g/100ml):	Insoluble
Solubility in Solvents (g/100ml):	Not Determined
VOCs (lbs./gallon):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined
Viscosity, Kinematic @ 20 C (centistrokes):	2.0-5.8
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	Not Determined

10. STABILITY AND REACTIVITY

Stability Data:	Stable
Hazardous Polymerization:	Will Not Occur
Conditions to Avoid	Keep away from heat, sparks and flame.
Incompatibility (Materials to Avoid)	Strong oxidizers.
Hazardous Decomposition Products	Carbon monoxide and carbon dioxide.
Additional Guidelines	Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure	Eye or skin contact, inhalation.
Inhalation	May cause respiratory irritation. May cause central nervous system depression including headache, dizziness, drowsiness, incoordination, slowed reaction time, slurred speech, giddiness and unconsciousness.
Skin Contact	May cause skin defatting with prolonged exposure. May cause skin irritation.
Eye Contact	May cause eye irritation.
Ingestion	Aspiration into the lungs may cause chemical pneumonitis including coughing, difficulty breathing, wheezing, coughing up blood and pneumonia, which can be fatal.
Aggravated Medical Conditions	Skin disorders.
Chronic Effects/Carcinogenicity	Contains petroleum distillates which have been shown to cause skin cancer in laboratory animals.
Other Information	None known.

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Toxicity Tests

Oral Toxicity:	Not determined
Dermal Toxicity:	Not determined
Inhalation Toxicity:	Not determined
Primary Irritation Effect:	Not determined
Carcinogenicity	Not determined
Genotoxicity:	Not determined
Reproductive / Developmental Toxicity:	Not determined

12. ECOLOGICAL INFORMATION

Mobility (Water/Soil/Air)	Not determined
Persistence/Degradability	Slowly biodegradable
Bio-accumulation	Not Determined

Ecotoxicological Information

Acute Fish Toxicity:	Not determined
Acute Crustaceans Toxicity:	Not determined
Acute Algae Toxicity:	Not determined
Chemical Fate Information	Not determined
Other Information	Not applicable

13. DISPOSAL CONSIDERATIONS

Disposal Method	Disposal should be made in accordance with federal, state, and local regulations.
Contaminated Packaging	Follow all applicable national or local regulations.

14. TRANSPORT INFORMATION

Land Transportation

DOT

Not restricted except for ADR

DOT (Bulk)
Diesel Fuel, Combustible Liquid, NA1993, III

Canadian TDG

Not restricted except for ADR

ADR
UN1202, Diesel, 3, III
Not restricted except for ADR

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Air Transportation

ICAO/IATA
UN1202, Diesel, 3, III
Not restricted except for ADR

Sea Transportation

IMDG
UN1202, Diesel, 3, III
Not restricted except for ADR

Other Shipping Information

Labels: Combustible

15. REGULATORY INFORMATION

US Regulations

US TSCA Inventory	All components listed on inventory.
EPA SARA Title III Extremely Hazardous Substances	Not applicable
EPA SARA (311,312) Hazard Class	Acute Health Hazard Chronic Health Hazard Fire Hazard
EPA SARA (313) Chemicals	This product does not contain a toxic chemical for routine annual "Toxic Chemical Release Reporting" under Section 313 (40 CFR 372).
EPA CERCLA/Superfund Reportable Spill Quantity For This Product	Not applicable.
EPA RCRA Hazardous Waste Classification	If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.
California Proposition 65	All components listed do not apply to the California Proposition 65 Regulation.
MA Right-to-Know Law	Does not apply.
NJ Right-to-Know Law	Does not apply.
PA Right-to-Know Law	Does not apply.

Canadian Regulations

Canadian DSL Inventory	All components listed on inventory.
WHMIS Hazard Class	B3 Combustible Liquids

16. OTHER INFORMATION

The following sections have been revised since the last issue of this MSDS
Not applicable

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Additional Information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Material Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.

Disclaimer Statement

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

*****END OF MSDS*****

EPAPA008000864

Material Safety Data Sheet
The Dow Chemical Company

Product Name: Diethanolamine

Issue Date: 09/15/2006
Print Date: 31 Jul 2007

The Dow Chemical Company encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. Product and Company Identification

Product Name
Diethanolamine

COMPANY IDENTIFICATION
The Dow Chemical Company
2030 Willard H. Dow Center
Midland, MI 48674
USA

Customer Information Number: 800-258-2436

EMERGENCY TELEPHONE NUMBER
24-Hour Emergency Contact: 989-636-4400
Local Emergency Contact: 989-636-4400

2. Hazards Identification

Emergency Overview
Color: Colorless above freezing point
Physical State: Liquid above freezing point
Odor: Ammoniacal
Hazards of product:
WARNING! Causes eye irritation. May cause skin irritation. May be harmful if swallowed.

OSHA Hazard Communication Standard
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Potential Health Effects
Eye Contact: May cause severe eye irritation. May cause severe corneal injury.
Skin Contact: Prolonged contact may cause skin irritation with local redness. Repeated contact may cause skin burns. Symptoms may include pain, severe local redness, swelling, and tissue damage. May cause more severe response if skin is abraded (scratched or cut). Not classified as corrosive to the skin according to DOT guidelines.
Skin Absorption: Prolonged skin contact is unlikely to result in absorption of harmful amounts.

* Indicates a Trademark

Inhalation: At room temperature, exposure to vapor is minimal due to low volatility. Vapor from heated material may cause respiratory irritation and other effects.
Ingestion: Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury. Swallowing may result in gastrointestinal irritation or ulceration.
Effects of Repeated Exposure: Results from repeated exposure tests on diethanolamine in laboratory animals include anemia (rats) and effects on kidney (rats and mice) and liver (mice). Heart and nervous system effects were also observed in animals given exaggerated doses of diethanolamine. Changes in other organs, causes of which are nonspecific, were judged secondary to the poor health of the animals due to the extremely high doses of diethanolamine given.
Cancer Information: Findings from a chronic diethanolamine skin painting study by NTP include liver and kidney tumors in mice; no tumors were observed in rats. Mechanistic studies indicate that tumor formation is of questionable relevance to humans.
Birth Defects/Developmental Effects: Has been toxic to the fetus in lab animals at doses toxic to the mother.

3. Composition Information

Component	CAS #	Amount
N,N-Diethanolamine	111-42-2	> 99.2 %

4. First-aid measures

Eye Contact: Wash immediately and continuously with flowing water for at least 30 minutes. Remove contact lenses after the first 5 minutes and continue washing. Obtain prompt medical consultation, preferably from an ophthalmologist.
Skin Contact: Wash skin with plenty of water.
Inhalation: Move person to fresh air; if effects occur, consult a physician.
Ingestion: Do not induce vomiting. Give one cup (8 ounces or 240 ml) of water or milk if available and transport to a medical facility. Do not give anything by mouth to an unconscious person.
Notes to Physician: Due to irritant properties, swallowing may result in burns/ulceration of mouth, stomach and lower gastrointestinal tract with subsequent stricture. Aspiration of vomitus may cause lung injury. Suggest endotracheal/esophageal control if lavage is done. Chemical eye burns may require extended irrigation. Obtain prompt consultation, preferably from an ophthalmologist. If burn is present, treat as any thermal burn, after decontamination. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. Fire Fighting Measures

Extinguishing Media: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Do not use direct water stream. May spread fire. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.
Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Burning liquids may be extinguished by dilution with water. Do not use direct water stream. May spread fire. Move container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage.
Special Protective Equipment for Firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers,

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boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.
Unusual Fire and Explosion Hazards: Container may rupture from gas generation in a fire situation. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.
Hazardous Combustion Products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Nitrogen oxides. Carbon monoxide. Carbon dioxide.

6. Accidental Release Measures

Steps to be Taken If Material Is Released or Spilled: Small spills: Absorb with materials such as: Non-combustible material. Sand. Clay. Vermiculite. Zorb-all®. Collect in suitable and properly labeled containers. Do NOT use absorbent materials such as: Cellulose. Sawdust. Large spills: Contain spilled material if possible. Pump into suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.
Personal Precautions: Isolate area. Refer to Section 7, Handling, for additional precautionary measures. Keep unnecessary and unprotected personnel from entering the area. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.
Environmental Precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

7. Handling and Storage

Handling

General Handling: Avoid contact with eyes. Avoid contact with skin and clothing. Do not swallow. Wash thoroughly after handling. Do not use sodium nitrite or other nitrosating agents in formulations containing this product. Suspected cancer-causing nitrosamines could be formed. Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion.

Storage

Store in a dry place. Avoid moisture. Do not store in: Aluminum. Copper. Copper alloys. Avoid freezing.

Storage Period:	Storage temperature:
	34 - 49 °C
Bulk	
6 Months	
Metal drums.	
24 Months	

8. Exposure Controls / Personal Protection

Exposure Limits

Component	List	Type	Value
N,N-Diethanolamine	ACGIH	TWA	2 mg/m3 SKIN

A "skin" notation following the exposure guideline refers to the potential for dermal absorption of the material including mucous membranes and the eyes either by contact with vapors or by direct skin contact.
It is intended to alert the reader that inhalation may not be the only route of exposure and that measures to minimize dermal exposures should be considered.

Personal Protection

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Eye/Face Protection: Use chemical goggles.
Skin Protection: When prolonged or frequently repeated contact could occur, use protective clothing chemically resistant to this material. Selection of specific items such as faceshield, boots, apron, or full-body suit will depend on the task. If hands are cut or scratched, use gloves chemically resistant to this material even for brief exposures.

Hand protection: Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur. Examples of preferred glove barrier materials include: Chlorinated polyethylene. Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Butyl rubber. Natural rubber ("latex"). Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyvinyl alcohol ("PVA"). Polyvinyl chloride ("PVC" or "vinyl"). Viton. NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Respiratory Protection: Atmospheric levels should be maintained below the exposure guideline. For most conditions, no respiratory protection should be needed; however, if handling at elevated temperatures without sufficient ventilation, use an approved air-purifying respirator. The following should be effective types of air-purifying respirators: Organic vapor cartridge.
Ingestion: Use good personal hygiene. Do not consume or store food in the work area. Wash hands before smoking or eating.

Engineering Controls

Ventilation: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.

9. Physical and Chemical Properties

Physical State	Liquid above freezing point
Color	Colorless above freezing point
Odor	Ammoniacal
Flash Point - Closed Cup	191 °C (376 °F) *Pensky-Martens Closed Cup ASTM D 93*
Flammable Limits In Air	**Lower:** 1.5 %(V) *Literature*
	Upper: No test data available
Autoignition Temperature	395 °C (743 °F) *Literature*
Vapor Pressure	< 0.01 mmHg @ 20 °C *Literature*
Boiling Point (760 mmHg)	268 °C (514 °F) *Estimated* Decomposes.
Vapor Density (air = 1)	3.6 *Literature*
Specific Gravity (H2O = 1)	1.092 30 °C/20 °C *Literature*
Freezing Point	28.0 °C (82.4 °F) *Literature*
Melting Point	Not applicable to liquids
Solubility In Water (by weight)	100 % @ 20 °C *Literature*
pH	11.5 (10% aqueous solution)
Octanol/Water Partition Coefficient	-2.18 *Shake flask (OECD 107 Test)*
Dynamic Viscosity	380 cps @ 30 °C *Literature*
Kinematic Viscosity	No test data available

10. Stability and Reactivity

Stability/Instability

Stable under recommended storage conditions. See Storage, Section 7. Hygroscopic.
Conditions to Avoid: Exposure to elevated temperatures can cause product to decompose. Generation of gas during decomposition can cause pressure in closed systems. Avoid moisture.

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Incompatible Materials: Avoid contact with: Nitrites. Strong acids. Strong oxidizers. Product may potentially react with various halogenated organic solvents, resulting in temperature and/or pressure increases Corrosive when wet. Heating above 60°C in the presence of aluminum can result in corrosion and generation of flammable hydrogen gas. Avoid unintended contact with: Halogenated hydrocarbons.

Hazardous Polymerization
Will not occur.

Thermal Decomposition
Decomposition products depend upon temperature, air supply and the presence of other materials.

11. Toxicological Information

Acute Toxicity
Ingestion
LD50, Rat, female 680 - 1,100 mg/kg
Skin Absorption
LD50, Rabbit > 8,200 mg/kg

Repeated Dose Toxicity
Results from repeated exposure tests on diethanolamine in laboratory animals include anemia (rats) and effects on kidney (rats and mice) and liver (mice). Heart and nervous system effects were also observed in animals given exaggerated doses of diethanolamine. Changes in other organs, causes of which are nonspecific, were judged secondary to the poor health of the animals due to the extremely high doses of diethanolamine given.

Chronic Toxicity and Carcinogenicity
Findings from a chronic diethanolamine skin painting study by NTP include liver and kidney tumors in mice; no tumors were observed in rats. Mechanistic studies indicate that tumor formation is of questionable relevance to humans. A number of factors may have influenced the results and are being considered in their interpretation.

Developmental Toxicity
Has been toxic to the fetus in lab animals at doses toxic to the mother. Did not cause birth defects in laboratory animals.

Genetic Toxicology
In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

12. Ecological Information

CHEMICAL FATE

Movement & Partitioning
Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is very high (Koc between 0 and 50). Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.
Henry's Law Constant (H): 5.35E-14 atm*m3/mole; 25 °C Measured
Partition coefficient, n-octanol/water (log Pow): -2.18 Shake flask (OECD 107 Test)
Partition coefficient, soil organic carbon/water (Koc): 1 Estimated

Persistence and Degradability
Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Material is ultimately biodegradable (reaches > 70% mineralization in OECD test(s) for inherent biodegradability).
Indirect Photodegradation with OH Radicals

Rate Constant	Atmospheric Half-life	Method
8.90E-11 cm3/s	0.167 d	Estimated

OECD Biodegradation Tests:

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Biodegradation	Exposure Time	Method
100 %	19 d	OECD 301E Test
94 %	14 d	OECD 302B Test

Biological oxygen demand (BOD):

BOD 5	BOD 10	BOD 20	BOD 28
10.3 %	34.7 %	56.3 %	

Chemical Oxygen Demand: 1.33 mg/mg
Theoretical Oxygen Demand: 2.13 mg/mg

ECOTOXICITY

Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in most sensitive species tested). May increase pH of aquatic systems to > pH 10 which may be toxic to aquatic organisms.

Fish Acute & Prolonged Toxicity

LC50, bluegill (Lepomis macrochirus), static: 1,850 - 2,100 mg/l

Aquatic Invertebrate Acute Toxicity

LC50, water flea Daphnia magna, 48 h: 122 mg/l

Aquatic Plant Toxicity

EC50, green alga Selenastrum capricornutum, biomass growth inhibition, 96 h: 3.3 - 3.6 mg/l

Toxicity to Micro-organisms

EC50, OECD 209 Test; activated sludge, respiration inhibition, 3 h: > 1,000 mg/l

13. Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. DOW HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device. As a service to its customers, Dow can provide names of information resources to help identify waste management companies and other facilities which recycle, reprocess or manage chemicals or plastics, and that manage used drums. Telephone Dow's Customer Information Group at 1-800-258-2436 or 1-989-832-1556 (U.S.), or 1-800-331-6451 (Canada) for further details.

14. Transport Information

DOT Non-Bulk
Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, NOS
Technical Name: CONTAINS DIETHANOLAMINE
Hazard Class: 9 **ID Number:** UN3082 **Packing Group:** PG III

DOT Bulk
Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, NOS
Technical Name: CONTAINS DIETHANOLAMINE
Hazard Class: 9 **ID Number:** UN3082 **Packing Group:** PG III

IMDG
Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, NOS
Technical Name: CONTAINS DIETHANOLAMINE
Hazard Class: 9 **ID Number:** UN3082 **Packing Group:** PG III
EMS Number: F-A,S-F
Marine pollutant.: No

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ICAO/IATA
Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
Technical Name: CONTAINS DIETHANOLAMINE
Hazard Class: 9 **ID Number:** UN3082 **Packing Group:** PG III

Additional Information

Reportable quantity: 101 lb – DIETHANOLAMINE

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. Regulatory Information

OSHA Hazard Communication Standard
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Immediate (Acute) Health Hazard	Yes
Delayed (Chronic) Health Hazard	No
Fire Hazard	No
Reactive Hazard	No
Sudden Release of Pressure Hazard	No

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313
This product contains the following substances which are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and which are listed in 40 CFR 372.

Component	CAS #	Amount
N,N-Diethanolamine	111-42-2	> 99.2 %

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:
The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Component	CAS #	Amount
N,N-Diethanolamine	111-42-2	> 99.2 %

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Special Hazardous Substances List:
To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)
This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

US. Toxic Substances Control Act
All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30
CEPA - Domestic Substances List (DSL)

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All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

16. Other Information

Product Literature

Additional information on this product may be obtained by calling your Dow Chemical Company sales or customer service contact. Ask for a product brochure. Additional information on this and other Dow products may be obtained by visiting our web page at www.dow.com.

Hazard Rating System

NFPA	Health	Fire	Reactivity
	2	1	0

Recommended Uses and Restrictions

Chemical Intermediate.

Revision

Identification Number: 78279 / 1001 / Issue Date 09/15/2006 / Version: 3.0
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

N/A	Not available
W/W	Weight/Weight
OEL	Occupational Exposure Limit
STEL	Short Term Exposure Limit
TWA	Time Weighted Average
ACGIH	American Conference of Governmental Industrial Hygienists, Inc.
DOW IHG	Dow Industrial Hygiene Guideline
WEEL	Workplace Environmental Exposure Level
HAZ_DES	Hazard Designation
Action Level	A value set by OSHA that is lower than the PEL which will trigger the need for activities such as exposure monitoring and medical surveillance if exceeded.

The Dow Chemical Company urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.

EPAPA008000872

BASF
The Chemical Company

Safety data sheet
Diethyl ketone

1. Substance/preparation and company identification

Company
BASF CORPORATION
100 Campus Drive
Florham Park, NJ 07932

24 Hour Emergency Response Information
CHEMTREC: (800) 424-9300
BASF HOTLINE: (800) 832-HELP

Molecular formula:	C(5)H(10)O
Chemical family:	ketones
Synonyms:	Diethylketone

2. Composition/information on ingredients

CAS Number	Content (W/W)	Chemical name
96-22-0		pentan-3-one

3. Hazard identification

Emergency overview

DANGER: FLAMMABLE LIQUID. MAY BE HARMFUL IF SWALLOWED.
MAY BE HARMFUL IF INHALED.
MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION.
INGESTION MAY CAUSE GASTRIC DISTURBANCES.
Avoid contact with the skin, eyes and clothing.
Avoid inhalation of mists/vapours.
Use with local exhaust ventilation.
Wear a NIOSH-certified (or equivalent) organic vapour/particulate respirator.
Wear NIOSH-certified chemical goggles.
Wear chemical resistant protective gloves.
Wear protective clothing.
Eye wash fountains and safety showers must be easily accessible.

Potential health effects

Primary routes of exposure
Routes of entry for solids and liquids include eye and skin contact, ingestion and inhalation. Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquified gases.

Irritation:
Irritating to respiratory system. Repeated exposure may cause skin dryness or cracking.

Sensitization:
The substance did not cause skin sensitization in humans.

Medical conditions aggravated by overexposure:
Data available do not indicate that there are medical conditions that are generally recognized as being aggravated by exposure to this substance/product.
See MSDS section 11 - Toxicological information.

Potential environmental effects

Aquatic toxicity:
The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations.

4. First-aid measures

General advice:
Remove contaminated clothing.

If inhaled:
Remove the affected individual into fresh air and keep the person calm. Assist in breathing if necessary. Immediate medical attention required.

If on skin:
Wash affected areas thoroughly with soap and water. Remove contaminated clothing. Wash soiled clothing immediately. If irritation develops, seek medical attention.

If in eyes:
In case of contact with the eyes, rinse immediately for at least 15 minutes with plenty of water. If irritation develops, seek medical attention.

If swallowed:
Rinse mouth and then drink plenty of water. Induce vomiting. Never induce vomiting or give anything by mouth if the victim is unconscious or having convulsions. Immediate medical attention required.

5. Fire-fighting measures

Flash point:	7 °C	(DIN 51755)
Autoignition:	425 °C	(DIN 51794)
Lower explosion limit:	1.6 %(V)	
Upper explosion limit:	7.7 %(V)	

Suitable extinguishing media:
water fog, foam, dry extinguishing media

Unsuitable extinguishing media for safety reasons:
water

Hazards during fire-fighting:

No particular hazards known.

Protective equipment for fire-fighting:
Firefighters should be equipped with self-contained breathing apparatus and turn-out gear.

Further information:
If exposed to fire, keep containers cool by spraying with water.

NFPA Hazard codes:
Health : 1 Fire: 3 Reactivity: 0 Special:

6. Accidental release measures

Personal precautions:
Breathing protection required.

Environmental precautions:
Substance/product is RCRA hazardous due to its properties.

Cleanup:
Spills should be contained, solidified, and placed in suitable containers for disposal.

7. Handling and storage

Handling

General advice:
See MSDS section 10 - Stability and reactivity. See MSDS section 5 - Fire fighting measures.

Protection against fire and explosion:
See MSDS section 5 - Fire fighting measures.

Storage

General advice:
Keep container tightly closed in a cool, well-ventilated place.
Avoid extreme heat. Keep away from sources of ignition - No smoking.

Storage stability:
Storage temperature: 20 °C
Storage duration: 24 Months

8. Exposure controls and personal protection

Components with workplace control parameters

pentan-3-one

ACGIH	TWA value 200 ppm ; STEL value 300 ppm ;	

Advice on system design:
Provide local exhaust ventilation to control vapours/mists.

Personal protective equipment

Respiratory protection:
Wear a NIOSH-certified (or equivalent) organic vapour/particulate respirator. Do not exceed the maximum use concentration for the respirator facepiece/cartridge combination. For emergency or non-routine, high exposure situations, use a NIOSH-certified full facepiece pressure demand self-contained breathing apparatus (SCBA) or a full facepiece pressure demand supplied-air respirator (SAR) with escape provisions. Observe OSHA regulations for respirator use (29 CFR 1910.134).

Hand protection:
Chemical resistant protective gloves, Consult with glove manufacturer for testing data.

Eye protection:
Tightly fitting safety goggles (chemical goggles).

General safety and hygiene measures:
Eye wash fountains and safety showers must be easily accessible. Wear protective clothing as necessary to prevent contact.

9. Physical and chemical properties

Form:	liquid	
Odour:	ketone-like	
Colour:	colourless to yellow	
pH value:	approx. 6	(50 g/ml)
Melting point:	-39 °C	
Boiling point:	101 - 102 °C	
Vapour pressure:	37.6 mbar	(20 °C)
Density:	0.815 g/cm3	(20 °C)
Partitioning coefficient n-octanol/water (log Pow):	0.85	
Solubility in water:		(20 °C) slightly soluble
Solubility (qualitative):	miscible solvent(s): organic solvents,	

10. Stability and reactivity

Substances to avoid:
No data available.

Hazardous reactions:
The product is chemically stable.

Corrosion to metals:
No corrosive effect on metal.

11. Toxicological information

Acute toxicity

Oral:
LD50/rat: approx. 2,900 mg/kg
Moderately toxic.

Inhalation:
Inhalation-risk test (IRT): No mortality within 10 minutes as shown in animal studies. Deaths possible with prolonged exposure.

Dermal:
LD50/rabbit: 16,200 mg/kg

Skin irritation:
rabbit: non-irritant (BASF-Test)

Eye irritation :
rabbit: Nonirritating.

Sensitization:
No sensitizing effect.

12. Ecological information

Environmental fate and transport

Biodegradation:

Test method:	APHA 'Standard Methods', No. 219, 1971, municipal sewage treatment plant effl.
Method of analysis:	BOD of the ThOD
Degree of elimination:	75 % (5 d)
Evaluation:	Readily biodegradable (according to OECD criteria). Literature data.

Bioaccumulation:

Because of the n-octanol/water distribution coefficient (log Pow) accumulation in organisms is not to be expected.

Chemical oxygen demand (COD):
2,246 mg/g

Biochemical oxygen demand (BOD):
Incubation period 5 d: 1,310 mg/g

Environmental toxicity

Acute and prolonged toxicity to fish:
Fathead minnow/LC50 (96 h): 1,540 mg/l
The statement of the toxic effect relates to the analytically determined concentration. Literature data.

Acute toxicity to aquatic invertebrates:
Directive 79/831/EEC Daphnia magna/EC50 (48 h): > 500 mg/l
Nominal concentration.

Toxicity to aquatic plants:
DIN 38412 Part 9 green algae/EC50 (72 h): > 500 mg/l
Nominal concentration.

Toxicity to microorganisms:
DIN 38412 Part 8 bacterium/EC50 (17 h): > 10,000 mg/l
Nominal concentration.

13. Disposal considerations

Waste disposal of substance:
Dispose of in a RCRA-licensed facility.
Do not discharge into waterways or sewer systems without proper authorization.
Dispose of in accordance with national, state and local regulations.

Container disposal:
Empty containers with less than 1 inch of residue may be landfilled at a licensed facility. Recommend crushing, puncturing or other means to prevent unauthorized use of used containers. If containers are not empty, they must be disposed of in a RCRA-licensed facility.

RCRA: D001

14. Transport information

Land transport
USDOT

Proper shipping name:	DIETHYL KETONE
Hazard class:	3
ID-number:	UN 1156
Packing group:	II

Sea transport
IMDG

Proper shipping name:	DIETHYL KETONE
Hazard class:	3
ID-number:	UN 1156
Packing group:	II
Marine pollutant:	NO

Air transport
IATA/ICAO

Proper shipping name:	DIETHYL KETONE
Hazard class:	3
ID-number:	UN 1156
Packing group:	II

15. Regulatory information

Federal Regulations

Registration status:
TSCA, US released / listed

OSHA hazard category: ACGIH TLV established, Skin and/or eye irritant, OSHA PEL established, Flammable Liquid

SARA hazard categories (EPCRA 311/312): Fire, Acute

State regulations

State RTK

CAS Number	Chemical name	State RTK
96-22-0	pentan-3-one	MA, NJ, PA

16. Other information

HMIS III rating
Health: 1 Flammability: 3 Physical hazard: 0

HMIS uses a numbering scale ranging from 0 to 4 to indicate the degree of hazard. A value of zero means that the substance possesses essentially no hazard; a rating of four indicates high hazard.

Local contact information
prod_reg@basf.com

IMPORTANT: WHILE THE DESCRIPTIONS, DESIGNS, DATA AND INFORMATION CONTAINED HEREIN ARE PRESENTED IN GOOD FAITH AND BELIEVED TO BE ACCURATE , IT IS PROVIDED FOR YOUR GUIDANCE ONLY. BECAUSE MANY FACTORS MAY AFFECT PROCESSING OR APPLICATION/USE, WE RECOMMEND THAT YOU MAKE TESTS TO DETERMINE THE SUITABILITY OF A PRODUCT FOR YOUR PARTICULAR PURPOSE PRIOR TO USE. NO WARRANTIES OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE MADE REGARDING PRODUCTS DESCRIBED OR DESIGNS, DATA OR INFORMATION SET FORTH, OR THAT THE PRODUCTS, DESIGNS, DATA OR INFORMATION MAY BE USED WITHOUT INFRINGING THE INTELLECTUAL PROPERTY RIGHTS OF OTHERS. IN NO CASE SHALL THE DESCRIPTIONS, INFORMATION, DATA OR DESIGNS PROVIDED BE CONSIDERED A PART OF OUR TERMS AND CONDITIONS OF SALE. FURTHER, YOU EXPRESSLY UNDERSTAND AND AGREE THAT THE DESCRIPTIONS, DESIGNS, DATA, AND INFORMATION FURNISHED BY BASF HEREUNDER ARE GIVEN GRATIS AND BASF ASSUMES NO OBLIGATION OR LIABILITY FOR THE DESCRIPTION, DESIGNS, DATA AND INFORMATION GIVEN OR RESULTS OBTAINED, ALL SUCH BEING GIVEN AND ACCEPTED AT YOUR RISK.
END OF DATA SHEET

MSDS Number: **O8764** * * * * * *Effective Date: 05/25/06* * * * * *Supercedes: 01/28/05*

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS | J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

DIETHYLENE GLYCOL

1. Product Identification

Synonyms: 2,2'-Oxydiethanol; 2,2'-Oxybisethanol; 2,2' Dihydroxydiethyl ether; CELLOSOLVE®; glycol ether; Glycolethyl ether
CAS No.: 111-46-6
Molecular Weight: 106.14
Chemical Formula: C4H10O3
Product Codes:
J.T. Baker: S856
Mallinckrodt: 11413, 4911

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Diethylene Glycol	111-46-6	99 - 100%	Yes

3. Hazards Identification

Emergency Overview

WARNING! HARMFUL IF SWALLOWED. MAY CAUSE IRRITATION TO SKIN AND EYES.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate (Life)
Flammability Rating: 1 - Slight
Reactivity Rating: 1 - Slight
Contact Rating: 1 - Slight
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES
Storage Color Code: Green (General Storage)

Potential Health Effects

Inhalation:
Low inhalation hazard unless heated because of low vapor pressure.

Ingestion:
Low acute toxicity. Probable lethal dose to humans is 0.5-5 g/kg. Causes nerve depression, liver and kidney lesions and anuria (urination retardation). Causes irritation to the gastrointestinal tract. Symptoms may include nausea, vomiting and diarrhea.
Skin Contact:
May be an irritant to skin on prolonged exposure.
Eye Contact:
May be an irritant to eyes and surrounding tissue.
Chronic Exposure:
Liver and kidney lesions and damage.
Aggravation of Pre-existing Conditions:
Persons with pre-existing skin disorders or eye problems or impaired liver or kidney function may be more susceptible to the effects of the substance.

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4. First Aid Measures

Inhalation:
Remove to fresh air. Not expected to require first aid measures.
Ingestion:
Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Call a physician.
Skin Contact:
Remove any contaminated clothing. Wash skin with soap and water for at least 15 minutes. Get medical attention if irritation develops or persists.
Eye Contact:
In case of contact, immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Call a physician if irritation persists.

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5. Fire Fighting Measures

Fire:
Flash point: 124C (255F) CC
Autoignition temperature: 229C (444F)
Flammable limits in air % by volume:
lel: 1.6; uel: 10.8
Fire is possible at elevated temperatures or by contact with an ignition source.
Explosion:
Above flash point, vapor-air mixtures are explosive within flammable limits noted above.

Fire Extinguishing Media:
Powder, alcohol foam, water spray or carbon dioxide.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer!

7. Handling and Storage

Keep in a tightly closed container. Protect from physical damage. Store in a cool, dry, ventilated area away from sources of heat, moisture and incompatibilities. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
AIHA Workplace Environmental Exposure Level (WEEL): Vapor and Aerosol = 50ppm; Aerosol, only = 10mg/m3.
Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded, a half-face respirator with an organic vapor cartridge and particulate filter (NIOSH type P95 or R95 filter) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece respirator with an organic vapor cartridge and particulate filter (NIOSH P100 or R100 filter) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. Please note that N series filters are not recommended for this material. For emergencies or instances where the exposure levels are not known, use a full-face piece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
Skin Protection:
Wear protective gloves and clean body-covering clothing.
Eye Protection:
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:
Clear, colorless liquid.
Odor:
Odorless.
Solubility:
Infinitely soluble.
Specific Gravity:
1.118 @ 20C/20C
pH:
No information found.
% Volatiles by volume @ 21C (70F):
100
Boiling Point:
244 - 245C (471 - 473F)
Melting Point:
-6.5C (21F)
Vapor Density (Air=1):
3.66
Vapor Pressure (mm Hg):
1 @ 91.8C (198F)
Evaporation Rate (BuAc=1):
No information found.

---

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products:
Toxic gases and vapors may be released if involved in a fire. Carbon dioxide and carbon monoxide may form when heated to decomposition.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Strong oxidizers, strong acids and strong bases.
Conditions to Avoid:
Incompatibles.

---

11. Toxicological Information

Oral rat LD50: 12565 mg/kg. Skin rabbit LD50: 11.89 g/kg Irritation: eye rabbit, standard Draize: 50 mg mild. Investigated as a tumorigen and reproductive effector.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Diethylene Glycol (111-46-6)	No	No	None

---

12. Ecological Information

Environmental Fate:
No information found.
Environmental Toxicity:
No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Not regulated.

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\--------

Ingredient	TSCA	EC	Japan	Australia
Diethylene Glycol (111-46-6)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\--------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Diethylene Glycol (111-46-6)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\--------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Diethylene Glycol (111-46-6)	No	No	No	Glycol ether

--------\Federal, State & International Regulations - Part 2\--------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Diethylene Glycol (111-46-6)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Pure / Liquid)

Australian Hazchem Code: None allocated.
Poison Schedule: None allocated.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

16. Other Information

NFPA Ratings: Health: **1** Flammability: **1** Reactivity: **0**
Label Hazard Warning:
WARNING! HARMFUL IF SWALLOWED. MAY CAUSE IRRITATION TO SKIN AND EYES.
Label Precautions:
Wash thoroughly after handling.
Avoid contact with eyes, skin and clothing.
Label First Aid:
If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Call a physician. In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes. Call a physician if irritation develops or persists.
Product Use:
Laboratory Reagent.
Revision Information:
MSDS Section(s) changed since last revision of document include: 9.
Disclaimer:
****
Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.
****
Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **D3416** * * * * * *Effective Date: 07/06/06* * * * * *Supercedes: 11/10/05*

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300
National Response in Canada
CANUTEC: 613-996-6666
Outside U.S. And Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

DIETHYLENETRIAMINE

1. Product Identification

Synonyms: DETA; bis (2-aminoethyl) amine, 2,2'-Diaminodiethylamine; Aminoethylethandiamine
CAS No.: 111-40-0
Molecular Weight: 103.17
Chemical Formula: NH2C2H4NHC2H4NH2
Product Codes: H768

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Diethylene Triamine	111-40-0	100%	Yes

3. Hazards Identification

Emergency Overview

DANGER! CORROSIVE. CAUSES BURNS TO ANY AREA OF CONTACT. HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. MAY CAUSE ALLERGIC SKIN OR RESPIRATORY REACTION.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Life)

Flammability Rating: 1 - Slight
Reactivity Rating: 2 - Moderate
Contact Rating: 4 - Extreme (Corrosive)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: White Stripe (Store Separately)

Potential Health Effects

Inhalation:
Inhalation can cause severe irritation of mucous membranes and upper respiratory tract. Symptoms may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea and vomiting. High concentrations may cause lung damage. May cause allergic reaction in sensitive individuals.
Ingestion:
Corrosive. Swallowing can cause severe burns of the mouth, throat, and stomach. Can cause sore throat, vomiting, diarrhea.
Skin Contact:
Corrosive. Symptoms of redness, pain, and severe burn can occur. May be absorbed through the skin with possible systemic effects. May cause allergic reaction in sensitive individuals.
Eye Contact:
Corrosive! Vapors are irritating and may cause damage to the eyes. Contact may cause severe burns and permanent eye damage.
Chronic Exposure:
Individuals chronically exposed may become sensitized, with allergic reactions to exposure.
Aggravation of Pre-existing Conditions:
Some individuals may become sensitized. Once acquired, sensitivity may be retained for many years, with possible cross-sensitization to other amines. Persons with pre-existing skin disorders or impaired respiratory function may be more susceptible to the effects of the substance.

---

4. First Aid Measures

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. CALL A PHYSICIAN IMMEDIATELY.
Ingestion:
DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Call a physician immediately.
Skin Contact:
Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician, immediately. Wash clothing before reuse.
Eye Contact:
Immediately flush eyes with gentle but large stream of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Call a physician immediately.

---

5. Fire Fighting Measures

Fire:
Flash point: 102C (216F) CC
Autoignition temperature: 395C (743F)
Flammable limits in air % by volume:
lel: 1.9; uel: 11.6

Low fire hazard when exposed to heat or flames.
Explosion:
Above flash point, vapor-air mixtures are explosive within flammable limits noted above.
Fire Extinguishing Media:
Water spray, dry chemical, alcohol foam, or carbon dioxide. Direct stream of water can scatter and spread flames. Water spray may be used to keep fire exposed containers cool.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer!

7. Handling and Storage

Protect against physical damage. Outside or detached storage is preferred. Inside storage should be in a standard flammable liquids storage room or cabinet. Separate from oxidizing materials. Storage and use areas should be No Smoking areas. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
-ACGIH Threshold Limit Value (TLV): 1 ppm (TWA) (skin)
Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, wear a supplied air, full-facepiece respirator, airlined hood, or full-facepiece self-contained breathing apparatus. Breathing air quality must meet the requirements of the OSHA respiratory protection standard (29CFR1910.134).
Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:
Yellow liquid.
Odor:
Slight ammonia odor.
Solubility:
Completely soluble in water.
Specific Gravity:
0.96 @ 20C/20C
pH:
No information found.
% Volatiles by volume @ 21C (70F):
No information found.
Boiling Point:
207C (405F)
Melting Point:
-39C (-38F)
Vapor Density (Air=1):
3.56
Vapor Pressure (mm Hg):
0.37 @ 20C (68F)
Evaporation Rate (BuAc=1):
No information found.

---

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage. Hygroscopic.
Hazardous Decomposition Products:
May form carbon oxides, nitrogen oxides, hydrocarbons and amine vapors when heated to decomposition.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
This material is a strong alkaline. It reacts with carbon dioxide from the air; reacts violently with strong oxidants, acids, halogens, and reactive organic compounds; is corrosive toward aluminum, zinc, copper and its alloys; and causes spontaneous ignition with cellulose nitrate.
Conditions to Avoid:
Heat, flames, ignition sources and incompatibles.

---

11. Toxicological Information

Oral rat LD50: 1080 mg/kg; skin rabbit LD50: 1090 mg/kg.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Diethylene Triamine (111-40-0)	No	No	None

---

12. Ecological Information

Environmental Fate:
When released into the soil, this material may evaporate to a moderate extent. When released into the soil, this material is expected to leach into groundwater. When released into the soil, this material is not expected to biodegrade. When released into water, this material is not expected to evaporate significantly. This material has a log octanol-water partition coefficient of less than 3.0. This material is not expected to significantly bioaccumulate. When released into the air, this material is expected to be readily degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material is expected to have a half-life of less than 1 day.
Environmental Toxicity:
No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: DIETHYLENETRIAMINE
Hazard Class: 8
UN/NA: UN2079
Packing Group: II
Information reported for product/size: 500ML

International (Water, I.M.O.)

Proper Shipping Name: DIETHYLENETRIAMINE
Hazard Class: 8
UN/NA: UN2079
Packing Group: II
Information reported for product/size: 500ML

International (Air, I.C.A.O.)

Proper Shipping Name: DIETHYLENETRIAMINE
Hazard Class: 8
UN/NA: UN2079
Packing Group: II
Information reported for product/size: 500ML

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\--------

Ingredient	TSCA	EC	Japan	Australia
Diethylene Triamine (111-40-0)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\--------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Diethylene Triamine (111-40-0)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\--------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Diethylene Triamine (111-40-0)	No	No	No	No

--------\Federal, State & International Regulations - Part 2\--------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Diethylene Triamine (111-40-0)	No	No	No

mical Weapons Convention: No TSCA 12(b): No CDTA: Yes
A 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Pure / Liquid)

Australian Hazchem Code: 2X
Poison Schedule: None allocated.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

16. Other Information

NFPA Ratings: Health: **3** Flammability: **1** Reactivity: **0**
Label Hazard Warning:
DANGER! CORROSIVE. CAUSES BURNS TO ANY AREA OF CONTACT. HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. MAY CAUSE ALLERGIC SKIN OR RESPIRATORY REACTION.
Label Precautions:
Do not breathe vapor.
Do not get in eyes, on skin, or on clothing.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Label First Aid:
In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing

contaminated clothing and shoes. Wash clothing before reuse. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In all cases call a physician immediately.

Product Use:

Laboratory Reagent.

Revision Information:

No Changes.

Disclaimer:

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Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

Material Safety Data Sheet

Diisopropylbenzene (Tech), 98% (GC)
MSDS# 31799

Section 1 - Chemical Product and Company Identification

MSDS Name:
Diisopropylbenzene (Tech), 98% (GC)
Catalog Numbers:
40781-0000, 40781-0010, 40781-0030
Synonyms:
Company Identification: Fisher Scientific UK
Bishop Meadow Road, Loughborough
Leics. LE11 5RG
For information in Europe, call:(01509) 231166
Emergency Number, Europe:01509 231166

Section 2 - Composition, Information on Ingredients

CAS#: 25321-09-9
Chemical Name: Diisopropylbenzene
%: 98
EINECS#: 246-835-6

Hazard Symbols:
None listed
Risk Phrases:
None listed

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Not available
Potential Health Effects
Eye:
Causes eye irritation.
Skin:
Causes skin irritation.
Ingestion:
May cause irritation of the digestive tract.
Inhalation:
May cause respiratory tract irritation.
Chronic:

Section 4 - First Aid Measures

Eyes:
Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.
Skin:
Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
Ingestion:
If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.
Inhalation:
Remove from exposure and move to fresh air immediately. If not

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breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician:

Section 5 - Fire Fighting Measures

General Information:

As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media:

Use agent most appropriate to extinguish fire.

Section 6 - Accidental Release Measures

General Information:

Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:

Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal.

Section 7 - Handling and Storage

Handling:

Wash thoroughly after handling. Use only in a well-ventilated area. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage:

Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls:

Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

CAS# 25321-09-9:

Personal Protective Equipment

Eyes:

Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin:

Wear appropriate protective gloves to prevent skin exposure.

Clothing:

Wear appropriate protective clothing to prevent skin exposure.

Respirators:

Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State:	Clear liquid
Color:	Not available
Odor:	Not available

pH: Not available
Vapor Pressure: 0.25 mm Hg @25C
Viscosity: Not available
Boiling Point: 77.0 - 82.0 deg C @ 10.00mm H
Freezing/Melting Point: Not available
Autoignition Temperature: Not available
Flash Point: 71 deg C (159.80 deg F)
Explosion Limits: Lower:Not available
Explosion Limits: Upper:Not available
Decomposition Temperature: Not available
Solubility in water: Not available
Specific Gravity/Density: .8570g/cm3
Molecular Formula: C12H18
Molecular Weight: 162.27

Section 10 - Stability and Reactivity

Chemical Stability:
Stable under normal temperatures and pressures.
Conditions to Avoid:
Incompatible materials.
Incompatibilities with Other Materials
Strong oxidizing agents.
Hazardous Decomposition Products
Irritating and toxic fumes and gases.
Hazardous Polymerization
Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 25321-09-9: CZ6330000
LD50/LC50:
RTECS: CAS# 25321-09-9: Draize test, rabbit, eye: 500 mg/24H Mild; Draize test, rabbit, skin: 100 mg/24H Moderate; Oral, rat: LD50 = 6500 uL/kg; Skin, rabbit: LD50 = 16 mL/kg;.
Carcinogenicity:
Diisopropylbenzene -
Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.
Other:
See actual entry in RTECS for complete information.

Section 12 - Ecological Information

Other:

Section 13 - Disposal Considerations

Dispose of in a manner consistent with federal, state, and local regulations.

Section 14 - Transport Information

IATA
Shipping Name: Not regulated as a hazardous material
Hazard Class:
UN Number:
Packing Group:

DOT
Shipping Name: Not regulated as a hazardous material
Hazard Class:
UN Number:

Packing Group:
RID/ADR
Shipping Name: Not regulated as a hazardous material
Hazard Class:
UN Number:
Packing Group:

Section 15 - Regulatory Information

European/International Regulations
European Labeling in Accordance with EC Directives
Hazard Symbols:Not available
Risk Phrases:
Safety Phrases:
S 24/25 Avoid contact with skin and eyes.
WGK (Water Danger/Protection)
CAS# 25321-09-9: 1
Canada
CAS# 25321-09-9 is listed on Canada's DSL List
US Federal
TSCA
CAS# 25321-09-9 is listed on the TSCA Inventory.

Section 16 - Other Information

MSDS Creation Date:
3/24/1998
Revision #4 Date
3/16/2007
The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantibility or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential, or exemplary damages howsoever arising, even if the company has been advised of the possibility of such damages.

Material Safety Data Sheet

Di-n-butylamine
MSDS# 06410

Section 1 - Chemical Product and Company Identification

MSDS Name:
Di-n-butylamine
Catalog Numbers:
11295-5000, D/1338/07, D/1338/PB07, D/1340/08, D/1340/PB08
Synonyms:
N-Butyl-1-butanamine; Di-n-butylamine; secondary alkyl amine.
Company Identification: Fisher Scientific UK
Bishop Meadow Road, Loughborough
Leics. LE11 5RG
For information in Europe, call:(01509) 231166
Emergency Number, Europe:01509 231166

Section 2 - Composition, Information on Ingredients

CAS#: 111-92-2
Chemical Name: Di-n-butylamine
%: 99
EINECS#: 203-921-8

Hazard Symbols:
C
Risk Phrases:
10 20/21/22 34

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Flammable. Harmful by inhalation, in contact with skin and if swallowed. Causes burns.
Potential Health Effects
Eye:
Causes eye burns.
Skin:
Harmful if absorbed through the skin. Causes skin burns.
Ingestion:
Harmful if swallowed. Causes gastrointestinal tract burns.
Inhalation:
Harmful if inhaled. Causes chemical burns to the respiratory tract.
Chronic:
Chronic exposure may cause effects similar to those of acute exposure.

Section 4 - First Aid Measures

Eyes:
Get medical aid immediately. Immediately flush eyes with plenty of water for at least 15 minutes.
Skin:
Get medical aid immediately. Rinse area with large amounts of water for at least 15 minutes.
Ingestion:
Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately.

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Inhalation:

Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician:

Section 5 - Fire Fighting Measures

General Information:

As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Use water spray to keep fire-exposed containers cool. Flammable liquid and vapor. Vapors are heavier than air and may travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas.

Extinguishing Media:

Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Section 6 - Accidental Release Measures

General Information:

Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:

Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Provide ventilation. Approach spill from upwind. Use water spray to cool and disperse vapors and protect personnel.

Section 7 - Handling and Storage

ıdling:

Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. Do not get in eyes, on skin, or on clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Do not ingest or inhale. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Use only with adequate ventilation. Keep away from heat, sparks and flame.

Storage:

Keep away from sources of ignition. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls:

Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

CAS# 111-92-2:

Germany: 5 ppm TWA (exposure factor 1); 29 mg/m3 TWA (exposure factor 1)

ˋrmany: skin notation

ˋsonal Protective Equipment

Eyes:

Wear chemical splash goggles and face shield.

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Skin:

Wear appropriate gloves to prevent skin exposure.

Clothing:

Wear appropriate protective clothing to prevent skin exposure.

Respirators:

Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State:	Liquid
Color:	clear, colorless
Odor:	amine-like - malodorous
pH:	12.2 (0.1M aq soln)
Vapor Pressure:	2.59 mm Hg @ 25 deg C
Viscosity:	0.9 mPa s 20 C
Boiling Point:	159 deg C (318.20F)
Freezing/Melting Point:	-62 deg C (-79.60F)
Autoignition Temperature:	260 deg C (500.00 deg F)
Flash Point:	39 deg C (102.20 deg F)
Explosion Limits: Lower:	.60
Explosion Limits: Upper:	6.80
Decomposition Temperature:	Not available
Solubility in water:	Slightly soluble
Specific Gravity/Density:	0.76
Molecular Formula:	C8H19N
Molecular Weight:	129.24

Section 10 - Stability and Reactivity

Chemical Stability:

Stable under normal temperatures and pressures. Amines absorb carbon dioxide from the air to form carbamate salts.

Conditions to Avoid:

Ignition sources.

Incompatibilities with Other Materials

Strong oxidizing agents, strong acids.

Hazardous Decomposition Products

Nitrogen oxides, carbon monoxide, carbon dioxide.

Hazardous Polymerization

Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 111-92-2: HR7780000

LD50/LC50:

RTECS: CAS# 111-92-2: Oral, mouse: LD50 = 290 mg/kg; Oral, rat: LD50 = 189 mg/kg; Skin, rabbit: LD50 = 770 mg/kg;.

Other: Inhalation, rats LC50: > 2.0 mg/l/1H (Mortality was not observed.) Air Products & Chemicals; Inhalation, rats LC50: > 573 ppm/1H (Mortality was not observed.) Huntingdon Research Centre; Inhalation, rats LC50: 1.15 mg/l/4H. Huntingdon Research Centre.

Carcinogenicity:
Di-n-butylamine -
Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.
Other:
See actual entry in RTECS for complete information.

Section 12 - Ecological Information

Not available

Section 13 - Disposal Considerations

Dispose of in a manner consistent with federal, state, and local regulations.

Section 14 - Transport Information

IATA
Shipping Name: Di-n-BUTYLAMINE
Hazard Class: 8 (3)
UN Number: 2248
Packing Group: II

IMO
Shipping Name: DI-n-BUTYLAMINE
Hazard Class: 8 (3)
UN Number: 2248
Packing Group: II

RID/ADR
Shipping Name: DI-n-BUTYLAMINE
Hazard Class: 8 (3)
UN Number: 2248
Packing Group: II

Section 15 - Regulatory Information

European/International Regulations
European Labeling in Accordance with EC Directives
Hazard Symbols: C
Risk Phrases:

R 10 Flammable.
R 20/21/22 Harmful by inhalation, in contact with skin and if swallowed.
R 34 Causes burns.

Safety Phrases:

S 23 Do not inhale gas/fumes/vapour/spray.
S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 28 After contact with skin, wash immediately with...
S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)
CAS# 111-92-2: 1

Section 16 - Other Information

MSDS Creation Date:
12/12/1997
Revision #7 Date
5/16/2007

Section 16 - Other Information

MSDS Creation Date:
12/12/1997
Revision #7 Date
5/16/2007
Revisions were made in Sections:
2, 3, 14
The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantibility or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential, or exemplary damages howsoever arising, even if the company has been advised of the possibility of such damages.

Material Safety Data Sheet

Airgas

Dipropylene Glycol

Section 1. Chemical product and company identification

Product Name	:	Dipropylene Glycol
Supplier	:	AIRGAS INC., on behalf of its subsidiaries 259 North Radnor-Chester Road Suite 100 Radnor, PA 19087-5283 1-610-687-5253
Synonym	:	dipropylene glycol
MSDS#	:	001111
Date of Preparation/Revision	:	**9/27/2006.**
In case of emergency	:	1-866-734-3438

Section 2. Hazards identification

Physical state	:	Liquid.
Emergency overview	:	Warning! CAUSES DAMAGE TO THE FOLLOWING ORGANS: SKIN, EYES. COMBUSTIBLE LIQUID AND VAPOR. VAPOR MAY CAUSE FIRE. Keep away from heat, sparks and flame. Keep container closed. Use only with adequate ventilation.

Potential acute health effects

Eyes	:	May cause severe eye irritation.
Skin	:	This product may irritate skin upon contact.
Inhalation	:	Harmful by inhalation.
Ingestion	:	Harmful if swallowed.
Potential chronic health effects	:	**CARCINOGENIC EFFECTS** Not available. **MUTAGENIC EFFECTS** Not available. **TERATOGENIC EFFECTS**: Not available.
Medical conditions aggravated by overexposure	:	Repeated or prolonged exposure is not known to aggravate medical condition.

See toxicological Information (section 11)

Section 3. Composition, Information on Ingredients

United States

			Exposure limits
propanol, oxybis-	25265-71-8	100	

Section 4. First aid measures

Eye contact	:	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.
Skin contact	:	In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.
Inhalation	:	If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.
Ingestion	:	Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention if symptoms appear.

?ction 5. Fire fighting measures

Flammability of the product	:	May be combustible at high temperature.
Auto-ignition temperature	:	310°C (590°F)
Products of combustion	:	These products are carbon oxides (CO, CO_2).
Fire hazards in presence of various substances	:	Highly flammable in presence of heat.
Fire fighting media and instructions	:	In case of fire, use water spray (fog), foam, dry chemicals, or CO_2.
		Combustible liquid and vapor. Vapor may cause flash fire. Vapors may accumulate in low or confined areas, travel considerable distance to source of ignition and flash back. Runoff to sewer may create fire or explosion hazard.
Special protective equipment for fire-fighters	:	Fire fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full facepiece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions	:	Immediately contact emergency personnel. Eliminate all ignition sources. Keep unnecessary personnel away. Use suitable protective equipment (Section 8). Do not touch or walk through spilled material.
Environmental precautions	:	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.
Methods for cleaning up	:	If emergency personnel are unavailable, contain spilled material. For small spills add absorbent (soil may be used in the absence of other suitable materials) and use a non-sparking or explosion proof means to transfer material to a sealed, appropriate container for disposal. For large spills dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Place spilled material in an appropriate container for disposal.

Section 7. Handling and storage

Handling	:	Keep container closed. Use only with adequate ventilation. Keep away from heat, sparks and flame. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Use explosion-proof electrical (ventilating, lighting and material handling) equipment.
Storage	:	Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

Section 8. Exposure Controls, Personal Protection

Engineering controls	:	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective occupational exposure limits. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal protection		
Eyes	:	Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
Skin	:	Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Respiratory	:	Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary.Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
ıands	:	Chemical-resistant, impervious gloves or gauntlets complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Personal protection in case of a large spill	:	Splash goggles. Full suit. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Product name	Exposure limits

Dipropylene Glycol

United States

panol, oxybis-

Section 9. Physical and chemical properties

Physical state	:	Liquid.
Color	:	Colorless.
Odor	:	Odorless.
Molecular weight	:	134.2 g/mole
Molecular formula	:	C6-H14-O3
Boiling/condensation point	:	228°C (442.4°F)
Melting/freezing point	:	-40°C (-40°F)
Specific gravity	:	1.02 (Water = 1)
Evaporation rate	:	<0.01 compared to Butyl acetate.

Section 10. Stability and reactivity

Stability and reactivity	:	The product is stable.
Incompatibility with various substances	:	Reactive with oxidizing agents.

Section 11. Toxicological information

Ingredient name	Test	Result	Route	Species
propanol, oxybis-	LD50	14850 mg/kg	Oral	Rat

Chronic effects on humans : Causes damage to the following organs: skin, eyes.

Other toxic effects on humans : Not considered to be toxic for humans.

Specific effects

Carcinogenic effects	:	No known significant effects or critical hazards.
Mutagenic effects	:	No known significant effects or critical hazards.
Reproduction toxicity	:	No known significant effects or critical hazards.

Section 12. Ecological information

Products of degradation	:	These products are carbon oxides (CO, CO_2) and water.
Toxicity of the products of biodegradation	:	The product itself and its products of degradation are not toxic.

Section 13. Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

Consult your local or regional authorities.

Section 14. Transport information

Dipropylene Glycol

Regulatory information	UN number	Proper shipping name	Class	Packing group	Label	Additional information
DOT Classification	Not regulated.	-	-	-		-
TDG Classification	Not regulated.	-	-	-		-
Mexico Classification	Not regulated.	-	-	-		-

Section 15. Regulatory information

United States

HCS Classification : Combustible liquid
Target organ effects

U.S. Federal regulations : TSCA 8(b) inventory: propanol, oxybis-

SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: No products were found.
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: No products were found.
Clean Water Act (CWA) 307: No products were found.
Clean Water Act (CWA) 311: No products were found.
Clean air act (CAA) 112 accidental release prevention: No products were found.
Clean air act (CAA) 112 regulated flammable substances: No products were found.
Clean air act (CAA) 112 regulated toxic substances: No products were found.

State regulations : Pennsylvania RTK: propanol, oxybis-: (generic environmental hazard)

Canada

WHMIS (Canada) : Not controlled under WHMIS (Canada).
CEPA DSL: propanol, oxybis-

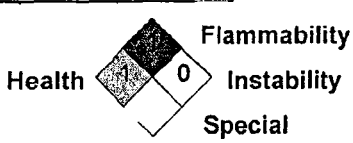
Section 16. Other information

Label Requirements : CAUSES DAMAGE TO THE FOLLOWING ORGANS: SKIN, EYES.
COMBUSTIBLE LIQUID AND VAPOR.
VAPOR MAY CAUSE FIRE.

Hazardous Material Information System (U.S.A.) :

Health	* 1
Fire hazard	1
Reactivity	0
Personal protection	A

National Fire Protection Association (U.S.A.) :



Notice to reader

the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

1.) Identification of the substance/preparation and company

Product details

Trade name

Di-sec-butylamine

Use

chemical intermediates (including monomers)

Identification of the manufacturer / supplier

Address

Celanese Chemicals Europe GmbH
Frankfurter Straße 111
D-61476 Kronberg/Ts.

Information provided by / telephone

EHSA Europe FAX-Nr.: +49 (0) 208 693 2053

Emergency telephone number +49 (0) 69-305 6418

2.) Composition / information on ingredients

Chemical characterization

Di-(1-methylpropyl) amine

Substance / product identification

CAS no.	626-23-3	**Index no.**	612-049-00-0
EINECS no.	210-937-9	**ELINCS number :**	

Hazardous ingredients

Di-sec-butylamine

CAS no.	626-23-3		
EINECS no.	210-937-9		
Concentration	>= 98,5	%-b.w.	%-b.w.
Classification	R10 Xn;R20/21/22		

3.) Hazards possibilities

Hazard symbols

F	Highly flammable
T	Toxic

R phrases

11	Highly flammable.
20/22	Harmful by inhalation and if swallowed.
24	Toxic in contact with skin.
35	Causes severe burns.

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4.) First aid measures

General Information
Remove contaminated clothing immediately and dispose of safely.

After inhalation
When inhaled remove to fresh air and seek medical aid.

After skin contact
Rinse affected skin for at least ten minutes with cold water, then bathe in 3% acetic acid for 30 minutes. Treat wounds like burn wounds. Immediate medical treatment necessary, as untreated burns can result in slow-healing wounds

After eye contact
In case of contact with eyes rinse thoroughly with plenty of lukewarm water and seek medical advice

After ingestion
Summon a doctor immediately.

Advice to doctor

Symptoms
Shortness of breath; Convulsions; Coughing; hypertensive effect

Hazards
Risk of stomach perforation; Risk of pulmonary oedema

Treatment
Symptoms appear mostly after several hours. If swallowed, flush stomach; Continue to monitor for pneumonia and pulmonary oedema. Treat skin and mucous membranes with antihistamines and corticosteroid preparations. In the event of pulmonary irritation treat initially with dexamethasone - dosing aerosol.

5.) Fire-fighting measures

Suitable extinguishing media
Foam; Dry powder; Carbon dioxide; Water spray jet

Extinguishing media that must not be used for safety reasons
strong water jet

Special exposure hazards arising from the substance or preparation itself, its combustion products or from resulting gases
In case of fires, hazardous combustion gases are formed: Carbon monoxide (CO). Carbon dioxide (CO2); Nitrous gases (NOx); Combustion gases of organic materials must in principle be graded as inhalation poisons.

Special protective equipment for firefighting
Use self-contained breathing apparatus.

Other information (chapter 5.)
Cool endangered environment with water spray jet.

6.) Accidental release measures

Personal precautions
Avoid contact with eyes and skin. Keep away sources of ignition. Ensure adequate ventilation.

Environmental precautions
Prevent spread over a wide area (e.g. by containment or oil barriers). Do not discharge into the drains/surface waters/groundwater.

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Methods for cleaning up/taking up

Pick up with absorbent material (eg sand, kieselgur, acid binder, universal binder, sawdust). Dispose of contaminated material as prescribed

7.) Handling and storage

Handling

Advice on safe handling

Provide good ventilation of working area (local exhaust ventilation if necessary). Transfer and handle only in enclosed systems.

Advice on protection against fire and explosion

Keep away from sources of ignition - refrain from smoking. Take precautionary measures against static charges. In case of fire, emergency cooling with water spray should be available

Temperature class

T2

Use

Agrochemicals

Storage

Hints on storage assembly

Keep in cool, well ventilated place away from acids; Do not store with strong oxidizing agents.

Further information on storage conditions

Keep container tightly closed. Store under nitrogen

8.) Exposure controls / personal protection

Ingredients with occupational exposure limits to be monitored

None

Personal protective equipment

Respiratory protection

filter apparatus, filter A; Full mask with above mentioned filter according to producers using requirements or self-contained breathing apparatus.

Hand protection

Chemical resistant gloves			
Appropriate Material	Nitrile rubber		
Type	Fleximax (Company COMASEC) or comparable article; or refer to glove producer recommendation.		
evaluation	according to EN 374: level 6		
Material thickness	appr.	0,55	mm
Time for permeation	>	480	min
Chemical resistant gloves			
Appropriate Material	PVC		
Type	Strongoflex Double Dip (Company NorthChem) or comparable article; or refer to glove producer recommendation.		
evaluation	Suitable according to practical experience.		
Material thickness	appr.	0,8	mm

Eye protection

Tightly fitting safety glasses

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Skin protection
protective clothing

General protective and hygiene measures
Contact with eyes and skin must be avoided; Do not inhale vapours. Hold emergency shower available.

Hygenic measures
Do not eat, drink or smoke during work time. Remove soiled or soaked clothing immediately. Wash hands before breaks and after work. Clean skin thoroughly after work; apply skin cream.

9.) Physical and chemical properties

Appearance

Form	liquid
Colour	colourless
Odour	amine-like

Safety data

Changes in physical state

type	Melting temperature		
Value	< -60		

Changes in physical state

type	Boiling temperature		
Value	134		
Pressure	1013	hPa	

Flash point

Value	20		°C
Method	DIN 51755		

Ignition temperature

Value	320		°C
Method	DIN 51794		

Vapour pressure

Value	appr. 14		hPa
Reference temperature	20	°C	
Method	calculated		
Value	appr. 60		hPa
Reference temperature	50	°C	
Method	calculated		

Density

Value	0.753		g/cm³
Method	DIN 51757		
Reference temperature	20	°C	

Viscosity

type	dynamic		
Value	1.2		mPa*s
Reference temperature	20	°C	

Solubility in water

Value	7		g/l
Reference temperature	20	°C	

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pH value

Value	appr.	11.5	
Reference temperature		20	°C
Concentration	7		g/l

Octanol/water partition coefficient (log Pow)

Value	2,2
Method	Calculation Hansch/Leo

Other information (chapter 9.)

Incompatible substances: Acids.

10.) Stability and reactivity

Hazardous decomposition products	None
Hazardous reactions	Reactions with acids and strong oxidising agents.

Thermal decomposition

Remarks	No decomposition if used as prescribed.

11.) Toxicological information

Acute toxicity

Acute oral toxicity

LD50		308		mg/kg
Species	rat			

Acute dermal toxicity

LD50		200	- 400	mg/kg
Species	rabbit			

Irritant/corrosive effects

Irritant effect on skin

Species	rabbit
evaluation	strongly corrosive

Irritant effect on eyes

Species	rabbit eye
evaluation	strongly corrosive

Other information

Serious toxic effects are possible in case of contact with large areasof skin; Symptomes of poisoning may only appear after several hours

12.) Ecological information

Data on elimination (persistence and degradability)

Biodegradability

Value	<	30
Method	OECD 302 B	
evaluation	not readily degradable	

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Ecotoxic effects

Fish toxicity

LC50	appr. 80	mg/l
Species	zebra fish	
Duration of exposure	96	h
Method	OECD 203	

Bacteria toxicity

EC0	500	mg/l
Species	activated sludge	
Method	fermentation tube test	

General information / ecology

Remarks Do not discharge product unmonitored into the environment.

13.) Disposal considerations

Product

Disposal required in compliance with all waste management related local regulations.
The choice of the appropriate method of disposal depends on the product composition by the time of disposal as well as the local statutes and possibilities for disposal.

Uncleaned packaging

Contaminated packaging should be emptied as far as possible and after appropriate cleansing may be taken for reuse.

14.) Transport information

Land transport ADR/RID

UN number	2733
Technical name	Amines, flammable, corrosive, n.o.s.
Danger releasing substance	(Di-sec-butylamine)
Class	3
Packaging group	II
Hazard no.	338

Inland waterways transport ADNR

Regulatory information	ADNR: Container -Ship and Tanker
UN number	2733
Technical name	Amines, flammable, corrosive, n.o.s.
Danger releasing substance	(Di-sec-butylamine)
Class	3
Packaging group	II

Marine transport IMDG

UN number	2733
Propper shipping name	Amines, flammable, corrosive, n.o.s.
Danger releasing substance	(Di-sec-butylamine)
Class	3
Packaging group	II
EmS	3-02 (Amdt 30-00) F-E, S-C (Amdt 31-02)

EPAPA008000912

Air transport ICAO/IATA

UN number	2733
Propper shipping name	Amines, flammable, corrosive, n.o.s.
Danger releasing substance	(Di-sec-butylamine)
Class	3
Packaging group	II

Dispatch by post
Not permitted

15.) Regulatory information

Hazardous component(s) to be indicated on label

Di-sec-butylamine

Labelling in accordance with EC directives
"EC-labelling"

Hazard symbols

Xn	Harmful

R phrases

10	Flammable.
20/21/22	Harmful by inhalation, in contact with skin and if swallowed.

Water Hazard Class (Ger.)

Class	1
Source	Classification according to VwVwS, Annex 3

16.) Other information

Other information
Observe national and local legal requirements

R phrases
Di-sec-butylamine

10	Flammable.
20/21/22	Harmful by inhalation, in contact with skin and if swallowed.

This information is based on our present state of knowledge. It shall describe our products regarding safety requirements and shall not be construed as a guarantee or statement of condition and/or quality.

EPAPA008000913

Anachemia

255 Norman.
Lachine (Montreal), Que
H8R 1A3

Material Safety Data Sheet

EMERGENCY NUMBERS:

(USA) CHEMTREC : 1(800) 424-9300 (24hrs)
(CAN) CANUTEC : 1(613) 996-6666 (24hrs)
(USA) Anachemia : 1(518) 297-4444
(CAN) Anachemia : 1(514) 489-5711

WHMIS	Protective Clothing	TDG Road/Rail
WHMIS CLASS: D-2B		Not controlled under TDG (Canada). PIN: Not applicable. PG: Not applicable.

Section I. Product Identification and Uses

Product name	**DODECYL ALCOHOL**
Chemical formula	CH3(CH2)11OH
Synonyms	1-Dodecanol, Lauryl alcohol, AC-3934, 36984
Supplier	Anachemia Canada. 255 Norman. Lachine (Montreal), Que H8R 1A3
Material uses	For laboratory use only.

CI#	Not available.
CAS#	112-53-8
Code	AC-3934
Formula weight	186.34
Supersedes	

Section II. Ingredients

Name	CAS #	%	TLV
1) DODECYL ALCOHOL	112-53-8	98	Not established by ACGIH

Toxicity values of the hazardous ingredients

DODECYL ALCOHOL:
ORAL (LD50): Acute: 4150 mg/kg (Rat). 1170 mg/kg (Mouse).
DERMAL (LD50): Acute: >10 ml/kg (Guinea pig).
INTRAVENOUS (LD50): Acute: 390 mg/kg (Rat).

Section III. Physical Data

Physical state and appearance / Odor	Moist white solid.
pH (1% soln/water)	Not applicable.
Odor threshold	Not available.
Percent volatile	Not available.
Freezing point	24 to 27°C
Boiling point	260 to 262°C
Specific gravity	0.82 (Water = 1)
Vapor density	7.4 (Air = 1)
Vapor pressure	0.1 mm of Hg (@ 20°C)
Water/oil dist. coeff.	Not available.
Evaporation rate	Not available.
Solubility	Insoluble in cold water.

Section IV. Fire and Explosion Data

Flash point	CLOSED CUP: >109°C
Flammable limits	LOWER: 0.6% UPPER: 4%
Auto-ignition temperature	259°C
Fire degradation products	Oxides of carbon (CO, CO2).
Fire extinguishing procedures	Use DRY chemical, carbon dioxide, or foam. Water or foam may cause frothing. Wear adequate personal protection to prevent contact with material or its combustion products. Self contained breathing apparatus with a full facepiece operated in a pressure demand or other positive pressure mode.
Fire and Explosion Hazards	The sensitivity to static discharge is not available. The sensitivity to impact is not available. When heated to decomposition it emits acrid smoke and fumes.

Section V. Toxicological Properties

Routes of entry	Ingestion and inhalation. Eye contact. Skin contact. Skin absorption.
Effects of Acute Exposure	Harmful by ingestion, inhalation or skin absorption. Irritant.
Eye	Causes severe irritation.
Skin	Causes skin irritation.
Inhalation	Material is irritating to mucous membranes and upper respiratory tract.
Ingestion	No specific information is available on this material.

Section V. Toxicological Properties

Effects of Chronic Overexposure	Carcinogenic effects: Not available. Mutagenic effects: Not available. Teratogenic effects: Not available. Toxicity of the product to the reproductive system: Not available. To the best of our knowledge, the chemical, physical, and toxicity of this substance has not been fully investigated.

Section VI. First Aid Measures

Eye contact	Immediately flush eyes with copious quantities of water for at least 15 minutes holding lids apart to ensure flushing of the entire surface. Call a physician.
Skin contact	Immediately flush skin with plenty of water and soap for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash contaminated clothing before reusing.
Inhalation	Remove patient to fresh air. Administer approved oxygen supply if breathing is difficult. Administer artificial respiration or CPR if breathing has ceased. Call a physician.
Ingestion	If conscious, wash out mouth with water. Never give anything by mouth to an unconscious or convulsing person. Call a physician.

Section VII. Reactivity Data

Stability	Stable. Conditions to avoid: High temperatures, sparks, open flames and all other sources of ignition, contamination.
Hazardous decomp. products	Not available.
Incompatibility	Oxidizing agents, bases, acids, acid anhydrides, acid chlorides, halogens, acetaldehyde, ethylene oxide, hexamethylene diisocyanate, hydrogen peroxide, sulfuric acid, hypochlorous acid, diisocyanates, isocyanates, lithium aluminum hydride, nitrogen teroxide, perchloric acid, barium perchlorate, diethyl aluminum bromide, tri-isobutyl aluminum.
Reaction Products	Not available. Hazardous polymerization will not occur.

Section VIII. Preventive Measures

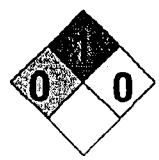
Protective Clothing in case of spill and leak	Wear respirator, chemical safety goggles, rubber boots and heavy rubber gloves.
Spill and leak	Evacuate the area. Eliminate all sources of ignition. Absorb on sand or vermiculite and place in a closed container for disposal. Avoid raising dust. Ventilate area and wash spill site after material pick up is complete. DO NOT empty into drains. DO NOT touch damaged container or spilled material.
Waste disposal	Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an after burner and scrubber. According to all applicable regulations.
Storage and Handling	Store in a cool place away from heated areas, sparks, and flame. Store in a well ventilated area. Store away from incompatible materials. Do not add any other material to the container. Do not wash down the drain. Do not breathe dust. Keep container tightly closed and dry. Manipulate in a well ventilated area or under an adequate fume hood. Avoid raising dust. Empty containers may contain a hazardous residue. Handle and open container with care. Minimize dust generation and exposure - use dust mask or appropriate protection. Take off immediately all contaminated clothing. This product must be manipulated by qualified personnel. Do not get in eyes, on skin, or on clothing. Wash well after use. In accordance with good storage and handling practices. Do not allow smoking and food consumption while handling.

Section IX. Protective Measures

Protective clothing	Splash goggles. Impervious rubber gloves, apron, coveralls, and/or other resistant protective clothing. Sufficient to protect skin. A OSHA/MSHA jointly approved respirator is advised in the absence of proper environmental controls. Do not wear contact lenses. Make eye bath and emergency shower available. Ensure that eyewash station and safety shower is proximal to the work-station location.
Engineering controls	Local mechanical exhaust ventilation capable of minimizing dust emissions at the point of use. Do not use in unventilated spaces.

Section X. Other Information

Special Precautions or comments Harmful solid! Irritant! Do not breathe dust. Avoid all contact with the product. Avoid prolonged or repeated exposure. Manipulate in a well ventilated area or under an adequate fume hood. Keep away from heat, sparks and flame. Handle and open container with care. Container should be opened only by a technically qualified person.
RTECS NO: JR5775000 (Dodecyl alcohol).



NFPA

Prepared by MSDS Department/Département de F.S..	**Validated 10-Mar-2005**

Telephone# (514) 489-5711

While the company believes the data set forth herein are accurate as of the date hereof, the company makes no warranty with respect thereto and expressly disclaims all liability for reliance thereon. Such data are offered solely for your consideration, investigation and verification.

E

T, deport -C Ed
#1087
Detergent-
Hot wash
Clean Rinse
Dry
Dry

EASTMAN

MATERIAL SAFETY DATA SHEET

Revision Date: 11/15/2004
MSDSUSA/ANSI/EN/150000000343/Version 4.0

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name	Eastman(TM) Solvent R
Product Identification Number(s)	02860-00, P0286000, P0286001, E0286001
Manufacturer/Supplier	Eastman Chemical Company 200 South Wilcox Drive Kingsport, TN 37660-5280 US +14232292000
MSDS Prepared by	Eastman Product Safety and Health
Chemical Name	not applicable
Synonym(s)	02860-00 446320
Molecular Formula	not applicable
Molecular Weight	not applicable
Product Use	solvent
OSHA Status	hazardous

For emergency health, safety & environmental information, call 800-EASTMAN.

For emergency transportation information, call CHEMTREC at 800-424-9300 or call 800-EASTMAN.

2. COMPOSITION INFORMATION ON INGREDIENTS

(Typical composition is given, and it may vary. A certificate of analysis can be provided, if available.)

Weight %	Component	CAS Registry No.
80%	hydrocarbon C9-C12	not available
15%	hydrocarbon C14-16	not available
5%	hydrocarbon C18-C20	not available

3. HAZARDS IDENTIFICATION

WARNING!
PROLONGED OR REPEATED SKIN CONTACT MAY CAUSE DRYING, CRACKING, OR IRRITATION
COMBUSTIBLE LIQUID AND VAPOR
HIGH VAPOR CONCENTRATIONS MAY CAUSE DROWSINESS

HMIS® Hazard Ratings: Health - 2, Flammability -2, Chemical Reactivity - 0

HMIS® rating involves data interpretations that may vary from company to company. They are intended only for rapid, general identification of the magnitude of the specific hazard. To deal adequately with the safe handling of this material, all the information contained in this MSDS must be considered.

4. FIRST-AID MEASURES

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Inhalation: If symptomatic, move to fresh air. Get medical attention if symptoms persist.
Eyes: Any material that contacts the eye should be washed out immediately with water. If easy to do, remove contact lenses. Get medical attention if symptoms persist.
Skin: Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash contaminated clothing before reuse. Destroy or thoroughly clean contaminated shoes.
Ingestion: Seek medical advice.

5. FIRE FIGHTING MEASURES

Extinguishing Media: water spray, dry chemical, carbon dioxide, foam
Special Fire-Fighting Procedures: Wear self-contained breathing apparatus and protective clothing. Use water spray to keep fire-exposed containers cool. USE WATER WITH CAUTION. Water may be ineffective in fighting the fire. Material will float and may ignite on surface of water. The fire could easily be spread by the use of water in an area where the water could not be contained.
Hazardous Combustion Products: carbon dioxide, carbon monoxide
Unusual Fire and Explosion Hazards: Combustible.

6. ACCIDENTAL RELEASE MEASURES

Wear appropriate personal protective equipment. Eliminate all ignition sources. Absorb spill with vermiculite or other inert material, then place in a container for chemical waste.
For Large Spills: Flush spill area with water spray. Prevent runoff from entering drains, sewers, or streams. Dike for later disposal.

7. HANDLING AND STORAGE

Personal Precautionary Measures: Avoid breathing high vapor concentrations. Avoid contact with eyes, skin, and clothing. Do not taste or swallow. Use only with adequate ventilation. Wash thoroughly after handling.
Prevention of Fire and Explosion: Keep away from heat, sparks, and flame. Keep from contact with oxidizing materials.
Storage: Keep container tightly closed.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Country specific exposure limits have not been established or are not applicable unless listed below.

Ventilation: Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust

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ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Respiratory Protection: If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. In the United States of America, if respirators are used, a program should be instituted to assure compliance with OSHA Standard 63 FR 1152, January 8, 1998. Respirator type: Air-purifying respirator with an appropriate, government approved (where applicable), air-purifying filter, cartridge or canister. Contact health and safety professional or manufacturer for specific information.

Eye Protection: It is a good industrial hygiene practice to minimize eye contact.

Skin Protection: Wear chemical-resistant gloves, footwear, and protective clothing appropriate for the risk of exposure. Contact health and safety professional or manufacturer for specific information.

Recommended Decontamination Facilities: safety shower, washing facilities, eye bath

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Form: liquid
Color: light yellow
Odor: hydrocarbon
Specific Gravity: 0.93
Boiling Point: 177 - 368 °C
Solubility in Water: negligible
Flash Point: 41 °C (Tag open cup)
Thermal Decomposition Temperature: Thermal stability not tested. Low stability hazard expected at normal operating temperatures.

10. STABILITY AND REACTIVITY

Stability:	Not fully evaluated. Materials containing similar structural groups are normally stable.
Incompatibility:	Material reacts with strong oxidizing agents.
Hazardous Polymerization:	Will not occur.

11. TOXICOLOGICAL INFORMATION

Acute toxicity data, if available, are listed below. Additional toxicity data may be available on request.

12. ECOLOGICAL INFORMATION

Acute toxicity data, if available, are listed below. Additional toxicity data may be available on request.

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This material has not been tested for environmental effects.

13. DISPOSAL CONSIDERATIONS

Discharge, treatment, or disposal may be subject to national, state, or local laws. Incinerate. Since emptied containers retain product residue, follow label warnings even after container is emptied.

14. TRANSPORT INFORMATION

Important Note: Shipping descriptions may vary based on mode of transport, quantities, package size, and/or origin and destination. Consult your company's Hazardous Materials/Dangerous Goods expert for information specific to your situation.

DOT (USA)

Class combustible liquid, Packing group III for quantities of 450 liters (119 gallons) or more; not regulated for smaller quantities

Possible Shipping Description(s):

not regulated

Hydrocarbons, liquid, n.o.s.
combustible liquid (OIL) UN 3295 III

Sea - IMDG (International Maritime Dangerous Goods)

Possible Shipping Description(s):

HYDROCARBONS, LIQUID, N.O.S.
3 UN 3295 III

Air - ICAO (International Civil Aviation Organization)

Possible Shipping Description(s):

Hydrocarbons, liquid, n.o.s.
3 UN 3295 III

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15. REGULATORY INFORMATION

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.
WHMIS (Canada) Status: controlled

WHMIS (Canada) Hazard Classification: B/3, D/2/B

SARA 311-312 Hazard Classification(s):
immediate (acute) health hazard
fire hazard

SARA 313: none, unless listed below

Carcinogenicity Classification (components present at 0.1% or more): none, unless listed below

TSCA (US Toxic Substances Control Act): All components of this product are listed on the TSCA inventory. Any impurities present in this product are exempt from listing.

16. OTHER INFORMATION

Visit our website at www.EASTMAN.com or call 001-423-229-2000.

The information contained herein is based on current knowledge and experience; no responsibility is accepted that the information is sufficient or correct in all cases. Users should consider these data only as a supplement to other information. Users should make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials, the safety and health of employees and customers, and the protection of the environment.

Highlighted areas indicate new or changed information.

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EMULSIONS CONTROL INC.

MATERIAL SAFETY DATA SHEET

PRODUCT/MATERIAL:	ECO 53BC	**EMERGENCY PHONE NO.**	
MANUFACUTURER:	EMULSIONS CONTROL, INC. 925 Hale Place, Suite A-7 Chula Vista, CA 91914	**SPILL:** **OFFICE:**	800-633-8253 619-656-8899

SECTION I – MATERIAL IDENTIFICATION

TRADE NAME:	ECO 53BC	**PRODUCT CODE NO:**	ECO 53BC
GENERIC NAME:	Oil based demulsifier	**MSDS CODE NO:**	ECO 53BC
CHEMICAL NAME:	Solvent blend of surface active organic compounds	**CAS REGISTRY NO:**	Not registered
SYNONYMS:	Emulsion breaker	**NOISH REGISTRY NO:**	Not registered
CHEMICAL FAMILY:	Hydrocarbon solvents, organic acids and resins	**CHEMICAL FORMULA:**	Mixture/ liquid/ organic compounds

SECTION II – HAZARD IDENTIFICATION

HEALTH/PHYSICAL HAZARDS: This material is a flammable liquid, a severe eye and skin irritant. Material similar to a major component have been shown to cause skin cancer in laboratory animals.

HAZARD LISTING: Flammable Liquid, n.o.s. (Isopropanol)

OTHER: Warning Label "Flammable Liquid"

Tanks, pipes and containers retain material or material residue. Failure to exercise caution during cleaning, maintenance, repair or sampling operations can be hazardous and lead to injury. Read sections V, VIII & X.

SECTION III – HAZARDOUS INGREDIENTS & RECOMMENDED EXPOSURE LIMITS

HAZARDOUS INGREDIENTS:	**RECOMMENDED EXPOSURE LIMITS**	
	LIMIT TYPE	**AMOUNT AGENCY***
1) Alcohols, ketones, esters, aliphatic and aromatic solvents	8-hr TWA	400 ppm X(I)
2) Surface active organic compounds (Proprietary)	None established	

(i) Recommended by manufacturer

- A = ACGIH; C = CAL/OSHA; M = MSHA; O= OSHA; X = OTHER

PRODUCT/MATERIAL: ECO 53BC

SECTION X – HANDLING DURING ROUTINE & NON-ROUTINE OPERATIONS

STORAGE: Store in closed containers in a cool, dry, well-ventilated area away from sources of heat and ignition and strong oxidizing agents. Containers should be electrically bonded and grounded when transferring material.

HANDLING: Use in a well-ventilated area and recommended protective equipment and clothing. Use explosion-proof tools and equipment. Avoid breathing vapors or mists and prolonged or repeated skin contact. Avoid heating above 70° F. Label all unattended containers.

MISUSE OF EMPTY CONTAINERS CAN BE HAZARDOUS. COMPLETELY DRAIN AND HAVE COMMERCIALLY CLEANED BEFORE ANY REUSE. KEEP CONTAINERS CLOSED AND DO NOT USE TO STORE OR MIX ANY OTHER MATERIALS BEFORE THEY HAVE BEEN COMMERCIALLY CLEANED. DO NOT CUT, WELD, DRILL, OR SUBJECT EMPTY CONTAINERS TO HEAT OR FLAMES. VAPORS MAY IGNITE AND EXPLODE.

SECTION XI – SPILL, LEAK & DISPOSAL PROCEDURES

SPILL OR LEAK PROCEDURES: Evacuate area for large spills. Remove all ignition sources and provide explosion-proof ventilation. Wear recommended protective clothing and equipment. Do not allow spills to enter sewers, streams or surface waters. Dike and contain spill. Use inert absorbent to reduce fumes and to pick up. Collect for later disposal.

DISPOSAL PROCEDURES: *DISPOSE OF IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.* Empty containers should be commercially cleaned and reconditioned before reuse.

SECTION XII – PHYSICAL DESCRIPTION & PROPERTIES

DESCRIPTION: A brown or red colored liquid with a slightly pungent odor.

MELTING POINT:	N/A	**SOLUBILITY (WATER):**	Negligible
BOILING POING/RANGE:	133-760° F	**pH:**	N/A
OVERPOINT:	N/A	**SPECIFIC GRAVITY:**	0.90-0.93
VAPOR PRESSURE:	65-75 mm of Hg @ 20° C	**API GRAVITY:**	N/A
% VOLATILE BY VOLUME:	30-50%	**VISCOSITY:**	N/A
VAPOR DENSITY:	Heavier than air	**POUR POINT:**	N/A
EVAPORATION RATE:	2.5-4 (N-Butyl Acetate=1)	**OTHER:**	None

MSDS CODE NO:	ECO 53BC	**NEW/REVISION DATE:**	February 13, 2006
PREPARED BY:	Sam Delchad, Ph.D.	**DATE:**	2-13-06

PRODUCT/MATERIAL: ECO 53BC

SECTION VII – CHEMICAL REACTIVITY INFORMATION

STABILITY: Stable under normal conditions of storage and handling.

REACTIVITY: Reacts with strong oxidizing agents and alkaline materials.

INCOMPATIBILITY: Strong oxidizing agents, alkaline materials

HAZARDOUS REACTION/DECOMPOSITION PRODUCTS: Carbon dioxide and carbon monoxide, oxides of sulfur and nitrogen.

SECTION VIII – FIRE & EXPLOSION HAZARD INFORMATION

NFPA RATING: **HEALTH:** 2 **FLAMMABILITY:** 3 **REACTIVITY:** 0

FLASH POINT (METHOND): <70° F (PMCC) **FIRE POINT/AUTOIGNITION TEMP:** No data
FLAMMABLE LIMITS (% BY VOLUME/AIR): **LOWER** 1 **UPPER** 4%

FIRE/EXPLOSION HAZARDS: This material is a moderate fire and explosion hazard and may be ignited by an ignition source above its flash point. Vapors may travel to ignition source and flash back. Containers may explode in fire. A vapor explosion hazard indoors, outdoors or in sewers. Empty containers retain material residue and may generate vapors which can ignite and explode.

;UMBUSTION PRODUCT: Carbon dioxide, carbon monoxide and water vapor. Oxides of sulfur and nitrogen.

EXTINGUISHING MEDIA: Carbon dioxide and dry chemical. Do not use water.

FIRE FIGHTING PROCEDURES: Fire fighters should wear full protective clothing and equipment, including self-contained breathing apparatus when fighting fires in enclosed spaces. Use water spray to cool containers, to dilute and disperse vapors, protect personnel, and to flush unignited spills from fire.

SECTION IX – PERSONAL PROTECTION & ENGINEERING CONTROLS

EYE & FACIAL PROTECTION: Chemical goggles are recommended to prevent eye contact. In situations where splashing may occur, splash goggles and a face shield should be worn.

SKIN PROTECTION: Impervious protective glove, long-sleeve clothing and a chemical apron are recommended to prevent skin contact (Butyl rubber or polyethylene are recommended!). Wear protective boots in situations where splashing may occur.

RESPIRATORY PROTECTION: In situations where vapor concentrations exceed the recommended exposure limits, a NIOSH-approved organic vapor cartridge respirator should be worn.

VENTILATION: Explosion-proof general mechanical ventilation or local exhaust is recommended to maintain vapor concentrations below the recommended exposure limits

)THER: An eye wash and source of running water should be available to flush or wash the eyes and skin.

PRODUCT/MATERIAL: ECO 53BC

SECTION IV – HEALTH HAZARD INFORMATION

GENERAL: This material is a moderate eye and skin irritant.

OCULAR/EYE: This material is a moderate eye irritant. Contact with the liquid may cause burning, redness, swelling, eye burns and eye damage.

DERMAL/SKIN: This material is a skin irritant. Prolonged or repeated contact may cause burning, redness, dermatitis, blistering and skin damage.

INHALATION/BREATHING: Exposure to mists or to excessive concentrations of vapors generated when this material is heated may cause irritation of nose, throat and respiratory tract and signs of central nervous system depression; i.e., headache, nausea, drowsiness and dizziness.

INGESTION/SWALLNG: Accidentally swallowing this material may cause irritation and burning of the mouth, throat, esophagus and gastrointestinal (GI) tract.

CHRONIC/OTHER:

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing skin, liver, kidney & respiratory disorders.

SECTION V – SEPCIAL HAZARDS & PRECAUTIONS

HAZAROUS DURING HON-ROUTINE OPERATIONS: Tank, pipes and containers contain material or material residue and may contain toxic, irritating, flammable or explosive vapors of high concentrations and pressures. Exposure to these vapors can cause serious physical harm or injury.

SPECIAL PRECAUTIONS & COMMENTS: Enclosed or head spaces in material tanks, pipes or containers y contain hazardous concentrations of fumes or vapors. Exercise caution and wear recommended protective equipment and clothing when opening valves or tank and container lids, entering empty tanks or during any operations such as cleaning, repair, maintenance or sampling where there is a potential for exposure to these fumes or vapors

SECTION VI – EMERGENCY & FIRST AID PROCEDURES

ATTENTION: IF VICTIM IS NOT BREATHING OR IF BREATHING DIFFICULTIES DEVELOP, ARTIFICIAL RESPIRATION OR OXYGEN SHOULD BE ADMINISTERED BY QUALIFIED PERSONNEL.

OCULAR/EYE CONTACT: Immediately flush affected eye(s) with clean water for at least 30 minutes, washing under the eyelids. Seek immediate medical assistance.

DERMAL/SKIN CONTACT: Immediately remove contaminated clothing. Flush contact areas with water and then thoroughly cleanse the skin by washing with soap and water. If irritation or redness develop and persist, seek medical assistance.

INHALATION/BREATHING: If symptoms of exposure develop, move away from source of exposure to vapors or mists. If symptoms of exposure persist, seek medical assistance.

INGESTION/SWALLING: If victim is conscious and alert, have them rinse mouth with water and then drink milk or water. Seek medical assistance.

COMMENTS/PHYSICIAN INFO: This material is a viscous petroleum solvent-based mixture of organics, acids, resins and amines which is moderately to severely irritating to the skin, eyes and mucous membranes.

MATERIAL SAFETY DATA SHEET

REVISION DATE: 01-30-2007 SUPERSEDES: None

SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

COMPANY INFORMATION
Specialty Construction Brands, Inc.
(formerly TEC Specialty Products, Inc.
An H.B. Fuller Company)
315 South Hicks Road
Palatine, IL 60067
Phone: 847-358-9500

Medical Emergency Phone Number (24 Hours): 1-888-853-1758
Transport Emergency Phone Number (CHEMTREC): 1-800-424-9300

PRODUCT INFORMATION

PRODUCT IDENTIFIER:	825349PM
PRODUCT NUMBER:	TA0440A MTO TINT
PRODUCT DESCRIPTION:	Epoxy resin

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

Unlisted ingredients are not 'hazardous' per the Occupational Safety and Health Administration Hazard Communication Standard (29 CFR 1910.1200) and/or are not found on the Canadian Workplace Hazardous Materials Information System ingredient disclosure list. See Section 8 for any additional exposure limit guidelines.

Chemical Name	CAS #	PERCENT	OSHA PEL
Epoxy resin	25085-99-8	50 - 70	Not established
Epoxy resin	68609-97-2	5 - 10	Not established
Glass oxide, bubbles	65997-17-3	5 - 10	TWA 6 MG/M3
Calcium carbonate	471-34-1	1 - 5	TWA (Respirable dust) 5 MG/M3 TWA (Total dust) 15 MG/M3
Titanium dioxide	13463-67-7	1 - 5	TWA (Total dust) 10 MG/M3
Crystalline silica	14808-60-7	0.1 - 1	TWA (Respirable dust) 0.1 MG/M3
Carbon black	1333-86-4	0.1 - 1	TWA 3.5 MG/M3
Titanium dioxide (Rutile)	1317-80-2	0.1 - 1	TWA (Total dust) 10 MG/M3

MATERIAL SAFETY DATA SHEET

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Moderate eye irritant.
Causes skin irritation. May cause allergic skin reaction.

Harmful if swallowed.
Cancer hazard.

HMIS RATING: HEALTH -- 2 FLAMMABILITY -- 1 REACTIVITY -- 0
See SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for personal protective equipment recommendations.

POTENTIAL HEALTH EFFECTS BY ROUTE OF ENTRY
EYE: Can cause moderate irritation, tearing and reddening, but not likely to permanently injure eye tissue.

SKIN: Can cause moderate skin irritation, defatting, and dermatitis. Not likely to cause permanent damage. May cause sensitization.

INHALATION: Can cause minor respiratory irritation. Inhalation of dusts produced during cutting, grinding or sanding of this product may cause irritation of the respiratory tract.
Overexposure to crystalline silica may cause silicosis.This product contains one or more materials that may be hazardous when present as an airborne dust. During normal handling of the product, the material is encapsulated within the product and will not present an exposure risk. Once the product has reached its final state and is abraded or disturbed, dusting and exposure may occur.

INGESTION: Ingestion is not an anticipated route of exposure. Harmful if swallowed. Irritating to mouth, throat, and stomach.

LONG-TERM (CHRONIC) HEALTH EFFECTS
TARGET ORGAN(S): Skin Lungs

REGULATED CARCINOGEN STATUS:
Unless noted below, this product does not contain regulated levels of NTP, IARC, ACGIH, or OSHA listed carcinogens.

Titanium dioxide

Crystalline silica

Carbon black

Titanium dioxide (Rutile)

EXISTING HEALTH CONDITIONS AFFECTED BY EXPOSURE: Skin disease including eczema and sensitization; Lung disease

SECTION 4: FIRST AID MEASURES

IF IN EYES: Flush eyes with plenty of water for at least 20 minutes retracting eyelids often. Tilt the head to prevent chemical from transferring to the uncontaminated eye. Get immediate medical attention.

IF ON SKIN: Wash with soap and water. Remove contaminated clothing and launder. Get medical attention if irritation develops or persists.

IF VAPORS INHALED: Remove to fresh air. Call a physician if symptoms persist.

IF SWALLOWED: Do not induce vomiting. Seek medical attention immediately. Drink two glasses of water or milk to dilute. Do not give anything by mouth to an unconscious person. Induced vomiting may lead to aspiration of the material into the lungs potentially causing chemical pneumonitis that may be fatal.

SECTION 5: FIRE FIGHTING MEASURES

FLASH POINT:	Not applicable
AUTOIGNITION TEMPERATURE:	Not established
LOWER EXPLOSIVE LIMIT (% in air):	Not established
UPPER EXPLOSIVE LIMIT (% in air):	Not established
EXTINGUISHING MEDIA:	Use water spray, foam, dry chemical or carbon dioxide.
UNUSUAL FIRE AND EXPLOSION HAZARDS:	Material will burn in a fire.
SPECIAL FIRE FIGHTING INSTRUCTIONS:	Persons exposed to products of combustion should wear self-contained breathing apparatus and full protective equipment.
HAZARDOUS COMBUSTION PRODUCTS:	Carbon dioxide, Carbon monoxide Silicon dioxide

SECTION 6: ACCIDENTAL RELEASE MEASURES

SPECIAL PROTECTION:	Exposure to the spilled material may be irritating or harmful. Follow personal protective equipment recommendations found in Section 8 of this MSDS. Additional precautions may be necessary based on special circumstances created by the spill including; the material spilled, the quantity of the spill, the area in which the spill occurred.
CLEAN-UP:	Dike if necessary, contain spill with inert absorbent and transfer to containers for disposal. Keep spilled product out of sewers, watersheds, or water systems.

Transport Emergency Phone Number (CHEMTREC): 1-800-424-9300

SECTION 7: HANDLING AND STORAGE

Handling: Harmful or irritating material. Avoid contacting and avoid breathing the material. Use only in a well ventilated area.

Storage: Store in a cool, dry place.

Consult the Technical Data Sheet for specific storage instructions.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

EYE PROTECTION:	Wear safety glasses with side shields when handling this product. Wear additional eye protection such as chemical splash goggles and/or face shield when the possibility exists for eye contact with splashing or spraying liquid, or airborne material. Have an eye wash station available.
SKIN PROTECTION:	Avoid skin contact by wearing chemically resistant gloves and long sleeved shirt. An apron may be appropriate if splashing can occur.
GLOVES:	Nitrile
RESPIRATORY PROTECTION:	Respiratory protection may be required to avoid overexposure when handling this product. Use a respirator if general room ventilation is not available or sufficient to eliminate symptoms. NIOSH approved air purifying respirator with dust/mist filter if product is sprayed. Respirators should be selected by and used following requirements found in OSHA's respirator standard (29 CFR 1910.134).
VENTILATION:	Use local exhaust ventilation or other engineering controls to

minimize exposures.

EXPOSURE LIMITS:

Chemical Name	ACGIH EXPOSURE LIMITS	AIHA WEEL
Epoxy resin	Not established	Not established
Epoxy resin	Not established	Not established
Glass oxide, bubbles	TWA 10 MG/M3	Not established
Calcium carbonate	TWA 10 MG/M3	Not established
Titanium dioxide	TWA 10 MG/M3	Not established
Crystalline silica	TWA (Respirable dust) 0.05 MG/M3	Not established
Carbon black	TWA 3.5 MG/M3	Not established
Titanium dioxide (Rutile)	TWA (Total dust) 10 MG/M3	Not established

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE:	Liquid
COLOR:	White
ODOR:	Aromatic Mild
ODOR THRESHOLD:	Not established
WEIGHT PER GALLON (lbs.):	9.00
SPECIFIC GRAVITY:	1.08
SOLIDS (% by weight):	100.0
pH:	Not established
BOILING POINT (deg. C):	Not established
FREEZING/MELTING POINT (deg. C):	Not established
VAPOR PRESSURE (mm Hg):	Not established
VAPOR DENSITY:	Not established
EVAPORATION RATE:	Not established
OCTANOL/WATER COEFFICIENT:	Not established

SECTION 10: STABILITY AND REACTIVITY

STABILITY:	Stable under normal conditions.
CHEMICAL INCOMPATIBILITY:	Not established
HAZARDOUS POLYMERIZATION:	Will not occur.
HAZARDOUS DECOMPOSITION PRODUCTS:	Carbon monoxide, carbon dioxide Silicon dioxide

MATERIAL SAFETY DATA SHEET

SECTION 11: TOXICOLOGICAL INFORMATION

CHEMICAL NAME	LD50/LC50
Epoxy resin	Not established
Epoxy resin	Not established
Glass oxide, bubbles	Not established
Calcium carbonate	Oral LD50 Rat = 6450 mg/kg
Titanium dioxide	Not established
Crystalline silica	Not established
Carbon black	Oral LD50 Rat >15400 mg/kg Dermal LD50 Rabbit > 3 g/kg
Titanium dioxide (Rutile)	Not established

TOXICOLOGY SUMMARY: No additional health information available.

SECTION 12: ECOLOGICAL INFORMATION

OVERVIEW: No ecological information available

SECTION 13: DISPOSAL CONSIDERATIONS

To the best of our knowledge, this product does not meet the definition of hazardous waste under the U.S. EPA Hazardous Waste Regulations 40 CFR 261. Disposal via incineration at an approved facility is recommended. Consult state, local or provincial authorities for more restrictive requirements.

SECTION 14: TRANSPORTATION INFORMATION

Consult Bill of Lading for transportation information.

DOT: NOT REGULATED

IATA: NOT REGULATED

SECTION 15: REGULATORY INFORMATION

INVENTORY STATUS

U.S. EPA TSCA: This product is in compliance with the Toxic Substances Control Act's Inventory requirements.

If you need more information about the inventory status of this product call 651-236-5858.

This product may contain chemical substances that are regulated for export by various government agencies (such as the Environmental Protection Agency, the Bureau of Industry and Security, or the Drug Enforcement Administration, among others). Before exporting this product from the USA or Canada, we recommend you contact us at 651-236-5858 (USA) or 450-655-1306 x227 (Canada) to request an export review.

MATERIAL SAFETY DATA SHEET

FEDERAL REPORTING
EPA SARA Title III Section 313
Unless listed below, this product does not contain toxic chemical(s) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) and 40 CFR part 372. EPA has advised that when a percentage range is listed the midpoint may be used to fulfill reporting obligations.

Chemical Name	CAS#	%

WHMIS STATUS: Unless listed below, this product is not controlled under the Canadian Workplace Hazardous Materials Information System.

D2B D2A

STATE REPORTING
Proposition 65, The Safe Drinking Water and Toxic Enforcement Act of 1986:
Unless listed below, this product does not contain known levels of any chemical known to the State of California to cause cancer or reproductive harm.

Chemical Name/List	CAS	Percent
Quartz (Carcinogen)	14808-60-7	0.1 - 1
Carbon black (Carcinogen)	1333-86-4	0.1 - 1
Nickel compounds (Carcinogen)	12607-70-4	0.001 - 0.01
Benzene, ethyl- (Carcinogen)	100-41-4	0.001 - 0.01
Epichlorohydrin (Carcinogen)	106-89-8	< 10 ppm
Lead compounds (Carcinogen)		< 10 ppm
Cadmium compounds (Carcinogen)		< 10 ppm
Benzene (Carcinogen)	71-43-2	< 10 ppm
Benzene (Developmental toxin)	71-43-2	< 10 ppm
Epichlorohydrin (Male reproductive toxin)	106-89-8	< 10 ppm
Benzene (Male reproductive toxin)	71-43-2	< 10 ppm

SECTION 16: ADDITIONAL INFORMATION

This Material Safety Data Sheet is prepared to comply with the United States Occupational Safety and Health Administration (OSHA) Hazard Communication Standard (29 CFR 1910.1200) and the Canadian Workplace Hazardous Materials Information System (WHMIS).

Prepared by: The Global Regulatory Department
Phone: 651-236-5842

The information and recommendations set forth herein are believed to be accurate. Because some of the information is derived from information provided to Specialty Construction Brands, Inc. from its suppliers, and because Specialty Construction Brands, Inc. has no control over the conditions of handling and use, Specialty Construction Brands, Inc. makes no warranty, expressed or implied, regarding the accuracy of the data or the results to be obtained from the use thereof. The information is supplied solely for your information and consideration, and Specialty Construction Brands, Inc. assumes no responsibility for use or reliance thereon. It is the responsibility of the user of Specialty Construction Brands, Inc. products to comply with all applicable federal, state and local laws and regulations.

SIGMA-ALDRICH

Material Safety Data Sheet

Version 3.0
Revision Date 03/22/2007
Print Date 08/16/2007

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : **Ethyl acetate**

Product Number : 58958
Brand : Fluka

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA
Telephone : +1 800-325-5832
Fax : +1 800-325-5052
Emergency Phone # : (314) 776-6555

2. COMPOSITION/INFORMATION ON INGREDIENTS

Formula : C4H8O2

CAS-No.	EC-No.	Index-No.	Concentration [%]
Ethyl acetate			
141-78-6	205-500-4	607-022-00-5	-

3. HAZARDS IDENTIFICATION

Emergency Overview

OSHA Hazards

Flammable Liquid
Delayed target organ effects
Moderate eye irritant

Target Organs

Blood, Kidney, Liver, Central nervous system

HMIS Classification

Health Hazard: 2
Chronic Health Hazard: *
Flammability: 3
Physical hazards: 0

NFPA Rating

Health Hazard: 2
Fire : 3
Reactivity Hazard: 1

Potential Health Effects

Inhalation May be harmful if inhaled. May cause respiratory tract irritation. Vapours may cause drowsiness and dizziness.

EPAPA008000934

Skin	May be harmful if absorbed through skin. May cause skin irritation. Repeated exposure may cause skin dryness or cracking.
Eyes	Causes eye irritation.
Ingestion	May be harmful if swallowed.

4. FIRST AID MEASURES

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIRE-FIGHTING MEASURES

Flammable properties

Flash point	-3.0 °C (26.6 °F) - closed cup
Ignition temperature	427 °C (801 °F)

Suitable extinguishing media
For small (incipient) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water. Carbon dioxide (CO2)

Special protective equipment for fire-fighters
Wear self contained breathing apparatus for fire fighting if necessary.

Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

Methods for cleaning up
Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

7. HANDLING AND STORAGE

Handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

Storage
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.Store in cool place.

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8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value	Control parameters	Update	Basis
Ethyl acetate	141-78-6	TWA	400 ppm 1,440 mg/m3	1996-05-18	US. American Conference of Governmental and Industrial Hygienists Threshold Limit Values for Chemical Substances in the Work Environment; Annual Reports for the Year 2004:Committees on Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs)
Remarks	Refers to Appendix A -- Carcinogens. 1996 Adoption				
		TWA	400 ppm 1,400 mg/m3	1989-03-01	US. Department of Labor - Occupational Safety and Health Administration (OSHA) 29 CFR 1910.1000 Z-1-A
		TWA	400 ppm 1,400 mg/m3	1993-06-30	US. Department of Labor - Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits (PEL) 29 CFR 1910.1000 Air Contaminants.

Personal protective equipment

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection
Handle with gloves.

Eye protection
Safety glasses

Skin and body protection
impervious clothing, Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Hygiene measures
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	clear, liquid
Colour	colourless

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Safety data

pH	no data available
Melting point	-84.0 °C (-119.2 °F)
Boiling point	76.5 - 77.5 °C (169.7 - 171.5 °F)
Flash point	-3.0 °C (26.6 °F) - closed cup
Ignition temperature	427 °C (801 °F)
Lower explosion limit	2.2 %(V)
Upper explosion limit	11.5 %(V)
Vapour pressure	97.3 hPa (73.0 mmHg) at 20.0 °C (68.0 °F)
Density	0.90 g/cm3
Water solubility	soluble
Partition coefficient (n-octanol/water)	log Pow: 0.73

10. STABILITY AND REACTIVITY

Storage stability
Stable under recommended storage conditions.

Conditions to avoid
Heat, flames and sparks.

Materials to avoid
Strong oxidizing agents

Hazardous decomposition products

Hazardous decomposition products formed under fire conditions.
Carbon oxides

Hazardous reactions
Vapours may form explosive mixture with air.

11. TOXICOLOGICAL INFORMATION

Acute toxicity

LD50 Oral - rat - 5,620 mg/kg

LC50 Inhalation - mouse - 2 h - 45,000 mg/m3

LD50 Dermal - rabbit - > 180,000 mg/kg

Irritation and corrosion

Skin: no data available

Sensitization

Remarks: no data available

Chronic exposure

This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

Signs and Symptoms of Exposure

Central nervous system depression, Drowsiness, narcosis, anemia

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12. ECOLOGICAL INFORMATION

Elimination information (persistence and degradability)

Biodegradability	Remarks: no data available

Ecotoxicity effects

Toxicity to fish	LC50 - Oncorhynchus mykiss (rainbow trout) - 350.00 - 600.00 mg/l - 96 h
	LC50 - Pimephales promelas (fathead minnow) - 220.00 - 250.00 mg/l - 96 h
Toxicity to daphnia and other aquatic invertebrates.	EC50 - Daphnia magna (Water flea) - 2,300.00 - 3,090.00 mg/l - 24 h
	LC50 - Daphnia magna (Water flea) - 560 mg/l - 48 h
Toxicity to algae	EC50 - No information available. - 4,300.00 mg/l - 24 h
	EC50 - SELENASTRUM - 1,800.00 - 3,200.00 mg/l - 72 h

Further information on ecology
no data available

13. DISPOSAL CONSIDERATIONS

Product
Contact a licensed professional waste disposal service to dispose of this material. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Observe all federal, state, and local environmental regulations.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN-No.: 1173 Class: 3 Packing group: II
Proper shipping name: Ethyl acetate

IMDG
UN-No.: 1173 Class: 3 Packing group: II EMS-No: F-E, S-D
Proper shipping name: ETHYL ACETATE
Marine pollutant: No

IATA
UN-No.: 1173 Class: 3 Packing group: II
Proper shipping name: Ethyl acetate

15. REGULATORY INFORMATION

OSHA Hazards
Flammable Liquid, Delayed target organ effects, Moderate eye irritant

TSCA Status
On TSCA Inventory

DSL Status
All components of this product are on the Canadian DSL list.

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SARA 302 Components
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Ethyl acetate	141-78-6	1989-12-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Ethyl acetate	141-78-6	1989-12-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Ethyl acetate	141-78-6	1989-12-01

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth, or any other reproductive defects.

16. OTHER INFORMATION

Further information
Copyright (2007): Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only., The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Co., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.

EPAPA008000939

Close

Material Safety Data Sheet

ULTRA Scientific · 250 Smith Street · North Kingstown, RI, USA 02852 · 401-294-9400

Product # RCC-181 **Last Updated: 11/14/2006**

Section I *Product Identification*

Name: Ethyl Alcohol
Matrix: neat compound

Section II *Composition / Information on Ingredients*

Component	*CAS #*	*% by Wt.*	*LD50*	*OSHA PEL*	*ACGIH TLV*	*RTECS #*	*Codes*
ethyl alcohol	000064-17-5	100	21000 mg/kg oral rat	N/A	1884 mg/m3	KQ6300000	

Codes: A-OSHA regulated carcinogen; B-IARC Group 1 carcinogen; C-IARC Group 2A carcinogen; D-IARC Group 2B carcinogen; E-NTP Group 1 carcinogen; F-NTP Group 2 carcinogen; G-SARA Title III compound; H-California Proposition 65 compound.

Section III *Hazards Identification*

Contains carcinogen(s) or cancer suspect agent(s)

All chemicals should be considered hazardous - direct physical contact should be avoided.

Section IV *First Aid Measures*

Inhalation: If inhaled, remove to fresh air. Give oxygen, if necessary. Contact a physician.

Skin Contact: In case of skin contact, flush with copious amounts of water. Remove contaminated clothing. Contact a physician.

Eye Contact: In case of eye contact, flush with copious amounts of water, lifting eyelids occasionally. Contact a physician.

Ingestion: If ingested, contact poison center immediately for recommended procedure. Contact a physician.

Section V *Fire Fighting Measures*

Fire and Explosion Hazard Data for Compound

Fire Hazard: N/A

Extinguishing Media: Carbon dioxide, dry chemical powder, or water spray.

Section VI *Accidental Release Measures*

Ventilate area of the leak or spill. Wear appropriate personal protective equipment as specified in Section VIII. A leaking bottle, vial, or ampule may be placed in a plastic bag, and normal disposal procedures followed. Take up spilled material with sand or other non-combustible absorbant material, and place in an appropriate container for later disposal. Flush spill area with water.

Section VII *Handling and Storage*

May be stored at room temperature

Keep in a tightly closed container, and store in a corrosion proof area.
This product should only be used by persons trained in the safe handling of hazardous chemicals.

Section VIII Exposure Controls / Personal Protection

Ensure that there is adequate ventilation to prevent airborne levels from exceeding recommended exposure limits (see Section II). Use appropriate MSHA/NIOSH approved safety equipment. Wear chemical goggles, face shield, gloves, and chemical resistant clothing, such as a laboratory coat and/or a rubber apron, to prevent contact with eyes, skin, and clothing.

Section IX Physical and Chemical Properties

Physical Data for Compound

Melting Pt.: N/A	***Boiling Pt.:*** N/A	***Density:*** N/A
Vapor Pressure: N/A	***Vapor Density:*** N/A	***Water Solubility:*** N/A
Appearance: N/A	***Odor:*** N/A	***Flash Point:*** N/A
Auto-Ignition Temperature: N/A	***LEL:*** N/A	***UEL:*** N/A

Section X Stability and Reactivity

Reactivity Data for Compound

Stability: stable ***Incompatibilities:*** N/A
Hazardous Decomposition Products: N/A
Hazardous Effects of Polymerization: no

Section XI Toxicological Information

See Section II for specific toxicological information for the ingredients of this product.

Section XII Ecological Information

No information is available.

Section XIII Disposal Considerations

Recycle, if possible. Any material which cannot be saved for recovery or recycling should be disposed of at an appropriate and approved waste disposal facility. Processing, use, and/or contamination of this product may change waste management requirements. Observe all applicable federal, state, and local environmental regulations concerning disposal.

Section XIV Transport Information

Shipment Type: Dangerous Goods in Excepted Quantity (US DOT Small Quantity Exemption)
UN Number: UN1170 ***Shipping Class:*** 3 ***Packing Group:*** II

Section XV Regulatory Information

No information is available.

Section XVI Other Information

The above information is believed to be correct, but does not purport to be all-inclusive. This data should be used only as a guide in handling this material. ULTRA Scientific, Inc., shall not be held liable for any damage resulting from handling or from contact with the above product.

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Material Safety Data Sheet

Ethyl Benzene

ACC# 08780

Section 1 - Chemical Product and Company Identification

MSDS Name: Ethyl Benzene
Catalog Numbers: O2751 1, O2751-1, O27511
Synonyms: Ethylbenzol; Phenylethane
Company Identification:
Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410
For information, call: 201-796-7100
Emergency Number: 201-796-7100
For CHEMTREC assistance, call: 800-424-9300
For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
100-41-4	Ethylbenzene	100	202-849-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear, colorless liquid. Flash Point: 21 deg C.
Warning! Causes eye irritation. **Flammable liquid and vapor.** Causes skin irritation. May be absorbed through intact skin. Aspiration hazard if swallowed. Can enter lungs and cause damage. Causes digestive and respiratory tract irritation. May cause central nervous system depression.
Target Organs: Central nervous system.

Potential Health Effects
Eye: Causes moderate eye irritation. Vapors may cause eye irritation.
Skin: Causes skin irritation. Prolonged and/or repeated contact may cause irritation and/or dermatitis. May be absorbed through the skin. Contact with the liquid may cause erythema (redness), exfoliation and vesiculation (blistering).
Ingestion: May cause irritation of the digestive tract. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure. Aspiration of material into the lungs may cause chemical pneumonitis, which may be fatal.

Inhalation: Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. Causes respiratory tract irritation. Vapors may cause dizziness or suffocation.
Chronic: Chronic inhalation may cause effects similar to those of acute inhalation.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.
Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.
Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: Containers can build up pressure if exposed to heat and/or fire. As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. Use water spray to keep fire-exposed containers cool. Flammable liquid and vapor. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. Containers may explode when heated.
Extinguishing Media: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. Use water spray to cool fire-exposed containers. Water may be ineffective. For large fires, use water spray, fog or alcohol-resistant foam. Contact professional fire-fighters immediately. Cool containers with flooding quantities of water until well after fire is out.
Flash Point: 21 deg C (69.80 deg F)
Autoignition Temperature: 810 deg F (432.22 deg C)
Explosion Limits, Lower:0.8
Upper: 6.7
NFPA Rating: (estimated) Health: 3; Flammability: 4; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Remove all sources of ignition. A vapor suppressing foam may be used to reduce vapors. Water spray may reduce vapor but may not prevent ignition in closed spaces.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Ground and bond containers when transferring material. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Keep away from heat, sparks and flame. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.
Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ethylbenzene	100 ppm TWA; 125 ppm STEL	100 ppm TWA; 435 mg/m3 TWA 800 ppm IDLH	100 ppm TWA; 435 mg/m3 TWA

OSHA Vacated PELs: Ethylbenzene: 100 ppm TWA; 435 mg/m3 TWA
Personal Protective Equipment
Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin: Wear appropriate protective gloves and clothing to prevent skin exposure.
Clothing: Wear appropriate protective gloves and clothing to prevent skin exposure.
Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Appearance: clear, colorless
Odor: aromatic odor
pH: Not available.
Vapor Pressure: 7.1 mm Hg @ 20 C
Vapor Density: 3.7
Evaporation Rate:<1 (butyl acetate=1)
Viscosity: 0.63 mPa s 20 C
Boiling Point: 277 deg F
Freezing/Melting Point:-139 deg F
Decomposition Temperature: Not available.
Solubility: Insoluble.
Specific Gravity/Density:0.9
Molecular Formula:C8H10
Molecular Weight:106.07

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, ignition sources, excess heat.
Incompatibilities with Other Materials: Oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 100-41-4: DA0700000
LD50/LC50:
CAS# 100-41-4:
Draize test, rabbit, eye: 500 mg Severe;
Inhalation, mouse: LC50 = 35500 mg/m3/2H;
Inhalation, rat: LC50 = 55000 mg/m3/2H;
Oral, rat: LD50 = 3500 mg/kg;
Oral, rat: LD50 = 3500 mg/kg;
Skin, rabbit: LD50 = 17800 uL/kg;

al, rat: LD50 = 5.46
rcinogenicity:
CAS# 100-41-4:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans
- **California:** carcinogen, initial date 6/11/04
- **NTP:** Not listed.
- **IARC:** Group 2B carcinogen

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: Mutation in mammalian somatic cells(Rodent,mouse) Lymphocyte = 80 mg/L.
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Rainbow trout: 14.0 mg/L; 96 Hr.; StaticFish: Fathead Minnow: 12.1 mg/L; 96 Hr.; Flow-throughFish: Bluegill/Sunfish: LC50 =150.0 mg/L; 96 Hr.; Flow-throughWater flea EC50 =2.1 mg/L; 48 Hr.; StaticBacteria: EC50 =9.8 mg/L; 30 minutes; Micotox TestWater flea 0 =75.0 mg/L; 48 minutes; Static, pH6.7-8.1, 72.0 mg/L CaCO3 Shrimp (mysidoposis ..ia), LC50=87.6 mg/L/96hr. Sheepshead minnow LC50=275 mg/L/96hr. Fathead minnow LC50=42.3 mg/L/96hr in hard water &48.5 mg/L/96hr in softwater.
Environmental: Experimental data on the bioconcentration of ethylbenzene include a log BCF of

1.9 in goldfish and the log BCF of 0.67 for clams exposed to the water-soluble fraction of crude oil. Using its octanol/water partition coefficient (log Kow= 3.15) and using a recommended regression equation, one can calculate a log BCF in fish of 2.16 indicating that ethylbenzene would not significantly bioconcentrate in aquatic organisms. Ethylbenzene has a moderate adsorption for soil. The measured Koc for silt loam was 164

Physical: The predominant photochemical reaction of ethylbenzene in the atmosphere is with hydroxyl radicals; the tropospheric half-life for this reaction is 5.5 and 24 hr in the summer and winter, actively. Degradation is somewhat faster under photochemical smog situations. Photooxidation products which have been identified include ethylphenol, benzaldehyde, acetophenone and m- and p-ethylnitrobenzene. Ethylbenzene is resistant to hydrolysis. Ethylbenzene does not significantly absorb light above 290 nm in methanol solution.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	ETHYLBENZENE	ETHYL BENZENE
Hazard Class:	3	3
UN Number:	UN1175	UN1175
Packing Group:	II	II
Additional Info:		FLASHPOINT 15C

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 100-41-4 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 100-41-4: Effective 6/19/87, Sunset 6/19/97

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs
CAS# 100-41-4: 1000 lb final RQ; 454 kg final RQ
SARA Section 302 Extremely Hazardous Substances
None of the chemicals in this product have a TPQ.
SARA Codes
CAS # 100-41-4: immediate, delayed, fire.
Section 313
This material contains Ethylbenzene (CAS# 100-41-4, 100%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.
Clean Air Act:
CAS# 100-41-4 is listed as a hazardous air pollutant (HAP).
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.
Clean Water Act:
CAS# 100-41-4 is listed as a Hazardous Substance under the CWA. CAS# 100-41-4 is listed as a Priority Pollutant under the Clean Water Act. CAS# 100-41-4 is listed as a Toxic Pollutant under the Clean Water Act.
OSHA:
None of the chemicals in this product are considered highly hazardous by OSHA.
STATE
CAS# 100-41-4 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65
The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:
WARNING: This product contains Ethylbenzene, a chemical known to the state of California to cause cancer.
California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations
European Labeling in Accordance with EC Directives
Hazard Symbols:
XN F
Risk Phrases:
R 11 Highly flammable.
R 20 Harmful by inhalation.

Safety Phrases:
S 16 Keep away from sources of ignition - No smoking.
S 24/25 Avoid contact with skin and eyes.
S 29 Do not empty into drains.

WGK (Water Danger/Protection)
CAS# 100-41-4: 1
Canada - DSL/NDSL
CAS# 100-41-4 is listed on Canada's DSL List.
Canada - WHMIS
This product has a WHMIS classification of B2, D2B.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.
Canadian Ingredient Disclosure List
CAS# 100-41-4 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

SDS Creation Date: 4/28/1999
Revision #4 Date: 10/03/2005

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Material Safety Data Sheet

Ethyl 4-(dimethylamino)butanoate

ACC# 13489

Section 1 - Chemical Product and Company Identification

MSDS Name: Ethyl 4-(dimethylamino)butanoate
Catalog Numbers: XBX00237CB, XBX00237DA, XBX00237ZZ
Synonyms:
Company Identification:
Maybridge PLC
Trevillett, Tintagel
Cornwall, England. PL34 0HW
For information, call: +44(0)1840770453
For emergencies, call: +44(0)7702924616

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
22041-23-2	Ethyl 4-(dimethylamino)butanoate	80+%	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Not available. Appearance: Not available.
Not available.
Target Organs: Respiratory system, gastrointestinal system, eyes, skin.

Potential Health Effects
Eye: Causes eye burns.
Skin: Harmful if absorbed through the skin. Causes skin burns.
Ingestion: Harmful if swallowed. Causes gastrointestinal tract burns.
Inhalation: Harmful if inhaled. Causes chemical burns to the respiratory tract.
Chronic: Not available.

Section 4 - First Aid Measures

l s: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid imme diately.

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
Ingestion: Do not induce vomiting. Get medical aid immediately.
Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.
Extinguishing Media: Use foam, dry chemical, or carbon dioxide.
Flash Point: Not available
Autoignition Temperature: Not available.
Explosion Limits, Lower: Not available.
Upper: Not available.
NFPA Rating: Not published.

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Do not breathe dust, vapor, mist, or gas. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale. Use only in a chemical fume hood.
Storage: Store in a cool, dry place. Store in a tightly closed container. Corrosives area.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ethyl 4-(dimethylamino)butanoate	none listed	none listed	none listed

OSHA Vacated PELs: Ethyl 4-(dimethylamino)butanoate: No OSHA Vacated PELs are listed for

this chemical.
Personal Protective Equipment
Eyes: Wear chemical splash goggles.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Appearance: Not available.
Odor: Not available.
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 77 - 79 deg C @14mm Hg
Freezing/Melting Point: Not available.
Decomposition Temperature: Not available.
Solubility: Not available.
Specific Gravity/Density: Not available.
Molecular Formula:C8H17NO2
Molecular Weight:159.23

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials.
Incompatibilities with Other Materials: Strong oxidizing agents, strong reducing agents, strong acids, strong bases.
Hazardous Decomposition Products: Carbon monoxide, oxides of nitrogen, carbon dioxide.
Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:
CAS# 22041-23-2: ES9600000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 22041-23-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.
Reproductive Effects: No data available.
Mutagenicity: No data available.
Neurotoxicity: No data available.
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.
Environmental: No information available.
Physical: No information available.
Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	AMINES, LIQUID, CORROSIVE, N.O.S.*	AMINES, LIQUID, CORROSIVE, N.O.S.*
Hazard Class:	8	8
UN Number:	UN2735	UN2735
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 22041-23-2 is not listed on the TSCA inventory. It is for research and development use only.
Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.

Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
ERCLA Hazardous Substances and corresponding RQs
None of the chemicals in this material have an RQ.
SARA Section 302 Extremely Hazardous Substances
None of the chemicals in this product have a TPQ.
Section 313 No chemicals are reportable under Section 313.
Clean Air Act:
This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.
Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.
OSHA:
None of the chemicals in this product are considered highly hazardous by OSHA.
STATE
CAS# 22041-23-2 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives
Hazard Symbols:
C
Risk Phrases:
R 20/21/22 Harmful by inhalation, in contact with skin and if swallowed.
R 34 Causes burns.

Safety Phrases:
S 23 Do not inhale gas/fumes/vapour/spray.
S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)
CAS# 22041-23-2: No information available.
Canada - DSL/NDSL
None of the chemicals in this product are listed on the DSL or NDSL list.
Canada - WHMIS
not available.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.
Canadian Ingredient Disclosure List

Section 16 - Additional Information

MSDS Creation Date: 2/10/2006
Revision #0 Date: Original.

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Material Safety Data Sheet

Catalog Number: 221711
Revision date: 26-Apr-2006

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY INFORMATION

Catalog Number: 221711

Product name: ETHYL CYCLOPENTANE

Supplier:
MP Biomedicals, LLC
29525 Fountain Parkway
Solon, OH 44139
tel: 440-337-1200

Emergency telephone number: CHEMTREC: 1-800-424-9300 (1-703-527-3887)

2. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	Weight %	ACGIH Exposure Limits:	OSHA Exposure Limits:
ETHYL CYCLOPENTANE	1640-89-7	90 - 100%	None	None

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Flammable

Category of Danger:
Flammable

Principle routes of exposure: Skin
Inhalation: *May cause irritation of respiratory tract*
Ingestion: May be harmful if swallowed.
Skin contact: May cause allergic skin reaction
Eye contact: Avoid contact with eyes

Statements of hazard Flammable
Statement of Spill or Leak - ANSI Label Eliminate all ignition sources. Absorb and/or contain spill with inert materials (e.g., sand, vermiculite). Then place in appropriate container. For large spills, use water spray to disperse vapors, flush spill area. Prevent runoff from entering waterways or sewers.
Precautions - ANSI Label Keep away from heat, sparks and flame. Keep containers closed. Use only with adequate ventilation. Do not breathe vapors or spray mist Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling.

4. FIRST AID MEASURES

General advice: In the case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
Inhalation: Move to fresh air. Call a physician immediately.
Skin contact: Rinse immediately with plenty of water and seek medical advice
Ingestion: Do not induce vomiting without medical advice.

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Eye contact: In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Protection of first-aiders: No information available
Medical conditions aggravated by exposure: None known

5. FIRE FIGHTING MEASURES

Suitable extinguishing media:	Carbon dioxide (CO2), Dry chemical, Foam, Water may be ineffective., Use dry chemical, CO2, water spray or `alcohol` foam.
Specific hazards:	Dangerous fire hazard. Dangerous explosion hazard when exposed to heat or flame. Easily forms explosive mixtures in air. Extremely flammable
Unusual hazards:	None known
Special protective equipment for firefighters:	Wear self contained breathing apparatus for fire fighting if necessary. In the event of fire and/or explosion do not breathe fumes.
Specific methods:	Water mist may be used to cool closed containers.
Flash point:	15.5°C
Autoignition temperature:	260 °C (500 °F)

NFPA rating:

NFPA Health:	1
NFPA Flammability:	3
NFPA Reactivity:	0

6. ACCIDENTAL RELEASE MEASURES

Personal precautions:	Remove all sources of ignition. Use personal protective equipment.
Environmental precautions:	Do not flush into surface water or sanitary sewer system.
Methods for cleaning up:	Soak up with inert absorbent material. Ground and bond containers when transferring material

7. HANDLING AND STORAGE

Storage:
ROOM TEMPERATURE

Handling:	Use only in area provided with appropriate exhaust ventilation.
Safe handling advice:	Wear personal protective equipment. Remove and wash contaminated clothing before reuse.
Technical measures/storage conditions:	Keep away from heat and sources of ignition Keep container tightly closed in a dry and well-ventilated place. Keep away from open flames, hot surfaces and sources of ignition
Incompatible products:	Oxidising and spontaneously flammable products

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures: Ensure adequate ventilation, especially in confined areas.
PERSONAL PROTECTIVE EQUIPMENT
Respiratory protection: In case of mist, spray or aerosol exposure wear suitable personal respiratory protection and protective suit.
Hand protection: Pvc or other plastic material gloves
Skin and body protection: Impervious clothing Long sleeved clothing
Eye protection: If splashes are likely to occur, wear: Safety glasses with side-shields
Hygiene measures: Handle in accordance with good industrial hygiene and safety practice.

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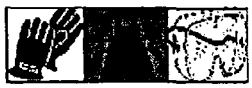

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor	Colorless; gasoline-like odor
Physical state:	Liquid
Formula:	C7-H14
Molecular weight:	98.19
Melting point/range:	-138 °C (-216 °F)
Boiling point/range:	103 °C (218 °F)
Density:	0.763 at 20 °C (water = 1)
Vapor pressure:	No data available
Evaporation rate:	No data available
Vapor density:	3.4 (air = 1)
Solubility (in water):	Insoluble
Flash point:	15.5°C
Autoignition temperature:	260 °C (500 °F)

10. STABILITY AND REACTIVITY

Stability:	Stable under recommended storage conditions.
Polymerization:	None under normal processing.
Hazardous decomposition products:	Thermal decomposition can lead to release of irritating gases and vapours such as carbon oxides.
Materials to avoid:	Strong oxidising agents
Conditions to avoid:	Exposure to air or moisture over prolonged periods.

11. TOXICOLOGICAL INFORMATION

Product Information
Acute toxicity

Components	**RTECS Number:**	**Selected LD50s and LC50s**
ETHYL CYCLOPENTANE	GY4450000	Not Determined

Chronic toxicity:	Chronic exposure may cause nausea and vomiting, higher exposure causes unconsciousness.
Local effects:	Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting.
Specific effects:	May include moderate to severe erythema (redness) and moderate edema (raised skin), nausea, vomiting, headache.
Primary irritation:	No data is available on the product itself.
Carcinogenic effects:	No data is available on the product itself.
Mutagenic effects:	No data is available on the product itself.
Reproductive toxicity:	No data is available on the product itself.

12. ECOLOGICAL INFORMATION

Mobility:	No data available
Bioaccumulation:	No data available
Ecotoxicity effects:	No data available
Aquatic toxicity:	May cause long-term adverse effects in the aquatic environment.

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Components	U.S. DOT - Appendix B - Marine Pollutan	U.S. DOT - Appendix B - Severe Marine Pollutants	United Kingdom - The Red List:
ETHYL CYCLOPENTANE	Not Listed	Not Listed	Not Listed

Components	Germany VCI (WGK)	World Health Organization (WHO) - Drinking Water	Ecotoxicity - Fish Species Data
ETHYL CYCLOPENTANE	Not Listed	Not Listed	Not Listed

Components	Ecotoxicity - Freshwater Algae Data	Ecotoxicity - Microtox Data	Ecotoxicity - Water Flea Data
ETHYL CYCLOPENTANE	Not Listed	Not Listed	Not Listed

Components	EPA - ATSDR Priority List	EPA - HPV Challenge Program Chemical List	California - Priority Toxic Pollutants
ETHYL CYCLOPENTANE	Not Listed	Not Listed	Not Listed

Components	California - Priority Toxic Pollutants	California - Priority Toxic Pollutants
ETHYL CYCLOPENTANE	Not Listed	Not Listed

13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. This product, if unaltered by use, may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority. Residue from fires extinguished with this material may be hazardous.

Contaminated packaging: Do not re-use empty containers

Methods for cleaning up: Soak up with inert absorbent material. Ground and bond containers when transferring material

14. TRANSPORT INFORMATION

UN/Id No: 1993

DOT:

Proper shipping name: Flammable liquid, n.o.s.
IATA Hazard Label(s): Flammable Liquid
Hazard Class 3 - Flammable liquid
Packing group: II

Emergency Response Guide Number (ERG): 128

Components	U.S. DOT - Appendix A Table 1 - Reportable Quantities
ETHYL CYCLOPENTANE	Not Listed

TDG (Canada):

WHMIS hazard class: B2 flammable liquids

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IMDG/IMO

Proper shipping name:	Flammable liquid, n.o.s.
IMDG - Hazard Classifications	Not Applicable

Components	U.S. DOT - Appendix B - Marine Pollutan	U.S. DOT - Appendix B - Severe Marine Pollutants
ETHYL CYCLOPENTANE	Not Listed	Not Listed

IMO-labels:

15. REGULATORY INFORMATION

International Inventories

Components	
ETHYL CYCLOPENTANE	
Inventory - United States TSCA - Sect. 8(b)	Not Listed
Canada DSL Inventory List -	Not Listed
EU EINECS List -	216-686-1; C7H14
Korean KECL:	KE-13586
Philippines PICCS:	Present

U.S. regulations:

Components	California Proposition 65 -	Massachusetts Right to Know List:	New Jersey Right to Know List:	Pennsylvania Right to Know List:
ETHYL CYCLOPENTANE	Not Listed	[present]	Not Listed	[present]

Components	Florida substance List:	Rhode Island Right to Know List:	Illinois - Toxic Air Contaminants	Connecticut - Hazardous Air Pollutants
ETHYL CYCLOPENTANE	[present]	Not Listed	Not Listed	Not Listed

Components	SARA 313 Emission reporting/Toxic Release of Chemicals	CERCLA/SARA - Section 302 Extremely Haz	NTP:	IARC:
ETHYL CYCLOPENTANE	Not Listed	Not Listed	None	None

SARA 313 Notification: The above is your notification as to the SARA 313 listing for this product(s) pursuant to Section 313 of Title III of the Superfund Ammendments and Reauthorization Act of 1986 and 40 CFR Part 372.

If you are unsure if you are subject to the reporting requirements of Section 313, or need more information, please call the EPA Emergency Planning and Community Right-To-Know Information Hotline: (800) 535-0202 or (202) 479-2499 (in Washington, DC or Alaska).

State Notification: The above information is your notice as to the Right-to-Know listings of the stated product(s). Individual states will list chemicals for a variety of reasons including, but not limited to, the compounds toxicity; carcinogenic, tumorigenic and/or reproductive hazards; and the compounds environmental impact if accidentally released.

16. OTHER INFORMATION

Prepared by: Health & Safety

EPAPA008000960

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End of Safety Data Sheet

EPAPA008000961

Material Safety Data Sheet

Catalog Number: 219203
Revision date: 25-Apr-2006

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY INFORMATION

Catalog Number: 219203

Product name: ETHYLCYCLOHEXANE

Supplier:
MP Biomedicals, LLC
29525 Fountain Parkway
Solon, OH 44139
tel: 440-337-1200

Emergency telephone number: CHEMTREC: 1-800-424-9300 (1-703-527-3887)

2. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	Weight %	ACGIH Exposure Limits:	OSHA Exposure Limits:
ETHYLCYCLOHEXANE	1678-91-7	90 - 100%	None	None

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Flammable

Category of Danger:
Flammable

Principle routes of exposure: Skin
Inhalation: May cause irritation of respiratory tract
Ingestion: May be harmful if swallowed.
Skin contact: May cause allergic skin reaction
Eye contact: Avoid contact with eyes

Statements of hazard Flammable
Statement of Spill or Leak - ANSI Label Eliminate all ignition sources. Absorb and/or contain spill with inert materials (e.g., sand, vermiculite). Then place in appropriate container. For large spills, use water spray to disperse vapors, flush spill area. Prevent runoff from entering waterways or sewers.

4. FIRST AID MEASURES

General advice: In the case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
Inhalation: Move to fresh air. Call a physician immediately.
Skin contact: Rinse immediately with plenty of water and seek medical advice
Ingestion: Do not induce vomiting without medical advice.
Eye contact: In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Protection of first-aiders: No information available
Medical conditions aggravated by exposure: None known

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5. FIRE FIGHTING MEASURES

Suitable extinguishing media:	Carbon dioxide (CO2), Dry chemical, Foam, Water may be ineffective.
Specific hazards:	Burning produces irritant fumes.
Unusual hazards:	None known
Special protective equipment for firefighters:	As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear
Specific methods:	Water mist may be used to cool closed containers.
Flash point:	Not determined
Autoignition temperature:	238 °C (460 °F)

NFPA rating:

NFPA Health:	1
NFPA Flammability:	1
NFPA Reactivity:	0

6. ACCIDENTAL RELEASE MEASURES

Personal precautions:	Use personal protective equipment.
Environmental precautions:	Prevent product from entering drains.
Methods for cleaning up:	Sweep up and shovel into suitable containers for disposal.

7. HANDLING AND STORAGE

Storage:

ROOM TEMPERATURE

Handling:	Use only in area provided with appropriate exhaust ventilation.
Safe handling advice:	Wear personal protective equipment.
Incompatible products:	Oxidising and spontaneously flammable products

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures: Ensure adequate ventilation.
PERSONAL PROTECTIVE EQUIPMENT
Respiratory protection: Breathing apparatus only if aerosol or dust is formed.
Hand protection: Pvc or other plastic material gloves
Skin and body protection: Usual safety precautions while handling the product will provide adequate protection against this potential effect.
Eye protection: Safety glasses with side-shields
Hygiene measures: Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor	Colorless
Physical state:	Liquid
Formula:	C8-H16
Molecular weight:	112.21
Melting point/range:	-111 °C (-168 °F)
Boiling point/range:	132 °C (269 °F)

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Density:	0.792 at 20 °C (water = 1)
Vapor pressure:	26 mm Hg at 38 °C
Evaporation rate:	No data available
Vapor density:	3.9 (air = 1)
Solubility (in water):	Insoluble
Flash point:	Not determined
Autoignition temperature:	238 °C (460 °F)

10. STABILITY AND REACTIVITY

Stability:	Stable under recommended storage conditions.
Polymerization:	None under normal processing.
Hazardous decomposition products:	Thermal decomposition can lead to release of irritating gases and vapours such as carbon oxides.
Materials to avoid:	-

Forms explosive mixture with air. Incompatible with oxidizers, acids and caustics.

Conditions to avoid:	Exposure to air or moisture over prolonged periods.

11. TOXICOLOGICAL INFORMATION

Product Information

Acute toxicity

Components	RTECS Number:	Selected LD50s and LC50s
ETHYLCYCLOHEXANE	Not Available	Not Determined

Chronic toxicity:	Chronic exposure may cause nausea and vomiting, higher exposure causes unconsciousness.
Local effects:	Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting.
Specific effects:	May include moderate to severe erythema (redness) and moderate edema (raised skin), nausea, vomiting, headache.
Primary irritation:	No data is available on the product itself.
Carcinogenic effects:	No data is available on the product itself.
Mutagenic effects:	No data is available on the product itself.
Reproductive toxicity:	No data is available on the product itself.

12. ECOLOGICAL INFORMATION

Mobility:	No data available
Bioaccumulation:	No data available
Ecotoxicity effects:	No data available
Aquatic toxicity:	May cause long-term adverse effects in the aquatic environment.

Components	U.S. DOT - Appendix B - Marine Pollutan	U.S. DOT - Appendix B - Severe Marine Pollutants	United Kingdom - The Red List:
ETHYLCYCLOHEXANE	Not Listed	Not Listed	Not Listed

Components	Germany VCI (WGK)	World Health Organization (WHO) - Drinking Water	Ecotoxicity - Fish Species Data
ETHYLCYCLOHEXANE	Not Listed	Not Listed	Not Listed

Components	Ecotoxicity - Freshwater Algae Data	Ecotoxicity - Microtox Data	Ecotoxicity - Water Flea Data
ETHYLCYCLOHEXANE	Not Listed	Not Listed	Not Listed

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Components	EPA - ATSDR Priority List	EPA - HPV Challenge Program Chemical List	California - Priority Toxic Pollutants
ETHYLCYCLOHEXANE	Not Listed	Not Listed	Not Listed

Components	California - Priority Toxic Pollutants	California - Priority Toxic Pollutants
ETHYLCYCLOHEXANE	Not Listed	Not Listed

13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. This product, if unaltered by use, may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority. Residue from fires extinguished with this material may be hazardous.

Contaminated packaging: Do not re-use empty containers

14. TRANSPORT INFORMATION

UN/Id No: Not regulated

DOT:

Proper shipping name: Not Regulated

Components	U.S. DOT - Appendix A Table 1 - Reportable Quantities
ETHYLCYCLOHEXANE	Not Listed

TDG (Canada):

WHMIS hazard class: Non-controlled

IMDG/IMO

IMDG - Hazard Classifications Not Applicable

Components	U.S. DOT - Appendix B - Marine Pollutan	U.S. DOT - Appendix B - Severe Marine Pollutants
ETHYLCYCLOHEXANE	Not Listed	Not Listed

IMO-labels:

15. REGULATORY INFORMATION

International Inventories

Components
ETHYLCYCLOHEXANE

Inventory - United States TSCA - Sect. 8(b)	Present
Canada DSL Inventory List -	Not Listed
Canada NDSL Inventory List -	Present
Australia (AICS):	Present

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EU EINECS List -	216-835-0; C8H16
Inventory - Japan:	3-2231
Korean KECL:	KE-13575

U.S. regulations:

Components	California Proposition 65 -	Massachusetts Right to Know List:	New Jersey Right to Know List:	Pennsylvania Right to Know List:
ETHYLCYCLOHEXANE	Not Listed	[present]	Not Listed	[present]

Components	Florida substance List:	Rhode Island Right to Know List:	Illinois - Toxic Air Contaminants	Connecticut - Hazardous Air Pollutants
ETHYLCYCLOHEXANE	[present]	Not Listed	Not Listed	Not Listed

Components	SARA 313 Emission reporting/Toxic Release of Chemicals	CERCLA/SARA - Section 302 Extremely Haz	NTP:	IARC:
ETHYLCYCLOHEXANE	Not Listed	Not Listed	None	None

SARA 313 Notification: The above is your notification as to the SARA 313 listing for this product(s) pursuant to Section 313 of Title III of the Superfund Ammendments and Reauthorization Act of 1986 and 40 CFR Part 372.

If you are unsure if you are subject to the reporting requirements of Section 313, or need more information, please call the EPA Emergency Planning and Community Right-To-Know Information Hotline: (800) 535-0202 or (202) 479-2499 (in Washington, DC or Alaska).

State Notification: The above information is your notice as to the Right-to-Know listings of the stated product(s). Individual states will list chemicals for a variety of reasons including, but not limited to, the compounds toxicity; carcinogenic, tumorigenic and/or reproductive hazards; and the compounds environmental impact if accidentally released.

16. OTHER INFORMATION

Prepared by: Health & Safety

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End of Safety Data Sheet

EPAPA008000966

VWR INTERNATIONAL

SAFETY DATA SHEET

1. Identification of the substance/preparation and of the company/undertaking

Identification of the product

Catalogue No: 66178 ID No.: 6617800

Product name: **Ethyl n-butyrate**

Manufacturer/supplier identification

Company: VWR International Ltd, Merck House, Poole, Dorset, BH15 1TD, England
Telephone : 01202 669700 Telefax : 01202 665599

Emergency telephone No.: 01202 669700

2. Composition/information on ingredients

Chemical characterization

Organic liquid

Product name: Ethyl n-butyrate

CAS number: 105-54-4 EC-No.:

3. Hazards identification

Flammable.

4. First aid measures

Eye contact: Irrigate thoroughly with water. If discomfort persists obtain medical attention.

Inhalation: Remove from exposure.

Skin contact: Wash off thoroughly with soap and water.

Ingestion: Wash out mouth thoroughly with water. In severe cases obtain medical attention.

5. Fire-fighting measures

Special risks:

Flammable.

Suitable extinguishing media:

Water spray, foam, dry powder or carbon dioxide

6. Accidental release measures

Shut off all sources of ignition. Wear appropriate protective clothing.
Absorb on an inert absorbent, (e.g. BDH Spillage absorption granules), transfer to a suitable container and arrange removal by disposal company. Wash site of spillage thoroughly with water and detergent.
For large spillages liquids should be contained with sand or earth and both liquids and solids transferred to salvage containers. Any residues should be treated as for small spillages.

7. Handling and storage

Handling:

Storage:

Store at room temperature (15 to 25°C recommended). Keep well closed and protected from direct sunlight and moisture.

8. Exposure controls/personal protection

As appropriate to the situation and the quantity handled.
Respirator: Self-contained breathing apparatus
Ventilation: Fume cupboard, flameproof
Gloves: Nitrile
Eye Protection: Goggles or face-shield
Other Precautions: Plastic apron, sleeves, boots - if handling large quantities

9. Physical and chemical properties

Product description	Colourless liquid, fruity odour
Melting temperature	-93°C

Boiling temperature	121°C
Density(g/ml)	0.88
Vapour pressure	n/a
-Density	n/a
Solubility in water	Practically insoluble
Flash point	26°C
Explosion limits: lower:	n/a
Auto-ignition temperature	463°C

10. Stability and reactivity

Stable.

May react with oxidising materials.

11. Toxicological information

Irritating to eyes. May irritate skin. May be harmful if ingested in large quantities.

Further data

LD50 13000 mg/kg oral, rat.

No evidence of carcinogenic properties. No evidence of mutagenic or teratogenic effects.

12. Ecological information

No environmental hazard is anticipated provided that the material is handled and disposed of with due care and attention.

13. Disposal considerations

Chemical residues are generally classified as special waste, and as such are covered by regulations which vary according to location. Contact your local waste disposal authority for advice, or pass to a chemical disposal company. Rinse out empty containers thoroughly before returning for recycling.

14. Transport information

UN-No.: 1180	IMDG class: 3.3
IMO:	Packaging group:
IATA:	Packaging group:

Correct technical name:
ADR/RID:

15. Regulatory information

Labelling according to EC directives

Symbol:

R-phrases: R10
Flammable.

S-phrases: S16
Keep away from sources of ignition - No smoking.

EC-No.:

Local Regulations

UK Exposure Limits: None assigned

16. Other information

Date of issue:	18/08/94
Date of print:	07/01/02

Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 12/05/2006 Reviewed on 08/07/2006

1 Identification of substance:

Product details:

Product name: Ethyl formate

Stock number:
A11113
L03027

Manufacturer/Supplier:
Alfa Aesar, A Johnson Matthey Company
Johnson Matthey Catalog Company, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Emergency Phone: (978) 521-6300
CHEMTREC: (800) 424-9300
Web Site: www.alfa.com

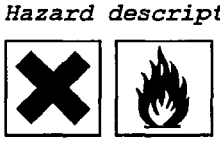
Information Department: Health, Safety and Environmental Department
Emergency information:
During normal hours the Health, Safety and Environmental Department.
After normal hours call Chemtrec at (800) 424-9300.

2 Composition/Data on components:

Chemical characterization:
Description: (CAS#)
Ethyl formate (CAS# 109-94-4); 100%
Identification number(s):
EINECS Number: 203-721-0
EU Number: 607-015-00-7

3 Hazards identification

Hazard description:



Xn Harmful
F Highly flammable

Information pertaining to particular dangers for man and environment
R 11 Highly flammable.
R 20/22 Harmful by inhalation and if swallowed.
R 36/37 Irritating to eyes and respiratory system.
Classification system
HMIS ratings (scale 0-4)
(Hazardous Materials Identification System)

HEALTH 1	Health (acute effects) = 1
FIRE 2	Flammability = 2
REACTIVITY 1	Reactivity = 1

4 First aid measures

After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm.
Seek immediate medical advice.
After skin contact
Immediately wash with water and soap and rinse thoroughly.

(Contd. on page 2)

Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 12/05/2006 Reviewed on 08/07/2006

Product name: Ethyl formate

(Contd. of page 1)

Seek immediate medical advice.
After eye contact
Rinse opened eye for several minutes under running water. Then consult a doctor.
After swallowing Seek immediate medical advice.

5 Fire fighting measures

Suitable extinguishing agents
CO2, extinguishing powder or water spray. Fight larger fire with alcohol resistant foam.
Special hazards caused by the material, its products of combustion or resulting gases:
In case of fire, the following can be released:
Carbon monoxide and carbon dioxide
Protective equipment:
Wear self-contained respirator.
Wear fully protective impervious suit.

6 Accidental release measures

Person-related safety precautions:
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation
Keep away from ignition sources
Measures for environmental protection:
Do not allow material to be released to the environment without proper governmental permits.
Measures for cleaning/collecting:
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
Keep away from ignition sources.
Additional information:
See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

Handling
Information for safe handling:
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation at the workplace.
Information about protection against explosions and fires:
Keep ignition sources away.
Protect against electrostatic charges.
Fumes can combine with air to form an explosive mixture.
Gases can be produced if heated in sealed containers, causing possible rupture or explosion.

Storage
Requirements to be met by storerooms and receptacles:
Store in a cool location.

(Contd. on page 3)

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Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 12/05/2006 Reviewed on 08/07/2006

Product name: Ethyl formate

(Contd. of page 2)

Information about storage in one common storage facility:
Do not store together with strongly basic or oxidizing materials.
Protect from heat.
Store away from water/moisture.
Further information about storage conditions:
Keep container tightly sealed.
Protect from humidity and water.
Store in cool, dry conditions in well sealed containers.

8 Exposure controls and personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Components with limit values that require monitoring at the workplace:

Ethyl Formate

	ppm
ACGIH TLV	100
Austria TWA	100
Belgium TWA	100
Denmark TWA	100
Finland TWA	100; 150-STEL
France TWA	100
Germany TWA	100
Ireland TWA	100; 150-STEL
Netherlands TWA	100
Poland TWA	100
Switzerland TWA	100; 200-STEL
United Kingdom TWA	100; 150-STEL
USA PEL	100

Components with limit values that require monitoring at the workplace:
Additional information: No data

Personal protective equipment
General protective and hygienic measures
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.
Breathing equipment:
Use suitable respirator when high concentrations are present.
Protection of hands: Impervious gloves
Eye protection: Safety glasses
Body protection: Protective work clothing.

9 Physical and chemical properties:

General Information	
Form:	Clear liquid
Color:	Colorless

(Contd. on page 4)

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Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 12/05/2006 Reviewed on 08/07/2006

Product name: Ethyl formate

(Contd. of page 3)

Odor:	Pleasant Aromatic
Change in condition	
Melting point/Melting range:	-80°C (-112°F)
Boiling point/Boiling range:	54°C (129°F)
Sublimation temperature / start:	Not determined
Flash point:	-19°C (-2°F)
Ignition temperature:	454°C (849°F)
Decomposition temperature:	Not determined
Auto igniting:	Self igniting at raised temperature.
Danger of explosion:	Product is not explosive. However, formation of explosive air/vapor mixtures is possible.
Explosion limits:	
Lower:	2.8 Vol %
Upper:	16 Vol %
Vapor pressure at 20°C (68°F):	0.0975 hPa (0 mm Hg)
Density at 20°C (68°F):	0.9170 g/cm³
Solubility in / Miscibility with	
Water:	Fully miscible
Alcohols:	Soluble
Organic solvents:	Soluble in ether. Soluble in acetone.

10 Stability and reactivity

Thermal decomposition / conditions to be avoided:
Decomposition will not occur if used and stored according to specifications.
Materials to be avoided:
Oxidizing agents
Bases
Heat
Water/moisture
Dangerous reactions
Unstable in the presence of bases which can lead to a vigorous reverse reaction that produces carbon monoxide gas, causing a possible explosion in a closed container.
Dangerous products of decomposition: Carbon monoxide and carbon dioxide

11 Toxicological information

Acute toxicity:

LD/LC50 values that are relevant for classification:		
Oral	LD50	1110 mg/kg (gpg) 1850 mg/kg (rat) 2075 mg/kg (rbt)
Dermal	LD50	>20 mL/kg (rbt)
Inhalative	LCLo/4H	8000 ppm/4H (rat)

(Contd. on page 5)

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Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 12/05/2006 Reviewed on 08/07/2006

Product name: Ethyl formate

(Contd. of page 4)

Irritation of skin	mild	460 mg (rbt)

Primary irritant effect:
on the skin: Irritant to skin and mucous membranes.
on the eye: Irritating effect.
Sensitization: No sensitizing effects known.
Other information (about experimental toxicology):
Tumorigenic effects have been observed on tests with laboratory animals.
Subacute to chronic toxicity:
Ethyl formate can irritate the eyes and, more severely, the respiratory system. Ingestion or inhalation causes somnolence, dyspnea, and gastro-intestinal disturbances. Laboratory experiments show that tumors can occur when applied periodically to the skin.
Additional toxicological information:
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
The Registry of Toxic Effects of Chemical Substances (RTECS) contains tumorigenic and/or carcinogenic and/or neoplastic data for components in this product.
No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.

12 Ecological information:

General notes:
Do not allow material to be released to the environment without proper governmental permits.

13 Disposal considerations

Product:
Recommendation
Consult state, local or national regulations to ensure proper disposal.

Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.
Recommended cleansing agent: Water, if necessary with cleansing agents.

14 Transport information

DOT regulations:

Hazard class:	3
Identification number:	UN1190
Packing group:	II
Proper shipping name (technical name):	ETHYL FORMATE

(Contd. on page 6)

Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 12/05/2006 Reviewed on 08/07/2006

Product name: Ethyl formate

(Contd. of page 5)

Label	3

Land transport ADR/RID (cross-border)

ADR/RID class:	3 (F1) Flammable liquids
Danger code (Kemler):	33
UN-Number:	1190
Packaging group:	II
Description of goods:	1190 ETHYL FORMATE

Maritime transport IMDG:

IMDG Class:	3
UN Number:	1190
Label	3
Packaging group:	II
Proper shipping name:	ETHYL FORMATE

Air transport ICAO-TI and IATA-DGR:

ICAO/IATA Class:	3
UN/ID Number:	1190
Label	3
Packaging group:	II
Proper shipping name:	ETHYL FORMATE

15 Regulations

Product related hazard informations:

Hazard symbols:
Xn Harmful
F Highly flammable

Risk phrases:
11 Highly flammable.
20/22 Harmful by inhalation and if swallowed.
36/37 Irritating to eyes and respiratory system.

Safety phrases:
9 Keep container in a well-ventilated place.
16 Keep away from sources of ignition - No smoking.
24 Avoid contact with skin.
26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
33 Take precautionary measures against static discharges.

(Contd. on page 7)

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Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 12/05/2006 Reviewed on 08/07/2006

Product name: Ethyl formate

(Contd. of page 6)

National regulations
All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.
All components of this product are listed on the Canadian Domestic Substances List (DSL).

Information about limitation of use:
For use only by technically qualified individuals.

16 Other information:
Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing MSDS: Health, Safety and Environmental Department.
Contact: Darrell R. Sanders

Redox Logo with tag line

MATERIAL SAFETY DATA SHEET

1. IDENTIFICATION

Product Name : TALL OIL FATTY ACID

Other Names : FATTY ACIDS, TALL OIL

Uses : Used in coatings, metallurgical and pharmaceuticals.

Organisation	Location	Telephone	Ask For
Redox Pty Ltd	2 Swettenham Road Minto NSW 2566 Australia	02-97333000	Technical Officer
Poisons Information Centre	Westmead NSW	131126 1800-251525	

2. HAZARD IDENTIFICATION

NOT Hazardous according to criteria of NOHSC

Risk Phrases

Safety Phrases

ERMA New Zealand Approval Code : No Data

HSNO Hazard Classification : No Data

This Material Safety Data Sheet may not provide exhaustive guidance for all HSNO Controls assigned to this substance. The ERMA website www.ermanz.govt.nz should be consulted for a full list of triggered controls and cited regulations

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Entity	CAS No.	Proportions (%)
TALL OIL FATTY ACID	[61790-12-3]	100

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure

Swallowed

Drink plenty of water. Seek medical attention.

Eye

Rinse immediately with plenty of water. Seek medical attention.

Skin

Wash off immediately with soap and water. Seek medical attention.

Inhaled

Move to fresh air. If symptoms or effects persist, seek medical attention.

Advice to Doctor

EPAPA008000979

Treat syr ...tically based on individual reactions of patient and judgement of doctor.

Additional Information

Aggravated medical conditions caused by exposure

No information available on medical conditions aggravated from this product.

5. FIRE FIGHTING MEASURES

Extinguishing Media

In case of fire, appropriate extinguishing media include dry powder or foam.

Hazards from Combustion Products

No information available on combustion products.

Special protective precautions and equipment for fire fighters

Fire fighters should wear a self contained breathing apparatus and full protective clothing along with protective equipment.

Flammability Conditions

Combustible liquid.

Additional Information

Hazchem Code : N/A

6. ACCIDENTAL RELEASE MEASURES

Emergency procedures

Personnel involved in the clean up should wear full protective clothing. Eliminate all sources of ignition. Increase ventilation. Avoid walking through spilled product as it may be slippery. Do NOT let product reach drains or waterways. If product does enter a waterway, advise the Environmental Protection Authority or your local Waste Authority. Use spark-proof equipment.

Methods and materials for containment and clean up

Soak up spilled product using absorbent non-combustible material such as sand or soil. Avoid using sawdust or cellulose. When saturated, collect material into suitable, labelled, dry, sealable containers and hold for safe disposal.

7. HANDLING AND STORAGE

Precautions for safe handling

Ensure an eye bath and safety shower are available and ready for use. Observe good personal hygiene practices and recommended procedures. Wash thoroughly after handling.

Conditions for safe storage, including any incompatibles

Store in a cool, dry, well-ventilated area. Keep containers tightly closed when not in use. Inspect regularly for deficiences such as damage or leaks. Protect against physical damage. Store away from incompatible materials. Take precautionary measures against static discharges.

Container Type
Iron drums tightly closed with inner coating with plastic.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

National Exposure Standards

No exposure standard has been established for this product by the Australian National Occupational Health and Safety Commission (NOHSC). However, the exposure standard for dust not otherwise specified is 10mg/m3 (for inspirable dust) and 3mg/m3 (for respirable dust).

Biological Limit Values

No information available on biological limit values for this product.

Engineering Controls

EPAPA00800980

Ensure ad ...ntilation system, especially in confined areas.

Personal Protection

RESPIRATOR: Wear an effective dust mask. EYES: Safety glasses. HANDS: Gloves. CLOTHING: Lightweight protective clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Yellow to brown liquid
Formula	Unspecified.
Odour	odourless
Vapour Pressure	Not Applicable
Vapour Density	Not Applicable
Boiling Point	N/A deg C
Melting Point	218'C deg C
Solubility in water	Insoluble
Specific Gravity	N/A (Water = 1)
Flash Point	Open Cup 196'C
pH	5 ( )
Flammability Limits (as percentage volume in air)	
Lower Explosion Limit	Not Applicable
Upper Explosion Limit	Not Applicable
Ignition Temperature	Not Applicable
Specific Heat Value	Not Applicable
Particle Size	Not Applicable
Volatile Organic Compounds (VOC) content	Not Applicable
Evaporation Rate	Not Applicable
Viscosity	Not Applicable
Percent Volatile	No Data
Octanol/Water partition coefficient	Not Applicable
Saturated Vapour Concentration	Not Applicable
Additional Characteristics	Not Applicable
Flame Propagation/Burning Rate of Solid Materials	Not Applicable
Properties of materials that may initiate or contribute to fire intensity	Not Applicable
Potential for Dust Explosion	Not applicable. Product is a liquid.
Reactions that Release Flammable Gases	Not Applicable
Fast or Intensely Burning Characteristics	Not Applicable
Non-flammables that could contribute unusual hazards to a fire	Not Applicable
Release of invisible flammable vapours and gases	No Data
Decomposition Temperature	No Data

Additional Information
Solubility: Soluble in alcohol and methyl-alcohol.

10. STABILITY AND REACTIVITY

Chemical Stability : Product is stable under normal conditions of use and storage.

Conditions to avoid : Avoid excessive heat, static discharges and high temperatures.

Incompatible Materials : Avoid oxidizing agents and ignition sources.

Hazardous Decomposition Products : Carbon monoxide and carbon dioxide.

Hazardous Reactions : Hazardous polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Toxicity Data

No toxicological information available for this product.

Health Effects - Acute

EPAPA00800981

Swallow

No information available.

Eye

No information available.

Skin

No information available.

Inhaled

No information available.

12. ECOLOGICAL INFORMATION

Ecotoxicity : No Data

Persistence and degradability : No persistence/degradability information available on this product.

Mobility : No information available on mobility for this product.

Additional information

Environmental fate (exposure) : No information available on environmental fate for this product.

Bioaccumulative potential : No information available on bioaccumulation for this product.

13. DISPOSAL CONSIDERATIONS

Disposal

Dispose of in accordance with all local, state and federal regulations.

Special Precautions for land fill or incineration

Contact a specialist disposal company or the local waste regulator for advice.

14. TRANSPORT INFORMATION

UN No.	
Shipping Name	Not Allocated
Dangerous Goods Class	
Subsidiary Risk	TALL OIL FATTY ACID
Pack Group	
Precaustion for User	C.2
Hazchem Code	
	None Allocated
	None Allocated
	No Data
	N/A

15. REGULATORY INFORMATION

EPAPA008000982

Poisons ...e	N/A
EPG	N/A
AICS Name	FATTY ACIDS, TALL OIL
NZ Toxic Substance	N
Additional information	No Data

16. OTHER INFORMATION

Revision Date : May 2006

Additional information

Legend to abbreviations and acronyms:

<	less than
>	greater than
AICS	Australian Inventory of Chemical Substances
CAS	Chemical Abstracts Service (Registry Number)
CO2	Carbon Dioxide
COD	Chemical Oxygen Demand
ERMA	Environmental Risk Management Authority
HSNO	Hazardous Substance and New Organism
IDLH	Immediately Dangerous to Life and Health
LC50	LC stands for lethal concentration. LC50 is the concentration of a material in air which causes the death of 50% (one half) of a group of test animals. The material is inhaled over a set period of time, usually 1 or 4 hours.
LD50	LD stands for "Lethal Dose". LD50 is the amount of a material, given all at once, which causes the death of 50% (one half) of a group of test animals
Misc	miscible
N/A	Not Applicable
NIOSH	National Institute for Occupational Safety and Health
NOHSC	National Occupational Health and Safety Commission
OECD	Organization for Economic Co-operation and Development
PEL	Permissible Exposure Limit
RCP	Reciprocal Calculation Procedure
STEL	Short Term Exposure Limit
TLV	Threshold Limit Value
TWA	Time Weighted Average
UN	United Nations (number)
cm2	square centimetres
deg C ('C)	degrees Celsius
g	gram
g/cm3	grams per cubic centimetre
g/l	grams per litre
immiscible	liquids are insoluble in each other
kg	kilogram
kg/m3	kilograms per cubic metre
ltr	Litre
m3	cubic metre
mbar	millibar
mg	milligram
mg/24H	milligrams per 24 hours
mg/kg	milligrams per kilogram
mg/m3	milligrams per cubic metre
miscible	liquids form one homogeneous liquid phase regardless of the amount of either component present
mm	millimetre
ppb	parts per billion
ppm	parts per million
ppm/2h	parts per million per 2 hours
ppm/6h	parts per millionper 6 hours
tne	tonne
ug/24H	micrograms per 24 hours

EPAPA00800983

wt

Literature references:

No Data

Sources for data:

No Data

QEC Logo | Respons Care Logo

Australia **New Zealand** **Sydney Office** Adelaide Auckland 2 Swettenham Road telephone: +61 (0)2 97333000 Brisbane Christchurch Mintofacsimile: NSW +61 (0)2 2566 97333111 Melbourne Hawkes Bay Australia www.redox.com Perth sydney@redox.com Sydney

This MSDS summarises Redox Pty Ltd best knowledge of the health and safety hazard information of the selected substance and how to safely handle the selected substance in the workplace however Redox Pty Ltd expressly disclaims that the MSDS is a representation or guarantee of the chemcial specifications for the substance. Each user should read the MSDS and consider the information in the context of how the selected substance will be handled and used in the workplace including its use in conjunction with other substances.

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EPAPA00800984

Redox Logo with tag line

MATERIAL SAFETY DATA SHEET

1. IDENTIFICATION

Product Name : FATTY ALCOHOL TECH 9/8

Other Names : C9-C11 SYNTHETIC ALCOHOL ETHOXYLATE (C9-11) ALKYL ALCOHOL, ETHOXYLATE

Uses : Surfactant.

Organisation	Location	Telephone	Ask For
Redox Pty Ltd	2 Swettenham Road Minto NSW 2566 Australia	02-97333000	Technical Officer
Poisons Information Centre	Westmead NSW	131126 1800-251525	

2. HAZARD IDENTIFICATION

Hazardous according to criteria of NOHSC

HARMFUL; IRRITANT

Risk Phrases

R22	Harmful if swallowed.
R41	Risk of serious damage to eyes.

Safety Phrases

S25	Avoid contact with eyes.
S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S37/39	Wear suitable gloves and eye/face protection.

ERMA New Zealand Approval Code : No Data

HSNO Hazard Classification : 6.1D 6.3A 8.3A 9.1D 9.3C

This Material Safety Data Sheet may not provide exhaustive guidance for all HSNO Controls assigned to this substance. The ERMA website www.ermanz.govt.nz should be consulted for a full list of triggered controls and cited regulations

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Entity	CAS No.	Proportions (%)
ALCOHOLS, C9-11, ETHOXYLATED	[68439-46-3]	100

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure

Swallowed

Do NOT induce vomiting. Rinse mouth out with water. Give water to drink. Seek immediate medical assistance.

Eye

Immediately flush eyes with copious amounts of water holding eyelids open. Transport to hospital or medical centre.

Skin

EPAPA00800985

Remove minated clothing. Flush affected area with copious amounts of water. If irritation persists, seek medical assistance.

Inhaled

Remove victim from exposure to fresh air. Keep at rest until fully recovered. If rapid recovery does not occur, seek medical assistance.

Advice to Doctor

Treat symptomatically based on individual reactions of patient and judgement of doctor. Product can cause corneal burns.

Additional Information

Aggravated medical conditions caused by exposure

No information available on medical conditions aggravated from exposure to this product.

5. FIRE FIGHTING MEASURES

Extinguishing Media

In case of fire, appropriate extinguishing media include large fires - water fog, fine water spray or foam. small fires - foam, dry chemical, carbon dioxide and water spray.

Hazards from Combustion Products

This product is a combustible liquid. Heating can cause expansion or decomposition leading to violent rupture of containers. Excessive heat will lead to accelerated oxidative degradation. On burning, product will emit toxic fumes including carbon dioxide and carbon monoxide.

Special protective precautions and equipment for fire fighters

Fire fighters should wear a self contained breathing apparatus and full protective clothing along with protective equipment.

Flammability Conditions

Combustible liquid.

Additional Information

Hazchem Code : N/A

6. ACCIDENTAL RELEASE MEASURES

Emergency procedures

Personnel involved in the clean up should wear full protective clothing. Eliminate all sources of ignition. Increase ventilation. Avoid walking through spilled product as it may be slippery. Do NOT allow product to reach drains or waterways. If product does enter a waterway advise the Environmental Protection Authority or your local Waste Authority. Use spark-proof tools and equipment.

Methods and materials for containment and clean up

Soak up spilled product using absorbent non-combustible material such as sand or soil. Avoid using sawdust or cellulose. When saturated, collect material into suitable, labelled, dry, sealable containers and hold for safe disposal. Once pick up is complete, flush the spill site with water to eliminate any residue. Hold contaminated water for treatment.

7. HANDLING AND STORAGE

Precautions for safe handling

Ensure an eye bath and safety shower are available and ready for use. Observe good personal hygiene practices and recommended procedures. Wash thoroughly after handling. Take precautionary measures against static discharges by bonding and grounding equipment.

Conditions for safe storage, including any incompatibles

Store in a cool, dry, well-ventilated area. Keep containers tightly closed when not in use. Open containers slowly in order to control possible pressure release. Inspect regularly for deficiencies such as damage or leaks. Protect against physical damage. Bulk storage tanks should be diked (bunded). Use non-sparking tools and equipment. Store away from incompatible materials including oxidizing agents, acids and ignition sources. Protect from direct sunlight. This product is classified as a "C2" Combustible Liquid for the purpose of storage and handling.

Container Type
Stainless steel or mild steel vessels are recommended. Do NOT use copper or its alloys.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EPAPA00800986

National ...sure Standards

No exposure standard has been established for this product by the Australian National Occupational Health and Safety Commission (NOHSC). However, the exposure standard for dust not otherwise specified is 10mg/m3 (for inspirable dust) and 3mg/m3 (for respirable dust).

Biological Limit Values

No biological limit allocated for this product.

Engineering Controls

A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area.

Personal Protection

RESPIRATOR: If inhalation risk from spray mists exists, wear an NIOSH approved half face-piece filter respirator suitable for organic particulates meeting the requirements of AS/NZS1715 and AS/NZS1716. EYES: Chemical goggles. HANDS: Impervious gloves. CLOTHING: Wear overalls and safety shoes to prevent exposure.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	white hazy liquid
Formula	Unspecified.
Odour	mild odour
Vapour Pressure	<10Pa mm Hg (1 atmosphere)
Vapour Density	Not Applicable
Boiling Point	N/A deg C
Melting Point	13'C deg C
Solubility in water	Soluble
Specific Gravity	0.998 (Water = 1)
Flash Point	Closed Cup >184'C
pH	6-8 (1% aqueous solution)
Flammability Limits (as percentage volume in air)	
Lower Explosion Limit	Not Applicable
Upper Explosion Limit	Not Applicable
Ignition Temperature	355'C
Specific Heat Value	Not Applicable
Particle Size	Not Applicable
Volatile Organic Compounds (VOC) content	Not Applicable
Evaporation Rate	Not Applicable
Viscosity	21cP
Percent Volatile	No Data
Octanol/Water partition coefficient	Not Applicable
Saturated Vapour Concentration	Not Applicable
Additional Characteristics	Not Applicable
Flame Propagation/Burning Rate of Solid Materials	Not Applicable
Properties of materials that may initiate or contribute to fire intensity	Not Applicable
Potential for Dust Explosion	Product is a liquid.
Reactions that Release Flammable Gases	Not Applicable
Fast or Intensely Burning Characteristics	Not Applicable
Non-flammables that could contribute unusual hazards to a fire	Not Applicable
Release of invisible flammable vapours and gases	No Data
Decomposition Temperature	No Data

Additional Information
Solubility: Readily soluble in water, simple alcohols glycol ethers, esters, chlorinated solvents and many aromatic oils and solvents. Insoluble in middle distillate fractions and paraffinic oils.

10. STABILITY AND REACTIVITY

Chemical Stability : Product is stable under normal conditions of use and storage.

Conditions to avoid : Avoid excessive heat, direct sunlight, static discharges and high temperatures.

Incompatible Materials : Incompatible with oxidizing agents, acids and sources of ignition.

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Hazardo ...omposition Products : On burning, product will emit toxic fumes including carbon di...ide and carbon monoxide.

Hazardous Reactions : Product reacts with oxidizing agents. Excessive heat will lead to accelerated oxidative degradation.

11. TOXICOLOGICAL INFORMATION

Toxicity Data

Oral LD50 Rat: 1000-2700mg/Kg Eye Rabbit: Severely irritating. Environmental and Human Safety of Major Surfactants - Alcohol Ethoxylates and Alkylphenol Ethoxylates, Talmage S. Lewis Publishers 1994.

Health Effects - Acute

Swallowed

Harmful if swallowed. May cause nausea, vomiting, diarrhoea, abdominal pain and irritation of the gastro-intestinal tract.

Eye

Risk of serious damage to eyes. Severe eye irritant. Contamination of eyes can result in permanent injury. Corrosive to eyes, contact can cause cornea burns.

Skin

May result in irritation. Will have a degreasing action on the skin. Repeated/prolonged skin contact may lead to irritant contact dermatitis.

Inhaled

Not expected to cause respiratory irritation unless present as an aerosol. Inhalation of high concentrations of mist may result in respiratory irritation.

12. ECOLOGICAL INFORMATION

Ecotoxicity : No Data

Persistence and degradability : BOD 28 day/COD: 56% (OECD 301C) Dissolved Organic Carbon Removal (DOC removal): 80% (OECD 301C) This product is expected to be readily biodegradable.

Mobility : No information available on mobility for this product.

Additional information

Environmental fate (exposure) : Avoid contaminating drains, sewers and waterways.

Bioaccumulative potential : No information available on bioaccumulation for this product.

13. DISPOSAL CONSIDERATIONS

Disposal

Dispose of in accordance with all local, state and federal regulations.

Special Precautions for land fill or incineration

Product is suitable for disposal by incineration or landfill through an approved agent. Drain container thoroughly, vent in a safe place away from sparks and fire as residue may cause an explosion hazard. Do not puncture, cut or weld unclean containers. Send to drum recoverer or metal reclaimer.

14. TRANSPORT INFORMATION

UN No.	
Shipping Name	Not Allocated
Dangerous Goods Class	
Subsidiary Risk	FATTY ALCOHOL TECH 9/8
Pack Group	
Precaustion for User	C.2
Hazchem Code	
	None Allocated

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None Allocated

HARMFUL; IRRITANT

N/A

15. REGULATORY INFORMATION

Poisons Schedule	N/A
EPG	N/A
AICS Name	ALCOHOLS, C9-11, ETHOXYLATED
NZ Toxic Substance	N
Additional information	No Data

16. OTHER INFORMATION

Revision Date : Sep 2005

Additional information

Legend to abbreviations and acronyms:

<	less than
>	greater than
AICS	Australian Inventory of Chemical Substances
CAS	Chemical Abstracts Service (Registry Number)
CO2	Carbon Dioxide
COD	Chemical Oxygen Demand
ERMA	Environmental Risk Management Authority
HSNO	Hazardous Substance and New Organism
IDLH	Immediately Dangerous to Life and Health
LC50	LC stands for lethal concentration. LC50 is the concentration of a material in air which causes the death of 50% (one half) of a group of test animals. The material is inhaled over a set period of time, usually 1 or 4 hours.
LD50	LD stands for "Lethal Dose". LD50 is the amount of a material, given all at once, which causes the death of 50% (one half) of a group of test animals
Misc	miscible
N/A	Not Applicable
NIOSH	National Institute for Occupational Safety and Health
NOHSC	National Occupational Health and Safety Commission
OECD	Organization for Economic Co-operation and Development
PEL	Permissible Exposure Limit
RCP	Reciprocal Calculation Procedure
STEL	Short Term Exposure Limit
TLV	Threshold Limit Value
TWA	Time Weighted Average
UN	United Nations (number)
cm2	square centimetres
deg C ('C)	degrees Celsius
g	gram
g/cm3	grams per cubic centimetre
g/l	grams per litre
immiscible	liquids are insoluble in each other
kg	kilogram
kg/m3	kilograms per cubic metre
ltr	Litre

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m3	...metre
mbar	...llibar
mg	milligram
mg/24H	milligrams per 24 hours
mg/kg	milligrams per kilogram
mg/m3	milligrams per cubic metre
miscible	liquids form one homogeneous liquid phase regardless of the amount of either component present
mm	millimetre
ppb	parts per billion
ppm	parts per million
ppm/2h	parts per million per 2 hours
ppm/6h	parts per millionper 6 hours
tne	tonne
ug/24H	micrograms per 24 hours
wt	weight

Literature references:

No Data

Sources for data:

No Data

QEC Logo | Respons Care Logo

Australia **New Zealand** **Sydney Office** Adelaide Auckland 2 Swettenham Road telephone: +61 (0)2 97333000 Brisbane Christchurch Mintofacsimile: NSW +61 (0)2 2566 97333111 Melbourne Hawkes Bay Australia www.redox.com Perth sydney@redox.com Sydney

This MSDS summarises Redox Pty Ltd best knowledge of the health and safety hazard information of the selected substance and how to safely handle the selected substance in the workplace however Redox Pty Ltd expressly disclaims that the MSDS is a representation or guarantee of the chemcial specifications for the substance. Each user should read the MSDS and consider the information in the context of how the selected substance will be handled and used in the workplace including its use in conjunction with other substances.

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EPAPA00800990

FEED STOCK

Petroleum Distillates/Fuel blendstock MSDS No. MI 160

KMCO

Revision: 0

Section 1 - Chemical Product and Company Identification

Product/Chemical Name: Petroleum distillate/fuel blendstock
Chemical Formula: Mixture
CAS Number: Mixture
Synonyms:
General Use: fuel blendstock
Manufacturer: KMCO, LP 16503 Ramsey Road, Crosby, Texas 77532, Phone (281) 328-3501, FAX (281) 328-9528

24-HOUR EMERGENCY NUMBER: CHEMTREC 1-800-424-9300

Section 2 - Composition / Information on Hazardous Ingredients

Ingredient Name	CAS Number	% wt *or* % vol
Ethanol	64-17-5	0 – 90 %
Toluene	108-88-3	0 – 90 %
Petroleum distillates (lube, mineral oil), (naptha)	8002-05-9	0 – 90 %
Mixed xylenes	1330-20-7	0 – 90 %
Water		0 – 50 %

	OSHA PEL		ACGIH TLV		NIOSH REL		NIOSH
Ingredient	TWA	STEL	TWA	STEL	TWA	STEL	IDLH
Ethanol	1000 ppm	None estab	1000 ppm	None estab	1000 ppm	None estab	3300 ppm
Petroleum distillate	500 ppm	None estab	None estab	None estab	None estab	None estab	
Xylene	100 ppm	None estab	100 ppm	150 ppm	100 ppm	150 ppm	None estab
Toluene	100 ppm	None estab	1090 ppm	None estab	100 ppm	None estab	500 ppm
Water	None estab	None estab	None estab	None estab	None estab	None estab	None estab

Section 3 - Hazards Identification

☆☆☆☆☆ **Emergency Overview** ☆☆☆☆☆
FOR INDUSTRIAL USE ONLY

HMIS	
H	2
F	3
R	0

Potential Health Effects

Acute Effects
Inhalation: Vapors can be irritating to eyes, nose and respiratory tract.
Eye: May be mildly irritating to the eyes.
Skin: Liquid is moderately irritating to the skin and could cause dry skin and dermatitis.
Ingestion: Moderately toxic. Can cause CNS depression, nausea, dizziness, vomiting and unconsciousness.
Carcinogenicity:
Medical Conditions Aggravated by Long-Term Exposure: May aggravate an existing dermatitis, throat or respiratory condition.
Chronic Effects: No adverse effects anticipated from available information.

Section 4 - First Aid Measures

Inhalation: Remove to fresh air. If not breathing, give artificial respiration. Get medical attention.
Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes, Get medical attention.
Skin Contact: Remove contaminated clothing and wash affected skin area thoroughly with soap and water. If skin irritation develops or persists, seek medical attention. Dispose of contaminated clothing in compliance with Federal, State, and local regulations.
Ingestion: Induce vomiting. Get medical attention.

After first aid, get appropriate in-plant, paramedic, or community medical support.

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Note to Physician

Special Handling Procedures:

Section 5 - Fire-Fighting Measures

Flash Point: 80 - 140 °F **Flash Point Method:**
Burning Rate:.Not Determined
Autoignition Temperature: Not Determined.
LEL: Not Determined.
UEL: Not Determined.
Flammability Classification: Severe fire hazard when exposed to heat or flame
Extinguishing Media: Foam, Dry Chemical, Carbon Dioxide, Water Fog
Unusual Fire or Explosion Hazards: Dangerous when exposed to heat or flame. Can react with oxidizing materials.
Hazardous Combustion Products: Carbon monoxide, carbon dioxide, and unidentified organic compounds
Fire-Fighting Instructions:. Use waterspray to cool surfaces. Do not use direct water stream to extinguish fires. Product may travel with water and reignite.
Fire-Fighting Equipment: Wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full face piece operated in pressure demand or other positive pressure mode.

NFPA

Section 6 - Accidental Release Measures

Spill /Leak Procedures: Remove all ignition sources, safely shut of source and contain spilled material. Use protective equipment in emergency and cleanup situations. Restrict water use during cleanup.
Small Spills: Contain with inert absorbent.
Large Spills
Containment: Use explosion proof pump to recover liquid. Spilled material and contaminated water or soil may be hazardous to human or other life forms.
Cleanup: Spilled material becomes a hazardous waste. Material must be disposed of in accordance with all Federal, State, and Local regulations.
Regulatory Requirements: Follow applicable OSHA regulations (29 CFR 1910.120).

Section 7 - Handling and Storage

Handling Precautions: Handle material in a well-ventilated area to minimize potential exposure hazard.
Storage Requirements: Store out of direct sunlight and in a cool well-ventilated area.
Regulatory Requirements:

Section 8 - Exposure Controls / Personal Protection

Engineering Controls: Controls should be such that adequate ventilation is provided.
Ventilation: Provide general or local exhaust ventilation systems. Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at its source.
Administrative Controls: Normal industrial requirements should be in place.
Respiratory Protection: Air-purifying respirator can be used in a well-ventilated environment where exposure above PEL/TLV is unlikely. If working in an enclosed area approved supplied air or self-contained breathing apparatus (SCBA) should be used.
Protective Clothing/Equipment: Wear chemically protective gloves, boots, aprons, and gauntlets to prevent prolonged or repeated skin contact. Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133). Contact lenses are not eye protective devices. Appropriate eye protection must be worn instead of, or in conjunction with contact lenses.
Safety Stations: Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work area.
Contaminated Equipment: Separate contaminated work clothes from street clothes. Launder before reuse. Remove this material from your shoes and clean personal protective equipment.
Comments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

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KMCO

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Appearance and Odor: Liquid with typical odor
Odor Threshold: Not determined
Vapor Pressure: 0.01- 2.5 @ 20°C
Vapor Density (Air=1): Not determined
Formula Weight: Not applicable - mixture
Density: 6.7 – 9.0 lbs/gallon
Specific Gravity (H_2O=1, at 20/20 °C): 0.8 – 1.1 @ 25°C
pH: Not determined

Water Solubility: Not determined
Other Solubilities: Not determined
Boiling Point: 100 – 200 @ 220 MM Hg, typical
Freezing/Melting Point: approx. – 40°C
Viscosity: 1 – 15 st @ 40°C
Refractive Index: Not determined
Surface Tension: Not determined
% Volatile: Not determined
Evaporation Rate (BuAc=1): Not Determined

Section 10 - Stability and Reactivity

Stability: Stable at room temperature in closed containers under normal storage and handling conditions.
Polymerization: Will not occur.
Chemical Incompatibilities: Strong oxidizing agents, strong bases
Conditions to Avoid: Heat and flame, ignition sources, imcompatabilities
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, steam and other unidentified organics.

Section 11- Toxicological Information

Toxicity Data:*

Eye Effects: Mildly to severely irritating to eyes
Skin Effects: Mildly irritating to skin
Inhalation: Can cause headache, drowsiness, Fatigue
Ingestion: Can cause liver and kidney damage

Acute Inhalation Effects: Can cause liver and kidney damage
Acute Oral Effects: Can cause liver and kidney damage
Chronic Effects: Repeated small exposure via any means can cause severe kidney problems. Skin allergy can develop.
Carcinogenicity: Not classifiable as a human carcinogen
Mutagenicity:
Teratogenicity:

* See NIOSH, *RTECS*, for additional toxicity data.

Section 12 - Ecological Information

Ecotoxicity: Data not available.
Environmental Fate: Data not available.
Environmental Degradation: Data not available.
Soil Absorption/Mobility: Data not available.

Section 13 - Disposal Considerations

Disposal: Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.
Disposal Regulatory Requirements: Consult current Federal, state, and local regulations.
Container Cleaning and Disposal: Dispose of container and unused contents in accordance with Federal, state, and local requirements.

Section 14 - Transport Information

DOT Transportation Data (49 CFR 172.101):

Shipping Name: Flammable, liquid, n.o.s. (contains petroleum distillate)
Shipping Symbols:
Hazard Class: 3
ID No.: NA 1993
Packing Group: 3
Label: Flammable Liquid
Special Provisions (172.102):

Packaging Authorizations
a) Exceptions:
b) Non-bulk Packaging:
c) Bulk Packaging:

Quantity Limitations
a) Passenger, Aircraft, or Railcar:
b) Cargo Aircraft Only:

Vessel Stowage Requirements
a) Vessel Stowage:
b) Other:

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Section 15 - Regulatory Information

EPA Regulations:
CERCLA Reportable Quantity (RQ): Toluene-1000 lbs. Mixed xylenes – 100 lbs.
SARA 311/312 Codes: Toluene, Xylene
SARA Toxic Chemical (40 CFR 372.65):
SARA EHS (Extremely Hazardous Substance) (40 CFR 355):.
OSHA Regulations:
Air Contaminant (29 CFR 1910.1000, Table Z-1, Z-1-A): Xylene
OSHA Specifically Regulated Substance (29CFR 1910):

Section 16 - Other Information

Prepared By: KMCO,LP.
Revision Notes: New MSDS.

Additional Hazard Rating Systems: None

Disclaimer: This product is FOR INDUSTRIAL USE ONLY. KEEP OUT OF REACH OF CHILDREN. DO NOT TAKE INTERNALLY.

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For additional product information, please contact the KMCO, LP., Sales Office at 281-885-1234.

EPAPA008000994

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS

J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

FERRIC NITRATE

1. Product Identification

Synonyms: Nitric acid, iron (3+) salt nonahydrate; iron nitrate nonahydrate; iron trinitrate
CAS No: 10421-48-4 (Anhydrous) 7782-61-8 (Nonahydrate)
Molecular Weight: 404.00
Chemical Formula: $Fe(NO_3)_3 \cdot 9H_2O$
Product Codes: **J.T. Baker:**
2018
Mallinckrodt:
5032, 5657

2. Composition/Information on Ingredients

Ingredient	CAS No.	Percent	Hazardous
Ferric Nitrate	10421-48-4	90 - 100%	Yes

3. Hazards Identification

Emergency Overview

DANGER! OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE. HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS THE LIVER.

J.T. Baker SAF-T-DATA ™ Ratings

(Provided here for your convenience)

Health:	Flammability:	Reactivity:	Contact:
2 - Moderate	0 - None	3 - Severe (Oxidizer)	2 - Moderate

Lab Protection Equip: GOGGLES; LAB COAT; PROPER GLOVES
Storage Color Code: Yellow (Reactive)

Potential Health Effects

Inhalation:
Causes irritation to the respiratory tract. Symptoms may include coughing, shortness of breath.

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Ingestion:

Causes irritation to the gastrointestinal tract. Repeated large doses can cause excess iron buildup in the body. Symptoms include gastrointestinal irritation, with abdominal cramps, vomiting, diarrhea, black stool and liver damage.

Skin Contact:

Causes irritation to skin. Symptoms include redness, itching, and pain.

Eye Contact:

Causes irritation, redness, and pain. Prolonged contact may cause a brownish discoloration to the eye.

Chronic Exposure:

Under some circumstances methemoglobinemia occurs in individuals when the nitrate is converted by bacteria in the stomach to nitrite. Chronic exposure may cause liver effects.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders or eye problems, or impaired liver, kidney or respiratory function may be more susceptible to the effects of the substance.

4. First Aid Measures

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion:

Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.

Skin Contact:

Immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:

Not combustible, but substance is a strong oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition. Fire may produce poisonous or irritating gases.

Explosion:

Contact with oxidizable substances may cause extremely violent combustion. Sealed containers may rupture when heated. Sensitive to mechanical impact.

Fire Extinguishing Media:

Dry chemical, foam, carbon dioxide, or water spray.

Special Information:

Wear full protective clothing and breathing equipment for high-intensity fire or potential explosion conditions.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

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Keep in a tightly closed container. Protect from physical damage. Store in a cool, dry, ventilated area away from sources of heat, moisture and incompatibilities. Separate from combustibles, organic or other readily oxidizable materials. Avoid storage on wood floors. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits

-ACGIH Threshold Limit Value (TLV):
1 mg/mμ (TWA) soluble iron salt as Fe

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.

Personal Respirator (NIOSH Approved)

If the exposure limit is exceeded and engineering controls are not feasible, a full facepiece particulate respirator (NIOSH type N100 filters) may be worn for up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids. glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear protective gloves and clean body-covering clothing.

Eye Protection:

Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:
Violet crystals.

Odor:
Slight nitric acid odor.

Solubility:
Freely soluble.

Specific Gravity:
1.684

pH:
No information found.

% Volatiles by volume @ 21°C (70°F)
0

Boiling Point:
< 100°C (< 212°F) Decomposes.

Melting Point:
47.2°C (117°F)

Vapor Density (Air=1):
No information found.

Vapor Pressure (mm Hg):
No information found.

Evaporation Rate (BuAc=1):
No information found.

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products

Emits nitrous oxides when heated to decomposition.

Hazardous Polymerization:

Will not occur.

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Incompatabilities:
Substance may react violently with some organic compounds or reducing agents.
Conditions to Avoid:
Heat, shock, friction, incompatibles.

11. Toxicological Information

Oral rat LD50: 3250 mg/kg

Cancer Lists

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Ferric Nitrate (10421-48-4)	No	No	None

12. Ecological Information

Environmental Fate:
No information found.
Environmental Toxicity:
No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations.

Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name:	FERRIC NITRATE		
Hazard Class:	5.1		
UN/NA:	UN1466	**Packing Group:**	III
Information reported for product/size:		12KG	

International (Water, I.M.O.)

Proper Shipping Name:	FERRIC NITRATE		
Hazard Class:	5.1		
UN/NA:	UN1466	**Packing Group:**	III
Information reported for product/size:		12KG	

15. Regulatory Information

Chemical Inventory Status

Ingredient	TSCA	EC	Japan	Australia	Korea	---Canada--- DSL	NDSL	Phil.
Ferric Nitrate (10421-48-4)	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes

Federal, State & International Regulations

Ingredient	---SARA 302--- RQ	TPQ	----------SARA 313---------- List	Chemical Catg.	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Ferric Nitrate (10421-48-4)	No	No	No	Nitrate Cmpd.	1000	No	No

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Chemical Weapons Convention: No **TSCA 12(b):** No **CDTA:** No

SARA 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure: No Reactivity: Yes (Mixture / Solid)

Australian Hazchem Code 1[T] **Australian Poison Schedule:** None allocated.

WHMIS: This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings:

Health: 1 Flammability: 0 Reactivity: 1 Other: Oxidizer

Label Hazard Warning:

DANGER! OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE. HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS THE LIVER.

Label Precautions:

Avoid contact with eyes, skin and clothing.
Avoid breathing dust.
Keep from contact with clothing and other combustible materials.
Wash thoroughly after handling.
Store in a tightly closed container.
Use only with adequate ventilation.
Remove and wash contaminated clothing promptly.

Label First Aid:

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. In all cases, get medical attention.

Product Use:

Laboratory Reagent.

Revision Information:

No changes.

Disclaimer:

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Prepared By Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

EPAPA008000999

FUEL OIL
MATERIAL SAFETY DATA SHEET FOR USA AND CANADA

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: FUEL OIL

SYNONYMS: Used oil fuel.

PRODUCT CODE: Prefix 07FO

PRODUCT USE: Fuel oil for industrial boilers. If this product is used in combination with other products, refer to the Material Safety Data Sheet for those products.

This number is for emergency use only. If you desire non-emergency product information, please call a phone number listed below.

24-HOUR EMERGENCY PHONE NUMBER MEDICAL AND TRANSPORTATION (SPILL):

1-800-468-1760

SUPPLIER: Safety-Kleen Systems, Inc.
5400 Legacy Drive
Cluster II, Building 3
Plano, Texas 75024
USA
1-800-669-5740
www.Safety-Kleen.com

TECHNICAL INFORMATION: 1-800-669-5740 Press 1 then 1, then Extension 7500

MSDS FORM NUMBER: 82430

ISSUE: May 10, 2006

ORIGINAL ISSUE: October 31,1998

SUPERSEDES: January 23, 2003

PREPARED BY: Product MSDS Coordinator

APPROVED BY: MSDS Task Force

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

WT%	NAME	SYNONYM	CAS NO.	OSHA PEL** TWA	OSHA PEL** STEL	ACGIH TLV® TWA	ACGIH TLV® STEL	LD[a]	LC[b]
				mg/m^3		mg/m^3	mg/m^3		
65 to 100*	Used oil	N.Av.	N.Av.	5[c]	N.Av.	5[c]	10[c]	N.Av.	N.Av.
0 to 25*	Water/Solids	N.Av.	N.Av.	N.Av.	N.Av.	N.Av.	N.Av.	N.Av.	N.Av.
0 to 10*	Hydrocarbon solvents. May include gasoline, diesel fuel, jet fuel, mineral spirits, etc.	N.Av.	N.Av.	N.Av.	N.Av.	N.Av.	N.Av.	N.Av.	N.Av.
0 to 1.5*	Metals. May include lead, iron, zinc, copper, chromium, arsenic, nickel, and others: each below 1.0 WT%.	N.Av.	N.Av.	N.Av.	N.Av.	N.Av.	N.Av.	N.Av.	N.Av.
0 to 1.0*	Polynuclear aromatics. May include naphthalene, fluoranthene, phenanthrene, pyrene, and others: each below 0.3 WT%.	N.Av.	N.Av.	N.Av.	N.Av.	N.Av.	N.Av.	N.Av.	N.Av.

*Even though the concentration range does not fall under the ranges prescribed by WHMIS, this is the actual range which varies with each batch of the product.
N. Av. = Not Available
[a]Oral-Rat LD_{50}
[b]Inhalation-Rat LC_{50}
[c]Based on Stoddard Solvent

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

APPEARANCE
Thick black, viscous liquid with a petroleum odor.

WARNING!

PHYSICAL HAZARDS
Combustible liquid and vapor.

HEALTH HAZARDS
May be harmful if inhaled.
May be harmful if swallowed.
May be harmful if absorbed through the skin.
May irritate the respiratory tract (nose, throat, and lungs), eyes, and skin.
May cause skin sensitization.
Suspect cancer hazard. Contains material which can cause cancer. Risk of cancer depends on duration and level of exposure.
Contains material which can cause birth defects.
Contains material which can cause central nervous system damage.

ENVIRONMENTAL HAZARDS
Components may be harmful to aquatic life.

POTENTIAL HEALTH EFFECTS

INHALATION (BREATHING): High concentrations of vapor may be harmful if inhaled. High concentrations of vapor or mist may irritate the respiratory tract (nose, throat, and lungs). High concentrations of vapor or mist may cause nausea, vomiting, headaches, dizziness, loss of coordination, numbness, and other central nervous system effects. Massive acute overexposure may cause rapid central nervous system depression, sudden collapse, coma, and/or death.

EYES: May cause irritation.

SKIN: May cause skin sensitization. May cause irritation. May be absorbed through the skin and cause harm as noted under **INHALATION (BREATHING)**.

INGESTION (SWALLOWING): May be harmful if swallowed. May cause throat irritation, nausea, vomiting, and central nervous system effects as noted under **INHALATION (BREATHING)**. Breathing product into the lungs during ingestion or vomiting may cause lung injury and possible death.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Individuals with pre-existing respiratory tract (nose, throat, and lungs), central nervous system, kidney, eye, and/or skin disorders may have increased susceptibility to the effects of exposure.

CHRONIC: Prolonged or repeated inhalation may cause toxic effects as noted under **INHALATION (BREATHING)**. Prolonged or repeated exposure may cause oil pneumonia, lung tissue inflammation, fibrous tissue formation, and central nervous system, liver and kidney damage, and may cause mutagenicity, reproductive toxicity, teratogenicity and birth defects. Prolonged or repeated eye contact may cause inflammation of the membrane lining the eyelids and covering the eyeball (conjunctivitis). Prolonged or repeated skin contact may cause drying, cracking, redness, itching, and/or swelling (dermatitis).

CANCER INFORMATION: This product contains mineral oils, untreated or mildly treated, which can cause cancer. This product may contain hydrocarbon and chlorinated solvents, metals, and polynuclear aromatics which can cause cancer. Risk of cancer depends on duration and level of exposure. For more information, see **SECTION 11: CARCINOGENICITY.** Also see **SECTION 15: CALIFORNIA**.

POTENTIAL ENVIRONMENTAL EFFECTS
Components may be toxic to aquatic life. Also see **SECTION 12: ECOLOGICAL INFORMATION.**

SECTION 4: FIRST AID MEASURES

INHALATION (BREATHING): Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Oxygen should only be administered by qualified personnel. Someone should stay with victim. Get medical attention if breathing difficulty persists.

EYES: If irritation or redness from exposure to vapor develops, move away from exposure into fresh air. Upon contact, immediately flush eyes with plenty of lukewarm water, holding eyelids apart, for 15 minutes. Get medical attention.

SKIN: Remove affected clothing and shoes. Wash skin thoroughly with soap and water. Get medical attention if irritation or pain develops or persists. Wash contaminated clothing before reuse.

INGESTION (SWALLOWING): Do NOT induce vomiting. Immediately get medical attention. Call 1-800-468-1760 for additional information. If spontaneous vomiting occurs, keep head below hips to avoid breathing the product into the lungs. Never give anything by mouth to an unconscious person.

NOTE TO PHYSICIANS: Treat symptomatically and supportively. Treatment may vary with condition of victim and specifics of incident. Call 1-800-468-1760 for additional information.

SECTION 5: FIRE FIGHTING MEASURES

FLASH POINT: 180°F (82°C) Closed Cup

FLAMMABLE LIMITS IN AIR: **LOWER:** Not available **UPPER:** Not available

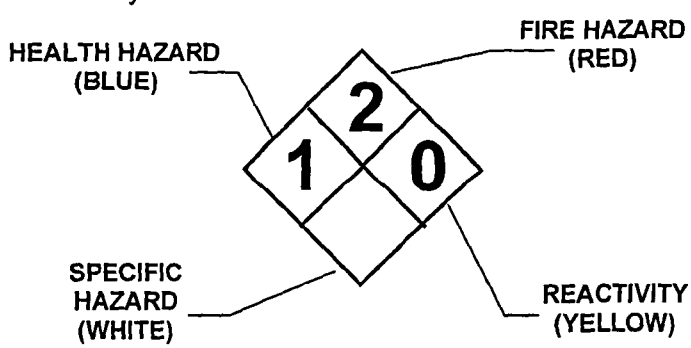
AUTOIGNITION TEMPERATURE: Not available

HAZARDOUS COMBUSTION PRODUCTS: Decomposition and combustion materials may be toxic. Burning may produce phosgene gas, nitrogen oxides, carbon monoxide and unidentified organic compounds.

CONDITIONS OF FLAMMABILITY: Heat, sparks, or flame.

EXTINGUISHING MEDIA: Carbon dioxide, regular foam, dry chemical, water spray, or water fog.

NFPA 704 HAZARD IDENTIFICATION: This information is intended solely for the use by individuals trained in this system.



FIRE FIGHTING INSTRUCTIONS: Keep storage containers cool with water spray. A positive-pressure, self-contained breathing apparatus (SCBA) and full-body protective equipment are required for fire emergencies.

FIRE AND EXPLOSION HAZARDS:	Vapor explosion hazard indoors, outdoors, or in sewers. Vapors may travel to ignition source and flashback. Vapors will spread along the ground and collect in low or confined areas. Run-off to sewer may create a fire hazard. Heated containers may rupture or be thrown into the air. "Empty" containers may retain residue and can be dangerous. Product is not sensitive to mechanical impact or static discharge.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Remove all ignition sources. Do not touch or walk through spilled product. Stop leak if you can do it without risk. Wear protective equipment and provide engineering controls as specified in **SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Ventilate area and avoid breathing vapor or mist. A vapor suppressing foam may be used to reduce vapors. Contain spill away from surface water and sewers. Contain spill as a liquid for possible recovery, or sorb with compatible sorbent material and shovel with a clean, sparkproof tool into a sealable container for disposal.

Additionally, for large spills: Water spray may reduce vapor, but may not prevent ignition in closed spaces. Dike far ahead of liquid spill for collection and later disposal.

SECTION 7: HANDLING AND STORAGE

HANDLING:	Keep away from heat, sparks, or flame. Where flammable mixtures may be present, equipment safe for such locations should be used. Use clean, sparkproof tools and explosion-proof equipment. When transferring product, metal containers, including trucks and tank cars, should be grounded and bonded. Do not breathe vapor or mist. Use in a well ventilated area. Avoid contact with eyes, skin, clothing, and shoes. Do not smoke while using this product.
SHIPPING AND STORING:	Keep container tightly closed when not in use and during transport. Store containers in a cool, dry place. Do not pressurize, cut, weld, braze, solder, drill, or grind containers. Keep containers away from heat, flame, sparks, static electricity, or other sources of ignition. Empty product containers may retain product residue and can be dangerous. See **SECTION 14: TRANSPORTATION INFORMATION** for Packing Group information.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Provide general ventilation needed to maintain concentration of vapor or mist below applicable exposure limits. Where adequate general ventilation is unavailable, use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below applicable exposure limits. Where explosive mixtures may be present, equipment safe for such locations should be used.

PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION: Use NIOSH-certified P- or R- series particulate filter and organic vapor cartridges when concentration of vapor or mist exceeds applicable exposure limits. Protection provided by air purifying respirators is limited. Do not use N-rated respirators. Selection and use of respiratory protective equipment should be in accordance in the USA with OSHA General Industry Standard 29 CFR 1910.134; or in Canada with CSA Standard Z94.4.

EYE PROTECTION: Wearing chemical goggles is recommended. Contact lens use is not recommended without eye protection.

SKIN PROTECTION: Where skin contact is likely, wear chemical impervious protective gloves; use of natural rubber (latex) or equivalent gloves is not recommended.

To avoid prolonged or repeated contact with product where spills and splashes are likely, wear appropriate chemical-resistant faceshield, boots, apron, whole body suits or other protective clothing.

PERSONAL HYGIENE: Use good personal hygiene. Wash thoroughly with soap and water after handling product and before eating, drinking, or using tobacco products. Clean affected clothing, shoes, and protective equipment before reuse. Discard affected clothing, shoes, and/or protective equipment if they cannot be thoroughly cleaned. Discard leather articles, such as shoes, saturated with this product.

OTHER PROTECTIVE EQUIPMENT: Where spills and splashes are likely, facilities storing or using this product should be equipped with an emergency eyewash and shower, both equipped with clean water, in the immediate work area.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE, APPEARANCE, AND ODOR: Thick black, viscous liquid with a petroleum odor.

ODOR THRESHOLD:	Not available.
MOLECULAR WEIGHT:	Not available.
SPECIFIC GRAVITY:	0.8 to 1.0 (water = 1) @ 60°F (16°C)
DENSITY:	6.7 to 8.3 LB/US gal (800 to 1000 g/l)
VAPOR DENSITY:	Not available.
VAPOR PRESSURE:	Not available.
BOILING POINT:	Not available.
FREEZING/MELTING POINT:	Not available.
pH:	Not applicable.
EVAPORATION RATE:	Less than 1 (Butyl acetate = 1)
SOLUBILITY IN WATER:	Slight.
FLASH POINT:	180°F (82°C) Closed Cup
FLAMMABLE LIMITS IN AIR:	**LOWER:** Not available **UPPER:** Not available
AUTOIGNITION TEMPERATURE:	Not available

SECTION 10: STABILITY AND REACTIVITY

STABILITY:	Stable under normal temperatures and pressures. Avoid heat, sparks, or flame.
INCOMPATIBILITY:	Avoid acids, alkalies, oxidizing agents, reducing agents, reactive metals or reactive halogens.
REACTIVITY:	Polymerization is not known to occur under normal temperature and pressures. Not reactive with water.
HAZARDOUS DECOMPOSITION PRODUCTS:	None under normal temperatures and pressures. See also **SECTION 5: HAZARDOUS COMBUSTION PRODUCTS.**

SECTION 11: TOXICOLOGICAL INFORMATION

SENSITIZATION: Based on best current information, there may be known human sensitization associated with this product.

MUTAGENICITY: Based on best current information, there may be known mutagenicity associated with this product.

CARCINOGENICITY: Mineral oils, untreated or mildly treated are categorized by IARC as carcinogenic to humans (Group 1). Mineral oils, untreated or mildly treated are listed by NTP as having limited evidence of carcinogenicity in humans or sufficient evidence of carcinogenicity in experimental animals. There may be hydrocarbon and chlorinated solvents, metals, and polynuclear aromatics present in this product which are listed by OSHA as carcinogens. There may be hydrocarbon and chlorinated solvents, metals, and polynuclear aromatics present in this product which are categorized by IARC as carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), and/or possibly carcinogenic to humans (Group 2B). There may be hydrocarbon and chlorinated solvents, metals, and polynuclear aromatics present in this product which are classified by NTP as known carcinogens and/or as having limited evidence of carcinogenicity in humans or sufficient evidence of carcinogenicity in experimental animals. There may be hydrocarbon and chlorinated solvents, metals, and polynuclear aromatics present in this product which are recognized by ACGIH as confirmed human carcinogens (A1) and/or suspected human carcinogens (A2).

Also see **SECTION 15: CALIFORNIA**.

REPRODUCTIVE TOXICITY: Based on best current information, there may be known reproductive toxicity associated with this product.

TERATOGENICITY: Based on best current information, there may be known teratogenicity associated with this product.

TOXICOLOGICALLY SYNERGISTIC PRODUCT(S): Based on best current information, there may be known toxicologically synergistic products associated with this product.

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICITY: Components of this product may be harmful to aquatic life.

OCTANOL/WATER PARTITION COEFFICIENT: Not available.

VOLATILE ORGANIC COMPOUNDS: 56 WT%; <500 g/L (calculated)
As per 40 CFR Part 51.100(s).

SECTION 13: DISPOSAL CONSIDERATIONS

DISPOSAL: Dispose in accordance with federal, state, provincial, and local regulations. Regulations may also apply to empty containers. The responsibility for proper waste disposal lies with the owner of the waste. Contact Safety-Kleen regarding proper recycling or disposal.

USEPA WASTE CODE(S): Based on available data, this information applies to the product as supplied to the user. Processing, use, or contamination by the user may change the waste code applicable to the disposal of this product.

SECTION 14: TRANSPORT INFORMATION

DOT:
Shipping Name: Combustible Liquid, n.o.s (Petroleum Oil)
UN/NA #: NA1993 **Hazard Class:** Combustible Liquid **Packing Group:** III
Required Label(s): None
Additional Info.: Non-bulk packages may be reclassified as Not Regulated.

TDG:
Shipping Name: Not regulated as a Dangerous Good.

EMERGENCY RESPONSE GUIDE NUMBER: 128
Reference *North American Emergency Response Guidebook*

SECTION 15: REGULATORY INFORMATION

USA REGULATIONS

SARA SECTIONS 302 AND 304: Based on the ingredients listed in **SECTION 2**, this product does may contain" extremely hazardous substances" listed pursuant to Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) Section 302 or Section 304 as identified in 40 CFR Part 355, Appendix A and B.

SARA SECTIONS 311 AND 312: This product poses the following health hazards as defined in 40 CFR Part 370 and is subject to the requirements of sections 311 and 312 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA):

Immediate (Acute) Health Hazard
Delayed (Chronic) Health Hazard
Fire Hazard

SARA SECTION 313: This product may contain "toxic" chemicals subject to the requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) and 40 CFR Part 372.

CERCLA: Based on the ingredients listed in **SECTION 2**, this product may contain any "hazardous substances" listed pursuant to the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) in 40 CFR Part 302, Table 302.4.

TSCA: Not available.

CALIFORNIA: This product is not for sale or use in the State of California.

CANADIAN REGULATIONS

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all information required by the CPR.

WHMIS:
Class B3 - Combustible Liquid
Class D2A - Chronic toxic effects.
Class D2B - Irritating to eyes and skin.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA): Not available.

SECTION 16. OTHER INFORMATION

REVISION INFORMATION: Regulatory update. Updated in Sections 1 (Dates), 3 (Emergency Overview), 4 (Phone Numbers), 8 (Personal Protective Equipment), 12 (Ecotoxicity Information), 13 (Disposal Considerations), 16 (Revision Information).

LABEL/OTHER INFORMATION: Not available.

User assumes all risks incident to the use of this (these) product(s). To the best of our knowledge, the information contained herein is accurate. However, Safety-Kleen assumes no liability whatsoever for the accuracy or completeness of the information contained herein. No representations or warranties, either express or implied, or merchantability, fitness for a particular purpose or of any other nature are made hereunder with respect to information or the product to which information refers. The data contained on this sheet apply to the product(s) as supplied to the user.

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PETERSBURG
OIL TERMINAL

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT & COMPANY IDENTIFICATION

Petersburg Oil Terminal
Refinery's identification: Novokuybyshevsk refinery, Syzran refinery, Orsk refinery, Salavat refinery, Moscow refinery, Nizhnekamsk refinery, Norsi refinery, Perm refinery, Samara refinery.

Product Name: Fuel Oil No. 6
(Straight Run Atmospheric Residual Oil) Last Revision: 03/22/00
MSDS Number: A0007b.msd Date Prepared: 09/01/06

Synonyms: M100, M40, E-4
Product Description: A complex mixture of paraffinic, olefinic, naphthenic and aromatic hydrocarbons.

2. COMPOSITION & INFORMATION ON INGREDIENTS

			Occupational Exposure Limits*			
			OSHA	ACGIH		
Product	**CAS No.**	**Wt%**	**PEL**	**TLV**	**Other**	**Units**
Fuel Oil No. 6	68333-00-4	100	N/A	N/A		(Straight Run Atmospheric Residual Oil)
Component(s)						
Hydrogen Sulfide	7783-06-4	0-0.04	10	10	15 STEL	ppm

CAUTION! Under certain circumstances sulfur compounds in hot product may form hydrogen sulfide (H_2S). Cooling product may continue to emit traces of H_2S temporarily entrapped or other dissolved gases.

Key: * = 8-Hr. TWA unless otherwise specified
STEL = Short Term Exposure Limit; 15 minutes.
N/A = Not Applicable

3. HAZARD IDENTIFICATION

Note: This product has not been tested by El Paso Corporation to determine its specific health hazards. Therefore, the information provided in this section includes health hazard information on the product components.

Carcinogenicity:	**NTP**	**IARC Monographs**	**OSHA Regulated**
Fuel Oil No. 6	No	2B*	No
Hydrogen Sulfide	No	No	No

5 MEZHEVOY CANAL, ST.PETERSBURG 198035, RUSSIA tel. + 7(812) 329 29 99 fax + 7(812) 329 29 89 e-mail pnt@mail.wplus.net www.oilterminal.ru

"2B*" = This product mixture (heavy residual fuel oils) has been classified by IARC as "possibly carcinogenic to humans".

Potential Health Effects From Overexposure:

Acute Effects:

Eyes:	Slight to moderate eye irritation.
Skin:	Moderately irritating; causing redness, drying and cracking of skin.
Inhalation:	Inhalation can be irritating to the mucous membrane and respiratory tract. May produce symptoms of intoxication such as; headache, dizziness, nausea, vomiting, loss of coordination. Hydrogen sulfide can cause headache, dizziness, respiratory paralysis, unconsciousness and/or death.
Ingestion:	Ingestion may cause gastrointestinal disturbances such as nausea, vomiting and diarrhea.

Chronic Effects:
Prolonged and repeated skin contact may cause dermatitis.

Additional Medical and Toxicological Information:
May aggravate pre-existing dermatitis. This product contains polynuclear aromatics, which have caused carcinogenic effects in laboratory animals.

4. FIRST AID MEASURES

Eye Contact:	Immediately flush with large amounts of water for at least 15 minutes, including under the eyelids. Contact a physician immediately, preferably an ophthalmologist. Speed and thoroughness in rinsing eyes are important to avoid permanent injury.
Skin Contact:	Cool the exposed area immediately. Remove contaminated clothing. Wash affected areas with soap and water, get medical attention.
Inhalation:	Remove to fresh air. If breathing has stopped, apply artificial respiration. Seek medical attention.
Ingestion:	Do not induce vomiting. If spontaneous vomiting occurs, hold the victim□s head lower than their hips to prevent aspiration.

5. FIRE FIGHTING MEASURES

Flash Point: >150°F
Flammable Limits in Air, % by Volume:
Lower: N/A
Upper: N/A
Autoignition Temperature: N/A
Extinguishing Media: Dry chemical, foam, carbon dioxide, and water spray.
NFPA Ratings: Health: 0 Flammability: 2 Reactivity: 0

General Hazard:
Flowing oil can be ignited by self-generated static electricity; check for combustible vapors prior to and during welding and torch cutting on tanks and vessels.

Fire Fighting Instructions:
Use a water spray to cool fire-exposed containers. Use a smothering technique for extinguishing fire of this combustible liquid. Do not use a force water stream directly on oil fires as this will tend to scatter the fire. Firefighters should wear self-contained breathing apparatus and full protective clothing.

6. ACCIDENTAL RELEASE

Remove source of heat or ignition including internal combustion engines and power tools. Clean up spill, but do not flush to sewers of surface water. Ventilate area and avoid breathing.

7. HANDLING & STORAGE

Store away from incompatible materials. Ground and bond all transfer and storage equipment to prevent static sparks and equip with self-closing valves, pressure vacuum bungs and flame arrestors. Empty containers may contain residue and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind or expose such containers to heat, flame sparks or other sources of ignition; they may explode and cause injury or death.

Additional Storage Warning: Hydrogen sulfide and other relatively low flash point substances may accumulate in vapor spaces of fuel oil tanks and bulk transport compartments. This not only poses an additional physical hazard (e.g., flammability) but also a potentially serious health hazard as well, due to the toxicity of hydrogen sulfide.

8. EXPOSURE CONTROL, PERSONAL PROTECTION

Eye Protection:	Remove contact lenses and wear chemical safety glasses or goggles where contact with liquid or mist may occur.
Skin Protection:	Wear impervious gloves when contact with skin may occur. Launder contaminated clothing prior to reuse. Wash with soap and water before eating, drinking or smoking.
Inhalation:	Use approved respiratory protective equipment for cleaning large spills or entry into tanks, vessels or other confined spaces.

Ventilation: Provide adequate general and local ventilation: (1) to maintain airborne chemical concentrations below applicable exposure limits, (2) to prevent accumulation of flammable vapors and formation of explosive atmospheres, and (3) to prevent formation of oxygen deficient atmospheres, especially in confined spaces. [Note: this product may release gases or vapors that can displace oxygen in enclosed areas.]

9. PHYSICAL & CHEMICAL PROPERTIES

See certificate of quality №456 dd 09/30/06
Odor: Mild petroleum
Appearance: Black viscous liquid

10. STABILITY & REACTIVITY

Stability: Stable under normal conditions of use.
Hazardous Polymerization: Will not occur.
Conditions to Avoid/Incompatibilities: Strong oxidizing agents, heat, sparks, flame and build up of static electricity.
Hazardous Decomposition Products: CO, CO_2, SO_2, H_2S, and reactive hydrocarbons.

11. TOXICOLOGICAL INFORMATION

No data available.

12. ECOLOGICAL INFORMATION

No data available.

13. DISPOSAL INFORMATION

Dispose through a licensed waste disposal company. Follow applicable federal, state and local disposal regulations.

14. TRANSPORT INFORMATION

Fuel Oil, 3, NA 1993, Packing Group III.

15. REGULATORY INFORMATION

EPA SARA TITLE III

Section 302 EPCRA Extremely Hazardous Substances (EHS)

Product Component	CAS No.	Wt%	RQ, lb	TPQ, lb
Hydrogen Sulfide	7783-00-4	0-0.04	100	500

Section 304 CERCLA Hazardous Substances

Product Component	CAS No.	Wt%	RQ, lb
Hydrogen Sulfide	7783-00-4	0-0.04	100

Section 311/312 Hazard Categorization

Acute:	Chronic:	Fire:	Pressure:	Reactive:
X	X	X		

Section 313 EPCRA Toxic Substances

Product Component	CAS No.	Wt.%
Hydrogen Sulfide	7783-00-4	0-0.04

Key: RQ = Reportable Quantity
TPQ = Threshold Planning Quantity of EHS

16. OTHER INFORMATION

THIS INFORMATION RELATES ONLY TO THE SPECIFIC MATERIAL DESIGNATED AND MAY NOT BE VALID FOR SUCH MATERIAL USED IN COMBINATION WITH ANY OTHER MATERIALS OR IN ANY PROCESS. SUCH INFORMATION IS TO THE BEST OF THIS COMPANY'S KNOWLEDGE AND BELIEVED ACCURATE AND RELIABLE AS OF THE DATE INDICATED. HOWEVER, NO REPRESENTATION, WARRANTY OR GUARANTEE IS MADE AS TO THE ACCURACY, RELIABILITY OR COMPLETENESS. IT IS THE USER'S RESPONSIBILITY TO SATISFY THEMSELVES AS TO THE SUITABILITY AND COMPLETENESS OF SUCH INFORMATION FOR THEIR OWN PARTICULAR USE.

This is the end of MSDS A0007b.msd

MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: GASOLINE, UNLEADED AUTOMOTIVE
Product Description: Hydrocarbons and Additives
Product Code: 123455-20, 9700, 977032, 977217, 977306, 977360, 977371, 977381, 977445, 977562, 977767, 977920, 979533, 97A039, 97A065, 97A078, 97A087, 97A102, 97A108, 97A146, 97A147, 97A152, 97A193, 97A200, 97A240, 97A266, 97A273, 97A290, 97A305, 97A316, 97A317, 97A328, 97A347, 97A380, 97A404, 97A424, 97A431, 97A441, 97A514, 97A556, 97A557, 97A613, 97A634, 97A653, 97A655, 97A659, 97A686, 97A696, 97A703, 97A712, 97A726, 97A736, 97A746, 97A767, 97A794, 97A798, 97A827, 97A848, 97A851, 97A876, 97A883, 97A907, 97A934, 97A948, 97A949, 97A960, 97A983, 97A989, 97AW38, 97C070, 97C072, 97C075, 97C110, 97C112, 97C113, 97C118, 97C127, 97C140, 97C148, 97C166, 97C417, 97C558, 97C576, 97C632, 97C702, 97C731, 97C759, 97C770, 97C782, 97C794, 97C870, 97C917, 97D130, 97D228, 97E002, 97E010, 97E041, 97E065, 97E087, 97E103, 97E104, 97E11, 97E112, 97E113, 97E170, 97E171, 97E196, 97E197, 97E259, 97E260, 97E304, 97E305, 97E347, 97E42, 97E532, 97E564, 97E581, 97E595, 97E606, 97E611, 97E619, 97E649, 97E655, 97E66, 97E682, 97E749, 97E860, 97E88, 97E999, 97F005, 97F020, 97F030, 97F054, 97F312, 97F344, 97F952, 97M190, 97M191, 97M192, 97M193, 97M194, 97M195, 97M229, 97M230, 97M232, 97N832, 97N844, 97N861, 97N873, 97N879, 97N891, 97N895, 97N917, 97N921, 97N954, 97Q303, 97Q763, 97Q781, 97Q782, 97R368, 97S760, 97X861, EMGF20
Intended Use: Fuel, Gasoline

COMPANY IDENTIFICATION

Supplier: EXXON MOBIL CORPORATION
3225 GALLOWS RD.
FAIRFAX, VA. 22037 USA

24 Hour Health Emergency	609-737-4411
Transportation Emergency Phone	800-424-9300
ExxonMobil Transportation No.	281-834-3296
MSDS Requests	713-613-3661
Product Technical Information	800-662-4525, 800-947-9147
MSDS Internet Address	http://www.exxon.com, http://www.mobil.com

SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

Reportable Hazardous Substance(s) or Complex Substance(s)

Name	CAS#	Concentration*
ETHYL ALCOHOL	64-17-5	< 11%
GASOLINE	86290-81-5	89 - 100%

Hazardous Constituent(s) Contained in Complex Substance(s)

Name	CAS#	Concentration*
BENZENE	71-43-2	0.1 - 5%
ETHYL BENZENE	100-41-4	1 - 5%
N-HEXANE	110-54-3	1 - 5%
NAPHTHALENE	91-20-3	<1%
PSEUDOCUMENE (1,2,4-TRIMETHYLBENZENE)	95-63-6	1 - 5%
TOLUENE	108-88-3	5 - 10%

TRIMETHYL BENZENE	25551-13-7	1 - 5%
XYLENES	1330-20-7	5 - 10%

* All concentrations are percent by weight unless material is a gas. Gas concentrations are in percent by volume.

NOTE: The concentration of the components shown above may vary substantially. In certain countries, benzene content may be limited to lower levels. Oxygenates such as tertiary-amyl-methyl ether, ethanol, di-isopropyl ether, and ethyl-tertiary-butyl ether may be present. Because of volatility considerations, gasoline vapor may have concentrations of components very different from those of liquid gasoline. The major components of gasoline vapor are: butane, isobutane, pentane, and isopentane. The reportable component percentages, shown in the composition/information on ingredients section, are based on API's evaluation of a typical gasoline mixture.

SECTION 3 HAZARDS IDENTIFICATION

This material is considered to be hazardous according to regulatory guidelines (see (M)SDS Section 15).

POTENTIAL PHYSICAL / CHEMICAL EFFECTS

Extremely flammable. Material can release vapors that readily form flammable mixtures. Vapor accumulation could flash and/or explode if ignited. Material can accumulate static charges which may cause an incendiary electrical discharge.

POTENTIAL HEALTH EFFECTS

Irritating to skin. If swallowed, may be aspirated and cause lung damage. May be irritating to the eyes, nose, throat, and lungs. May cause central nervous system depression. High-pressure injection under skin may cause serious damage. Prolonged and repeated exposure to benzene may cause serious injury to blood forming organs and is associated with anemia and to the later development of acute myelogenous leukemia (AML).

Target Organs: Lung | Skin |

ENVIRONMENTAL HAZARDS

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

NFPA Hazard ID:	Health:	1	Flammability:	3	Reactivity:	0
HMIS Hazard ID:	Health:	1*	Flammability:	3	Reactivity:	0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 4 FIRST AID MEASURES

INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing

before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION

Seek immediate medical attention. Do not induce vomiting.

NOTE TO PHYSICIAN

If ingested, material may be aspirated into the lungs and cause chemical pneumonitis. Treat appropriately.

PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE

Benzene- Individuals with liver disease may be more susceptible to toxic effects.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Inappropriate Extinguishing Media: Straight Streams of Water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. If a leak or spill has not ignited, use water spray to disperse the vapors and to protect personnel attempting to stop a leak. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Firefighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Unusual Fire Hazards: Extremely Flammable. Vapors are flammable and heavier than air. Vapors may travel across the ground and reach remote ignition sources causing a flashback fire danger. Hazardous material. Firefighters should consider protective equipment indicated in Section 8.

Hazardous Combustion Products: Smoke, Fume, Sulfur oxides, Aldehydes, Oxides of carbon, Incomplete combustion products

FLAMMABILITY PROPERTIES

Flash Point [Method]: <-40C (-40F) [ASTM D-56]
Flammable Limits (Approximate volume % in air): LEL: 1.4 UEL: 7.6
Autoignition Temperature: >250°C (482°F)

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. US regulations require reporting releases of this material to the environment which exceed the applicable reportable quantity or oil spills which could reach any waterway including intermittent dry creeks. The National Response Center can be reached at (800)424-8802.

PROTECTIVE MEASURES

Avoid contact with spilled material. Warn or evacuate occupants in surrounding and downwind areas if required due to toxicity or flammability of the material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for Personal Protective Equipment.

SPILL MANAGEMENT

Land Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do it without risk. All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. Prevent entry into waterways, sewer, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Large Spills: Water spray may reduce vapor; but may not prevent ignition in closed spaces. Recover by pumping or with suitable absorbent.

Water Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do it without risk. Do not confine in area of spill. Advise occupants and shipping in downwind areas of fire and explosion hazard and warn them to stay clear. Allow liquid to evaporate from the surface. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dike far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7 HANDLING AND STORAGE

HANDLING

Avoid breathing mists or vapors. Avoid contact with skin. Use non-sparking tools and explosion-proof equipment. Potentially toxic/irritating fumes/vapors may be evolved from heated or agitated material. Do not siphon by mouth. Use only with adequate ventilation. Use proper bonding and/or grounding procedures. Do not use as a cleaning solvent or other non-motor fuel uses. For use as a motor fuel only. It is dangerous and/or unlawful to put fuel into unapproved containers. Do not fill container while it is in or on a vehicle. Static electricity may ignite vapors and cause fire. Place container on ground when filling and keep nozzle in contact with container. Do not use electronic devices (including but not limited to cellular phones, computers, calculators, pagers or other electronic devices, etc.) in or around any fueling operation or storage area unless the devices are certified intrinsically safe by an approved national testing agency and to the safety standards required by national and/or local laws and regulations. Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source).

Static Accumulator: This material is a static accumulator.

STORAGE

Ample fire water supply should be available. A fixed sprinkler/deluge system is recommended. Keep container closed. Handle containers with care. Open slowly in order to control possible pressure release. Store in a cool, well-ventilated area. Outside or detached storage preferred. Storage containers should be grounded and

bonded. Drums must be grounded and bonded and equipped with self-closing valves, pressure vacuum bungs and flame arresters.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

Exposure limits/standards (Note: Exposure limits are not additive)

Source	Form	Limit / Standard			Note	Source
BENZENE		OSHA Action level	0.5 ppm		N/A	OSHA Sp.Reg.
BENZENE		STEL	5 ppm		N/A	OSHA Sp.Reg.
BENZENE		TWA	1 ppm		N/A	OSHA

bonded. Drums must be grounded and bonded and equipped with self-closing valves, pressure vacuum bungs and flame arresters.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

Exposure limits/standards (Note: Exposure limits are not additive)

Source	Form	Limit / Standard			Note	Source
BENZENE		OSHA Action level	0.5 ppm		N/A	OSHA Sp.Reg.
BENZENE		STEL	5 ppm		N/A	OSHA Sp.Reg.
BENZENE		TWA	1 ppm		N/A	OSHA Sp.Reg.
BENZENE		STEL	2.5 ppm		Skin	ACGIH
BENZENE		TWA	0.5 ppm		Skin	ACGIH
ETHYL ALCOHOL		TWA	1900 mg/m3	1000 ppm	N/A	OSHA Z1
ETHYL ALCOHOL		TWA	1000 ppm		N/A	ACGIH
ETHYL BENZENE		TWA	435 mg/m3	100 ppm	N/A	OSHA Z1
ETHYL BENZENE		STEL	125 ppm		N/A	ACGIH
ETHYL BENZENE		TWA	100 ppm		N/A	ACGIH
GASOLINE	Vapor.	TWA	300 mg/m3	100 ppm	N/A	ExxonMobil
GASOLINE		STEL	500 ppm		N/A	ACGIH
GASOLINE		TWA	300 ppm		N/A	ACGIH
N-HEXANE		TWA	1800 mg/m3	500 ppm	N/A	OSHA Z1
N-HEXANE		TWA	50 ppm		Skin	ACGIH
NAPHTHALENE		TWA	50 mg/m3	10 ppm	N/A	OSHA Z1
NAPHTHALENE		STEL	15 ppm		Skin	ACGIH
NAPHTHALENE		TWA	10 ppm		Skin	ACGIH
PSEUDOCUMENE (1,2,4-TRIMETHYLBENZENE)		TWA	25 ppm		N/A	ACGIH
TOLUENE		Ceiling	300 ppm		N/A	OSHA Z2
TOLUENE		Maximum concentration	500 ppm		N/A	OSHA Z2
TOLUENE		TWA	200 ppm		N/A	OSHA Z2
TRIMETHYL BENZENE		TWA	25 ppm		N/A	ACGIH
XYLENES		TWA	435 mg/m3	100 ppm	N/A	OSHA Z1
XYLENES		STEL	150 ppm		N/A	ACGIH
XYLENES		TWA	100 ppm		N/A	ACGIH

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions.
Control measures to consider:
Use explosion-proof ventilation equipment to stay below exposure limits.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:
No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapor warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Work conditions can greatly affect glove durability; inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:
If prolonged or repeated contact is likely, chemical resistant gloves are recommended. If contact with forearms is likely, wear gauntlet style gloves.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:
If prolonged or repeated contact is likely, chemical, and oil resistant clothing is recommended.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

ENVIRONMENTAL CONTROLS
See Sections 6, 7, 12, 13.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Typical physical and chemical properties are given below. Consult the Supplier in Section 1 for additional data.

GENERAL INFORMATION
Physical State: Liquid
Color: Clear (May Be Dyed)
Odor: Petroleum/Solvent
Odor Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 C): 0.74
Flash Point [Method]: <-40C (-40F) [ASTM D-56]
Flammable Limits (Approximate volume % in air): LEL: 1.4 UEL: 7.6
Autoignition Temperature: >250°C (482°F)
Boiling Point / Range: > 20C (68F)
Vapor Density (Air = 1): 3 at 101 kPa
Vapor Pressure: > 26.6 kPa (200 mm Hg) at 20 C
Evaporation Rate (n-butyl acetate = 1): > 10
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): > 3
Solubility in Water: Negligible
Viscosity: <1 cSt (1 mm2/sec) at 40 C
Oxidizing Properties: See Sections 3, 15, 16.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: N/A

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Avoid heat, sparks, open flames and other ignition sources.

MATERIALS TO AVOID: Halogens, Strong Acids, Alkalies, Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Route of Exposure	Conclusion / Remarks
Inhalation	
Toxicity (Rat): LC50 > 5000 mg/m3	Minimally Toxic. Based on test data for structurally similar materials.
Irritation: No end point data.	Elevated temperatures or mechanical action may form vapors, mist, or fumes which may be irritating to the eyes, nose, throat, or lungs. Based on assessment of the components.
Ingestion	
Toxicity (Rat): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Skin	
Toxicity (Rabbit): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Irritation: No end point data.	Moderately irritating to skin with prolonged exposure. Based on test data for structurally similar materials.
Eye	

Irritation: Data available.	May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials.

CHRONIC/OTHER EFFECTS

For the product itself:

Laboratory animal studies have shown that prolonged and repeated inhalation exposure to light hydrocarbon vapors in the same boiling range as this product can produce adverse kidney effects in male rats. However, these effects were not observed in similar studies with female rats, male and female mice, or in limited studies with other animal species. Additionally, in a number of human studies, there was no clinical evidence of such effects at normal occupational levels. In 1991, The U.S. EPA determined that the male rat kidney is not useful for assessing human risk.

Vapor concentrations above recommended exposure levels are irritating to the eyes and the respiratory tract, may cause headaches and dizziness, are anesthetic and may have other central nervous system effects. Small amounts of liquid aspirated into the lungs during ingestion or from vomiting may cause chemical pneumonitis or pulmonary edema.

Gasoline unleaded: Caused cancer in animal tests. Chronic inhalation studies resulted in liver tumors in female mice and kidney tumors in male rats. Neither result considered significant for human health risk assessment by the United States EPA and others. Did not cause mutations In Vitro or In Vivo. Negative in inhalation developmental studies and reproductive tox studies.Inhalation of high concentrations in animals resulted in reversible central nervous system depression, but no persistent toxic effect on the nervous system. Non-sensitizing in test animals. Caused nerve damage in humans from abusive use (sniffing).

Contains:

BENZENE: Caused cancer (leukemia), damage to the blood-producing system, and serious blood disorders from prolonged, high exposure based on human epidemiology studies. Caused genetic effects and effects on the immune system in laboratory animal and some human studies. Caused toxicity to the fetus in laboratory animal studies. ETHANOL: Prolonged or repeated exposure to high concentrations of ethanol vapor or overexposure by ingestion may produce adverse effects to brain, kidney, liver, and reproductive organs, birth defects in offspring, and developmental toxicity in offspring.

NAPHTHALENE: Exposure to high concentrations of naphthalene may cause destruction of red blood cells, anemia, and cataracts. Naphthalene caused cancer in laboratory animal studies, but the relevance of these findings to humans is uncertain. N-HEXANE: Prolonged and/or repeated exposures to n-Hexane can cause progressive and potentially irreversible damage to the peripheral nervous system (e.g. fingers, feet, arms, legs, etc.). Simultaneous exposure to Methyl Ethyl Ketone (MEK) or Methyl Isobutyl Ketone (MIBK) and n-Hexane can potentiate the risk of adverse effects from n-Hexane on the peripheral nervous system. n-Hexane has been shown to cause testicular damage at high doses in male rats. The relevance of this effect for humans is unknown.

TOLUENE : Concentrated, prolonged or deliberate inhalation may cause brain and nervous system damage. Prolonged and repeated exposure of pregnant animals (> 1500 ppm) have been reported to cause adverse fetal developmental effects.

TRIMETHYLBENZENE: Long-term inhalation exposure of trimethylbenzene caused effects to the blood in laboratory animals.

ETHYLBENZENE: Caused cancer in laboratory animal studies. The relevance of these findings to humans is uncertain.

Additional information is available by request.

The following ingredients are cited on the lists below:

Chemical Name	CAS Number	List Citations
BENZENE	71-43-2	1, 3, 6
ETHYL BENZENE	100-41-4	5

GASOLINE	86290-81-5	5
NAPHTHALENE	91-20-3	2, 5

--REGULATORY LISTS SEARCHED--

1 = NTP CARC
2 = NTP SUS
3 = IARC 1
4 = IARC 2A
5 = IARC 2B
6 = OSHA CARC

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Expected to be toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

MOBILITY

More volatile component -- Highly volatile, will partition rapidly to air. Not expected to partition to sediment and wastewater solids.
Less volatile component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

PERSISTENCE AND DEGRADABILITY

Biodegradation:

Majority of components -- Expected to be inherently biodegradable

Atmospheric Oxidation:

More volatile component -- Expected to degrade rapidly in air

BIOACCUMULATION POTENTIAL

Majority of components -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

REGULATORY DISPOSAL INFORMATION

RCRA Information: Disposal of unused product may be subject to RCRA regulations (40 CFR 261). Disposal of the used product may also be regulated due to ignitability, corrosivity, reactivity or toxicity as determined by the Toxicity Characteristic Leaching Procedure (TCLP). Potential RCRA characteristics: IGNITABILITY. TCLP (BENZENE)

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and

can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14 TRANSPORT INFORMATION

LAND (DOT)

Proper Shipping Name: GASOLINE
Hazard Class & Division: 3
ID Number: 1203
Packing Group: II
ERG Number: 128
Label(s): 3
Transport Document Name: UN1203, GASOLINE, 3, PG II

LAND (TDG)

Proper Shipping Name: GASOLINE
Hazard Class & Division: 3
UN Number: 1203
Packing Group: II
Special Provisions: 17

SEA (IMDG)

Proper Shipping Name: MOTOR SPIRIT or GASOLINE or PETROL
Hazard Class & Division: 3
EMS Number: F-E, S-E
UN Number: 1203
Packing Group: II
Label(s): 3
Transport Document Name: UN1203, MOTOR SPIRIT or GASOLINE or PETROL, 3, PG II, (-40°C c.c.)

AIR (IATA)

Proper Shipping Name: GASOLINE
Hazard Class & Division: 3
UN Number: 1203
Packing Group: II
Label(s): 3
Transport Document Name: UN1203, GASOLINE, 3, PG II

SECTION 15 REGULATORY INFORMATION

OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purpose, this material is classified as hazardous in accordance with OSHA 29CFR 1910.1200.

NATIONAL CHEMICAL INVENTORY LISTING: AICS, DSL, EINECS, ENCS, KECI, PICCS, TSCA

EPCRA: This material contains no extremely hazardous substances.

CERCLA: This material is not subject to any special reporting under the requirements of the Comprehensive

Environmental Response, Compensation and Liability Act (CERCLA). Contact local authorities to determine if other reporting requirements apply.

SARA (311/312) REPORTABLE HAZARD CATEGORIES: Fire. Immediate Health. Delayed Health.

SARA (313) TOXIC RELEASE INVENTORY:

Chemical Name	CAS Number	Typical Value
PSEUDOCUMENE (1,2,4-TRIMETHYLBENZENE)	95-63-6	1 - 5%
N-HEXANE	110-54-3	1 - 5%
ETHYL BENZENE	100-41-4	1 - 5%
XYLENES	1330-20-7	5 - 10%
BENZENE	71-43-2	0.1 - 5%
NAPHTHALENE	91-20-3	<1%
TOLUENE	108-88-3	5 - 10%

The Following Ingredients are Cited on the Lists Below:

Chemical Name	CAS Number	List Citations
BENZENE	71-43-2	1, 2, 4, 10, 11, 13, 15, 16, 17, 18, 19
ETHYL ALCOHOL	64-17-5	1, 4, 13, 16, 17, 18, 19
ETHYL BENZENE	100-41-4	1, 4, 10, 13, 16, 17, 18, 19
GASOLINE	86290-81-5	1, 18
N-HEXANE	110-54-3	1, 4, 13, 16, 17, 18, 19
NAPHTHALENE	91-20-3	1, 4, 5, 10
PSEUDOCUMENE (1,2,4-TRIMETHYLBENZENE)	95-63-6	1, 13, 16, 17, 18, 19
TOLUENE	108-88-3	4, 11, 13, 15, 16, 17, 18, 19
TRIMETHYL BENZENE	25551-13-7	1, 13, 16, 17, 18, 19
XYLENES	1330-20-7	1, 4, 5, 13, 15, 16, 17, 18, 19

--REGULATORY LISTS SEARCHED--

1 = ACGIH ALL	6 = TSCA 5a2	11 = CA P65 REPRO	16 = MN RTK
2 = ACGIH A1	7 = TSCA 5e	12 = CA RTK	17 = NJ RTK
3 = ACGIH A2	8 = TSCA 6	13 = IL RTK	18 = PA RTK
4 = OSHA Z	9 = TSCA 12b	14 = LA RTK	19 = RI RTK
5 = TSCA 4	10 = CA P65 CARC	15 = MI 293	

Code key: CARC=Carcinogen; REPRO=Reproductive

SECTION 16 OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:
No revision information is available.
THIS MSDS COVERS THE FOLLOWING MATERIALS: ESSO EXTRA MIDGRADE UNLEADED | ESSO MIDGRADE UNLEADED | ESSO PREMIUM UNLEADED | ESSO REGULAR UNLEADED | ESSO SUPER PREMIUM UNLEADED | EXXON MIDGRADE UNLEADED | EXXON PREMIUM UNLEADED | EXXON REGULAR UNLEADED | GASOLINE | INDOLENE GASOLINE | MIDGRADE UNLEADED | MOBIL EXTRA UNLEADED |

MOBIL REGULAR UNLEADED | MOBIL SPECIAL UNLEADED | MOBIL SUPER UNLEADED | PREMIUM UNLEADED | REGULAR UNLEADED | UNLEADED GASOLINE

PRECAUTIONARY LABEL TEXT:
Contains: BENZENE, GASOLINE
DANGER!
HEALTH HAZARDS
Irritating to skin. If swallowed, may be aspirated and cause lung damage. Prolonged and repeated exposure to benzene may cause serious injury to blood forming organs and is associated with anemia and to the later development of acute myelogenous leukemia (AML).
Target Organs: Lung | Skin |

PHYSICAL HAZARDS
Extremely flammable. Material can accumulate static charges which may cause an incendiary electrical discharge. Material can release vapors that readily form flammable mixtures. Vapor accumulation could flash and/or explode if ignited.

PRECAUTIONS
Avoid breathing mists or vapors. Avoid contact with skin. Use non-sparking tools and explosion-proof equipment. Potentially toxic/irritating fumes/vapors may be evolved from heated or agitated material. Do not siphon by mouth. Use only with adequate ventilation. Use proper bonding and/or grounding procedures.

FIRST AID
Inhalation: Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

Eye: Flush thoroughly with water. If irritation occurs, get medical assistance.

Oral: Seek immediate medical attention. Do not induce vomiting.

Skin: Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

FIRE FIGHTING MEDIA
Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

SPILL/LEAK
Land Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do it without risk. Prevent entry into waterways, sewer, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Recover by pumping or with suitable absorbent.

Water Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do it without risk. Do not confine in area of spill. Advise occupants and shipping in downwind areas of fire and explosion hazard and warn them to stay clear. Allow liquid to evaporate from the surface. Seek the advice of a specialist before using dispersants.

This warning is given to comply with California Health and Safety Code 25249.6 and does not constitute an admission or a waiver of rights. This product contains a chemical known to the State of California to cause cancer, birth defects, or other reproductive harm. Chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm are created by the combustion of this product.

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Material Safety Data Sheet

Material Name: 44K® **MSDS ID: 208**

*** Section 1 - Chemical Product and Company Identification ***

Part Number: 208, 208A, 2081, 2085, 20816, 20830, 20853
Product Use: Gasoline Additive
Manufacturer Information

BG Products Inc.
701 S. Wichita Street
Wichita, KS 67213

Phone: (316) 265-2686
Fax: (316) 265-0718
Emergency # 1-800-424-9300 (CHEMTREC)

*** Section 2 - Hazards Identification ***

Emergency Overview

WARNING:

- Combustible liquid. Do not use or store near flames, sparks, or hot surfaces.
- This product is irritating to the eyes and skin.
- This product may be harmful by inhalation.
- This product may be harmful if it is swallowed.

HMIS Ratings: Health: 1 **Fire:** 2 **Physical Hazard:** 0 **Pers. Prot.:** B
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

*** Section 3 - Composition / Information on Ingredients ***

CAS #	Component	Percent
Mixture	Petroleum distillates	40-70
8052-41-3	Mineral spirits	20-25

Component Related Regulatory Information

This product may be regulated, have exposure limits or other information identified as the following: Naphtha (petroleum), hydrotreated heavy, Petroleum distillates, hydrotreated light, Petroleum naphtha, light aromatic.

Component Information

This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication). This product is considered a controlled product under the Canadian Controlled Products Regulations (CPR).

*** Section 4 - First Aid Measures ***

First Aid: Eyes

In case of contact, immediately flush eyes with large amounts of water, continuing to flush for 15 minutes. If irritation persists get medical attention.

First Aid: Skin

For skin contact flush with large amounts of water while removing contaminated clothing. If irritation persists, get medical attention.

First Aid: Ingestion

If ingested, get immediate medical attention. Do not induce vomiting unless instructed to do so by medical personnel.

First Aid: Inhalation

Move person to non-contaminated air. Give artificial respiration if not breathing. Call a physician if symptoms develop or persist.

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*** Section 5 - Fire Fighting Measures ***

General Fire Hazards

See Section 9 for Flammability Properties.
Keep away from heat, sparks, or open flame.

Hazardous Combustion Products

Upon decomposition, this product emits carbon monoxide, carbon dioxide and/or low molecular weight hydrocarbons.

Extinguishing Media

Dry chemical, foam, carbon dioxide.

Fire Fighting Equipment/Instructions

Fire fighters should wear full-face, self contained breathing apparatus and impervious protective clothing. Fire fighters should avoid inhaling any combustion products.

NFPA Ratings: Health: 1 **Fire:** 2 **Reactivity:** 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

*** Section 6 - Accidental Release Measures ***

Containment Procedures

Contain the discharged material. Remove sources of ignition.

Clean-Up Procedures

Wear appropriate protective equipment and clothing during clean-up. Absorb spill with inert material. Shovel material into appropriate container for disposal.

Evacuation Procedures

Isolate area. Keep unnecessary personnel away. In case of large spills, follow all facility emergency response procedures.

Special Procedures

Wear appropriate personal protective equipment.

*** Section 7 - Handling and Storage ***

Handling Procedures

Avoid getting this material into contact with your skin and eyes. Wash thoroughly after handling. Use this product with adequate ventilation. Keep container closed.

Storage Procedures

Do not store this material in open or unlabeled containers. Store this product in air-tight containers away from sources of heat and light.

*** Section 8 - Exposure Controls / Personal Protection ***

A: Component Exposure Limits

Mineral spirits (8052-41-3)

ACGIH:	100 ppm TWA
OSHA:	100 ppm TWA; 525 mg/m3 TWA
NIOSH:	350 mg/m3 TWA
	1800 mg/m3 Ceiling (15 min)

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B: Canadian Provincial Exposure Limits

Petroleum distillates (Mixture)

British Columbia:	200 mg/m3 TWA (as total hydrocarbon vapour) (related to Jet fuels) Skin notation (related to Jet fuels)

Mineral spirits (8052-41-3)

Alberta:	100 ppm TWA; 572 mg/m3 TWA
British Columbia:	290 mg/m3 TWA 580 mg/m3 STEL
Manitoba:	100 ppm TWA; 525 mg/m3 TWA
New Brunswick:	100 ppm TWA; 525 mg/m3 TWA
NW Territories:	100 ppm TWA; 575 mg/m3 TWA 125 ppm STEL; 720 mg/m3 STEL
Nova Scotia:	100 ppm TWA
Nunavut:	100 ppm TWA; 575 mg/m3 TWA 125 ppm STEL; 720 mg/m3 STEL
Ontario:	525 mg/m3 TWAEV
Quebec:	100 ppm TWAEV; 525 mg/m3 TWAEV
Saskatchewan:	525 mg/m3 TWA; 100 ppm TWA 656 mg/m3 STEL; 125 ppm STEL
Yukon:	100 ppm TWA; 575 mg/m3 TWA 150 ppm STEL; 720 mg/m3 STEL

Engineering Controls

Provide adequate local exhaust ventilation to maintain worker exposure below exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes/Face

Wear safety glasses; chemical goggles (if splashing is possible).

Personal Protective Equipment: Skin

Use appropriate hand protection.

Personal Protective Equipment: Respiratory

Use NIOSH approved respirator with cartridge, air line, or SCBA as appropriate based on workplace exposure evaluations.

Personal Protective Equipment: General

Use good industrial hygiene practices in handling this material.

* * * Section 9 - Physical & Chemical Properties * * *

Appearance:	Light yellow liquid	**Odor:**	Solvent
Physical State:	Liquid	**Flash Point:**	43°C (110°F)
Flash Point Method:	PMCC	**Boiling Point:**	156°C (312°F)
Melting Point:	Not Determined	**Pour Point**	<-48°C (-55°F)
Specific Gravity:	0.8533	**Bulk Density:**	7.114 lbs/gal
Solubility (H2O):	Insoluble	**Vapor Pressure:**	Not Available
Vapor Density:	Not Available	**Auto Ignition:**	Not Available
Lower Flammability Limit:	Not Available	**Upper Flammability Limit:**	Not Available
pH:	Not Available		

* * * Section 10 - Chemical Stability & Reactivity Information * * *

Chemical Stability

Stable under normal conditions.

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Chemical Stability: Conditions to Avoid
Keep away from heat, ignition sources and incompatible materials. Avoid strong oxidizing agents.

Incompatibility
This product may react with oxidizing agents. Strong oxidizing agents (peroxides, chlorine, strong acids).

Hazardous Decomposition
Upon decomposition, this product emits carbon monoxide, carbon dioxide and/or low molecular weight hydrocarbons.

Possibility of Hazardous Reactions
Will not occur.

*** Section 11 - Toxicological Information ***

Acute Dose Effects

A: General Product Information
An LD50 value for this product has not been determined.

B: Component Analysis - LD50/LC50
Petroleum distillates (Mixture)
Oral LD50 Rat: >5000 mg/kg; Dermal LD50 Rabbit: >3160 mg/kg (related to Naphtha (petroleum), hydrotreated heavy)

Carcinogenicity

A: General Product Information
No carcinogenicity data available for this product.

B: Component Carcinogenicity
None of this product's components are listed by ACGIH, IARC, OSHA, NIOSH, or NTP.

*** Section 12 - Ecological Information ***

Ecotoxicity
No information available for the product.

*** Section 13 - Disposal Considerations ***

Waste Disposal Instructions
Dispose of in accordance with all applicable Federal, State, Provincial, and local regulations.

*** Section 14 - Transportation Information ***

US DOT Information
Shipping Name: Petroleum Lubricating Oil, Not Regulated

IMDG Information
Shipping Name: Flammable Liquid, n.o.s. (contains Mineral Spirits and Petroleum Distillates)
UN #: 1993 **Hazard Class:** 3 **Packing Group:** III **Flash Point:** 43°C
Required Label(s): Flammable; Limited Quantity if less than or equal to 5L

IATA Information
Shipping Name: Flammable Liquid, n.o.s. (contains Mineral Spirits and Petroleum Distillates)
UN #: 1993 **Hazard Class:** 3 **Packing Group:** III **Flash Point:** 43°C
Required Label(s): Flammable; Limited Quantity if less than or equal to 5L

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*** Section 15 - Regulatory Information ***

US Federal Regulations

Components of this product have been checked against the non-confidential TSCA inventory by CAS Registry Number. Components not identified on this non-confidential inventory are exempt from listing (i.e. as polymers) or are listed on the confidential inventory as declared by the supplier.

A: Component Analysis

None of this products components are listed under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), or CERCLA (40 CFR 302.4).

B: Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
Mineral spirits	8052-41-3	Yes	DSL	EINECS

State Regulations

Other state regulations may apply. Check individual state requirements.

Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
Mineral spirits	8052-41-3	Yes	Yes	Yes	Yes	Yes	Yes

Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Mineral spirits	8052-41-3	1 %

*** Section 16 - Other Information ***

Other Information

We believe the statements, technical information and recommendations contained herein are reliable, but they are given without warranty or guarantee of any kind, express or implied, and we assume no responsibility for any loss, damage, or expense, direct or consequential, arising out of their use. You must notify each person to whom this mixture or trade name product is sold. This statement must not be detached. Any copy or redistribution of the Material Safety Data Sheet shall include this statement.

Key/Legend

ACGIH = American Conference of Governmental Industrial Hygienists; CAS = Chemical Abstract Services; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; CFR = Code of Federal Regulations; CPR = Controlled Product Regulations; DOT = Department of Transportation; DSL = Domestic Substances List; EEC = European Economic Community; EINECS = European Inventory of Existing Commercial Chemical Substances; ELINCS = European List of Notified Chemical Substances; EPA = Environmental Protection Agency; HMIS = Hazardous Materials Information System; IARC = International Agency for Research on Cancer; IATA = International Air Transport Association; IDL = Ingredient Disclosure List; IMDG = International Maritime Dangerous Goods; LC50 = Lethal Concentration 50%; LD50 = Lethal Dose 50%; NDSL = Non-Domestic Substances List; NFPA = National Fire Protection Agency; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; SARA = Superfund Amendments and Reauthorization Act; SCBA = Self Contained Breathing Apparatus; TSCA = Toxic Substance Control Act; WHMIS = Workplace Hazardous Materials Information System.

End of MSDS 208

EPAPA008001036

Material Safety Data Sheet

Gluconic acid, zinc salt hydrate

ACC# 15782

Section 1 - Chemical Product and Company Identification

MSDS Name: Gluconic acid, zinc salt hydrate
Catalog Numbers: AC392010000
Synonyms: Zinc gluconate hydrate
Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01
For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
Not available	Gluconic acid, zinc salt hydrate		unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Not available. Appearance: white powder.
Not available.
Target Organs: None known.

Potential Health Effects
Eye: May cause eye irritation.
Skin: May cause skin irritation. May be harmful if absorbed through the skin.
Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.
Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.
Chronic: Not available.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
Ingestion: Get medical aid. Wash mouth out with water.
Inhalation: Remove from exposure and move to fresh air immediately. Get medical aid.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.
Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.
Flash Point: Not available.
Autoignition Temperature: > 155 deg C (> 311.00 deg F)
Explosion Limits, Lower: Not available.
Upper: Not available.
NFPA Rating: Not published.

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Avoid breathing dust, mist, or vapor. Avoid contact with skin and eyes. Avoid ingestion and inhalation.
Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Gluconic acid, zinc salt hydrate	none listed	none listed	none listed
Zinc, bis(D-gluconato-O1,O2)-	none listed	none listed	none listed

OSHA Vacated PELs: Gluconic acid, zinc salt hydrate: No OSHA Vacated PELs are listed for this chemical. Zinc, bis(D-gluconato-O1,O2)-: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment
Eyes: Wear chemical splash goggles.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder
Appearance: white
Odor: odorless
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: Not available.
Decomposition Temperature: Not available.
Solubility: 100 g/l (20°C)
Specific Gravity/Density: Not available.
Molecular Formula:C12H22O14Zn.xH2O
Molecular Weight:455.68

Section 10 - Stability and Reactivity

Chemical Stability: Not available.
Conditions to Avoid: Incompatible materials.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 4468-02-4: ZH3750000
LD50/LC50:
CAS# 4468-02-4:
Oral, mouse: LD50 = 1290 mg/kg;

Carcinogenicity:
CAS# 4468-02-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.
Reproductive Effects: No data available.
Mutagenicity: No data available.
Neurotoxicity: No data available.
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.
Environmental: No information available.
Physical: No information available.
Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:		No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

Gluconic acid, zinc salt hydrate is not listed on the TSCA inventory. It is for research and development use only.

CAS# 4468-02-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
ERCLA Hazardous Substances and corresponding RQs
None of the chemicals in this material have an RQ.
SARA Section 302 Extremely Hazardous Substances
None of the chemicals in this product have a TPQ.
Section 313 No chemicals are reportable under Section 313.
Clean Air Act:
This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.
Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.
OSHA:
None of the chemicals in this product are considered highly hazardous by OSHA.
STATE
CAS# 4468-02-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives
Hazard Symbols:
Not available.
Risk Phrases:

Safety Phrases:
S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)
CAS# 4468-02-4: 0
Canada - DSL/NDSL
CAS# 4468-02-4 is listed on Canada's DSL List.
Canada - WHMIS
not available.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.
Canadian Ingredient Disclosure List

Section 16 - Additional Information

MSDS Creation Date: 2/08/2007
Revision #0 Date: Original.

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of

the possibility of such damages.

SIGMA-ALDRICH

Material Safety Data Sheet

Version 3.1
Revision Date 05/17/2007
Print Date 08/22/2007

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : **Glycerol**

Product Number : G9012
Brand : Sigma-Aldrich

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA
Telephone : +1 800-325-5832
Fax : +1 800-325-5052
Emergency Phone # : (314) 776-6555

2. COMPOSITION/INFORMATION ON INGREDIENTS

Formula : C3H8O3
Molecular Weight : 92.09 g/mol

CAS-No.	EC-No.	Index-No.	Concentration [%]
Glycerol			
56-81-5	200-289-5	-	-

3. HAZARDS IDENTIFICATION

Emergency Overview

OSHA Hazards

Delayed target organ effects
Mild skin irritant
Mild eye irritant

Target Organs

Kidney

HMIS Classification

Health Hazard: 1
Chronic Health Hazard: *
Flammability: 1
Physical hazards: 0

NFPA Rating

Health Hazard: 1
Fire : 0
Reactivity Hazard: 1

Potential Health Effects

Inhalation May be harmful if inhaled. May cause respiratory tract irritation.

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Skin	May be harmful if absorbed through skin. May cause skin irritation.
Eyes	May cause eye irritation.
Ingestion	May be harmful if swallowed.

4. FIRST AID MEASURES

If inhaled
If breathed in, move person into fresh air. If not breathing give artificial respiration

In case of skin contact
Wash off with soap and plenty of water.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water.

5. FIRE-FIGHTING MEASURES

Flammable properties

Flash point	160 °C (320 °F) - closed cup
Ignition temperature	370 °C (698 °F)

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Special protective equipment for fire-fighters
Wear self contained breathing apparatus for fire fighting if necessary.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Avoid breathing vapors, mist or gas.

Environmental precautions
Do not let product enter drains.

Methods for cleaning up
Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

Handling
Normal measures for preventive fire protection.

Storage
Keep container tightly closed in a dry and well-ventilated place.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value	Control parameters	Update	Basis
Glycerol	56-81-5	TWA	10 mg/m3	1994-09-01	US. American Conference of Governmental and Industrial Hygienists Threshold Limit Values for Chemical Substances in the Work Environment; Annual Reports for the Year 2004:Committees on

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					Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs)
Remarks	Inhalable fraction. See Appendix C, paragraph A. Inhalable Particulate Mass TLVs (IPM-TLVs) for those materials that are hazardous when deposited anywhere in the respiratory tract.				
		TWA	5 mg/m3	1989-03-01	US. Department of Labor - Occupational Safety and Health Administration (OSHA) 29 CFR 1910.1000 Z-1-A
		TWA	5 mg/m3	1989-03-01	US. Department of Labor - Occupational Safety and Health Administration (OSHA) 29 CFR 1910.1000 Z-1-A
		TWA	15 mg/m3	1993-06-30	US. Department of Labor - Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits (PEL) 29 CFR 1910.1000 Air Contaminants.
		TWA	5 mg/m3	1993-06-30	US. Department of Labor - Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits (PEL) 29 CFR 1910.1000 Air Contaminants.

Personal protective equipment

Respiratory protection
Respiratory protection is not required. Where protection is desired, use multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection
Handle with gloves.

Eye protection
Safety glasses

Hygiene measures
General industrial hygiene practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	liquid
Colour	clear
Odour	odourless

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Safety data

pH	5.5
Melting point	20 °C (68 °F)
Boiling point	182 °C (360 °F) at 26.7 hPa (20.0 mmHg) 290 °C (554 °F) 290 °C (554 °F)
Flash point	160 °C (320 °F) - closed cup
Ignition temperature	370 °C (698 °F)
Lower explosion limit	0.9 %(V)
Vapour pressure	< 0.13 hPa (< 0.10 mmHg) at 20 °C (68 °F)
Density	1.2620 g/cm3 1.2610 g/cm3
Water solubility	soluble

10. STABILITY AND REACTIVITY

Storage stability
Stable under recommended storage conditions.

Materials to avoid
Strong bases, Strong oxidizing agents

Hazardous decomposition products

Hazardous decomposition products formed under fire conditions.
Carbon oxides

11. TOXICOLOGICAL INFORMATION

Acute toxicity

LD50 Oral - rat - 12,600 mg/kg

LC50 Inhalation - rat - 1 h - > 570 mg/m3

LD50 Dermal - rabbit - > 10,000 mg/kg

Irritation and corrosion

Skin - rabbit - Mild skin irritation - 24 h

Eyes - rabbit - Mild eye irritation - 24 h

Sensitization

no data available

Chronic exposure

no data available

Signs and Symptoms of Exposure

prolonged or repeated exposure can cause:, Nausea, Headache, Vomiting

Potential Health Effects

Inhalation	May be harmful if inhaled. May cause respiratory tract irritation.
Skin	May be harmful if absorbed through skin. May cause skin irritation.
Eyes	May cause eye irritation.

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Ingestion	May be harmful if swallowed.
Target Organs	Kidney,

12. ECOLOGICAL INFORMATION

Elimination information (persistence and degradability)

no data available

Ecotoxicity effects

Toxicity to fish	LC50 - Carassius auratus (goldfish) - > 5,000 mg/l
	LC50 - Pimephales promelas (fathead minnow) - 44,000 mg/l
	LC50 - other fish - > 100,100 mg/l
	LC50 - Oncorhynchus mykiss (rainbow trout) - 67,500 mg/l - 96 h

Further information on ecology

no data available

13. DISPOSAL CONSIDERATIONS

Product
Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
Not dangerous goods

IMDG
Not dangerous goods

IATA
Not dangerous goods

15. REGULATORY INFORMATION

OSHA Hazards
Delayed target organ effects, Mild skin irritant, Mild eye irritant

TSCA Status
On TSCA Inventory

DSL Status
All components of this product are on the Canadian DSL list.

SARA 302 Components
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

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	CAS-No.	Revision Date
Glycerol	56-81-5	1991-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Glycerol	56-81-5	1991-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Glycerol	56-81-5	1991-07-01

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth, or any other reproductive defects.

16. OTHER INFORMATION

Further information
Copyright 2007 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only., The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Co., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.

EPAPA008001048

HALLIBURTON

MATERIAL SAFETY DATA SHEET

Product Trade Name: **GLYCOLIC ACID**

Revision Date: 02-Jan-2007

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Trade Name: GLYCOLIC ACID
Synonyms: None
Chemical Family: Organic acid
Application: Acid

Manufacturer/Supplier
Baroid Drilling Fluids
a Product Service Line of Halliburton Energy Services, Inc.
P.O. Box 1675
Houston, TX 77251
Telephone: (281) 871-4000
Emergency Telephone: (281) 575-5000

Prepared By
Chemical Compliance
Telephone: 1-580-251-4335

2. COMPOSITION/INFORMATION ON INGREDIENTS

SUBSTANCE	CAS Number	PERCENT	ACGIH TLV-TWA	OSHA PEL-TWA
Glycolic acid		60 - 100%	3 ppm	Not applicable

3. HAZARDS IDENTIFICATION

Hazard Overview May cause eye, skin, and respiratory burns. May be harmful if swallowed.

4. FIRST AID MEASURES

Inhalation If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult give oxygen. Get medical attention.

Skin In case of contact, immediately flush skin with plenty of soap and water for at least 15 minutes. Get medical attention. Remove contaminated clothing and launder before reuse.

Eyes In case of contact, or suspected contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention immediately after flushing.

Ingestion Do not induce vomiting. Slowly dilute with 1-2 glasses of water or milk and seek medical attention. Never give anything by mouth to an unconscious person.

Notes to Physician Not Applicable

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5. FIRE FIGHTING MEASURES

Flash Point/Range (F):	Not Determined
Flash Point/Range (C):	Not Determined
Flash Point Method:	Not Determined
Autoignition Temperature (F):	Not Determined
Autoignition Temperature (C):	Not Determined
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Upper (%):	Not Determined

Fire Extinguishing Media	All standard firefighting media.
Special Exposure Hazards	Reacts with metals to generate flammable hydrogen gas. Decomposition in fire may produce toxic gases.
Special Protective Equipment for Fire-Fighters	Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.
NFPA Ratings:	Health 3, Flammability 0, Reactivity 0
HMIS Ratings:	Flammability 0, Reactivity 0, Health 3

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures	Use appropriate protective equipment.
Environmental Precautionary Measures	Prevent from entering sewers, waterways, or low areas.
Procedure for Cleaning / Absorption	Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Neutralize to pH of 6-8. Scoop up and remove.

7. HANDLING AND STORAGE

Handling Precautions	Avoid contact with eyes, skin, or clothing. Avoid breathing vapors. Wash hands after use. Launder contaminated clothing before reuse.
Storage Information	Store away from alkalis. Store in a cool well ventilated area. Keep container closed when not in use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls	Use in a well ventilated area. Local exhaust ventilation should be used in areas without good cross ventilation.
Respiratory Protection	Acid gas respirator.
Hand Protection	Impervious rubber gloves.
Skin Protection	Full protective chemical resistant clothing.
Eye Protection	Chemical goggles; also wear a face shield if splashing hazard exists.
Other Precautions	Eyewash fountains and safety showers must be easily accessible.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Color:	Amber
Odor:	Mild burnt sugar

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9. PHYSICAL AND CHEMICAL PROPERTIES

pH:	1-2
Specific Gravity @ 20 C (Water=1):	1.27
Density @ 20 C (lbs./gallon):	10.6
Bulk Density @ 20 C (lbs/ft3):	Not Determined
Boiling Point/Range (F):	212
Boiling Point/Range (C):	100
Freezing Point/Range (F):	Not Determined
Freezing Point/Range (C):	Not Determined
Vapor Pressure @ 20 C (mmHg):	Not Determined
Vapor Density (Air=1):	Not Determined
Percent Volatiles:	Not Determined
Evaporation Rate (Butyl Acetate=1):	Not Determined
Solubility in Water (g/100ml):	Soluble
Solubility in Solvents (g/100ml):	Not Determined
VOCs (lbs./gallon):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined
Viscosity, Kinematic @ 20 C (centistrokes):	Not Determined
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	Not Determined

10. STABILITY AND REACTIVITY

Stability Data:	Stable
Hazardous Polymerization:	Will Not Occur
Conditions to Avoid	None anticipated
Incompatibility (Materials to Avoid)	Strong oxidizers. Contact with metals. Avoid halogens. Mercury. Silver. Cyanides.
Hazardous Decomposition Products	Flammable hydrogen gas. Carbon monoxide and carbon dioxide.
Additional Guidelines	Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure	Eye or skin contact, inhalation.
Inhalation	Causes severe respiratory irritation.
Skin Contact	Causes severe burns.
Eye Contact	May cause eye burns.
Ingestion	Causes burns of the mouth, throat and stomach.
Aggravated Medical Conditions	Skin disorders.
Chronic Effects/Carcinogenicity	Prolonged, excessive exposure may cause erosion of the teeth.
Other Information	None known.

Toxicity Tests

Oral Toxicity:	LD50: 4240 mg/kg (Rat)
Dermal Toxicity:	Not determined
Inhalation Toxicity:	Not determined

Primary Irritation Effect:	Not determined
Carcinogenicity	Not determined
Genotoxicity:	Not determined
Reproductive / Developmental Toxicity:	Not determined

12. ECOLOGICAL INFORMATION

Mobility (Water/Soil/Air)	Not determined
Persistence/Degradability	Readily biodegradable
Bio-accumulation	Not Determined

Ecotoxicological Information

Acute Fish Toxicity:	Not determined
Acute Crustaceans Toxicity:	Not determined
Acute Algae Toxicity:	Not determined
Chemical Fate Information	Not determined
Other Information	Not applicable

13. DISPOSAL CONSIDERATIONS

Disposal Method	Disposal should be made in accordance with federal, state, and local regulations.
Contaminated Packaging	Follow all applicable national or local regulations.

14. TRANSPORT INFORMATION

Land Transportation

DOT
Corrosive Liquid, Acidic, Organic, N.O.S., 8, UN3265, II
(Contains Glycolic Acid)
NAERG 153

Canadian TDG
Corrosive Liquid, Acidic, Organic, N.O.S.(Contains Glycolic Acid), 8, UN3265, II

ADR
UN3265,Corrosive Liquid, Acidic, Organic, N.O.S.(Contains Glycolic Acid), 8, II

Air Transportation

ICAO/IATA
UN3265,Corrosive Liquid, Acidic, Organic, N.O.S., 8, II
(Contains Glycolic Acid Solution)

Sea Transportation

EPAPA008001052

IMDG
UN3265,Corrosive Liquid, Acidic, Organic, N.O.S.(Contains Glycolic Acid), 8, II
EmS F-A, S-B

Other Shipping Information

Labels: Corrosive

15. REGULATORY INFORMATION

US Regulations

US TSCA Inventory	All components listed on inventory.
EPA SARA Title III Extremely Hazardous Substances	Not applicable
EPA SARA (311,312) Hazard Class	Acute Health Hazard
EPA SARA (313) Chemicals	This product does not contain a toxic chemical for routine annual "Toxic Chemical Release Reporting" under Section 313 (40 CFR 372).
EPA CERCLA/Superfund Reportable Spill Quantity For This Product	Not applicable.
EPA RCRA Hazardous Waste Classification	If product becomes a waste, it does meet the criteria of a hazardous waste as defined by the US EPA, because of: Corrosivity D002
California Proposition 65	All components listed do not apply to the California Proposition 65 Regulation.
MA Right-to-Know Law	Does not apply.
NJ Right-to-Know Law	Does not apply.
PA Right-to-Know Law	Does not apply.

Canadian Regulations

Canadian DSL Inventory	All components listed on inventory.
WHMIS Hazard Class	E Corrosive Material

16. OTHER INFORMATION

The following sections have been revised since the last issue of this MSDS
Not applicable

Additional Information	For additional information on the use of this product, contact your local Halliburton representative. For questions about the Material Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.

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Disclaimer Statement

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

*****END OF MSDS*****

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4-18-07
#32

Material Safety Data Sheet

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

Texaco Starplex®

Product Use: Grease
Product Number(s): CPS221927, CPS221935
Synonyms: Texaco Starplex® 1, Texaco Starplex® 2
Company Identification
Chevron Products Company
Global Lubricants
6001 Bollinger Canyon Road
San Ramon, CA 94583
United States of America

Transportation Emergency Response
CHEMTREC: (800) 424-9300 or (703) 527-3887
Health Emergency
Chevron Emergency Information Center. Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623
Product Information
email : lubemsds@chevrontexaco.com
Product Information: 800-LUBE-TEK
MSDS Requests: 800-414-6737

SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT
Highly refined mineral oil (C15 - C50)	Mixture	70 - 95 %wt/wt
Zinc dialkyldithiophosphate	68649-42-3	1 - 5 %wt/wt

SECTION 3 HAZARDS IDENTIFICATION

IMMEDIATE HEALTH EFFECTS
Eye: Not expected to cause prolonged or significant eye irritation.
Skin: Contact with the skin is not expected to cause prolonged or significant irritation. Not expected to be harmful to internal organs if absorbed through the skin. High-Pressure Equipment Information. Accidental high-velocity injection under the skin of materials of this type may result in serious injury. Seek medical attention at once should an accident like this occur. The initial wound at the injection site may not appear to be serious at first; but, if left untreated, could result in disfigurement or amputation of the affected part.

Ingestion: Not expected to be harmful if swallowed.
Inhalation: Not expected to be harmful if inhaled. Contains a petroleum-based mineral oil. May cause respiratory irritation or other pulmonary effects following prolonged or repeated inhalation of oil mist at concentration levels above the recommended mineral oil mist exposure limit. Symptoms of respiratory irritation may include coughing and difficulty breathing.

SECTION 4 FIRST AID MEASURES

Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.

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Skin: No specific first aid measures are required. As a precaution, remove clothing and shoes if contaminated. To remove the material from skin, apply a waterless hand cleaner, mineral oil, or petroleum jelly. Then wash with soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.
Ingestion: No specific first aid measures are required. Do not induce vomiting. As a precaution, get medical advice.
Inhalation: No specific first aid measures are required. If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs.
Note to Physicians: In an accident involving high-pressure equipment, this product may be injected under the skin. Such an accident may result in a small, sometimes bloodless, puncture wound. However, because of its driving force, material injected into a fingertip can be deposited into the palm of the hand. Within 24 hours, there is usually a great deal of swelling, discoloration, and intense throbbing pain. Immediate treatment at a surgical emergency center is recommended.

SECTION 5 FIRE FIGHTING MEASURES

FIRE CLASSIFICATION:
OSHA Classification (29 CFR 1910.1200): Not classified by OSHA as flammable or combustible.

NFPA RATINGS: Health: 0 Flammability: 1 Reactivity: 0

FLAMMABLE PROPERTIES:
Flashpoint: (Cleveland Open Cup) 200 °C (392 °F) (Min)
Autoignition: No Data Available
Flammability (Explosive) Limits (% by volume in air): Lower: Not Applicable Upper: Not Applicable

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.
PROTECTION OF FIRE FIGHTERS:
Fire Fighting Instructions: This material will burn although it is not easily ignited. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in vicinity of spilled material.
Spill Management: Clean up spills immediately, observing precautions in Exposure Controls/Personal Protection section.
Reporting: Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required.

SECTION 7 HANDLING AND STORAGE

Precautionary Measures: Keep out of the reach of children.
General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.
Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'.
Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

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SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:
Use in a well-ventilated area.

PERSONAL PROTECTIVE EQUIPMENT
Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.
Skin Protection: No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include: Neoprene, Nitrile Rubber, Silver Shield, Viton.
Respiratory Protection: No respiratory protection is normally required.
If user operations generate an oil mist, determine if airborne concentrations are below the occupational exposure limit for mineral oil mist. If not, wear an approved respirator that provides adequate protection from the measured concentrations of this material. For air-purifying respirators use a particulate cartridge.
Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.
Occupational Exposure Limits:

Component	Agency	TWA	STEL	Ceiling	Notation
Highly refined mineral oil (C15 - C50)	ACGIH	5 mg/m3	10 mg/m3	--	--
Highly refined mineral oil (C15 - C50)	OSHA Z-1	5 mg/m3	--	--	--

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Varies depending on specification
Physical State: Semi-solid
Odor: Petroleum odor
pH: Not Applicable
Vapor Pressure: <0.01 mmHg @ 20 °C (68 °F)
Vapor Density (Air = 1): >1
Boiling Point: No Data Available
Solubility: Soluble in hydrocarbon solvents; insoluble in water.
Melting Point: No Data Available
Specific Gravity: 0.9
Viscosity: 15 cSt @ 100°C (212°F) (Min)
Evaporation Rate: No Data Available

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Incompatibility With Other Materials: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Hazardous Decomposition Products: None known (None expected)
Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS

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Eye Irritation: The eye irritation hazard is based on evaluation of data for similar materials or product components.
Skin Irritation: The skin irritation hazard is based on evaluation of data for similar materials or product components.
Skin Sensitization: No product toxicology data available.
Acute Dermal Toxicity: The acute dermal toxicity hazard is based on evaluation of data for similar materials or product components.
Acute Oral Toxicity: The acute oral toxicity hazard is based on evaluation of data for similar materials or product components.
Acute Inhalation Toxicity: The acute inhalation toxicity hazard is based on evaluation of data for similar materials or product components.

ADDITIONAL TOXICOLOGY INFORMATION:
This product contains petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils requires a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B). These oils have not been classified by the American Conference of Governmental Industrial Hygienists (ACGIH) as: confirmed human carcinogen (A1), suspected human carcinogen (A2), or confirmed animal carcinogen with unknown relevance to humans (A3).

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY
The toxicity of this material to aquatic organisms has not been evaluated. Consequently, this material should be kept out of sewage and drainage systems and all bodies of water.

ENVIRONMENTAL FATE
This material is not expected to be readily biodegradable.

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. Oil collection services are available for used oil recycling or disposal. Place contaminated materials in containers and dispose of in a manner consistent with applicable regulations. Contact your sales representative or local environmental or health authorities for approved disposal or recycling methods.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.
DOT Shipping Description: PETROLEUM LUBRICATING GREASE; NOT REGULATED AS A HAZARDOUS MATERIAL FOR TRANSPORTATION UNDER 49 CFR
Additional Information: NOT HAZARDOUS BY U.S. DOT. ADR/RID HAZARD CLASS NOT APPLICABLE.

IMO/IMDG Shipping Description: PETROLEUM LUBRICATING GREASE: NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER THE IMDG CODE

ICAO/IATA Shipping Description: PETROLEUM LUBRICATING GREASE; NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER ICAO

SECTION 15 REGULATORY INFORMATION

EPCRA 311/312 CATEGORIES: 1. Immediate (Acute) Health Effects: NO
2. Delayed (Chronic) Health Effects: NO
3. Fire Hazard: NO
4. Sudden Release of Pressure Hazard: NO

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5. Reactivity Hazard: NO

REGULATORY LISTS SEARCHED:

01-1=IARC Group 1	03=EPCRA 313
01-2A=IARC Group 2A	04=CA Proposition 65
01-2B=IARC Group 2B	05=MA RTK
02=NTP Carcinogen	06=NJ RTK
	07=PA RTK

The following components of this material are found on the regulatory lists indicated.

Zinc dialkyldithiophosphate 03, 06

CHEMICAL INVENTORIES:
All components comply with the following chemical inventory requirements: AICS (Australia), DSL (Canada), EINECS (European Union), KECI (Korea), TSCA (United States).

One or more components does not comply with the following chemical inventory requirements: PICCS (Philippines).

NEW JERSEY RTK CLASSIFICATION:
Under the New Jersey Right-to-Know Act L. 1983 Chapter 315 N.J.S.A. 34:5A-1 et. seq., the product is to be identified as follows: PETROLEUM OIL (Grease)

WHMIS CLASSIFICATION:
This product is not considered a controlled product according to the criteria of the Canadian Controlled Products Regulations.

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 0 Flammability: 1 Reactivity: 0

HMIS RATINGS: Health: 1 Flammability: 1 Reactivity: 0
(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

LABEL RECOMMENDATION:
Label Category : GREASE 1 - GRS1

REVISION STATEMENT: This revision updates the following sections of this Material Safety Data Sheet: 15
Revision Date: July 26, 2006

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Government Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	MSDS - Material Safety Data Sheet
CVX - Chevron	NFPA - National Fire Protection Association (USA)
DOT - Department of Transportation (USA)	NTP - National Toxicology Program (USA)
IARC - International Agency for Research on Cancer	OSHA - Occupational Safety and Health Administration

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI

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MSDS Standard (Z400.1) by the Chevron Energy Technology Company, 100 Chevron Way, Richmond, California 94802.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

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Material Safety Data Sheet

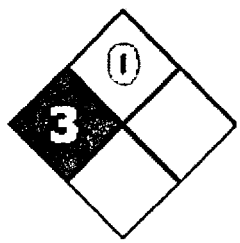
SOCHEM

PPE

HMIS

Health Hazard	3
Fire Hazard	0
Reactivity	1

NFPA



Preparation Date 03-Jun-2008 **Revision Date** **Revision Number** 0

1. PRODUCT AND COMPANY IDENTIFICATION

Product Code L-GR CAUSTIC 18-30%
Product Name Lo-Grade Caustic 18-30%
Contact Manufacturer
Sochem Solutions, Inc.
P. O. box 1912
Gonzales, LA 70707
225-644-3180
Emergency Telephone Number CHEMTREC: (call 24 Hours) 1-800-424-9300
or for International calls dial 703-527-3887 (collect calls accepted)

Application of Substance/the prepartion Industrial Cleaning Chemical

2. HAZARDS IDENTIFICATION

Emergency Overview
- The product causes burns of eyes, skin and mucous membranes

Eye contact
- Causes eye burns

Skin contact
- It will cause burns and irritation

Inhalation
- Avoid breathing vapors or mists

Ingestion
- Severe damage to the gastrointestinal tract

Principle Routes of Exposure Eye contact Skin contact Ingestion Inhalation

Aggravated Medical Conditions
- Existing dermatitis

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS-No	Weight %	EINECS
50% Liquid caustic soda	1310-73-2	18-30	-

29CFR Part 1910, Subpart Z (OSHA) Toxic and Hazardous Substances
Part 355, Appendix A (Extermly Hazardous Substances) EPA
TLV for Chemcial Substances
Annual Report on Carcinogens
Supplier: Material Safety Data Sheets

4. FIRST AID MEASURES

Skin Contact
- Wash with Large amounts of water

Eye Contact
- Flush with water for 15 mintues
- Consult a physician

Inhalation
- Remove to fresh air
- If breathing has stopped, call a physician

Ingestion
- Do not induce vomiting
- Drink large quantity of water, and consult physician

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
- Use extinguishing measures that are appropriate to local circumstances and the surrounding environment

Special Protective Equipment
- None

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions
- Ensure adequate ventilation

Environmental Precautions
- Stop flow and contain spill
- Small spill: Pick up with absorbent material
- Neutralize before disposal

Methods for Clean-up
- Neutralized
- Flush with water to sewer.
- Follow Federal, State and Local regulations
- Large spill reclaim, put in containers

7. HANDLING AND STORAGE

Handling

Safe Handling Advice
- Handle in accordance with good industrial hygiene and safety practice

Storage
- Keep container tightly closed
- Do not store in aluminum containers or use with soft metal parts.

Incompatible products
- Strong Acid

Specific use(s)
- None

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Chemical Name	OSHA PEL	ACGIH TWA
50% Liquid caustic soda	2 mg/m^3	N/A

Personal Protective Equipment

Respiratory Protection
- In case of mist, spray or aerosol exposure wear suitable personal respiratory protection and protective suit

Hand Protection
- Rubber gloves
- Neoprene gloves
- Any chemical resistant gloves

Eye/face Protection
- Chemical goggles
- Face-shield

Skin Protection
- Wear protective gloves/clothing
- Rubber or plastic boots

General Hygiene Considerations
- Avoid breathing mist

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Semi viscous Clear Liquid	**Color**	• Clear
Physical State	• Semi viscous liquid	**pH**	14
Flash Point	N/A	**Autoignition Temperature**	
Boiling Point/Range	288°F		
Solubility	Complete in water	**Vapor Density**	Not est.
Bulk Density	10.60	**Viscosity**	Not available

10. STABILITY AND REACTIVITY

Chemical Stability
- Stable

Incompatible Materials
- Strong acids

Hazardous Decomposition Products
- None under normal use

Hazardous Polymerization
- Hazardous polymerisation does not occur

Possibility of Hazardous Reactions
None under normal processing

11. TOXICOLOGICAL INFORMATION

Local effects

cause irritation	Causes burns. Irritating to skin. dryness of skin.
Eye irritation	Corrosive to the eyes and may cause severe damage including blindness.
Inhalation	May cause irritation of respiratory tract.
Ingestion	Ingestion causes burns of the upper digestive and respiratory tracts.

Long term Effects

12. ECOLOGICAL INFORMATION

Ecotoxicity effects Contains no substances known to be hazardous to the environment or not degradable in waste water treatment plants

Additional ecological information No information available

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method Follow Federal, state and Local regulations.. Large Spill: Reclaim, put in containers. Neutralize before disposal. Flush spill area with water and neutralize with dilute acid if necessary. Do not use aluminum equipment.. Small Spill: Pick up with absorbent material.. Neutralize. Flush with water.

Contaminated Packaging Keep container closed when not in use.

Further information Wash contaminated clothing before reuse

14. TRANSPORT INFORMATION

DOT

Proper Shipping Name	HM-SODIUM HYDROXIDE, SOLUTION CORROSIVE LABEL
Hazard Class	8
UN-No	1824
Packing Group	II
ERG Code	ERG-154

15. REGULATORY INFORMATION

R -phrase(s)	None
S -phrase(s)	None
Symbol(s)	Not a hazardous substance or preparation according to EC-directives 67/548/EEC or 99/45/EC
EU Labeling	None
Contains	None

U.S. Inventories

Chemical Name	TSCA	NJRTK	MRTKL	PARTK
50% Liquid caustic soda		N/A		

International Inventories

Chemical Name	TSCA	DSL	EINECS	ENCS	IECSC	KECL	PICCS	AICS
50% Liquid caustic soda	-	-	-	-	-	-	-	-

16. OTHER INFORMATION

Prepared By Sochem Solutions, Inc.

End of MSDS

EPAPA008001065

Drivers:

Truck #	Driver	Truck Reg #	Weekly Mileage wk()	Weekly Mileage wk()	Weekly Mileage wk()	Weekly Mileage wk()	Weekly Mileage wk()	Weekly Mileage wk()	Weekly Mileage wk()	Weekly Mileage wk()
273	Brent Sittig	R87-990	Houston							
2001	Juan Mendoza	R88-017	179509							
2004	Kevin Wilson	RD3-K61	38379							
292	unassigned	R88-08	133921							
2006	Chris Saylor	RD3-K63	25546							
285	OPEN	R88-001	437083							
2003	Juan Frias	R88-059	111811							
296	Brad Wood	R88-012	Sold							
2005	WRECKED	RD3-K62	WRECKED							
278	OPEN	R87-994	50740							
294	OPEN	R88-010	120369							
277	OPEN	R87-993	700296							
286	OPEN	R88-002	185415							
299	LeRoy Brown	R88-016	113660							

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TRL # 200

BRAKE CONTROL CABLE

Drivers:

Truck #	Driver	Truck Reg #	7-1-09 Weekly Mileage wk()	7-8 Weekly Mileage wk()	7-14 Weekly Mileage wk()	Weekly Mileage wk()	Weekly Mileage wk()	Weekly Mileage wk()	Weekly Mileage wk()	Weekly Mileage wk()
286	OPEN	R88002	185445	185445	185545					
2001	Juan Mendoza	R88-017	187114	187214	187440					
2004	Kevin Wilson	RD3-K61	44436	44966	46860					
292	unassigned	R88008	134052	134052	134478					
2006	CHRIS SAYLOR	RD3-K63	33029	33234	33765					
285	LEROY BROWN	R88-001	442285	443366	443582					
2003	Juan Frias	R88-059	120715	122079	123431					
277	OPEN	R87993	700347	700347	700347					
278	OPEN	R87-994	[illegible]	61562	62114					
294	OPEN	R88-010	120764	120916	121003					

EPAPA008001068

Alfredo Garza
Al Longoria
Albert Hall
Andres Soto
~~Armondo R., Jr.~~
~~Armondo R., Sr.~~
Arthur Nickerson
~~Benjamin Mata~~
Bo Cumberland
Bobby Boston
Bobby Rodrigues
Brad Wood
Brent Sittig
Brian Weathers
Candido Rosales
Carlos Navarro
~~Chris Gaylor~~
~~Christopher Jiles~~
Clark Hickman
Cody Hampton
Crecencio Padron
Dan Bowman
Dana Carter
~~Darrin Raymond~~
~~David Vandenburg~~
~~Derek Tucker~~
Durim Tafilaj
Eligio Martinez
~~Floyd Rivers~~
Francisco Lopez
Gary Braukman
Gary Lenertz
~~Glenn Manning~~
Glen Olsen
~~Godfrey Ghery~~
Greg Bowman
~~Greg Lawrence~~
Irvin Woodard
Jack Gipson

(b) (6)

James Pharms
Javier Rodriguez
Jeff Thomas
Joaquin Alvarez
Joe Carillo
Joe Gonzales TOP GUN
Joe Hernandez
Jorge Lara
Jorge Martinez
Jose Espinal
Jose Gonzalez
Jose Padron
Jose Ramirez
Joseph Hernandez
Joy Baker
Juan Frias
Juan Mendoza
Juan Morales
Juanita Thomas
Kara Disney
Karl Guidry
Kelli Lofton
Loren Thomas
~~Luis Resendez~~
~~Mark Smith~~
~~Marlin Moser~~
Matt Bowman
Matt Taylor
Mechanics (gen)
Melba Stephens
~~Michael Balch~~
Miles Root
Morgan McCarlley
Noah Berry
Omar Sanchez
~~Perry West~~
Peter Semien
Prabhaker Thangudu
Preston Sanders

(b) (6)

Ramiz Talifaz
Richard Olson
Richard Tullos
~~Robert Henry~~
Robert Hickman
Rolando Morales
Rolando Soto
Ryan Thomas
~~Salvador Garcia~~
~~Samuel Brown~~
~~Sebastien Mccrimmons~~
Steve Stricker
~~Willie Denton~~

Reg

Heck
Jiles
Rod
Frias
Rivers

(b) (6)

Material Safety Data Sheet

Science Stuff, Inc.
1104 Newport Ave
Austin, TX 78753

Sodium hydroxide

Phone (512) 837-6020
Chemtrec 800-424-9300
24 Hour Emergency Assistance

Section 1 Identification

Product Number:	C2582
Product Name:	Sodium Hydroxide Reagent, A.C.S., Pellets
Trade/Chemical Synonyms	
Formula:	NaOH
RTECS:	WB4900000
C.A.S	CAS# 1310-73-2

Health:	3
Flammability	0
Reactivity	2

Hazard Rating:
Least Slight Moderate High Extreme
0 1 2 3 4
NA = Not Applicable NE = Not Established

Section 2 Component Mixture

Sara 313	Component	CAS Number	%	Dim	Exposure Limits:
☑	Sodium Hydroxide	CAS# 1310-73-2	100%	W/W	OSHA PEL 2 mg/mƒ ACGIH 2mg/mƒ

Section 3 Hazard Identification (Also see section 11)

Causes severe irritation and burns. Harmful if swallowed. Avoid breathing vapor or dust. Use with adequate ventilation. Avoid contact with eyes, skin, and clothes. Wash thoroughly after handling. Keep container closed.

Section 4 First Aid Measures

Causes severe irritation and burns. Harmful if swallowed. Avoid breathing vapor or dust. Use with adequate ventilation. Avoid contact with eyes, skin, and clothes. Wash thoroughly after handling. Keep container closed.

FIRST AID: CALL A PHYSICIAN. SKIN: In case of contact, immediately flush skin with water for at least 15 minutes while removing contaminated clothing and shoes. Thoroughly clean clothing and shoes before reuse.

EYES: Wash eyes with plenty of water for at least 15 minutes, lifting lids occasionally. Seek Medical Aid. INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen

INGESTION: If swallowed, induce vomiting immediately after giving two glasses of water. Never give anything by mouth to an unconscious person.

Section 5 Fire Fighting Measures

Fire Extinguisher Type:	Any means suitable for extinguishing surrounding fire. Adding water to sodium hydroxide will release heat!
Fire/Explosion Hazards:	Not considered to be a fire hazard. Hot or molten material can react violently with water, or metals.
Fire Fighting Procedure:	Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and clothing.

Section 6 Accidental Release Measures

Protective clothing required. Sweep, scoop or pick up spilled material. Transfer to a closed preferably metal container for waste disposal to approved facility.

Section 7 Handling and Storage

Store in a cool, dry, well-ventilated place away from incompatible materials. Keep tightly closed. Wash thoroughly after handling.

Section 8 Exposure Controls & Personal Protection

Respiratory Protection:NIOSH/MSHA-approved respirator

Ventilation: Mechanical: ☑ Local Exhaust: ☑

Hand Protection: Wear appropriate gloves to prevent skin exposure

Eye Protection: *Goggles and Face* Shield

Other Protective Equipment: clothing to prevent skin exposure

Section 9 Physical and Chemical Properties

Melting Point:	318°C (604°F)	Specific Gravity	Not available
Boiling Point:	1390°C (2534° F)	Percent Volatile by Volume:	<1
Vapor Pressure:	Negligible	Evaporation Rate:	N/A
Vapor Density:	>1	Evaporation Standard:	
Solubility in Water:	Soluble	Auto ignition Temperature:	N/A
Appearance and Odor:	White odorless deliquescent crystals	Lower Flamm. Limit in Air:	N/A
Flash Point:	Not flammable	Upper Flamm. Limit in Air:	N/A

Section 10 Stability and Reactivity Information

Stability: Stable
Conditions to Avoid: Water, incompatibilities, temperature extremes.

Materials to Avoid:
Acids, flammable liquids, organic halogens, metals, nitrocompounds

Hazardous Decomposition Products:
Sodium oxide

Hazardous Polymerization:Will Not Occur

Condition to Avoid:None known

Section 11 Additional Information

DANGER! CORROSIVE! May be fatal if ingested! May be harmful if inhaled. Causes burns to any area of contact! For eye or skin contact, immediately flush with water for at least 15 minutes. In case of ingestion, DO NOT induce vomiting. Give large quantities of water or milk. Get medical attention immediately.

DOT Classification: Sodium Hydroxide Solid, 8, UN1823, PG II

271 Pump oil
252 Pump oil
281 Hyd. oil

EPAPA008001071

New Equipment Data Sheet

Unit #	
Make	
Model	
Vin	
Year	
Type	
Description	
Licenses #	
Date acquired	

Tire and Wheel Position

Tire Size	
Wheel Type	
Number Whl Positions	

Motor

Make	
Model	
Serial Number	
HP Rating	

Transmission

Make	
Model	
Serial Number	

Differential / Axle #1

Make	
Model	
Serial Number	
Ratio	

Trailer and Tank

Gallons Capacity	
Max Weight	
Dot-MC	
Vale Location	
Compartments	

Last Inspection Dates

PM	
VIK	
UC	
T	
P	
DOT / State Insp	

Tank Strapping Chart

File Copy	
Note Book	
Share Drive	

Differential / Axle #2

Make	
Model	
Serial Number	
Ratio	

List any Additional Equipment

Completed By: _____ Date: _____

Loaded in Database By: _____ Date: _____

10/30/2008

CES Environmental Services, Inc.

Tank Thickness Inspection

Unit Number _____ Date _____

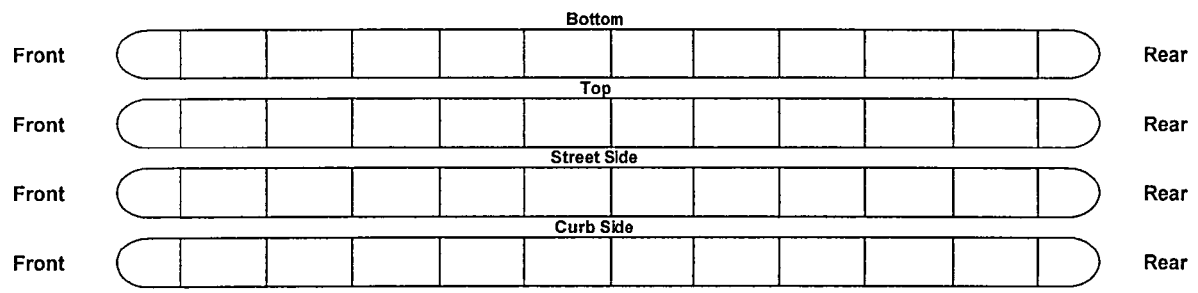
This certifies the tank described below has been ultrasonically tested on the tank shell and bulk heads IAW Federal code Title 49, DOT Section 180.407

Owner: _____

Manufacture: _____ Serial No: _____

Year: _____ Capacity: _____

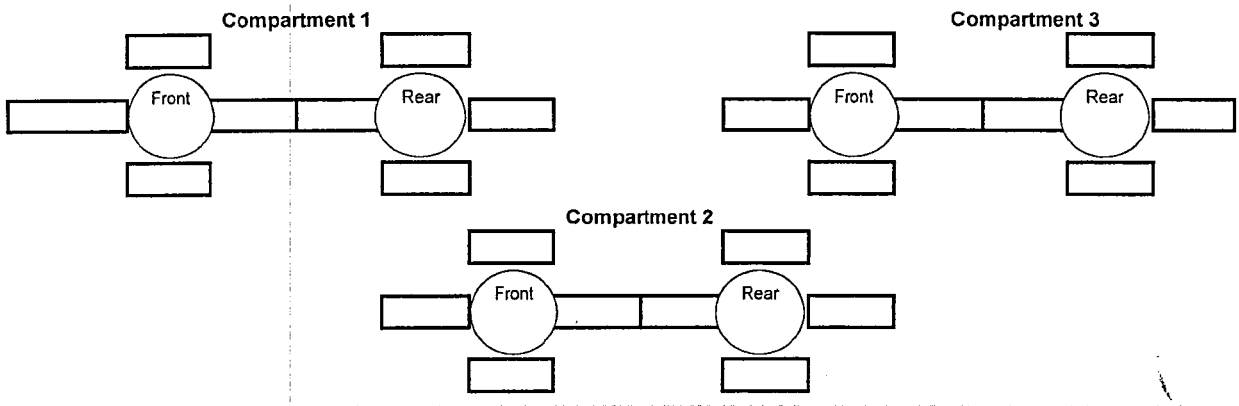
DOT Spec No. _____ Number of Comp. _____



Original Thickness

Bottom: _____ **Top:** _____ **Sides:** _____ **Heads:** _____

Comments: _____



Return to Service: ☐ **Remove From Service:** ☐ **CT Number 2293**

Date of Test: _____

Inspected By: _____ Signature: _____

CES Environmental Services, Inc.

Bill Of Lading # : 89497

Folder ID :	Process Solutions (Total Petrochemical- Port Arthur) Spent Naphthenic Caustic

P.O. # 2006032077 Load # 1399

Original – Shipper Provided Short Form Straight Bill of Lading – Not Negotiable – Domestic

SHIPPED FROM :

Total Petrochemicals Inc.-Port Arthur, TX
7600 32nd Street
Port Arthur , TX 77642-7901
(409) 963-6825

11a) PA-3093
11b)
11c)
11c)

The property described below, in apparent good order, except as noted (content and condition of packages unknown), marked, consigned, and destined as indicated below, which *said carrier (the word carrier being understood throughout this as meaning any person or corporation authorized to be in possession of the property under the contract) agrees* to carry to its unusual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. This Bill of Lading is a receipt for goods; it is not of itself a contract of carriage. It is mutually agreed, as to each carrier of all or as to any said over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions contained in the applicable contract between shipper and carrier or intermediary.

For payment: Charges to be billed to Shipper or the "Billed to" party are set forth in the governing contract with Shipper. No charges other than those contained therein may be billed to Shipper or the "Billed to" party without prior written consent of Shipper. The extra copy of this Bill of Lading, furnished at the time of shipment, must be attached to the freight bill submitted to Shipper or the "Billed to" party and sent to:

CONSIGNED TO :

CES Environmental (Port Arthur)
2420 Gulfway Dr.
Port Arthur , TX 77640

CARRIER :

CES Environmental (Port Arthur)
2420 Gulfway Dr.
Port Arthur , TX 77640

This is to certify that the product stated below are properly classified, described, packaged, marked and labeled and is in proper condition for transportation according to the applicable regulations of the Department of Transportation. If this Shipment moves between to ports by a carrier by water, the law requires that the Bill of Lading shall state whether it is "carrier's or shipper's weight."

Intermodal Certificate: All information required by Federal Highway Administration regulations at 49 CFR 390.54® implementing the Intermodal Safe Container Act of 1992 is set forth on the face of this bill of lading. The shipper name herein is the tendering party.

Haz	Container No.	Container Type	Total Quantity	Unit Wt/Vol	Description of Materials, Special Marks, and Exceptions
No	1	TT		G	RQ, UN1760, Corrosive liquids, n.o.s. (Naphthenic caustic acid), 8, PGII
			79,980 Lbs.		TICKET # 0469305
			9,300 Gal's		8.6 P.P.G.

Shipper : Total Petrochemicals Inc.-Port Arthur, TX

Per : Tom **Signature :** M Bennett **Date :** 8-3-09

Carrier CES Environmental (Port Arthur)

Per : Kevin Wilson **Signature :** K Wilson **Date :** 8-3-09

Receiving Facility : CES Environmental (Port Arthur)

Per : PACES **Signature :** Jy M **Date :** 8-3-09

White (Generator Return Copy) Yellow (Transporter Copy) Pink (Receiving Facility Copy) Golden Rod (Generator 1st Copy)

ALTIVIA

AUTHORIZED SIGNATURE

LTIVIA
532 HADEN HOUSTON TX.

08 03 09
7:00 AM

CES Environmental

GROSS	76600 lb	
TARE	27580 lb	(TRH)
NET	49020 lb	(NETC)

LINDEN BULK TRANSPORTATION SW, LLC
9938 CHEMICAL ROAD
PASADENA, TX 77507
TEL: (281) 291-9828 / 1-800-928-2855
FAX: (281) 291-9240

430333

ALL SHADED AREAS TO BE COMPLETED BY DRIVERS

MILES: 93

PICK UP DATE	PICK UP TIME	PICK UP DRIVER / OPERATOR	TRACTOR NO.	TRAILER NO.	SHIPPER NO.
08/03/2009	06:00-06:00	MASCULINE WALKER	2197	F004	154170
		CONTAINER #			

SHIPPER:
ALTIVIA
1632 HADEN ROAD

PICK UP AT:
HOUSTON, TX

SHIPPER INFORMATION:	LOADING TIME IN	LOADING TIME OUT	LOADING DETENTION ATTACH TVR
	6:30	7:00	YES NO

DELIVERY DATE	DELIVERY TIME	DELIVERY DRIVER / OPERATOR	TRACTOR NO.	TRAILER NO.	RECEIVER NO.
08/03/2009	09:00-09:00	MASCULINE WALKER	2197	F004	29077537

RECEIVER:
CES ENVIRONMENTAL - PACES
2420 SOUTH GULFWAY DR

DELIVER TO:
PORT ARTHUR, TX

RECEIVER INFORMATION:	UNLOADING TIME IN	UNLOADING TIME OUT	UNLOADING DETENTION ATTACH TVR
	8:30	9:15	YES NO

COMPT NO.	QUANTITY	HM	COMMODITY	WEIGHT
	4996 GAL	Y	AQUACHLOR 12.5 AC6013-1 HYPOCHLORITE SOUTION, CORROSIVE 8 CORROSIVE, UN1791, PG III	GROSS: 76,600
1 CARGO TANK				TARE: 49,020 27,580
OUTSIDE SCALE	YES NO		PRODUCT TEMPERATURE	NET: 49,020

COMPT NO.	QUANTITY	HM	COMMODITY	WEIGHT
				GROSS:
PUMP	COMP			TARE:
			PRODUCT TEMPERATURE	NET:

COMPT NO.	QUANTITY	HM	COMMODITY	WEIGHT
				GROSS:
DISCHARGE HOSE	FT			TARE:
			PRODUCT TEMPERATURE	NET:

COMPT NO.	QUANTITY	HM	COMMODITY	WEIGHT
				GROSS:
				TARE:
			Rogen Green 7960 PRODUCT TEMPERATURE	NET:

UNLOADING AUTHORIZATION: This will serve as verification that I have checked **ALL PAPERWORK, PLACARDS, TAGS & SEALS** and verified that the **TRAILER # and PLACARDS** match the **TRAILERS # & PRODUCT** found on the **SHIPPERS BOL & LINDEN MANIFEST**. I have also furnished the **LINDEN** driver with **UNLOADING INSTRUCTIONS** and confirmed that the **CORRECT CONNECTION** has been made **PRIOR** to unloading.

RECEIVER'S SIGNATURE

PROOF OF DELIVERY: This will certify that the above lading was received in good condition, except as noted. This will also serve as verification of the time in & time out indicated above.

RECEIVER'S SIGNATURE

DRIVER/OPERATOR COPY

ALTIVIA
1100 Louisiana Suite 3160
Houston, TX 77002
Tel: 713-658-9000
Fax: 713-658-0102

ALTIVIA

QUALITY CONTROL DEPARTMENT

CERTIFICATE OF ANALYSIS

ORDER NUMBER	BOL NUMBER	REPORT DATE	DATE OF MANUFACTURE	EXPIRATION DATE
154170	154170	07/31/2009	07/31/2009	10/29/2009

SHIP TO	P.O. NUMBER	RELEASE NUMBER
CES Environmental	29077537	

PRODUCT CODE	PRODUCT NAME	PRODUCT LOT NUMBER
AC6013-1GBulk	12.5% Solution	07319-11125

SPECIFICATION	SPECIFICATION VERSION	SPECIFICATION DATE	QUANTITY
ALTIVIA	2.2000	07/31/2009	

ANALYTICAL RESULTS		
VARIABLE	SPECIFICATION REQUIREMENT	TEST RESULT
Available Chlorine (%)	10.50 =< Value =< 13.50	12.30 %
Excess Sodium Hydroxide (%)	0.10 =< Value =< 2.00	0.50 %
Sodium Hypochlorite (%)	11.10 =< Value =< 14.00	12.91 %
Specific Gravity	1.1500 =< Value =< 1.2500	1.2124
REMARKS		

Truck ID: 2197

Trailer ID: 002

Seal #: _____

I certify that the above listed material has been supplied in accordance with the requirements of the purchase order and applicable specifications.

CERTIFIED CORRECT BY:

QB

QUALITY CONTROL

Contact:
Bo (713) 416-4160
Jay (832) 231-3035
** DELIVER BEFORE 3:00 P.M. **
** Plant has air and crows foot connector and 2 or 3" camlock **

Standard safety equipment required on truck (TWIC card, nomex, safety glasses, hard hat, clean shaven driver, steel toed boots)

154170

FOR CHEMICAL EMERGENCY - Spill, Leak, or Accident
CALL CHEMTREC - 800 - 424 - 9300

NOTICE: On arrival of shipment examine product. Report any variations to our shipping office immediately. Any damage to container or product should be noted by the agent. _____ Signature of consignee	This is to certify that the above-named materials are property classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulation of the Department of Transportation. Earl Mast Signature	If the shipment moves between two ports by a carrier by water, the law requires that the bill of lading shall state whether it is "carrier's or shipper's weight". Shipper's imprint in lieu of stamp; not a part of bill of lading approved by the Interstate Commerce Commission.

RECEIVED, subject to the classifications and lawfully filed tariffs in effect on the date of the issue of this Bill of Lading, the property described above in apparent good order, except as noted (contents and condition of contents of packages unknown), marked,consigned, and destined as indicated above which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or property over all or any portion of said route to destination and as to each party at any time interested in all or any said property, that every service to be perfomed hereunder shall be subject to all the bill of lading terms and conditions in the governing classification on the date of shipment.

Shipper hereby certifies that he is familiar with all the bill of lading terms and conditions in the governing classification and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

SHIPPER	CARRIER	
Shipper	PLACARDS OFFERED DRIVER PLEASE INITIAL. _____	PLACARDED ☐ NAME OF PLACARD _____
PER Permanent Post Office Of Shipper	AGENT	
Seal #(s):	PER	
	TOTAL NO. OF PACKAGES REC'D. _____	

ALTIVIA

MATERIAL SAFETY DATA SHEET

Sodium Hypochlorite Solution 10-15%

ALTIVIA 24 Hour Emergency Phone Number: 713-636-3189
Transportation Emergencies CHEMTREC: 800-424-9300

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME:	**Sodium Hypochlorite Solution 10-15%**
CHEMICAL NAME/ FAMILY:	Sodium Hypochlorite
TRADE NAMES/ SYNONYMS:	Bleach; hypochlorous acid, sodium salt; soda bleach; sodium oxychloride
PRODUCT USE:	Bleaching agent, chemical intermediate, disinfectant.
MOLECULAR FORMULA:	NaOCl
MANUFACTURER:	ALTIVIA, 1100 Louisiana, Suite 3160, Houston, TX 77002

SECTION 2: COMPOSITION/ INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS NUMBER	% RANGE
Sodium Hypochlorite	7681-52-9	9.5 – 16.5
Sodium Hydroxide	1310-73-2	0-1%
Water	7732-18-5	Balance

* Denotes chemical subject to reporting requirements of Section 313 of Title III of the 1986 Superfund Amendments and Reauthorization Act (SARA) and 40 CFR Part 372.

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Danger! Corrosive. May cause skin and eye irritation or chemical burns to broken skin. Causes eye damage. Harmful if swallowed. Strong oxidizer. Does not burn. Decomposes when heated, during a fire or upon contact with acids releasing corrosive chlorine gas. During a fire corrosive hydrogen chloride gas may be generated.

POTENTIAL HEALTH EFFECTS

EYE
Liquid or mist contact can produce severe eye irritation and burns. Prolonged exposures may cause eye damage and blindness.

SKIN
Can cause irritation and burns. Liquid contact can cause blistering and eczema. Prolonged exposure may cause dermatitis.

EPAPA008001079

INGESTION
Oral or gastrointestinal irritation. Corrosion of mucous membranes, perforation of esophagus and stomach may follow.

INHALATION
Irritation of the respiratory system. Mist or fumes may cause bronchial irritation, coughing, difficult breathing, nausea and pulmonary edema.

SIGNS AND SYMPTOMS OF EXPOSURE
Irritation or burns to the eyes and skin. Inhalation may cause coughing, choking, irritation and pulmonary edema. Sodium hypochlorite solutions are corrosive following ingestion and may cause irritation, burns and vomiting.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
None known.

EFFECTS FOLLOWING REPEATED EXPOSURE
Prolonged contact with sodium hypochlorite may cause dermatitis, permanent eye damage including blindness.

SECTION 4: FIRST AID MEASURES

EYES
Hold eye open and rinse slowly and gently for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Get medical attention for irritation or any other symptom.

SKIN
Take off contaminated clothing and shoes. Rinse skin immediately with plenty of water for 15-20 minutes. Get medical attention for irritation or burns. Wash clothing and thoroughly clean shoes before reuse.

INGESTION
Get immediate medical attention. Have person drink a glass of water immediately if able to swallow. **Do not induce vomiting** unless directed to do so by medical personnel. Do not give anything by mouth to an unconscious person.

INHALATION
Remove person from exposure to fresh air. If person is not breathing, call 911 or an ambulance, and then give artificial respiration (CPR). If individual is breathing, but with difficulty, get immediate medical attention.

NOTES TO PHYSICIAN
The absence of visible signs or symptoms of burns does not reliably exclude the presence of actual tissue damage.

See Section 11 for Toxicological Information.

SECTION 5: FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT
Not combustible (does not burn)

AUTO IGNITION TEMPERATURE
Not Established

FLAMMABLE LIMITS IN AIR (% BY VOLUME)
Not Established

EXTINGUISHING MEDIA
Water, water mist, foam, carbon dioxide, dry powder.

HAZARDOUS COMBUSTION PRODUCTS
Thermal decomposition may release toxic gases such as chlorine and hydrogen chloride gas.

FIRE FIGHTING INSTRUCTIONS
Use extinguishing agents suitable for the surrounding fire and not contraindicated for use with sodium hypochlorite. Sodium Hypochlorite releases oxygen when heated, which may increase the severity of an existing fire. Use water spray to cool fire exposed surfaces and to protect personnel. Avoid inhalation of material or combustion by-products. Firefighters should wear full protective clothing and NIOSH approved positive pressure self-contained breathing apparatus.

SECTION 6: ACCIDENTAL RELEASE MEASURES

WATER SPILL
Prevent additional discharge of material, if possible to do so without hazard.

LAND SPILL
Prevent additional discharge of material, if possible to do so without hazard. For small spills implement cleanup procedures; for large spills implement cleanup procedures and, if in public area, advise authorities.

GENERAL PROCEDURES
No smoking in spill areas. Isolate spill area and deny entry to unnecessary or unprotected personnel. Remove all sources of ignition, such as flames, hot glowing surfaces or electric arcs. Stop source of spill as soon as possible and notify appropriate personnel. Cleanup personnel must wear proper protective equipment (refer to Section 8). Decontaminate all clothing. Notify all downstream water users of possible contamination.

Create a dike or trench to contain all liquid material. Liquid material may be removed with a vacuum truck. Spill materials may also be absorbed using clay, soil or nonflammable commercial absorbents.

Do not place spill materials back in their original container. Containerize and label all spill materials properly.

RELEASE NOTES
Notify the National Response Center (800/424/8802) of uncontained releases to the environment in excess of the Reportable Quantity (RQ). See Section 15, Regulatory Information. Recycle or dispose of recovered material in accordance with all federal, state, and local, regulations.

For all transportation accidents, call CHEMTREC at 800/424-9300.

SECTION 7: HANDLING AND STORAGE

HANDLING

Do not get in eyes, or on skin, or clothing. Do not taste or swallow. Avoid breathing mists or fumes. Do not handle with bare hands.

Carefully monitor handling, use and storage to avoid spills and leaks. Follow protective controls set forth in Section 8 when handling this product. Do not eat, drink, or smoke in work area. Wash hands prior to eating, drinking, or using restroom.

STORAGE

STORAGE CONDITIONS
Store in closed, properly labeled tanks or containers. Keep away from heat, direct sunlight and sources of ignition. Do not remove or deface labels or tags. Store in a cool, well ventilated place away from incompatible materials. Do

not pressurize, cut, heat, or weld containers. Do not drop, roll or skid drums. Keep drums upright. Do not reuse empty containers without commercial cleaning or reconditioning.

STORAGE TEMPERATURE
Do not store above 35°C (95°F).

INCOMPATIBLE MATERIALS FOR STORAGE OR TRANSPORT
Acids, ammonia compounds, oxidizing materials, peroxides, reducing agents and most metals.

SECTION 8: EXPOSURE CONTROLS PERSONAL PROTECTION

ENGINEERING CONTROLS

VENTILATION
Use closed systems when possible. Local exhaust ventilation is recommended if vapors, mists or aerosols are generated.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

EYE AND FACE PROTECTION
Wear chemical goggles. A face shield should be worn in addition to goggles where splashing or spraying is possible.

SKIN PROTECTION
Wear chemical resistant clothing. Neoprene gloves, boots and apron or slicker suit.

RESPIRATORY PROTECTION
A NIOSH approved respirator with N95 (dust, fume, mist) filters may be permissible under certain circumstances where airborne concentrations are expected to exceeded exposure limits, or when symptoms have been observed that are indicative of overexposure.

When decomposition products exist, acid gas cartridges are also required.

A half face piece air-purifying respiratory may be used in concentrations up to 10X the acceptable exposure level and a full face piece air-purifying respirator may be used in concentrations up to 50X the acceptable exposure level.

Supplied air should be used when the level is expected to be above 50X the acceptable level, or when there is a potential for uncontrolled release.

A respiratory protection program that meets 29 CFR 1910.134 must be followed whenever workplace conditions warrant use of a respirator.

GENERAL
Safety shower and eye wash station must be provided in the immediate work area. Protective equipment and clothing should be selected, used, and maintained according to applicable standards and regulations. For further information, contact the clothing or equipment manufacturer.

EXPOSURE GUIDELINES

Component Data:	Sodium Hypochlorite AIHA (STEL 15 minutes) - 2mg/m^3
Component Data:	Sodium Hydroxide OSHA (TWA) - 2mg/m^3
	Sodium Hydroxide ACGIH Ceiling - 2mg/m^3

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

CHEMICAL FORMULA	NaOCl
MOLECULAR WEIGHT	74.4
APPEARANCE	Clear colorless to pale yellow liquid
ODOR	Characteristic bleach odor
pH @ 25°C	11.5-13.5
VAPOR PRESSURE	Not Established
VOLATILES, % BY VOLUME	Not Established
BOILING POINT	110°C (230°F)
FREEZING POINT	< -12°C (10°F)
SOLUBILITY IN WATER	Complete
EVAPORATION RATE	Not Established
SPECIFIC GRAVITY	1.13-1.27 @ 21°C (70°F)
DENSITY	9.42-10.58 @ 21°C (70°F)
VISCOSITY	Not Established

SECTION 10: STABILITY AND REACTIVITY

CHEMICAL STABILITY
Stable under normal use conditions. May decompose upon heating and exposure to sunlight.

CONDITIONS TO AVOID
Avoid heat, flames, sparks and other sources of ignition. Avoid direct sunlight, acidic conditions, the presence of metals and other impurities.

INCOMPATIBILITY WITH OTHER MATERIALS
Acids, ammonia compounds, oxidizing materials, peroxides, reducing agents and most metals.

HAZARDOUS DECOMPOSITION PRODUCTS
Thermal decomposition may release toxic gases such as chlorine and hydrogen chloride gas.

HAZARDOUS POLYMERIZATION
Will not occur.

SECTION 11: TOXICOLOGICAL INFORMATION

ANIMAL TOXICOLOGY

The toxicity and corrosivity of this material is a function of concentration and pH. This material is irritating and may be corrosive to all tissue.

EYES
Very dilute solutions have caused no irritation. More concentrated solutions have caused corrosive injury, which did not heal within 21 days.

SKIN
LD_{50} (Dermal, Rabbit): > 10,000 mg/m^3 (undiluted)

ACUTE ORAL EFFECTS
LC_{50} (Oral, Female Mouse): ~ 7,540 mg/kg; cited as 5.8 ml/kg (50% solution)

LC_{50} (Oral, Rat): 8,910 mg/kg (undiluted)

ACUTE INHALATION EFFECTS
No available data.

EFFECTS FOLLOWING PROLONGED OR REPEATED EXPOSURE
Dermatitis.

CARCINOGENICITY
This product (or any component at a concentration of 0.1% or greater) is not listed by NTP, IARC, OSHA EPA, or any other authority as a carcinogen.

MUTAGENICITY
No available data.

REPRODUCTIVE/DEVELOPMENTAL TOXICITY
No available data.

SECTION 12: ECOLOGICAL INFORMATION

GENERAL COMMENT
This material is believed to be a moderate order of toxicity based on analogous material.

ENVIROMENTAL FATE
This material is inorganic and not subject to biodegradation. This material is believed not to persist in the environment. This material may be harmful to aquatic organisms in low concentrations.

SECTION 13: DISPOSAL CONSIDERATIONS

SPILL RESIDUES
Processing, use or contamination of this product may change the waste management options. All disposals of this material must be done in accordance with Federal, state and local regulations. Waste characterization and compliance with disposal regulations are the responsibilities of the waste generator. If this product becomes a waste it may be subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D002.

SECTION 14: TRANSPORT INFORMATION

THIS MATERIAL IS A HAZARDOUS AS DEFINED BY 49 CFR 172.01 BY THE U.S DEPARTMENT OF TRANSPORTATION.

DOT IDENTIFICATION NO.: UN 1791

DOT SHIPPING DESCRIPTION (49 CFR 172.101): Hypochlorite solutions, Corrosive, 8

PACKAGING GROUP: III

PLACARD REQUIRED: Corrosive 8, UN 1791

LABEL REQUIRED: Corrosive 8. Label as required by EPA and by OSHA Hazard Communication Standard, and any applicable state and local regulations.

EMERGENCY RESPONSE GUIDE NUMBER: 154

SECTION 15: REGULATORY INFORMATION

U S FEDERAL REGULATIONS

CERCLA REPORTABLE QUANTITY (RQ)

Ingredient	CAS NO.	RQ
Sodium Hypochlorite	7681-52-9	100 lbs
Sodium Hydroxide	1310-73-2	1000 lbs

TSCA (TOXIC SUBSTANCES CONTROL ACT)
All components of this product are listed on the TSCA Inventory or are exempt from TSCA Inventory requirements.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA) TITLE III

SARA SECTION 302 (EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 302.4):
Not Applicable

SARA SECTION 311/312 HAZARD CATEGORIES (40 CFR 370.2):

Fire Hazard	Yes
Reactivity Hazard	No
Release of Pressure	No
Acute Health Hazard	Yes
Chronic Health Hazard	No

SARA SECTION 313 (40 CFR 372.65):
Components identified with an asterisk (*) in Section 2 are subject to the reporting requirements of Section 313 of Title III of the 1986 Superfund Amendments and Reauthorization Act (SARA) and 40 CFR Part 372.

OSHA PROCESS SAFETY (29 CFR 1910.119):
Not regulated.

OTHER U.S. REGUALATIONS
Federal Insecticide, Fugicide and Rodenticide Act (FIFRA): Registered pesticide (40 CFR 152.10)

INTERNATIONAL REGULATIONS

CANADA

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA)
DSL/ NDSL: This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

SECTION 16: OTHER INFORMATION

NFPA RATINGS	
HEALTH	3
FLAMMABILITY	0
INSTABILITY	1

HMIS CODES	
HEALTH	3
FLAMMABILITY	0
REACTIVITY	1
PROTECTION	C

RATING NOTES
Hazardous Materials Identification: 4 = Severe, 3 = Serious, 2 = Moderate, 1 = Slight, 0 = Minimal.

Emergency Information:	For Any Other Information Contact:
Call toll free 24 hours a day: 713-636-3189	ALTIVIA, Technical Marketing, 1100 Louisiana, Suite 3160, Houston, TX 77002. Phone: 713-658-9000 8 AM – 5 PM CST, Monday through Friday

Revisions

12/28/2005: Revised to conform to ANSI Standard Z400.1-1998, replaces MSDS A2002-05/04.

Disclaimer of Warranty:
The information provided in this Material Safety Data Sheet has been obtained from sources believed to be reliable. ALTIVIA provides no warranties, either expressed or implied and assumes no responsibility for the accuracy or completeness of the data contained herein. This information is offered for your information, consideration, and investigation. You should satisfy yourself that you have all current data relevant to your particular use. ALTIVIA knows of no medical condition, other than those noted on this material safety data sheet, which are generally recognized as being aggravated by exposure to this product.

CES Environmental Services, Inc.

Bill Of Lading # : 89497

Folder ID :	Process Solutions (Total Petrochemical- Port Arthur) Spent Naphthenic Caustic	P.O. # 2006032077	Load # 1399

Original – Shipper Provided Short Form Straight Bill of Lading – Not Negotiable – Domestic

SHIPPED FROM :
Total Petrochemicals Inc.-Port Arthur, TX
7600 32nd Street
Port Arthur , TX 77642-7901
(409) 963-6825

11a) PA-3093
11b)
11c)
11c)

The property described below, in apparent good order, except as noted (content and condition of packages unknown), marked, consigned, and destined as indicated below, which said carrier (the word carrier being understood throughout this as meaning any person or corporation authorized to be in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. This Bill of Lading is a receipt for goods; it is not of itself a contract of carriage. It is mutually agreed, as to each carrier of all or as to any said over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions contained in the applicable contract between shipper and carrier or intermediary.

For payment: Charges to be billed to Shipper or the "Billed to" party are set forth in the governing contract with Shipper. No charges other than those contained therein may be billed to Shipper or the "Billed to" party without prior written consent of Shipper. The extra copy of this Bill of Lading, furnished at the time of shipment, must be attached to the freight bill submitted to Shipper or the "Billed to" party and sent to:

CONSIGNED TO :
CES Environmental (Port Arthur)
2420 Gulfway Dr.
Port Arthur , TX 77640

CARRIER :
CES Environmental (Port Arthur)
2420 Gulfway Dr.
Port Arthur , TX 77640

This is to certify that the product stated below are properly classified, described, packaged, marked and labeled and is in proper condition for transportation according to the applicable regulations of the Department of Transportation. If this Shipment moves between to ports by a carrier by water, the law requires that the Bill of Lading shall state whether it is "carrier's or shipper's weight."

Intermodal Certificate: All information required by Federal Highway Administration regulations at 49 CFR 390.5409 implementing the Intermodal Safe Container Act of 1992 is set forth on the face of this bill of lading. The shipper name herein is the tendering party.

Haz	Container No.	Container Type	Total Quantity	Unit Wt/Vol	Description of Materials, Special Marks, and Exceptions
No	1	TT		G	RQ, UN1760, Corrosive liquids, n.o.s. (Naphthenic caustic acid), 8, PGII
			79,980 Lbs.		TICKET # 0469365
			9,300 Gal's		8.6 P.P.G.

Shipper : Total Petrochemicals Inc.-Port Arthur, TX
Per : Tom **Signature :** M Bennett **Date :** 8-3-09

Carrier CES Environmental (Port Arthur)
Per : Kevin Wilson **Signature :** K Wilson **Date :** 8-3-09

Receiving Facility : CES Environmental (Port Arthur)
Per : PACES **Signature :** [signature] **Date :** 8-3-09

White (Generator Return Copy) Yellow (Transporter Copy) Pink (Receiving Facility Copy) Golden Rod (Generator 1st Copy)

Caustic Soda, Shipment Grade

Material Safety Data Sheet

Arkema Inc.

1 PRODUCT AND COMPANY IDENTIFICATION

Thio and Fine Chemicals
Arkema Inc.
2000 Market Street
Philadelphia, PA 19103

EMERGENCY PHONE NUMBERS:
Chemtrec: (800) 424-9300 (24hrs) or (703) 527-3887
Medical: Rocky Mountain Poison Control Center
(866) 767-5089 (24Hrs)

Information Telephone Numbers	Phone Number	Available Hrs
Customer Service	1-800-628-4453	8:30 to 5:30 EST

Product Name	Caustic Soda, Shipment Grade
Product Synonym(s)	
Chemical Family	Alkali
Chemical Formula	NAOH
Chemical Name	Sodium Hydroxide
EPA Reg Num	
Product Use	

2 COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient Name	CAS RegistryNumber	Typical %	OSHA
Carbon disulfide	75-15-0	<0.1%	Y
Sodium hydroxide	1310-73-2	10-15%	Y
Water	7732-18-5	85-90%	N

The substance(s) marked with a "Y" in the OSHA column, are identified as hazardous chemicals according to the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200)

This material is classified as hazardous under Federal OSHA regulation.

The components of this product are all on the TSCA Inventory list.

3 HAZARDS IDENTIFICATION

Emergency Overview

Orange slightly turbid liquid with foul odor.
DANGER!
FLAMMABLE LIQUID AND VAPOR.
CAUSES EYE, SKIN AND RESPIRATORY TRACT BURNS. MAY CAUSE BLINDNESS.
CAUSES SEVERE DIGESTIVE TRACT BURNS.
EVEN DILUTE SOLUTIONS MAY CAUSE BURNS.

Potential Health Effects

Inhalation and skin contact are expected to be the primary routes of occupational exposure to this material. This material is a strong alkali that can be destructive to tissue producing severe burns which are not immediately painful or visible. Contact with body tissues may produce deep ulceration, scarring or loss of sight. Concentrations as low as 2-3% can cause injury. Dermatitis (inflammation of the skin) and superficial skin damage can result from repeated or prolonged contact with very dilute solutions. High levels of dust or mist may be corrosive to mucous membranes producing eye or lung injury and chemical pneumonia. Lower concentrations may produce irritation of eyes, nose or upper respiratory tract with coughing, sore throat and shortness of breath. Prolonged exposure may result in ulceration of the nasal passages. If swallowed, this material may cause severe internal injury, characterized by pain in the mouth

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and stomach, vomiting, and breathing difficulties. Medical conditions which may be aggravated by exposure to this material include lung disease or limited respiratory capacity.

4 FIRST AID MEASURES

IF IN EYES, immediately flush with plenty of water for at least 15 minutes. Get medical attention immediately.

IF ON SKIN, immediately flush with plenty of water. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Destroy contaminated shoes.

IF SWALLOWED, do NOT induce vomiting. Give water to drink. Get medical attention immediately. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

IF INHALED, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

5 FIRE FIGHTING MEASURES

Fire and Explosive Properties

Auto-Ignition Temperature	NE	
Flash Point	70 F - >150 F	Flash Point Method
Flammable Limits- Upper	NE	
Lower	NE	

Extinguishing Media

Use water spray, carbon dioxide, foam or dry chemical.

Fire Fighting Instructions

Fire fighters and others who may be exposed to products of combustion should wear full fire fighting turn out gear (full Bunker Gear) and self-contained breathing apparatus (pressure demand NIOSH approved or equivalent). Fire fighting equipment should be thoroughly decontaminated after use.

Fire and Explosion Hazards

Contact with metal can form hydrogen gas. Hydrogen is extremely flammable and can form explosive mixtures with air. Closed containers may explode when heated or contents contaminated with water.

6 ACCIDENTAL RELEASE MEASURES

In Case of Spill or Leak

Stop the leak, if possible. Ventilate the space involved. Contain, vacuum up, place in non-sparking container for disposal. Prevent waterway contamination. Construct a dike to prevent spreading. Collect run-off and transfer to drums or tanks for later disposal. Consult a regulatory specialist to determine appropriate state or local reporting requirements, for assistance in waste characterization and/or hazardous waste disposal and other requirements listed in pertinent environmental permits.

7 HANDLING AND STORAGE

Handling

Do not get in eyes, on skin or clothing. Avoid breathing vapor or mist. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. To avoid rapid temperature rise, violent spattering, or explosive eruptions: always add caustic to water when mixing. Never add water to a caustic when mixing. Heat water to 80-100 F before adding product. Add small amounts of product slowly and evenly over surface of water with constant stirring. Never increase concentration of product by more than 5% with any single

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7 HANDLING AND STORAGE

addition. Water should not exceed 160 F during addition.

Storage

Do NOT store near strong acids.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls

Investigate engineering techniques to reduce exposures below airborne exposure limits. Provide ventilation if necessary to control exposure levels below airborne exposure limits (see below). If practical, use local mechanical exhaust ventilation at sources of air contamination such as open process equipment. Consult ACGIH ventilation manual or NFPA Standard 91 for design of exhaust systems. Monitor carbon monoxide and oxygen levels in tanks and enclosed spaces.

Eye / Face Protection

Where there is potential for eye contact, wear a face shield, chemical goggles, and have eye flushing equipment immediately available.

Skin Protection

Wear appropriate chemical resistant protective clothing and chemical resistant gloves to prevent skin contact. Consult glove manufacturer to determine appropriate type glove material for given application. Wear face shield and chemical resistant clothing such as a rubber apron when splashing may occur. Rinse contaminated skin promptly. Wash contaminated clothing and clean protective equipment before reuse. Wash skin thoroughly after handling.

Respiratory Protection

Avoid breathing vapor or mist. When airborne exposure limits are exceeded (see below), use NIOSH approved respiratory protection equipment appropriate to the material and/or its components. Consult respirator manufacturer to determine appropriate type equipment for given application. Observe respirator use limitations specified by NIOSH or the manufacturer. For emergency and other conditions where exposure limit may be significantly exceeded, use an approved full face positive-pressure, self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. Respiratory protection programs must comply with 29 CFR § 1910.134.

Airborne Exposure Guidelines for Ingredients

Exposure Limit		Value
Sodium hydroxide		
ACGIH CEILING	-	2 mg/m3
OSHA TWA PEL	-	2 mg/m3
Carbon disulfide		
ACGIH Skin designator	-	Y
ACGIH TWA	-	1 ppm
OSHA Ceiling PEL	-	30 ppm
OSHA TWA PEL	-	20 ppm

-Only those components with exposure limits are printed in this section.
-Skin contact limits designated with a "Y" above have skin contact effect. Air sampling alone is insufficient to accurately quantitate exposure. Measures to prevent significant cutaneous absorption may be required.
-ACGIH Sensitizer designator with a value of "Y" above means that exposure to this material may cause allergic reactions.
-WEEL-AIHA Sensitizer designator with a value of "Y" above means that exposure to this material may cause allergic skin reactions.

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9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance/Odor	Orange slightly turbid liquid with foul odor.
pH	NE
Specific Gravity	1.073 @ 15 C
Vapor Pressure	30 @ 100 F
Vapor Density	NA
Melting Point	NA
Freezing Point	NE
Boiling Point	NE
Solubility In Water	99.98%

10 STABILITY AND REACTIVITY

Stability

This material is chemically stable under normal and anticipated storage and handling conditions.

Incompatibility

Reacts violently or explosively with water, acids and organic materials such as chlorinated hydrocarbons. Toxic carbon monoxide gas can form upon contact with food or beverage products.

Hazardous Decomposition Products

Will react with some metals such as aluminum, tin or zinc to generate hydrogen gas. Hydrogen gas can result in explosive hazards in confined spaces.

11 TOXICOLOGICAL INFORMATION

Toxicological Information

Data on this material and/or its components are summarized below.

Sodium Hydroxide

Single exposure (acute) studies indicate that this material is slightly toxic if absorbed through the skin (rat LD50 1,350 mg/kg; dry sodium hydroxide) and corrosive to rabbit eyes and skin. Many publications in the scientific literature confirm that this material is corrosive to all tissues. Repeated inhalation resulted in lung damage in rats. No tumors were seen in long-term animal studies. No genetic changes were observed in tests using bacteria.

No significant increases in mortality in relation to duration or intensity of exposures were reported in an epidemiologic study of a small group of workers exposed to caustic dust for 30 years or more. Massive ingestion of this material has been implicated as causing esophageal cancer. Squamous cell carcinomas of the esophagus occurred approximately 12-42 years later in individuals who survived accidental childhood ingestion and are likely due to the tissue destruction and possible scarring of the esophagus rather than a direct effect of this material.

Carbon Disulfide

Single exposure (acute) studies indicate that this material is slightly toxic to rats if swallowed (LD50 3,188 mg/kg) or rabbits if absorbed through skin (LD50 2,025 mg/kg), practically non-toxic to rats if inhaled (1-hr LC50 40 mg/l), and severely irritating to rabbit skin and eyes. The neurological effects of long-term exposure have been documented in occupational populations who were generally exposed to levels of 20 ppm or more in viscose rayon production. Exposed workers have experienced headaches, nausea, dizziness, tiredness, memory loss, sleep disturbances, irritability and other psychological symptoms in the early stages of intoxication. Long- term exposure has resulted in decreased nerve conduction velocities, memory loss,

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11 TOXICOLOGICAL INFORMATION

peripheral neuropathy (numbness) in the lower legs and forearms, tremors, poor coordination and personality disorders. In addition, several studies have shown adverse effects on the heart including increases in atherosclerosis, death from coronary or ischemic heart disease and blood pressure. Other studies have indicated that long-term overexposure can cause adverse effects on the eyes including increased hemorrhages or microaneurysms of the retina. Studies of occupationally exposed workers have suggested that long-term exposure to higher levels may cause reproductive effects. Male workers had decreased libido, reduced sperm count and altered endocrine function and female workers reported menstrual irregularities. Sperm from exposed workers have shown alterations indicative of spermatogenic damage. There is conflicting evidence whether increased pregnancy complications and a higher frequency of spontaneous abortions are related to exposures in female workers.

Animal studies have confirmed neurological effects. Rats exposed for long periods to high levels showed decreased motor conduction velocity, hindlimb motor defects, peripheral nerve swelling and degeneration. Repeated exposure of monkeys has resulted in reduced visual acuity. Following inhalation exposure in male rats, minor reproductive effects such as decreased sperm counts and abnormal mating behavior, but no pathological changes were noted in testes. A two-generation reproduction study in exposed female rats showed no reduction in fertility, but mothers exposed to high dose levels had reduced pup viability. Multiple developmental toxicity studies in rats and rabbits have presented evidence of increased birth defects and embryotoxicity at high dose levels; however, exposures at levels that are not maternally toxic generally do not cause birth defects, although developmental effects have been observed. No genetic changes were observed in tests using bacteria, but have been observed in animal cells.

12 ECOLOGICAL INFORMATION

Ecotoxicological Information

Data on this material and/or its components are summarized below.

Sodium Hydroxide
Data from several species of fish showed a range of tolerance (brook trout > spotfin and Lake Emerald shiners > minnows > mosquitofish > goldfish) that was most likely related to changes in the pH produced by addition of sodium hydroxide to the water. The minimum lethal concentration for minnows, Mayfly larvae and Daphnia was 100 ppm and for Chironomus larvae, 700 ppm.

Carbon Disulfide
This material is moderately toxic to Daphnia magna (LC50 2.1 mg/l). It is moderately toxic to guppies (LC50 4 mg/l) and slightly toxic to green algae (LC50 21 mg/l). It is practically non-toxic to mosquitofish (LC50 135 mg/l) and bacteria (LC50 341 mg/l).

Chemical Fate Information

Data on this material and/or its components are summarized below.

Sodium Hydroxide
No data were available, but this material is a strong alkali that easily dissolves in water with resulting acid/base chemistry.

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13 DISPOSAL CONSIDERATIONS

Waste Disposal

Consult with environmental engineer or professional to determine if neutralization is appropriate and for handling procedures for residual materials. Note: Chemical additions to, processing of, or otherwise altering this material may make this waste management information incomplete, inaccurate, or otherwise inappropriate. Furthermore, state and local waste disposal requirements may be more restrictive or otherwise different from federal laws and regulations.

14 TRANSPORT INFORMATION

DOT Name	Flammable Liquid, Corrosive, NOS
DOT Technical Name	(Sodium Hydroxide; Carbon Disulfide)
DOT Hazard Class	3, 8
UN Number	UN 2924
DOT Packing Group	PG II
RQ	Sodium Hydroxide 1000# (dry basis); Carbon Disulfide 100#
DOT Special Information	Subsidiary hazard: 8 Corrosive On a waste manifest, add the word "Waste"

15 REGULATORY INFORMATION

Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370)

Immediate (Acute) Health	Y	Fire	Y
Delayed (Chronic) Health	N	Reactive	N
		Sudden Release of Pressure	N

The components of this product are all on the TSCA Inventory list.

Ingredient Related Regulatory Information:

SARA Reportable Quantities	CERCLA RQ	SARA TPQ
Sodium hydroxide	1000 LBS	
Water	NE	
Carbon disulfide	100 LBS	10000 LBS

SARA Title III, Section 313

This product does contain chemical(s) which are defined as toxic chemicals under and subject to the reporting requirements of, Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372. See Section 2

Carbon disulfide

SARA Title III, Section 302

This product does contain chemical(s), as indicated below, currently on the Extremly Hazardous Substance List, Section 302, SARA Title III. See Section 2 for further details regarding concentrations and registry numbers.

Carbon disulfide

California Prop 65 - Developmental Toxin

This product does contain the following chemical(s), as indicated below, currently on the California List of Developmental Toxins.

Carbon disulfide

Massachusetts Right to Know

This product does contain the following chemicals(s), as indicated below, currently on the Massachusetts Right to Know Substance List.

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Massachusetts Right to Know
This product does contain the following chemicals(s), as indicated below, currently on the Massachusetts Right to Know Substance List.
Carbon disulfide
Sodium hydroxide

New Jersey Right to Know
This product does contain the following chemical(s), as indicated below, currently on the New Jersey Right-to-Know Substances List.
Carbon disulfide
Sodium hydroxide

Pennsylvania Environmental Hazard
This product does contain the following chemical(s), as indicated below, currently on the Pennsylvania Environmental Hazard List.
Carbon disulfide
Sodium hydroxide

Pennsylvania Right to Know
This product does contain the following chemical(s), as indicated below, currently on the Pennsylvania Hazardous Substance List.
Carbon disulfide
Sodium hydroxide

16 OTHER INFORMATION

Revision Information

Revision Date	23 FEB 2007	Revision Number 6
Supercedes Revision Dated	07-NOV-2006	

Revision Summary
Moved from Retired to Active 03.

Key
NE= Not Established NA= Not Applicable (R) = Registered Trademark

Miscellaneous
NOTE: Toxic carbon monoxide gas can form upon contact with food and beverage products in enclosed spaces and cause death.

Arkema Inc. believes that the information and recommendations contained herein (including data and statements) are accurate as of the date hereof. NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, WARRANTY OF MERCHANTABILITY, OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, IS MADE CONCERNING THE INFORMATION PROVIDED HEREIN. The information provided herein relates only to the specific product designated and may not be valid where such product is used in combination with any other materials or in any process. Further, since the conditions and methods of use are beyond the control of Arkema Inc., Arkema Inc. expressly disclaims any and all liability as to any results obtained or arising from any use of the product or reliance on such information.

EPAPA008001094

MSDS Number: **S8234** * * * * * *Effective Date:* ***11/09/07*** * * * * * *Supercedes:* ***02/04/05***

MSDS Material Safety Data Sheet

From: **Mallinckrodt Baker, Inc.**
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS | J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
***Chemtrec:* 703-527-3887**

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

SULFURIC ACID, 52 - 100 %

1. Product Identification

Synonyms: Oil of vitriol; Babcock acid; sulphuric acid
CAS No.: 7664-93-9
Molecular Weight: 98.08
Chemical Formula: H2SO4 in H2O
Product Codes:
J.T. Baker: 5030, 5137, 5374, 5802, 5815, 5858, 5859, 5868, 5889, 5897, 5961, 5971, 5997, 6163, 6902, 9671, 9673, 9674, 9675, 9676, 9679, 9680, 9681, 9682, 9684, 9687, 9691, 9693, 9694
Mallinckrodt: 21201, 2468, 2876, 2878, 2900, 2904, 3780, 4222, 5524, 5557, H644, H850, H976, H996, V651, XL003

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Sulfuric Acid	7664-93-9	52 - 100%	Yes
Water	7732-18-5	0 - 48%	No

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3. Hazards Identification

Emergency Overview

POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR CONTACTED WITH SKIN. HARMFUL IF INHALED. AFFECTS TEETH. WATER REACTIVE. CANCER HAZARD. STRONG INORGANIC ACID MISTS CONTAINING SULFURIC ACID CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 4 - Extreme (Poison)
Flammability Rating: 0 - None
Reactivity Rating: 2 - Moderate
Contact Rating: 4 - Extreme (Corrosive)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: White (Corrosive)

Potential Health Effects

Inhalation:
Inhalation produces damaging effects on the mucous membranes and upper respiratory tract. Symptoms may include irritation of the nose and throat, and labored breathing. May cause lung edema, a medical emergency.

Ingestion:
Corrosive. Swallowing can cause severe burns of the mouth, throat, and stomach, leading to death. Can cause sore throat, vomiting, diarrhea. Circulatory collapse with clammy skin, weak and rapid pulse, shallow respirations, and scanty urine may follow ingestion or skin contact. Circulatory shock is often the immediate cause of death.

Skin Contact:
Corrosive. Symptoms of redness, pain, and severe burn can occur. Circulatory collapse with clammy skin, weak and rapid pulse, shallow respirations, and scanty urine may follow skin contact or ingestion. Circulatory shock is often the immediate cause of death.

Eye Contact:
Corrosive. Contact can cause blurred vision, redness, pain and severe tissue burns. Can cause blindness.

Chronic Exposure:
Long-term exposure to mist or vapors may cause damage to teeth. Chronic exposure to mists containing sulfuric acid is a cancer hazard.

Aggravation of Pre-existing Conditions:
Persons with pre-existing skin disorders or eye problems or impaired respiratory function may be more susceptible to the effects of the substance.

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J. T. Baker NEUTRASORB® acid neutralizers are recommended for spills of this product.

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7. Handling and Storage

Store in a cool, dry, ventilated storage area with acid resistant floors and good drainage. Protect from physical damage. Keep out of direct sunlight and away from heat, water, and incompatible materials. Do not wash out container and use it for other purposes. When diluting, always add the acid to water; never add water to the acid. When opening metal containers, use non-sparking tools because of the possibility of hydrogen gas being present. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

---

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
For Sulfuric Acid:
- OSHA Permissible Exposure Limit (PEL) -
1 mg/m3 (TWA)
- ACGIH Threshold Limit Value (TLV) -
0.2 mg/m3(T) (TWA) for sulfuric acid - A2 Suspected Human Carcinogen for sulfuric acid contained in strong inorganic mists.

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, a full facepiece respirator with an acid gas cartridge and particulate filter (NIOSH type N100 filter) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P particulate filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres. Where respirators are required, you must have a written program covering the basic requirements in the OSHA respirator standard. These include training, fit testing, medical approval, cleaning, maintenance, cartridge change schedules, etc. See 29CFR1910.134 for details.

Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

EPAPA008001097

MSDS Number: **S8234** * * * * * *Effective Date:* ***11/09/07*** * * * * * *Supercedes:* ***02/04/05***

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

SULFURIC ACID, 52 - 100 %

1. Product Identification

Synonyms: Oil of vitriol; Babcock acid; sulphuric acid
CAS No.: 7664-93-9
Molecular Weight: 98.08
Chemical Formula: H2SO4 in H2O
Product Codes:
J.T. Baker: 5030, 5137, 5374, 5802, 5815, 5858, 5859, 5868, 5889, 5897, 5961, 5971, 5997, 6163, 6902, 9671, 9673, 9674, 9675, 9676, 9679, 9680, 9681, 9682, 9684, 9687, 9691, 9693, 9694
Mallinckrodt: 21201, 2468, 2876, 2878, 2900, 2904, 3780, 4222, 5524, 5557, H644, H850, H976, H996, V651, XL003

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Sulfuric Acid	7664-93-9	52 - 100%	Yes
Water	7732-18-5	0 - 48%	No

EPAPA008001098

9. Physical and Chemical Properties

Appearance:
Clear oily liquid.
Odor:
Odorless.
Solubility:
Miscible with water, liberates much heat.
Specific Gravity:
1.84 (98%), 1.40 (50%), 1.07 (10%)
pH:
1 N solution (ca. 5% w/w) = 0.3; 0.1 N solution (ca. 0.5% w/w) = 1.2; 0.01 N solution (ca. 0.05% w/w) = 2.1.
% Volatiles by volume @ 21C (70F):
No information found.
Boiling Point:
ca. 290C (ca. 554F) (decomposes at 340C)
Melting Point:
3C (100%), -32C (93%), -38C (78%), -64C (65%).
Vapor Density (Air=1):
3.4
Vapor Pressure (mm Hg):
1 @ 145.8C (295F)
Evaporation Rate (BuAc=1):
No information found.

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage. Concentrated solutions react violently with water, spattering and liberating heat.
Hazardous Decomposition Products:
Toxic fumes of oxides of sulfur when heated to decomposition. Will react with water or steam to produce toxic and corrosive fumes. Reacts with carbonates to generate carbon dioxide gas, and with cyanides and sulfides to form poisonous hydrogen cyanide and hydrogen sulfide respectively.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Water, potassium chlorate, potassium perchlorate, potassium permanganate, sodium, lithium, bases, organic material, halogens, metal acetylides, oxides and hydrides, metals (yields hydrogen gas), strong oxidizing and reducing agents and many other reactive substances.
Conditions to Avoid:
Heat, moisture, incompatibles.

11. Toxicological Information

Toxicological Data:
Oral rat LD50: 2140 mg/kg; inhalation rat LC50: 510 mg/m3/2H; standard Draize, eye rabbit, 250 ug (severe); investigated as a tumorigen, mutagen, reproductive effector.
Carcinogenicity:
Cancer Status: The International Agency for Research on Cancer (IARC) has classified "strong inorganic acid mists containing sulfuric acid" as a known human carcinogen, (IARC category 1). This classification applies only to mists containing sulfuric acid and not to sulfuric acid or sulfuric acid solutions.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Sulfuric Acid (7664-93-9)	No	No	None
Water (7732-18-5)	No	No	None

12. Ecological Information

Environmental Fate:
When released into the soil, this material may leach into groundwater. When released into the air, this material may be removed from the atmosphere to a moderate extent by wet deposition. When released into the air, this material may be removed from the atmosphere to a moderate extent by dry deposition.
Environmental Toxicity:
LC50 Flounder 100 to 330 mg/l/48 hr aerated water/Conditions of bioassay not specified; LC50 Shrimp 80 to 90 mg/l/48 hr aerated water /Conditions of bioassay not specified; LC50 Prawn 42.5 ppm/48 hr salt water /Conditions of bioassay not specified.
This material may be toxic to aquatic life.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: SULFURIC ACID (WITH MORE THAN 51% ACID)
Hazard Class: 8
UN/NA: UN1830
Packing Group: II
Information reported for product/size: 440LB

International (Water, I.M.O.)

Proper Shipping Name: SULFURIC ACID (WITH MORE THAN 51% ACID)
Hazard Class: 8
UN/NA: UN1830
Packing Group: II
Information reported for product/size: 440LB

---

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

Ingredient	TSCA	EC	Japan	Australia
Sulfuric Acid (7664-93-9)	Yes	Yes	Yes	Yes
Water (7732-18-5)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\----------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Sulfuric Acid (7664-93-9)	Yes	Yes	No	Yes
Water (7732-18-5)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\----------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Sulfuric Acid (7664-93-9)	1000	1000	Yes	No
Water (7732-18-5)	No	No	No	No

--------\Federal, State & International Regulations - Part 2\----------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Sulfuric Acid (7664-93-9)	1000	No	No
Water (7732-18-5)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: Yes
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: Yes (Pure / Liquid)

Australian Hazchem Code: 2P

EPAPA008001102

Poison Schedule: None allocated.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

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16. Other Information

NFPA Ratings: Health: **3** Flammability: **0** Reactivity: **2** Other: **Water reactive**
Label Hazard Warning:
POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR CONTACTED WITH SKIN. HARMFUL IF INHALED. AFFECTS TEETH. WATER REACTIVE. CANCER HAZARD. STRONG INORGANIC ACID MISTS CONTAINING SULFURIC ACID CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure.
Label Precautions:
Do not get in eyes, on skin, or on clothing.
Do not breathe mist.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Do not contact with water.
Label First Aid:
In all cases call a physician immediately. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before re-use. Excess acid on skin can be neutralized with a 2% bicarbonate of soda solution. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.
Product Use:
Laboratory Reagent.
Revision Information:
No Changes.
Disclaimer:
****

Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING

EPAP008001103

FROM USE OF OR RELIANCE UPON THIS INFORMATION.
****

Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately.
Ingestion:
DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Call a physician immediately.
Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Excess acid on skin can be neutralized with a 2% solution of bicarbonate of soda. Call a physician immediately.
Eye Contact:
Immediately flush eyes with gentle but large stream of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Call a physician immediately.

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5. Fire Fighting Measures

Fire:
Concentrated material is a strong dehydrating agent. Reacts with organic materials and may cause ignition of finely divided materials on contact.
Explosion:
Contact with most metals causes formation of flammable and explosive hydrogen gas.
Fire Extinguishing Media:
Dry chemical, foam or carbon dioxide. Do not use water on material. However, water spray may be used to keep fire exposed containers cool.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Structural firefighter's protective clothing is ineffective for fires involving this material. Stay away from sealed containers.

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6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

3. Hazards Identification

Emergency Overview

POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR CONTACTED WITH SKIN. HARMFUL IF INHALED. AFFECTS TEETH. WATER REACTIVE. CANCER HAZARD. STRONG INORGANIC ACID MISTS CONTAINING SULFURIC ACID CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 4 - Extreme (Poison)
Flammability Rating: 0 - None
Reactivity Rating: 2 - Moderate
Contact Rating: 4 - Extreme (Corrosive)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: White (Corrosive)

Potential Health Effects

Inhalation:
Inhalation produces damaging effects on the mucous membranes and upper respiratory tract. Symptoms may include irritation of the nose and throat, and labored breathing. May cause lung edema, a medical emergency.

Ingestion:
Corrosive. Swallowing can cause severe burns of the mouth, throat, and stomach, leading to death. Can cause sore throat, vomiting, diarrhea. Circulatory collapse with clammy skin, weak and rapid pulse, shallow respirations, and scanty urine may follow ingestion or skin contact. Circulatory shock is often the immediate cause of death.

Skin Contact:
Corrosive. Symptoms of redness, pain, and severe burn can occur. Circulatory collapse with clammy skin, weak and rapid pulse, shallow respirations, and scanty urine may follow skin contact or ingestion. Circulatory shock is often the immediate cause of death.

Eye Contact:
Corrosive. Contact can cause blurred vision, redness, pain and severe tissue burns. Can cause blindness.

Chronic Exposure:
Long-term exposure to mist or vapors may cause damage to teeth. Chronic exposure to mists containing sulfuric acid is a cancer hazard.

Aggravation of Pre-existing Conditions:
Persons with pre-existing skin disorders or eye problems or impaired respiratory function may be more susceptible to the effects of the substance.

Daily Nap Caustic Shift Report

Date	Incoming Job #	Incoming Gallons	Incoming Trailer	Storage Tank START Strap STOP		RV 3 Strap START STOP		Initial Feed Oil %	Oil sent out	~~Acid trailer~~ Comment
2-Dec	77048	5000	267					2%		
2-Dec	77097	5000	Lt848					3%		
3-Dec	77099	5000	Lt848					3%		
4-Dec	77100	5000	Lt848					2%		
4-Dec	77101	5000	638					4%		
8-Dec	77405	5000	7253					3%		
8-Dec	77408	5000	7253					2%		
9-Dec	77407	5000	LT1047					2%		
				3	3	52				
12-12	77899									

Operator: _____

Manager: _____

6000
250
0

EPAPA008001106

05 57 29 75

Loyale Assurance

W:

26 01 BP 12 263. Abidjan 01

Tank 501 } oil content solids content
color, allowance full titration

601 } oil content Solid content
color allowance, Full titration

10.2 → 10.8 → 12.7

0.4550	42.6	44	61.2	65.2

0.92

EPAPA008001107

INVOICE

Thermal Scientific, Inc.

ODESSA (432) 337-2352 ● (800) 826-4486 ● FAX (432) 337-2417
AMARILLO (806) 335-1711 ● FAX (806) 335-2002
BEAUMONT (409) 724-2428 ● FAX (409) 724-2949
CORPUS CHRISTI (361) 884-7152 ● FAX (361) 888-7642

INVOICE NUMBER: **0081540-IN**
INVOICE DATE: 12/4/2008
ORDER NUMBER:
ORDER DATE:
DELIVERY TICKET:
CUSTOMER NUMBER: CASH1

SOLD TO:
CES ENVIROMENTAL
2420 GULFWAY DRIVE
Port Arthur, TX 77640

SHIP TO:
CES ENVIROMENTAL
2420 GULFWAY DRIVE
Port Arthur, TX 77640

Confirm To:
GODFREY 713 676 1460 EXT 149

Customer P.O.	Ship VIA	F.O.B.	Terms
CREDIT CARD	PICK UP		NO TERMS

Item Number	Unit	Ordered	Shipped	Back Ordered	Price	Amount
P8577-1 PUMP, AIR-CADET, VACUUM/PRESURE, DIAPHRAM, SINGLE HEAD, 0.6cfm, 115V, BARNANT 420-1901	EACH	1	1 **Whse:** 400	0	283.96	283.96
*OVERNIGHT RED RED CHARGES	EACH	1	1	0	50.00	50.00
*13691 DISPERSION TUBES	PACK	1	1	0	52.00	52.00

ORDER COMPLETE THANK YOU

Invoice Paid By Credit Card Type VISA Card Ending 4686
Authorization Code: 063925
THANK YOU

AUTHORIZED SIGNATURE_____

Net Invoice:	385.96
Less Discount:	0.00
Freight:	0.00
Sales Tax:	31.83
Invoice Total:	**417.79**
Less Deposit:	417.79
Invoice Balance:	0.00

REMIT TO:
THERMAL SCIENTIFIC, INC.
P.O. BOX 314
ODESSA, TEXAS 79760

Past due balances are subject to a finance charge. No credit will be allowed for merchandise returned without prior authorization. All returns must be within 30 days of purchase and may be subject to a restocking fee

Serving Science & Industry Since 1962

CES Environmental Services, Inc.

CES SAMPLE EVALUATION FORM

Sample ID # 1208-27 **Date:** 12-8-08

CES Sales Representative: Gary Brandenburg
Requested Turnaround / Completion Date: ASAP

Customer Name: Valero - CC
Generator Name and Location: Valero Corpus Christi
Ultimate Objective for Performing Analysis: Sulfidic caustic processing

Provide a Detailed Description of the Process Generating the Waste, Material, or Product:
caustic used to scrub gas

Provide a detailed Composition to the best of your knowledge:
Component / Approximate Percentage or PPM:

caustic soda	5.20		
water	95.80		
Hydrocarbons	2-5		

Internal Analysis to be Performed on Wastewater/Sludge and Oily Water/sludge:

Wastewater Treatability____	Percent Solids____	Percent Oil____
Specific Gravity____	Chlor-d-tect (oil phase)____	pH____
Phenols____	Oil and Grease (water phase)___	TOC____
Distillation Test____	Metals____	Flash____
GC/MS____	Chlor-n-oil (oil phase)____	Centrifuge Test____

Other Internal Analysis (List)_____
Off-site Lab Analysis (List)_____
Note: Must have an approved P.O. for any external lab analysis

Internal Analysis to be Performed on Hydrocarbons or other Organic Chemicals:

Ash____	Black Oil Suitability____	Viscosity____
Specific Gravity____	Light End Suitability____	Distillation Test____
Flash____	CES Fuel Suitability____	Hydro-scout____
Chlor-d-tect____	Color____	Chlor-n-oil____
Water by Distillation____	Water Extractability____	

Other Internal Analysis (List)_____
Off-site Lab Analysis (List)_____
Note: Must have an approved P.O. for any external lab analysis

Internal Analysis to be Performed on Spent Caustic:

Percent Potassium Hydroxide____	Specific Gravity 1.10	Sulfides 4.374
Percent Sodium Hydroxide 11.21	Chlorides____	Sodium____
Percent Solids by Centrifuge____	Oil by Centrifuge____	TOC____

Other Internal Lab Analysis (List)_____
Off-site Lab Analysis (List)_____
Note: Must have an approved P.O. for any external lab analysis

33.6 / 43.2m 54.2m

56.2 / 57

18.4 → 21.2

67.2

73.8

18.4 22.8

KmTex 606 { Solid No solid
oil No oil
Color

EPAPA008001110

77263	Sittig	Brent		285	237	KMTEX	load of methanol water to Newpark.	3rd	1/3 Day
77407	Wilson	Kevin	Done	2004	LT-1047	Total Petrochemicals Inc.-Port Arthur, TX	p/u Naphthenic caustic as directed, haul to PACES**630AM-3PM**send add'l drivers for training-should be getting both load before noon	0600	1/2 Day
77373	Wilson	Kevin	Waiting to Load	2004	LT-1047	KMCO, Inc.	load SIB and bring to CES port Arthur.	2nd	1/2 Day
77445	Wood	Brad	Done	273	265	Targa Midstream Services LP	load CBF, Haul to CES PA...will redirect to deridder	0500	1/4 Day
77340	Wood	Brad	Cancel	2005	265	CES Environmental Services @ KMTEX	**be at kmtex by 2:45pm** go to Kmtex and load caustic from tank 607 and haul to deridder	3rd	1/2 Day

Report Printed 12/9/2008 2:12:53 PM

EPAPA008001111

CES Environmental Port Arthur Dispatch Board

FOR : Tuesday 12/9/2008

Job Note ID	Driver	Helper	Truck	Trailer	Misc Equipment	Customer	Job Description	Start Time	Job Length
77613	Abreu Wilfrido	Done	291	1264		CES Environmental Services - Port Arthur	load wastewater and haul to np	0600	1/3 Day
77614	Abreu Wilfrido	In Route	291	1264		CES Environmental Services - Port Arthur	load wastewater and haul to np	2nd	1/3 Day
77616	Abreu Wilfrido		291	1264		CES Environmental Services - Port Arthur	load wastewater and haul to np	3rd	1/3 Day
77574	Carrillo Rudy	Done	282	258		KMTEX	load of reg w/w to np		
77575	Carrillo Rudy	In Route	282	258		KMTEX	load of reg w/w to np		
77576	Carrillo Rudy		282	258		KMTEX	load of reg w/w to np		
77611	Crawley Kevin	Done	2006	208		CES Environmental Services - Port Arthur	load wastewater and haul to np	0600	1/3 Day
77617	Crawley Kevin	Waiting to Load	2006	208		CES Environmental Services - Port Arthur	load wastewater and haul to np	2nd	1/3 Day
77618	Crawley Kevin		2006	208		CES Environmental Services - Port Arthur	load wastewater and haul to np	3rd	1/3 Day
77406	Denton William		278	267		Total Petrochemicals Inc.- Port Arthur, TX	p/u Naphthenic caustic as directed, haul to PACES**630AM-3PM**send add'l drivers for training-should be getting both load before noon	0600	1/2 Day
77372	Denton William	Done	278	7253		KMCO, Inc.	load SIB and bring to CES port Arthur.	0800	1/2 Day
77366	Denton William	Cancel	278	267		CES Environmental Services @ KMTEX	**be at kmtex by 8:30am** Load WHITE LIQUOR from tank 607 MAKE SURE TRAILER IS MARKED WITH SPECIAL MARKINGS!! PER MATT BOWMAN!!	2nd	1/2 Day
77350	Mendoza Juan	Cancel	2001	LT423		CES Environmental Services @ KMTEX	**be at kmtex by 6:00am** go to Kmtex and load caustic from tank 607 and haul to deridder	0530	1/2 Day
77345	Mendoza Juan	Cancel	2001	LT423		CES Environmental Services @ KMTEX	**be at kmtex by 1:30pm** go to Kmtex and load caustic from tank 607 and haul to deridder	2nd	1/2 Day
77361	Mendoza Juan	Unloading	2001	265		CES Environmental Services - Port Arthur	haul loaded traielr to deridder...targe cbf redirect	2nd	1/4 Day
77615	Mendoza Juan	Cancel	2001			CES Environmental Services - Port Arthur	load wastewater and haul to np	2nd	1/2 Day
77261	Sittig Brent	Done	285	237		KMTEX	load of methanol water to Newpark.	0530	1/3 Day
77262	Sittig Brent	Unloading	285	237		KMTEX	load of methanol water to Newpark.	2nd	1/3 Day

EPAPA008001112

Daily Nap Caustic Shift Report

Date	Incoming Job #	Incoming Gallons	Incoming Trailer	Storage Tank Strap		RV 3 Strap		Initial Feed Oil %	Oil sent out	Comment
				Start	Stop	Start	Stop			
2-Dec	77048	5000	267					2%		
2-Dec	77097	5000	Lt848					3%		
3-Dec	77099	5000	Lt848					3%		
4-Dec	77100	5000	Lt848					2%		
4-Dec	77101	5000	638					4%		
8-Dec	77405	5000	7253					3%		
8-Dec	77408	5000	7253					2%		
9-Dec	77407	5000	LT1047					2%		
11-Dec	11411		261							

Operator: _____

Manager: _____

EPAPA00800113

77768	Wilson Kevin	2004	LT-848	CES Environmental Services - Port Arthur	haul loaded trailer to deridder...arkema redirect	2nd	1/3 Day
77762	Wilson Kevin	2004	LT-848	CES Environmental Services - Port Arthur	load wastewater and haul to np	3rd	1/3 Day
77352	Wood Brad	2005	232	CES Environmental Services @ KMTEX	**be at kmtex by 6:00am** go to Kmtex and load caustic from tank 607 - GO TO CES Port Arthur for QC prior to hauling to Boise	0530	1/2 Day
77355	Wood Brad	2005	232	CES Environmental Services @ KMTEX	**be at kmtex by 3:30pm** go to Kmtex and load caustic from tank 607 - GO TO CES Port Arthur for QC prior to hauling to Boise	2nd	1/2 Day

EPAPA00800114

CES Environmental Dispatch Board

Thursday 12/11/2008

Job Note ID	Driver	Helper	Truck	Trailer	Misc Equipment	Customer	Job Description	Start Time	Job Length
77571				226		Hexion Specialty Chemicals-Hope, AR	OUTSIDE CARRIER NEED TO TRAILER in AM TO TRANSLOAD GOING TO NEWPARK REDIRECT JOB#77572		
77308	Abreu Wilfrido	IN ROUTE TO ARKEMA	291			Arkema, Inc. - Houston	be at magellan at 7am. Pickup a trailer and haul load to Magellan/intergulf offload then return to arkema. Print BOL NEED CLEAN TRAILER & CLEAN CERTIFICATE ASK AL FOR TANK#	0500	1/3 Day
77400	Abreu Wilfrido		101			Advanced Aromatics	Drums pick up need a flat bed trailer because of a low rack. Trailer must not be longer than 12'6"	2nd	1/3 Day
77572	Abreu Wilfrido		291	226		CES Environmental Services, Inc. (TSDF)	haul trailer to newpark and offload. PM JOB - HEXION HOPE REDIRECT JOB#77571	3rd	1/3 Day
77705	Berry Noah		287	270		Conoco Phillips (Westlake LA)	pickup load of sulfuric acid from lake charles and haul to CES Houston...be at conoco at 9am	0500	3/4 Day
77311	Berry Noah	Need C OF A AM Please	287	225		PPG Industries, Inc	Pickup trailer #225 from PPG and bring back to CES - make a late job but not night driver	2nd	1/4 Day
77756	Bozeman Donald	GET TRLR RINSED AT NP	284	256		CES Environmental Services, Inc. (TSDF)	haul trailer #256 to newpark and offload- sherwin williams redirect	0500	1/3 Day
77725	Bozeman Donald		284	256		Green Earth Fuels of Houston LLC	Vac out load of water and bring to CES.	2nd	1/3 Day
77726	Bozeman Donald		284	256		Green Earth Fuels of Houston LLC	Vac out load of water and bring to CES.	3rd	1/3 Day
77728	Bozeman Donald		284	256		Green Earth Fuels of Houston LLC	Vac out load of water and bring to CES.	4th	1/3 Day
0	Carrillo Rudy		282			CES Environmental Services - Port Arthur	WORKING AT PACES		Full Day
0	Denton William		278			CES Environmental Services - Port Arthur	WORKING AT PACES		Full Day
77777	Dominguez Jose		294	207	CES Box 624	CES Environmental Services, Inc. (TSDF)	haul box 624 to bfi-mccarty	0500	1/3 Day
77775	Dominguez Jose		294	207	CES Box 623	CES Environmental Services, Inc. (TSDF)	haul 623 to Republic and offload	2nd	1/2 Day
77780	Espinal Jose		104			CES Environmental Services, Inc. (TSDF)	Haul truck 104 to the landfill and offload.	0500	1/3 Day
77675	Frias Juan		2003	260		CES Environmental Services, Inc.	Load trailer _____ from Frac Tank and haul to Phoenix Oil **MUST HAVE VAPOR RECOVERY**	0500	1/2 Day
77636	Frias Juan	GO TO BURBANK AND PICK UP DRUMS	2003	246		CES Environmental Services, Inc.	CUSTOMER IS NOLTEX: Deliver 25 New open top metal drums.	2nd	1/2 Day
77532	Garza Alfredo		289	228		Socotherm LaBarge, LLC	pump out w/w and bring to ces**	0500	1/3 Day

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77519	Garza Alfredo		289	228		AMTEX Machine Products, Inc.	vac out ww, haul to Newpark** NO SLEEPER TRUCKS**	2nd	1/2 Day
77668	Gipson Jack	J. Ramirez				Green Earth Fuels of Houston LLC	Clean out frac tanks on site. Field truck.	0500	Full Day
77665	Gipson Jack		108			CES Environmental Services, Inc.	Deliver vacuum box from CES to Green Earth on Jefferson. Must be first job in the morning.	0500	Full Day
77713	Gonzales Joe		297	251		CES Environmental Services, Inc.	Return box 1212 to Evergreen tank solutions.	2nd	1/4 Day
77641	Gonzales Joe		297	251	CES Box 605	CES Environmental Services, Inc. (TSDF)	pick up Rolled Alloys box#605 from tankwash & haul to Republic.	3rd	1/2 Day
77398	Hall Albert		299	206		NOV (Magnolia)	pump out septic waste and haul to gcwda Need BOL	0500	1/3 Day
77635	Hall Albert		299	206		Miller Transporters	pump out biosludge and haul to CES***must be there before 3PM**	2nd	1/3 Day
77727	Hall Albert		299	206		Green Earth Fuels of Houston LLC	Vac out load of water and bring to CES.	3rd	1/3 Day
77525	Hernandez Joe		107			Green Earth Fuels of Houston LLC	Clean out frac tanks on site. Air Mover.	0500	Full Day
77682	Hickman Robert		281	236	CES Box 641	CES Environmental Services, Inc. (Tankwash)	haul 641 to republic and offload	0500	1/2 Day
77567	Hickman Robert		281	236		RohMax USA, Inc.-Houston	Haul class 1 trash to republic. Do not need liner	2nd	1/2 Day
77676	Lawrence Gregory	QUINN	286	217		Hillcorp	pick up 18 NH drums & deliver one cut top tote. Customer has dock & forlift	0500	1/3 Day
77715	Lawrence Gregory	QUINN	286	217		Goodman Manufacturing (Furnace Plant)	DRUM PICK UP, haul to CES***1st or 2nd job please	2nd	1/3 Day
77680	Lawrence Gregory	QUINN	286	217		MSI Equipment Centers	Pick up 6 drums. Haz material. MANIFEST & BOL	3rd	1/3 Day
77773	Rodriguez Bobby	IN ROUTE TO ZACH	2002	215		ZaCh System Corp. (La Porte)	Pickup trailer#215 from ZaCh and deliver to PSC in avalon	0500	Full Day
77708	Rosales Candido	LOADING	290	233		CES Environmental Services, Inc	load oil from oil facility and haul to us oil recovery	0500	1/2 Day
77707	Rosales Candido		290	233		CES Environmental Services, Inc	load oil from oil facility and haul to us oil recovery	2nd	1/2 Day
77393	Salazar Alfonso	LEAVING TO LUB.	279	257		Lubrizol-Deer Park	haul load to systech in KS. Have the trailer washed out at Systech Prior to leaving!	0500	Full Day
77533	Sanchez Jose		293	228		Socotherm LaBarge, LLC	pump out w/w and bring to ces**	1600	1/3 Day
77779	Sanchez Omar	IN ROUTE TO GATX	2000	253		GATX (Hearne)	return empty vac box to GATX***1st job please	0500	3/4 Day
77515	Sanders Preston	LEAVING TO REP	295	252		CES Environmental Services, Inc. (TSDF)	haul ROS to Republic and offload	0500	1/3 Day
77511	Sanders Preston		295	252		Lubrizol-Deer Park	Use large vacuum tuck (5,000gal), remove ROS and take to CES. Will be redirected after QC to Republic as Class 1 sludge. Job#75516	2nd	1/3 Day
77516	Sanders Preston		295	252		CES Environmental Services, Inc. (TSDF)	haul ROS to Republic and offload	3rd	1/3 Day
77754	Sanfilippo Sergio	ANTHONY (LEAVING TO OCEAN)	288	248		Oceaneering International, Inc. (11927)	Drum pick up and tote delivery. Need LIFT GATE, Drum Dolly & Pallet Jack for all three sites.	0500	1/3 Day

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77757	Sanfilippo Sergio	ANTHONY	288	248	Oceaneering International, Inc. (11917)	Pick up drums & deliver totes. 2nd job	2nd	1/3 Day
77681	Sanfilippo Sergio	ANTHONY	288	248	Oceaneering International, Inc. (Charles Street)	Drum pick up and tote delivery. 3rd job - need lift gate.	3rd	1/3 Day
77722	Semien Peter	IN ROUTE TO GOODMAN	283	243	Goodman Manufacturing (Cooling Plant)	suck out clarifier w/w and sludge as directed, haul to CES	0600	1/3 Day
77679	Semien Peter		283	243	Black Warrior Wireline	vac out 5000 gal of rinsewater, haul to CES.	2nd	1/3 Day
77634	Semien Peter		283	243	Miller Transporters	pump out biosludge and haul to CES***must be there before 3PM**	3rd	1/3 Day
0	Soto Andre	MILTON- (IN ROUTE TO PA)	103		CES Environmental Services - Port Arthur	REPORT TO BRIAN WEATHERS IN PORT ARTUR	0500	Full Day
77778	Taylor Matthew	LEAVING TO NP	280	241	CES Environmental Services, Inc. (TSDF)	haul loaded trailer to NP...green earth redirect	0500	1/3 Day
77709	Taylor Matthew		280	241	CES Environmental Services, Inc	load oil from oil facility and haul to us oil recovery	2ND	1/3 Day
77706	Taylor Matthew		280	241	CES Environmental Services, Inc	load oil from oil facility and haul to us oil recovery	3RD	1/2 Day
77771	West Perry	LEAVING TO PHOENIX	292	259	CES Environmental Services, Inc.	Load trailer _____ from Frac Tank and haul to Phoenix Oil **MUST HAVE VAPOR RECOVERY**	0500	1/2 Day
77494	West Perry		292	259	Vopak	go to vopak & remove Lubrizol ROS	2nd	1/3 Day
77729	Woodard Irvin	M. Espinal	102		Brenntag	1 techs and field truck. Irving Woodard please. Tank cleaning job. Take empty tote	0500	1/2 Day

EPAPA008001117

DECLARATION OF INSPECTION

DECLARATION OF INSPECTION PRIOR TO BULK CARGO TRANSFER		RADIO NO.	
VESSEL:		DATE/TIME ISSUED	
		VESSEL PIC SIGNATURE	
TRANSFER FACILITY:	CES ENVIRONMENTAL SERVICES, INC.	DATE/TIME RETURNED	
LOCATION:		FACILITY PIC SIGNATURE	

The following list refers to requirements set forth in detail 33 CFR 156.150 and 46 CFR 35.35-30

The spaces adjacent to items on the list are provided to indicate that the detailed requirement has been met.

		INITIAL FACILITY	INITIAL VESSEL
1.	Communication System/Language Fluency. (156.120 (q) (154.560) (155.785) (156.120V))	MCT3	
2.	Warning Signs and red Warning Signal. (35.35-30)	MCT3	
3.	Adequate Vessels Mooring. (156.120 (a))	MCT3	
4.	Transfer System Alignment. (156.120 (d))	MCT3	
5.	Transfer System; unused components. (156.120 (e) (f) (154.120) (155.805))	MCT3	
6.	Transfer System; fixed piping. (156.120 (g))	MCT3	
7.	Overboard. Discharges/Sea Suction Lashed Valves. (156.120 (h))	MCT3	
8.	Hoses or Loading Arms condition. (156.120 (l) (j) (154.500) (154.510))	MCT3	
9.	Hoses; length and support. (156.120 (b) (c))	MCT3	
10.	Connections. (156.120 (k) (p) (156.130))	MCT3	
11.	Monitoring Devices. (156.120 (l) (154.525))	MCT3	
12.	Discharge Containment System Capacity Maintained. (156.120 (m) (n) (p) (154.530) (155.310) (155.320) (154.545))	MCT3	
13.	Scuppers or Drains. (156.120 (o) (155.310))	MCT3	
14.	Emergency Shutdown. (156.120 (r) (154.550) (155.780))	MCT3	
15.	Repair Work Authorization. (35.35-30)	MCT3	
16.	Boiler and Galley Fires Safety. (35.35-30)	MCT3	
17.	Fires or Open Flames. (35.35-30)	MCT3	
18.	Lighting (sunset to sunrise). (156.120 (y) (z) (154.570) (155.790))	MCT3	
19.	Safe Smoking Spaces. (35.35-30)	MCT3	
20.	Spill and Emergency shutdown procedures. (156.120 (w))	MCT3	
21.	Sufficient Personnel. (156.120 (s) (156.115 (u))	MCT3	
22.	Pre-Transfer Conference - refer to the reverse side for the items to be discussed. (156.120 (w))	MCT3	
23.	Agreement to begin Transfer. (156.120 (x))	MCT3	
24.	Persons-in-Charge immediate vicinity/positioned to observe and supervise transfer. (156.160)	MCT3	
25.	Cargo Information Card - Reviewed and Issued. (151.45-2 (e) (3))	MCT3	
26.	Inert Gas System - Operating Properly. (32.53)	MCT3	

I do certify that I have personally inspected this facility or vessel with reference to the requirements set forth in section 35.35-30 and that opposite each of them I have indicated by my initials that the regulations have been complied with.

	SIGNATURE			SIGNATURE	
FACILITY	TITLE		VESSEL	TITLE	
	TIME AND DATE			TIME AND DATE	14:00 12-11-08

I certify that I have read the above declaration and detailed requirements and all conditions remain satisfactory.

SUBSEQUENT FACILITY PERSON-IN-CHARGE			SUBSEQUENT VESSEL PERSON-IN-CHARGE		
SIGNATURE/TITLE	TIME	DATE	SIGNATURE/TITLE	TIME	DATE

TRANSFER START 14:00 **TRANSFER COMPLETE**

EPAPA008001118

14.4

0.57

1.22

4609

Garth

Road

Bayton

7752

(S)

EPAPA008001119

CES Environmental Port Arthur Dispatch Board

FOR : Friday 12/12/2008

Job Note ID	Driver	Helper	Truck	Trailer	Misc Equipment	Customer	Job Description	Start Time	Job Length
77585				LT-423		KMTEX	load of methanol water to Newpark.		
77584				LT-423		KMTEX	load of methanol water to Newpark.		
77583				LT-423		KMTEX	load of methanol water to Newpark.		
77444				265		Targa Midstream Services LP	load LSNG w/ammonia, Haul to CES PA		
77582				261		KMTEX	load of methanol water to Newpark.		
77377				267		KMCO, Inc.	load SIB and bring to CES port Arthur.		
77739						KMTEX	load of methanol water to Newpark.		
77738						KMTEX	load of methanol water to Newpark.		
77737						KMTEX	load of methanol water to Newpark.		
77736						KMTEX	load of methanol water to Newpark.		

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EPAPA008001120

16.8

0.80

Carbonate

7.4

EPAPA008001121

CES Environmental Port Arthur Dispatch Board

FOR : Wednesday 12/31/2008

Job Note ID	Driver	Helper	Truck	Trailer	Misc Equipment	Customer	Job Description	Start Time	Job Length
78776	K C			237		CES Environmental Services - Port Arthur	load wastewater and haul to US Oil Recovery		
78775				268		CES Environmental Services - Port Arthur	load wastewater and haul to US Oil Recovery		
78774				LT423		CES Environmental Services - Port Arthur	load wastewater and haul to US Oil Recovery		
78773				237		CES Environmental Services - Port Arthur	load wastewater and haul to US Oil Recovery		
78772				268		CES Environmental Services - Port Arthur	load wastewater and haul to US Oil Recovery		
78771				LT423		CES Environmental Services - Port Arthur	load wastewater and haul to US Oil Recovery		
78673	Mendoza Juan		2001	261		CES Environmental Services - Port Arthur	Load caustic from barge & haul to Boise Cascade.		
78674	Mendoza Juan		2001	261		CES Environmental Services - Port Arthur	Load caustic from barge & haul to Boise Cascade.		
78685	Sittig Brent		285			Targa Midstream Services LP	load LSNG w/ammonia, Haul to CES PA		
78676	Wilson Kevin		2004	LT-638		CES Environmental Services - Port Arthur	Load caustic from barge & haul to Boise Cascade.		
78675	Wilson Kevin		2004	LT-638		CES Environmental Services - Port Arthur	Load caustic from barge & haul to Boise Cascade.		

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CES Environmental Port Arthur Dispatch Board

FOR : Wednesday 12/31/2008

Job Note ID	Driver	Helper	Truck	Trailer	Misc Equipment	Customer	Job Description	Start Time	Job Length
78776						CES Environmental Services - Port Arthur	load wastewater and haul to US Oil Recovery		
78775						CES Environmental Services - Port Arthur	load wastewater and haul to US Oil Recovery		
78774						CES Environmental Services - Port Arthur	load wastewater and haul to US Oil Recovery		
78773						CES Environmental Services - Port Arthur	load wastewater and haul to US Oil Recovery		
78772						CES Environmental Services - Port Arthur	load wastewater and haul to US Oil Recovery		
78771						CES Environmental Services - Port Arthur	load wastewater and haul to US Oil Recovery		
78673	Mendoza Juan		2001	261		CES Environmental Services - Port Arthur	Load caustic from barge & haul to Boise Cascade.		
78674	Mendoza Juan		2001	261		CES Environmental Services - Port Arthur	Load caustic from barge & haul to Boise Cascade.		
78685	Sittig Brent		285			Targa Midstream Services LP	load LSNG w/ammonia, Haul to CES PA		
78676	Wilson Kevin		2004	LT-638		CES Environmental Services - Port Arthur	Load caustic from barge & haul to Boise Cascade.		
78675	Wilson Kevin		2004	LT-638		CES Environmental Services - Port Arthur	Load caustic from barge & haul to Boise Cascade.		

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CES Environmental Dispatch Board

Tuesday 12/30/2008

Job Note ID	Driver	Helper	Truck	Trailer	Misc Equipment	Customer	Job Description	Start Time	Job Length
0	Bozeman Donald		284			CES Environmental Services - Port Arthur	GO TO PACES AT 7:00am	0500	Full Day
0	Garza Alfredo		289			CES Environmental Services - Port Arthur	GO TO PACES AT 7:00am	0500	Full Day
78652	Sanchez Omar		2000	260		Valero Refining Co Texas	Pick up load of sulfidic caustic & haul to PACES - Vacuum truck	0600	1/2 Day
78651	Sanchez Omar		2000	260		Valero Refining Co Texas	Pick up load of sulfidic caustic & haul to PACES - Vacuum truck	2nd	1/2 Day
78653	Semien Peter		283	271		Valero Refining Co Texas	Pick up load of sulfidic caustic & haul to PACES - Vacuum truck	0600	1/2 Day
78654	Semien Peter		283	271		Valero Refining Co Texas	Pick up load of sulfidic caustic & haul to PACES - Vacuum truck	2nd	1/2 Day

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CES Environmental Dispatch Board

Tuesday 12/30/2008

Job Note ID	Driver	Helper	Truck	Trailer	Misc Equipment	Customer	Job Description	Start Time	Job Length
78157		OUTSIDE CARRIER		226		Hexion Specialty Chemicals-Hope, AR	OUTSIDE CARRIER NEED TO TRAILER in AM TO TRANSLOAD GOING TO NEWPARK REDIRECT JOB#78159		
78727		MIDSTATE TRANSPORTER				CES Environmental Services, Inc.	Midstate will pickup from trailer #419		
78731		MIDSTATE TRANSPORTER				CES Environmental Services, Inc.	Midstate will pickup from trailer #1305		
78732		MIDSTATE TRANSPORTER				CES Environmental Services, Inc.	outside carrier to pickup black oil from tank 6		
78156		OUTSIDE CARRIER		256		Hexion Specialty Chemicals-Hope, AR	OUTSIDE CARRIER NEED TO TRAILER in AM TO TRANSLOAD GOING TO NEWPARK REDIRECT JOB#78158		
78706	Abreu Wilfrido		291	251	CES Box 625	CES Environmental Services, Inc. (TSDF)	haul 625 to Republic and offload	0600	1/2 Day
78689	Abreu Wilfrido		291	251	CES Box 624	CES Environmental Services, Inc. (TSDF)	haul box 624 from process facility to Republic.	2nd	1/2 Day
75335	Berry Noah		287	259		Hexion Specialty Chemicals (Brady, TX)	suck out totes and bring to CES	0600	Full Day
0	Bozeman Donald		284			CES Environmental Services - Port Arthur	GO TO PACES AT 7:00am	0500	Full Day
78656	Carrillo Rudy		282	LT-1264		Lubrizol-Deer Park	haul load to systech in KS.	0500	Full Day
78681	Denton William		278	233		Lubrizol - Bayport	Haul loaded trailer to KS - Offload time is 8am Wednesday	0600	Full Day
78710	Dominguez Jose		294	253		Noltex	haul box 603 to Rampak and offload. Return to CES.	0600	1/2 Day
78642	Dominguez Jose		294	253		Evergreen Tank Solutions	Pick up clean box# N23968ZB from tankwash & return to Evergreen.	2nd	1/4 Day
78720	Dominguez Jose	CHECK BOX TO SEE IF CLEANED	294	253		Clean Harbors Environmental Services, Inc.	Pick up empty box# 276096 from Clean Harbours & check into tankwash.	3rd	1/4 Day
78721	Dominguez Jose	CHECK BOX TO SEE IF CLEANED	294	253		Clean Harbors Environmental Services, Inc.	Pick up empty box#276387 from Clean Harbours & check into tankwash.	4th	1/4 Day
0	Espinal Jose						VACATION		Full Day
78679	Frias Juan		2003	228		Lubrizol-Deer Park	haul load to systech in KS.	0600	Full Day
0	Garza Alfredo		289			CES Environmental Services - Port Arthur	GO TO PACES AT 7:00am	0500	Full Day
78249	Gonzales Joe		297			Arkema, Inc. - Houston	be at magellan at 7am. Pickup a trailer and haul load to Magellan/intergulf offload then return to arkema. Print BOL NEED CLEAN TRAILER & CLEAN CERTIFICATE	0600	1/3 Day

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						ASK AL FOR TANK#		
78724	Gonzales Joe		297	241	Agri Biofuels	big truck please***load ww and haul to Newpark	2nd	1/2 Day
0	Gonzales Joe					OFF BY 1700	3rd	1/3 Day
78544	Hall Albert		299	206	Champion Technologies	pump out nh w/w and bring to CES***	0530	1/3 Day
78757	Hall Albert		299	206	Delta Chemical	North side of railpit. Emergency pick up of water from fire alarm system.	2nd	1/3 Day
78159	Hall Albert		299	256	CES Environmental Services, Inc. (TSDF)	haul Hexion redirect to Newpark. Must be in PM	3rd	1/3 Day
78737	Henry Robert		276		Delta Chemical	Pick up frac tank and bring to tankwash	0700	1/3 Day
78755	Hernandez Joe	J. Ramirez	105		Rectorseal	will need 1 Supervisor and 1 helper to clean one poly tank....need an air mover @ customer request	0600	Full Day
78718	Hickman Robert		281	252	Ameriforge Corporation	pump out sewage water and haul to GCWDA***	0600	1/3 Day
78667	Hickman Robert		281	252	VAM-USA	pump out Phosphate Liquids deliver to CES.	2nd	1/3 Day
78666	Hickman Robert		281	252	VAM-USA	large truck to vac out oily water & coolant	3rd	1/3 Day
78547	Lawrence Gregory	MELVIN	286	245	Smith International	PICK UP DRUMS AND DELIVERY OF EMPTIES SMITH INTERNATIONAL NEED HELPER	0600	3/4 Day
78158	Lawrence Gregory		286	226	CES Environmental Services, Inc. (TSDF)	haul Hexion redirect to Newpark. Must be in PM	2nd	1/4 Day
0	Morales Rolando					VACATION		Full Day
0	Rodriguez Bobby		2002	262		FINISH RETURNING FROM KS		1/2 Day
78741	Rodriguez Bobby		276		Delta Chemical	Pick up frac tank and bring to tankwash	2nd	1/4 Day
78332	Rosales Candido		290	207	CES Environmental Services, Inc. (TSDF)	Haul box 2668 to TECo and offload. Return to CES and check into tankwash.	0500	Full Day
78677	Salazar Alfonso		279	257	Lubrizol-Deer Park	haul loaded trailer to systech in KS.	0600	Full Day
78652	Sanchez Omar		2000	260	Valero Refining Co Texas	Pick up load of sulfidic caustic & haul to PACES - Vacuum truck	0600	1/2 Day
78651	Sanchez Omar		2000	260	Valero Refining Co Texas	Pick up load of sulfidic caustic & haul to PACES - Vacuum truck	2nd	1/2 Day
78543	Sanders Preston		295	205	Champion Technologies	pump out RO w/w and bring to CES**level indicator must work on truck*** Be onsite at 7:30am	0600	1/3 Day
78647	Sanders Preston		295	205	Dana Container	pump out nh w/w and bring to CES	2nd	1/3 Day
78649	Sanders Preston		295	205	Dana Container	pump out nh w/w and bring to CES	3rd	1/3 Day
78534	Sanfilippo Sergio	J. Gipson	288	217	Advanced Aromatics	Drum pick up - in middle of plant. Take drum dolly & lift gate.	0600	1/3 Day
78548	Sanfilippo Sergio	J. Gipson	288	242	Exxon Mobile Lubricants Trading Company	Pick up product drums. Labels printed already JLE	2nd	3/4 Day

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78653	Semien Peter	283	271	Valero Refining Co Texas	Pick up load of sulfidic caustic & haul to PACES - Vacuum truck	[illegible]	[illegible]
78654	Semien Peter	283	271	Valero Refining Co Texas	Pick up load of sulfidic caustic & haul to PACES - Vacuum truck	2nd	1/2 Day
0	Soto Andre				VACATION		Full Day
78659	Taylor Matthew	280	243	Ocean Chie	vacuum out waste water from ship.	0600	1/3 Day
78626	Taylor Matthew	280	243	Ocean Chie	vacuum out waste water from ship.	2nd	1/3 Day
78712	Taylor Matthew	280	243	Green Earth Fuels of Houston LLC	remove material from vacuum boxes. Vacuum trailer.	3rd	1/3 Day
78521	West Perry	292	270	Farouk Systems	vac truck to get 1 load of nh w/w to CES**	0600	1/3 Day
78650	West Perry	292	270	Dana Container	pump out nh w/w and bring to CES	2nd	1/3 Day
78648	West Perry	292	270	Dana Container	pump out nh w/w and bring to CES	3rd	1/3 Day
78532	Woodard Irvin	104		Lubrizol-Deer Park	PCB Groundwater at Delta/ Lubrizol. **POLY TANK**	0600	1/3 Day
78704	Woodard Irvin	104		NOV Rig Solutions Sparesand Service	Air machine to suck out totes and sump haul to CES	2nd	1/3 Day
78660	Woodard Irvin	104		Forged Vessel Connections, Inc.	vaccum out oily water and bring to CES. 104/105 by 4pm!!!!!!!! Semi-clean vacuum truck	3rd	1/3 Day

EPAPA008001127

Method: RSH Mercaptan sulfur 12/3/2008 2:55:02 PM
Start time: 12/11/2008 8:22:44 A

Results

No.	Comment / ID	Start time	Sample size and results			
1/1	WASTEWATER/2	12/11/2008 8:22:45 AM		0.4479	g	
			R1 =	NaN	% as H2S	H2S Content
			R3 =	NaN	%Mercap no H2S	Mercaptan Content w/o H2S

Statistics

Rx	Name	n	Mean value	Unit	s	srel [%]
R1	H2S Content	1	NaN	% as H2S	NaN	NaN
R3	Mercaptan Content w/o H2S	1	NaN	%Mercap no H2S	NaN	NaN

(1) Modified
(2) Excluded
(3) Out of limits
(4) Resource expired
(5) srel above max srel
(6) srel above max srel for multiple determination
(7) Value out of limits, not saved in setup
(8) Sample data out of limits
(9) Standard evaluation used
(10) Result from buffer

0.4201

0.8 ml
13.2 ml — 18.2

65889

EPAPA0000[illegible]

Method: **RSH** **Mercaptan sulfur** **12/3/2008 2:55:02 PM**
Start time: **12/10/2008 10:57:12**

Results

No.	Comment / ID	Start time	Sample size and results			
1/1	TRL 237/12/10/08	12/10/2008 10:57:12 AM		0.4917	g	
			R1 =	0.034	% as H2S	H2S Content
			R2 =	0.01	% as Mercaptan	Mercaptan Content
			R3 =	0.069	%Mercap no H2S	Mercaptan Content w/o H2S

Statistics

Rx	Name	n	Mean value	Unit	s	srel [%]
R1	H2S Content	1	0.034	% as H2S	NaN	NaN
R2	Mercaptan Content	1	0.01	% as Mercaptan	NaN	NaN
R3	Mercaptan Content w/o H2S	1	0.069	%Mercap no H2S	NaN	NaN

(1) Modified
(2) Excluded
(3) Out of limits
(4) Resource expired
(5) srel above max srel
(6) srel above max srel for multiple determination
(7) Value out of limits, not saved in setup
(8) Sample data out of limits
(9) Standard evaluation used
(10) Result from buffer

77768	Wilson Kevin	2004	LT-848	CES Environmental Services - Port Arthur	haul loaded trailer to deridder...arkema redirect	2nd	1/3 Day
77762	Wilson Kevin	2004	LT-848	CES Environmental Services - Port Arthur	load wastewater and haul to np	3rd	1/3 Day
77352	Wood Brad	2005	232	CES Environmental Services @ KMTEX	**be at kmtex by 6:00am** go to Kmtex and load caustic from tank 607 - GO TO CES Port Arthur for QC prior to hauling to Boise	0530	1/2 Day
77355	Wood Brad	2005	232	CES Environmental Services @ KMTEX	**be at kmtex by 3:30pm** go to Kmtex and load caustic from tank 607 - GO TO CES Port Arthur for QC prior to hauling to Boise	2nd	1/2 Day

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237- ww -
638

EPAPA008001131

12-27-08

Drum ID #	Hitec Product ID (unless otherwise noted)	Net Weight (lbs)	Post Flush?	Drum ID#	Hitec Product ID (unless otherwise noted)	Net Weight (lbs)	Post Flush?
6071	5046			7013	953A		
6072	5046			7014	953A		
6073	5046			7015	953A		
6074	5046			7016	953A		
6075	953A			7017	953A		
6076	953A			7018	~~953A~~	5046	
6077	953A			7019	5046		
6078	953A			7020	5046		
6079	953A			7021	5046		
6080	953A						
6081	953A						
6082	953A						
6083	953A						
6084	953A						
6085	953A						
6086	953A						
6087	953A						
6088	953A						
6089	953A						
6090	953A						
6091	8153						
6092	8153						
6093	8153						
6094	8153						
6095	8153						
6096	8153						
6097	8153						
6098	8153						
6099	8153						
7000	8153						
7001	8153						
7002	8153						
7003	8153						
7004	8153						
7005	8153						
7006	8153						
7007	8153						
7008	8153						
7009	8153						
7010	8153						
7011	953A						
7012	953A						

14 2006

TT 265

DATE 12-31-08 NO. 015

PORT ARTHUR CHEMICAL ENVIRONMENTAL SERVICES
P.O. BOX 218
2420 SOUTH GULFWAY DRIVE
PORT ARTHUR, TEXAS 77640

SCALE TICKET
15
SCALE TICKET
15

12/31/2008	01:05:50 pm	
12/31/2008	02:03:38 pm	
GROSS	31620	lb
GROSS	72520	lb
TARE	40700	

DRIVER ON ❑ OFF ❑

WEIGHED BY

TK 2001

TR 261

DATE 12-31-08 NO. 016

PORT ARTHUR CHEMICAL ENVIRONMENTAL SERVICES
P.O. BOX 218
2420 SOUTH GULFWAY DRIVE
PORT ARTHUR, TEXAS 77640

SCALE TICKET 15
SCALE TICKET 16

12/31/2008	01:28:53 pm	
12/31/2008	01:51:07 pm	
GROSS	31120	lb
GROSS	77240	lb
TARE	46120	

DRIVER ON ☐ OFF ☐

WEIGHED BY

TK 259

TR 638

DATE 12·31·08 NO. 014

PORT ARTHUR CHEMICAL ENVIRONMENTAL SERVICES
P.O. BOX 218
2420 SOUTH GULFWAY DRIVE
PORT ARTHUR, TEXAS 77640

SCALE TICKET
SCALE TICKET
16

12/31/2008 12:55:23 pm
12/31/2008 01:17:14 pm

DRIVER ON ☐ OFF ☐

GROSS 31920 lb
GROSS 76220 lb

WEIGHED BY [signature]

TARE 44300

EPAPA008001135

TK 2006

TR 965

DATE 12-31-05 NO. 011

PORT ARTHUR CHEMICAL ENVIRONMENTAL SERVICES
P.O. BOX 218
2420 SOUTH GULFWAY DRIVE
PORT ARTHUR, TEXAS 77640

SCALE TICKET
16
SCALE TICKET
16

12/31/2005	11:16:29 am	
12/31/2005	12:06:44 pm	
GROSS	30120	lb
GROSS	64800	lb
TARE	34680	

DRIVER ON ☐ OFF ☑

WEIGHED BY

TK 98C

TR 96C

DATE 12-31-05 NO. 010

PORT ARTHUR CHEMICAL ENVIRONMENTAL SERVICES
P.O. BOX 218
2420 SOUTH GULFWAY DRIVE
PORT ARTHUR, TEXAS 77640

SCALE TICKET
SCALE TICKET
16

12/31/2005	10:28:16 am	
12/31/2005	11:35:59 am	
GROSS	78760	lb
GROSS	33340	lb
TARE	45420	

DRIVER ON ☐ OFF ☑

WEIGHED BY

tk 297

tk 271

DATE 12-31-08 NO. 009

PORT ARTHUR CHEMICAL ENVIRONMENTAL SERVICES
P.O. BOX 218
2420 SOUTH GULFWAY DRIVE
PORT ARTHUR, TEXAS 77640

SCALE TICKET
SCALE TICKET
16

	12/31/2008	09:35:43 am	
	12/31/2008	10:20:35 am	
GROSS		61420	lb
GROSS		34200	lb
NET		27220	

DRIVER ON ☐ OFF ☑

WEIGHED BY

Tk 2005

TR 208

DATE 12-31-08 NO. 008

PORT ARTHUR CHEMICAL ENVIRONMENTAL SERVICES
P.O. BOX 218
2420 SOUTH GULFWAY DRIVE
PORT ARTHUR, TEXAS 77640

SCALE TICKET
16
SCALE TICKET
16

12/31/2008	08:48:05 am	
12/31/2008	09:50:57 am	
GROSS	57700	lb
GROSS	30000	lb
NET:	27700	

DRIVER ON ☐ OFF ☑

WEIGHED BY

TK 988

TR 937

DATE 12-31-08 NO. 007

PORT ARTHUR CHEMICAL ENVIRONMENTAL SERVICES
P.O. BOX 218
2420 SOUTH GULFWAY DRIVE
PORT ARTHUR, TEXAS 77640

SCALE TICKET
15

SCALE TICKET
16

	12/31/2008	08:04:28 am	
GROSS	12/31/2008	01:58:17 pm	
	77600		lb
GROSS		29620	lb
TARE		47880	

DRIVER ON ☐ OFF ☐

WEIGHED BY

TK 285

TK 848

DATE 12-31-08 NO. 006

PORT ARTHUR CHEMICAL ENVIRONMENTAL SERVICES SCALE TICKET
P.O. BOX 218 16
2420 SOUTH GULFWAY DRIVE
PORT ARTHUR, TEXAS 77640

12-31-08
33110 - 7:34 AM
12.31.08 79420
TARE 46180
12/31/2008 07:45:04 am

GROSS 79340 lb

DRIVER ON ☐ OFF ☑

WEIGHED BY

TH 2006

TR 268

DATE 12-31-08 NO. 005

PORT ARTHUR CHEMICAL ENVIRONMENTAL SERVICES
P.O. BOX 218
2420 SOUTH GULFWAY DRIVE
PORT ARTHUR, TEXAS 77640

SCALE TICKET 15
SCALE TICKET 16

12/31/2008	06:50:46 am	
12/31/2008	07:36:36 am	
GROSS	31800	lb
GROSS	81240	lb
NET	49440	

DRIVER ON ☐ OFF ☑

WEIGHED BY_____

TK 289

TK 638

DATE 12.31.08 NO. 004

PORT ARTHUR CHEMICAL ENVIRONMENTAL SERVICES
P.O. BOX 218
2420 SOUTH GULFWAY DRIVE
PORT ARTHUR, TEXAS 77640

SCALE TICKET 15
SCALE TICKET 16

12/31/2008	06:39:18 am	
12/31/2008	07:41:53 am	
GROSS	31660	lb
GROSS	75360	lb
NET	43700	

DRIVER ON ☐ OFF ☑

WEIGHED BY

tk 2001
tr 201

DATE 12-31-08 NO. 003

PORT ARTHUR CHEMICAL ENVIRONMENTAL SERVICES
P.O. BOX 218
2420 SOUTH GULFWAY DRIVE
PORT ARTHUR, TEXAS 77640

SCALE TICKET
16
SCALE TICKET
16

12/31/2008	05:37:17 am	
12/31/2008	07:30:21 am	
GROSS	31160	lb
GROSS	75920	lb
NET	44760	

DRIVER ON ☐ OFF ☑

WEIGHED BY Laura Parker

TA 2004

TR 269

DATE 12-31-08 NO. 002

PORT ARTHUR CHEMICAL ENVIRONMENTAL SERVICES SCALE TICKET
16
P.O. BOX 218
2420 SOUTH GULFWAY DRIVE
PORT ARTHUR, TEXAS 77640

12/31/2008 05:21:19 am

	GROSS	78780	lb
	GROSS	31220	110-OK
	TARE	47560	

DRIVER ON ☐ OFF ☑

WEIGHED BY

TK 283
TR 271

DATE 12-30-08 NO. 001

PORT ARTHUR CHEMICAL ENVIRONMENTAL SERVICES
P.O. BOX 218
2420 SOUTH GULFWAY DRIVE
PORT ARTHUR, TEXAS 77640

SCALE TICKET
15

GROSS 12/30/2008 03:54:52 pm
7550 lb

SCALE TICKET
15
12/30/2008 06:40:30 pm
GROSS 33980 lb

DRIVER ON ☐ OFF ☑

WEIGHED BY L James

pg 1553

		HEAVY	LIGHT	NET	
12-30-08	P.S. 283/271	79560	33980	45580	001
		HEAVY	LIGHT	NET/TARE	Itch #
12-31-08	2004 / 269	78780	31220	47560	002
12-31-08	2001 / 261	75920	31160	44760	003
12-31-08	289 / 638	75360	31660	43700	004
12-31-08	285 / 848 DEL	79420	33240		006
12-31-08	2006 / 268	81240	31800	49440	005
12-31-08	288 / 237	77500	29620	47880	007
12-31-08	2005 / 208	57700	30000	27700	008
12-31-08	297 / 271 (CONC)	81420	34200	47220	009
12-31-08	280 / 260 (DEL)	78760	33340	45420	010
12-31-08	2005 / 265	64800	30120	34680	011
12-31-08	2004 / 269	64540			013
12-31-08	289 / 638	76220	31920	44330	014
12-31-08 *	2006 / 268	72520	31820	40700	015
12-31-08	2001 / 261	77240	31120	46120	016
12-31-08	288 / 237		29620		017

TKT W/TKR PWK TO B.W.; 237 US RUN CANCELED; 2 TKTS NOTED TO B.W.

12-31-08 288/237 ↓ 79220 018

* PRE LOAD

CHEMTEX

Environmental & Industrial Hygiene Services
3082 25th Street, Port Arthur, TX 77642
Phone: (409) 983-4575, Fax: (409) 982-1522
E-mail: chemtexpa@sbcglobal.net

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL
ANALYTICAL SERVICES REQUEST

CLIENT: CES Environmental Services **ATTN:** Marlin Moser	**ADDRESS:** 2420 South Gulfway Drive Port Arthur, TX 77641	**Phone #:** (713)539-6574 **Email:** mmoser@cesenvironmental.com ggbery@cesenvironmental.com
BILLING CONTACT/ADDRESS: (If different from above)	**P. O. #:** / **PROJECT NO:** / **PROJECT:**	**SITE/LOCATION:** 2420 South Gulfway Drive
SAMPLE(S) COLLECTED BY (PRINT NAME): Godefroy Gbery	**Expected Turnaround Time** 2-4 hr Rush____ 24 hr Rush____ 48 hr Rush ✓ 5-7 days____ 7-14 days____	**REQUESTED ANALYSES**

Sample Matrix Codes: Drinking Water DW; Groundwater GW; Liquid Waste LW; Oil(s) O; Paint Chips PC; Sand Sn; Sludge Sl; Soil/Solid S; Solid Waste SW; Trip Blank TB; Water W; Wipes WP; Wastewater WW

CHEMTEX #	SAMPLE IDENTIFICATION	COLLECTION Date	COLLECTION Time	Sample Matrix	Composite/ Grab	Preservative	Sample Containers No.	Sample Containers Size (oz.)	Sample Containers Type (Glass/ Plastic)	Ash	BTU	Sodium Chloride	Zinc	Iron	Water Content
P8120675	267	12/18/08	19:00	Oils	YO	NO			P	✓	✓	✓	✓	✓	✓

Sulfide (H_2S) added 12/19/08
Hydrogen

Special Remarks: Samples must be preserved on ice after sample collection and transported in ice chest.

Relinquished By: [signature]	Date/Time: 12/18/08 8-11:45 am	Received By: Lassie Lawrence	Date/Time: 12/18/08 11:45 am
Relinquished By:	Date/Time:	Received By:	Date/Time:

Yard Check

Date: 12/30/08

Performed by:

7:00 am

Tank #	Unloaded?	Loaded?	Contains:
208		✓	Empty Nish @ 9:30 am
224			Wastewater ph to low
232		✓	Vacuum trailer
237	~~Empty~~ ✓	✓	Empty Wasterwater? Wastewater @ 7:45
Acid 255		✓	Acid In Houston
~~258~~			
~~261~~			
265		✓	loaded SIB
266	✓ Into frac tank	✓	RVI SIB oil
267	✓ Into frac tank	✓	RVI SIB oil
268			
269	Empty		Wastewater ???
~~270~~			
~~423~~			
~~638~~			
~~848~~			
1047		✓	Targa
~~1264~~			Houston tonight
7253			In Houston to be repaired
Acid Trailer 8177		✓	loaded Acid

Yard Check

Date: 12/29/08

Performed by:

Tank #	Unloaded?	Loaded?	Contains:
208	✓	✓	Empty
224	✓	✓	Wash water
232	X	X	Transfert water
237	✓		Empty
255	✓		Empty
~~258~~			
261	X		Kmtex tank 607 needs to be repaired & washed out
265		✓	SiB (should be empty today
266		✓	RVI SiB oil
267		✓	RVI SiB oil
[redacted]			
[redacted]			
~~270~~			
[redacted]			
[redacted]			
848		✓	SiB oil (should be empty today
1047		✓	TARGA load
[redacted]			
7253	X	X	empty
[redacted]			

Yard Check

Date: 12/3#/08

Performed by:

Tank #	Unloaded?	Loaded?	Contains:
208	✓		Empty
224		✓	Wastewater (PH 1.14)
232	✓		Y
237	✓		
255	✓		
~~258~~			
~~261~~			
265			?? Need to be vented
266		✓	RVI SiB od
267		✓	RVI SiB od
~~268~~			
269	✓		
~~270~~			
~~423~~	✓		
~~638~~	✓		
~~848~~	✓		
1047			TARGA LSNG
~~1264~~			
~~7253~~			Houston
8177		✓	Acid

Yard Check

Date: 12/31/08

Performed by: Suzi

7:00 am

Tank #	Unloaded?	Loaded?	Contains:
208	✓		Empty
224		✓	Wastewater ph. to low
232			Vaccum trailer
237			
255			(acid) in Houston
258			
261			
265		empty	empty needs to be washed
266			empty needs to be washed
267			empty needs to be washed
268		preloaded WW	
269		empty	
270			
423			empty
638			
848		✓	
1047			Targa (into Caustic)
1264			Houston
7253			In Houston to be repaired
8177			loaded acid in Houston

(Internal Valve needs to be repaired)

Sulfidic Caustic Batch Tracking

- When load arrives, the sample is titrated, and the ph dropped down to a 3.5, the lab tech notifies the operator of the results. If oil or any other unwanted/abnormal results are noticed, the shift supervisor should be notified before unloading.
- The load samples will be kept together and retained 4 weeks after the Batch is completed.
- If the Batch is preloaded in RV2 or frac tanks, a composite sample should be tested and added to the Batch list with a retain sample.
- Each sample that arrives will be recorded in the log books in the lab with the job#, date, time, titration information, and any notes of any abnormal results.
- Once the Batch is loaded into RV1, a composite sample will be taken and treatability will be done in the lab. This step is very critical. An exact amount of injection must be determined and all results recorded. If any abnormal results or amounts of chemicals are needed, we need to resample and retest the treatability. Do not begin the reaction process until we are 100% certain of the end results and exact amounts of injection needed. This sample needs to be retained as well.
- Samples from RV1 will be taken throughout the process and and tested for ph. These samples won't need to be retained except for the last one which will be between a ph of 3.7-4.2. This sample will be titrated and retained with the batch group of samples.
- Once the load is transferred to the wastewater tank and peroxide added, the trailers will be loaded and a retain from each trailer will be checked for ph and the sample retained with the batch number and the trailer # on it.
- The NaSH will need to be titrated before the beginning of each load. Periodic sampling will need to be done to ensure that the NaSH doesn't become spent. When the NaSH is spent, a final titration and a retain sample needs to be kept with the batch number and grouped with the rest of the batch. These completed samples will need to be put in a glass sample jar and labeled as finished product from batch number?
- All of the titration results, the shift reports and any other pertinent information will need to be copied and filed in the filing cabinet and the file labeled with the batch number.
- All samples will be grouped together in the sample cabinet and retained for 4 weeks.

Brad Wood

From: Matt Bowman
Sent: Sunday, December 28, 2008 9:42 PM
To: Keld Andersen; Brian Weathers; Bo Cumberland; Brad Wood; Krissy Reese
Cc: Godefroy Gbery; Miles Root; Ryan Thomas; Steve Stricker; Scott Shimer; Greg Bowman
Subject: list of immediate action items for PACES
Attachments: Port_Arthur_Immediate_needs_for_PACES[1].docx

To everyone,

Attached hereto you will see a list of all immediate action items over which Keld and I have discussed and upon which we have agreed. These items will all need to be completed and finalized no later than the end of this week (Friday, Jan. 2).

Although these action items and SOPs must be completed by the end of this week, there are some items which must be handled immediately (even without SOPs finalized). Pursuant to these items, the following must be actuated and made effective immediately until the SOPs are finalized (this means starting tomorrow morning):

**Brad (Krissy as a back-up) - you are now responsible for controlling all trailers as well as continuous and accurate trailer inventory in the Access Database. The inventory spreadsheet can be found in Access under the Port Arthur Dispatch Board. I suggest you
familiarize yourself with this immediately. If you have questions about how to work the spreadsheet, please contact Ryan immediately for help. This spreadsheet must be detailed and consistently and constantly updated.
**Brad - you are now responsible for determining an action plan for all trailers with maintenance issues and requiring maintenance, mechanical issues unloading/loading (finding a solution), ensuring the scheduling for VIKs, etc.

**Godfrey and Suzi - you are now responsible for updating Brad on the status of all trailers in the possession of Operations. That is, you must keep in constant communication with Operations and keep Brad apprised of trailer status while in they are loading/unloading
feedstock, products, etc. This means Godfrey and Suzi must track trailers thoughout the process in plant and communicate this with Brad so that he can keep Access updated.
**Godfrey and Suzi- You will be responsible for ensuring the QC on caustic batches such that they do not exceed a run total of 8% concentration (combined sulfides, caustic, and carbonates). You should communicate all your information with Brian so that he can
determine what will be processed in each batch. If you have technical questions, these should be addressed to either Keld or me.
**Godfrey and Suzi - you are now accountable for ensuring the proper calibration and maintenance on the pH probes and autotitrator. If you have any questions about how this is performed, contact Miles immediately.
**Godfrey and Suzi - You are responsible for ensuring the QC on our Nash to ensure that it neither entirely spends nor salts out due to carbonates. If you have technical questions, these should be addressed to either Keld or me.
**Godfrey and Suzi - you are responsible for checking drivers in, reviewing the paperwork on all incoming loads, signing the paperwork and putting the facility copy in the proper lab inbox until the end of the day (at which time it should be taken to the front and place in the
proper in-box), ensuring that you get a sample on each trailer and/or feedstock and run a full titration and bench scale processing on each trailer and report this to Brian, Bo, and Keld (via email for now). You must review the PFI in Access to ensure the load meets the

expected parameters (if it does not, you must notify Brian immediately...even prior to acceptance). When performing your bench scale processing, you must ensure that you use the exact acid that the plant will be using for processing. You must report the volume

percentage of the exact acid to be used per volume of feedstock...report this to Brian, Bo, and Keld (via email for now).

**Brian (Bo as a back-up) - you are now responsible for determining an action plan for every trailer and determining and scheduling all production runs based upon QC information from the lab and . You will need to manage all our feedstocks from barge, KMTEX, trucks,

etc. You will build production runs in RV2 to be transferred to RV1 when you are ready to make a production run.

**Brian (Bo as a back-up) - you will be responsible for monitoring the Chemcial Inventory Board and ensuring we order and maintain adequate chemical inventories.

**Brian (Bo as a back-up) - you are responsible for managing and directing all maintenance and capital upgrade crews. You must set maintenance priorities, ensure we have critical parts on hand, and ensure that we stay ahead of routine maintenance activities.

**Brian (Bo as assistant and back-up) - you are responsible for immediately training the Operators to do their job properly. Operators in plant per shift include a Sulfidic Caustic Operator, a Naphthenic Caustic Operator, 2 Utility Operators (one of which will require

Coast Guard Certification), and a Warehouseman.

--The Sulfidic Caustic Operators must only be responsible for running their unit. Key items and duties for this position include: Circulating RV1 and providing the Lab with a composite pre-processing sample,Transferring feed from RV2 into RV1, Performing production

runs in RV1, Transferring finished wastewater from RV1 into the Wastewater tank, Adding bleach/peroxide to the Wastewater tank, Assisting in loading out finished NaSH product, Assisting in loading caustic (or an effective substitute) into the NaSH Tank prior to a

production run, changing out the KO pot circulating solution if required (if this solution gets even a little dirty, this indicates a problem and must be changed out immediately), draining any fluids in the flare KO tank if the levels get too high, purging RV1 with air at the end

of each run so the vessel may be opened during wastewater transfer from RV1 into the wastewater tank, monitoring the wastewater transfer from RV1 into the wastewater tank to ensure that all oil stays in RV1, checking for potential solids accumulation in the bottom of

RV1 at the end of each run and cleaning them out via circulation with hot water, checking for signs of bubbling over at the end of each run (this can be seen as a residue on the top dome lids of RV1), transferring oil from RV1 to the Oil/Water Separator tank when oil

levels in RV1 become excessive, and monitor the oil/water separator tank to ensure wastewater is drawn out and this tank always has capacity for oil/water mixtures.

During a production run, the Sulfidic Caustic Operators should constantly do all the following: check temp. and pres. gauges on RV1 (typical temperatures should not exceed 160 F and pressure should not exceed 10 PSI), while adding acid (as prescribed by the lab)

they should check the flow meter and verify via strapping the tank/trailer from which the acid is being pumped (typical flow should be kept less than 6 g.p.m. but may need to be less during release of carbonates), check the acid pumps and area to ensure the pumps are

working properly and there are no leaks, pull samples from each sample port at the bottom of RV1 to check for potential unwanted solids and pH level (pH must always be taken to 5 or less), check the KO pot sample port to ensure no bubble overs (as indicated by

dirtiness in the KO water in circulation), check the pressure and temp. gauges on the KO pot to ensure they match those of RV1, check the pressure and temperature gauges on the NaSH Tank (temp. should be kept 120 F minimum especially as nash gets closer to

EPAPA008001155

spent and pressure in headspace should register 0 PSI), check the Nash tank pump to ensure it is circulating, sample the nash product and take it to the Lab Tech to check percent spent (this will need to be done progressivley more often the closer the nash gets to fully

spent), check the heat source (boiler/steamer) to ensure that steam is being added to the NaSH tank coils, check the flare to ensure it stays ignited and is not smoking (if the flare is smoking it will need immediate adjustment), draining the flare line from the high roof into

the water bucket (when full, this can be dumped in the Lab sump), checking the high level on the flare ko tank (this can be drained into the same bucket and dumped in the lab sump when full). As the production run nears the end, the operator should add the acid slowly

to allow the unit to completely mix and ensure the pH target is not over-run. If the Sulfidic Caustic Operator exceeds expected acid addition by more than 5% (as indicated by both tank/trailer strapping and the flow meter), he must immediately stop production and

contact Brian, Keld, or Matt as this might indicate a problem.

--The Naphthenic Caustic Operator must be responsible for running their unit as well as assisting the Sulfidic Caustic Operator when required. The operator will build loads in the holding vessel and transfer the feed into the reaction vessel when he is ready to make a

production run. The operator will circulate the reaction vessel and provide the Lab with a composite pre-processing sample for evaluation. This operator's main job will be to monitor the system and ensure acid is added (per laboratory recommendations) until the pH

reaches between 2.5 and 3 pH units. The operator must ensure that the pH is not overshot!!!! Acid should be added slowly towards the end of each run and the production unit allowed to circulate to ensure complete mixing. When Naphthenic Acid Oil levels reach

critical levels (as determined by the sample ports), the operator will ensure the oil is loaded into a product trailer. The operator will always leave sufficient interface of water and oil to ensure that water is never sent to the product trailers and that product oil is never sent

out as wastewater. When a production run is completed, the operator will also assist in unloading wastewater from the reaction vessel into wastewater trailers.

--Utility Operators main job is to load/unload trailers, barges, railcars, etc. They are also responsible for inter (between KMTEX and PACES) and intra plant transfers of materials. They are also responsible for moving trailers in-plant. They also have primary

responsibility for PROPERLY sampling ALL inbound feedstocks and all outbound products and wastes. These operators must ensure to provide the lab accurate composite samples. Utility Operators are also responsible for assisting Sulfidic Caustic Operators

and Naphthenic Caustic Operators when required.

--The Warehouseman will deal with load, un-load, and inventory all drums. He will communicate with Kim and Brian concerning all movements.

**Bo (Brian as a back-up) - you are now responsible for maintaining chemical inventories for the chemicals we use in production (caustic or alternatives for NASH production, bleach, hydrogen peroxide, and sulfuric acid). You must hang a dry erase board in the lab

(I believe one is already in place) and update inventories for all chemicals twice per day (morning and evening). The board should be titled "Chemical Inventory Board".

**Bo - you will be accountable for doing strapping measurements on RV1 and immediately developing a spreadsheet to correlate the measurements on our level gauge to actual gallons. This spreadsheet must be lamanated and affixed to RV1.

8. An SOP on trailer sampling. This should include both safety and mechanical/technical issues concerning the sampling procedures. This is where we will discuss the use of respirator and then breathing air if personal alarms go off. Also discuss the proper use of a sludge judge or other sampling device to absolutely ensure a representative sample is taken. Once we have the permanent platforms in place, we can go back and modify this SOP.
   TO BE COMPLETED BY: MATT, BRIAN, BO, AND GODFREY
9. An SOP for paperflow for Essential Operating Paperwork. Essentially I have already labeled the in-boxes in the lab and up front. We can use the Houston SOP as a very basic outline but the PACES should be significantly easier. The receiving document (site copy) should be kept by the lab and placed in an inbox until the end of the day and then brought to the front and placed in those inboxes. Daily paperwork for drivers is also up front and has an in-box.
   TO BE COMPLETED BY: MATT, BRAD, AND KRISSY
10. An SOP for trailer management logistics that will include a trailer inventory spreadsheet as part of our Access program (temporarily we can start in Excel as we have already developed a working template). The basic functions by position have already been defined at the bottom of the spreadsheet.
    TO BE COMPLETED BY: MATT, BRIAN, BRAD, BO, AND GODFREY
11. A strapping chart for RV1 and a corresponding conversion chart that equates gallons to the level on our level gauge. Both the strapping chart and the conversion chart must be laminated and posted onto RV1
    TO BE COMPLETED BY: KELD
12. Strapping charts posted to each trailer we use in acid service.
    TO BE COMPLETED BY: BRAD

Yard Check

Date: 12-22-08
Performed by: Wood

Tank #	Unloaded?	Loaded?	Contains:
208			KMTX Methanol Water X3
224		✓	W/W
232		~~✓~~ ✓	~~NAP Caustic Total~~
237		✓	TARGA LSNG - 12-20-08
255	✓		
258		✓	KMTX 607 OILY - 12-15-08
261		✓	KMTX 607 OILY - 12-19-08
265		✓	RVI SIB OIL SLOP - 12-18-08
266		✓	RVI SIB OIL SLOP - 12-15-08
267		✓	RVI SIB OIL SLOP - 12-15-08
268			KMTX 607 - Deridder
269		✓	Sodium Bicarbonate
~~270~~			~~Houston~~
423		✓	Conoco - Acid
638		✓	TARGA LSNG - 12-17-08
848		✓	RVI SIB OIL SLOP / 1/2 full / 12-18-08
1047			NAP Caustic - Total
1264		✓	KMTX Reg W/W
7253	✓		Rope OFF Invest. Scene
8177		✓	PARTIAL LOAD Acid

Empty LOADED Dispached

(4103
LISA)
1800-676-2718
CARBISCATA/log.

CES Environmental Port Arthur Dispatch Board

FOR : Monday 12/22/2008

Job Note ID	Driver	Helper	Truck	Trailer	Misc Equipment	Customer	Job Description	Start Time	Job Length
78356	Crawley Kevin		2006	1264		KMTEX	load of reg w/w to np	0600	1/3 Day
78357	Crawley Kevin		2006	1264		KMTEX	load of reg w/w to np	2nd	1/3 Day
78358	Crawley Kevin		2006	1264		KMTEX	load of reg w/w to np	3rd	1/3 Day
78140	Mendoza Juan	in route	2001	LT-1047		Total Petrochemicals Inc.-Port Arthur, TX	p/u Naphthenic caustic as directed, haul to PACES**630AM-10am**asked to get both loads before 10am	0530	1/2 Day
78390	Mendoza Juan		2001	268		CES Environmental Services @ KMTEX	**be at kmtex by 10:00am** go to Kmtex and load caustic from tank 607 and bring to PACES for Q/C and haul to deridder	2nd	1/2 Day
78141	Sittig Brent		285	232		Total Petrochemicals Inc.-Port Arthur, TX	p/u Naphthenic caustic as directed, haul to PACES**630AM-10am**asked to get both loads before 10am	0700	1/2 Day
78391	Sittig Brent		285	261		CES Environmental Services @ KMTEX	**be at kmtex by 11:00am** go to Kmtex and load caustic from tank 607 and bring to PACES for Q/C and haul to deridder	2nd	1/2 Day
78359	Wilson Kevin	loading	2004	208		KMTEX	load of methanol water to Newpark.	0500	1/3 Day
78360	Wilson Kevin		2004	208		KMTEX	load of methanol water to Newpark.	2nd	1/3 Day
78361	Wilson Kevin		2004	208		KMTEX	load of methanol water to Newpark.	3rd	1/3 Day

Report Printed 12/22/2008 6:50:21 AM

EPAPA008001159

Yard Check

Date: 12-24-08

Performed by: Wood

Tank #	Unloaded?	Loaded?	Contains:
208	✓ Nash		KMTX Reg W/W LOADING Nash. Unloaded TK 1606
224		✓	CES W/W - Internal Value
232	VAC	✓	
237		✓	Valero Sulfidic Caustic
255		✓	Conoco Acid * Need to transloaded for VIR
X 258			Going Back to Haston Perm.
261		✓	
265		✓	? Nash
266		✓	RVI SIB Oil Slop
267		✓	RVI SIB Oil Slop
268		✓	200gal heel ? Took to KMTX Put on steam — OFF LOADED
269	✓		
~~270~~			
423	✓		
638			TARGA CBF Redirect
848		✓	2/3 Full RVI SIB Slop Oil
1047	✓		TARGA CBF Redirect
1264	✓		
7253	✓		Has Leak IN Barrel Need to Verify
8177			Acid

Dispatch on Call
713

Alfonzo Salizar - 279-1264
Sleeper
713-231-3751

Darrin - Dispatch - Fri

Jenny - on call

Yard Check

Date: 12-24-08

Performed by: Wood

Tank #	Unloaded?	Loaded?	Contains:
208	✓ Nash		KMTX Reg W/W LOADING Nash Unloaded TK 1660
224		✓	CES W/W - Interned Value
232	VAC	✓	
237		✓	Valero Sulfidic Caustic
255		✓	Conoco Acid * Need to transload for VIK
X 258			Going Back to Haaston Perm.
261		✓	
265		✓	? Nash
266		✓	RVI SIB Oil Slop
267		✓	RVI SIB Oil Slop
268		✓	200gal heel ? Took to KMTX put on steam OFF LOADE
269	✓		
~~270~~			
423	✓		
638			TARGA CBF Redirect
848		✓	2/3 Full RVI SIB Slop Oil
1047	✓		TARGA CBF Redirect
1264	✓		
7253	✓		Has Leak IN Barrel Need to Verify
8177			Acid

Dispatch on Call
713

Alfonzo Salizar - 279-1264
Sleeper
713-231-3751

Darrin - Dispatch - Fri

Jenny - on call

Yard Check

Date: 12-24-08

Performed by: Wood

Tank #	Unloaded?	Loaded?	Contains:
208	✓ Nash		KMTX Reg W/W LOADING Nash unloaded TK 1606
224		✓	CES W/W - Internal Value
232	VAC	✓	
237		✓	Valero Sulfidic Caustic
255		✓	Conoco Acid * Need to transloaded for VIR
X 258			Going Back to Haston Perm.
261		✓	
265		✓	? Nash
266		✓	RVI SIB Oil Slop
267		✓	RVI SIB Oil Slop
268		✓	200gal heel ? Took to KMTX Put on steam OFF LOADED
269	✓		
~~270~~			
423	✓		
638			TARGA CBF Redirect
848		✓	2/3 Full RVI SIB Slop Oil
1047	✓		TARGA CBF Redirect
1264	✓		
7253	✓		Has Leak IN Barrel Need to Verify
8177			Acid

Dispatch on Call
713

Alfonzo Salizar - 279-1264
Sleeper
713-231-3751

Darrin - Dispatch - Fri

Jenny - on call

Yard Check

Date: 12-24-08

Performed by: Wood

Tank #	Unloaded?	Loaded?	Contains:
208	✓		KMTX Reg W/W LOADING NASH
224		✓	CES W/W - Internal Value
232		✓	
237		✓	Valero Sulfidic Caustic
255	✓	✓	Conoco-Acid * Need to transloael for VLK
258			Going Back to Houston Perm.
261		✓	
265		✓	? Nash
266		✓	RU1 SIB Oil Slop
267		✓	RU1 SIB Oil Slop
268		✓	200gal heel ? Toxic to KMTX Put on steam
269	✓		
~~270~~			
423	✓	✓	
638			TARGA CBF Redirect
848		✓	2/3 Full RU1 SIB Slop Oil
1047			TARGA CBF Redirect
1264	✓		
7253	✓		Has Leak
8177			~~Cond~~ Acid

Yard Check

Date: 12-24-08 /2

Performed by: Wood

Tank #	Unloaded?	Loaded?	Contains:
208	X ✓ Nash		KMTX Reg W/W LOADING Unloaded Nash TK 1010
224	X	✓	CES W/W - Interned Value
232	VAC X	✓	
237	X	✓	Valero Sulfidic Caustic
255	X	✓	Conoco Acid * Need to transloaded for VIR
X 258			Going Back to Hasston Perm.
261	X	✓	
265	X	✓	? Nash
266	X	✓	RVI SIB Oil Slop
267	X	✓	RVI SIB Oil Slop
268	X	✓	~~Sour heel~~ ? Took to KMTX Put on steam OFF LOADE
269	✓	Empty	Waslew (KMTX → NP
~~270~~			
423	✓	Empty	Wastewater (Kmtex → NP
638	✓	Empty	~~Targa CBF Redirect~~
848	X	✓	2/3 Full RVI SIB Slop Oil
1047	X		Targa CBF Redirect
1264	✓	Empty	Empty
7253	✓ X		Has Leak IN Barrel Need to Verify
8177			Acid (Conoco)

Dispatch on Call
713

Alfonzo Salizar - 279-1264
Sleeper
713-231-3751

Darrin - Dispatch - Fri

Jenny - on call

Date: 11-7-08

Daily Pump Maint. Log

Pump #	Alignment	Seal Leaking	Vibration	Oil Level	Glycol Level	PSI Reading	Comment
PA-001 Load Pump	Good	No	Normal	Good	Good	Good	Good Working Condition
PA-002 Recirc Pump	Good	No	Normal	Good	Good	Good	Good Working Condition
PA-003 Spare	Good	No	None	Good	Good	Good	Ready to Pump
PA-004 WW	Good	No	None	Good	No Glycol	Good	Grease inserts, No Glycol
PA-005 NaSh	Good	No	Normal	Good	Grease insert	Good	Needs new carriage bearing
PA-006 Acid	Good	No	Normal	No oil Level	None	Good	Good Working Condition
PA-007 Peroxide	Good	No	Normal	No oil level	None	Good	Ready to go
PA-008 Peroxide	Good	No	Normal	No oil level	None	Good	Ready to go
PA-009 Bleach	Good	No	Normal	No oil levels	None	Good	Ready to go
PA-010 Lab Sump	Good	No	None	None	None	Good	Ready to go
PA-011 ~~Caustic~~							
Knockout	Good	yes	No	Good	None	Good	Need to order seal

Additional Comments

Serial # DX50678A
Dutco pump

Mechanic: Dustin Harrington

EPAPA008001165

Date: 11-8-08

Daily Pump Maint. Log

Pump #	Alignment	Seal Leaking	Vibration	Oil Level	Glycol Level	PSI Reading	Comment
PA-001							
Load Pump	Good	No	Normal	Good	Good	Good	Good Condition
PA-002							
Recirc Pump	Good	No	Normal	Good	Good	Good	Good Condition
PA-003							
Spare	Good	No	Normal	Good	Good	Good	Good Condition
PA-004							
WW	Good	No	Normal	Good	Grease Insert	Good	Good Condition
PA-005							
NaSh	Good	No	Normal	Grease	Grease	Good	Needs Carriage bearing
PA-006							
Acid	Good	No	Normal	None	None	Good	Good Condition
PA-007							
Peroxide	Good	No	Normal	Grease	None	Good	Good Condition
PA-008							
Peroxide	Good	No	Normal	Grease	None	Good	Good Condition
PA-009							
Bleach	Good	No	Normal	None	None	Good	Good Condition
PA-010							
Lab Sump	Good	No	None	None	None	Good	Good Condition
PA-011							
~~Caustic~~ Knockout	Good	Yes	Normal	Grease	Grease	Good	Needs New Seal

Additional Comments

Serial # DX50678A
Dutco Pump

Mechanic: Dustin Harrington

EPAPA008001166

Date: 11-10-08

Daily Pump Maint. Log

Pump #	Alignment	Seal Leaking	Vibration	Oil Level	Glycol Level	PSI Reading	Comment
PA-001 Load Pump	Good	No	Normal	Good	Good	Good	Good Condition
PA-002 Recirc Pump	Good	No	Normal	Good	Good	Good	Good Condition
PA-003 Spare	Good	No	Normal	Good	Good	Good	Good Condition
PA-004 WW	Good	No	Normal	Grease	None	Good	Good Condition
PA-005 NaSh	Good	No	Normal	Grease	None	Good	Good Condition
PA-006 Acid	Good	No	Normal	None	None	Good	Good Condition
PA-007 Peroxide	Good	No	Normal	None	None	Good	Good Condition
PA-008 Peroxide	Good	No	Normal	None	None	Good	Good Condition
PA-009 Bleach	Good	No	Normal	None	None	Good	Good Condition
PA-010 Lab Sump	Good	No	Normal	None	None	Good	Good Condition
PA-011 Caustic	Good	Yes	Normal	None	None	Not Available	Still Needs Seal
Knockout							

Additional Comments

Knockout pump needs seal

Mechanic: Dustin Harrington

EPAPA008001167

Date: 11-11-08

Daily Pump Maint. Log

Pump #	Alignment	Seal Leaking	Vibration	Oil Level	Glycol Level	PSI Reading	Comment
PA-001							
Load Pump	Good	No	Normal	Good	Good	Good	Good Condition
PA-002							
Recirc Pump	Good	No	Normal	Good	Good	Good	Good Condition
PA-003							
Spare	Good	No	Normal	Good	Good	Good	Good Condition
PA-004							
WW	Good	No	Normal	Good	Grease	Good	Good Condition
PA-005							
NaSh	Good	No	Normal	Grease	None	Good	Good Condition
PA-006							
Acid	Good	No	Normal	None	None	Good	Good Condition
PA-007							
Peroxide	Good	No	Normal	None	None	Good	Good Condition
PA-008							
Peroxide	Good	No	Normal	None	None	Good	Good Condition
PA-009							
Bleach	Good	No	Normal	None	None	Good	Good Condition
PA-010							
Lab Sump	Good	No	Normal	None	None	Good	Good Condition
PA-011							
~~Caustic~~ Knockout	Good	yes	Normal	good	None	Bad	Needs Seal

Additional Comments

Need to order seal ASAP

Mechanic: Dustin Harrington

EPAPA00800116

Date: 11-17-08

Daily Pump Maint. Log

Pump #	Alignment	Seal Leaking	Vibration	Oil Level	Glycol Level	PSI Reading	Comment
PA-001							
Load Pump	Good	No	Normal	OK	~~No Glycol~~ Good	Good	Ready
PA-002							
Recirc Pump							
PA-003	Good	No	Normal	OK	Good	Good	Ready
Spare							
PA-004							
WW	Good	No	Normal	OK	No Glycol	Good	Ready
PA-005							
NaSh	Good	No	Normal	Grease	No Glycol	Good	Running
PA-006							
Acid	Good	No	Normal	N/A	N/A	Good	Ready
PA-007							
Peroxide	Good	No	Normal	N/A	N/A	Good	Ready
PA-008							
Peroxide	Good	No	Normal	N/A	N/A	Good	Ready
PA-009							
Bleach	Good	No	Normal	N/A	N/A	Good	Ready
PA-010							
Lab Sump	Good	No	Normal	N/A	N/A	Good	Ready
PA-011							
~~Caustic~~	Good	yes	Normal	Good	N/A	Bad	Need to repair seal
Knockout							

Additional Comments

Seal is in For knockout pump

Mechanic: Dustin Harrington

EPAPA008001169

Date: 11-13-08

Daily Pump Maint. Log

Pump #	Alignment	Seal Leaking	Vibration	Oil Level	Glycol Level	PSI Reading	Comment
PA-001							
Load Pump	Good	No	Normal	good	Good	Good	Ready
PA-002							
Recirc Pump	Good	No	Normal	good	Good	Good	Ready
PA-003							
Spare	Good	No	Normal	good	Good	Good	Ready
PA-004							
WW	Good	No	Normal	good	Grease	Good	Ready
PA-005							
NaSh	Good	NO	Normal	grease	Grease	Bad	Pump is clogged up
PA-006							
Acid	Good	No	Normal	N/A	N/A	good	Ready
PA-007							
Peroxide	Good	No	Normal	N/A	N/A	good	Ready
PA-008							
Peroxide	Good	No	Normal	N/A	N/A	good	Ready
PA-009							
Bleach	Good	No	Normal	N/A	N/A	good	Ready
PA-010							
Lab Sump	Good	No	Normal	NA	N/A	good	Ready
PA-011							
Caustic	Good	No	Normal	N/A	N/A	good	Ready
Knockout	Good	YES	Good	Good	N/A	Bad	Needs Seal

Additional Comments

Greased All Pumps today. Seal is ready for knockout pump

Mechanic: Dustin Harrington

EPAPA008001170

Date: 11-21-08

Daily Pump Maint. Log

Pump #	Alignment	Seal Leaking	Vibration	Oil Level	Glycol Level	PSI Reading	Comment
PA-001							
Load Pump	Good	No	Good	Good	Good	Good	Ready
PA-002							
Recirc Pump	Good	No	Good	Good	Good	Good	Ready
PA-003							
Spare	Good	No	Good	Good	Good	Good	Ready
PA-004							
WW	Good	No	Normal	Normal	Grease	Good	Ready
PA-005							
NaSh	Good	No	Normal	Grease	Grease	Good	Ready
PA-006							
Acid	Good	No	Normal	N/A	N/A	Good	Ready
PA-007							
Peroxide	Good	No	Normal	N/A	N/A	Good	Ready
PA-008							
Peroxide	Good	No	Normal	N/A	N/A	Good	Ready
PA-009							
Bleach	Good	No	Normal	N/A	N/A	Good	Ready
PA-010							
Lab Sump	Good	No	Normal	N/A	N/A	Good	Ready
PA-011							
Caustic	Good	No	Normal	N/A	N/A	Good	Ready
Knockout	Good	No	Normal	Good	N/A	See Comment	Ready

Additional Comments

Knockout is fixed but doesn't seem to be pumping properly due to possible cloggup in the line

Mechanic: Dustin Harrington

EPAPA008001171

Date: 1-16-09

Daily Pump Maint. Log

Pump #	Alignment	Seal Leaking	Vibration	Oil Level	Glycol Level	PSI Reading	Comment
PA-001							
Load Pump	Good	No	Normal	Good	Good	Good	Greased / Good
PA-002							
Recirc Pump	Good	NO	Normal	Good	Good	Hose Broke	Greased / need to replace gauge / Good
PA-003							
Spare	N/A	N/A	N/A	N/A	N/A	" "	Greased
PA-004							
WW	Good	NO	Normal		Grease		Greased / Good
PA-005							
NaSh	Good	NO	Good		Grease		Greased / Good
PA-006							
Acid	Good	NO	Normal	N/A	N/A		Good
PA-007							
Peroxide	Good	NO	N/A	N/A	N/A	N/A	Good
PA-008							
Peroxide	Good	NO	N/A	N/A	N/A	N/A	Good
PA-009							
Bleach	Good	NO	N/A	N/A	N/A	N/A	Good /
PA-010							
Lab Sump	Good	Yes (clamp)	Normal	N/A	N/A	N/A	Clamp on Suction side cracked Small leak
PA-011							
Caustic	N/A	N/A	N/A	N/A	N/A	N/A	
Knockout	Good	NO	normal	Good	N/A	Good	

Additional Comments

Need to replace gauge on Recirc pump under RU2
Clamp on Sump Pump Leaking (minor)

Mechanic: Bill Dickerson

EPAPA008001172

Date: 1-19-09

Daily Pump Maint. Log

Pump #	Alignment	Seal Leaking	Vibration	Oil Level	Glycol Level	PSI Reading	Comment
PA-001	Good	No	Good	Good	Good	Good	Good
Load Pump							
PA-002	Good	No	Good	Good	Good	N/A	Good / needs new gauge
Recirc Pump							
PA-003	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Spare							
PA-004	Good	No	good	Good	N/A		Good / [illegible]
WW							
PA-005	Good	No	good		N/A		good
NaSh							
PA-006	Good	No	Good				good
Acid							
PA-007	Good	No	Good				Good
Peroxide							
PA-008	Good	No	Good				Good
Peroxide							
PA-009	N/A	N/A	N/A	N/A	N/A	N/A	out of commision, being replaced
Bleach							
PA-010	Good	No	Good				Good
Lab Sump							
PA-011	N A	N A	N A	N A	N A	N A	N A
Caustic							
Knockout	Good	No	Good	Good	N/A	Good	good

Additional Comments

Bleach pump out of commission. Nipple Tight in heads

Mechanic: Billy Dickerson

EPAPA008001173

Date: 1-20-09

Daily Pump Maint. Log

Pump #	Alignment	Seal Leaking	Vibration	Oil Level	Glycol Level	PSI Reading	Comment
PA-001							
Load Pump	Good	No	Normal	Good	Good	Good	Good / Greased
PA-002	Good	No	Normal	Good	Good	Good	Good / Greased
Recirc Pump							
PA-003							
Spare	N/A	No	N/A	Low	Low	Good	Good / Needs Fluids / Topped
PA-004							
WW	Good	No	Normal	Grease	N/A	N/A	Good / Greased / Small leak
PA-005							
NaSh	Good	No	Normal	Grease	N/A	N/A	Good / Greased
PA-006							
Acid	Good	No	Normal	N/A	N/A	N/A	Good
PA-007							
Peroxide	Good	No	Normal	N/A	N/A	good	Good
PA-008							[redacted]
Peroxide	Good	No	normal	N/A	N/A	good	Good
PA-009							
Bleach	N/A						not fixed yet
PA-010							
Lab Sump	Good	No	normal	N/A	N/A	N/A	Good
PA-011							
Caustic	N/A						
Knockout	Good	No	Normal	Good	N/A		Good

Additional Comments

Load pump: sight glass for oil has slight

Bleach pump not fixed yet

WW has fitting with small leak

Mechanic: Billy Dickerson

EPAPA008001174

Date: 1-21-09

Daily Pump Maint. Log

Pump #	Alignment	Seal Leaking	Vibration	Oil Level	Glycol Level	PSI Reading	Comment
PA-001							
Load Pump	Good	No	Normal	Good	Good	Good	Good
PA-002							
Recirc Pump	Good	No	Normal	Good	Good	Good	Good
PA-003							
Spare	N/A	No	N/A	Low	Low	Good	Needs Fluids
PA-004							
WW	Good	No	Normal	Greese	N/A	N/A	Good / tank drain leaking
PA-005							
NaSh	Good	No	Normal	Grease	N/A	N/A	Good
PA-006							
Acid	Good	NO	Normal	N/A	N/A	N/A	Good
PA-007							
Peroxide	Good	NO	Normal	N/A	N/A	Good	Good
PA-008							
Peroxide	Good	NO	Normal	N/A	N/A	Good	Good
PA-009							
Bleach	Good	No	Normal	N/A	N/A	N/A	Good
PA-010							
Lab Sump	Good	NO	Normal	N/A	N/A	N/A	Good (still needs headlined to it)
PA-011							
Caustic	NA						
KnockOut	Good	No	Normal	Good	N/A		Good

Additional Comments

Bleach pump fixed & back in service. Need to check for leaks with pressure on it.

Plugged tank drain on WW pump

Mechanic: Billy Dickerson

EPAPA008001175

Date: 1-22-09

Daily Pump Maint. Log

Pump #	Alignment	Seal Leaking	Vibration	Oil Level	Glycol Level	PSI Reading	Comment
PA-001							
Load Pump	Good	No	Normal	Good	Good	Good	Good
PA-002							
Recirc Pump	Good	No	Normal	Good	Good	Good	Good
PA-003							
Spare	N/A						Don't operate / needs oil & glycol
PA-004							
WW	~~N/A~~ Good	No	Normal	Good	N/A	N/A	Good
PA-005							
NaSh	Good	No	Normal	Good	N/A	N/A	Good
PA-006							
Acid	Good	No	Good	N/A	N/A	N/A	Good
PA-007							
Peroxide	Good	No	normal	N/A	N/A	N/A	Good
PA-008							
Peroxide	Good	No	normal	N/A	N/A	Good	Good
PA-009							
Bleach	Good	No	Normal	N/A	N/A	N/A	Good
PA-010							
Lab Sump	Good	No	Normal	N/A	N/A	N/A	Good
PA-011							
Caustic	N/A						
Knockout	Good	No	Normal	Good	N/A	N/A	Good

Additional Comments

Put oil & anti-freeze in PA-003, ready to go

Mechanic: Billy Dickerson

EPAPA008001176

Date: 1-23-09

Daily Pump Maint. Log

Pump #	Alignment	Seal Leaking	Vibration	Oil Level	Glycol Level	PSI Reading	Comment
PA-001							
Load Pump	Good	No	Normal	Good	Good	Good	Good / Greased
PA-002							
Recirc Pump	Good	No	Normal	Good	Good	Good	Good / Greased
PA-003							
Spare	N/A	No	N/A	Good	Good	N/A	Good
PA-004							
WW	Good	No	Normal	Good	N/A	N/A	Good / Greased
PA-005							
NaSh	Good	No	Normal	N/A	N/A	N/A	Good / Greased
PA-006							
Acid	Good	No	Normal	N/A	N/A	N/A	Good
PA-007							
Peroxide	Good	No	Normal	N/A	N/A	N/A	Good
PA-008							
Peroxide	Good	No	Normal	N/A	N/A	Good	Good
PA-009							
Bleach	Good	No	Normal	N/A	N/A	N/A	Good
PA-010							
Lab Sump	Good	No	Normal	N/A	N/A	N/A	Good
PA-011							
Caustic	N/A						
Knockout	Good	No	Normal	Good	N/A	N/A	Gauge Broke on gas pot

Additional Comments

Greased pumps & motors

Mechanic: Billy Dickerson

EPAPA008001177

Date: 1-26-09

Daily Pump Maint. Log

Pump #	Alignment	Seal Leaking	Vibration	Oil Level	Glycol Level	PSI Reading	Comment
PA-001							
Load Pump	Good	NO	Normal	Good	Good	Good	Good
PA-002							
Recirc Pump	Good	NO	Normal	Good	Good	Good	Good / Small leak in glycol line
PA-003							
Spare	Good	NO	N/A	Good	Good	N/A	Good
PA-004 I	Good	NO		Good	N/A	N/A	
WW II	Good	NO	Normal	Good	N/A	N/A	Good
PA-005							
NaSh	Good	NO	Normal	N/A	N/A	N/A	Good
PA-006							
Acid x 3	Good	NO	Normal	N/A	N/A	N/A	Good
PA-007							
Peroxide	Good	NO	Normal	N/A	N/A	N/A	Good
PA-008							
Peroxide	Good	NO	Normal	N/A	N/A	Good	Good
PA-009							
Bleach	Good	NO	Normal	N/A	N/A	N/A	Good
PA-010							
Lab Sump	Good	NO	Normal	N/A	N/A	N/A	Good
PA-011							
Caustic	~~Good~~ N/A	~~NO~~	~~Normal~~	~~N/A~~	~~N/A~~	~~N/A~~	~~Good~~
Knockout	Good	NO	Normal	Good	N/A	N/A	Good

Additional Comments

- Drained Compressor
- Tightened up nut on glycol line: Check later to see if still leaking

Mechanic: Billy Dickerson

EPAPA008001178

Date: 1-27-09

Daily Pump Maint. Log

Pump #	Alignment	Seal Leaking	Vibration	Oil Level	Glycol Level	PSI Reading	Comment
PA-001							
Load Pump	Good	No	N/A *	Good	Good	N/A	Good / sight glass has sludge
PA-002							
Recirc Pump	Good	No	Normal	Good	Good	Good	Good / Sight glass has sludge
PA-003							
Spare	Good	No	N/A *	Good	Good	N/A *	Good
PA-004 I	Good	No	N/A *	Good	N/A	N/A	Good
WW II	Good	No	Normal	Good	N/A	N/A	Good
PA-005							
NaSh	Good	NO	Normal	N/A	N/A	N/A	Good
PA-006							
Acid x3	Good	No	N/A *	N/A	N/A	N/A	Good
PA-007							
Peroxide	Good	No	N/A *	N/A	N/A	N/A	Good
PA-008							
Peroxide	Good	No	N/A *	N/A	N/A	N/A *	Good
PA-009							
Bleach	Good	No	N/A *	N/A	N/A	N/A	Good
PA-010							
Lab Sump	Good	No	N/A *	N/A	N/A	N/A	Good
PA-011							
Caustic	N/A						
Knockout	Good	No	N/A *	Good	N/A	N/A	Good

Additional Comments

- Load Pump oil sight glass has sludge build up
- Recirc. Pump has sludge build up as well
- Drained Compressor
- Check eyewash stations & showers - all good

Mechanic: Billy Dickerson

EPAPA008001179

Date: 1-28-09

Daily Pump Maint. Log

Pump #	Alignment	Seal Leaking	Vibration	Oil Level	Glycol Level	PSI Reading	Comment
PA-001							
Load Pump	Good	No	Normal	Good	Good	Good	Good
PA-002							
Recirc Pump	Good	No	Normal	Good	Good	Good	Good / Small leak in glycol line
PA-003							
Spare	Good	No	N/A *	Good	Good	N/A *	Good
PA-004 I	Good	No	N/A *	Good	N/A	N/A	Good
WW II	Good	No	Normal	Good	N/A	N/A	Good
PA-005							
NaSh	Good	No	Normal	N/A	N/A	N/A	Good
PA-006							
Acid x3	Good	No	N/A *	N/A	N/A	N/A	Good
PA-007							
Peroxide	Good	No	N/A *	N/A	N/A	N/A	Good
PA-008							
Peroxide	Good	No	N/A *	N/A	N/A	N/A *	Good
PA-009							
Bleach	Good	No	N/A *	N/A	N/A	N/A	Good
PA-010							
Lab Sump	Good	No	N/A *	N/A	N/A	N/A	Good
PA-011							
Caustic	N/A						
Knockout	Good	No	Normal	Good	N/A	N/A	Good

Additional Comments

- small leak in 4" pipe @ RV 1 :(1" nipple @ weld)
- PA-001 has small leak in glycol line @ bottle; tightened nut, check later (may need teflon)

Mechanic: Billy Dickerson

EPAPA008001180

Date: 1-29-09

Daily Pump Maint. Log

Pump #	Alignment	Seal Leaking	Vibration	Oil Level	Glycol Level	PSI Reading	Comment
PA-001							
Load Pump	Good	No	N/A *	Good	Good	N/A *	Good / Greased
PA-002							
Recirc Pump	Good	No	Normal	Good	Good	Good	Good / Greased
PA-003							
Spare	Good	No	N/A *	Good	Good	N/A *	Good
PA-004 I	Good	NO	N/A *	Good			Good / Greased
WW II	Good	NO	N/A *	Good	N/A	N/A	Good
PA-005							
NaSh	Good	NO	Normal	N/A	N/A	N/A	Good / Greased
PA-006							
Acid x3	Good	NO	N/A *	N/A	N/A	N/A	Good
PA-007							
Peroxide	Good	NO	N/A *	N/A	N/A	N/A	Good
PA-008							
Peroxide	Good	NO	N/A *	N/A	N/A	N/A	Good
PA-009							
Bleach	Good	NO	N/A *	N/A	N/A	N/A	Good
PA-010							
Lab Sump	Good	NO	N/A *	N/A	N/A	N/A	Good
PA-011							
Caustic	N/A						
Knockout	Good	NO	Normal	Good	N/A	N/A	Good

Additional Comments

- Drained tompresser
- greased motors & pumps

Mechanic: Billy Dickerson

EPAPA008001181

Date: 1-30-09

Daily Pump Maint. Log

Pump #	Alignment	Seal Leaking	Vibration	Oil Level	Glycol Level	PSI Reading	Comment
PA-001							
Load Pump	good	No	Normal	good	good	good	good
PA-002							
Recirc Pump	good	No	Normal	good	good	good	good
PA-003							
Spare	good	No	N/A *	good	good	N/A *	good
PA-004 I	good	No	good	good	N/A	N/A	good
WW II	good	No	good	good	N/A	N/A	good
PA-005							
NaSh	good	No	Normal	N/A	N/A	N/A	good
PA-006							
Acid x3	good	No	Normal	N/A	N/A	N/A	good
PA-007							
Peroxide	good	No	N/A *	N/A	N/A	N/A	good
PA-008							
Peroxide	good	No	Normal	N/A	N/A		good/Relay switch bad ; bad
PA-009							
Bleach	good	No		N/A	N/A	N/A	
PA-010							
Lab Sump	good	No	N/A *	N/A	N/A	N/A	good
PA-011							
Caustic	N/A						
Knockout	good	No	Normal	good	N/A	N/A	good

Additional Comments

- Relay switch in junction box bad (PA-008) ; ~~Switch~~ manual on/off switch @ RVI for bleach pump bad
- blew down compressor

Mechanic: BM Dickerson

EPAPA00800182

Date: 2-2-09

Daily Pump Maint. Log

Pump #	Alignment	Seal Leaking	Vibration	Oil Level	Glycol Level	PSI Reading	Comment
PA-001							
Load Pump	Good	No	Good	Good	Good	Good	Good
PA-002							
Recirc Pump	Good	No	Good	Good	Good	Good	Good
PA-003							
Spare	Good	No	N/A *	Good	Good	N/A *	Good
PA-004 I	Good	No	N/A *	Good	N/A	N/A	Good
WW II	Good	No	N/A *	[redacted]	N/A	N/A	Good
PA-005							
NaSh	Good	No	Good	N/A	N/A	N/A	Good
PA-006							
Acid x3	Good	No	Good	N/A	N/A	N/A	Good
PA-007							
Peroxide	Good	No	Good	N/A	N/A	N/A	Good
PA-008							
Peroxide	Good	No	Good	N/A	N/A	N/A	Good / See comments
PA-009							
Bleach	Good	No	Good	N/A	N/A	N/A	Good
PA-010							
Lab Sump	Good	No	Good	N/A	N/A	N/A	Good
PA-011							
Caustic	N/A						
Knockout	Good	No	Good	Good	N/A	N/A	Good

Additional Comments

- PA-008: need electrician to look @ switch.
- Inspected Showers & eye wash stations.
- blew down compressor

Mechanic: Billy Dickerson

EPAPA00800183

Date: 3-19-09

Daily Pump Maint. Log

Pump #	Alignment	Seal Leaking	Vibration	Oil Level	Glycol Level	PSI Reading	Comment
PA-001							
Load Pump	Good	No	Good	Good	Good	Good	Good
PA-002							
Recirc Pump	Good	No	Good	Good	Low	Good	Good
PA-003							
Spare	Good	No	Good	Good	Good	Good	needs glycol
PA-004 ~~WW~~	Good	No	Good	Good	N/A	N/A	Good
WW	Good	No	Good	Good	N/A	N/A	Good
PA-005							
NaSh	Good	No	Good	Good	N/A	N/A	Good
PA-006							
Acid X3	Good	No	Good	N/A	N/A	N/A	Good
PA-007							
Peroxide							
PA-008	N/A	N/A	N/A	N/A	N/A	N/A	
Peroxide							
PA-009							
Bleach	Good	No	Good	N/A	N/A	N/A	Good
PA-010							
Lab Sump						→	need bushings to lock up pump
PA-011							
Caustic	N/A	N/A	N/A	N/A	N/A	N/A	
~~Knockout~~	Good	No	Good	Good	N/A	N/A	Good

Additional Comments

Mechanic: Billy Dickerson

EPAPA00800184

Date: 3-23-09

Daily Pump Maint. Log

Pump #	Alignment	Seal Leaking	Vibration	Oil Level	Glycol Level	PSI Reading	Comment
PA-001							
Load Pump	Good	No	Good	Good	[redacted] Good	Good	Good / [redacted]
PA-002							
Recirc Pump	Good	No	Good	Good	Low	Good	Good / add glycol
PA-003							
Spare	Good	No	Good	Good	Good	Good	Good
PA-004 WW ±							
WW ±	Good	No	Good	Good	N/A	N/A	Good
PA-005							
NaSh	Good	No	Good	Good	N/A	N/A	Good
PA-006							
Acid	Good	No	Good	N/A	N/A	N/A	Good
PA-007							
Peroxide	N/A						
PA-008							
Peroxide							
PA-009							
Bleach	Good	No	Good	N/A	N/A	N/A	Good
PA-010							
Lab Sump							Need bushings to INSTALL
PA-011							
Caustic	[redacted]	[redacted]					
Knockout	Good	No [redacted]	Good	Good	N/A	N/A	Good

Additional Comments

Mechanic: Billy Dickerson

EPAPA00800185

Date: 4-1-09

Daily Pump Maint. Log

Pump #	Alignment	Seal Leaking	Vibration	Oil Level	Glycol Level	PSI Reading	Comment
PA-001							
Load Pump	✓	X	✓	✓	✓	✓	✓ needs mixed to glycol
PA-002							
Recirc Pump	✓	X	✓	✓	✓	✓	✓ Added glycol
PA-003							
Spare	✓	X	✓	✓	✓	✓	✓
PA-004							
WW	✓	X	✓	✓	N/A	N/A	✓
WW2	✓	X	✓	✓	N/A	N/A	✓ Small leak in Drain Plug
PA-005							
NaSh	✓	X	✓	✓	N/A	N/A	✓
PA-006							
Acidx3	✓	X	✓	N/A	N/A	N/A	✓
PA-009							
Bleach	✓	X	✓	N/A	N/A	N/A	✓
PA-010							
Lab Sump	✓	X	✓	N/A	N/A	N/A	✓
PA-011							
Caustic	N/A	→	→	→	→	→	
Knockout	✓	X	✓	✓	N/A	N/A	✓
NV1	N/A	→	→	→	→	→	
NV2	✓	X	✓	✓	N/A	N/A	✓

Additional Comments

WW2 - Tightened plug to stop leak

Mechanic: Billy Dickerson

EPAPA008001186

Date: 4-7-09

Daily Pump Maint. Log

Pump #	Alignment	Seal Leaking	Vibration	Oil Level	Glycol Level	PSI Reading	Comment
PA-001							
Load Pump	✓	X	✓	✓	✓	✓	✓ Needs Nitrogen
PA-002							
Recirc Pump	✓	X	✓	✓	✓	✓	✓
PA-003							
Spare	✓	X	N/A	✓	✓	N/A	✓ Small leak in glycol line
PA-004							
WW	✓	X	✓	✓	N/A	N/A	✓
WW2	✓	X	✓	✓	N/A	N/A	✓
PA-005							
NaSh	✓	X	✓	✓	N/A	N/A	✓
PA-006							
Acidx3	✓	X	✓	N/A	N/A	N/A	✓
PA-009							
Bleach	✓	X	✓	N/A	N/A	N/A	✓
PA-010							
Lab Sump	✓	X	✓	N/A	N/A	N/A	✓
PA-011							
Caustic	N/A						
Knockout	✓	X	✓	✓	N/A	N/A	✓
NV1	N/A						
NV2	✓	X	✓	✓	N/A	N/A	✓

Additional Comments

Mechanic: Billy Dickerson

EPAPA008001187

Bill of Lading No. 4132529
Delivery No. 4132529
Ship Date 23-Jan-2009

SHIPPER PROVIDED SHORT FORM BILL OF LADING
NOT NEGOTIABLE - DOMESTIC

RECEIVED, in apparent good order, except as noted, packaged, marked, consigned and destined as shown below and in accordance with all federal and state regulations. This Bill of Lading is not subject to any rate agreements, contracts, tariffs or classifications, whether individually determined or filed with any federal or state regulatory agency, except as specifically agreed to in writing by FMC and the carrier.

Shipper Order No. 1639252

From FMC Corporation Chemical Products Group
Customer PO. 376947

At FMC - Bayport 12000 Bay Area Blvd, Bayport, TX 77507-1310

All parties hereto and their assigns are familiar with, and agree, that this bill of lading is subject to: the contract in effect between the Shipper and Carrier.

Consignee	This shipment is **PREPAID**, Remit Bill To:
CES ENVIRONMENTAL SERVICE INC. 2420 S. GULFWAY PORT ARTHUR TX 77642	FMC CORPORATION C/O CASS INFORMATION SYSTEMS PO BOX 6542 CHELMSFORD, MA 01824-0942

Route					
Delivering Carrier	FMC TRUCK (FMCT)	Vehicle No.	FMC-68	Seal No.	

Special Instructions:

Additional Text Area:

If this shipment is being tendered to Carrier on a "Collect" basis (as indicated above right), Carrier must look exclusively to Consignee for payment of all freight charges without any recourse back to **FMC Corporation Chemical Products Group** in the event of any non payment by the Consigne Notwithstanding any provision in its tariffs, rules, or individually established rates to the contrary, Carrier's acceptance of this provision (1) expressly waives any rights it might otherwise have had to seek recovery of freight or other charges from **FMC Corporation Chemical Products Group** and (2) is evidenced by the signature of Carrier, by its agent, at the bottom of this bill of lading. Note - Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property. The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding. Rate: 1.65 per lb.

HM	No. of Pkgs.	Pkg	Description of Articles, Special Marks and Exceptions	Weight
X	1	TT	**UN 2014, HYDROGEN PEROXIDE, AQUEOUS SOLUTIONS, WITH NOT LESS THAN 20 PERCENT BUT NOT MORE THAN 40 PERCENT HYDROGEN PEROXIDE, 5.1 (8), PG II,** EMERGENCY RESPONSE GUIDE NUMBER 140. HYD PEROXIDE 35% STANDARD BULK **Product Code :** 0000004269	**21,340 LB**
X	1	CYL	**UN 1066, NITROGEN, COMPRESSED, 2.2** (for unloading purposes only)	
X	1	CAN	**UN 1203, GASOLINE, 3, PG II** (for unloading purposes only) Batch - 0000930087 _____ LB net wt., Adjusted wt. at _____ on 100% basis = _____ LB DELIVER 01/22/2009	**10 GAL**

Gross: 52,100 **Net :** 21,340 **Tare :** 30,760 LB

MOTOR CARRIER'S CHECK LIST: Shipment loaded properly: X Shipment Blocked and Braced: ____ Placards Offered: X Placards Accepted: X Refused: ____
Emergency Reponse Information is attached to this bill of lading and has been explained and is understood: ✓ ER Guide ✓ MSDS ____ COA X Other ____
Carrier has accepted appropriate NAERG number pages ✓ Date 1-22-09
I am aware of the applicable provisions of title 49 of the Code of Federal Regulations governing the movement of these materials.

MOTOR CARRIER'S SIGNATURE: _____ Date: 1-22-09
Materials classed as Poison Toxic are prohibited from being transported with foodstuffs, feed or any other edible material intended for humans or animals.

For Chemical Emergency involving Spill, Leak, Fire, Exposure or Accident call day or night:
CHEMTREC (800) 424-9300

This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation. Received in apparent good order. Exceptions noted.

SHIPPER, PER: T. Montello **AGENT, PER:** _____ ( ) if "X" Car is trip leased to consignee.

FMC

FMC Corporation

Peroxygen Chemicals Division
Bayport Plant
12000 Bay Area Boulevard
Pasadena, Texas 77507

WEIGHT TICKET

No. 16098

Customer Name CES - PORT ARTHUR, TX

Product 35% HYDROGEN PEROXIDE

Carrier QUALITY FMC

Trailer No. FMC 68

Weigher T.M.

Certified Public Weigh Master

	WEIGHT	TIME	DATE
STEERING AXLE			
TRACTOR TOTAL	52100 LB	04:12 PM	01/21/09
GROSS WEIGHT	30760 LB	02:01 PM	01/21/09
TARE WEIGHT	21340		
NET WEIGHT			

FMC Chemical Products Group
1735 Market Street
Philadelphia PA 19103

FOR CUSTOMER SERVICE PLEASE CALL: 1-800-323-7107

Certificate of Analysis

Shipped to:	***FMC Order #***	: 1639252
CES ENVIRONMENTAL SERVICE INC.	***Customer PO***	: 376947
2420 S. GULFWAY	***Net weight***	: 21,340 LB
PORT ARTHUR TX 77642		
Ship Date: 23-Jan-2009	***Certificate Date:*** 21-Jan-2009	

Product: HYD PEROXIDE 35% STANDARD BULK

PROPERTY INSPECTION METHOD	SPECIFICATION	BATCH/Mfg.Dt 0000930087 21-Jan-2009
Container Identification		**FMC-68**
Assay, %	35.00 - 35.80 PCT	35.60
Color, APHA	22.0 AC Max	< 22.0
pH	3.7 PH Max	2.4
Stability, 3 hour	99.6 PCT Min	> 99.6

16811/68

Authorized By:
Robert Alekseyczyk

Shift Report Date:

Day shift or Evening shift Performed by:

Tank #	Unloaded?	Loaded?	Contains:
208			WW TO NP
224			Field services Needed
232			Need TO get out FOR VIK 1-23-09
237		?	NASH
255		?	
~~258~~			NOT Here
261			
265			
266			
267		✓	NASH
268		✓	NASH
269			
270			
423			
638			
848			
1047			
1264			
~~7253~~			VIK Being done
8177			

Shift Report Date:

Day shift or Evening shift Performed by:

Tank #	Unloaded?	Loaded?	Contains:
~~208~~			
224			Field service
232		?	
237			Not in use
255			~~Not in use~~ Acid
258			Not in use
~~261~~			
~~265~~			
~~266~~			
267			Not in use
268			Not in use
~~269~~			
270			Houston
~~423~~			Acid
~~638~~			
~~848~~			
~~1047~~			
~~1264~~			
7253			
~~8177~~			Acid

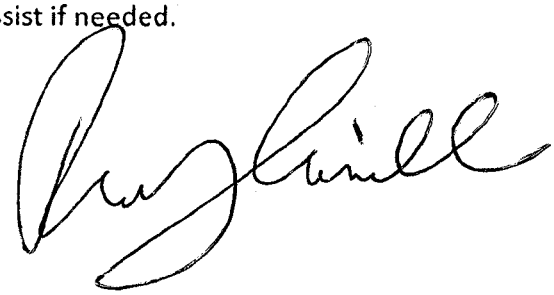
Shift Report Date:

Day shift or Evening shift Performed by:

Tank #	Unloaded?	Loaded?	Contains:
208			
224			
232			
237			
255			
258			
261			
265			
266			
267			
268			
269			
270			
423			
638			
848			
1047			
1264			
7253			
8177			

Procedures for loading and unloading trailers

- **LOADING TRAILERS:**
- Ensure driver pulls trailer correctly and safely to loading area.
- The paperwork for loading the trailer will be in the Lab in the hanging box labeled outbound loads or the driver may have them with him.
- The operator will ensure that the proper product is being loaded into the proper trailer. If there are any discrepancies or confusion, the operator must check with the Logistics Manager before any transfers are made.
- Once verified, the operator will ground the trailer and ensure that the driver has chocked the wheels.
- The operator will don a respirator, bleed pressure, and open the manway on top to confirm that the trailer is empty.(All personnel will have a respirator on when opening any domelid)! No Exceptions.
- Once confirmed, the operator will hook up the vapor exchange line to the tank being unloaded.
- The Driver MUST be in full PPE and safety watch the operator during the entire loading process and assist the operator when asked.
- The operator will load the trailer and visually check in the manway to ensure the trailer is filled to the correct capacity. Close and lock down the manway.
- Once the transfer is complete, blow down and unhook loading hoses, and transfer hose.
- The Driver is to inspect the trailer before moving. The driver is responsible for ensuring that the trailer is properly sealed and ready for transport.
- **UNLOADING TRAILERS:**
- Absolutely no trailers are to be unloaded without the proper paperwork, a sample taken, and the profile verified in the lab.
- Will follow same safety procedures as explained in the loading section.
- The driver will stay in the loading area in PPE throughout the duration of the transfer and assist if needed.



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Date	Training

TONIGHT

1ST Preload 208, 266, 269 From FrakTK 1003

2nd Send ~~to~~ Remaining WW From WWTK TO FrakTK 1003

3RD TRANSFER RV-1 TO WW TK

4TH TRANFER RV-2 TO RV-1 And Process

5TH LOAD NASH TK INTO 232 BEFORE STEP 4 Reload From NaOH TK

TOMORROW

6:00 AM

208 266 269 goes TO NP

9:00 AM

208 266 269 Reload From ~~Fra WW TK OR~~ FrakTK 1003

Port Arthur Chemical & Environmental Services, LLC.

PACES Trailer Inventory Report

Trailer #	Status	Date	Time	Job #	Customer	Contents	Comments
208	Empty	1/21/2009			2258	CES waste water	diaspatched to NP. TO BE PRELOADED FOR 1-22-09
224	OOS	1/13/2009			2258	CES Waste Water	Internal valve will not open. Offloaded a portion into waste water tank. Plans are to dig out
232					2258	VAC TRAILER	Internal plant work NEEDS TO CLEANED FOR VIK INSP. NO LATER 1-23-09
237	Empty	1/21/2009			2258	NaSH	on yard to be loaded with NaSh
255	OOS	1/15/2009			171	KMTX regular waste water	hauled to CES Houston tank wash to be repaired.
258						HOUSTON-HOUSTON-HOUSTON	@ Houston Yard Perm.
261	Empty	1/21/2009			2258	disulfide oil KMTX tk.167	dispatched to PEAK. In route to PACES to be dispatched for feed. Needs to rinsed
265	Loaded	1/21/2009			2258	KMTX reg waste water	dispatched to haul PACES Waste water preloaded for 1-22-09
266	Loaded	1/21/2009			2258	PACES WASTE WATER	dispatched to haul PACES waste water preloaded for 1-22-09
267	Loaded	1/20/2009			2258	PACES waste water	on yard loaded with NaSh
268	OOS	1/8/2009			2258	NaSH	OOS used to store NaSh
269	Empty	1/21/2009			2258	PACES waste water	dispatched for feed
7253	OOS	1/12/2009			2258		In Houston to be repaired and VIK inspection performed
8177	Loaded	1/21/2009			1904	Spent Sulfuric Acid	Loaded on line ready to use in plant.
LT-1047	Empty	1/21/2009			2258	Targa LSNG	dispatched for Targa CBF redirect to DeRidder
LT-423	Loaded	1/14/2009			1904	spent sulfuric acid	in plant being used to process
LT-638	Loaded	1/21/2009			2258	CCL-7 barge	Dispatched to DeRidder preloaded for 1-22-09
LT-848	Loaded	1/21/2009			2258	CCL-7 Barge	Dispatched to DeRidder preloadede for 1-22-09
Mat-1264	Empty	1/21/2009			1194	kmtex water	dispatched to haul KMTX waste water

EPAPA008001198

FLARE REPORT

DAILY LOG FOR Feb 2009

DATE			OPERATOR/ SHIFT	FLAME COLOR	SMOKE?
2-2			Mike	clear	no
2-3			"	"	"
2-4			Mike Rudd	blue to clear	none
2-5			MR	clear	none
2-9			Mike L.	blue to clear	none
2-10			MR	blue	none
2-11			Mike	"	"
2-12			Mike	"	"
2-16			MR	blue to clear	none
2-18			Mike Rudd	clear	none
2-20			Mike	blue	none
2-24			MR	clear	" "
2-25			Mike	blue to clear	" "
2-26			MR	blue to clear	" "
2-27			Mike	clear	" "
			March 2009		
3-5-09			MR	blue	" "
3-4-09			Mike	clear to blue	none
3-5			MR	blue	none
3-6			Mike Rudd	blue to clear	no smoke
3-9			Mike Rudd	clear	no smoke
3-10			MR	clear to blue	" "
3-11			Michael Rudd	blue to clear	" "
3-12			Michael Rudd	blue	no smoke
3-13			Michael Rudd	clear	no smoke
3-16			MR	blue to clear	none
3-18			Michael Rudd	blue to clear	none
3-19			MR	clear	none
3-20			MR	blue to clear	none
3-21			Michael Rudd	clear	none
3-23			Michael Rudd	clear	" "
3-24			Michael Rudd	blue to clear	" "
3-25			MR	clear	" "
3-30			Michael Rudd	blue to clear	" "
3-31			Michael Rudd	clear	" "

Trailer Log Date: 12-29-08

Day Shift or night shift

Job #	Trailer #	Unloaded?	Loaded?	Contains:	Initials
78144 ~~7855~~	4638	✓		MAP Caustic	MR
78468	271	✓		Feed stock, Valero	MR
78466	260	✓		Feed stock Valero	MR
78639	1264		✓	waste water	AS
78640	269		✓	waste water	AS
	4848	✓		Feed Stock in RU 2	MR
~~7864~~	~~2264~~	~~✓~~		~~Water~~	~~AS~~
78467	~~2271~~ 271	✓		Valero FEED STOCK	DS
78465	260	✓		Valero FEED STOCK	DS
78707	268		✓	waste water	AS

Trailer Log

Date: 12-30-08

Day Shift or night shift

Job #	Trailer #	Unloaded?	Loaded?	Contains:	Initials
78671	261		✓	Barge	D.S.
78753	LT848		✓	Barge Citgo Deridder	DS
78707	268		✓	wastewater	AS
78708	237		✓	waste water	AS
78708	268		✓	wast water	KB
78653	271	✓		Valero Caustic	AS
78652	260	✓		Valero Caustic	AS
	208		✓	NASH	DS
78669	638		✓	Barge Deridder	DS
78715	237		✓	W.W.	M.R.
? 78781	269		✓	W.W Preload	MR
	266	✓		SIB oil into Frat	MR
	267	✓		SIB oil into Frat	MR
	265	✓		SIB oil into Frat	MR
78654	271	✓		Valero Caustic	MR
~~78773~~	~~268~~		✓	~~wast water~~	~~KB~~
~~78775~~	~~237~~		✓	~~wast water~~	~~KB~~

Trailer Log Date: 12-31-08

Day Shift or night shift

Job #	Trailer #	Unloaded?	Loaded?	Contains:	Initials
78773	268		✓	waste water	KB
78775	237		✓	W. W	KB
78787	271	✓	~~✓~~ AS	Valero Caustic	AS
78788	260	✓		Valero Caustic	AS
78772	269		✓	waste water	MR
78774	265		✓	W. W	MR
78861	268		✓	waste water	KB
78774	237		✓	wast water	KB
	266		✓	Oil from RV	MR
	267		✓	oil from RV	MR
78796	271	✓		~~✓~~ Valero Caustic	AS
78789	260	✓		Valero Caustic	MR
	232		✓	FRAT 1003	MR
	232	✓		FRAT 1003	MR

Trailer Log Date: 1-2-09

Day Shift or night shift

78785

Job #	Trailer #	Unloaded?	Loaded?	Contains:	Initials
78863	269		✓	W.W At 7:15	MR
78690	LT-638		✓	CAUSTIC From Barge	BO
78691	LT-848		✓	CAUSTIC FROM BARGE	BO
78693	261		✓	CAUSTIC From Barge	BO
	265		✓	" " "	D.S
78815	271	✓		UA/MRO Feed Stock	MR
78662	269		✓	W.W.	MR
78868	237		✓	W.W	MR
78813	271	✓		UA/MRO Feed Stock	MR
78814	260	✓		UA/MRO Feed Stock	MR
78816	260	✓		UA/MRO Feed Stock	MR

Trailer Log Date: 12-22-08

Day Shift or night shift

Job #	Trailer #	Unloaded?	Loaded?	Contains:	Initials
78140	1047	✓		NAP Caustic	BO
78141	1264	✓		NAP Caustic	BO
78350	268	✓		RUZ	MR
78291	261	✓		RUZ	MR
77367	258	✓		RZ	MR

Trailer Log Date: 12-23-08

Day Shift or night shift

Job #	Trailer #	Unloaded?	Loaded?	Contains:	Initials
78241		✓		Vitero Water	MR
78487	4 1047		✓	W.W. Newpark	MR
78423			✓	WW	MR
78424			✓	WW	MR

Trailer Log Date: 12-24-08

Day Shift or night shift

Job #	Trailer #	Unloaded?	Loaded?	Contains:	Initials
	208		✓	NASH	MR
	261	✓		Feed stock into R02	MR

Trailer Log Date: 12-27-08

Day Shift or night shift

Job #	Trailer #	Unloaded?	Loaded?	Contains:	Initials
78585	269		✓	Waste Water	MCT3
	268		✓	" "	MCT3
78587	1264		✓	W. W	MCT3

Trailer Log

Day Shift or night shift

Date: ~~1-4-08~~ 1-5-08

Job #	Trailer #	Unloaded?	Loaded?	Contains:	Initials
79022	~~265~~ 265		✓	wastewater	KB
79025 ~~79026~~	268		✓	wastwater	KB
79023	237		✓	W.W	KB
78819	271	✓		caustic Valero for feed	MR
78817	260	✓		Valero caustic fed	MR
78700	LT-638		✓	Boise Caustic	MR
78703	LT-848		✓	Boise Caustic	MR
78821	260	✓		valeroCaustic	KB

Trailer Log

Day Shift or night shift

Date: ~~1-15-09~~ Jan 6, 2009

START'D 15K FROM F-K TK 1003

Job #	Trailer #	Unloaded?	Loaded?	Contains:	Initials	BATCH #
78821	260	RV-2		VALERO - 5000	~~BO~~	1-4
78823	271	RV-2		VALERO - 5000	BO	1-4
N/A	268	RV-2		BARGE - 5000	BO	1-4
79085	208		NP	WENT TO NP WW	BO	
79040	265		NP	WENT TO NP WW	BO	
78873	LT-648		DERRIDER	CAUSTIC FROM BARGE	BO	
78875	LT-638		DERRIDER	CAUSTIC FROM BARGE	BO	
79096	268		NASH	TO go TO KMTX	BO	
79084	265		NP	WW TO NP	BO	
79043	261		NP	WW TO NP	BO	
~~79089~~	261		NP	WW TO NP	BO	
78876	LT-638		DERRIDER	CAUSTIC FROM BARGE	BO	Pre-load Pre-load
78874	LT-648		DERRIDER	CAUSTIC FROM BARGE	BO	
78822	260	RV-2	~~Valero~~	caustic	KB	
	LT 1047		✓	wast water	KB	
78825	271	RV-2	Valero	caustic	KB	
79147	268		✓	wastwater	KB	
79156	LT1047		✓	WASTE WATER	KB	
	268		✓	WASTEWATER	KB	

Trailer Log

Day Shift or night shift

Date: ~~12-19-08~~ 1-09-09

Job #	Trailer #	Unloaded?	Loaded?	Contains:	Initials
	237		✓	Waste Water	MCT3
	1264		✓	Waste Water	MCT3
	237		—	w/w	AS
	1264		—	w/w	AS

Trailer Log

Day Shift or night shift

Date: ~~1-15-09~~ Jan 8, 2009

Job #	Trailer #	Unloaded?	Loaded?	Contains:	Initials
78826	271	✓		Valero Feedstock	M.R
78824	260	✓		Valero	AS
79186	265		✓	W.W to NewPark	MR
79179	268		✓	WW for NewPark	MR
79243	261	✓	✓ 60°	Feed stock RU 1	MR
79180	268		✓	wast water	KB
78882	848		✓	Barge for Desch	MR
78830	260	✓		VAlero Feed	MR
78831	271	✓		VAlero Feed	MR
~~78833~~	265	Preload	✓	W.W. for Newpark	MR
79235	261	✓		501 from Kinder	
79236	261	✓		501 from Kinder	

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Trailer Log

Day Shift or night shift

Date: ~~1-15-08~~ ~~1-10-08~~ 1-09-08

Job #	Trailer #	Unloaded?	Loaded?	Contains:	Initials
79292	261	RV-2 ✓		RADSATS	JBR
	271	RV-2		VALERO	M.
79295	237		WW	WW TO NP	M.
	232	✓		RV2 Clean up W.	MK
79299	265		✓	WW	MR
79296	237		✓	WW	MR

Shift Report
Day shift or Evening shift

Date:
Performed by: 12-09

Tank #	Unloaded?	Loaded?	Contains:
1264 ~~298~~	✓	✓	wastwater 79373
237 ~~234~~		~~✓~~ ✓	~~79375 W.W~~ 79375 WW
261 232	✓		501 from Kinder to RU1 79430
237 ~~237~~		✓	W.W 79376
1264 ~~255~~		✓	W.W 79374
237 ~~258~~		✓	WW 79377
848 ~~263~~	✓		RU 2 from 501 79434
265 ~~265~~	✓		RU2 from 501 79435
261 ~~266~~	✓		RU2 from 501 79436
208 ~~269~~		✓	W.W 79742 ? #506
848 ~~268~~	✓		RU2 from 501 ~~79430~~ 79437
269			
270			
423			
638			
848			
1047			
1264			
7253			
8177			

Shift Report Date: 1-13-09

Day shift or Evening shift Performed by:

Tank #	Unloaded?	Loaded?	Contains:	
237 ~~208~~		✓	WW 79479	
269 ~~237~~		✓	WW 79471	
1638 ~~239~~		✓	CAustic Barge Boise	79231
848 ~~237~~		✓	CAustic Barge Boise	79233
261 ~~255~~	✓	✓	Kmtex 501 79511 RV2	
237 ~~258~~		✓	WW 79481	
261 261	✓		RV2 jmt 501 79512	
261 265	✓		RV2 out 501 79527	
208 266		✓	WW 79482	
261 267	✓		RV2 501 79526 501	
261 268	✓		RV2 501 79524	
269				
270				
423				
638				
848				
1047				
1264				
7253				
8177				

Shift Report Date: 12-~~14~~-09

Day shift or Evening shift Performed by:

Tank #		Unloaded?	Loaded?	Contains:
205	~~258~~		✓	W.W Newpark 79541
265	~~224~~		✓	W.W Newpark 79561
261	~~232~~	✓		RV2 from 501 79546
848	~~237~~		✓	Barge 79238
638	~~255~~			Barge 79236
205	~~258~~		✓	W.W Newpark 79542
261	261	✓		RV2 501 79547
261	~~265~~	✓		RV2 501 79548
205	266		✓	W.W Newpark 79543
265	267		✓	W.W Newpark 79544
261	268	✓		RV2 501 Kemtex 79549
1047	269	✓		RV2 501 Kemtex 79550
265	270		✓	W.W newpark 79545
	423			
	638			
	848			
	1047			
	1264			
	7253			
	8177			

Shift Report Date: 1-~~15~~16-09

Day shift or Evening shift Performed by:

Tank #	Unloaded?	Loaded?	Contains:
237 ~~208~~	V		79710
1264 ~~224~~		V	w/w 79701
208 ~~232~~		V	w/w ~~208~~ 79699
~~237~~			~~79710~~
261 ~~285~~	V		RV2 501 79720
LT-638 ~~258~~		V	barge 79628
265 261		V	barge 79579
265			
266			
~~3~~1264 267		V	w/w 79704
261 268	V		RV2 501 79723
261 269	V		RV2 501 79722
261 ~~270~~	✓		RV2 79726
261 ~~423~~	✓		RV2 79727
638			
848			
1047			
1264			
7253			
8177			

Shift Report Date: 1-15-09

Day shift or Evening shift Performed by:

Tank #	Unloaded?	Loaded?	Contains:
~~269~~ 268		✓	W.W 79603
265 ~~224~~		✓	W.W 79601
269 ~~232~~		✓	WW 79604
269 ~~237~~		✓	WW 79606
265 ~~255~~		✓	WW 79605
265 ~~258~~		✓	WW 79602
261 261	✓		~~Spent Caustic~~ ID# 79597 ~~AS~~ RV2 501
261 ~~255~~	✓		79597 RV2 501
261 266	✓		RV2 501 79594
261 267	✓		~~RV1~~ RV2 501 79598
268			
269			
270			
423			
638			
848			
1047			
1264			
7253			
8177			

Shift Report Date: 1-18-09

Day shift or Evening shift Performed by:

Tank #	Unloaded?	Loaded?	Contains:
269 ~~208~~	✓	~~✓~~	79803 RV2 501
638 224	✓		79802 RV2 501
638 232	✓		79804 RV2 501
269 237	✓		79805 RV2 501
638 255	✓		79806 RV2 501
269 258	✓		79807 RV2 501
261			
265			
266			
267			
268			
269			
270			
423			
638			
848			
1047			
1264			
7253			
8177			

28.2

Shift Report Date: 1-19-09

Day shift or Evening shift Performed by:

Tank #	Unloaded?	Loaded?	Contains:
208 ~~208~~		✓	W.W 79815 to Newpark
1264 ~~234~~		✓	WW 79810 to Newpark
267 ~~232~~		✓	W.W 79816 to Newpark
848 ~~237~~	✓		RV2 79793 501
266 255	✓		RV2 79794 501
1264 ~~258~~		✓	w/w 79822
267 ~~261~~		✓	w/w 79817
308 265		✓	w/w 79814
LT848 ~~266~~	✓		Feed Stock into RV2 79795 501
266 267	✓		RV2 79796 501
1264 268		✓	WW 79801 Newpark
267 269		✓	W.W 79818 Newpark
265 ~~270~~		✓	W.W 79819
208 ~~423~~		✓	W/W 79813
LT848 ~~638~~	✓		RV1 ~~79795~~ 79797
266 ~~848~~	✓		RV2 79798
1264 1047		✓	W-W
~~848 1264~~	✓		RV2 79792 ?? Why 2
266 7253			RV1 79808
8177			

79795
79800

Shift Report
Day shift or Evening shift

Date: 1-20.09
Performed by:

Tank #	Unloaded?	Loaded?	Contains:
Lt848 ~~208~~	✓		RV2, 501, 79839
269 ~~224~~		✓	W.W. newpark 79917
1047 232	✓		NAP caustic 79764 ok
208 237		✓	W.W newpark 79924 ~~79923~~
1264 255		✓	W.W newpark 79920
Lt638 258	✓		RV2 501 79834
126M 261		✓	W/W newpark 79921
LT1047 265		✓	W/W newpark ~~79926~~ 79927
Lt848 266	✓		RV2 501 79838
~~LT1047~~ 267			
208 ~~268~~		✓	W/W 79922
266 269		✓	light oils 79942 Rmtex
LT638 270	✓		RV2 79833 501
LT-848 423	✓		RV2 79836 501
Lt 638 638		✓	RV2 79832 501
848			
1047			
1264			
7253			
8177			

Shift Report Date:

Day shift or Evening shift Performed by:

Tank #	Unloaded?	Loaded?	Contains:
269 ~~258~~		✓	W.W. Newpark 79965
266 ~~224~~		✓	W.W Newpark 79960
265 ~~232~~		✓	W.W. Newpark 79964
208 ~~237~~		✓	W.W Newpark 79969
269 ~~255~~		✓	W/W Newpark 79966
266 ~~258~~		✓	W/W Newpark 79961
208 ~~261~~		✓	W/W Newpark 79968
~~265~~ ~~265~~		✓	W/W Newpark 79963
LT-848 ~~266~~	✓		501 RV2 79840
LT-638 267	✓		501 RV2 79844
LT-1047 ~~268~~	✓		MAP Carson RV1 79765
269 ~~260~~		✓	W/W Newpark 79967
270 ~~270~~	✓		RV1 Valero 79933
271 423	✓	✓	Valero 79935
~~271~~ 638		✓	
~~LT-~~ 848			
~~LT~~ 1047			
1264			
7253			
8177			

79933 270

79832

Shift Report Date: 1-23-09

Day shift or Evening shift Performed by:

Tank #	Unloaded?	Loaded?	Contains:
239 ~~208~~		✓	w/w newpark 80079
265 ~~224~~		✓	w/w newpark 80044
266 ~~232~~		✓	w/w newpark 80040
266 ~~237~~		✓	w/w newpark 80041
208 ~~255~~		✓	w/w newpark 80186
208 ~~258~~		✓	w/w newpark 80187
269 ~~261~~		✓	w/w newpark 80184
269 ~~265~~		✓	w/w newpark 80183
LT-1047 ~~266~~	✓		in to caustic tank 79906
LT-638 ~~267~~		✓	barge 79678
LT-848 ~~268~~		✓	barge 79681
LT-1047 ~~269~~		✓	barge 79679
269 ~~270~~		✓	w/w newpark 80182
208 ~~423~~		✓	w/w newpark 80185
208 638		✓	w/w frack tank 80287
848			
1047			
1264			
7253			
8177			

Shift Report Date: 1-27-09

Day shift or Evening shift Performed by:

Tank #	Unloaded?	Loaded?	Contains:
266 ~~208~~		✓	W.W. Newpark 80336
208 ~~224~~		✓	WW Newpark 80334
Lt 638 ~~252~~		✓	Boise Barge 80383
266 ~~237~~		✓	WW Newpark 80335
267 ~~255~~		✓	W.W Newpark 80374
267 258	✓		606 Kuntz 80380
261			
265			
266			
267			
268			
269			
270			
423			
638			
848			
1047			
1264			
7253			
8177			

Shift Report Date: 1-28-09

Day shift or Evening shift Performed by:

Tank #	Unloaded?	Loaded?	Contains:
80146 ~~298~~		✓	Boise
80426 ~~224~~		✓	WW Newpark
80208 ~~232~~		✓	Boise
80421 ~~237~~	✓		Kmtes 501 feed
80422 ~~255~~	✓		" "
80423 ~~258~~	✓		" "
261			
265			
266			
267			
268			
269			
270			
423			
638			
848			
1047			
1264			
7253			
8177			

Shift Report

Day shift or Evening shift

Date: 1-29-09

Performed by:

Tank #	Unloaded?	Loaded?	Contains:
~~208~~		~~✓~~	~~W/W~~
Lt 638 ~~224~~		✓	Boise Barge Deritter 80209
208 232		✓	W/W 80518 New Park
266 237		✓	W/W 80515 New Park
Lt 848 255		✓	Boise 80150
269 ~~258~~	✓		RV 1 501 feed 80497
269 261	✓		RV 1 501 feed 80501
267 265	✓		RV 1 501 80499
269 266	✓		RV 1 501 80506
267 267	✓		RV 1 501 80503
268			
269			
270			
423			
638			
848			
1047			
1264			
7253			
8177			

Shift Report
Day shift or Evening shift

Date: 1-30-09
Performed by:

Tank #	Unloaded?	Loaded?	Contains:
261 ~~208~~		✓	Barge Caustic 80141
4638 224		✓	" " 80155
232			
237			
255			
258			
261			
265			
266			
267			
268			
269			
270			
423			
638			
848			
1047			
1264			
7253			
8177			

Shift Report Date: 2/2/09

Day shift or Evening shift Performed by:

Tank #	Unloaded?	Loaded?	Contains:
208 [redacted]		√	W/W 80703
267 [redacted]		√	W/W 80705
208 [redacted]		√	W/W 80702
267 [redacted]		√	W/W 80700
270 [redacted]	√		20% Caustic 80680
258			
261			
265			
266			
267			
268			
269			
270			
423			
638			
848			
1047			
1264			
7253			
8177			

Shift Report
Day shift or Evening shift

Date: 2/3/09
Performed by:

Tank #	Unloaded?	Loaded?	Contains:
267 [redacted]		√	w/w 80764 Newpark
208 [redacted]		√	w/w 80767 Newpark
261 [redacted]		√	oil 80782
261 [redacted]		√	oil 80783
208 [redacted]		√	w/w 80766 Newpark
267 [redacted]		√	w/w 80763 Newpark
LT-848 [redacted]	√		Naphthenic - 80667
265			
266			
267			
268			
269			
270			
423			
638			
848			
1047			
1264			
7253			
8177			

Shift Report
Day shift or Evening shift

Date: 2/4/09
Performed by:

Tank #	Unloaded?	Loaded?	Contains:
208 [redacted]		✓	W/W Newpark 80909
LT-1047 [redacted]	✓		Naphthenic caustic 80668
[redacted]		✓	
237			
255			
258			
261			
265			
266			
267			
268			
269			
270			
423			
638			
848			
1047			
1264			
7253			
8177			

Shift Report Date: 02/05/09

Day shift or Evening shift Performed by:

Tank #	Unloaded?	Loaded?	Contains:
208 ~~223~~		✓	W/W Newark 80908
LT-848 224		✓	W/W Newark 80907
232			
237			
255			
258			
261			
265			
~~266~~			
267			
268			
269			
270			
423			
638			
848			
1047			
1264			
7253			
8177			

Shift Report Date: 02/12/09

Day shift or Evening shift Performed by:

Tank #	Unloaded?	Loaded?	Contains:
420 ~~268~~		✓	W/W newpark 8/318
258 ~~264~~		✓	W/W newpark 8/324
420 ~~232~~		✓	W/W newpark 8/319
237			
255			
258			
261			
265			
266			
267			
268			
269			
270			
423			
638			
848			
1047			
1264			
7253			
8177			

Shift Report
Day shift or Evening shift

Date: 02/09/09
Performed by:

Tank #	Unloaded?	Loaded?	Contains:
L-1047 ~~208~~		✓	w/w Newpark [redacted] 81093
269 ~~224~~	✓		Naphthenic 81058
L-1047 232		✓	w/w Newpark 81092
LT-423 ~~LT-208 237~~		✓	w/w Newpark 81090
420 255		✓	w/w NP 81319
2-12-09 258			
~~T9~~ ~~261~~	239 ✓		Caustic 1607 Kmtex 81377 into RV 2
265			
266			
267			
268			
269			
270			
423			
638			
848			
1047			
1264			
7253			
8177			

Shift Report Date:

Day shift or Evening shift Performed by:

Tank #	Unloaded?	Loaded?	Contains:
266 ~~208~~		✓	81680 W.W Newpark
258 ~~224~~		✓	81677 W.W. Newpark
266 232		✓	81684 W.W Newpark
258 237		✓	81678 W.W Newpark
255			
258			
261			
265			
266			
267			
268			
269			
270			
423			
638			
848			
1047			
1264			
7253			
8177			

Shift Report Date: 2-20-09

Day shift or Evening shift Performed by:

Tank #	Unloaded?	Loaded?	Contains:
266 ~~208~~		✓	ww. Newpark 81767
258 ~~224~~		✓	W.W Newpark 81762
268 232	✓		feed kmtex tank 601 81503
237		✓	W.W Newpark 81766
255			
258			
261			
265			
266			
267			
268			
269			
270			
423			
638			
848			
1047			
1264			
7253			
8177			

Shift Report
Day shift or Evening shift

Date: 02/23/09
Performed by:

Tank #	Unloaded?	Loaded?	Contains:
266 [redacted]		✓	W/W newpark 81840
LT-423 [redacted]		✓	w/w newpark 81818
420 [redacted]	✓		Naphthenic 81555
266 [redacted]		✓	w/w newpark 81884
LT-423 [redacted]		✓	w/w newpark 81819
LT-423 [redacted]		✓	w/w newpark 81817 (PL)
266 [redacted]		✓	w/w newpark 81884
LT-423 [redacted]		✓	w/w newpark 81817
258 [redacted]		✓	w/w newpark ? (PL) for 02/24/09
268 [redacted]	✓		Feedstock 81854 RV1
268 [redacted]	✓		Feedstock 81853 RV2
237 [redacted]		✓	with Wash
270			
423			
638			
848			
1047			
1264			
7253			
8177			

(237 268 Feed unloaded)

Shift Report
Day shift or Evening shift

Date: 02/24/09
Performed by:

Tank #	Unloaded?	Loaded?	Contains:
258		✓	w/w newpark 81894
266		✓	w/w newpark 81897
420	✓		Naphthenic 81556
258		✓	w/w newpark 81893 Preloaded
258		✓	w/w newpark 81895
237		✓	NASL
266		✓	w/w newpark 81898
8177	✓		Acid 81816
258		✓	w/w newpark 81896
267			
268			
269			
270			
423			
638			
848			
1047			
1264			
7253			
8177			

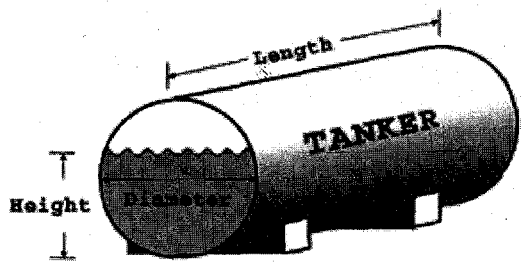
Shift Report
Day shift or Evening shift

Date: 2-26-09
Performed by:

Tank #	Unloaded?	Loaded?	Contains:
255 ~~208~~	✓		Feed Stock 81877 tank 174
255 224	✓		Feed stock 81861 tank 607
~~264~~ 258 232		✓	W.W 82057
258 237		✓	W.W 82058
1264 255		✓	W.W 82061
258 258		✓	W.W 82059
1264 261		✓	W.W. 82062
255 265	✓		Feed stock 81857 tank 607
255 266	✓		Feed stock 81866 tank 607
8177 267	✓		Acid from Phillips 82043
1264 268	✓		Feed stock 81871 tank 607
269			
270			
423			
638			
848			
1047			
1264			
7253			
8177			

handymath.com
Solutions For Technicians

Calculation of Height of Liquid in a Horizontal Cylindrical Container



Entered Values			Calculated Values	
Diameter of Cylinder (ft)	Length of Cylinder (ft)	Volume of Liquid in Cylinder (gal)	Height of Liquid in Cylinder (in)	Maximum Volum Cylinder (gal)
8	48	18000	95	18048.525193
8	48	17750	92	18048.525193
8	48	17500	89	18048.525193
8	48	17250	87	18048.525193
8	48	17000	86	18048.525193
8	48	16750	84	18048.525193
8	48	16500	82	18048.525193
8	48	16250	81	18048.525193
8	48	16000	80	18048.525193
8	48	15750	78	18048.525193
8	48	16500	82	18048.525193
8	48	16250	81	18048.525193
8	48	16000	80	18048.525193
8	48	15750	78	18048.525193
8	48	15500	77	18048.525193
8	48	15250	76	18048.525193
8	48	15000	74	18048.525193
8	48	14750	73	18048.525193
8	48	14500	72	18048.525193
8	48	14250	71	18048.525193
8	48	14000	70	18048.525193
8	48	13750	68	18048.525193
8	48	13500	67	18048.525193
8	48	13250	66	18048.525193
8	48	13000	65	18048.525193
8	48	12750	64	18048.525193
8	48	12500	63	18048.525193
8	48	12250	62	18048.525193
8	48	12000	61	18048.525193
8	48	11750	59	18048.525193
8	48	11500	58	18048.525193
8	48	11250	57	18048.525193

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8	48	11000	56	18048.525193
8	48	10750	55	18048.525193
8	48	10500	54	18048.525193
8	48	10250	53	18048.525193
8	48	10000	52	18048.525193
8	48	9750	51	18048.525193
8	48	9500	50	18048.525193
8	48	9250	49	18048.525193
8	48	9000	48	18048.525193
8	48	8750	47	18048.525193
8	48	8500	46	18048.525193
8	48	8250	45	18048.525193
8	48	8000	44	18048.525193
8	48	7750	43	18048.525193
8	48	7500	42	18048.525193
8	48	7250	41	18048.525193
8	48	7000	39	18048.525193
8	48	6750	38	18048.525193
8	48	6500	37	18048.525193
8	48	6250	36	18048.525193
8	48	6000	35	18048.525193
8	48	5750	34	18048.525193
8	48	5500	33	18048.525193
8	48	5250	32	18048.525193
8	48	5000	31	18048.525193
8	48	4750	30	18048.525193
8	48	4500	29	18048.525193
8	48	4250	27	18048.525193
8	48	4000	26	18048.525193
8	48	3750	25	18048.525193
8	48	3500	24	18048.525193
8	48	3250	23	18048.525193
8	48	3000	21	18048.525193
8	48	2750	20	18048.525193
8	48	2500	19	18048.525193
8	48	2250	18	18048.525193
8	48	2000	16	18048.525193
8	48	1750	15	18048.525193
8	48	1500	13	18048.525193
8	48	1250	12	18048.525193
8	48	1000	10	18048.525193
8	48	750	8	18048.525193
8	48	500	6	18048.525193
8	48	250	4	18048.525193

Note: If the height of the liquid is not calculated, then the liquid volume given is greater than the calculated maximum volu of the cylindrical container.

Back to Calculator

EPAPA008001239

y (Inches)	Volume (Gallons)	y (Inches)	Volume (Gallons)	y (Inches)	Volume (Gallons)
1	51	45	14463	89	34743
2	144	46	14910	90	35177
3	264	47	15360	91	35607
4	407	48	15812	92	36034
5	569	49	16267	93	36457
6	749	50	16723	94	36877
7	944	51	17181	95	37292
8	1153	52	17641	96	37704
9	1375	53	18103	97	38111
10	1609	54	18566	98	38514
11	1855	55	19030	99	38913
12	2112	56	19496	100	39307
13	2380	57	19963	101	39695
14	2657	58	20430	102	40079
15	2944	59	20899	103	40458
16	3239	60	21368	104	40830
17	3543	61	21838	105	41198
18	3856	62	22308	106	41559
19	4176	63	22779	107	41914
20	4503	64	23250	108	42262
21	4838	65	23721	109	42604
22	5180	66	24192	110	42939
23	5529	67	24663	111	43267
24	5884	68	25134	112	43587
25	6245	69	25605	113	43899
26	6612	70	26075	114	44204
27	6985	71	26544	115	44499
28	7364	72	27012	116	44786
29	7747	73	27480	117	45063
30	8136	74	27947	118	45330
31	8530	75	28412	119	45587
32	8928	76	28877	120	45833
33	9331	77	29340	121	46068
34	9739	78	29801	122	46290
35	10150	79	30261	123	46499
36	10566	80	30720	124	46694
37	10986	81	31176	125	46873
38	11409	82	31630	126	47035
39	11836	83	32082	127	47178
40	12266	84	32532	128	47299
41	12699	85	32980	129	47392
42	13136	86	33425	130	47443
43	13575	87	33867		
44	14018	88	34307		

CES Environmental Services, Inc.

4904 Griggs Ro
Houston TX 770
Tel. (713) 676-14
Fax. (713) 676-14

Material / Product Approval Letter

Date 5/7/2009

Dear **Ryke Anderson**

Thank you for choosing CES Environmental Services, Inc. for your material / product recycling needs. The following material has been approved at our facility in Houston, TX. If the material received does not conform to the profile, then rejection or additional charges may apply.

CES Profile # PA-3310

Expiration Date 5/7/2011

Producer: RW Anderson, Inc.
Address: P.O. Box 379
Sulpher, LA 70663

Material / Product Information

Name of Material / Product 91% Sulfuric Acid
Container Type:

Detailed Description of Process Generating or Producing the Material / Product:
From oil refinery alkylation unit

Color: dark brown - black **Odor:** acidic **pH:** 1-2
Physical State:

Incompatibilities: Highly reactive & capable of igniting finely divided combustible materials on contact. Extremely hazardous in contact with many materials, particularly carbides, chlorates, fulminates, nitrates, picrates, powdered metals and other combustible materials.

Safety Related Data/Special Handling:
PPE: Respiratory: A NIOSH certified full face air purifying respirator with a type 95 (R P) particulate filter in combination with an acid gas cartridge may be used under conditi where airborne concentrations are expected to exceed exposure limits.

Sulfidic Caustic Operator Check List

Start Up Check List

- [ ] Check and titrate NaSH- Can never get over spent; 87% max with pump working properly.
- [ ] Check flare scrubber and KO pot-Drain any liquids.
- [ ] Check flare flame-No smoke, flame not too big.
- [ ] Check KO pot water-70% on level gage and clean clear water when pump working properly.
- [ ] Check circulation pumps to see working properly on RV1.
- [ ] Check for an leaks or abnormalities on acid system.
- [ ] Check that all valves are in proper position on top of RV1.

Operational Check List

- [ ] Regulate pressure on RV1- Should be between 8-12 lbs.
- [ ] Check temperature on RV1-No more than 110 degrees.
- [ ] Check pressure on KO pot-No more than 8-12 lbs.
- [ ] Check temperature on KO pot-No more than 110 degrees.
- [ ] Check level gage on KO pot-Should stay steady @70%.
- [ ] Check pump on KO pot.
- [ ] Check sample of water to ensure it stays clean.
- [ ] Check pressure on top of NaSH tank-Should stay at 0.
- [ ] Check pump on NaSH tank for proper operations.
- [ ] Pull samples on NaSH tank throughout run so that it does not spend.
- [ ] Check acid system and pump for any leaks and drain water.
- [ ] Check flare KO pot for any liquid-Must drain if any found.
- [ ] Check flare scrubber for any liquid-Must drain if any found.
- [ ] Check samples periodically to ensure that too much acid isn't spent.
- [ ] Check all areas for excessive odor.
- [ ] Entire area must stay spill free.

Napthenic Caustic Processing Operator Position Responsibilities

1.) Driver brings feed into the unit via tank trailer. Operator spots trailer in a position to be unloaded.
2.) Sampling trailer. Operator wearing a full face respirator, safety harness attached to yo-yo to prevent falls from trailer while sampling. Using PVC gloves and a sludge judge, insert sludge judge into caustic pull out and drain caustic into sample jar and repeat until jar is full.
3.) Take the sample to the lab for analysis, operator must wait until the load is approved before unloading process begins.
4.) Operator will then hook hose to cam lock fitting located on the bottom of the trailer while wearing face shield, PVC gloves and.
5.) Operator will then line the valves in a manner in which he can pump from the truck of into the either NV-1 or NV-2.

Operating The Napthenic Unit

1.) Operator will line up the correct valves and begin to circulate NV-1.
2.) Operator will the insure he has a sufficient amount of acid to begin processing if there is not, the operator must transfer acid from the main acid tank to the napthenic area acid tank.
3.) Operator will then begin to inject 20 gals the acid in line through the acid line.
4.) Operator will then pull a sample from the sample port on the circulation line. PPE while sampling will be PVC glove, face shield, and safety glasses.
5.) Once the operator has pulled a sample he is to take the sample to the lab and run a pH on the water. The target Ph is a 3.
6.) Once the target pH is met the operator will then send the water to the storage tank that is instructed by the Plan Manager.

separator (aka bilge tank). This is in preparation for running the phenolic caustic in tank 606 at KMTEX. We need to run all this material at once because the product needs to be segregated (approximately 60,000 gallons of product will be produced) and the water will need special handling. Jay, I need for you to do a trial run in the lab and then add bleach and peroxide to the water so I can test it ahead of time.

Pete,
We currently have about 35,000 gallons of Naphthenic acid that is ready for sale. Also, we are going to do a production run that will produce about 60,000 gallons of cresylic acid that needs to be sold. Do you have another update?

Thanks,
Matt

~~WW = MT (Waste Water)~~

~~1000~~
~~1003~~ FULL of W.W (Waste Water)

~~OWS 60%~~ of Recovered oil & WATER APX 12,000 GAL
~~NaOH~~
~~CAUSTIC 50/50~~ 5200 GALLONS

RV1 35,000 GAL. W.W (Waste Water)

RV2 32,000 of Feed STOCK (SULFIOIC CAUSTIC)

NV1 18,000 W.W

NV2 10,000 Feed STOCK (NAPTHANIC CAUSTIC)

1008 10,000 NAP Acid (Naphthenic)

1007 20,000 NAP Acid

MUD TANK 10,000 Kinder morgen Feed

WASH Tk. Phenolic 3500

K.O. Tk 1000 gal - Water

- Hazard assessment by Sudhir Desai and identification of responsive measures and proper PPE during all phases of the operation at the Port Arthur Plant; focus on all processing, sampling and lab procedures, as well as operations on the barge
    - Assessment will also include determination of the necessity of pressure relief valves on the vessels and H2S monitor maintenance, readings and documentation
    - **Due: May 15, 2009**
- Provide training to employees based upon Sudhir Desai's findings and document such training
    - **Due: May 20, 2009**
- Provide Sudhir Desai's area and personal monitoring test results to OSHA
    - **Due: May 14, 2009**
- Provide OSHA an explanation of the knock-out tank and "scrubber" system to clarify the safety of such system
    - **Due: May 14, 2009**
- Ensure sufficient number breathing air equipment for on-site storage
    - **Due: May 15, 2009**
- Continue attempts to contact Coast Guard regarding resuming operation on the barge (multiple attempts to contact already)
    - **Due: Ongoing**
- Provide OSHA copies of confined space permits for prior confined space entry at the Port Arthur plant
    - **Due: May 22, 2009**
- Label all confined spaces as "Confined Space / Permit Required"
    - **Due: May 22, 2009**
- Ensure all chemical containers are properly labeled
    - **Due: May 22, 2009**
- Provide site specific training regarding personal H2S monitors and facility operations with new policies, including the following:
    - Training on evacuation to collection point in event of H2S alarm; designate someone to be responsible for accounting for all employees at the collection point; establish procedure for re-entering facility following alarm; rehearse evacuation in response to alarms sounding.
    - Utilizing H2S sniffer vs. personal H2S monitor for sampling head space in vessels
    - Training on rescue procedures
    - **Due: May 20, 2009**
- Install barricade chains in warehouse alongside rail tracks (south wall)
    - **Due: May 22, 2009**
- Install / provide fall protection
    - **Due: May 27, 2009**
- Enclose wiring on H2S alarm system panel
    - **Due: May 20, 2009**

- Regular maintenance programs:
  - Establish program to test and monitor wall thicknesses of piping and vessels for corrosion
  - Schedule regular maintenance on the H2S and fire alarm systems
  - **Due: May 22, 2009**
- Install eye wash near bleach container
  - **Due: May 22, 2009**
- Review training records of all Port Arthur employees to ensure proper training
  - **Due: May 15, 2009**
- Update logistics of rescue protocol relating to confined space work
  - **Due: May 22, 2009**
- All new training information included in written materials
  - **Due: May 15, 2009**
- Relocate flammable drums in warehouse to locations equipped to handle potential fires
  - **Due: May 15, 2009**
- Ensure proper installation of propane tank
  - **Due: May 22, 2009**

192.168. 20.65

Material Safety Data Sheet

HYDROFLUORIC ACID, AQUEOUS (70%)

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Hydrofluoric Acid, Aqueous (70%)

OTHER/GENERIC NAMES: Aqueous HF, Hydrofluoric Acid Solution, 70% HF, HF Acid

PRODUCT USE: Metal Pickling, Glass Etching, Chemical Derivatives

MANUFACTURER: Honeywell International
Industrial Products
101 Columbia Road
Box 1053
Morristown, New Jersey 07962-1053

FOR MORE INFORMATION CALL:
(Monday-Friday, 8:00am-4:30pm EST)
HF Technical Service Department
800-622-5002
Or visit the Honeywell HF website:
http://www.HFacid.com

IN CASE OF EMERGENCY CALL:
(24 Hours/Day, 7 Days/Week)
800-707-4555 or 602-365-4980
For Transportation Emergencies:
800-424-9300 (CHEMTREC for US)
613-996-6666 (CANUTEC for Canada)

2. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME	CAS NUMBER	WEIGHT %
Hydrofluoric Acid	7664-39-3	70
Water	7732-18-5	30

Trace impurities and additional material names not listed above may also appear in the Regulatory Information Section 15 towards the end of the MSDS. These materials may be listed for local "Right-To-Know" compliance and for other reasons.

3. HAZARDS IDENTIFICATION

EMERGENCY **OVERVIEW: Clear, colorless, corrosive fuming liquid with an extremely acrid odor. Forms dense white vapor clouds if released. Both liquid and vapor can cause severe burns to all parts of the body. Specialized medical treatment is required for all exposures.**

EPAPA008001248

MATERIAL SAFETY DATA SHEET
Hydrofluoric Acid, Aqueous (70%)

POTENTIAL HEALTH HAZARDS

SKIN: Both liquid and vapor can cause severe burns, which may not be immediately painful or visible. HF will penetrate skin and attack underlying tissues. Large or multiple burns totaling over 25 square inches of body surface area may also cause hypocalcemia (depletion of calcium in the body) and other toxic effects which may be fatal. Prolonged contact with very dilute HF solutions will cause burns.

EYES: Both liquid and vapor can cause irritation or corneal burns.

INHALATION: **Mild exposure**: Can irritate nose, throat and respiratory system. Onset of symptoms may be delayed for several hours.

Severe exposure: Can cause nose and throat burns, lung inflammation and pulmonary edema (fluid in the lungs). Also results in other toxic effects including hypocalcemia (depletion of calcium in the body) which if not properly treated can result in death.

INGESTION: Can cause severe mouth, throat and stomach burns and may be fatal if swallowed. Even with small amounts of dilute solutions, profound and possibly fatal hypocalcemia (depletion of calcium in body) and systematic toxicity is likely to occur unless medical treatment is promptly initiated

DELAYED EFFECTS: The effects of contact with dilute solutions of hydrofluoric acid or its vapors may be delayed. The potential delay in clinical signs or symptoms for dilute solutions is given below. Symptoms might include pain, redness of the skin and possible tissue destruction.

HF Concentration	Delay in Symptoms
>50%	Immediately Apparent
20%-50%	1-8 hours
0%-20%	Up to 24 hours

Can also cause bone and joint changes in humans (Fluorosis).

Carcinogenicity: Hydrofluoric Acid is not listed by NTP, IARC, OSHA, US EPA, ACGIH or Health Canada as a carcinogen.

4. FIRST AID MEASURES

SKIN: Remove the victim from the contaminated area and immediately wash the burned area with plenty of water for a minimum of 15 minutes. Limit washing to 5 minutes if treatment specific for HF exposure is available. Remove all contaminated clothing while washing continuously. After thorough washing for at least 5 minutes, the burned area should be immersed in a solution of 0.13% iced aqueous Zephiran® Chloride until pain is relieved. As an alternate first aid treatment, 2.5% calcium gluconate gel may be continuously massaged into the burned area until the pain is relieved. For larger burns or burns treated with calcium gluconate gel (in which pain is present longer than 30 minutes), a physician should inject 5% aqueous calcium gluconate beneath, around and into the burned area. Use of local anesthetics is not recommended, as reduction in pain is an indicator of effectiveness of treatment.

EPAPA008001249

MATERIAL SAFETY DATA SHEET
Hydrofluoric Acid, Aqueous (70%)

EYES: Irrigate eyes for at least 15 minutes with copious quantities of water, keeping eyelids apart and away from eyeballs during irrigation. Get competent medical attention immediately, preferably an eye specialist. If a physician is not immediately available, apply one or two drops of 0.5% tetracaine hydrochloride solution, or other aqueous topical ophthalmic anesthetic and continue irrigation. Do not use the solution described for skin treatment. Use no oils or greases unless instructed to do so by a physician. Irrigate with 1% calcium gluconate in normal saline for 1 to 2 hours to prevent or lessen corneal damage.

INHALATION: Move to fresh air. Keep the victim lying down, quiet and warm. Get competent medical attention immediately. If breathing has stopped, start artificial respiration at once. An authorized person should administer oxygen to a victim who is having difficulty breathing, until the victim is able to breathe easily by himself. Calcium Gluconate, 2.5% in normal saline may be given by nebulizer with oxygen. Do not give stimulants unless instructed to do so by a physician. Victim should be examined by a physician and held under observation for at least 24 hours.

INGESTION: Drink large amounts of water to dilute. Do not induce vomiting. Several glasses of milk or several ounces of milk of magnesia may be given for their soothing effect. Take victim to a doctor.

ADVICE TO PHYSICIAN: For burns of large skin areas (greater than 25 square inches), for ingestion and for significant inhalation exposure, severe systemic effects may occur. Monitor and correct for hypocalcemia, cardiac arrhythmias, hypomagnesemia and hyperkalemia. In come cases hemodialysis may be indicated. For certain burns, especially of the digits, use of intra-arterial calcium gluconate may be indicated. For inhalation exposures, treat as chemical pneumonia. Monitor for hypocalcemia. 2.5% calcium gluconate in normal saline by nebulizer or by IPPB with 100% oxygen may decrease pulmonary damage. Bronchodilators may also be administered.
A booklet titled "Recommended Medical Treatment for Hydrofluoric Acid Exposure" is available from the Honeywell HF website: http://www.HFacid.com

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT:	Not flammable
FLASH POINT METHOD:	Closed cup
AUTOIGNITION TEMPERATURE:	Not applicable
UPPER FLAME LIMIT (volume % in air):	Not applicable
LOWER FLAME LIMIT (volume % in air):	Not applicable
FLAME PROPAGATION RATE (solids):	Not applicable
OSHA FLAMMABILITY CLASS:	Not applicable

EXTINGUISHING MEDIA:
Use water or suitable agent for fires adjacent to non-leaking tanks or containers of HF. Do not use solid water streams near ruptured tanks or spills of HF. Acid reacts with water and can splatter acid onto personnel.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
Reaction with certain metals generates flammable and potentially explosive hydrogen gas. Considerable heat is produced when contacted with many substances. Heat increases pressure and may explode container. Will react violently with water.

SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS:
Wear self-contained breathing apparatus approved by NIOSH and full chemical protective clothing. Use water spray to keep containers cool.

EPAPA008001250

MATERIAL SAFETY DATA SHEET
Hydrofluoric Acid, Aqueous (70%)

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE: (Always wear recommended personal protective equipment.)
Good ventilation is necessary. Discharge will ordinarily be a vapor or a liquid that gives off fumes of HF gas. Those treating spills or repairing leaks must use full protective equipment. Take actions to minimize environmental impact. Try to contain spillage and avoid drainage to areas which cannot be treated. Rapid dilution of the spill with water to <50% will reduce the amount of fumes given off. Carefully neutralize the dilute liquid with lime slurry, soda ash, limestone, caustic soda or other alkaline material. (See Sections 10 and 13 for more information.)

Spills and releases may have to be reported to Federal and/or local authorities. See Section 15 regarding reporting requirements.

7. HANDLING AND STORAGE

NORMAL HANDLING: (Always wear recommended personal protective equipment.)
Do not breathe vapor or mist. Use only with adequate ventilation. Avoid all contact with skin, eyes and clothing. Use dilute solutions. Do not add water to acid.

STORAGE RECOMMENDATIONS:
Store in approved containers only. Store in cool, well-ventilated area. Flammable hydrogen gas can be generated in metal storage containers. Diking of storage tanks is recommended. Carbon steel in HF service may be subject to discriminate hydrogen blistering and possibly other hydrogen related damage and should, therefore, be monitored, inspected and repaired if needed. Non-destructive tank thickness testing (NDT) and other techniques should be utilized for periodic checks of tank wall thickness and to assure equipment integrity.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:
Sufficient to control vapor and acid mists below permissible TLV levels. Packaging and unloading areas and open process equipment may require mechanical exhaust systems.

PERSONAL PROTECTIVE EQUIPMENT

SKIN PROTECTION:
For product use, wear hydrofluoric acid-resistant jacket, trousers, boots and gauntlet gloves. For protection, use air-supplied totally encapsulating HF resistant protective suit.

EYE PROTECTION:
Wear hard hat, chemical safety goggles (plastic lenses), and full face plastic shield. For protection, use air-supplied hydrofluoric acid resistant hood.

RESPIRATORY PROTECTION:
Must use a respirator approved by NIOSH for HF gas or mists, as applicable. Some operations require a NIOSH-approved, self-contained breathing apparatus or air supplied

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MATERIAL SAFETY DATA SHEET
Hydrofluoric Acid, Aqueous (70%)

ADDITIONAL RECOMMENDATIONS:
Eyewash and quick-drench shower facilities, protected from freezing, should be available where HF is stored or handled.

EXPOSURE GUIDELINES **(Guidelines exist for the following ingredients)**

INGREDIENT NAME	ACGIH TLV	OSHA PEL	OTHER LIMIT
Hydrofluoric Acid	3 ppm – CEILING	3 ppm (TWA)	3 mg(F)/g creatinine in urine pre-shift 10 mg(F)/g creatinine post-shift***

OSHA STEL	NIOSH IDLH
6 ppm (15 min.)	30 ppm (30 mins)

AIHA Emergency Response Planning Guideline

ERPG-1	ERPG-2	ERPG-3
2 ppm (60 mins)	20 ppm (60 mins)	50 ppm (60 mins)
2 ppm(10 mins)	50 ppm (10 mins)	170 ppm (10 mins)

*** Biological Exposure Index

OTHER EXPOSURE LIMITS FOR POTENTIAL DECOMPOSITION PRODUCTS: None

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Colorless liquid, fumes in air
PHYSICAL STATE: Liquid
MOLECULAR WEIGHT: 20.01 (HF)
CHEMICAL FORMULA: 70% HF in water by weight
ODOR: Sharp pungent odor
SPECIFIC GRAVITY: (Water = 1.0) 1.25 at 39°F (3.9°C) 1.225 at 70°F, (21.1°C)
SOLUBILITY IN WATER: (Weight %) 100% by weight
pH: Not applicable
BOILING POINT: 151°F (66.1°C)
MELTING POINT: -95.8°F (-71.0°C)
VAPOR PRESSURE: 110 mm Hg at 70°F (21.1°C)
VAPOR DENSITY (Air = 1.0): 2.21 at 70°F, (21.1°C) 1.76 at 80°F, (26.7°C)
EVAPORATION RATE: Not applicable
% VOLATILES: 100%
IONIZATION POTENTIAL: 15.98 eV
FLASH POINT: Not flammable.
(Flammability and additional flammability data are found in section 5.)

10. STABILITY AND REACTIVITY

NORMALLY STABLE? (CONDITIONS TO AVOID): Stable under normal conditions.

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MATERIAL SAFETY DATA SHEET
Hydrofluoric Acid, Aqueous (70%)

INCOMPATIBILITIES:
Glass, concrete and other silicon bearing materials: yield silicon tetrafluoride gas. Pressure buildup from this process has been known to rupture glass containers. Carbonates, sulfides and cyanides: yield toxic gases: carbon dioxide, hydrogen sulfide and hydrogen cyanide. Alkalis, some oxides: cause strong violent exothermic reactions. Common metals: yield hydrogen gas, a fire and explosive reactive hazard. Corrosive to many materials including leather, natural rubber and many organics. Considerable heat is evolved and violent reaction can occur when water is added to HF.

HAZARDOUS DECOMPOSITION PRODUCTS:
Not applicable. Boils away as hydrogen fluoride gas and water.

HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL INFORMATION

IMMEDIATE (ACUTE) EFFECTS:

Inhalation LC_{50} (Rat)	=	5,100 ppm/5 min
LC_{50} (Rat)	=	1,300 ppm/60 min
LC_{50} (Mouse)	=	6,247 ppm/5 min

Skin: Application of HF was corrosive to rabbit skin with 1hour exposure, but not with 1minute exposure.

DELAYED (SUBACUTE AND CHRONIC) EFFECTS:
Prolonged exposure can cause bone and joint changes in humans. (Fluorosis – Increased bone density and mottled enamel)

OTHER DATA: None

12. ECOLOGICAL INFORMATION

Aquatic toxicity: 660 ppm/*/fish/lethal/fresh water. (*time period not specified).

13. DISPOSAL CONSIDERATIONS

RCRA

Is the unused product a RCRA hazardous waste if discarded? Yes
If yes, the RCRA number is: U134 (hydrofluoric acid) and D002 (Corrosive)

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MATERIAL SAFETY DATA SHEET
Hydrofluoric Acid, Aqueous (70%)

OTHER DISP[illegible] CONSIDERATIONS: As waste disposal methods may vary, contact the supplier for specific recom[illegible]ions. Treat small amounts by adding to an excess of water and neutralize with a lime slurry, soda ash, limestone, [illegible] soda or other alkali. Add to water and neutralize cautiously as reaction is immediate and can be violent. Consi[illegible] amounts of harmful vapors may be released. Good ventilation is required. Dispose of residue (or slurry) by rem[illegible] an approved chemical waste landfill or by an approved waste contractor.

The informatio[illegible]ered here is for the product as shipped. Use and/or alterations to the product such as mixing with other material [illegible] significantly change the characteristics of the material and alter the RCRA classification and the proper disposa[illegible].

14. TRANS[illegible] INFORMATION

PROPER DO[illegible]PPING DESCRIPTION:
(FOR QUAN[illegible] OF >143 LBS "AS IS" IN A SINGLE CONTAINER)
RQ H[illegible]oric Acid, *with more than 60% strength*, 8, UN1790, PG I, (6.1)

PLACARDS [illegible]RED:
Prim[illegible] 8 [illegible]rrosive
Subs[illegible] Class 6 [illegible] Poison (optional)

EMERGENC[illegible]PONSE GUIDEBOOK (2000 EDITION): Guide No. 157

For additional [illegible]tion on shipping regulations affecting this material, contact the information number found in Section 1.

15. REGUL[illegible]RY INFORMATION

TOXIC SUBS[illegible]S CONTROL ACT (TSCA)
TSCA INV[illegible]RY STATUS: Hydrofluoric Acid, Aqueous is listed.

OTHER T[illegible]SSUES: None

SARA TITLE [illegible]RCLA:
RQs a[illegible] TP[illegible]
"Report[illegible]ble Q[illegible] [illegible] and/or "Threshold Planning Quantities" (TPQs) exist for the following ingredients.

INGREDI[illegible] NAME	SARA/CERCLA RQ (lbs)	SARA EHS TPQ (lbs)
Hydrofluor[illegible]	100 as 100% HF	100 as 100% HF
	(Equal to 143 lbs. as 70% HF)	

Spills or releas[illegible] resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Resp[illegible] Center [(80[illegible]) 424-8802] and to your Local Emergency Planning Committee.
SECTION [illegible]HAZARD CLASS: Immediate. Delayed
SARA 313 [illegible]IC CHEMICALS:

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MATERIAL SAFETY DATA SHEET
Hydrofluoric Acid, Aqueous (70%)

The follow ngredients are SARA 313 "Toxic Chemicals". CAS numbers and weight percents are found in Section

INGREDI NAME	COMMENT
Hydrofluo cid	None

STATE RIGH O-KNOW

In addition ingredients found in Section 2, the following are listed for state right-to-know purposes.

INGREDI NAME	WEIGHT %	COMMENT
No ingredi in this section		

ADDITIONAL GULATORY INFORMATION:

Storag in process use greater than the specified threshold quantity of 1000 lbs. is subject to EPA Part 68, Section 112(r)7 Accidental Release Prevention Requirements: Risk Management Programs.

WHMIS CLA ICATION (CANADA):

Class ivision E, Subdivision A and
Class
This p has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the inform required by the CPR.

FOREIGN IN TORY STATUS:

Canad DSL (Domestic Substances List)
EINE ropean Inventory of Existing Chemical Substances) (EINECS #:231-634-8)

16. OTH RMATION

CURRENT IS DATE: January, 2004
PREVIOUS IS DATE: January, 2003

CHANGES M DS FROM PREVIOUS ISSUE DATE ARE DUE TO THE FOLLOWING:

Minor word ification made in Sections 1, 8, 14, 15.

OTHER INF ATION: National Fire Prevention Association (NFPA) Rating
Health 4, Flammability 0, Reactivity 1, Special Instruction – None

EPAPA008001255

Standard Operating Procedure

THINK... USE GOOD JUDGMENT	Port Arthur Chemical & Environmental Services, LLC.	YOUR ATTITUDE COUNTS
Date Issued: 03/12/2009	DEPARTMENT(S): -Operations -Processing -Transportation -Maintenance and Field Services -Sales, Finance, and Administration	Revised Date: 04/09/2009
SOP Number: 09-004	SOP Title: Flow of Essential Operating Paperwork	SOP Description: Defines the flow of essential operating paperwork such as Transportation Work Tickets, Manifests, Bill Of Ladings, etc. from origination to the beginning of the Billing Cycle.

1 Creation of Essential Operating Paperwork

Essential operating paperwork is initially created by the **Customer Service and Inside Sales Representatives**, the **Logistics Supervisor** or the **Administrative Assistants-General**. The only exception is jobs where **Customers** arrive without notice for routine jobs.

Essential operating paperwork is collectively items such as:

- Uniform Hazardous Waste Manifests
- Job Information Profiles
- Transportation Work Tickets
- Bill Of Ladings for Products Sold
- Bill Of Ladings for Products Purchased
- Scale Tickets*
- Non-Bulk Container Labels
- Roll-Off or Tote Container-Level 1 Inspection Forms
- Out of State Mileage Logs
- Trailer Inspection Forms
- Driver's Vehicle Inspection Reports
- Driver's Daily Logs
- Inbound Wastewater Load Reports
- Outbound Wastewater Tank Reports
- Outbound Load Reports
- Inbound Load Reports
- Declaration of Inspection (DOI)**

*Drivers only give one (1) copy of the Scale Ticket to requesting Customers.
**DOIs are required if loading off Barges.

2 Origination and Routing Essential Operating Paperwork

After initial essential operating paperwork is printed, the **Logistics Supervisor** or the **Administrative Assistants-General** will then package the paperwork and put the bundled paperwork in the Inbox Titled **Driver's Next Day Paperwork** located in the **Main Office**. The bundled paperwork will be placed in individual Manila Folders with each **Driver's** Name on the front in bold letters.

Drivers shall pick-up their essential operating paperwork from the Inbox Titled **Driver's Next Day Paperwork**. All essential operating paperwork in the **Driver's Manila Folders** must be fully completed.

Note: For any loads leaving **Port Arthur Chemical & Environmental Services, LLC. (PACES)** that require a signature from the **Laboratory Technicians**, the **Driver** must get the **Laboratory Technicians** signature prior to leaving. In the event the **Laboratory Technicians** are not available, then the **Driver** will notify the **Logistics Supervisor** for further instructions.

Jobs concerning **PACES** Products sold to "Buyers" (not transported by **PACES**), **PACES** Wastes (not transported by **PACES**), and **Customer** Waste Shipments bound for **PACES**, but subcontracted to **Third Party Transporters**, the **Customer Service and Inside Sales Representatives**, the **Logistics Supervisor** or the **Administrative Assistants-General** will print and give the essential operating paperwork directly to the **Laboratory Technicians**. The **Laboratory Technicians** shall immediately put this paperwork in an Inbox Titled **Subcontracted Transportation** located in the **Laboratory**. For all the above listed items (where **PACES** is not the "Transporter"), the **Customer Service and Inside Sales Representatives**, the **Logistics Supervisor** or the **Administrative Assistants-General** are required to print a Manifest or a Bill Of Lading as well as a complete Job Information Profile.

Jobs that require **PACES** to supply the **Customer** with pre-printed Manifest(s) or Bill Of Lading(s), the **Customer Service and Inside Sales Representative** will complete the following:

1. Create the Job Number(s).
2. Leave the date blank and the job as new.
3. Print the Manifest(s) or the Bill Of Lading(s).

Note: If the **Customer Service and Inside Sales Representative** is not able to print the Manifest(s) or the Bill Of Lading(s), then the **Customer Service and Inside Sales Representative** will give the appropriate department who will be printing the Manifest(s) or the Bill Of Lading(s) the Job Number(s) to print out.

For completed loads picked-up at a **Customer** and dropped at an off-site Facility, all essential operating paperwork should be turned in at the **Main Office** as instructed in 5) hereinafter. procedures for loads received at **PACES** or shipped from **PACES** are discussed in 3) and 4) hereinafter.

3 Receiving Loads at PACES

The first thing that must be done is that all **Drivers** must sign the Driver Sign In Sheet located on the **Shared Drive** within the **CES and PACES Forms and Logos Folder** and placed in the **Driver Sign In Binder** just outside the **Laboratory**.

Next, for loads Inbound for **PACES, PACES Drivers** and **Subcontracted Drivers** should present all Manifests or Bill Of Ladings and associated Scale Tickets to the **Laboratory Technicians** (including Manifests and Bill Of Ladings destined for other Facilities not yet delivered or "In-Transit"). The **Driver** will place the Transportation Work Ticket in their Manila Folder to be placed in the Inbox Titled **Completed Driver's Paperwork** located in the **Main Office**. The **Laboratory Technicians** must immediately write the Trailer Number at the top of each Manifest or Bill Of Lading.

Note: For **Subcontracted Drivers** who arrive at **PACES** with their Bill Of Lading, the **Laboratory Technicians** will create a Job Number for that job. However, if the **Customer Service and Inside Sales Representative** is aware the load is Inbound for **PACES** then the **Customer Service and Inside Sales Representative** will enter in the job and assign the Job Number.

Note: For Manifests only, the **Laboratory Technicians** will write the PACES Sample ID # (which is the Job Number) and the Batch ID in **Section 14** of the Manifest.

Next, concerning loads Inbound for **PACES**, the **Laboratory Technicians** will immediately place the paperwork in the Inbox Titled **Un-Received Inbound Paperwork** located in the **Laboratory**. Bill Of Ladings and associated Scale Tickets will stay in this Inbox until a sample has been taken, the loads analyzed and properly documented, and treatment/handling determinations have been made. The **Driver** will place the Transportation Work Ticket in their Manila Folder to be placed in the Inbox Titled **Completed Driver's Paperwork**. Once the loads are ready to be officially received and processed, the **Laboratory Technicians** will sign and/or keep all copies except the "Transporter Copy" for **Outside Transporters**. The "Outside Transporter's Copy" should be either given directly back to the **Outside Transporter** or placed in the Inbox Titled **Outside Driver Manifests or Bill Of Ladings** located in the **Laboratory**. For **PACES Drivers**, the "Transporters Copy" shall be left attached.

Bill Of Ladings and associated Scale Tickets brought in by **PACES Drivers** after hours or when no **Laboratory Technician** is working should be placed in the Inbox Titled **After Hours Manifests or Bill Of Ladings** located in the **Laboratory**. The **Driver** will place the Transportation Work Ticket in their Manila Folder to be placed in the Inbox Titled **Completed Driver's Paperwork**.

Certain loads will arrive at **PACES** and cannot be officially received for some of the following reasons:

1. The load does not meet specifications (as spelled out in the **PACES** Profile).

2. The load requires further Analysis and/or QC by the **Laboratory Technicians** to determine if **PACES** can legally and technically or physically treat the load.

3. The load must be held for a period of time and may be processed at a later date.

In such cases, the original Bill Of Lading and associated Scale Ticket will be temporarily placed in the Inbox Titled **Received Loads In Processing (Copies Only) and Un-Received Loads Pending Additional Analysis (Originals)** located in the **Laboratory**. Once a determination has been made, the load will either be rejected or received as normal. The **Driver** will place the Transportation Work Ticket in their Manila Folder to be placed in the Inbox Titled **Completed Driver's Paperwork** for the **Logistics Supervisor** or the **Administrative Assistants-General** to review.

For all other Manifests and Bill Of Ladings to be officially received by **PACES**, the **Laboratory Technicians** will place the "Generator's Initial Copy" of the Manifest in the Inbox Titled **Paperwork For Office** located in the **Laboratory**. If a Certificate of Analysis (COA) was accompanying the Manifest then the COA will be stapled to the Manifest. The "Receiving Facility Copy" of the Bill Of Lading along with a copy of the Scale Ticket will be stapled together and filed by month in the File Cabinet Titled **Bill Of Ladings and Scale Tickets For Inbound Loads** located next to the **Laboratory Technician's Desk**. All other remaining copies of the Bill Of Lading and Scale Ticket will be paper clipped together and placed in Inbox Titled **Paperwork For Office**.

For loads that have been sampled, Manifests/Bill Of Ladings validated, QC run, officially accepted, and are ready to unloaded, but will be unloaded at a later time, the remaining paperwork shall be place in the Inbox Titled **Received Loads On-The-Line and Ready To Unload (Originals)** located in the **Laboratory**. After such loads are unloaded, the remaining paperwork shall be placed in the Inbox Titled **Paperwork For Office**.

For all incoming Products (including Caustic Loads) and all off-spec Wastes/Materials, the **Laboratory Technicians** will complete an Inbound Load Report in accordance with the "Process Facility Information" listed in the Profile in the **CES/PACES Access Database**. The "Receiving Facility Copy" along with a copy of the Scale Ticket will be placed in the File Cabinet Titled **Bill Of Ladings and Scale Tickets For Inbound Loads**. The remaining copies will be paper clipped to the Manifests and Bill Of Ladings and placed in the Inbox Titled **Paperwork For Office**.

4 Shipment of Loads of Waste and Product from PACES

For all Products and Wastes shipped from **PACES**, the **Logistics Supervisor** will put the essential operating paperwork in the **Driver's Manila Folder** to be placed in the Inbox Titled **Driver's Next Day Paperwork** for loads leaving **PACES** the following day. It is the responsibility of the **Laboratory Technicians** to be sure the appropriate Trailers are unloaded, cleaned or loaded and that samples are pulled and QC'd in a timely manner so the loads may leave **PACES** as scheduled.

The **Laboratory Technicians** should contact the **Vice President of Operations and Maintenance** if a problem arises such that the load will not be ready to ship. Otherwise, the

Laboratory Technicians will sign as the **Shipper** (Bill Of Lading) or the **Generator** (Manifest), indicating to the **Driver** that the load is ready to ship. UNDER NO CIRCUMSTANCES should a **Driver** leave **PACES** without the paperwork signed.

Note: All Outbound Sodium Hydrosulfide (NaSH) and Wastewater Loads are required to have a COA. The **Laboratory Technicians** will make three (3) copies of the COA. The **Driver** will give one (1) copy to the **Customer**, the **Driver** will leave one (1) copy in the **Driver's Manila Folder** with the essential operating paperwork, and the **Laboratory Technicians** will staple the other copy to the "Generator's Initial Copy" of the Manifest.

For all Products shipped (and Wastes if required) from **PACES**, the **Laboratory Technicians** will complete an Outbound Load Report in accordance with the "Process Facility Information" listed in the Profile in the **CES/PACES Access Database**. Once complete, this form and all copies should be placed in the Inbox Titled **Completed Outbound Load Reports (Ready to Ship)** located in the **Laboratory**. The form should remain in this Inbox until the time of shipment.

Concerning loads that are picked up at **PACES** (Waste or Product) by **Subcontracted/Third Party Drivers** (as discussed earlier in this Standard Operating Procedure (SOP)), the **Customer Service and Inside Sales Representatives**, the **Logistics Supervisor** or the **Administrative Assistants-General** should print all essential operating paperwork and give them to the **Laboratory Technicians** to be placed in the Inbox Titled **Completed Outbound Load Reports (Ready to Ship)** (as discussed earlier in this SOP).

Upon arrival of the **PACES Driver** or **Third Party Driver**, the **Laboratory Technicians** must do the following:

1. For Waste Loads, sign the Manifest and keep the appropriate designated "Facility Copy of Manifests." This copy should be placed in the Inbox Titled **Paperwork For Office**. Give the remaining copies to the **Driver**.

   Note: In this regard, all **Drivers** (including **PACES Drivers**) will treat the **Laboratory** as if they were making a pick-up at any other **Customer**.

2. For Product/Material Loads and/or Waste Loads requiring an Outbound Load Report, remove the Outbound Load Report from the Inbox Titled **Completed Outbound Load Reports (Ready to Ship)**, sign the Outbound Load Report and detach the "Generator's Copy," sign the Manifest or Bill Of Lading and remove the designated "Generator's Initial Copy" and paperclip it to the Outbound Load Report and place the bundle in the Inbox Titled **Paperwork For Office**. Paperclip all other copies of the Inbound Load Report and give to the **PACES Drivers** or **Third Party Drivers**.

Paperwork from the **Laboratory** to the **Main Office**:

1. Before leaving for the day the **Laboratory Technicians** will remove all paperwork from the Inbox Titled **Paperwork For Office** and carry it to the **Main Office**. The **Laboratory Technicians** shall place the balance of this paperwork in the Inbox Titled **Paperwork From Laboratory** located in the **Main Office**.

2. Every morning, the **Administrative Assistants-General** will pull the **Driver's Manila Folders** from the Inbox Titled **Completed Driver's Paperwork** and the paperwork from the Inbox Titled **Paperwork From Laboratory** to sort through and staple all the appropriate paperwork (e.g. Manifest, Bill Of Lading, Scale Ticket, Transportation Work Ticket, etc.) together based on the Job Number to enter the Manifest/Bill Of Lading Number, Quantity, Pounds, and mark the job as "Complete" in the **CES/PACES Access Database** as well as cross off the Job Numbers that the paperwork has been received for on the **PACES Dispatch Board** from the previous day to ensure all **Drivers** are turning in their paperwork.

   Note: If the **Driver's** paperwork is not being turned in, then notify the **Logistics Supervisor** to assist you in getting the paperwork.

   For the paperwork that is not complete (i.e. only have the Transportation Work Ticket or the Manifest/Bill Of Lading) place the following paperwork in the Inbox Titled **Partially Completed Driver's Paperwork**. This Inbox should not hold paperwork for more than two (2) days, if so; the **Administrative Assistants-General** will notify the appropriate department for the missing paperwork.

   Note: Along with sorting through and stapling the paperwork from the Inboxes Titled **Completed Driver's Paperwork** and **Paperwork From Laboratory**, the **Administrative Assistants-General** will also match the paperwork from the Inbox Titled **Partially Completed Driver's Paperwork**. Remember the Inbox Titled **Partially Completed Driver's Paperwork** should either be empty or one (1) day behind. Paperwork that is in this Inbox for more than two (2) days then the **Administrative Assistants-General** will notify the appropriate department for the missing paperwork.

3. The **Administrative Assistants-General** will file numerically and by month all Manifests and/or Bill Of Ladings in the File Cabinet Titled **Inbound Feed (Manifests, Bill Of Ladings)**, file numerically and by month all Outbound Bill Of Ladings in the File Cabinet Titled **Outbound Products (Bill Of Ladings)**, and file numerically and by month all Outbound Wastes Manifests in the File Cabinet Titled **Outbound Wastes (Manifests)**. All Scale Tickets and Transportation Work Tickets will be stapled to and filed with either the appropriate Manifest or Bill Of Lading. These File Cabinets are located in the **Logistics Office**.

   The Declaration of Inspection (DOI) is filed by Vessel Number and date in the File Drawer on the right hand side of the **Administrative Assistants-General's Desk**.

   Note: The **Administrative Assistants-General** will file all completed original Manifests and will place the copies in a Manila Folder to be placed in the Inbox Titled **Interoffice Mail To Houston/From Houston** located in the **Main Office** to be taken to the **Administrative Assistant-Customer Service and Logistic's Desk** three (3) times a week. The completed original Bill Of Ladings, Scale Tickets, and Transportation Work Tickets will be placed in a Manila Folder to be placed in the Inbox Titled **Interoffice Mail To Houston/From Houston** to be taken to the **Administrative Assistant-Customer Service and Logistic's Desk** three (3) times a week to be reviewed for completeness and given to the appropriate **Administrative**

Assistants-Accounts Receivable Representative for proper billing and to be placed in the appropriate **PACES Customer Job Folder** for later use by the **AR/AP Office** and the **Administrative Assistants-General** will file a copy of the completed Bill Of Ladings, Scale Tickets, and Transportation Work Tickets in the appropriate File Cabinet for proper tracking purposes only.

5 Completion of Essential Operating Paperwork-Drivers

At the end of each day, **Drivers** should turn in remaining essential operating paperwork at the **Main Office**. Driver's Daily Logs should be placed in the Inbox Titled **Completed Driver's Daily Logs** located in the **Logistics Office**. Driver's Vehicle Inspection Reports, Trailer Inspection Forms, and Roll-Off or Tote Container-Level 1 Inspection Forms should be place in the Inbox Titled **Completed Driver's Vehicle Inspection Reports & Roll-Off or Tote Container Inspection Forms & Trailer Inspection Forms** located in the **Logistics Office.** The remaining essential operating paperwork should be placed in the Inbox Titled **Completed Driver's Paperwork** located in the **Main Office** for the **Logistics Supervisor** or the **Administrative Assistants-General** to review.

PACES Drivers going to **CES Environmental Services, Inc. (CES)** will give the **Laboratory Technicians** at **CES** the Manifest or Bill Of Lading and the associated Scale Ticket. The **Driver** will place the Transportation Work Ticket in their Manila Folder to be placed in the Inbox Titled **Completed Driver's Paperwork** and follow the above listed procedures for the remaining balance of the essential operating paperwork.

Note: The **PACES Dispatch Board** will have **Receiving Facility Houston** and the **CES Dispatch Board** will have **PACES Driver** under the "Helper Column" for the Job Number that these types of scenarios apply to.

CES Drivers going to **PACES** will give the **Laboratory Technicians** at **PACES** the Manifest or Bill Of Lading and the associated Scale Ticket. The **Driver** will place the Transportation Work Ticket in their Manila Folder to be placed in the Inbox Titled **Completed Driver's Paperwork** and follow the SOP for **CES Drivers** for the remaining balance of the essential operating paperwork.

Note: The **CES Dispatch Board** will have **Receiving Facility Port Arthur** and the **PACES Dispatch Board** will have **CES Driver** under the "Helper Column" for the Job Number that these types of scenarios apply to.

Finally, for all Transportation Only Jobs where **PACES** provides Transportation, the **Drivers** will place their Driver's Daily Logs in the Inbox Titled **Completed Driver's Daily Logs** and their Driver's Vehicle Inspection Reports, Trailer Inspection Forms, and Roll-Off or Tote Container-Level 1 Inspection Forms in the Inbox Titled **Completed Driver's Vehicle Inspection Reports & Roll-Off or Tote Container Inspection Forms & Trailer Inspection Forms** and keep all other essential operating paperwork in the **Driver's Manila Folder** and place it in the Inbox Titled **Completed Driver's Paperwork** for the **Logistics Supervisor** or the **Administrative Assistants-General** to review.

Note: Transportation Only Jobs will only have a Transportation Work Ticket.

6 Completion of Essential Operating Paperwork-Logistics

The essential operating paperwork in the Inbox Titled **Completed Driver's Paperwork** will be removed and appropriately reviewed by the **Logistics Supervisor** or the **Administrative Assistants-General.**

The **Logistics Supervisor** or the **Administrative Assistants-General** shall place all Driver Fuel Receipts and Out of State Mileage Logs in a Manila Folder to be placed in the Inbox Titled **Interoffice Mail To Houston/From Houston** to be placed in the Inbox Titled **Fuel Receipts and Out Of State Mileage Logs** located in the **HSE Office**. The **Health, Safety, and Environmental Manager** will file the Driver Fuel Receipts and Out of State Mileage Logs to be used in completing IFTA Reports.

For all Preloaded Jobs, the **Logistics Supervisor** will ensure the "Helper Column" states "Preloaded" and the "Job Description Column" states "Preloaded from XXXXX to take to XXXXX on XXXXX" so that the **Administrative Assistants-General** and the **Administrative Assistant-Customer Service and Logistics** can look in the **CES/PACES Access Database** at the "Job Detail Screen" for that particular Job Number and see exactly what essential operating paperwork will be received.

The Inbox Titled **Completed Driver's Daily Logs** will be emptied and entered into the Spreadsheet Titled **Truck Driver's Daily Time Log** located on the **Shared Drive** within the **PACES Facility Folder** each day by the **Logistics Supervisor** or the **Administrative Assistants-General**. After review, the **Logistics Supervisor** or the **Administrative Assistants-General** will file the Driver's Daily Logs by month/**Driver**/Day in the File Cabinet Titled **Driver's Daily Logs** located in the **Logistics Office**.

Note: On the 15th of every month the **Administrative Assistants-General** will send the prior months Driver's Daily Logs to the **CES Main Office** by placing the Driver's Daily Logs in a Manila Folder to placed in the Inbox Titled **Interoffice Mail To Houston/From Houston** to be placed in the Inbox Titled **Complete Driver's Logs "Ready To File"** located in the **HSE Office**. The **Health, Safety, and Environmental Manager** shall then ensure final filing of the Driver's Daily Logs.

The Inbox Titled **Completed Driver's Vehicle Inspection Reports & Roll-Off or Tote Container Inspection Forms & Trailer Inspection Forms** shall be inspected first each day by the **Mechanic Lead Man** to detect any equipment needing repair. If no damages are noted (and consequently no repairs required), the **Mechanic Lead Man** will sign all essential operating paperwork on the "Mechanic's Signature" Line and place the essential operating paperwork in the Inbox Titled **VIRs To Be Filed** located in the **Logistics Office**.

If a repair is needed, the **Mechanic Lead Man** shall remove the essential operating paperwork, and proceed as described hereinafter. For essential operating paperwork removed from the Inbox Titled **Completed Driver's Vehicle Inspection Reports & Roll-Off or Tote Container Inspection Forms & Trailer Inspection Forms** by the **Mechanic Lead Man** (that denote damage), the **Mechanic Lead Man** shall complete an Equipment and Facility Work Order located on the **Shared Drive** within the **CES and PACES Forms and Logos Folder**,

affix it to the form indicating the damage/problem, and place the forms in the Inbox Titled **Incomplete Equipment and Facility Work Orders** located in the **Fleet Maintenance and Equipment Office**.

Once the **Mechanic Lead Man** has signed off indicating corrective actions have been taken, the **Mechanic Lead Man** will place the paperwork in the Inbox Titled **VIRs To Be Filed**. The **Logistics Supervisor** or the **Administrative Assistants-General** will file all paperwork in the appropriate **Unit Book** located on the **Unit Bookshelf**. The **Unit Bookshelf** is located in the **Logistics Office**.

If it is deemed by the **Mechanic Lead Man** that damages were caused by **PACES Customers**, the **Mechanic Lead Man** will immediately notify the appropriate **Customer Service and Inside Sales Representatives** (via email) so that the **Customer** can be notified about the charges (the **Customer Service and Inside Sales Representatives** will make a note in the **CES/PACES Access Database** under "Billing Comments" about the charges). The **Mechanic Lead Man** should also be sure to note the **Customer** and job on the completed Equipment and Facility Work Order.

Immediately upon completion of the equipment repair, the **Mechanic Lead Man** should sign all essential operating paperwork in the area designated for "Mechanic's Signature." Next, the **Mechanic Lead Man** will place the completed Equipment and Facility Work Order in the Inbox Titled **Completed Equipment and Facility Work Orders "Ready For Data Entry"** located in the **Main Office**. The **Administrative Assistants-General** will enter the information on the completed Equipment and Facility Work Order into the **CES/PACES Access Database**. The **Administrative Assistants-General** will immediately file the completed Equipment and Facility Work Order by Truck Number or Trailer Number within the File Cabinet Titled **Equipment and Facility Work Orders** located in the **Logistics Office**.

If any damages were caused by **PACES Customers**, after the **Administrative Assistants-General** enters the information on the completed Equipment and Facility Work Order into the **CES/PACES Access Database** then the **Administrative Assistants-General** will make a copy to file in the File Cabinet Titled **Equipment and Facility Work Orders** and then place the completed original in a Manila Folder to be placed in the Inbox Titled **Interoffice Mail To Houston/From Houston** to be taken to the **Administrative Assistant-Customer Service and Logistic's Desk** three (3) times a week to be reviewed for completeness and given to the appropriate **Administrative Assistants-Accounts Receivable Representative** for proper billing and to be placed in the appropriate **PACES Customer Job Folder** for later use by the **AR/AP Office**.

7 Completion of Essential Operating Paperwork-Customer Service and Inside Sales Representatives

Essential operating paperwork that is complete (i.e. no paperwork is missing) shall be immediately placed in a Manila Folder to be placed in the Inbox Titled **Interoffice Mail To Houston/From Houston** to be taken to the **Administrative Assistant-Customer Service and Logistic's Desk** three (3) times a week to be reviewed for completeness and given to the appropriate **Administrative Assistants-Accounts Receivable Representative** for proper

billing and to be placed in the appropriate **PACES Customer Job Folder** for later use by the **AR/AP Office**.

Note: Essential operating paperwork that is not complete (i.e. paperwork is still missing) should not be sent to the **Customer Service and Inside Sales Representative's Office**.

Tenative Production plan for PACES for next 2 to 3 weeks

Matt Bowman

Sent: Tuesday, May 05, 2009 5:33 PM

To: Jennifer Rust; Bo Cumberland; Jay Matlock; Steve Stricker; Joe Camp

Cc: Greg Bowman; Clark Hickman; Pete Alford; Scott Shimer

Bo, Jenny, Steve,
Please have KMTEX to transfer tank 181 into tank 166. We will then need to clean tank 181. Steve, please pump all material residue into a truck. This tank does not need to be cleaned, it just need to be empty and clear of solids. If you need to use a little first flush, that is ok. After cleaning, take the product residue and first flush water and unload it into tank 166. Please bear in mind that product you are putting in tank 166 stuff goes to PEAK or Rhodia and they do not like water, sodium, or any solids so try not to get any solids in the first flush....there should not be any in the tank now anyway. Any additional water after the first flush can be taken to PACES and put into the wastewater tank.
Next, tank 181 should be used to store the naphthenic acid in the frac tanks (Bo will need to make the transfer with trucks). I believe that all or at least most of what we have on hand right now will fit into this tank 181. This will free up our two frac tanks for use in the centrifuge operation and oil blending.

Jenny,
Please have the 70,000 gallons in the CCL26 transferred into tank 607 at KMTEX and then shifted back to our dock.

Steve, Jay,
We need to get this barge cleaned and off rent as soon as possible. This will save us $17,500 per month immediately!!

Jay, Jenny, Bo, Steve,
With the lack of sulfidic caustic coming in right now, we are probably going to be in short supply soon. In fact, after the CCL26 barge is transferred to 607, we are only going to have a little over 300,000 gallons of material. All this material should be sent to the paper mills (Deridder and Evedale which may come on-line next week and want 5 loads per day). When the barge arrives from Citgo, we should stop pulling from 607 and pull from the barge instead (material should still be going to the mills). This will ensure that we can be ready to go back to Citgo as soon as they need us back with the barge.

Jay, Steve,
As soon as you clear out the feed that is in-plant now, we should work running the Kinder Morgan material in the mud tank. You will need to work from the top down as previously discussed. Then you will need pump the sludge that remains in the bottom of this mud tank into the vacuum box. This will free up the mud tank for temporary use in storing cresylic acid from upcoming production (discussed below).

Steve, Jay,
As soon as the two frac tanks and mud tank are empty, they need to be moved inside the building in a position such that they will be in a proper area when containment is poured (this should also include the third frac tank that is still being repaired). We can discuss the exact placement of all three frac tanks and the mud tank when I come out on Thursday.

Steve, Jay,
Next, we need to get RV1 empty. The water obviously goes to WW and the oil should go to the oil/water

CES Inventory

PRODUCT	TANK/ RAILCAR #	NET WEIGHT	PRODUCT TOTAL	# per Gal	Gallon
RECOVERED BLACK OIL	T-167	347,981	347,981	7.34	47,409
CES FUEL	T-181	262,620	262,620		
Sulfidic Caustic	T-607	1,466,158	1,466,158	9.46	154,985
Phenolic Caustic	T-222	924,544		9.52	97,116
Phenolic Caustic	T-606	4,208,334	5,132,878	9.52	442,052
ORGANO SULFUR FEEDSTOCK	T-166	273,989		7.70	35,583
ORGANO SULFUR FEEDSTOCK	T-601	484,340	758,329	7.10	68,217
LOW FLASH OIL	T-600	634,778	634,778	8.69	73,047

68% oil
15% H_2O
17% rag

73

medicfirstaid.com

EPAPA008001267

CES Environmental Port Arthur Dispatch Board

FOR : Tuesday 6/2/2009

Job Note ID	Driver	Helper	Truck	Trailer	Misc Equipment	Customer	Job Description	Start Time	Job Length
86785		Houston Driver				CES Environmental Services - Port Arthur	load CBF, Haul to CES PA...will redirect to deridder		
86926		Houston Driver				CES Environmental Services, Inc.	WHITE LIQUOR (TARGA REDIRECT CBF) MAKE SURE TRAILER IS MARKED WITH SPECIAL MARKINGS!!		
86933	Brown Leroy		285	227		KMTEX	load of Methanol w/w to NP. 7:15am	0600	1/3 Day
86936	Brown Leroy		285	227		KMTEX	load of Methanol w/w to NP. 11am	2nd	1/3 Day
86939	Brown Leroy		285	227		KMTEX	load of Methanol w/w to NP. 2:45pm	3rd	1/3 Day
86752	Frias Juan		2002	260		Citgo Refinery	Load naphthenic caustic from Citgo in Lake Charles and haul to PACES. SEE INBOUND	0700	1/2 Day
86921	Mendoza Juan		2001	261		CES Environmental Services - Port Arthur	haul trailer to Boise Cascade.	0600	1/2 Day
86925	Mendoza Juan		2001	261		CES Environmental Services - Port Arthur	haul trailer to Boise Cascade.	2nd	1/2 Day
86953	Saylor Chris		2006	262	—	CES Environmental Services - Port Arthur	Offload w/w into Tank 607 at 7am	0600	1/4 Day
86954	Saylor Chris		2006	268	—	CES Environmental Services - Port Arthur	Offload w/w into Tank 607 at 8:30am	2nd	1/4 Day
86955	Saylor Chris		294	258	—	CES Environmental Services - Port Arthur	Offload w/w into Tank 607 at 9:45am	3rd	1/4 Day
86956	Saylor Chris		2006	262	✓	CES Environmental Services - Port Arthur	Offload w/w into Tank 607 at 11am	4th	1/4 Day
86923	Wilson Kevin		2004	420		CES Environmental Services - Port Arthur	haul trailer to Boise Cascade.	0700	1/2 Day
86922	Wilson Kevin		2004	420		CES Environmental Services - Port Arthur	haul trailer to Boise Cascade.	2nd	1/2 Day

Report Printed 6/2/2009 12:45:22 PM

ZACHARY

EPAPA00800126

-Monday morning: complete rescue training til noon
-Traet waste water in W/W tk. with bleach and send the water to New Park.
- Send material from RV-1 to Tk.607 @ KMTX, check oil phase to see if it will be able to go to Tk. 607 also
- Heat OWS to extract water, water will go to R-V1
-Transfer RV-2 to Rv-1, process RV-1
- Transfer RV-1 to W/W tk., treat and send to New Park (we will need to order more bleach)
-Transfer Frac Tk. 1000 to Rv-1 along with remaining water from RV-2(This will free up RV-2 to begin installing Static mixer)
-Transfer NAP water from Frac tk. 1006 to RV-1
- Process RV-1 then Transfer to WW tk.
- Move Nap oil from frac tk 1008 to 1006
-Move frak tk 1008 into containment (we will more than likely need to start usng this to store Nap acid)
- Load trucks to go to paper mills from Frac Tk. 1003
This will allow us to have W/W Frac tk, 1000, 1003 empty to be used for Nap water and Rv-2 empty

-NAP Unit.
-Move water from NV-1 to asphalt centrifuge storage tk. for temperory storage
-We will need to get a trailer from dispatch to store Nap oil until we can free up the frac tk 1008
-Unload Trl. 260 into NV-1, process NV-1 send water to top off asphalt Tk.
- Once we free up Rv-1 we will be able to empty asphalt tk.

SULFIDIC PROCESSING PROCEDURES

Below are the procedures that will be followed when processing the Sulfidic Caustic

Step 1: Driver brings feed into unit, Driver then signs in at the lab and brings paperwork to lab technician.

Step 2: Operator wearing full face respirator, climbs on top of the trailer to pull sample, and brings back to lab for QC. Operator waits for lab to either accept or reject load.

Step 3: Once sample has been approved by lab, Operator then unloads trailer into RV1.

Step 4: Operator lines the tank for circulation

Step 5: While tank is circulating, Operator starts injecting acid to bring the PH down to a 3

Step 6: After circulating for 1 hour, Operator takes sample to lab to check PH, if PH is not a 3, lab will determine how much more acid will be needed to finish run.

Step 7: Once PH has reached a 3, operator will then transfer water to the wastewater tank, and product is shipped to a storage tank by truck.

NAPTHENIC PROCESSING PROCEDURES

Below are the procedures that will be followed when processing the Napthenic Caustic

Step 1: Driver brings feed into unit, Driver then signs in at the lab and brings paperwork to lab technician.

Step 2: Operator wearing full face respirator, climbs on top of the trailer to pull sample, and brings back to lab for QC. Operator waits for lab to either accept or reject load.

Step 3: Once sample has been approved by lab, Operator then unloads trailer into NV1.

Step 4: Operator lines the tank for circulation

Step 5: While tank is circulating, Operator starts injecting acid to bring the PH down to a 3

Step 6: After circulating for 1 hour, Operator takes sample to lab to check PH, if PH is not a 3, lab will determine how much more acid will be needed to finish run.

Step 7: Once PH has reached a 3, operator will then transfer water to the wastewater tank, and product is shipped to a storage tank by truck.

Brien M. Watson

(b) (6) [redacted]

August 11, 2008

RE:

Dear Sir or Madam:

Please review the enclosed resume, which highlights the skills and accomplishments that will enable me to contribute to your company. During my years in waste management, I demonstrated leadership skill, proficiency and superior work habits. I would appreciate the opportunity to meet with you to discuss a future with your company.

As Radiation Safety Officer with Newpark Environmental Services L.L.C. , I had the opportunity to use my professional skill to increase productivity, safety procedures and be in compliance with state regulation on a regular basis. I administered weekly site audit, safety meetings, and also coordinated programs to maintain effective and efficient production throughout my daily operations.

Thank you for taking the time to review my qualifications. I would appreciate the opportunity to interview and answer any questions that you may have.

Sincerely,

Brien M. Watson

Brien Watson

(b) (6)
[redacted]

OBJECTIVE

Obtain a position in production, quality control and/or industrial engineering. Be able to utilize knowledge of computers, professional people skills, organizational training and business experience.

EXPERIENCE

November 2006 to Present — **Newpark Environmental Services L.L.C.**
Winnie, TX
Radiation Safety Officer

Responsible for establishing safety procedures in compliance with state regulations for Naturally Occurring Radioactive Material (NORM). Sampling and testing waste from oil and gas products, forming data analysis and reporting results to state authorities. Coordinate with Environmental, Safety and Health administrators, work supervisors, employees and contract personnel on protection equipment and prevention to being over exposed the NORM material.

April 2006 to November 2006 — **Newpark Industrial Disposal**
Winnie, TX
Process Operator

Sampling of material for lab analysis and reporting. Process of non-hazardous material for transfer to injection wells. Maintenance of facility to maintain efficient production and disposal. Recording injection data in compliance with state regulated agencies.

June 2005 to January 2006 — **SM & P utility resources**
Houston, TX
Utility Locator

Located underground facilities for Texas Gas Services and Southwestern Bell. Monitored Gas flow through service lines to avoid leaks. Analysis phone service during any underground excavating.

November 2001 to September 2004 — **E Z Corp.**
Port Arthur, TX
Customer Service Representative

Managed and coordinated short term loan center. Prepared and approved loans. Scheduled work hours, monthly audits and sales promotions.

January 1999 to April 2001 — **H.B. Zachry Construction**
San Antonio, TX
Craft Coordinator

Coordinator in electrical department. Organized blueprint work packages for field production. Ordering and distribution of material and calculated man hours. Reported material budget on monthly analysis.

April 1998 to December 1999 — **Aladdin Construction**
Biloxi, MS
Material Handler

Ordering and distribution of material for multiple job sites.

EDUCATION

Lamar State College
Port Arthur, TX
NCCER Construction Core Curriculum

American Radiation Services
Port Allen, LA
Radiation Safety

Lamar Institute Of Technology
Beaumont, TX
Drafting Technology

Southern University
Baton Rouge, LA
Drafting Engineering

Thomas Jefferson High School
Port Arthur, TX
Basic Studies

SKILLS

Computer Literate
Blueprint Reading

HONORS

Who's Who Among American High School Students, May 1995

CERTIFICATIONS

Radiation Safety Officer State Certification
Transportation of NORM Certification
NORM Surveying and Control Certification
NCCER Construction Core Curriculum
OSHA Supervisor Safety Training
Adult First Aid/CPR Certification

REFERENCES

References Available on Request

Application For Employment
Solicitud de Empleo

We consider applications for all positions without regard to race, color, religion, creed, sex, national origin, disability, sexual orientation, citizenship status or any other legally protected status. Aceptamos solicitudes para todas las posiciones sin tomar en cuenta raza, color, religión, credo, sexo, nacionalidad, incapacidad, orientación sexual, estado de ciudadanía, o cualquier otro estado protegido legalmente.

(PLEASE PRINT/SIRVASE ESCRIBIR EN LETRAS DE MOLDE)

Position(s) Applied For/Puesto(s) que solicita	Date of Application/Fecha de la Solicitud
	8-12-08

How Did You Learn About Us?/¿Cómo se enteró sobre nosotros?

☐ *Advertisement/Anuncio* ☐ *Employment Agency/Agencia de Empleo* ☐ *Inquiry/Vino por su cuenta*

☐ *Relative/Pariente* ☐ *Friend/Amigo* ☐ *Other/Otro* _____

Last Name/Apellido(s)	First Name/Nombre(s)	Middle Name
Wade	DemountT	O

Address/Dirección *Number/Número* *Street/Calle* *City/Ciudad* *State/Estado* *Zip Code/Código Postal*

(b) (6) [redacted]

Telephone Number(s)/Numero(s) de Teléfono	Social Security Number/Número de Seguro Social (voluntary) (voluntario)
(b) (6) [redacted]	4

Best time to contact you at home is: La mejor hora para comunicarse con usted en casa es: 7:00 AM/PM

If you are under 18 years of age, can you provide required proof of your eligibility to work?
Si es menor de 18 años, ¿puede proveer las pruebas requeridas sobre su elegibilidad para trabajar? ☑ *Yes/Sí* ☐ *No*

Have you ever filed an application with us before? ¿Ha solicitado empleo en esta empresa anteriormente? ☐ *Yes/Sí* ☒ *No*

If Yes, give date _____ *En caso afirmativo, indique la fecha* _____

Have you ever been employed with us before? ¿ Ha trabajado en esta empresa anteriormente? ☐ *Yes/Sí* ☒ *No*

If Yes, give date _____ *En caso afirmativo, indique la fecha* _____

Do any of your friends or relatives, other than spouse, work here?
¿Trabaja en esta empresa algún amigo o familiar? ☐ *Yes/Sí* ☒ *No*

Are you currently employed? ¿Trabaja actualmente? ☒ *Yes/Sí* ☐ *No*

May we contact your present employer? ¿Nos autoriza a ponernos en contacto con su empleador actual? ☒ *Yes/Sí* ☐ *No*

Are you prevented from lawfully becoming employed in this country because of Visa or Immigration Status
¿Tiene prohibido trabajar legalmente en este país a causa de su situación de inmigración o visa?
Proof of citizenship or immigration status will be required upon employment.
Si se le contrata se le pedirá prueba de ciudadanía o situación de inmigración. ☐ *Yes/Sí* ☒ *No*

What is your desired salary range? (b) (6) [redacted] *¿Cual es el alcance de su salario deseado?* _____

Date available for work/¿En qué fecha estará disponible para trabajar? 08/18/08

Are you available to work:/¿Está disponible para trabajar:

☒ *Full-Time/Tiempo Completo* ☐ *Part-Time/Tiempo Parcial* ☐ *Temporary/Temporario*

Are you currently on "lay-off" status and subject to recall?
¿Está actualmente en despido temporal y sujeto a que lo vuelvan a emplear?. ☐ *Yes/Sí* ☒ *No*

WE ARE AN EQUAL OPPORTUNITY EMPLOYER/ESTA FIRMA OFRECE IGUALDAD DE OPORTUNIDAD DE EMPLEO

NAME/NOMBRE: _____ POSITION/PUESTO: _____ DATE/FECHA: ___/___/___

Education/Educación

	Name and Address of School *Nombre y Dirección de Escuela*	Course of Study *Curso de Estudios*	Number of Years Completed *Número de Años Terminados*	Diploma/Degree *Título o Diploma*
Elementary School *Escuela Primaria*				
High School *Escuela Secundaria*	M.B. Smiley High		4	Diploma
Undergraduate College *Universidad de Pregrado*				
Graduate/Professional *Posgrado/Profesional*				
Other (Specify) *Otro (Especifique)*				

Describe any specialized training, apprenticeship, skills and extra-curricular activities.
Describa su capacitación especializada, aprendizaje,destrezas y actividades extracurriculares.

Describe any job-related training received in the United States military.
Describa la capacitación especializada relacionada con el empleo que haya recibido de las fuerzas armadas de los Estados Unidos.

Employment Experience/Experiencia Laboral

Start with your present or last job. Include any job-related military service assignments and volunteer activities. You may exclude organizations which indicate race, color, religion, gender, national origin, disabilities or other protected status.
Indique primero su empleo actual o su último empleo. Incluya las actividades de servicio militar relacionadas con su empleo y las actividades como voluntario. Está autorizado a excluir las organizaciones que indiquen su raza, color, religión, género, origen nacional, sus incapacidades físicas o mentales o cualquier otra condición protegida por la ley.

1.

Employer/Empleador	Dates Employed / Fechas de Empleo	Work Performed/Trabajo Realizado
New Park	From/Desde: 9/07 To/Hasta:	changing Valve, unloading and loading trucks, injecting, sampling
Address/Dirección: 26400 Wilber Rd Winnie, TX	Hourly Rate/Salary / Paga por Hora/Sueldo	
Telephone Number(s)/Número(s) de teléfono: (409) 794-3119	Starting/Inicial: (b) (6) Final:	
Job Title/Titulo del Empleo: Process Operator	Supervisor/Supervisor: Kenneth William	
Reason for Leaving/Motivo por el Cual Dejó su Empleo: money / Benefits		

2.

Employer/Empleador	Dates Employed / Fechas de Empleo	Work Performed/Trabajo Realizado
Wal-Mart	From/Desde: 4/06 To/Hasta: 9/07	stocking
Address/Dirección: I-45 N Spring Tx	Hourly Rate/Salary / Paga por Hora/Sueldo	
Telephone Number(s)/Número(s) de Teléfono:	Starting/Inicial: (b) (6) Final:	
Job Title/Titulo del Empleo: Over Night Stocker	Supervisor/Supervisor: Keith	
Reason for Leaving/Motivo por el Cual Dejó su Empleo: moved		

3.

Employer/Empleador	Dates Employed / Fechas de Empleo	Work Performed/Trabajo Realizado
Utili Serv	From/Desde: 09/06 To/Hasta: 09/07	lead of crew 4, re-reads and reading between 400 to 600 meter adey.
Address/Dirección: 39 st Port Aethur, Tx	Hourly Rate/Salary / Paga por Hora/Sueldo	
Telephone Number(s)/Número(s) de Teléfono:	Starting/Inicial: (b) (6) Final:	
Job Title/Titulo del Empleo: meter reader	Supervisor/Supervisor: Katrina Williams	
Reason for Leaving/Motivo por el Cual Dejó su Empleo: benefit		

4.

Employer/Empleador	Dates Employed / Fechas de Empleo	Work Performed/Trabajo Realizado
Grocery Supply	From/Desde: 10/06 To/Hasta: 4/06	filling order for stores by using pallect jack
Address/Dirección: 610 loop	Hourly Rate/Salary / Paga por Hora/Sueldo	
Telephone Number(s)/Número(s) de Teléfono:	Starting/Inicial: (b) (6) Final:	
Job Title/Titulo del Empleo: order puller	Supervisor/Supervisor:	
Reason for Leaving/Motivo poe el Cual Dejó su Empleo: No room for advancment		

If you need additional space, please continue on a separate sheet of paper
Si necesita más espacio continue en otra hoja de papel

List professional, trade, business or civic activities and offices held. Indique los puestos profesionales, vocacionales, comerciales o cívicos que haya ocupado, o las actividades de este tipo que haya realizado.
You may exclude membership which would reveal gender, race, religion, national origin, age, ancestry, disability or other protected status / Está autorizado a excluir la participación que revele su sexo, raza, religión, origen nacional, edad, ascendencia, incapacidad física o mental, o cualquier otra condición protegida por la ley:

Additional Information/Información Adicional

Other Qualifications/Destrezas y Calificaciones Especiales

Summarize special job-related skills and qualifications acquired from employment or other experience.

Resuma las destrezas y calificaciones, o cualquier otro tipo de experiencia, que haya adquirido en otros empleos y que estén relacionadas con el empleo que solicita.

Specialized Skills/Destrezas Especializadas (Check Skills/Equipment Operated/Marque sus Destrezas o Equipos que Puede Operar)

___Terminal	___Spreadsheet	Production/Mobile Machinery (list) Maquinaria	Other (list) Otro (indique)
___PC/MAC	___Word Processing		
___Typewriter	___Shorthand		
WPM ___	WPM ___		

State any additional information you feel may be helpful to us in considering your application.
Indique cualquier información adicional que considere que nos sería útil para evaluar su solicitud.

Note to Applicants: DO NOT ANSWER THIS QUESTION UNLESS YOU HAVE BEEN INFORMED ABOUT THE REQUIREMENTS OF THE JOB FOR WHICH YOU ARE APPLYING.
Can you perform the essential functions of the job, for which you are applying, either with or without a reasonable accommodation? A review of the activities involved in such a job or occupation has been given.

☐ YES ☐ NO

Nota para el solicitante: NO CONTESTE ESTA PREGUNTA A MENOS QUE LE HAYAN INFORMADO SOBRE LOS REQUISITOS DEL EMPLEO QUE SOLICITA.
¿Puede ejecutar de manera razonable las actividades que debera realizar en el empleo u ocupación que solicita? Se adjunta una descripción de las actividades a realizarse en dicho empleo u ocupación. ☐ SI ☐ NO

References/Referencias

1. Maxine Williams	(b) (6)	
(Name/Nombre)		e Teléfono
(Address/Dirección)		
2. Ronda Jones		
(Name/Nombre)		e Teléfono
(Address/Dirección)		
3. Jacinna Coles		
(Name/Nombre)		Phone #/Número de Teléfono

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Position(s) Applied For Is Open:
El puesto que se solicita está disponible: ☐ *Yes/Sí* ☐ *No*

Position(s) Considered For:/Puesto(s) para el (los) cual(es) se considera:

_____

_____

Date/Fecha _____

NAME/NOMBRE: _____ *POSITION/PUESTO:* _____ *DATE/FECHA:* ____ / ____ / ____

Applicant's Statement/Declaración del Empleado

I certify that answers given herein are true and complete./Certifico que las respuestas dadas en la presente son completas y verdaderas.

I authorize investigation of all statements contained in this application for employment as may be necessary in arriving at an employment decision.

This application for employment shall be considered active for a period of time not to exceed 45 days. Any applicant wishing to be considered for employment beyond this time period should inquire as to whether or not applications are being accepted at that time.

I hereby understand and acknowledge that, unless otherwise defined by applicable law, any employment relationship with this organization is of an "at will" nature, which means that the Employee may resign at any time and the Employer may discharge Employee at any time with or without cause. It is further understood that this "at will" employment relationship may not be changed by any written document or by conduct unless such change is specifically acknowledged in writing by an authorized executive of this organization.

In the event of employment, I understand that false or misleading information given in my application or interview(s) may result in discharge. I understand, also, that I am required to abide by all rules and regulations of the employer.

Autorizo la investigación de todas las declaraciones que aparecen en esta solicitud de empleo que sea necesaria para tomar una decisión sobre el puesto de trabajo que solicito.

Esta solicitud de empleo se considerará activa durante un período que no excederá los 45 días. Los solicitantes que deseen que se les considere para puestos de trabajo después de este período de tiempo, deberán preguntar si se aceptan o no solicitudes en ese momento.

Por la presente entiendo y acepto que, a menos que lo definan de otra manera las leyes aplicables, todas las relaciones de trabajo con esta organización serán de tipo " a voluntad ", lo que significa que el Empleado podrá renunciar en cualquier momento y que el Empleador podrá despedir al Empleado en cualquier momento, con o sin causa. Además, se entiende que la relación de trabajo " a voluntad " no se podrá cambiar mediante ningún documento escrito ni por ninguna conducta, a menos que un ejecutivo autorizado de esta organización haya aceptado dicho cambio por escrito.

En caso que se me contrate, entiendo que toda información falsa o engañosa que haya dado en mi solicitud o en mi(s) entrevista(s) puede resultar en mi despido. Entiendo, además, que deberé cumplir con todas las regulaciones y reglamentos de mi empleador.

Dennis A Wade _____ 8-12-08

Signature of Applicant/Firma del Solicitante *Date/Fecha*

FOR PERSONNEL DEPARTMENT USE ONLY/*PARA USO EXCLUSIVO DEL DEPARTAMENTO DE PERSONAL*

Arrange Interview/Fijar Fecha de Entrevista ☐ *Yes/Sí* ☐ *No*

Remarks/Comentarios _____

_____ _____

INTERVIEWER *DATE*

Employed/Empleado ☐ *Yes/Sí* ☐ *No* *Date of Employment/Fecha de Empleo* _____

Job Title/Título del Empleo _____ *Hourly Rate/Salary/Pago por Hora/Sueldo* _____

Department/Departamento _____

By/Por _____

NAME AND TITLE/NOMBRE Y TÍTULO *DATE/FECHA*

NOTES/ANOTACIONES _____

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Amsterdam

Rev. 9/06

EPAPA008001280

Application For Employment
Solicitud de Empleo

We consider applications for all positions without regard to race, color, religion, creed, sex, national origin, disability, sexual orientation, citizenship status or any other legally protected status. Aceptamos solicitudes para todas las posiciones sin tomar en cuenta raza, color, religión, credo, sexo, nacionalidad, incapacidad, orientación sexual, estado de ciudadanía, o cualquier otro estado protegido legalmente.

(PLEASE PRINT/SIRVASE ESCRIBIR EN LETRAS DE MOLDE)

Position(s) Applied For/Puesto(s) que solicita	Date of Application/Fecha de la Solicitud
PROCESS OPERATOR	08-12-08

How Did You Learn About Us?/¿Cómo se enteró sobre nosotros?

☐ Advertisement/Anuncio ☐ Employment Agency/Agencia de Empleo ☐ Inquiry/Vino por su cuenta
☐ Relative/Pariente ☑ Friend/Amigo ☐ Other/Otro _____

Last Name/Apellido(s)	First Name/Nombre(s)	Middle Name
WATSON	BRIEN	MARCUS

Address/Dirección Number/Número	Street/Calle	City/Ciudad	State/Estado	Zip Code/Código Postal
(b) (6) [redacted]				

Telephone Number(s)/Numero(s) de Teléfono	Social Security Number/Numero de Seguro Social (voluntary) (voluntario)

Best time to contact you at home is: La mejor hora para comunicarse con usted en casa es: ..... 6:00 AM PM

If you are under 18 years of age, can you provide required proof of your eligibility to work? .....
Si es menor de 18 años, ¿puede proveer las pruebas requeridas sobre su elegibilidad para trabajar?.... ☐ Yes/Sí ☐ No

Have you ever filed an application with us before? ¿Ha solicitado empleo en esta empresa anteriormente? ☐ Yes/Sí ☑ No

If Yes, give date _____ En caso afirmativo, indique la fecha _____

Have you ever been employed with us before? ¿ Ha trabajado en esta empresa anteriormente? ..... ☐ Yes/Sí ☑ No

If Yes, give date _____ En caso afirmativo, indique la fecha _____

Do any of your friends or relatives, other than spouse, work here? .....
¿Trabaja en esta empresa algún amigo o familiar? ..... ☑ Yes/Sí ☐ No

Are you currently employed? ¿Trabaja actualmente? ..... ☑ Yes/Sí ☐ No

May we contact your present employer? ¿Nos autoriza a ponernos en contacto con su empleador actual? ☑ Yes/Sí ☐ No

Are you prevented from lawfully becoming employed in this country because of Visa or Immigration Status
¿Tiene prohibido trabajar legalmente en este país a causa de su situación de inmigración o visa?
Proof of citizenship or immigration status will be required upon employment. .....
Si se le contrata se le pedirá prueba de ciudadanía o situación de inmigración. ..... ☐ Yes/Sí ☑ No

What is your desired salary range? (b) (6) [redacted] ¿Cual es el alcance de su salario deseado? _____

Date available for work/¿En qué fecha estará disponible para trabajar? 08/29/08

Are you available to work:/¿Está disponible para trabajar:

☑ Full-Time/Tiempo Completo ☐ Part-Time/Tiempo Parcial ☐ Temporary/Temporario

Are you currently on "lay-off" status and subject to recall?
¿Está actualmente en despido temporal y sujeto a que lo vuelvan a emplear?. ☐ Yes/Sí ☑ No

WE ARE AN EQUAL OPPORTUNITY EMPLOYER/ESTA FIRMA OFRECE IGUALDAD DE OPORTUNIDAD DE EMPLEO

NAME/NOMBRE: _____ POSITION/PUESTO: _____ DATE/FECHA: ___/___/___

Education/Educación

	Name and Address of School *Nombre y Dirección de Escuela*	Course of Study *Curso de Estudios*	Number of Years Completed *Número de Años Terminados*	Diploma/Degree *Título o Diploma*
Elementary School *Escuela Primaria*	TYRRELL ELEMEN. 4401 FERNDALE PORT ARTHUR, TX 77642	BASIC STUDIES	6YRS	ELEMENTARY DIPLOMA
High School *Escuela Secundaria*	THOMAS JEFFERSON 2200 JEFFERSON DR. PORT ARTHUR, TX 77642	BASIC STUDIES	4YRS	HIGH SCHOOL DIPLOMA
Undergraduate College *Universidad de Pregrado*	SOUTHERN UNIVERSITY BATON ROUGE, LA	DRAFTING	2YRS	N/A
Graduate/Professional *Posgrado/Profesional*	N/A	N/A	N/A	N/A
Other (Specify) *Otro (Especifique)*	STILWELL TECHNICAL 4801 9TH AVE. PORT ARTHUR, TX 77642	DRAFTING	2YRS	TECHNICAL DIPLOMA

Describe any specialized training, apprenticeship, skills and extra-curricular activities.
Describa su capacitación especializada, aprendizaje, destrezas y actividades extracurriculares.

N/A

Describe any job-related training received in the United States military.
Describa la capacitación especializada relacionada con el empleo que haya recibido de las fuerzas armadas de los Estados Unidos.

N/A

Employment Experience/Experiencia Laboral

Start with your present or last job. Include any job-related military service assignments and volunteer activities. You may exclude organizations which indicate race, color, religion, gender, national origin, disabilities or other protected status.
Indique primero su empleo actual o su último empleo. Incluya las actividades de servicio militar relacionadas con su empleo y las actividades como voluntario. Está autorizado a excluir las organizaciones que indiquen su raza, color, religión, género, origen nacional, sus incapacidades físicas o mentales o cualquier otra condición protegida por la ley.

1.

Employer/Empleador	Dates Employed / Fechas de Empleo		Work Performed/Trabajo Realizado
NEWPARK ENVIRONMENTAL SERVICES	From/Desde	To/Hasta	
Address/Dirección: 26462 WILBER RD. WINNIE TX 77665	NOV 06	PRESENT	ESTABLISH SAFETY PROCEDURES IN COMPLIANCE WITH STATE REGULATION FOR NORM OIL AND GAS WASTE.
Telephone Number(s)/Número(s) de teléfono: 409-794-3455	Hourly Rate/Salary / Paga por Hora/Sueldo		
Job Title/Titulo del Empleo: RADIATION SAFETY	Starting/Inicial	Final	
Supervisor/Supervisor: MEL HEBERT	(b) (6)		
Reason for Leaving/Motivo por el Cual Dejó su Empleo: PRESENT JOB			

2.

Employer/Empleador	Dates Employed / Fechas de Empleo		Work Performed/Trabajo Realizado
NEWPARK INDUSTRIAL DISPOSAL	From/Desde	To/Hasta	
Address/Dirección: 26400 WILBER RD. WINNIE TX 77665	APR. 06	NOV. 06	PROCESS OF NON-HAZARDOUS MATERIAL FOR TRANSFER TO INJECTION WELLS.
Telephone Number(s)/Número(s) de Teléfono: 409-794-3450	Hourly Rate/Salary / Paga por Hora/Sueldo		
Job Title/Titulo del Empleo: PROCESS OPERATOR	Starting/Inicial	Final	
Supervisor/Supervisor: MIKE CLOONEY	(b) (6)		
Reason for Leaving/Motivo por el Cual Dejó su Empleo: PROMOTION			

3.

Employer/Empleador	Dates Employed / Fechas de Empleo		Work Performed/Trabajo Realizado
SM&P UTILITY RESOURCES	From/Desde	To/Hasta	
Address/Dirección: 15403 VANTAGE PKWY. HOUSTON TX 77032	JUNE 05	JAN. 06	LOCATED UNDERGROUND UTILITIES FOR TEXAS GAS AND SBC.
Telephone Number(s)/Número(s) de Teléfono: 281-987-2140	Hourly Rate/Salary / Paga por Hora/Sueldo		
Job Title/Titulo del Empleo: UTILITY LOCATOR	Starting/Inicial	Final	
Supervisor/Supervisor: BUTCH URNIE	(b) (6)		
Reason for Leaving/Motivo por el Cual Dejó su Empleo: REDUCTION OF FORCE			

4.

Employer/Empleador	Dates Employed / Fechas de Empleo		Work Performed/Trabajo Realizado
EZ CORP	From/Desde	To/Hasta	
Address/Dirección: 4135 LUCAS BEAUMONT TX 77708	NOV. 01	SEPT. 04	MANAGED AND COORDINATED SHORT TERM LOAN CENTER.
Telephone Number(s)/Número(s) de Teléfono: 409-892-2728	Hourly Rate/Salary / Paga por Hora/Sueldo		
Job Title/Titulo del Empleo: CUSTOMER SERVICE	Starting/Inicial	Final	
Supervisor/Supervisor: BRAD THIBEDEAUX	(b) (6)		
Reason for Leaving/Motivo poe el Cual Dejó su Empleo: REDUCTION OF FORCE			

If you need additional space, please continue on a separate sheet of paper
Si necesita más espacio continue en otra hoja de papel

List professional, trade, business or civic activities and offices held. Indique los puestos profesionales, vocacionales, comerciales o cívicos que haya ocupado, o las actividades de este tipo que haya realizado.
You may exclude membership which would reveal gender, race, religion, national origin, age, ancestry, disability or other protected status / Está autorizado a excluir la participación que revele su sexo, raza, religión, origen nacional, edad, ascendencia, incapacidad física o mental, o cualquier otra condición protegida por la ley:

Additional Information/Información Adicional

Other Qualifications/Destrezas y Calificaciones Especiales

Summarize special job-related skills and qualifications acquired from employment or other experience.

Resuma las destrezas y calificaciones, o cualquier otro tipo de experiencia, que haya adquirido en otros empleos y que estén relacionadas con el empleo que solicita.

RADIATION SAFETY OFFICER, NORM CERTIFIED, NORM TRANSPORTATION CERTIFIED, NORM SURVEY CERTIFIED, NACER CONSTRUCTION CERTIFIED, CPR CERTIFIED.

Specialized Skills/Destrezas Especializadas (Check Skills/Equipment Operated/Marque sus Destrezas o Equipos que Puede Operar)

___ Terminal	✓ Spreadsheet	Production/Mobile Machinery (list) Maquinaria	Other (list) Otro (indique)
✓ PC/MAC	✓ Word Processing	_____	_____
___ Typewriter	___ Shorthand	_____	_____
WPM ___	WPM ___	_____	_____
		_____	_____

State any additional information you feel may be helpful to us in considering your application.
Indique cualquier información adicional que considere que nos sería útil para evaluar su solicitud.

N/A

Note to Applicants: DO NOT ANSWER THIS QUESTION UNLESS YOU HAVE BEEN INFORMED ABOUT THE REQUIREMENTS OF THE JOB FOR WHICH YOU ARE APPLYING.
Can you perform the essential functions of the job, for which you are applying, either with or without a reasonable accommodation? A review of the activities involved in such a job or occupation has been given.

☑ YES ☐ NO

Nota para el solicitante: NO CONTESTE ESTA PREGUNTA A MENOS QUE LE HAYAN INFORMADO SOBRE LOS REQUISITOS DEL EMPLEO QUE SOLICITA.
¿Puede ejecutar de manera razonable las actividades que debera realizar en el empleo u ocupación que solicita? Se adjunta una descripción de las actividades a realizarse en dicho empleo u ocupación.

☐ SI ☐ NO

References/Referencias

1. PAM TROSCLAIR (PORT ARTHUR CHAMBER OF COMMERCE) (b) (6) [redacted]
   (Name/Nombre) Phone #/Número de Teléfono
   (b) (6) [redacted]
   (Address/Dirección)
2. MEL HEBERT (NEWPARK RESOURCES) (b) (6) [redacted]
   (Name/Nombre) Phone #/Número de Teléfono
   (b) (6) [redacted]
3. _____ ( ) _____
   (Name/Nombre) Phone #/Número de Teléfono

FOR PERSONNEL DEPARTMENT USE ONLY
PARA USO EXCLUSIVO DEL DEPARTAMENTO DE PERSONAL

Position(s) Applied For Is Open:
El puesto que se solicita está disponible: ☐ *Yes/Si* ☐ *No*

Position(s) Considered For:/Puesto(s) para el (los) cual(es) se considera:

_____

_____

Date/Fecha _____

NAME/NOMBRE: _____ *POSITION/PUESTO:* _____ *DATE/FECHA:* ____ / ____ / ____

Applicant's Statement/Declaración del Empleado

I certify that answers given herein are true and complete./Certifico que las respuestas dadas en la presente son completas y verdaderas.

I authorize investigation of all statements contained in this application for employment as may be necessary in arriving at an employment decision.

This application for employment shall be considered active for a period of time not to exceed 45 days. Any applicant wishing to be considered for employment beyond this time period should inquire as to whether or not applications are being accepted at that time.

I hereby understand and acknowledge that, unless otherwise defined by applicable law, any employment relationship with this organization is of an "at will" nature, which means that the Employee may resign at any time and the Employer may discharge Employee at any time with or without cause. It is further understood that this "at will" employment relationship may not be changed by any written document or by conduct unless such change is specifically acknowledged in writing by an authorized executive of this organization.

In the event of employment, I understand that false or misleading information given in my application or interview(s) may result in discharge. I understand, also, that I am required to abide by all rules and regulations of the employer.

Autorizo la investigación de todas las declaraciones que aparecen en esta solicitud de empleo que sea necesaria para tomar una decisión sobre el puesto de trabajo que solicito.

Esta solicitud de empleo se considerará activa durante un período que no excederá los 45 días. Los solicitantes que deseen que se les considere para puestos de trabajo después de este período de tiempo, deberán preguntar si se aceptan o no solicitudes en ese momento.

Por la presente entiendo y acepto que, a menos que lo definan de otra manera las leyes aplicables, todas las relaciones de trabajo con esta organización serán de tipo " a voluntad ", lo que significa que el Empleado podrá renunciar en cualquier momento y que el Empleador podrá despedir al Empleado en cualquier momento, con o sin causa. Además, se entiende que la relación de trabajo " a voluntad " no se podrá cambiar mediante ningún documento escrito ni por ninguna conducta, a menos que un ejecutivo autorizado de esta organización haya aceptado dicho cambio por escrito.

En caso que se me contrate, entiendo que toda información falsa o engañosa que haya dado en mi solicitud o en mi(s) entrevista(s) puede resultar en mi despido. Entiendo, además, que deberé cumplir con todas las regulaciones y reglamentos de mi empleador.

Buen M. Watson — 08/12/08

Signature of Applicant/Firma del Solicitante — *Date/Fecha*

FOR PERSONNEL DEPARTMENT USE ONLY/*PARA USO EXCLUSIVO DEL DEPARTAMENTO DE PERSONAL*

Arrange Interview/Fijar Fecha de Entrevista ☐ *Yes/Sí* ☐ *No*

Remarks/Comentarios _____

_____ _____

INTERVIEWER *DATE*

Employed/Empleado ☐ *Yes/Sí* ☐ *No* *Date of Employment/Fecha de Empleo* _____

Job Title/Título del Empleo _____ *Hourly Rate/Salary/Pago por Hora/Sueldo* _____

Department/Departamento _____

By/Por _____

NAME AND TITLE/NOMBRE Y TÍTULO *DATE/FECHA*

NOTES/ANOTACIONES _____

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Amsterdam

Rev. 9/06

EPAPA008001286

Straight Bill of Lading - Short Form - Original - Not Negotiable

B/L DATE: 09/19/2008

B/L NO.: 132317

FROM: ALTIVIA - Greens Bayou
AT: Houston,TX USA

CARRIER: Customer P/U
Truck #: 5 Trailer #: 4448.

ALTIVIA
1100 Louisiana Suite 3160
Houston, TX 77002
Tel: 713-658-9000
Fax: 713-658-0102

SHIP TO
Skyhawk Chemicals, Inc.
** Customer Pick-Up **
Houston , TX 77015-6402
USA

Customer Number

Order Number

SOLD TO
Skyhawk Chemicals, Inc.
Attn: Clark A Knickerbocker
and/ or David Gaspard
701 North Post Oak Rd., #540
Houston , TX 77024-
USA

PO NUMBER	RELEASE NUMBER	CUST. NO.	SALES AGENT	ORDER NUMBER
07407		80034-75 10.	Lucas	132317

SHIP DATE	WHSE	FREIGHT	FOB REMARK	DELIVERY DATE	DELIVERY TYPE
9/21/2008	10	Customer Pickup	FOB Origin	09/21/2008	Regular

SHIPPED QUANTITY	SHIPPED PACKAGING	HM	DESCRIPTION	NET WEIGHT (LB)	GROSS WEIGHT (LB)	FRT CLASS
1	1.00 e Package		Contains: Cutting Fee - Sulfuric Acid SV2002-EACH	1.00	1.00	
3,271	1.00 Gal 1 Cargo Tank (Gal)	X	Sulfuric Acid Class 8, RQ UN 1830,PG II, RQ (Sulfuric Acid) ERG 137 Contains: Sulfuric Acid 93% CM5129-1GBulk Product Remarks: NET WT / 15.2891 = GALLONS FOR CHEMICAL EMERGENCY - Spill, Leak, or Accident **CALL CHEMTREC - 800 - 424 - 9300**	~~50,000.00~~ 46920	~~50,000.00~~ 77620	70

NOTICE: On arrival of shipment examine product. Report any variations to our shipping office immediately. Any damage to container or product should be noted by the agent.

Signature of consignee

This is to certify that the above-named materials are property classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulation of the Department of Transportation.

Earl Mast Signature

If the shipment moves between two ports by a carrier by water, the law requires that the bill of lading shall state whether it is "carrier's or shipper's weight".

Shipper's imprint in lieu of stamp; not a part of bill of lading approved by the Interstate Commerce Commission.

RECEIVED, subject to the classifications and lawfully filed tariffs in effect on the date of the issue of this Bill of Lading, the property described above in apparent good order, except as noted (contents and condition of contents of packages unknown), marked,consigned, and destined as indicated above which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or property over all or any portion of said route to destination and as to each party at any time interested in all or any said property, that every service to be performed hereunder shall be subject to all the bill of lading terms and conditions in the governing classification on the date of shipment.

Shipper hereby certifies that he is familiar with all the bill of lading terms and conditions in the governing classification and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

SHIPPER	CARRIER
Shipper [signature]	PLACARDS OFFERED DRIVER PLEASE INITIAL. JGS PLACARDED ☑ NAME OF PLACARD UN1830
PER Permanent Post Office Of Shipper	AGENT BTI
Seal #(s): 1217.	PER [signature] TOTAL NO. OF PACKAGES REC'D.

AUTHORIZED SIGNATURE

ALTIVIA 9390.

132317.

LTIVIA
632 HAD-EN HOUSTON TX.
USTOMER Skyhawk

NO. 46660
DATE 09 21 08
TIME 7:53 AM

VEHICLE ID 4448

GROSS	77620	lb
TARE	30700	lb (1)
NET	46920	lb

ALTIVIA
1100 Louisiana Suite 3160
Houston, TX 77002
Tel: 713-658-9000
Fax: 713-658-0102

ALTIVIA

QUALITY CONTROL DEPARTMENT

CERTIFICATE OF ANALYSIS

ORDER NUMBER	BOL NUMBER	REPORT DATE	DATE OF MANUFACTURE	EXPIRATION DATE
132317	132317	09/19/2008	09/19/2008	12/18/2008

SHIP TO	P.O. NUMBER	RELEASE NUMBER
Skyhawk Chemicals, Inc.	07407	

PRODUCT CODE	PRODUCT NAME	PRODUCT LOT NUMBER
CM5129-1GBulk	Sulfuric Acid 93%	t93098-03

SPECIFICATION	SPECIFICATION VERSION	SPECIFICATION DATE	QUANTITY
ALTIVIA	0.1000	09/19/2008	

ANALYTICAL RESULTS		
VARIABLE	SPECIFICATION REQUIREMENT	TEST RESULT
Specific Gravity	1.8347 =< Value =< 1.8407	1.8364
Strength (%)	93.0 =< Value =< 95.0	93.5 %
REMARKS		

Truck ID: 5

Trailer ID: 4448

Seal #: 1217.

I certify that the above listed material has been supplied in accordance with the requirements of the purchase order and applicable specifications.

CERTIFIED CORRECT BY:

QUALITY CONTROL

Application For Employment
Solicitud de Empleo

We consider applications for all positions without regard to race, color, religion, creed, sex, national origin, disability, sexual orientation, citizenship status or any other legally protected status. Aceptamos solicitudes para todas las posiciones sin tomar en cuenta raza, color, religión, credo, sexo, nacionalidad, incapacidad, orientación sexual, estado de ciudadanía, o cualquier otro estado protegido legalmente.

(PLEASE PRINT/SIRVASE ESCRIBIR EN LETRAS DE MOLDE)

Position(s) Applied For/Puesto(s) que solicita	Date of Application/Fecha de la Solicitud
PROCESS OPERATOR	12 AUGUST 2008

How Did You Learn About Us?/¿Cómo se enteró sobre nosotros?

☐ Advertisement/Anuncio ☐ Employment Agency/Agencia de Empleo ☐ Inquiry/Vino por su cuenta
☐ Relative/Pariente ☑ Friend/Amigo ☐ Other/Otro _____

Last Name/Apellido(s)	First Name/Nombre(s)	Middle Name
RENFRO SR.	ATHOAN	LAMOON

Address/Dirección Number/Número Street/Calle City/Ciudad State/Estado Zip Code/Código Postal

(b) (6)

Telephone Number(s)/Numero(s) de Teléfono | Social Security Number/Numero de Seguro Social (voluntary)

(b) (6)

Best time to contact you at home is: La mejor hora para comunicarse con usted en casa es: ..... 18:00 AM PM

If you are under 18 years of age, can you provide required proof of your eligibility to work? .....
Si es menor de 18 años, ¿puede proveer las pruebas requeridas sobre su elegibilidad para trabajar?.... ☐ Yes/Sí ☐ No

Have you ever filed an application with us before? ¿Ha solicitado empleo en esta empresa anteriormente? ☐ Yes/Sí ☑ No

If Yes, give date _____ En caso afirmativo, indique la fecha _____

Have you ever been employed with us before? ¿ Ha trabajado en esta empresa anteriormente? ..... ☐ Yes/Sí ☑ No

If Yes, give date _____ En caso afirmativo, indique la fecha _____

Do any of your friends or relatives, other than spouse, work here? .....
¿Trabaja en esta empresa algún amigo o familiar? ..... ☐ Yes/Sí ☑ No

Are you currently employed? ¿Trabaja actualmente?..... ☑ Yes/Sí ☐ No

May we contact your present employer? ¿Nos autoriza a ponernos en contacto con su empleador actual? ☑ Yes/Sí ☐ No

Are you prevented from lawfully becoming employed in this country because of Visa or Immigration Status
¿Tiene prohibido trabajar legalmente en este país a causa de su situación de inmigración o visa?
Proof of citizenship or immigration status will be required upon employment. .....
Si se le contrata se le pedirá prueba de ciudadanía o situación de inmigración. ..... ☐ Yes/Sí ☑ No

What is your desired salary range? (b) (6) ¿Cual es el alcance de su salario deseado? _____

Date available for work/¿En qué fecha estará disponible para trabajar? 08/25/08

Are you available to work:/¿Está disponible para trabajar:

☑ Full-Time/Tiempo Completo ☑ Part-Time/Tiempo Parcial ☐ Temporary/Temporario

Are you currently on "lay-off" status and subject to recall?
¿Está actualmente en despido temporal y sujeto a que lo vuelvan a emplear?. ☐ Yes/Sí ☑ No

WE ARE AN EQUAL OPPORTUNITY EMPLOYER/ESTA FIRMA OFRECE IGUALDAD DE OPORTUNIDAD DE EMPLEO

NAME/NOMBRE: ATHOAN L. RENFRO SR. POSITION/PUESTO: _____ DATE/FECHA: 08/12/08

Education/Educación

	Name and Address of School *Nombre y Dirección de Escuela*	Course of Study *Curso de Estudios*	Number of Years Completed *Número de Años Terminados*	Diploma/Degree *Titulo o Diploma*
Elementary School *Escuela Primaria*	LUCIAN L. LOCKHART SOUTHMORE BLVD. HOUSTON, TX. 77004	BASIC ELEMENTARY EDUCATION	6	
High School *Escuela Secundaria*	JACK YATES HIGH SCH. 3703 SAMPSON HOUSTON, TX.	HIGH SCHOOL EDUC.	4	HIGH SCHOOL DIPLOMA HONORS CURR.
Undergraduate College *Universidad de Pregrado*				
Graduate/Professional *Posgrado/Profesional*				
Other (Specify) *Otro (Especifique)*	BROOKE ARMY MED. CTR. SAN ANTONIO, TX.	MEDICAL FIELD (U.S. ARMY)	2	A.I.T. CERTIFIED 91-ALPHA

Describe any specialized training, apprenticeship, skills and extra-curricular activities.
Describa su capacitación especializada, aprendizaje, destrezas y actividades extracurriculares.

CONFINED SPACE TRAINED (PERMIT REQUIRED)
FULL FACE RESPIRATOR (FIT TESTED/QUALIFIED) RESP. PROTECTION
MEDIC FIRST AID - CPR CERTIFIED
CERTIFIED FORKLIFT OPERATOR FROM TWO TON TO FIFTEEN TON OPERABLE
HAZWOPER, HAZCOM, CONTROL OF HAZARDOUS ENERGY QUALIFIED
35 TON TO 90 TON CERTIFIED CRANE OPERATOR/RIGGER CERTIFIED
ABILITY TO NOT ONLY OPERATE A POSITIVE DISPLACEMENT PUMP, CENTRIFUGAL PUMP, WARMAN AND VAUGHN TRASH PUMPS WHICH ALSO INVOLVES THE REPAIRING THEREOF.
HANDLING OF AND PROPER SAMPLING TECHNIQUES WHEN DEALING NATURALLY OCCURRING RADIOACTIVE MATERIALS IN A LAB AND FIELD ENVIRONMENT

Describe any job-related training received in the United States military.
Describa la capacitación especializada relacionada con el empleo que haya recibido de las fuerzas armadas de los Estados Unidos.

MEDIC FIRST AIDE = 91-ALPHA
COMBAT MEDIC = 91-CHARLIE

BY BEING A CERTIFIED MEDIC IN THE U.S. ARMY (ACTIVE/RESERVE STATUS) HAS SHINED A MUCH BRIGHTER LIGHT ON "SAFETY" IN ITSELF SIMPLY BECAUSE IF ONE MAN IN CHARLIE 232ND MEDIC BATTALION IS HORSE PLAYING ON A 24 MILE ROAD MARCH AND HE HURTS HIMSELF IN THE PROCESS ONE MAN WILL HAVE TO BE LEFT BEHIND WITH HIM TO GIVE HIM AIDE.

Employment Experience/Experiencia Laboral

Start with your present or last job. Include any job-related military service assignments and volunteer activities. You may exclude organizations which indicate race, color, religion, gender, national origin, disabilities or other protected status.
Indique primero su empleo actual o su último empleo. Incluya las actividades de servicio militar relacionadas con su empleo y las actividades como voluntario. Está autorizado a excluir las organizaciones que indiquen su raza, color, religión, género, origen nacional, sus incapacidades físicas o mentales o cualquier otra condición protegida por la ley.

1.
Employer/Empleador: NEW PARK ENVIRONMENTAL INC.
Address/Dirección: 26462 WILBER ROAD WINNIE, TX. 77665
Telephone Number(s)/Número(s) de teléfono: 409.394.3455
Job Title/Titulo del Empleo: SITE MANAGER
Supervisor/Supervisor: TERRY VISRINE
Reason for Leaving/Motivo por el Cual Dejó su Empleo: BETTER FAMILIES LIVING CONDITION, BETTER CHANCE OF ADVANCEMENT
Dates Employed/Fechas de Empleo: From/Desde 11/1994 To/Hasta PRESENT DAY
Hourly Rate/Salary/Paga por Hora/Sueldo: Starting/Inicial (b) (6) Final
Work Performed/Trabajo Realizado: HANDLES ALL FACETS OF BEING A SITE MGR FROM SHIPPING/RECEIVING TO NORM DISPOSAL. WORK CLOSELY W/ THE MAIN OFFICE IN REGARDS TO SAFETY ROLES BEING FOLLOWED OUT THROUGHLY

2.
Employer/Empleador: EAS CARE COMMUNITY LIVING CORP
Address/Dirección: 3255 EXECUTIVE BLVD. BMT, TX. 77705
Telephone Number(s)/Número(s) de Teléfono: 409-842-0559
Job Title/Titulo del Empleo: —
Supervisor/Supervisor: BETTY BASHAR
Reason for Leaving/Motivo por el Cual Dejó su Empleo: MORE MONEY AND ROOM FOR ADVANCEMENT
Dates Employed/Fechas de Empleo: From/Desde 06/1994 To/Hasta 11/1994
Hourly Rate/Salary/Paga por Hora/Sueldo: Starting/Inicial (b) (6) Final
Work Performed/Trabajo Realizado: ADMINISTERED TO THE MENTALLY AND PHYSICALLY CHALLENGED IN A HOME SETTING. ACQUIRED A NEW OUTLOOK ON OTHERS WHICH MAY BE CHAL.

3.
Employer/Empleador: U.S. ARMY (FORT L.W. MISSOURI/FORT POLK/FORT SAM HOU
Address/Dirección: VARIOUS FORTS DURING 4 YEAR TOUR OF DUTY
Telephone Number(s)/Número(s) de Teléfono: VARIED AS WELL
Job Title/Titulo del Empleo: SPEC-4
Supervisor/Supervisor: VARIOUS OFFICERS
Reason for Leaving/Motivo por el Cual Dejó su Empleo: HONORABLE MEDICAL DISCHARGE/END OF TOUR OF DUTY
Dates Employed/Fechas de Empleo: From/Desde 06/1988 To/Hasta 04/1992
Hourly Rate/Salary/Paga por Hora/Sueldo: (b) (6)
Work Performed/Trabajo Realizado: BASIC TRAINING WAS FILLED WITH STUFF/SO SESSIONS FROM HOW TO SIMPLY FIRE A M-16A1 RIFLE TO A TOURNIQUET ON AN INDIVIDUALS LIMB THAT MAY NOT BE ABLE TO BE REATTACHED. HOSPITAL (MY ROLE) TRIAGE NURSE

4.
Employer/Empleador: SWEDES PLACE
Address/Dirección: WASHINGTON COUNTY, TX. HWY 60
Telephone Number(s)/Número(s) de Teléfono: N/A
Job Title/Titulo del Empleo: A.M./BARTENDER
Supervisor/Supervisor: TRUMANN SWEDA
Reason for Leaving/Motivo poe el Cual Dejó su Empleo: REUNITED W/ MY WIFE AND KIDS
Fechas de Empleo: From/Desde 06/1993 To/Hasta 05/1994
Hourly Rate/Salary/Paga por Hora/Sueldo: Starting/Inicial (b) (6) Final
Work Performed/Trabajo Realizado: RAN AN ENTIRE NIGHT CLUB WITH A CAPACITY OF 300 PEOPLE. PLACE ORDERS, ENFORCES ALL RULES, MAINTAINED LOT OF ACRE WHERE CLUB WAS LOCATED

If you need additional space, please continue on a separate sheet of paper
Si necesita más espacio continue en otra hoja de papel

List professional, trade, business or civic activities and offices held. Indique los puestos profesionales, vocacionales, comerciales o cívicos que haya ocupado, o las actividades de este tipo que haya realizado.
You may exclude membership which would reveal gender, race, religion, national origin, age, ancestry, disability or other protected status / Está autorizado a excluir la participación que revele su sexo, raza, religión, origen nacional, edad, ascendencia, incapacidad física o mental, o cualquier otra condición protegida por la ley:

Additional Information/Información Adicional

Other Qualifications/Destrezas y Calificaciones Especiales

Summarize special job-related skills and qualifications acquired from employment or other experience.

Resuma las destrezas y calificaciones, o cualquier otro tipo de experiencia, que haya adquirido en otros empleos y que estén relacionadas con el empleo que solicita.

WORKING AS FOURTEEN YEAR TENIOR W/NEW PARK I LEARNED HOW TO TROUBLE SHOOT REPAIR REBUILD AND SIMPLY REPLACE CENTRIFUGAL PUMPS, VAUGHN TRASH PUMPS, WARMAN PUMPS AND ALSO GATOR PUMP (TRASH) AND ALL 4 PUMPS IT ALSO INCLUDES REPLACING MECHANICAL SEALS AND BEARINGS.

Specialized Skills/Destrezas Especializadas (Check Skills/Equipment Operated/Marque sus Destrezas o Equipos que Puede Operar)

		Production/Mobile Machinery (list) Maquinaria	Other (list) Otro (indique)
___ Terminal	___ Spreadsheet	55 TO 90 TON CHERRY PICK.	BALL MILL GRINDING UNIT
___ PC/MAC	___ Word Processing	SEATRAK 1750-D	BUCKET ELEVATOR
✓ Typewriter	___ Shorthand	KOMATSU PC-250	WASHER
WPM 25-30	WPM ___	CASE 586 E FORKLIFT	D-6 DOZER FORKLIFT 15 TON CAT SKIDSTEER

State any additional information you feel may be helpful to us in considering your application.
Indique cualquier información adicional que considere que nos sería útil para evaluar su solicitud.

VERY DRIVEN TO ACCOMPLISHE ANY TASK GIVEN REGARDLESS IF THERE'S NOT ADEQUITE TOOLS TO ACHEIVE THE GOALS AT HAND. SELF STARTER, MOTIVATED, ONE OF THE DRIVING FORCES BEHIND AN UNBLEMISHED 8 YEAR TRACK W/OUT A LOST TIME ACCIDENT. ABILITY TO CONFORM AND MAKE NECESSARY ADJUSTMENTS DESPITE TIME, WEATHER AND CIRCUMSTANCES

Note to Applicants: DO NOT ANSWER THIS QUESTION UNLESS YOU HAVE BEEN INFORMED ABOUT THE REQUIREMENTS OF THE JOB FOR WHICH YOU ARE APPLYING.

Can you perform the essential functions of the job, for which you are applying, either with or without a reasonable accommodation? A review of the activities involved in such a job or occupation has been given.

☑ YES ☐ NO

Nota para el solicitante: NO CONTESTE ESTA PREGUNTA A MENOS QUE LE HAYAN INFORMADO SOBRE LOS REQUISITOS DEL EMPLEO QUE SOLICITA.

¿Puede ejecutar de manera razonable las actividades que debera realizar en el empleo u ocupación que solicita? Se adjunta una descripción de las actividades a realizarse en dicho empleo u ocupación.

☐ SI ☐ NO

References/Referencias

1. CLIFFORD HARDY (Name/Nombre) (b) (6) [redacted] (Address/Dirección) (b) (6) [redacted] Phone #/Número de Teléfono
2. MELVIN HOBERT (Name/Nombre) (b) (6) [redacted] (Address/Dirección)
3. MICHEAL CLOONEY (Name/Nombre)

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PARA USO EXCLUSIVO DEL DEPARTAMENTO DE PERSONAL

Position(s) Applied For Is Open:
El puesto que se solicita está disponible: ☐ *Yes/Sí* ☐ *No*

Position(s) Considered For:/Puesto(s) para el (los) cual(es) se considera:

_____

_____

Date/Fecha _____

NAME/NOMBRE: Athena L. Rowles POSITION/PUESTO: _____ DATE/FECHA: 08 / 12 / 08

Athean L. Renfro
(b) (6)

OBJECTIVE

To obtain a position that would utilize my knowledge, experience and personal qualities to aide in achieving the goals set to make a positive contribution to this company.

EMPLOYMENT HISTORY

January 1994 to Present

Newpark Environmental Services L.L.C.
Winnie, TX
Facility Site Manager

Supervise 12 employees in the treatment and disposal of Naturally Occurring Radioactive Material (NORM) in compliance with state regulations. Create on the job training programs for all employees. Development and implement new guidelines for establishing health and safety parameters in regulatory compliance and liability prevention. Coordinate and delegate responsibilities to maintain the most safe, effective and efficient way to perform daily operations. Ensure all procedures and guidelines are maintained and followed safely. Assist Radiation Safety Officer to perform all laboratory operations.

ACCOMPLISHMENTS

United States Army
Fort Leonardwood, Missouri
Granted an honorable medical discharge which fulfilled my eight year enlistment

CERTIFICATIONS

Hazwooper Certification
Heavy Eqiupment Operators Certification
Radiation Safety Officer State Certification
Transportation of NORM Certification
Confined Space and H2S Awareness Training
35 Ton/50 Ton Operators Certification
Adult First Aid/CPR Certification

EDUCATION

Jack Yates Sr. High School
Houston, TX
Basic Studies

Brook Army Medical Center for A.I.T.
Fort Leonardwood, MO
Advanced medical field training. Obtained an advanced knowledge of methods and procedures for field hospital environment.

REFERENCES AND RECOMMENDATIONS

Available Upon Request

sell as is

① Palletize all full drums of Afton Hitech 5789 (factory Packaged) – Segregate in a Row 3 high, ~~single Rows~~ 2 wide
good pallets only (no missing boards)
* we will sell as is after removing all labels but stencil with "H 5789"
Stencil on side and top

3062 Octane Booster Set acid

② Segregate all fuel additives (should say "fuel Additives") or Infinium f--- will also be thin
into rows 3 high, 2 wide
* These will be bulked and sold to Jack as diesel fuel Additive

Cetane set ac

③ ~~Segregate 5715 to sell as is → Stencil H 5715 on top~~
~~this is already done~~

HITEC ~ 9000 Series Segregat

④ Make one huge area for segregation of all VI Improvers. These will need to be heated and bulked for sale. this is All Afton 5700 Series drums
Also any drums that have a sweet smell (like motor oil) → low end VI market for $1/gal.

⑤ Segregate all factory pack Afton VI 5711 to be sold as is, stencil as H 5711

608
680
7411
5751
5751
680
7411
57777
5761
5751
514
514
57777D
5708
619A
637
5756
577D
521
4238
5750
5736
57777
521
5708
57777D
577D
Fatty Acid

Fatty Acid
6416
1921
Infineum M7188
Infineum M7188
7160
7160
Infineum F7589
Infineum F7589
Infineum T4180
Infineum F7589
7160D
Mineral oil 150
Infineum R541
8053
6431
6431
Tec Gard 265
1921
1921
6446
059
6803
466
466
Infineum C9404
Infineum R1683
7411
Tec 260
619A
Mineral oil 150
?
Specialty Cub Add
5708

57777D
Tec 265
Tec 265
Tec 265
Tec 265
5708
7411
5733
5710A
5785H
559
?
?
Tec 260
Tec 260
Infineum C9404
Infineum C9404
466
5724
059
059
1919
washoil
Infineum 6901
6158
5708
7411
7411
5756
5756
6431
6431
57777D

X15508
5754
5754
Infineum C9404
Infineum C9404
9227A
9227A
648
9227A
1919
1919
9227A
57777D
9325
614
washoil
washoil
6456
Infineum 57589
Infineum C9404
6403
578514
5751
Infineum F7589

LSC-Kingwood
20000 Kingwood Dr.
Kingwood, TX 77339

Receipt: 001685997

Received From: Td Luce

Date of Receipt
06/23/09

Payment For	Tasha Luce		09/FA	843.00
Mastercard	4765		843.00	
Total:			843.00	

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
Green Drum	CC flush			46	Drums
~~H~~	~~5710~~			III	Drum
~~H~~	~~9227~~			III	Drum
H	7099			I	Drum
H	674			I	Drum
~~H~~	~~5714~~			II	Drum
~~H~~	~~1211~~			I	Drum
H	5739			I	Drum
~~H~~	~~5910~~			I	Drum
~~H~~	~~6422~~			~~IIII~~ II	Drum
H	7164			I	Drum
~~H~~	~~466~~			I	Drum
~~H~~	~~6560~~			I	Drum
~~H~~	~~5724~~			I	Drum
~~H~~	~~059~~			I	Drum
~~H~~	~~4103~~			I	Drum
~~H~~	~~5789~~			II	Drum
~~H~~	~~7050~~			III	Drum
~~H~~	~~5940~~			I	Drum
~~H~~	~~5708~~			I	Drum
~~H~~	~~5736~~			I	Drum
~~H~~	~~9300~~			I	Drum
~~H~~	~~9227~~			~~IIII~~ I	Drum
H	9325			I	Drum
H	1204			I	Drum

269 Pal

2

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
	Infineum	P5169			1
	Infineum	F7589			1
→	[redacted]				
	Infineum	C9402			1
	Infineum	T4180			1
	Infineum [redacted]	NF5800			[redacted] Drums [redacted]37
	Infineum	C9404			[redacted]8 Drums
→	[redacted]				
	Infineum	C9208			1
	Infineum	T4448			1
	Infineum	PX18			1
	X	15663		For R and D use only	1
→	[redacted]				
	Grade [redacted]	T-1800			
		552GP			
		9300			
		[redacted]			
→	[redacted]	6560			
	[redacted]	5708			
	[redacted]	5708			
	[redacted]	5708			
		5708			
		5708			
		5708			
		[redacted]5708			
→	[redacted]	5708			
	[redacted]	9325			
	[redacted]	9325			
	[redacted]	5711			
		[redacted]9325			
		1919			
		1268			
		5727			
		6410			

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
	466	4		5708	4566
	3333	1		5708	6411
	5774	2		1932X	6431
	~~466~~	0		1931X	7411
	5708			5747	5708
	5777			[redacted] 5777D	5708
	5708			5777D	5788
	5708			5747	4103
	6560 C			5756	4140 A
	3062			6560C	4140 A
	5708			4858	5777
	5708			6456	6560 C
	9300			6431	5751
	6560			6560 C	6560
	7012			6530P	6560 C
	5708			5777	Pour Point Depressant 500
	[redacted] 5785			3062	[redacted] 5747
	7050			5785H	5754
	7050			5785H	6560
	5785H			5777	5708
	5785H			5777	4238
	5708			5708	5708
	5777D			5708	5708
	5756			5777	5714
	5756			[redacted] 5751	5708
	6431			5786	5708
	3062			5777D	4238
	5750			5777D	5710
	5750			5714	5724
	5774			5714	5724
	5751			5756	5710
	5751			6431	5751
	5724			5751	5751
	4140 A			5708	5751
	7050			5747	6560 C
	5785H			5747	5788
	6560			5708	5724
	4103			5747	5724
	~~466~~			5751	5724
	~~466~~			5708	5777
	9325			5747	5751
					4238 6560
					4238
					4140A
					5756
					5756

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3062
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4140A
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5751
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675
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6303
675
5777
6560
1919
5750
5747
5750

1921
7411
GA2217
TecGard 250
X15742
559
6456
5747
5756
4103
9325
9325
3191
5710
9300
5747
5710
5708A
5708A
5708A
5708A
5777
466
6456
7411
5706
6403
5324
5777
5710A
5739
9325

5777
7411
7411
6530P
5747
5750
5739
8053
3053
5708A
TecGard 235
TecGard 235
7169
Wash oil
5769
5727
[redacted] 5708
521
5708
5738
570P
9300
5751
521
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5785H
5774
5774
9325
5774
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TecGard 235
TecGard 235
514
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5751
5777
1463C
Wash oil
514
514
5710
5777
5777D
BioTec E85
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833
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6130
6130

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3191
3191
5708
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5708
686
5750
8774
5233
9325
7411
5777D
5769
5769
5769
5769
5785
5785
5739
466
614
614
614
614
5785H
9325
5785H
5739
Crank case D
644
055
514
6130
7050
6130
6130

EPAPA008001302

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
	H5789				
	H5789				
	H5789				
	H5789				
	H5789				
	H5789				
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	H6560				
	H6560				
	H6560				
	H6560				
	H6560				
	H6560				
	H6560				
	H6560				
	H6560				
	H7197				
	H7197				
	H7197				
	H7197				
	H7160D				
	H7160D				
	H7160D				
	H7160D				

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
H	5715				
H	5715				
H	5715				
H	5715				
H	5715				
H	5715				
H	5715				
H	5715				
H	5715				
H	5715				
H	5715				
H	5715				
H	7160 D	7160 D			
H	7160 D	7160 D			
H	7160 D	7160 D			
H	7160 D	7160 D			
H	7160 D	7160 D			
H	7160 D	7160 D			
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H	7160 D				
H	7160 D				

40

11
188
+ 18
206

212
14
226
17
243

59

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
1 H	7160 D '				
1 H	7160 D '				
1 H	7160 D '				
1 H	7160 D '				
1 H	7160 D '				
1 H	7160 D '				
1 H	7160 D '				
1 H	7160 D				
1 H	7160 D '				
1 H	7160 D '				
1 H	7160 D '				
1 H	7160 D '				
1 H	7160 D '				
1 H	7160 D '				
1 H	7160 D '				
1 H	7160 D '				
1 H	5715 '				
1 H	5715 '				
1 H	5715 '				
1 H	5715 '				
' H	5715 '				
1 H	5715 '				
1 H	5715 '				
1 H	5715 '				
1 H	5715 '				
1 H	5715 '				
1 H	5715 '				
1 H	5715 '				
1 H	5715 '				
1 H	5715 '				
1 H	5715 '				
1 H	5715 '				
1 H	5715 '				
1 H	5715 '				
1 H	5715 '				
1 H	5715 '				
1 H	5715 '				
1 H	5715 .				
1 H	5715 .				
1 H	5715 .				
H					

40

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action	
H	5708			[redacted] 卌	Pal	
H	5789			|||	Pal	
H	473C			卌	Drum	5
H	5711			[redacted] 卌 卌 卌 卌 卌	Drum	34
H	5777 D			卌	Drum	5
H	5710			||	Drum	2
H	1275			|	Drum	1
H	9325			|	Drum	1
I	7580			卌 卌 卌 卌 |	Pal	
I	2344			卌 卌 卌 |||	Pal	
I	7580			|||	Drum	3
I	4558			||	Drum	2
I	5315			|	Drum	1
H	5777			|	[redacted] Pal	
H	[redacted] 4566			|	Drum	1
H	5736			|	Drum	1
H	5754			|	Drum	1
D	500			|	Drum	1
H	7050			|	Drum	1
H	7186			|	Drum	1
H	8423			|	Drum	1
H	1921			|	Drum	1
H	5777D			[redacted] |	[redacted] Pal	
H	6560 C			||	Drum	2
H	5777			||	Drum	2
H	[redacted] 5777D			|||	Drum	3
H	5714			|	Drum	1
H	637			|	Drum	1
H	6431			|	Drum	1
Black Dr[redacted]	PAO 8			卌 卌 ||||	Pal	
Black Drums	Wash oil			||||	Pal	
Green Drums	PPD Flush			卌 卌 卌 ||	Pal	
Green Drum	PPD Flush			|||	Drum	3
H	5711			卌 卌 卌 卌 [redacted] |||	Drum	23
H	473C			卌 |||	Drum	8
H	5747			||	Drum	2
H	5708			|	Drum	1
H	5711			卌 卌 卌 ||	Drum	17
H	388			|	Drum	1
H	6130			|||	Drum	3
H	9300			|||	Drum	3

160
5
3
20
14
17

29
14
46

46
52

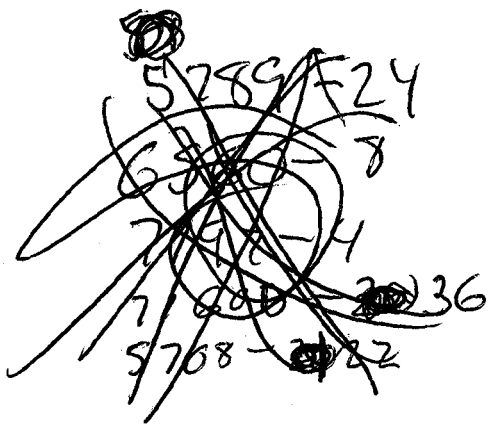
52
14
66

66
17
83

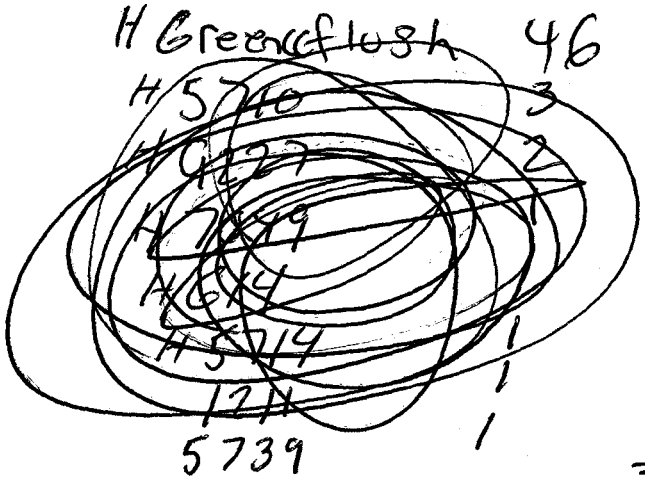
243
17
260

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
	Specialty Lube AD			IIII IIII IIII	Drum
	Mineral oil - 150			II	Drum
	Tec Gard 236			III	Drum
H	5751			II	Drum
H	6417			I	Drum
H	7411			I	Drum
H	466			I	Drum
H	5727			IIII IIII IIII	~~Drum~~ Pal
H	5708			IIII IIII	Pal
H	059			II	Drum
H	559			I	Drum
	mobil Stack 1122			III	Drum
H	7160 D			I	Drum
H	680			I	Drum
	Lubrizol 3046			IIII IIII IIII IIII IIII	Drum
H	5727			III	Drum
H	5708			I	Drum
H	5715			I	Drum
H	5755			I	Drum
H	C416			I	Drum
	Infineum C9404			II	Drum
H	5756			I	Drum
	C9463			I	Drum
H	5708			I	Drum
H	4238			I	Drum
H	5736 A			II	Drum
H	369			I	Drum
	948 oil flush			IIII	Drum
	PAO 6			II	Drum
H	5710 A			I	Drum
	~~5715A~~			~~II~~	~~Drum~~
H	C421			IIII	Drum
H	7050			II	Drum
H	5788			III	Drum
H	5738			I	Drum
H	7160 D			I	Drum
H	403 C			I	Drum
H	9345			I	Drum
H	5785			I	Drum
	Gear Per AD			III	Drum

Black without label



H Greenflush 46



5739

H 5710 – 3
H 9227 – 9
H 7049 – 1
H 614 – 1
H 5714 – 2
H 1211 1
H 5739 – 1
H 890 – 2
H 6421 – 7
H 1164 – 1
H 466 – 2
H 6560 – 1
H 5724 – 1
H 059 – 1
H 4103 – 1
H 5788 – 2
H 7050 – 3
H 5708 – 1
H 5738 – 1
H 9300 – 1
H 9325 – 1
H 1204 – 1

Specialty lube AD – 14
mineral oil – 150 – 2
Tec Gard 236 – 3

H5751 – 2
H6417 – 1
H7411 – 1

5727 –

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
3363	NEED LIST				
3364	NEED LIST				
3365	NEED LIST				
3366	NEED LIST				
3367	NEED LIST				
3368	NEED LIST				
3369	NEED LIST				
3370	NEED LIST				
3371	NEED LIST				
3372	NEED LIST				
3373	NEED LIST				
3374	NEED LIST				
3375	NEED LIST				
3376	NEED LIST				
3377	NEED LIST				
3378	NEED LIST				
3379	NEED LIST				
3380	NEED LIST				
3381	NEED LIST				
3382	NEED LIST				
3383	NEED LIST				
3384	NEED LIST				
3385	NEED LIST				
3386	NEED LIST				
3387	NEED LIST				
3388	NEED LIST				
3389	NEED LIST				
3390	NEED LIST				
3391	NEED LIST				
3392	NEED LIST				
3393	NEED LIST				
3394	NEED LIST				
3395	NEED LIST				
3396	NEED LIST				
3397	NEED LIST				
3398	NEED LIST				
3399	NEED LIST				
3400	NEED LIST				
3401	NEED LIST				
3402	NEED LIST				
3403	NEED LIST				

Row II 6

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
	5710			5774	5777
5714	[illegible]			5777	5777
5714	[illegible]			9300	Tec Gard 260
6431	[illegible]			1919	Tec Gard 260
5714	5710			9325	Tec Gard 260
5714	6511			[illegible]	Tec Gard 260
9325				[illegible]	GPA
5714				[illegible]	GPA
5711	6560C			[illegible]	GPA
6560C	[illegible]			[illegible]	GPA
5739	[illegible]			9300	5750
473C	[illegible]			9300	680
OLOA? 19075	[illegible]			521	Mineral oil-150
1275	[illegible]			1919	5724
PPD500	[illegible]			466	511
5786	[illegible]			5716	619A
4103	[illegible]			5751	466
Specialty Lub Add	[illegible]			5777	511
Waste oil	[illegible]			5777D	6459
Waste oil	[illegible]			5324	1974
→ waste oil	[illegible]			5324	1974
5708	[illegible]			5324	7021
5785H	[illegible]			5324	5708
6456	[illegible]			059	5708
5769	[illegible]			5777	5708
6456	[illegible]			5708	6560
5777D	[illegible]			[illegible] 5754	511
1275	[illegible]			7197	1275
1275	[illegible]			5739	Tec Gard 530
9300	[illegible]			552GP	Tec Gard 530
Infineum C9404	[illegible]			7411	Tec Gard 530
Infineum C9404	[illegible]			552GP	Tec Gard 530
Infineum C9404	[illegible]			Gear Performance	GPA
Infineum C9404	5756			[illegible]	511
511T				[illegible]	1275
5750				[illegible]	466
5750	[illegible]			Mineral oil 150	3437 Stock##
Infineum BP1099	[illegible]			5708	3122 Stock##
Infineum C9404	[illegible]			Gear Performance	4103
Infineum C9404	5751			6560	Mineral oil-150
Infineum C9404				Gear Performance	5785H
Infineum C9404	Infineum C9404				381
Infineum C9404					6456
Infineum C9404					6130
					6459
					7050

5724
7050
543
6403
5710
5710A
Infineum C9404
5755
4566
6431
5708
5777D
6423
344
5731
6560
6560
6560
5708
5708
5708
5708
659
659
659
4140A
5777
5777
5777
5777
5777D
6560C
5708
3062
6560

608 6416
680 1921
7411 Infineum M7188
5751 Infineum M7188
5751 7160
680 7160
680
7411 Infineum F7589
5777 Infineum F7589
5751 Infineum T4180
514 Infineum F7589
514 7160D
514
5777D Mineral oil ~150
5708 Infineum R541
619A Infineum R541
C37 6053
5756 6431
5777D 6431
521 TecGard 265
4238 1921
1921
~~5708~~ 5750 6446
5736 059
5777 6303
521 466
5708 466
5777D Infineum C9404
5777D Infineum R683
7411
Fatty Acid
Fatty Acid

Tec 260
619A
Mineral oil ~150
?
~~[redacted]~~
Specialty Club Add
5708
5777D
Tec 265
Tec 265
Tec 265
Tec 265
5708
7411
5733
5710A
5785H
559
?
?
?
Tec 260
Tec 260
Infineum C9404
Ifineum C9404
466
5724
059
059

Infineum G901

1919 6158
Wash oil 5708
7411
7411
5756
5756
6431
6431
5777D
Specialty Club Add X15508
5754
5754
Infineum C9404
Infineum C9404
9227A
9227A
648
9227A
1919
1919
9227A
5777D
9325
614
Wash Oil
Wash oil
6456
Infineum F7589
Infineum C9404
6403
5785H
5751
Infineum F7589

PACES Daily Job Plan (Operations/Lab/Warehouse)

25-Mar-09	Check when complete	Primary Responsibility	Secondary Responsibility
OPERATIONS			
strap all tanks and give to Suzi to enter into access		Cody	Ricky
transfer barge#7 comp. 3 into #26 comp. 3		Dennis	Mike
transfer barge#26 comp.1 into barge #26 comp. 2		Dennis	Mike
transfer barge #7 comp. 2 into #26 comp.2		Dennis	Mike
pick-up pressure washer at 7:00 and pressure wash the entire drive thru and the entire processing unit		Ricky	Mike
ship 6 loads of wastewater to Newpark (from frac tanks and ww tank)		Cody	Mike
repair lawn mower		Glen	Ricky
redrum leaky sludge drums, label and put beside wall		Kenny	
drip water into containment after leak is repaired and clean entire area. Once neutralized, this water can be sucked up and put into rv2		Ricky	Ricky
clean and organize around barge dock area		Dennis	
inspect all fire extinguishers to ensure they are current		Mike	
inspect all safety showers and eyewash stations and ensure they are clean		Kenny	
ensure breathing air stations are set up properly		Mike	Ricky
drain all water from the oily water separator into the w/w tanks (upon completion, oil will be sent to KTMEX tank 600)		Cody	Mike
absolutely no standing puddles anywhere in warehouse!!		all	
ensure that wall by the railroad tracks is neat orderly and all containers are labeled.		Kenny	
LABORATORY			
organize sample bins in lab		Brian/Ryan	Brian/Ryan
clean and organize lab and outside area including entrance		Brian/Ryan	
ensure fire extinguisher is in lab		Brian/Ryan	
titrate barge # 7 comp. 1,2,3. samples are in the lab.	X	Brian/Ryan	
MAINTENANCE			
work on transfer piping from bilge tank to rv1		Bo/Billy	Billy
continue working on old ows demolition		Bo/Billy	
clean and organize entire maintenance area		Bo/Billy	
gather all bottles and secure.(there are some in Glen's area as well		Bo/Billy	
fix barricade tape around holes in warehouse		Bo/Billy	
		Bo/Billy	
WAREHOUSE		Bo/Billy	
Dump trash cans around the facility into the trash box/ place cans in correct areas. (each trash drum spot should have a trash can and a spill Kit located right beside it		Tony	
police entire facility for all trash		Tony	
clean organize drum area and outside dock area		Tony	
blow warehouse with the air blower		Tony	
		Tony	

W/W ~~FROM~~ TANKS ~~to~~

Phone for Kenny

STRAPPING Chart for Caustic tank →

224/267 - W/W →

269 - Water Rag →

268 - Nash →

IN PRODUCT INVENTORY vessel, need New frac tanks and ISO tainer On Access

1 Quart sample of Cressylic!

		Tony	
		Tony	
mow grass -- around warehouse, front office, outside fenceline by road		Tony	Mike
Field services		Tony	
~~filter rain for rent box through filter pot and put into rv2~~ Solidify R4R Box		Tony	
~~transfer rain~~ for rent frac tank into red frac tank ~~with new manway on it.~~ Once emptied, this can get cleaned and taken off rent		Steve	
TRANSFER R4R FRAC TANK			
Once the plant is clean, You are responsible for keeping it this way. Everyone has an area that they are responsible for. This WILL be enforced. If you are unable to perform your job and keep the plant tidy, or unable to clean up immediately after a spill or a mess, please let me know so that we can help with whatever problems that you are having with doing this. It is critical that we take good care of this plant as we are planning to grow very rapidly here in the near future. Stepping over product puddles or handling valves and instrumentation with sludge all over them, or having trash sitting all over everything is something that e can correct without having to take any extra time. Everyone has become proficient at their jobs, no we need to use that same dedication to ensuring that we have a nice, orderly work environment.		All	
KEEP PLANT CLEAN AND ORGANIZED!!!		Everyone	

Miscellaneous Notes: **AIG WILL BE HERE THURSDAY FOR A**
EVERYONE IS WEARING THE

EPAPA00801315

$3{,}000\overline{)120{,}000}$

CHEMTEX

Environmental & Industrial Hygiene Services
3082 25th Street, Port Arthur, TX 77642
Phone: (409) 983-4575, Fax: (409) 982-1522
E-mail: chemtexpa@sbcglobal.net

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL
ANALYTICAL SERVICES REQUEST

CLIENT: CES Environmental Services **ATTN:** Mr. James Matlock	**ADDRESS:** 2420 S. Gulfway Dr. P.A., TX 77641	**Phone #:** 832-231-3035 **Fax #:**409-984-5558 **Email:** mbowman@cesenvironmental.com
BILLING CONTACT/ADDRESS: (If different from above)	**P. O. #:** / **PROJECT NO:** / **PROJECT:**	**SITE/LOCATION:** PACES
SAMPLE(S) COLLECTED BY (PRINT NAME): Jay Matlock	**Expected Turnaround Time** 2-4 hr Rush____ 24 hr Rush___ 48 hr Rush X 7-14days X	**REQUESTED ANALYSES**

Sample Matrix Codes: Drinking Water: **DW**; Groundwater: **GW**; Liquid Waste: **LW**; Oil(s): **O**; Paint Chips: **PC**; Sand: **Sn**; Sludge: **Sl**; Soil/Solid: **S**; Solid Waste: **SW**; Trip Blank: **TB**; Water: **W**; Wipes: **WP**; Wastewater: **WW**

CHEMTEX #	SAMPLE IDENTIFICATION	COLLECTION Date	COLLECTION Time	Sample Matrix	Composite/ Grab	Chemical Preservative	Sample Containers No.	Sample Containers Size (oz.)	Sample Containers Type (Glass/ Plastic)	Phenol "acid extractable"	2,4, Dimethyl phenol	o-cresol	m-cresol	p-cresol			
	Naphthenic Water	5-6-09	12:15p	WW	Grab		1	500ml	P	X	X	X	X	X			
	Sulfidic Water	5-6-09	12:15p	WW	Grab		2	500ml	P	X	X	X	X	X			

Remarks: Samples must be preserved on ice after sample collection and transported in ice chest. ☐ Regulatory ☑ Non-Regulatory

Relinquished By:	Date/Time:	Received By:	Date/Time:
Jay Matlock	5-6-09 1:25p	Lassee Laughlin	5/06/09 1:25pm
Relinquished By:	Date/Time:	Received By:	Date/Time:

Facilities also available at: 5544 Leopard St., Corpus Christi, TX 78408; (361)299-9900 chemtexcc@sbcglobal.net and 138 S. Cities Service Hwy., Sulphur, LA 70663 (337) 626-2121 chemtexlc@sbcglobal.net

NOTICE / DISCLAIMER: Client has asked Chemtex to perform the analyses listed above, on the samples described herein. Any analytical results, opinions or interpretations which may be provided to Client are based upon the information and material supplied by Client, for whose exclusive and confidential use a report will be made. No person or entity other than Client may rely on any such report. Any such reliance will be unjustified. Any person, other than Client, that reads or relies on any such report, does so at his or her own risk. Chemtex makes no warranty or representation, express or implied, of any type, and expressly disclaims same. Any report provided by Chemtex shall not be reproduced, in whole or in part, without the written approval of Chemtex. In no event shall Chemtex be responsible for any damage greater than the amount that it received for performing some or all of the analyses listed above

(b) (4)

[redacted]

CES Environmental Port Arthur Dispatch Board

FOR : Tuesday 7/7/2009

Job Note ID	Driver	Helper	Truck	Trailer	Misc Equipment	Customer	Job Description	Start Time	Job Length
88546		Houston Driver	2003	230		CES Environmental Services - Port Arthur	delivery of 52 drums of H5708, 11 drums of H5777, and 32 drums of H5711 to EGF Partners in Houston (make sure to get light and heavy weight tickets from driver)		
88472		DUPLICATE				CES Environmental Services - Port Arthur	haul loaded trailer to Evedale		
88172		HOUSTON DRIVER		234		Citgo Refinery	Load naphthenic caustic from Citgo in Lake Charles and haul to PACES. SEE INBOUND		1/3 Day
88473	Brown Leroy		285	261		CES Environmental Services - Port Arthur	haul loaded trailer to Evedale	2nd	1/3 Day
88471	Brown Leroy		285	261		CES Environmental Services - Port Arthur	haul loaded trailer to Evedale	3rd	1/3 Day
88642	Brown Leroy		285	261		CES Environmental Services - Port Arthur	haul loaded trailer to Evedale	630 am	1/3 Day
88469	Frias Juan		2003	420		CES Environmental Services - Port Arthur	haul loaded trailer to Evedale	3rd	1/3 Day
88470	Frias Juan		2003	420		CES Environmental Services - Port Arthur	haul loaded trailer to Evedale	630 am	1/3 Day
88475	Saylor Chris		2006	225		CES Environmental Services - Port Arthur	haul loaded trailer to Boise Cascade.	2nd	1/2 Day
88478	Saylor Chris		2006	225		CES Environmental Services - Port Arthur	haul loaded trailer to Evedale	600	1/3 Day
88579	Wilson Kevin		2004	237		Total Petrochemicals Inc.- Port Arthur, TX	p/u Naphthenic caustic as directed, haul to PACES**MUST BE ON TIME SEE INBOUND		1/4 Day
88474	Wilson Kevin		2004	254		CES Environmental Services - Port Arthur	haul loaded trailer to Boise Cascade.	2nd	1/2 Day

Report Printed 7/7/2009 7:17:13 AM

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225 Boise

EPAPA008001320

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
101	6416	400			CES Fuel Additive
3294	6416	406			
3590	6416	443			
22	6417	50			CES Fuel Additive
2	6421	331			CES Fuel Additive
3582	6421	445			
3583	6421	445			
70	6431	400			CES Fuel Additive
88	6431	400			CES Fuel Additive
3135	6431	400			
3574	6431	456			
3575	6431	456			
3576	6431	456			
3577	6431	456			
3578	6431	456			
3579	6431	456			
3580	6431	456			
3581	6431	456			
89	6456	191			CES Fuel Additive
3282	6456	400			
15	6560	305			CES Fuel Additive
26	6560	208			CES Fuel Additive
75	6560	400			CES Fuel Additive
82	6560	400			CES Fuel Additive
85	6560	400			CES Fuel Additive
87	6560	60			CES Fuel Additive
91	6560	400			CES Fuel Additive
94	6560	400			CES Fuel Additive
99	6560	400			CES Fuel Additive
100	6560	400			CES Fuel Additive
107	6560	400			CES Fuel Additive
1783	6560	401			
3078	6560	400			
3093	6560	400			
3116	6560	400			
3131	6560	400			
3157	6560	400			
3265	6560	400			
3276	6560	400			
3327	6560	400			
3588	6560	439			

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
3589	6560	439			
37	6638	164			CES Fuel Additive
98	7049	85			CES Fuel Additive
79	7050	171			CES Fuel Additive
80	7050	174	y		CES Fuel Additive
83	7050	126	y		CES Fuel Additive
105	7050	147	y		CES Fuel Additive
106	7050	400			CES Fuel Additive
108	7050	400			CES Fuel Additive
1782	7050	110			
3104	7050	400			
3274	7050	386			
3283	7050	127	Y		
3343	7050	128	Y		
1791	7169	414		WO	
1792	7169	414			
1342	7188	157	y		CES Fuel Additive
3320	7380	111	Y		
3321	7380	131	Y		
113	7411	400			CES Fuel Additive
114	7411	400			CES Fuel Additive
116	7411	227			CES Fuel Additive
121	7411	210	y		CES Fuel Additive
123	7411	400			CES Fuel Additive
1210	7411	298	y		CES Fuel Additive
1211	7411	243	y		CES Fuel Additive
1212	7411	147	y		CES Fuel Additive
1219	7411	400			CES Fuel Additive
1222	7411	198	y		CES Fuel Additive
1223	7411	166	y		CES Fuel Additive
1237	7411	400			CES Fuel Additive
1240	7411	165	y		CES Fuel Additive
1241	7411	170	y		CES Fuel Additive
1242	7411	400			CES Fuel Additive
1245	7411	400			CES Fuel Additive
3125	7411	400			
3146	7411	157	Y		
3147	7411	156	Y		
3148	7411	400			
3300	7411	400			
3302	7411	194	Y		

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
3303	7411	174	Y		
3316	7411	216	Y		
3318	7411	212	Y		
7	7476	95			CES Fuel Additive
81	8053	192			CES Fuel Additive
56	8703	202			CES Fuel Additive
34	8722	126			CES Fuel Additive
1221	8722	86			CES Fuel Additive
1236	8722	400			CES Fuel Additive
1248	8722	215	y		CES Fuel Additive
109	9300	443	y		CES Fuel Additive
110	9300	198	y		CES Fuel Additive
118	9300	140	y		CES Fuel Additive
119	9300	150	y		CES Fuel Additive
127	9300	144	y		CES Fuel Additive
128	9300	210	y		CES Fuel Additive
1202	9300	164	y		CES Fuel Additive
1203	9300	262	y		CES Fuel Additive
1214	9300	153	y		CES Fuel Additive
1215	9300	400			CES Fuel Additive
1224	9300	400			CES Fuel Additive
1225	9300	160	y		CES Fuel Additive
1226	9300	150	y		CES Fuel Additive
1227	9300	400			CES Fuel Additive
1228	9300	400			CES Fuel Additive
1229	9300	152	y		CES Fuel Additive
1235	9300	168	y		CES Fuel Additive
1238	9300	150	y		CES Fuel Additive
1239	9300	161	y		CES Fuel Additive
1247	9300	400			CES Fuel Additive
1253	9300	400			CES Fuel Additive
1301	9300	141	y		CES Fuel Additive
1302	9300	127	y		CES Fuel Additive
1303	9300	183	y		CES Fuel Additive
1304	9300	153	y		CES Fuel Additive
3122	9300	400			
3143	9300	400			
3268	9300	186	Y		
3269	9300	176	Y		
3270	9300	262	Y		
3271	9300	400			

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
3305	9300	276	Y		
14	9325	20			CES Fuel Additive
46	9325	123			CES Fuel Additive
111	9325	231	y		CES Fuel Additive
112	9325	143	y		CES Fuel Additive
117	9325	164	y		CES Fuel Additive
120	9325	163	y		CES Fuel Additive
124	9325	400			CES Fuel Additive
125	9325	130	y		CES Fuel Additive
126	9325	255	y		CES Fuel Additive
129	9325	159	y		CES Fuel Additive
1208	9325	400			CES Fuel Additive
1220	9325	160	y		CES Fuel Additive
1230	9325	195	y		CES Fuel Additive
1231	9325	167	y		CES Fuel Additive
1232	9325	400			CES Fuel Additive
1243	9325	180	y		CES Fuel Additive
1251	9325	154	y		CES Fuel Additive
1254	9325	400			CES Fuel Additive
3099	9325	210	Y		
3168	9325	266	Y		
3169	9325	249	Y		
3260	9325	142	Y		
3334	9325	150	Y		
3338	9325	400			
1761	15764				
1762	15764				
1767	15764				
1784	19215	410			
3151	?				
3152	?				
3153	?				
1809	1463C	414			
1836	1480C	414			
16	1910B	344			CES Fuel Additive
93	1910B	136	y		CES Fuel Additive
104	1910B	336			CES Fuel Additive
1793	2715J	414			
3115	2785H	152	Y		
1827	304 WO	414			
1937	317T	450			

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
1954	403C	401			
1799	428 WO	414			
3525	5227D	500			
77	552GP	400			CES Fuel Additive
3162	552GP	395			
3164	552GP	116	Y		
3165	552GP	129	Y		
59	5701A	371			CES Viscosity Modifier
863	5708A	86	y		CES Base Oil
865	5708A	76	y		CES Base Oil
31	5710A	304			CES Viscosity Modifier
902	5710A	399			CES Viscosity Modifier
666	5711E	408			CES Viscosity Modifier
667	5711E	408			CES Viscosity Modifier
711	5717D	171			CES Viscosity Modifier
3	5736A	395			CES Viscosity Modifier
200	5736A	178	y		CES Base Oil
201	5736A	172	y		CES Base Oil
413	5736A	137	y		CES Base Oil
40	5777D	247			CES Viscosity Modifier
133	5777D	163	y		CES Base Oil
163	5777D	375			CES Viscosity Modifier
164	5777D	158	y		CES Base Oil
234	5777D	208	y		CES Base Oil
236	5777D	375			CES Viscosity Modifier
242	5777D	200	y		CES Base Oil
254	5777D	375			CES Viscosity Modifier
255	5777D	128	y		CES Base Oil
300	5777D	135	y		CES Base Oil
301	5777D	105	y		CES Base Oil
326	5777D	75	y		CES Base Oil
327	5777D	163	y		CES Base Oil
387	5777D	153	y		CES Base Oil
397	5777D	400			CES Viscosity Modifier
403	5777D	173	y		CES Base Oil
419	5777D	115	y		CES Base Oil
434	5777D	375			CES Viscosity Modifier
455	5777D	400	y		CES Base Oil
457	5777D	400	y		CES Base Oil
491	5777D	375			CES Viscosity Modifier
492	5777D	400			CES Viscosity Modifier

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
515	5777D	96	y		CES Base Oil
590	5777D	400			CES Viscosity Modifier
635	5777D	375			CES Viscosity Modifier
636	5777D	233	y		CES Base Oil
637	5777D	200			CES Viscosity Modifier
648	5777D	400			CES Viscosity Modifier
697	5777D	375			CES Viscosity Modifier
763	5777D	199	y		CES Base Oil
765	5777D	79	y		CES Base Oil
766	5777D	375			CES Viscosity Modifier
814	5777D	400			CES Viscosity Modifier
815	5777D	135	y		CES Base Oil
843	5777D	10	y		CES Base Oil
844	5777D	17	y		CES Base Oil
871	5777D	171	y		CES Base Oil
872	5777D	135	y		CES Base Oil
883	5777D	135	y		CES Base Oil
884	5777D	94	y		CES Base Oil
904	5777D	375			CES Viscosity Modifier
913	5777D	175	y		CES Base Oil
950	5777D	100			CES Viscosity Modifier
955	5777D	220	y		CES Base Oil
956	5777D	213	y		CES Base Oil
1146	5777D	133	y		CES Base Oil
1147	5777D	375			CES Viscosity Modifier
1148	5777D	375			CES Viscosity Modifier
1149	5777D	137	y		CES Base Oil
1152	5777D	375			CES Viscosity Modifier
1153	5777D	200	y		CES Base Oil
1160	5777D	375			CES Viscosity Modifier
1165	5777D	337			CES Viscosity Modifier
1166	5777D	158	y		CES Base Oil
1167	5777D	155	y		CES Base Oil
1176	5777D	151	y		CES Base Oil
1177	5777D	145	y		CES Base Oil
1187	5777D	180	y		CES Base Oil
1188	5777D	183	y		CES Base Oil
3090	5777D	160	Y		
3091	5777D	127	Y		
3289	5777D	151	Y		
3290	5777D	130	Y		

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
3291	5777D	375			
3340	5777D	110	Y		
3341	5777D	100	Y		
3342	5777D	375			
804	5785A	400			CES Viscosity Modifier
3117	5785H	243	Y		
3126	5785H	400			
3127	5785H	159	Y		
3129	5785H	143	Y		
1833	615G WO	414			
1698	619A				
1735	619A				
1818	619A	414			
92	6421J	400			CES Fuel Additive
3587	6421J	445			
1797	648 WO	414			
1807	648 WO	414			
1815	648 WO	414			
84	6560J	400			CES Fuel Additive
102	6560J	400			CES Fuel Additive
1819	7169 WO	414			
1798	7408 WO	414			
1800	7408 WO	414			
1801	8053 WO	414			
1806	8700 WO	414			
3519	9227A	500			
3520	9227A	500			
3521	9227A	500			
3522	9227A	500			
3523	9227A	500			
3524	9227A	500			
3526	9227A	500			
3527	9227A	500			
3528	9227A	500			
1710	CPA				
1736	CPA				
1780	CPA				
421	fatty acid	120	y		
424	fatty acid	40%	y		
425	fatty acid	136	y		
506	fatty acid	400	y		

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
507	fatty acid	300	y		
669	fatty acid	400			
728	fatty acid	127			
742	fatty acid	330			
3170	Gear Performance				
3171	Gear Performance				
3172	Gear Performance				
3173	Gear Performance				
3174	Gear Performance				
3175	Gear Performance				
3176	Gear Performance				
3177	Gear Performance				
3202	Gear Performance	403			
3203	Gear Performance	403			
3204	Gear Performance	403			
3205	Gear Performance	403			
3218	Gear Performance	421			
3220	Gear Performance	421			
3221	Gear Performance	421			
3223	Gear Performance	325			
3224	Gear Performance	325			
3225	Gear Performance	325			
3226	Gear Performance	403			
3229	Gear Performance	403			
3232	Gear Performance	403			
675	GPA	1/5 full			
1689	GPA				
1690	GPA				
1691	GPA				
1692	GPA				
1697	GPA				
1699	GPA				
1701	GPA				
1702	GPA				
1703	GPA				
1704	GPA				
1712	GPA				
1713	GPA				
1714	GPA				
1715	GPA				
1716	GPA				

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
1717	GPA				
1718	GPA				
1719	GPA				
1720	GPA				
1721	GPA				
1722	GPA				
1723	GPA				
1724	GPA				
1725	GPA				
1726	GPA				
1727	GPA				
1728	GPA				
1731	GPA				
1732	GPA				
1734	GPA				
1748	GPA				
1754	GPA				
1756	GPA				
1771	GPA				
1772	GPA				
1777	GPA				
1778	GPA				
282	IA891U	400		Fuel Additive	CES Fuel Additive
196	Missing label	189			
3347	n-decanal				
371	**NEED LIST**	400			
3348	**NEED LIST**				
3349	**NEED LIST**				
3350	**NEED LIST**				
3351	**NEED LIST**				
3352	**NEED LIST**				
3353	**NEED LIST**				
3354	**NEED LIST**				
3355	**NEED LIST**				
3356	**NEED LIST**				
3357	**NEED LIST**				
3358	**NEED LIST**				
3359	**NEED LIST**				
3360	**NEED LIST**				
3361	**NEED LIST**				
3362	**NEED LIST**				

[redacted]

F7580 - 88
F7589 - 12

[redacted]

RACI access management

	Responsible	Accountable	Confirm	Inform	
current trailer inventory	Lab tech	Log. Manager	Prod. Coord.	Prod. Manager	
Tank Inventory	operator	Prod. Coord.	Prod. Manager	plant manager	
Offsite tank inventory	plant manager	plant manager	plant manager	Log. Manager	
Process facility main form	Lab tech	lab manager	Prod. Manager	plant manager	
NaSH calculation NaHS and Na2S list	Lab tech	lab manager	Prod. Coord.	Prod. Manager	
Sulfidic Caustic Batch process (new record)	Lab tech	lab manager	Prod. Coord.	Prod. Manager	
Sulffidic Caustic batch process list	Lab tech	lab manager	Prod. Coord.	Prod. Manager	
Napthenic Caustic Batch process (new record)	Lab tech	lab manager	Prod. Coord.	Prod. Manager	
Napthenic Caustic Batch process list	Lab tech	lab manager	Prod. Coord.	Prod. Manager	
dispatch board/ efficiency	Log. Manager	Log. Manager	Prod. Manager	plant manager	

EPAPA00800133

EMPLOYEE PHONE EXTENSIONS					
101	Juanita Thomas	123	Main Conference Room	145	
102	Kara Disney	124	Main Breakroom	146	
103	Jeff Thomas	125	Matt Bowman	147	
104		126	Melisa Garza	148	
105	Melba Stephens	127		149	Jay Matlock
106		128	Greg Bowman	150	
107	Jenny Rust	129	Sam Brown	151	
108	Kim Harmon	130	Houston Lab	152	
109	Noelia Barajas	131	Clint Hopkins	153	Brian Weathers
110	Javier Rodriguez	132	Miles Root	154	Matt Bowman (PA)
111	Al Longoria	133	Tankwash	155	Melisa Garza (PA)
112	Morgan MacCarley	134		156	Bo Cumberland
113	Joe Camp	135	Tankwash Breakroom	157	
114	Prabhakar Thangudu	136		158	
115		137	Scott Shimer	159	
116	Shannon Ward	138		160	
117		139	Steve Stricker	161	
118	Dan Bowman	140		162	
119	Dana Carter	141	Clark Hickman	163	
120	Gary Brauckman	142	Maintenance Shop	164	
121	Joy Baker	143	Parts Room	165	
122	Anissa Wright	144		166	

CES Environmental Port Arthur Dispatch Board

FOR : Tuesday 6/16/2009

Job Note ID	Driver	Helper	Truck	Trailer	Misc Equipment	Customer	Job Description	Start Time	Job Length
87661	Brown Leroy	InRoute	299	267		CES Environmental Services - Port Arthur	haul loaded trailer to Evedale	2nd	1/3 Day
87660	Brown Leroy		299	267		CES Environmental Services - Port Arthur	haul loaded trailer to Evedale	3rd	1/3 Day
87662	Brown Leroy	Done	299	267		CES Environmental Services - Port Arthur	haul loaded trailer to Evedale	630 am	1/3 Day
87658	Frias Juan		2003	266		CES Environmental Services - Port Arthur	haul loaded trailer to Evedale	2nd	1/3 Day
87659	Frias Juan	InRoute	2003	266		CES Environmental Services - Port Arthur	haul loaded trailer to Evedale	630 am	1/3 Day
87786	Gipson Jack	In Route	273	225		CES Environmental Services - Port Arthur	load wastewater and haul to np make sure driver looks for batch ID	1000	1/4 Day
87812	Mendoza Juan	InRoute	2001	419		CES Environmental Services - Port Arthur	load wastewater and haul to np make sure driver looks for batch ID	2nd	1/4 Day
87683	Mendoza Juan	Done	2001	261		CES Environmental Services - Port Arthur	Load WHITE LIQUOR from CCL26 & haul to Boise Cascade. MAKE SURE TRAILER IS MARKED WITH SPECIAL MARKINGS!!	630 am	1/2 Day
87687	Saylor Chris		2006	269		CES Environmental Services - Port Arthur	haul trailer to Boise Cascade.	2nd	1/2 Day
87607	Saylor Chris	InRoute	2006	259		Citgo Refinery	Load naphthenic caustic from Citgo in Lake Charles and haul to PACES. SEE INBOUND	630 am	1/4 Day
87688	Wilson Kevin		2004	420		CES Environmental Services - Port Arthur	haul trailer to Boise Cascade.	2nd	1/2 Day
87689	Wilson Kevin	In Route	2004	420		CES Environmental Services - Port Arthur	haul trailer to Boise Cascade.	630 am	1/2 Day

Report Printed 6/16/2009 1:52:28 PM

EPAPA008001333

190909

253826

144,735.36 GAL

or 28.947 TRUCK LOADS

2164.50

1281.58

Newpark Environmental Services
Big Hill NIW Disposal Facility

CES Port Arthur TX NaSH facility
Criteria for Acceptance of Process Wastewater

1. CES shall process its sulfidic caustic waste stream to maximize the removal of organic sulfur compounds as follows:
   a. maximum pH reduction during process stage
   b. addition of hypochlorite solution to process waste water

2. CES shall titrate each loaded tanker for concentrations of dissolved H_2S and mercaptans. A printed titration report shall be attached to the shipment manifest.

3. Prior to collecting the waste verification sample, NES shall monitor tanker emissions from the 2" cleanout cap at the top of the tanker using a portable four-gas detector (H_2S, CO, O_2, LEL)

4. NES personnel shall collect the waste verification sample through the 2" cleanout cap at the top of the tanker.

5. The tanker shall be positioned so that emissions monitoring and waste verification sampling can be conducted with NES personnel positioned in a cross-wind orientation.

6. NES not offload any shipment when:
   - a. onsite pH verification result exceeds pH 6.1
   b. shipment titration result is not attached to manifest
   c. shipment titration result indicates unacceptable concentration of organic sulfur compounds
   c. four-gas detector indicates unacceptable levels of emissions
   d. shipment creates nuisance odor condition (judgment of NES personnel)
   e. tanker cannot be offloaded at liquid waste offloading area due to unacceptable levels of solids in shipment

CES/PACE HYDROGEN SULFIDE POLICY

Hydrogen Sulfide is an extremely dangerous gas; therefore, maximum precautions must be taken when exposed to high concentration levels or levels above the OSHA ceiling level of 20 PPM.

The odor threshold level for hydrogen sulfide is just below the level of one parts per million (PPM) and for mercaptan is below the level of one parts per billion (PPB). At such a low concentration level, chronic and acute adverse health effect is not expected. As a result, Occupational Safety and Health Administration (OSHA) has established a Ceiling (C) exposure limit for hydrogen sulfide at 20 PPM and methyl mercaptan limit at 10 PPM. ACGIH Threshold Limit Value (TLV) for methyl mercaptan is 0.5 PPM

At these ceiling concentration levels, both chemicals may produce adverse health effects, but this becomes a big nuisance as well as uncomfortable to work in the area before the concentration of these chemicals reach this level.

Engineering controls like exhaust ventilation removing hydrogen sulfide and mercaptan to combustion device like flare are the preferred option. However, in the absence of effective engineering controls, adequate personal protection must be exercised by all CES personnel while working at the CES or client facilities.

When working around hydrogen sulfide or other sulfur compounds like methyl mercaptan, dimethyl sulfide or dimethyl disulfide, the area monitor and the personal hydrogen sulfide monitor provides better protection. But, when necessary or warranted, prescribed Personal Protective Equipment (PPE) must be used by all CES personnel.

Personal protective equipment selection depends upon the concentration and duration of exposure. When the concentration of hydrogen sulfide or methyl mercaptan is unknown, air supplied full face respiratory protection must be used.

All pressurized vessels shall be handled with engineering controls and/or by using full face supplied air respirator or SCBA.

If the vessel is not under pressure, full face respirator equipped with Organic/Acid cartridges can be used when personal or area hydrogen sulfide monitors do not trigger the alarm set at 10 PPM.

All CES personnel must understand that the concentrations for hydrogen sulfide should never exceeded ceiling levels at anytime and they must evacuate to the muster or rally point whenever area or personal hydrogen sulfide monitor alarm is sounded and should not return until alarm turns off indicating that hydrogen sulfide is below the set point of 10 PPM.

All CES employees must follow this policy while working at CES facilities and any violators will be terminated.

INTEROFFICE MEMORANDIUM
PATRIOT SECURITY, E.O.C.

DATE: 7/15/2009

TO: SUPERVISORS

CC: ON CALL MANAGERS

RE: CES ENVIROMENTAL – ADDITIONAL POST ORDERS

ATTENTION, S/O's that work EVENINGS and GRAVEYARDS:

- S/O's are to search 100% of the vehicles. That means EVERY vehicle that exits the plant. No EXCEPTIONS! There has been reports of tools and equipment missing.
- If you have any problems regarding this, contact the following people and the Patriot Supervisor (# 727-4944).
    - Jay Matlock (Cell# 832-231-3035)
    - Steve Stricker (Cell# 281-433-7052)
    - Matt Bowan (Cell# 713-826-1329) if you have any problems.

If you have any questions please contact the On Call Manager.

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
3973	I			Fuel	
6423	I				
4566	IIII				
6560	~~IIII~~ ~~IIII~~ III	[illegible]		Additive	
6416	~~I~~ II				
6431	~~IIII~~ IIII				
6560J	IIII				
6403	II				
6421	II				
4140A	III				
6423	I				
6403	I				
BioTech E85	I				
6560C	~~IIII~~ ~~IIII~~				
4238	II				
3062	I				
[illegible]					
6530P	I				
6456	I				
4858	I				

60 Drums

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
[redacted]	Fuel & Additive				
6431	11				
3062	11				
6560C	1111				
5708	11				
4566	11				
6411	1				
7411	1				
6530	1				
5751	1				
4858	1				
6456	1				
5756	1				
4140	11				
3937	1				
6423	1				

Hitec Performance
1932 x 11
5708 11

713 637 8600

HEctorr@apstemps.com

PMUAOC@apstemps.com

Erik

Erik

Erik Brad

Erik

Erik Braden

Erik Braden

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
[redacted]	[redacted]				
	Performance				
5708	1111				
5736	1				
5747	11				
5708	11				
5756	1				
5714	11				
5777	1111				
5785	11				
5751	11				
5746	1				
1932X	1				

Drum ID #	Hitec Product ID	Net Weight (lbs)	~~Flush~~ Drum?	Follow-up notes	Action
	5708	Clear	83 drums	84 drums	Pour Point Depressant
	5714	Amber	1 drum		
	5784	Amber	1drum	2drums	Pour Point Dispersant
	8053	Amber	1drum		
	5777D	Dark Brn.	5drums	8 drums	VI Improver
	672	Drk Brn	3drums		
	5777	Clear	32 drums	117 Drums	
	5727		15 drums		
	5747		11		
	5739		6		
	5254		1		
	5251		6		
	5785		9		
	5710		7		
	5715		72		
	5769		3		
	5750		4		
	5755		2	App. 8850gal.	
	5236		1		
	5703		1		
	5738		3		
	5724		2		
	5786		1		
	5724		1		
	7160 D	Dark	12	39 drums	Detergent
	7160 H	Dark	3	Dete. 950gal.	
	7411		16		
	7160		4		
	614		4		
	473 C	Red	5	300gal.	ATF Add Pack
	3478	Dark Red	1		ATF Add Pack
	466		4		ATF ~~Concentrate~~ Add Pack
	403		1		ATF Conc.
	5324	Dark	2		Lube Oil Add
	511		3		
	9325		3	500gal.	
	3191		1		
	9300		1		
	I 265	Thick	4	200	
	T 260		1		

Drum ID #	Hitec Product ID	Color ~~Net Weight~~ (lbs)	Visc. ~~Flash~~ ~~Drum?~~	Drum Amt ~~Follow-up notes~~	Content ~~Action~~
	1463 C	Dark Brn	57 cst.	1 drum	Detergent Intermediate
~~✓~~	9300	Dark Brn	59 cst	1 drum	Lube Oil Add
	~~5715~~				
	6403 FA	Yellow	2 cst.	3 drums	Gas Detergent Add.
	6416 FA		320 cst.	4 drums	Gas Fuel Add.
	T265	Brown	400 cst.	4 drums	Lube Oil Add.
	T260	Amber	500 cst.	1 drum	Lube Oil Add
	514 FA	Dark	24 cst.	2 drums	Industrial Oil Add (Detergent)
	6431 FA			1 drum	Gas Fuel Add.
	6560 J FA	Amber	2 cst.	5 drums	Fuel Add.
	6560 FA			12 drums	Fuel Add.
	6421 FA			1 drum	Fuel Add
	6456 Gas FA			1 drum	Fuel Add.
				630 drums total	
	Infenium Drums				
	2344			29 drums	
	7580			68 drums	
	V387			3 drums	
	7187			3 drums	
	5315			10 drums	
	4558			6 drums	
	9220			1 drum	
	ATF Sample			3 drums	
				123 total	

Drum ID #	Hitec Product ID	Color ~~Net Weight~~ (lbs)	Visc. ~~Flash~~ ~~Drum?~~	Drum Amt ~~Follow-up notes~~	Contents ~~Action~~
	5046	Clear	46 cst	8 drums	Synthetic Lube Oil
	3478	Clear	4 cst.	1 drum	ATF Add. Pkg.
	7050	Drk Brn.	245 cst	4 drums	Crankcase Add.
	312 G	Drk Brn.		1 drum	Crankcase Add
—	672	Dark Brn	750 cst	3 drums	Visc. Index Improver
	387	Amber	7.1 cst	1 drums	Gear Oil Add.
	833	Dark Brn.	5 cst.	1 drum	Booster Pkg
	644	Dark BRN	320 cst.	2 drums	Dispersant
	510	Brown	55 cst	1 drum	Multifunctional Oil Add.
	343	Clear	9 cst.	1 drum	GEAR Add. Pkg.
	6774			1 drum	
	3973 FA.	Amber		1 drum	Octane Imp.
	5789	Amber	150 cst	1 drum	Pour Point Dispersant —
	8053	Amber	150 cst	1 drums	POUR Point Dispersant —
—	5755	Pale Color	11000 cst	1 drum	VI Improver —
—	466	Clear	26 cst.	4 drums	ATF Additive
	5738	Amber	620 cst.	3 drums	VI Improver
	1921 J	Red	380	1 drum	Petrochemicals
	2375 A	Clear	~~Best~~	1 drum	Gear Add. Pkg.
	648	Brn.	475 est	1 drum	
	5774	Clear	735 cst	2 drums	VI Imp
	5786	Clear	860 cst	1 drum	VI Imp
	Crankcase			2 drums	
	X15508	Drk Brn	460 est.	1 drum	Dispersant
	5966			1 drum	
	Process Oil S.N.			1 drum	
—	7160	Dark	140 cst	4 drums	Detergent
—	403	Dark Brn.	50 cst.	1 drum	ATF Concentrate
	9345	Dark	67 cst	1 drum	Crankcase Detergent
	7050	Dark Brn.	245 cst	1 drum	Crankcase Add Pkg.
	5724	Yellow	1250 cst.	1 drum	VI Improver
=	614	Dark Brn.	16 cst	4 drums	Detergents
	3685			1 drums	
	643 D	Brn	590 cst	1 drum	Ashless Dispersant
	1919	Red	260 cst.	4 drums	Ashless Dispersant
	6303	Clear		1 drum	Gear Add. Pkg
	675	Clear	180 cst	1 drum	Anti-Wear Hyd. Oil Add.
	1921	Red	380 cst.	1 drum	Petrochemicals
	7411	Dark	250 cst	1 drum	Detergent
	9325	Dark	88 cst	3 drums	Lube Oil Add.
	3191	Dark	30 cst.	1 drum	Lube Oil Add. — Friction Modifier

Drum ID #	Hitec Product ID	Color ~~Net Weight~~ (lbs)	Visc. ~~Flush Drum?~~	Drum Amt ~~Follow-up notes~~	Contents ~~Action~~
	5708	Clear.	1500cst	83 drums	Pour Point Dep. (Heat)
	MO-5N 150			47 drums	Done
	7160 D			12 drums	Detergent.
	7160 H			3 drums	Detergent.
	5727 D	Dk Brn.		5 drums	VI Improver
	Special Lube Add.			10 drums	
	5711	Clear	1400cst	83 drums	VI Improver
	473 C	Red	7.9cst.	5 drums	ATF Add pack
	5777	Clear	1135cst	32 drums	VI Improver
	7169 Wash Oil			24 drums	
	5727	Clear	820cst	15 drums	VI Improver
	5747	Clear	1140	11 drums	VI Improver
	Clear Performance Add			23 drums	
	552 GP	Light Brn	100cst	2 drums	Grease Add.
	5324	Dark Brn	160cst	2 drums	Lube Oil Add.
	7411	Dark Brn	250cst	2 drums	Detergent
	6130	Amber	230cst	5 drums	Diesel Oil Treatment
	152	Clear	2850cst	1 drum	Tackiness Add Heat
	059	Waxy Solid		68 drums	Friction Modifier
	5739	Clear	575cst	96 drums	VI Improver
	5754	Clear	1050cst	1 drum	VI Improver
	5751	Clear	1240cst	6 drums	VI Imp
	5785	Clear	850cst	9 drums	VI Imp
	7411	Dk Brn	250cst	15 drums	Detergent
	5710	Amber	850cst	7 drums	VI Imp
	5703	LT Amber	50cst	1 drum	VI Imp
	559	Amber	23cst	2 drums	Rust Inhibitor
	5714	Amber	860cst	1 drum	Pour Point dep
	619A	Dark Brn	32cst	4 drums	Antioxidant
	6403	Yellow	10cst	2 drums	Gasoline Detergent Add
	511	Amber	29cst	3 drums	Lube Oil Add.
	637	Brown	375cst	4 drums	Dispersant
	7045	~~Light Yellow~~	~~225cst~~	1 drum	~~VI Imp~~
	5715	Light Yellow	225cst	72 drums	VI Imp
	6421			1 drum	
	5769	Yellow	750cst	3 drums	VI Imp
	5750	Clear	900cst	4 drums	VI Imp
	5755	Yellow	1240 cst	1 drum	VI Imp.
	5736	Yellow	725	1 drum	VI Imp
	521	Dark Brn.	9.8cst.	6 drum	Hyd. Additive Package
	~~466~~			~~1 drum~~	

263 Hydro.

(52)

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
	7050			11	
	[redacted]			2	
	[redacted]			2	
	[redacted]			2	
	[redacted] 5735			1	
	5788			1111	
	6421			1111	
	343			1	
	5727			1	

6/3/09

Drum ID #	Inf. ~~Hitec Product ID~~	P Net Weight (lbs)	Flush Drum?	Drums Follow-up notes	Action
–	2344	~~卌~~	7	Pallets I	
–	7580	~~[illegible]~~ 卌	17	Pallets	
	~~[illegible]~~				
–	V387			III	
–	7187			III	
	5315			卌 卌 I	
	4558			卌 I	
	9220			I	
	ATF Sample			III	
	~~5715~~				
	Lubrizol	5708	48	drums	

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174

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
—	6421			1	
	X 15264			11	
—	6560 J FA			IIII	
—	6560 FA	11		IIII	
—	6421 FA			1	
	6456 6ms FA			1	
—	5785			11	
—	5769			11	
—	5750			1111	
—	5255			1	
—	5736			1	
—	H521			1	
—	H637			11	
—	5747	1		IIII.11	
—	H466			1	
—	5727	IIIIIIIIIII		1	
	[illegible]				
—	5046	11			
—	3478			1	overpak
—	521			III	
—	7050			111	
—	312 G			1	OP
—	672			161	
—	387			1	
—	833			1	
—	644			11	
—	510			1	
—	343			1	
—	6774			1	
—	3973			1	
—	5789			1	
—	7050			11	
—	8053			1	
—	5755			1	
—	6431 FA			1	
—	466			11	
—	5738			111	
—	1921 J			1	
—	2375 A			1	
—	648			1	
—	5774			11	
—	5786			1	

3-31

2757
6560 MSDS
5715
6560
6560S

5708A?

BEHNKE Lubricants

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
	5715				
	MO. - SN 150	[illegible]	46	~~[illegible]~~ 1	TPL235 1111
	680			1	
—	7160D —	[illegible] 11		11111 (12) —	Crankcase 11 —
—	5770			[illegible] —	X15508
—	SCA			[illegible] —	H059 111
—	5711	[illegible]		83drums —	5966 1
—	473C	[illegible]		[illegible] —	Process Oil SN 1
—	7160H	3		111 —	466
—	5777	[illegible]	(32)	[illegible] 11 —	PHO 2 1 —
—	552GP			11 —	7160D 1111
—	5324			11 —	403 1
—	7411			11 —	9345 1
—	6403 FA			111	7050 1
—	6130	1		1	Bio Tech E85 FA 1
—	6416 FA			1111 —	5724 1
—	152			1 —	614 1111
—	7169 Wash Oil	11		[illegible] —	3685 1
—	059			111 —	GA 2217 1
—	5708	[illegible]		[illegible] —	643 D 1
—	5739			1111 —	1919 1111
—	5754			1 —	6303 1
—	5739			11 —	675 1
—	T265			1111 —	1921 1
—	5751			[illegible] —	7411 1
—	5785			[illegible] —	9325 111
	6456 FA			11 —	3191 1
—	5703			1	~~559~~ 1
—	5710			[illegible] 11 —	1463 C 1
—	5785			11 —	9300 1
—	559			1	~~T235~~ 11
—	T260	1		1111	5715 18p
—	7411		11	[illegible] 11	
—	5714			1	
—	619A			1111	
	Fatty Acid (OLEIC)			11	
—	5708			[illegible] 11	1
—	514 FA	11		[illegible]	
—	GPA	[illegible]		111	
—	6403			11	
—	6431 FA			1111	
—	511	1		111	
—	637			11	
	7045			1	

23
12

18
4

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
~~5002~~					
		Actual		Thick - 5208 - 30 -	
~~6130~~				5715 -	78 - 130
5002	55 drums			5710 -	2
1275	50 drums			SLA -	4 7,150 gal
472	13 drums			6130 -	8
686	28 drums			514 -	8
5708 -	141 drums	~~29~~ 1		Thick	
5727	75 drums	42		Visc.	Thin
5002		~~76~~ 16,4		thin Base	51
5715		78		thick Visc.	
Lacar Rec.	*	9			*
511		4		Thin	4
~~Wash Oil~~		~~32~~		~~Thin w/sand?~~	
686		28	Visc	Thick & Black ~~[illegible]~~? *	
5710		2		~~Thin~~ Thick	
1275				Thin Base	
387		1		Thin Base	1
SLA		4		Thick Visc.	
4103				Fuel	
MD. SN		7		Thin Base	7
388		4		Thin Base	4
2317		4		Thin Base	4
2357		2		Thin Base	2 124
308		1		Thin Base	1
352		3½		Thin Base	3
348		1,4		Thin B O	5 6820 gal.
355		2		Thin B O	2
305		1		Base Thin	1
385		1		Thin Base	1
387		1		Thin B O	1
510		4,2,4,2,		B.O. light Color	12
335		2,2,1		Thin B O	4
356				Thin B.O.	
343		1			1
484		4,1		Thin Base O.I	5
312		1		Thin Base	1
6130		8		Thick Visc	8
511		1		Light B.O.	1
335		1		Wet	
338		2		Thin B O	1
2370		4		Thin	4
514		8		Thick Visc	

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
	Gear Performance	9			
	5754	2		Thick - Clear	16
	7380	1		Thin - ~~Clear~~ Clear	
	966	1		Thin ~~Yellow~~ Yellow B.O.	
	1275	1			
	5785 H	2		Thin Visc. Fallout	
	5751	1		Thick Visc	
	5708	2		Thick Visc	Half Drums
	Tec Guard 206A	½		Thick Visc	—
	7411				
	6416 F.A	1			
	543			Thin Dard	
	1272	1		Base Oil	
	6560 FA	1		Thin Solvent	
	6416 FA	1		Thick Visc	
	5255	1		Thick Visc	
	521	1		Base Oil	
	6421 L	1		F.A.	
	6421	1		FA	
	6431	8		FA	
	1919	10		Thick Visc.	
	5727	10		Thick (Red)	
	4995	21		Base Oil	
	3430				
	3421				
	3428				
	3429				
	3432				
	3433				
	3434				
	3435				
	3402				
	3403				
	3401				
	3400				
	3398				
	3397				
	3397				

Daily Sample Log

Date	Sample #	Material Type	Time Sampled	Sampled By	% NaOH	% Sulfides	Comments

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Visc. Improver

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
3571					
3570					
3568					
3569					
3127					
3115					
3114					
3129					
3117					
1736					
3255					
3256					
3241					
3253					
3254					
3140					
3142					
3143					
3065	5715				
3037					
3038					
3039					
3040					
3021					
3022					
3023					
3024					
3011					
3012					
3010					
3019					

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
1942	TechGuard 260A	386			
1941	TG 236	445			
1943	TG 236	386			
1944	TG 236	386			
1744	TG 265				
1745	WO				
1746	WO				
1795	WO	414			
1796	WO	414			
1802	WO	414			
1803	WO	414			
1804	WO	414			
1811	WO	414			
1812	WO	414			
1813	WO	414			
1817	WO	414			
1820	WO	414			
1821	WO	414			
1822	WO	414			
1826	WO	414			
1832	WO	414			
1834	WO	414			
1837	WO	414			
1838	WO	414			
3150	WO				

2757

Jeff treat M

26 drums

Crude Dea.

MO-150 SN

Ind.

514 - Oil Add.

6130 - Diese Oil treat.

Inf. C9404

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
	5002		1763	486	–
1945 –			1764		–
1946 –			1757		–
1947 –			1758		–
1948 –					
1961 –			1709	HT-3500	–
1962 –					
1963 –			3529	4995	–
1960 –			3530		–
1994 –			3531		–
1995 –			3532		–
1996 –			3537		–
1997 –			3538		–
1986 –			3539		–
1987 –			3540		–
1988 –			3533		–
1989 –			3534		–
1998 –			3535		–
1999 –			3536		–
2000 –			47		–
2001 –			48		–
1990 –			49		–
1991 –			50		–
1992 –			43		–
1993 –			44		–
1957 –			45		–
1964 –			46		–
1965 –					
1966 –			3428	355	–
1959 –			3429	348	–
1982 –			3435	387	–
1983 –			3434	352	–
~~1989~~ –			3433		–
1974 –			3432		–
75 –			3421	378	–
76 –					
77 –			56	5002	–
67 –			58		–
68 –			59		–
69 –			84	5002	–
70 –			85		–

35 –
36 –
37 –

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
1674	59	399		P.A.	
1675	59	399			
1682	59				
1683	59				
1684	59				
3222	59	325			
3235	59	403			
1816	152	414			
1823	152	414			
1808	234	414		TECHGUARD	
1790	235	414			
1828	235	414			
1831	235	414		TECHGUARD	
1677	260				
1678	260				
1679	260				
1680	260				
1769	260				
1770	260				
1779	260				
2006	265	443			
2007	265	443			
2008	265	443			
2009	265	443			
1835	340	414			
60	343	326			CES Fuel Additive
1971	343	485			
1972	343	485			
1973	343	485			
1978	343	485			
1979	343	485			
1980	343	485			
1981	343	485			
1939	344	494			
3257	350	?			
1794	355	414			
1814	355	414			
1824	355	414			
1825	355	414			
1705	381				
1706	381				

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
1256	466	360			CES Fuel Additive
1257	466	99	y		CES Fuel Additive
1259	466	46	y		CES Fuel Additive
1279	466	146	y		CES Fuel Additive
1282	466	368	y		CES Fuel Additive
1283	466	360	y		CES Fuel Additive
1287	466	157	y		CES Fuel Additive
1294	466	245	y		CES Fuel Additive
1785	466	368			
1786	466	368			
3123	466	400			
3139	466	360			
3154	466	400			
3155	466	103	Y		
3278	466	150	Y		
3279	466	140	Y		
3304	466	400			
1789	484	414			
1810	484	414		THIN	
1829	484	414			
1830	484	414			
1940	484	386			
1686	511				
1688	511				
1693	511				
1695	511				
1700	511				
1707	511				
1708	511				
3227	511	403			
3214	514	421			
3215	514	421			
3216	514	421			
3217	514	421			
3240	514	421			
3241	514	421			
3242	514	421			
3243	514	421			
3251	514	220			
3252	514	421			
3253	514	421			

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
3254	514	421			
3255	514	421			
3256	514	421			
55	521	91			CES Fuel Additive
115	521	400			CES Fuel Additive
122	521	115	y		CES Fuel Additive
1200	521	400			CES Fuel Additive
1201	521	133	y		CES Fuel Additive
1209	521	400			CES Fuel Additive
1213	521	176	y		CES Fuel Additive
1216	521	147	y		CES Fuel Additive
1233	521	153	y		CES Fuel Additive
1234	521	400			CES Fuel Additive
1246	521	176	y		CES Fuel Additive
1249	521	144	y		CES Fuel Additive
1250	521	135	y		CES Fuel Additive
1252	521	400			CES Fuel Additive
3585	521	478			
2002	530	507			
2003	530	507			
2004	530	507			
2005	530	507			
3591	543	437			
1687	559				
3228	559	403			
1953	567	428			
1955	567	428			
54	611	140			CES Fuel Additive
1694	619				
1696	619				
1755	619				
3258	619	?			
1673	637	350			
1681	637				
1685	637				
1730	637				
1749	637				
1750	637				
1768	637				
3296	637	165	Y		
3297	637	400			

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
3298	637	166	Y		
1676	672	360			
1733	672				
1849	672	403			
1850	672	403			
1851	672	403			
1852	672	403			
3195	672	403			
3196	672	403			
3197	672	403			
3198	672	403			
3199	672	403			
3200	672	403			
3201	672	403			
1609	686	365			
1610	686	365			
1611	686	365			
1612	686	365			
1661	686	365			
1662	686	365			
1663	686	345			
1664	686	345			
1665	686	345			
1666	686	365			
1667	686	365			
1668	686	365			
1669	686	365			
1670	686	365			
1671	686	365			
1672	686	365			
1757	686		✓		
1758	686		✓		
1759	686				
1760	686				
1763	686		✓		
1764	686		✓		
1765	686				
1766	686				
1773	686				
1774	686				
1775	686				

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
1776	686				
1805	953	414			
3095	1139	207	Y		
3096	1139	400			
57	1195	400			CES Fuel Additive
24	1272	164			CES Fuel Additive
3592	1272	518			
69	1275	400			CES Fuel Additive
1255	1275	256	y		CES Fuel Additive
1258	1275	200	y		CES Fuel Additive
1260	1275	400			CES Fuel Additive
1261	1275	213	y		CES Fuel Additive
1262	1275	222	y		CES Fuel Additive
1263	1275	400			CES Fuel Additive
1264	1275	400			CES Fuel Additive
1265	1275	400			CES Fuel Additive
1266	1275	245	y		CES Fuel Additive
1267	1275	400			CES Fuel Additive
1268	1275	200	y		CES Fuel Additive
1269	1275	223	y		CES Fuel Additive
1270	1275	400			CES Fuel Additive
1271	1275	400			CES Fuel Additive
1272	1275	400			CES Fuel Additive
1273	1275	400			CES Fuel Additive
1275	1275	100	y		CES Fuel Additive
1280	1275	400			CES Fuel Additive
1281	1275	120			CES Fuel Additive
1286	1275	121	y		CES Fuel Additive
1288	1275	160	y		CES Fuel Additive
1289	1275	400			CES Fuel Additive
1290	1275	158	y		CES Fuel Additive
1291	1275	160	y		CES Fuel Additive
1295	1275	174	y		CES Fuel Additive
1296	1275	142	y		CES Fuel Additive
1297	1275	157	y		CES Fuel Additive
1298	1275	400			CES Fuel Additive
1311	1275	185	y		CES Fuel Additive
1312	1275	172	y		CES Fuel Additive
1325	1275	400			CES Fuel Additive
1328	1275	144	y		CES Fuel Additive
1337	1275	157	y		CES Fuel Additive

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
1338	1275	400			CES Fuel Additive
1341	1275	145	y		CES Fuel Additive
3080	1275	181	Y		
3088	1275	400			
3089	1275	196	Y		
3118	1275	192	Y		
3119	1275	400			
3121	1275	220	Y		
3124	1275	400			
3288	1275	196	Y		
3293	1275	180	Y		
3309	1275	400			
3322	1275	400			
3325	1275	153	Y		
3326	1275	160	Y		
3339	1275	400			
1218	1280	178	y		CES Fuel Additive
8	1910	252			CES Fuel Additive
17	1910	255			CES Fuel Additive
21	1919	272			CES Fuel Additive
23	1919	47			CES Fuel Additive
3564	1919	448			
3565	1919	448			
3566	1919	448			
3567	1919	448			
3568	1919	448			
3569	1919	448			
3570	1919	448			
3571	1919	448			
3572	1919	448			
3573	1919	448			
25	1921	276			CES Fuel Additive
36	1932	143			CES Fuel Additive
68	2585	489			CES Fuel Additive
72	2585	160	y		CES Fuel Additive
1274	2585	172	y		CES Fuel Additive
1276	2585	158	y		CES Fuel Additive
1277	2585	287	y		CES Fuel Additive
1278	2585	400			CES Fuel Additive
1284	2585	47	y		CES Fuel Additive
1285	2585	289	y		CES Fuel Additive

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
1292	2585	177	y		CES Fuel Additive
1293	2585	143	y		CES Fuel Additive
3144	2585	182	Y		
3145	2585	74	Y		
3149	2585	400			
90	3062	200			CES Fuel Additive
3107	3062	200			
3281	3062	200			
3311	3062	200			
18	3191	208			CES Fuel Additive
58	3191	14			CES Fuel Additive
3344	3191	148	Y		
3345	3191	140	Y		
3259	3478	?			
1709	3500				
1326	4100	200			CES Fuel Additive
47	4103	102			CES Fuel Additive
73	4103	200			CES Fuel Additive
103	4103	200			CES Fuel Additive
1331	4103	200			CES Fuel Additive
1788	4103	414			
3112	4103	200			
3130	4103	200			
3332	4103	200			
1324	4530	400			CES Fuel Additive
65	4995	348			CES Fuel Additive
95	4995	80			CES Fuel Additive
3529	4995	448	✓		
3530	4995	448	✓		
3531	4995	448	✓		
3532	4995	448	✓		
3533	4995	448	✓		
3534	4995	448	✓		
3535	4995	448	✓		
3536	4995	448	✓		
3537	4995	448	✓		
3538	4995	448	✓		
3539	4995	448	✓		
3540	4995	448	✓		
3541	4995	448			
3542	4995	448			

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
3543	4995	448	✓	—	
3544	4995	448	✓	—	
3545	4995	448	✓	—	
3546	4995	448	✓	—	
3547	4995	448	✓	—	
3548	4995	448	✓	—	
3549	4995	448	✓	—	
3550	4995	448	✓	—	
3561	4995	448			
1934	5002	437	✓	—	
1935	5002	437	✓	—	
1936	5002	437	✓	—	
1938	5002	437			
1945	5002	437	✓	—	
1946	5002	437	✓	—	
1947	5002	437	✓	—	
1948	5002	437	✓	—	
1949	5002	437	✓		
1950	5002	437	✓		
1951	5002	437			
1952	5002	437			
1956	5002	437	✓		
1957	5002	437	✓	—	
1958	5002	437	✓		
1959	5002	437	✓		
1960	5002	437	✓	—	
1961	5002	437	✓	—	
1962	5002	437	✓	—	
1963	5002	437	✓	—	
1964	5002	437	✓	—	
1965	5002	437	✓	—	
1966	5002	437	✓	—	
1967	5002	437	✓	—	
1968	5002	437	✓	—	
1969	5002	437	✓	—	
1970	5002	437	✓	—	
1974	5002	437		—	
1975	5002	437		—	
1976	5002	437		—	
1977	5002	437		—	
1982	5002	437	✓	—	

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Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
1983	5002	437	✓	—	
1984	5002	437	✓	—	
1985	5002	437	✓	—	
1986	5002	437	✓	—	
1987	5002	437	✓	—	
1988	5002	437	✓	—	
1989	5002	437	✓	—	
1990	5002	437	✓	—	
1991	5002	437	✓	—	
1992	5002	437	✓	—	
1993	5002	437	✓	—	
1994	5002	437	✓	—	
1995	5002	437	✓	—	
1996	5002	437	✓	—	
1997	5002	437	✓	—	
1998	5002	437	✓		
1999	5002	437	✓		
2000	5002	437	✓		
2001	5002	507	✓		
2010	5002	437			
2011	5002	437			
2012	5002	437			
2013	5002	437			
412	5706	118	y		CES Base Oil
52	5708	363			CES Viscosity Modifier
145	5708	244	y		CES Base Oil
146	5708	245	y		CES Base Oil
182	5708	400			CES Viscosity Modifier
193	5708	38			CES Viscosity Modifier
199	5708	130	y		CES Base Oil
206	5708	226	y		CES Base Oil
208	5708	215	y		CES Base Oil
210	5708	400			CES Viscosity Modifier
313	5708	316			CES Viscosity Modifier
343	5708	386	y		CES Base Oil
347	5708	146	y		CES Base Oil
357	5708	188	y		CES Base Oil
358	5708	199	y		CES Base Oil
366	5708	400			CES Viscosity Modifier
391	5708	138	y		CES Base Oil
407	5708	400			CES Viscosity Modifier

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
414	5708	408			CES Viscosity Modifier
427	5708	131	y		CES Base Oil
429	5708	400			CES Viscosity Modifier
443	5708	400			CES Viscosity Modifier
450	5708	20	y		CES Base Oil
451	5708	155	y		CES Base Oil
452	5708	400	y		CES Base Oil
453	5708	240	y		CES Base Oil
454	5708	100	y		CES Base Oil
470	5708	21	y		CES Base Oil
477	5708	162	y		CES Base Oil
485	5708	295	y		CES Base Oil
514	5708	135	y		CES Base Oil
516	5708	154	y		CES Base Oil
527	5708	400			CES Viscosity Modifier
531	5708	400			CES Viscosity Modifier
570	5708	400			CES Viscosity Modifier
577	5708	381			CES Viscosity Modifier
583	5708	200			CES Viscosity Modifier
633	5708	200	y		CES Base Oil
634	5708	214	y		CES Base Oil
639	5708	408			CES Viscosity Modifier
640	5708	408			CES Viscosity Modifier
641	5708	408			CES Viscosity Modifier
642	5708	400			CES Viscosity Modifier
650	5708	158	y		CES Base Oil
659	5708	400			CES Viscosity Modifier
665	5708	408			CES Viscosity Modifier
668	5708	390			CES Viscosity Modifier
670	5708	400			CES Viscosity Modifier
687	5708	225	y		CES Base Oil
688	5708	211	y		CES Base Oil
703	5708	400			CES Viscosity Modifier
704	5708	400			CES Viscosity Modifier
705	5708	400			CES Viscosity Modifier
706	5708	400			CES Viscosity Modifier
741	5708	400			CES Viscosity Modifier
768	5708	111	y		CES Base Oil
769	5708	400			CES Viscosity Modifier
770	5708	320	y		CES Base Oil
785	5708	42			CES Viscosity Modifier

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
847	5708	400			CES Viscosity Modifier
853	5708	182			CES Viscosity Modifier
854	5708	178	y		CES Base Oil
866	5708	241	y		CES Base Oil
873	5708	208	y		CES Base Oil
874	5708	201	y		CES Base Oil
875	5708	178	y		CES Base Oil
876	5708	165	y		CES Base Oil
881	5708	143	y		CES Base Oil
911	5708	206	y		CES Base Oil
965	5708	235	y		CES Base Oil
983	5708	242	y		CES Base Oil
985	5708	130	y		CES Base Oil
986	5708	142	y		CES Base Oil
1003	5708	144	y		CES Base Oil
1004	5708	135	y		CES Base Oil
1014	5708	408			CES Viscosity Modifier
1028	5708	120	y		CES Base Oil
1031	5708	327	y		CES Base Oil
1032	5708	309	y		CES Base Oil
1033	5708	386			CES Viscosity Modifier
1037	5708	400			CES Viscosity Modifier
1042	5708	199	y		CES Base Oil
1044	5708	112	y		CES Base Oil
1053	5708	400			CES Viscosity Modifier
1055	5708	132	y		CES Base Oil
1058	5708	400			CES Viscosity Modifier
1065	5708	208	y		CES Base Oil
1072	5708	211	y		CES Base Oil
1074	5708	400			CES Viscosity Modifier
1077	5708	400			CES Viscosity Modifier
1078	5708	177	y		CES Base Oil
1080	5708	400			CES Viscosity Modifier
1092	5708	216	y		CES Base Oil
1204	5708	400			CES Viscosity Modifier
1206	5708	237	y		CES Base Oil
1207	5708	160	y		CES Base Oil
1781	5708	408			
2014	5708	408			
2015	5708	408			
2016	5708	408			

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
2017	5708	408			
2018	5708	408			
2019	5708	408			
2020	5708	408			
2021	5708	408			
2042	5708	408			
2043	5708	408			
2044	5708	408			
2057	5708	408			
2058	5708	408			
2059	5708	408			
2060	5708	408			
2073	5708	408			
2074	5708	408			
2075	5708	408			
2076	5708	408			
2077	5708	408			
2078	5708	408			
2079	5708	408			
2080	5708	408			
2085	5708	408			
2086	5708	408			
2087	5708	408			
2088	5708	408			
2097	5708	408			
2098	5708	408			
2099	5708	408			
3000	5708	408			
3086	5708	108	Y		
3087	5708	105	Y		
3100	5708	173	Y		
3101	5708	164	Y		
3105	5708	400			
3113	5708	408			
3301	5708	177	Y		
3308	5708	222	Y		
3310	5708	212	Y		
3312	5708	106	Y		
3323	5708	400			
3333	5708	27	Y		
3335	5708	400			

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
74	5710	400			CES Viscosity Modifier
132	5710	400			CES Viscosity Modifier
147	5710	399			CES Viscosity Modifier
153	5710	225			CES Viscosity Modifier
154	5710	209			CES Viscosity Modifier
165	5710	196	y		CES Base Oil
271	5710	202	y		CES Base Oil
317	5710	204			CES Viscosity Modifier
365	5710	400			CES Viscosity Modifier
383	5710	213	y		CES Base Oil
409	5710	221	y		CES Base Oil
502	5710	399			CES Viscosity Modifier
536	5710	400	y		CES Base Oil
537	5710	124	y		CES Base Oil
538	5710	183	y		CES Base Oil
539	5710	133	y		CES Base Oil
541	5710	400			CES Viscosity Modifier
545	5710	116	y		CES Base Oil
547	5710	400			CES Viscosity Modifier
628	5710	133			CES Viscosity Modifier
725	5710	188			CES Viscosity Modifier
726	5710	190			CES Viscosity Modifier
780	5710	87			CES Viscosity Modifier
811	5710	400			CES Viscosity Modifier
827	5710	216	y		CES Base Oil
828	5710	158	y		CES Base Oil
850	5710	400			CES Viscosity Modifier
900	5710	399			CES Viscosity Modifier
919	5710	246	y		CES Base Oil
922	5710	399			CES Viscosity Modifier
971	5710	205	y		CES Base Oil
979	5710	166	y		CES Base Oil
980	5710	190	y		CES Base Oil
981	5710	400			CES Viscosity Modifier
982	5710	228	y		CES Base Oil
1000	5710	399			CES Viscosity Modifier
1009	5710	134	y		CES Base Oil
1010	5710	166	y		CES Base Oil
1021	5710	175	y		CES Base Oil
1022	5710	181	y		CES Base Oil
1024	5710	400			CES Viscosity Modifier

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
1025	5710	215	y		CES Base Oil
1026	5710	189	y		CES Base Oil
1066	5710	210	y		CES Base Oil
1079	5710	156	y		CES Base Oil
1081	5710	140	y		CES Base Oil
3079	5710	400			
3081	5710	152	Y		
3083	5710	150	Y		
3098	5710	400			
3110	5710	400			
3287	5710	131	Y		
3324	5710	150	Y		
498	5711	315			CES Viscosity Modifier
44	5714	80			CES Viscosity Modifier
144	5714	125	y		CES Base Oil
202	5714	130	y		CES Base Oil
263	5714	222	y		CES Base Oil
268	5714	400			CES Viscosity Modifier
270	5714	212	y		CES Base Oil
287	5714	412			CES Viscosity Modifier
288	5714	177	y		CES Base Oil
289	5714	174	y		CES Base Oil
339	5714	209	y		CES Base Oil
458	5714	400			CES Viscosity Modifier
459	5714	400			CES Viscosity Modifier
460	5714	400			CES Viscosity Modifier
461	5714	400			CES Viscosity Modifier
474	5714	150	y		CES Base Oil
475	5714	121	y		CES Base Oil
504	5714	400			CES Viscosity Modifier
519	5714	400			CES Viscosity Modifier
526	5714	400			CES Viscosity Modifier
604	5714	184	y		CES Base Oil
695	5714	412			CES Viscosity Modifier
707	5714	205			CES Viscosity Modifier
708	5714	43			CES Viscosity Modifier
833	5714	75	y		CES Base Oil
834	5714	62	y		CES Base Oil
887	5714	187	y		CES Base Oil
888	5714	161	y		CES Base Oil
893	5714	198	y		CES Base Oil

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
894	5714	217	y		CES Base Oil
916	5714	179	y		CES Base Oil
945	5714	412			CES Viscosity Modifier
946	5714	400			CES Viscosity Modifier
972	5714	400			CES Viscosity Modifier
973	5714	158	y		CES Base Oil
974	5714	198	y		CES Base Oil
975	5714	177	y		CES Base Oil
976	5714	125	y		CES Base Oil
977	5714	400			CES Viscosity Modifier
978	5714	181	y		CES Base Oil
987	5714	400	y		CES Base Oil
1016	5714	400			CES Viscosity Modifier
1017	5714	285	y		CES Base Oil
1018	5714	283	y		CES Base Oil
1027	5714	400			CES Viscosity Modifier
1030	5714	400			CES Viscosity Modifier
1039	5714	217	y		CES Base Oil
1040	5714	201	y		CES Base Oil
1057	5714	120	y		CES Base Oil
1089	5714	412			CES Viscosity Modifier
1090	5714	412			CES Viscosity Modifier
1093	5714	400			CES Viscosity Modifier
1205	5714	97			CES Viscosity Modifier
1321	5714	105	y		CES Base Oil
1322	5714	125	y		CES Base Oil
3094	5714	159	Y		
3097	5714	135	Y		
3261	5714	210	Y		
3262	5714	166	Y		
3263	5714	400			
3264	5714	400			
3280	5714	412			
3285	5714	400			
3299	5714	156	Y		
3306	5714	56	Y		
50	5715	122			CES Viscosity Modifier
508	5715	300	y		CES Base Oil
528	5715	399			CES Viscosity Modifier
546	5715	212			CES Viscosity Modifier
620	5715	153	y		CES Base Oil

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
776	5715	150	y		CES Base Oil
778	5715	165	y		CES Base Oil
879	5715	222	y		CES Base Oil
880	5715	259	y		CES Base Oil
923	5715	261	y		CES Base Oil
924	5715	399			CES Viscosity Modifier
926	5715	218	y		CES Base Oil
1013	5715	400			CES Viscosity Modifier
1029	5715	337			CES Viscosity Modifier
3001	5715	399			
3002	5715	399			
3003	5715	399			
3004	5715	399			
3005	5715	399			
3006	5715	399			
3007	5715	399			
3008	5715	399			
3009	5715	399			
3010	5715	399			
3011	5715	399			
3012	5715	399			
3013	5715	399			
3014	5715	399			
3015	5715	399			
3016	5715	399			
3017	5715	399			
3018	5715	399			
3019	5715	399			
3020	5715	399			
3021	5715	399			
3022	5715	399			
3023	5715	399			
3024	5715	399			
3025	5715	399			
3026	5715	399			
3027	5715	399			
3028	5715	399			
3029	5715	399			
3030	5715	399			
3031	5715	399			
3032	5715	399			

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
3033	5715	399			
3034	5715	399			
3035	5715	399			
3036	5715	399			
3037	5715	399			
3038	5715	399			
3039	5715	399			
3040	5715	399			
3041	5715	399			
3042	5715	399			
3043	5715	399			
3044	5715	399			
3045	5715	399			
3046	5715	399			
3047	5715	399			
3048	5715	399			
3049	5715	399			
3050	5715	399			
3051	5715	399			
3052	5715	399			
3053	5715	399			
3054	5715	399			
3055	5715	399			
3056	5715	399			
3057	5715	399			
3058	5715	399			
3059	5715	399			
3060	5715	399			
3061	5715	399			
3062	5715	399			
3063	5715	399			
3064	5715	399			
3065	5715	399			
3066	5715	399			
3067	5715	399			
3068	5715	399			
3069	5715	399			
3070	5715	399			
3071	5715	399			
3072	5715	399			
3073	5715	399			

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
3074	5715	399			
3075	5715	399			
3076	5715	399			
3077	5715	399			
39	5724	75			CES Viscosity Modifier
45	5724	343			CES Viscosity Modifier
191	5724	400			CES Viscosity Modifier
215	5724	220	y		CES Base Oil
217	5724	198	y		CES Base Oil
222	5724	213	y		CES Base Oil
224	5724	400			CES Viscosity Modifier
262	5724	400			CES Viscosity Modifier
377	5724	400			CES Viscosity Modifier
480	5724	160	y		CES Base Oil
481	5724	80	y		CES Base Oil
601	5724	190	y		CES Base Oil
602	5724	400			CES Viscosity Modifier
647	5724	375			CES Viscosity Modifier
751	5724	362			CES Viscosity Modifier
905	5724	154			CES Viscosity Modifier
906	5724	158	y		CES Base Oil
1034	5724	400			CES Viscosity Modifier
1041	5724	400			CES Viscosity Modifier
1048	5724	399			CES Viscosity Modifier
1049	5724	164	y		CES Base Oil
1050	5724	164	y		CES Base Oil
1299	5724	132	y		CES Base Oil
1300	5724	120	y		CES Base Oil
3163	5724	399			
33	5727	211			CES Viscosity Modifier
48	5727	63			CES Viscosity Modifier
513	5727	400			CES Viscosity Modifier
611	5727	400			CES Viscosity Modifier
624	5727	94	y		CES Base Oil
626	5727	200			CES Viscosity Modifier
729	5727	186			CES Viscosity Modifier
2022	5727	401			
2023	5727	401			
2024	5727	401			
2025	5727	401			
2026	5727	401			

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
2027	5727	401			
2028	5727	401			
2029	5727	401			
2030	5727	401			
2031	5727	401			
2032	5727	401			
2033	5727	401			
2034	5727	401			
2035	5727	401			
2036	5727	401			
2037	5727	401			
2038	5727	401			
2039	5727	401			
2040	5727	401			
2041	5727	401			
2045	5727	401			
2046	5727	401			
2047	5727	401			
2048	5727	401			
2049	5727	401			
2050	5727	401			
2051	5727	401			
2052	5727	401			
2053	5727	401			
2054	5727	401			
2055	5727	401			
2056	5727	401			
2061	5727	401			
2062	5727	401			
2063	5727	401			
2064	5727	401			
2065	5727	401			
2066	5727	401			
2067	5727	401			
2068	5727	401			
2069	5727	401			
2070	5727	401			
2071	5727	401			
2072	5727	401			
2081	5727	401			
2082	5727	401			

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
2083	5727	401			
2084	5727	401			
2089	5727	401			
2090	5727	401			
2091	5727	401			
2092	5727	401			
2093	5727	401			
2094	5727	401			
2095	5727	401			
2096	5727	401			
3551	5727	439			
3552	5727	439			
3553	5727	439			
3554	5727	439			
3555	5727	439			
3556	5727	439			
3557	5727	439			
3558	5727	439			
3559	5727	439			
3560	5727	439			
3562	5727	439			
3563	5727	439			
1001	5730	400			CES Viscosity Modifier
187	5733	400			CES Viscosity Modifier
211	5733	188	y		CES Base Oil
212	5733	400			CES Viscosity Modifier
213	5733	192	y		CES Base Oil
310	5733	193			CES Viscosity Modifier
748	5733	164			CES Viscosity Modifier
788	5733	372			CES Viscosity Modifier
933	5733	401			CES Viscosity Modifier
997	5733	401	y		CES Base Oil
1019	5733	180	y		CES Base Oil
1020	5733	210	y		CES Base Oil
3120	5733	400			
3284	5733	192	Y		
3286	5733	121	Y		
130	5736	400			CES Viscosity Modifier
379	5736	128	y		CES Base Oil
795	5736	156			CES Viscosity Modifier
1085	5736	91			CES Viscosity Modifier

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
1572	5736	395			Base Oil
1573	5736	395			Base Oil
1574	5736	395			Base Oil
63	5738	382			CES Viscosity Modifier
588	5738	198	y		CES Base Oil
589	5738	400			CES Viscosity Modifier
617	5738	400			CES Viscosity Modifier
1047	5738	400			CES Viscosity Modifier
297	5739	272	y		CES Base Oil
299	5739	400			CES Viscosity Modifier
330	5739	221	y		CES Base Oil
352	5739	79			CES Viscosity Modifier
580	5739	400			CES Viscosity Modifier
581	5739	200			CES Viscosity Modifier
597	5739	381			CES Viscosity Modifier
715	5739	104			CES Viscosity Modifier
773	5739	224	y		CES Base Oil
774	5739	400			CES Viscosity Modifier
775	5739	222	y		CES Base Oil
1007	5739	151	y		CES Base Oil
1008	5739	159	y		CES Base Oil
1060	5739	200	y		CES Base Oil
1064	5739	400			CES Viscosity Modifier
3346	5739	400			
846	5741	165	y		CES Base Oil
38	5742	383			CES Viscosity Modifier
384	5742	184	y		CES Base Oil
408	5742	213	y		CES Base Oil
503	5742	400			CES Viscosity Modifier
701	5746	205			CES Viscosity Modifier
281	5747	225	y		CES Base Oil
342	5747	381	y		CES Base Oil
698	5747	380			CES Viscosity Modifier
699	5747	163			CES Viscosity Modifier
823	5747	216	y		CES Base Oil
824	5747	270	y		CES Base Oil
845	5747	158	y		CES Base Oil
1150	5747	381			CES Viscosity Modifier
1154	5747	400			CES Viscosity Modifier
1161	5747	381			CES Viscosity Modifier
1162	5747	220	y		CES Base Oil

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
1163	5747	222	y		CES Base Oil
1168	5747	156	y		CES Base Oil
1169	5747	168	y		CES Base Oil
1172	5747	42			CES Viscosity Modifier
1180	5747	193	y		CES Base Oil
1191	5747	121	y		CES Base Oil
1193	5747	381	y		CES Base Oil
1194	5747	125	y		CES Base Oil
314	5749	228			CES Viscosity Modifier
787	5749	207			CES Viscosity Modifier
895	5749	399			CES Viscosity Modifier
64	5750	287			CES Viscosity Modifier
292	5750	111	y		CES Base Oil
293	5750	89	y		CES Base Oil
381	5750	399			CES Viscosity Modifier
382	5750	399			CES Viscosity Modifier
410	5750	399			CES Viscosity Modifier
411	5750	400			CES Viscosity Modifier
488	5750	137	y		CES Base Oil
489	5750	177	y		CES Base Oil
520	5750	399			CES Viscosity Modifier
678	5750	399			CES Viscosity Modifier
679	5750	399			CES Viscosity Modifier
680	5750	399			CES Viscosity Modifier
681	5750	399			CES Viscosity Modifier
723	5750	180			CES Viscosity Modifier
724	5750	233			CES Viscosity Modifier
738	5750	179			CES Viscosity Modifier
783	5750	204			CES Viscosity Modifier
789	5750	327			CES Viscosity Modifier
1043	5750	153	y		CES Base Oil
1045	5750	375		post-flush or pre-flush?	CES Viscosity Modifier
1046	5750	177	y		CES Base Oil
1054	5750	400			CES Viscosity Modifier
1070	5750	205	y		CES Base Oil
1076	5750	400			CES Viscosity Modifier
1333	5750	120	y		CES Base Oil
1334	5750	110	y		CES Base Oil
3092	5750	400			
3102	5750	112	Y		
3103	5750	132	Y		

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
61	5751	91			CES Viscosity Modifier
180	5751	381			CES Viscosity Modifier
203	5751	161	y		CES Base Oil
204	5751	163	y		CES Base Oil
226	5751	225	y		CES Base Oil
228	5751	188	y		CES Base Oil
244	5751	381			CES Viscosity Modifier
393	5751	201	y		CES Base Oil
540	5751	193	y		CES Base Oil
578	5751	200			CES Viscosity Modifier
598	5751	400			CES Viscosity Modifier
662	5751	144	y		CES Base Oil
663	5751	176			CES Viscosity Modifier
682	5751	390			CES Viscosity Modifier
719	5751	196			CES Viscosity Modifier
721	5751	198			CES Viscosity Modifier
757	5751	110			CES Viscosity Modifier
758	5751	40			CES Viscosity Modifier
798	5751	275	y		CES Base Oil
799	5751	271	y		CES Base Oil
882	5751	381			CES Viscosity Modifier
917	5751	223	y		CES Base Oil
918	5751	178	y		CES Base Oil
927	5751	380			CES Viscosity Modifier
1063	5751	381			CES Viscosity Modifier
1075	5751	400			CES Viscosity Modifier
1082	5751	51			CES Viscosity Modifier
1313	5751	180	y		CES Base Oil
1314	5751	150	y		CES Base Oil
3136	5751	220	Y		
3142	5751	145	Y		
3156	5751	237	Y		
3307	5751	381			
3313	5751	140	Y		
3314	5751	143	Y		
3315	5751	381			
3317	5751	172	Y		
3319	5751	191	Y		
3328	5751	100	Y		
3329	5751	112	Y		
3331	5751	381			

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
13	5754	145			CES Viscosity Modifier
462	5754	126	y		CES Base Oil
463	5754	105	y		CES Base Oil
587	5754	214	y		CES Base Oil
606	5754	156	y		CES Base Oil
756	5754	156			CES Viscosity Modifier
851	5754	400			CES Viscosity Modifier
3138	5754	381			
3140	5754	249	Y		
3141	5754	280	Y		
19	5755	148			CES Viscosity Modifier
315	5755	234			CES Viscosity Modifier
3584	5755	419			
28	5756	133			CES Viscosity Modifier
53	5756	85			CES Viscosity Modifier
552	5756	326	y		CES Base Oil
561	5756	171	y		CES Base Oil
3160	5756	169	Y		
3161	5756	155	Y		
500	5760	95			CES Viscosity Modifier
1086	5760	149			CES Viscosity Modifier
340	5769	183	y		CES Base Oil
684	5769	408			CES Viscosity Modifier
790	5769	236			CES Viscosity Modifier
733	5772	217			CES Viscosity Modifier
42	5774	37			CES Viscosity Modifier
66	5774	159			CES Viscosity Modifier
76	5774	74	y		CES Base Oil
97	5774	400			CES Viscosity Modifier
151	5774	133			CES Viscosity Modifier
152	5774	104			CES Viscosity Modifier
336	5774	89	y		CES Base Oil
476	5774	195	y		CES Base Oil
484	5774	160	y		CES Base Oil
518	5774	400			CES Viscosity Modifier
615	5774	230			CES Viscosity Modifier
621	5774	200			CES Viscosity Modifier
936	5774	400			CES Viscosity Modifier
949	5774	399			CES Viscosity Modifier
953	5774	181	y		CES Base Oil
954	5774	163	y		CES Base Oil

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
1098	5774	200	y		CES Base Oil
1119	5774	158	y		CES Base Oil
1122	5774	400			CES Viscosity Modifier
1135	5774	175	y		CES Base Oil
3266	5774	141	Y		
3267	5774	160	Y		
3272	5775	375			
62	5777	91			CES Viscosity Modifier
171	5777	400			CES Viscosity Modifier
267	5777	202	y		CES Base Oil
269	5777	202	y		CES Base Oil
273	5777	400			CES Viscosity Modifier
274	5777	116	y		CES Base Oil
332	5777	182	y		CES Base Oil
346	5777	194	y		CES Base Oil
356	5777	190	y		CES Base Oil
359	5777	199	y		CES Base Oil
363	5777	375			CES Viscosity Modifier
372	5777	208	y		CES Base Oil
389	5777	200	y		CES Base Oil
390	5777	166	y		CES Base Oil
464	5777	375			CES Viscosity Modifier
466	5777	375			CES Viscosity Modifier
487	5777	350			CES Viscosity Modifier
517	5777	136	y		CES Base Oil
556	5777	400			CES Viscosity Modifier
592	5777	400			CES Viscosity Modifier
593	5777	400			CES Viscosity Modifier
605	5777	188	y		CES Base Oil
646	5777	399			CES Viscosity Modifier
677	5777	375			CES Viscosity Modifier
686	5777	193	y		CES Base Oil
689	5777	215	y		CES Base Oil
722	5777	186			CES Viscosity Modifier
764	5777	156	y		CES Base Oil
782	5777	194			CES Viscosity Modifier
818	5777	375			CES Viscosity Modifier
839	5777	375			CES Viscosity Modifier
840	5777	375			CES Viscosity Modifier
842	5777	193	y		CES Base Oil
907	5777	177	y		CES Base Oil

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
908	5777	183	y		CES Base Oil
910	5777	395			CES Viscosity Modifier
925	5777	400			CES Viscosity Modifier
931	5777	400			CES Viscosity Modifier
947	5777	227	y		CES Base Oil
948	5777	227	y		CES Base Oil
1144	5777	375			CES Viscosity Modifier
1145	5777	400			CES Viscosity Modifier
1151	5777	375			CES Viscosity Modifier
1155	5777	279	y		CES Base Oil
1156	5777	200			CES Viscosity Modifier
1157	5777	400			CES Viscosity Modifier
1158	5777	108	y		CES Base Oil
1159	5777	122			CES Viscosity Modifier
1164	5777	208	y		CES Base Oil
1170	5777	100	y		CES Base Oil
1171	5777	280	y		CES Base Oil
1173	5777	400			CES Viscosity Modifier
1174	5777	375			CES Viscosity Modifier
1175	5777	400			CES Viscosity Modifier
1178	5777	249	y		CES Base Oil
1182	5777	168	y		CES Base Oil
1183	5777	102	y		CES Base Oil
1184	5777	110	y		CES Base Oil
1185	5777	209	y		CES Base Oil
1186	5777	177	y		CES Base Oil
1190	5777	179	y		CES Base Oil
1305	5777	131	y		CES Base Oil
1306	5777	120	y		CES Base Oil
1307	5777	140	y		CES Base Oil
1308	5777	157	y		CES Base Oil
1309	5777	127	y		CES Base Oil
1315	5777	134	y		CES Base Oil
1316	5777	110	y		CES Base Oil
1318	5777	151	y		CES Base Oil
1787	5777	365			
3082	5777	375			
3084	5777	157	Y		
3085	5777	141	Y		
3132	5777	183	Y		
3133	5777	161	Y		

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
3166	5777	135	Y		
3167	5777	138	Y		
3292	5777	375			
3295	5777	120	Y		
3330	5777	135	Y		
3336	5777	140	Y		
3337	5777	157	Y		
3586	5777	412			
996	5782	212	y		CES Base Oil
9	5785	372			CES Viscosity Modifier
10	5785	338			CES Viscosity Modifier
11	5785	315			CES Viscosity Modifier
29	5785	478			CES Viscosity Modifier
35	5785	76			CES Viscosity Modifier
197	5785	150			CES Viscosity Modifier
198	5785	139	y		CES Base Oil
348	5785	132	y		CES Base Oil
349	5785	142	y		CES Base Oil
350	5785	27			CES Viscosity Modifier
388	5785	187	y		CES Base Oil
405	5785	223	y		CES Base Oil
431	5785	383			CES Viscosity Modifier
497	5785	400			CES Viscosity Modifier
523	5785	360			CES Viscosity Modifier
532	5785	400			CES Viscosity Modifier
533	5785	400			CES Viscosity Modifier
654	5785	400			CES Viscosity Modifier
671	5785	400			CES Viscosity Modifier
713	5785	132			CES Viscosity Modifier
714	5785	313			CES Viscosity Modifier
991	5785	121	y		CES Base Oil
992	5785	213	y		CES Base Oil
993	5785	214	y		CES Base Oil
1002	5785	126			CES Viscosity Modifier
1005	5785	126	y		CES Base Oil
1015	5785	400			CES Viscosity Modifier
1023	5785	214	y		CES Base Oil
1067	5785	200	y		CES Base Oil
1069	5785	193	y		CES Base Oil
1330	5785	149	y		CES Base Oil
27	5786	38			CES Viscosity Modifier

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
67	5786	213			CES Viscosity Modifier
368	5786	171	y		CES Base Oil
369	5786	173	y		CES Base Oil
395	5786	140	y		CES Base Oil
877	5786	155	y		CES Base Oil
995	5786	199	y		CES Base Oil
1006	5786	139			CES Viscosity Modifier
1056	5786	388			CES Viscosity Modifier
1094	5786	338			CES Viscosity Modifier
3134	5786	188	Y		
3137	5786	182	Y		
3277	5786	388			
1	5788	179			CES Viscosity Modifier
230	5788	198	y		CES Base Oil
233	5788	161	y		CES Base Oil
240	5788	400			CES Viscosity Modifier
294	5788	86	y		CES Base Oil
295	5788	68	y		CES Base Oil
361	5788	392			CES Viscosity Modifier
554	5788	177	y		CES Base Oil
998	5788	312	y		CES Base Oil
1011	5788	202	y		CES Base Oil
1012	5788	174	y		CES Base Oil
1035	5788	392			CES Viscosity Modifier
1036	5788	392	y		CES Base Oil
1038	5788	392			CES Viscosity Modifier
1061	5788	150	y		CES Base Oil
1062	5788	164	y		CES Base Oil
1068	5788	372			CES Viscosity Modifier
1071	5788	165	y		CES Base Oil
1073	5788	176	y		CES Base Oil
1083	5788	260	y		CES Base Oil
1084	5788	249	y		CES Base Oil
1087	5788	100	y		CES Base Oil
1088	5788	110	y		CES Base Oil
1091	5788	392			CES Viscosity Modifier
3106	5788	392			
3108	5788	150	Y		
3109	5788	150	Y		
3158	5788	110	Y		
3159	5788	85	Y		

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
658	5789	400			CES Viscosity Modifier
784	5789	325			CES Viscosity Modifier
1051	5789	230	y		CES Base Oil
1052	5789	189			CES Viscosity Modifier
1059	5789	400			CES Viscosity Modifier
3178	6130				
3179	6130				
3180	6130				
3181	6130				
3182	6130				
3183	6130				
3184	6130				
3185	6130				
3186	6130				
3187	6130				
3188	6130				
3189	6130				
3206	6130	399			
3207	6130	399			
3208	6130	399			
3209	6130	399			
3210	6130	399			
3211	6130	399			
3212	6130	399			
3213	6130	399			
3230	6130	399			
3231	6130	399			
3244	6130	399			
3245	6130	399			
3246	6130	399			
3247	6130	399			
3248	6130	399			
3249	6130	399			
41	6403	395			CES Fuel Additive
3111	6403	400			
3128	6403	400			
3593	6403	449			
71	6416	400			CES Fuel Additive
78	6416	406	y		CES Fuel Additive
86	6416	400			CES Fuel Additive
96	6416	400			CES Fuel Additive

Drum ID #	Hitec Product ID	Net Weight (lbs)	Flush Drum?	Follow-up notes	Action
3404	NEED LIST				
3405	NEED LIST				
3406	NEED LIST				
3407	NEED LIST				
3408	NEED LIST				
3409	NEED LIST				
3410	NEED LIST				
3411	NEED LIST				
3412	NEED LIST				
3413	NEED LIST				
3414	NEED LIST				
3415	NEED LIST				
3416	NEED LIST				
3417	NEED LIST				
3418	NEED LIST				
3419	NEED LIST				
3420	NEED LIST				
3421	NEED LIST				
3422	NEED LIST				
3423	NEED LIST				
3424	NEED LIST				
3425	NEED LIST				
3426	NEED LIST				
3427	NEED LIST				
3428	NEED LIST				
3429	NEED LIST				
3430	NEED LIST				
3273	Pour Pt Depressant 500	400			
3219	PPD 500				
3275	PPD 500	200			
1711	SLA				
1751	SLA				
1752	SLA				
1737	Spec Lube Add				
1738	Spec Lube Add				
1739	Spec Lube Add				
1740	Spec Lube Add				
1741	Spec Lube Add				
1742	Spec Lube Add				
1743	Spec Lube Add				
3114	Spec Lube Add	155	Y		

LOADING FROM (i.e. Tank):

SIZE OF FITTING:

TYPE OF FITTING:

CAN CUSTOMER LOAD WITH FORKLIFT ☐ YES ☐ NO

Note: Pallets are only good if they drive the forklift into the trailer. Otherwise, it is a huge and painful experience for the driver. If pallets are used, then the drums must be shrink wrapped.

FIELD SERVICE WORK

HELPER REQUIRED: ☐ YES ☐ NO **IF YES, HOW MANY?** 0

EQUIPMENT NEEDED:

EPAPA008001387

(b) (4)

(b) (4)

(b) (4)

(b) (4)

b) (4)

(b) (4)

Hoist Inspection Report

Topics: Housekeeping, Working in the heat of summer, Respirator care, Refresh on CPR and First Aid Care.

Date	Inspected By:	Condition and Disposition Of Hoist

EPAPA008001394

PAINT Brushes - BLACK PAINT
PAINT Rollers - SMALL & Big
Desreaser for cleaning spill in front of NAP unit
TOOL'S TO FIX Broke pumps & LOCKING Box w/ Lock
H-1 inch crows FOOT

3 inch caps for Hoses TO Help Minimize spills
3 inch PLUGS " "

~~Some~~ gloves Med & Large

PACES Tank Inventory

Date _____

Tank Number/Description	Volume (Gal/%)	Misc. Notes
RV2	16,000 GAL	
RV1	90 %	
WW Tank	76 %	
Frac Tank 1000	4½ FT	Wastewater Storage
Frac Tank 1003	4 FT	Wastewater Storage
NV1	11,000 GAL	
NV2	11,000 GAL	
Propane Tank	61 %	
NaOH (Caustic Tank)	83 %	
Acid Tank 1		
Acid Tank 2		
Bleach Tank		
Peroxide Totes		Note how many totes/gallons we have
CCL 7 - Compartment 1		
CCL 7 - Compartment 2		
CCL 7 - Compartment 3		
CCL 26 - Compartment 1	9 FT	
CCL 26 - Compartment 2	9 FT	
CCL 26 - Compartment 3	MT	
Frac Tank 1006	7 FT	Tank is being repaired
Frac Tank 1007	~~8~~ 8FT	Citgo Sulfidic Caustic
Frac Tank 1008	~~8~~ 8FT	Naphthenic Acid Storage

OUSA 93 %

NaHS Tank

72 lbs

PACES Tank Inventory

Date _____

Tank Number/Description	Volume (Gal/%)	Misc. Notes
RV2		
RV1		
WW Tank		
Frac Tank 1000		Wastewater Storage
Frac Tank 1003		Wastewater Storage
NV1		
NV2		
Propane Tank		
NaOH (Caustic Tank)		
Acid Tank 1		
Acid Tank 2		
Bleach Tank		
Peroxide Totes		Note how many totes/gallons we have
CCL 7 - Compartment 1		
CCL 7 - Compartment 2		
CCL 7 - Compartment 3		
CCL 26 - Compartment 1		
CCL 26 - Compartment 2		
CCL 26 - Compartment 3		
Frac Tank 1006		Tank is being repaired
Frac Tank 1007		Citgo Sulfidic Caustic
Frac Tank 1008		Naphthenic Acid Storage

PACES Tank Inventory

Date _____

Tank Number/Description	Volume (Gal/%)	Misc. Notes
RV2		
RV1		
WW Tank		
Frac Tank 1000		Wastewater Storage
Frac Tank 1003		Wastewater Storage
NV1		
NV2		
Propane Tank		
NaOH (Caustic Tank)		
Acid Tank 1		
Acid Tank 2		
Bleach Tank		
Peroxide Totes		Note how many totes/gallons we have
CCL 7 - Compartment 1		
CCL 7 - Compartment 2		
CCL 7 - Compartment 3		
CCL 26 - Compartment 1		
CCL 26 - Compartment 2		
CCL 26 - Compartment 3		
Frac Tank 1006		Tank is being repaired
Frac Tank 1007		Citgo Sulfidic Caustic
Frac Tank 1008		Naphthenic Acid Storage

PACES Tank Inventory

Date _____

Tank Number/Description	Volume (Gal/%)	Misc. Notes
RV2		
RV1		
WW Tank		
Frac Tank 1000		Wastewater Storage
Frac Tank 1003		Wastewater Storage
NV1		
NV2		
Propane Tank		
NaOH (Caustic Tank)		
Acid Tank 1		
Acid Tank 2		
Bleach Tank		
Peroxide Totes		Note how many totes/gallons we have
CCL 7 - Compartment 1		
CCL 7 - Compartment 2		
CCL 7 - Compartment 3		
CCL 26 - Compartment 1		
CCL 26 - Compartment 2		
CCL 26 - Compartment 3		
Frac Tank 1006		Tank is being repaired
Frac Tank 1007		Citgo Sulfidic Caustic
Frac Tank 1008		Naphthenic Acid Storage

PACES Tank Inventory

Date _____

Tank Number/Description	Volume (Gal/%)	Misc. Notes
RV2		
RV1		
WW Tank		
Frac Tank 1000		Wastewater Storage
Frac Tank 1003		Wastewater Storage
NV1		
NV2		
Propane Tank		
NaOH (Caustic Tank)		
Acid Tank 1		
Acid Tank 2		
Bleach Tank		
Peroxide Totes		Note how many totes/gallons we have
CCL 7 - Compartment 1		
CCL 7 - Compartment 2		
CCL 7 - Compartment 3		
CCL 26 - Compartment 1		
CCL 26 - Compartment 2		
CCL 26 - Compartment 3		
Frac Tank 1006		Tank is being repaired
Frac Tank 1007		Citgo Sulfidic Caustic
Frac Tank 1008		Naphthenic Acid Storage

PACES Tank Inventory

Date _____

Tank Number/Description	Volume (Gal/%)	Misc. Notes
RV2		
RV1		
WW Tank		
Frac Tank 1000		Wastewater Storage
Frac Tank 1003		Wastewater Storage
NV1		
NV2		
Propane Tank		
NaOH (Caustic Tank)		
Acid Tank 1		
Acid Tank 2		
Bleach Tank		
Peroxide Totes		Note how many totes/gallons we have
CCL 7 - Compartment 1		
CCL 7 - Compartment 2		
CCL 7 - Compartment 3		
CCL 26 - Compartment 1		
CCL 26 - Compartment 2		
CCL 26 - Compartment 3		
Frac Tank 1006		Tank is being repaired
Frac Tank 1007		Citgo Sulfidic Caustic
Frac Tank 1008		Naphthenic Acid Storage

CES Environmental Port Arthur Dispatch Board

FOR : Friday 6/19/2009

Job Note ID	Driver	Helper	Truck	Trailer	Misc Equipment	Customer	Job Description	Start Time	Job Length
87673	Brown Leroy		285	267		CES Environmental Services - Port Arthur	haul loaded trailer to Evedale	2nd	1/3 Day
87674	Brown Leroy		285	227		CES Environmental Services - Port Arthur	haul loaded trailer to Evedale	630 am	1/3 Day
87670	Frias Juan		2003	266		CES Environmental Services - Port Arthur	haul loaded trailer to Evedale	2nd	1/3 Day
87610	Frias Juan		2003	260		Citgo Refinery	Load naphthenic caustic from Citgo in Lake Charles and haul to PACES. SEE INBOUND	630 am	1/3 Day
87928	Frias Juan		2003			KMTEX	Haul box loaded with scrap metal and offload at site indicated by customer.	800 am	1/3 Day
87696	Mendoza Juan		2001	268		CES Environmental Services - Port Arthur	haul trailer to Boise Cascade.	2nd	1/2 Day
87686	Mendoza Juan		2001	261		CES Environmental Services - Port Arthur	Load WHITE LIQUOR from CCL26 & haul to Boise Cascade. MAKE SURE TRAILER IS MARKED WITH SPECIAL MARKINGS!!	630 am	1/2 Day
87672	Saylor Chris		2006	237		CES Environmental Services - Port Arthur	haul loaded trailer to Evedale	2nd	1/3 Day
87698	Saylor Chris		2006	269		CES Environmental Services - Port Arthur	haul trailer to Boise Cascade.	630 am	1/2 Day
87671	Wilson Kevin		2004	258		CES Environmental Services - Port Arthur	haul loaded trailer to Evedale	2nd	1/2 Day
87697	Wilson Kevin		2004	420		CES Environmental Services - Port Arthur	haul trailer to Boise Cascade.	630 am	1/2 Day

Report Printed 6/19/2009 6:45:52 AM

EPAPA008001402

Item #40

CES-PACES

EPA-CID Case No. 0606-0015

LOCATION FOUND	BUILDING	ROOM	CONTAINER
	Warehouse	Lab	W

DESCRIPTION OF DOCUMENTS OR THINGS TAKEN	GENERAL	SPECIFIC
	Automated time clock for employees on wall w/ employee badges (names copied as shown to right) →	- Johnstone Maleche - Leroy Brown - James Matlock - Bo Cumberland - Dennette Sartin - Jorge Martinez - Kevin Wilson - Jerry Honey - Juan Mendoza - one (1) illegible

SEIZING INVESTIGATOR	NAME (PRINTED)	AGENCY	INITIALS
	Brett Spiers	EPA CID	

Item # 39

CES-PACES

EPA-CID Case No. 0606-0015

	BUILDING	ROOM	CONTAINER
LOCATION FOUND	Warehouse	Lab	5

	GENERAL	SPECIFIC
DESCRIPTION OF DOCUMENTS OR THINGS TAKEN	CES Calibration Checklists	2 pages

	NAME (PRINTED)	AGENCY	INITIALS
SEIZING INVESTIGATOR	Rogen Garcia	TCEQ	RGG

Port Arthur Chemical
& Environmental Services, LLC.

CALIBRATION CHECKLIST

DATE	TIME	INITIALS		DATE	TIME	INITIALS		DATE	TIME	INITIALS
5/1										
5/4										
5/5										
5/6										
5/7										
5/8										
5/11										
5/12										
5/13										
5/14										
5/15										
5/18										
5/19										
5/20	6:30Am	SM								
5/21	7:00Am	SM								
5/22	1:00 P.M	JM								
5/25										
5/26										
5/27										
5/28										
5/29										

Port Arthur Chemical
& Environmental Services, LLC.

CALIBRATION CHECKLIST

DATE	TIME	INITIALS		DATE	TIME	INITIALS		DATE	TIME	INITIALS
6/1										
6/2										
6/3										
6/4										
6/5										
6/8										
6/9										
6/10										
6/11										
6/12										
6/15										
6/16										
6/17										
6/18										
6/19										
6/22										
6/23										
6/24										
6/25										
6/26										
6/29										
6/30										

EPAPA008001406

Item # 38

CES-PACES

EPA-CID Case No. 0606-0015

LOCATION FOUND	BUILDING	ROOM	CONTAINER
	Warehouse	Lab	L

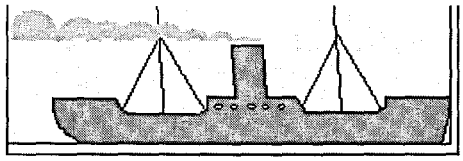
DESCRIPTION OF DOCUMENTS OR THINGS TAKEN	GENERAL	SPECIFIC
	Copy of email re: "3am tomorrow" dated 7/1/2009	From: Jennifer Rust To: Jay Matlock, Mike Rust; Bo Cumberland 1 page
	Citgo Marine Bill of Lading dated 6/29/09	Bill of Lading signed 6/29/09 1 page

SEIZING INVESTIGATOR	NAME (PRINTED)	AGENCY	INITIALS
	Roger Garcia	TCEQ	RG

CITGO PETROLEUM

MARINE BILL OF LADING

06/29/2009



SHIPPED APPARENT GOOD ORDER BY: CITGO PETROLEUM
ON BOARD THE CCL 26
FROM THE PORT OF LAKE CHARLES, LOUISIANA
NOMINATION SC062409

Commodity RQ, SODIUM HYDROXIDE, solution, 8, UN1824, PGII, Corrosive (CAUSTIC SODA, SPENT)

Approximate Qty 650.000 Short Tons

EMERGENCY RESPONSE TELEPHONE NUMBER CHEMTREC 1-800-424-9300

MATERIAL SAFETY DATA SHEETS ATTACHED

THIS IS TO CERTIFY THAT THE ABOVE NAMED MATERIALS ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED, AND LABELED, AND ARE IN THE PROPER CONDITION FOR TRANSPORTATION ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION.

AGENT FOR CITGO PETROLEUM CORPORATION: Charles Desormeaux DATE 06/29/2009

TO BE DELIVERED AT THE PORT OF: AS DESIGNATED
OR SO NEAR THERETO AS THE VESSEL CAN GET SAFELY AFLOAT TO: C E S ENVIRONMENTAL SERVICES INC
OR ORDER ON PAYMENT OF FREIGHT AT THE RATE OF : AS AGREED
THIS SHIPMENT IS CARRIED UNDER AND PURSUANT TO THE TERMS OF THE CHARTER.
IN WITNESS TEHREOF THE MASTER HAS SIGNED ONE(1) COPY OF THE BILLS OF LADING,

DATED AT: LAKE CHARLES LOUISIANA

DATE: x 6/29/09 MASTER'S SIGNATURE: x

PURSUANT TO D.O.T. REGULATIONS CONTAINED IN 46 CFR Ch. 1(35.01-10)(151.45-7)(153.907)
E.P.A. REGULATIONS CONTAINED IN THE CLEAN AIR ACT CFR 40 PART 80.(60)(74)(77) AND (106):
ATTACHED ARE MANDATORY DOCUMENTS THAT MUST ACCOMPANY THIS SHIPMENT:
MARINE BILL OF LADING x
MATERIAL SAFETY DATA SHEET(S) x
PRODUCT TRANSFER DOCUMENT(S) _____
(REQUIRED FOR GASOLINE ONLY) (SIGN FOR RECEIPT ONLY)

NON-NEGOTIABLE BILL OF LADING

A 835

A7 845

2570.71

1696.96

#1 107,940

#2 71,232

Bo Cumberland

From: Jennifer Rust
Sent: Wednesday, July 01, 2009 4:32 PM
To: Jay Matlock; Miles Root; Bo Cumberland
Cc: Matt Bowman; Steve Stricker
Subject: 3am tomorrow

Today –

- Frac tanks 1000 & 1003 and all Targa trailers need to be checked to insure no solids or oil is present. If present they must be filtered.

Prior to loading / unloading barge samples need to be pulled & mixed following the ratio below to insure color, odor, solids, oil are acceptable. This material must appear similar to Citgo's typical spent caustic. In a 100 milliliter container mix the following;

- 7.69 ml of w/w from 1000 & 1003
- 7.69 ml of Targa material
- 84.6 ml of representative barge sample

Tomorrow –

- Targa trailers to be put into barge (see below)
- Frac tanks 1000 & 1003 (apx. 6 loads) need to be put into barge (see below)
- 258 &1259 need to be unloaded into w/w tank & entire tank, mixed & treated w/ bleach until phenols are less than 1,000. Loads should then be scheduled into Houston for processing.

Miles / Bo or anyone has any additional comments or suggestions please let us know.

Compartment #1	Compartment#2	Compartment#3
2 -Targa trailers	1 -Targa Trailer	2 -Targa trailers
2 w/w loads from 1000/1003	2 w/w loads from 1000/1003	2 – w/w loads from 1000/1003

Thank You,

Jenny Rust

CES Environmental Services, Inc.
4904 Griggs Road
Houston, TX 77021
Office: (713) 676-1460
Direct: (713) 800-7907
Cell: (713) 367-8581

Item #37

CES-PACES

EPA-CID Case No. 0606-0015

LOCATION FOUND	BUILDING	ROOM	CONTAINER
	Warehouse	Lab	R

DESCRIPTION OF DOCUMENTS OR THINGS TAKEN	GENERAL	SPECIFIC
	Daily H_2S Monitor Reading Log	July readings 1 pg
	Confined Space Entry Permit M. Landis & J. Matlock	Permit w/ attachments 13 pages
	CES Dispatch Board	2 pages dated 5/1/2009 & 5/2/2009

SEIZING INVESTIGATOR	NAME (PRINTED)	AGENCY	INITIALS
	Roger Garcia	TCEQ	RGG

Daily H2S Monitor Reading Log

Month July

Day	H2S -1			H2S-2			H2S-3			H2S-4			H2S-5		
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	OFF	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	OFF	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	OFF	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18															
19															
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25															
26															
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0			0			0			0			0		
31															

Check each H2S monitor three (3) times daily and write down the PPM. Once in the morning, once mid day, and at the end of the work day.

CONFINED SPACE ENTRY PERMIT

(TO BE COMPLETED BY THE ENTRY SUPERVISOR)

Workman
Snee

SECTION A: GENERAL INFORMATION (PLEASE PRINT)

1. **Description of the Confined Space:** Barge Inspection

2. **Description of Work to be Performed:** Inspect inside of Barge

3. **Date Issued:** 7/2/09 4.**Time Issued:** 1:45 am / (pm)

5. **Date Expires:** 7/2/09 6.**Time Expires:** ____:____ am / pm

7. **Attendant:** Mike Landis 8.**Entry Supervisor:** J. Matlock

SECTION B: CHECKLIST FOR ISOLATION AND UNAUTHORIZED ACCESS PREVENTION

(Circle the correct answer for each question).

1. **Are external barriers in place?** YES NO (N/A)
2. **Has mechanical lockout/tagout been completed?** YES NO (N/A)
3. **Has electrical lockout/tagout been completed?** YES NO (N/A)
4. **Have other De-energizing steps been completed?** YES NO N/A
   If so, describe: _____
5. **Have lines/pipes been disconnected?** (YES) NO N/A
6. **Have lines/pipes been blocked?** YES NO (N/A)
7. **Have lines/pipes been capped?** YES NO (N/A)
8. **Have barricades been set up?** YES NO (N/A)
9. **Have warning signs been placed?** YES NO (N/A)
10. **Any possible overhead falling debris** YES NO N/A

Report Unauthorized Entry to: J. Matlock

Phone: 832-231-3035

SECTION C: PRE-ENTRY CHECKLIST (Check or fill in the correct answers).

1. **Purging: Were lines/pipes purged?** [ ] YES [✓] NO [ ] N/A

   If so, what method was used? [ ] Nitrogen [ ] Steam [ ] Water
   [ ] Other (Specify): _____

2. **VENTILATION: Is forced ventilation being maintained?** [ ] YES [✓] NO [ ] N/A

3. **ATMOSPHERIC GAS TESTS PERFORMED BY:** J. Matlock

TESTER INFORMATION	ATMOSPHERIC HAZARD TESTED	ACCEPTABLE RANGE OF HAZARD	ACTUAL READING (Record)	ACCEPTABLE? (Circle One)
DATE: 7/2/09	Oxygen Content (% O2)	19.5% - 23.5%	20.9 %	(YES) NO
TIME: 1:45	Combustible Gas (% LEL)	0% - 10%	0 %	(YES) NO
SIGNATURE: J. Mat	Other:(Specify):	PEL = ppm	0 ppm	(YES) NO

CAUTION: Toxic or flammable gases or vapors may stratify in the confined space. Be sure to test at various levels and locations within the confined space. Always check the oxygen content first.

4. SPECIFIC HAZARDOUS TASKS: Certain tasks performed in confined spaces greatly increase the risks to Entrants. Check all tasks to be performed.

[ ] Painting or Solvent-Cleaning [ ] Cleaning/Sweeping/Vacuuming
[ ] Scraping/Removing Residue [ ] OTHER

(explain):_____

5. RESCUE PROCEDURE:

_____

_____

RESCUE PERSONNEL:
Names: **Phone:**
J Matlock 832-231-3035
M. Rudd _____
Dir Shaddix _____

OUTSIDE SOURCES & PHONE:
Fire Dept._____
Ambulance _____
Hospital _____
Other: _____

6. SPECIAL EQUIPMENT NEEDED (Check):

[✓] Air-Purifying Respirators
[ ] Air-Supplying Respirators
[ ] Air-Supplying Respirators with Escape Bottle
[ ] SCBA or Supplied Air (for rescue personnel)
[ ] Safety Harnesses
[ ] Lifelines
[ ] Hoisting Apparatus
[ ] Communications Equipment:_____
[ ] Temporary Lighting
[ ] Non-Sparking Tools
[ ] Protective Clothing:

Permit and Checklists Prepared By: J. Matlock
Approved By (Unit Supervisor): J. Matlock

CONFINED SPACE PERSONNEL ENTRY LOG
(PLEASE PRINT)

Description of the Confined Space: CCL 7

Entry Supervisor: J. Matlock **Date:** 7/2/07

Attendant(s): Mike Landis @ Chem Carriers

ENTRANT'S NAME	TIME IN	TIME OUT	TIME IN	TIME OUT	TIME IN	TIME OUT
Mike Landis	1:53					

Drum ID #	Hitec Product ID (unless otherwise noted) Pal	Net Weight (lbs) Da	Post Flush?	Drum ID#	Hitec Product ID (unless otherwise noted)	Net Weight (lbs)	Post Flush?
7580	19	11					
PPD Flush							
5789		101 Dr					
Tnt union misc Flush		71					

3 1 1/76

t/68

DECLARATION OF INSPECTION

DECLARATION OF INSPECTION PRIOR TO BULK CARGO TRANSFER		RADIO NO.	
VESSEL:	CCL 26 Trailer Caustic	DATE/TIME ISSUED	
		VESSEL PIC SIGNATURE	Ricky Stall
TRANSFER FACILITY:	CES ENVIRONMENTAL SERVICES, INC.	DATE/TIME RETURNED	
LOCATION:	Paves	FACILITY PIC SIGNATURE	

The following list refers to requirements set forth in detail 33 CFR 156.150 and 46 CFR 35.35-30

The spaces adjacent to items on the list are provided to indicate that the detailed requirement has been met.

		INITIAL FACILITY	INITIAL VESSEL
1.	Communication System/Language Fluency. (156.120 (q) (154.560) (155.785) (156.120V))		RS
2.	Warning Signs and red Warning Signal. (35.35-30)		RS
3.	Adequate Vessels Mooring. (156.120 (a))		RS
4.	Transfer System Alignment. (156.120 (d))		RS
5.	Transfer System; unused components. (156.120 (e) (f) (154.120) (155.805))		RS
6.	Transfer System; fixed piping. (156.120 (g))		RS
7.	Overboard. Discharges/Sea Suction Lashed Valves. (156.120 (h))		RS
8.	Hoses or Loading Arms condition. (156.120 (l) (j) (154.500) (154.510))		RS
9.	Hoses; length and support. (156.120 (b) (c))		RS
10.	Connections. (156.120 (k) (p) (156.130))		RS
11.	Monitoring Devices. (156.120 (l) (154.525))		RS
12.	Discharge Containment System Capacity Maintained. (156.120 (m) (n) (p) (154.530) (155.310) (155.320) (154.545))		RS
13.	Scuppers or Drains. (156.120 (o) (155.310))		RS
14.	Emergency Shutdown. (156.120 (r) (154.550) (155.780))		RS
15.	Repair Work Authorization. (35.35-30)		RS
16.	Boiler and Galley Fires Safety. (35.35-30)		RS
17.	Fires or Open Flames. (35.35-30)		RS
18.	Lighting (sunset to sunrise). (156.120 (y) (z) (154.570) (155.790))		RS
19.	Safe Smoking Spaces. (35.35-30)		RS
20.	Spill and Emergency shutdown procedures. (156.120 (w))		RS
21.	Sufficient Personnel. (156.120 (s) (156.115 (u))		RS
22.	Pre-Transfer Conference - refer to the reverse side for the items to be discussed. (156.120 (w))		RS
23.	Agreement to begin Transfer. (156.120 (x))		RS
24.	Persons-in-Charge immediate vicinity/positioned to observe and supervise transfer. (156.160)		RS
25.	Cargo Information Card - Reviewed and Issued. (151.45-2 (e) (3))		RS
26.	Inert Gas System - Operating Properly. (32.53)		RS

I do certify that I have personally inspected this facility or vessel with reference to the requirements set forth in section 35.35-30 and that opposite each of them I have indicated by my initials that the regulations have been complied with.

FACILITY	SIGNATURE		VESSEL	SIGNATURE	Ricky Stall
	TITLE			TITLE	TKMO Pic
	TIME AND DATE			TIME AND DATE	

I certify that I have read the above declaration and detailed requirements and all conditions remain satisfactory.

SUBSEQUENT FACILITY PERSON-IN-CHARGE			SUBSEQUENT VESSEL PERSON-IN-CHARGE		
SIGNATURE/TITLE	TIME	DATE	SIGNATURE/TITLE	TIME	DATE
TRANSFER START			TRANSFER COMPLETE		

EPAPA008001417

DECLARATION OF INSPECTION

DECLARATION OF INSPECTION PRIOR TO BULK CARGO TRANSFER		RADIO NO.	
VESSEL:	CCL 26 Trailer	DATE/TIME ISSUED	
	Caustic	VESSEL PIC SIGNATURE	Ricky Stall
TRANSFER FACILITY:	CES ENVIRONMENTAL SERVICES, INC.	DATE/TIME RETURNED	
LOCATION:	Paulsboro	FACILITY PIC SIGNATURE	

The following list refers to requirements set forth in detail 33 CFR 156.150 and 46 CFR 35.35-30

The spaces adjacent to items on the list are provided to indicate that the detailed requirement has been met.

		INITIAL	
		FACILITY	VESSEL
1.	Communication System/Language Fluency. (156.120 (q) (154.560) (155.785) (156.120V))		RS
2.	Warning Signs and red Warning Signal. (35.35-30)		RS
3.	Adequate Vessels Mooring. (156.120 (a))		RS
4.	Transfer System Alignment. (156.120 (d))		RS
5.	Transfer System; unused components. (156.120 (e) (f) (154.120) (155.805))		RS
6.	Transfer System; fixed piping. (156.120 (g))		RS
7.	Overboard. Discharges/Sea Suction Lashed Valves. (156.120 (h))		RS
8.	Hoses or Loading Arms condition. (156.120 (i) (j) (154.500) (154.510))		RS
9.	Hoses; length and support. (156.120 (b) (c))		RS
10.	Connections. (156.120 (k) (p) (156.130))		RS
11.	Monitoring Devices. (156.120 (l) (154.525))		RS
12.	Discharge Containment System Capacity Maintained. (156.120 (m) (n) (p) (154.530) (155.310) (155.320) (154.545))		RS
13.	Scuppers or Drains. (156.120 (o) (155.310))		RS
14.	Emergency Shutdown. (156.120 (r) (154.550) (155.780))		RS
15.	Repair Work Authorization. (35.35-30)		RS
16.	Boiler and Galley Fires Safety. (35.35-30)		RS
17.	Fires or Open Flames. (35.35-30)		RS
18.	Lighting (sunset to sunrise). (156.120 (y) (z) (154.570) (155.790))		RS
19.	Safe Smoking Spaces. (35.35-30)		RS
20.	Spill and Emergency shutdown procedures. (156.120 (w))		RS
21.	Sufficient Personnel. (156.120 (s) (156.115 (u))		RS
22.	Pre-Transfer Conference - refer to the reverse side for the items to be discussed. (156.120 (w))		RS
23.	Agreement to begin Transfer. (156.120 (x))		RS
24.	Persons-in-Charge immediate vicinity/positioned to observe and supervise transfer. (156.160)		RS
25.	Cargo Information Card - Reviewed and Issued. (151.45-2 (e) (3))		RS
26.	Inert Gas System - Operating Properly. (32.53)		RS

I do certify that I have personally inspected this facility or vessel with reference to the requirements set forth in section 35.35-30 and that opposite each of them I have indicated by my initials that the regulations have been complied with.

FACILITY	SIGNATURE		VESSEL	SIGNATURE	Ricky Stall
	TITLE			TITLE	TKMPIC
	TIME AND DATE			TIME AND DATE	

I certify that I have read the above declaration and detailed requirements and all conditions remain satisfactory.

SUBSEQUENT FACILITY PERSON-IN-CHARGE			SUBSEQUENT VESSEL PERSON-IN-CHARGE		
SIGNATURE/TITLE	TIME	DATE	SIGNATURE/TITLE	TIME	DATE
TRANSFER START			TRANSFER COMPLETE		

EPAPA008001418

DECLARATION OF INSPECTION

DECLARATION OF INSPECTION PRIOR TO BULK CARGO TRANSFER		RADIO NO.	
VESSEL:	CCL 26 Trailer Cawsti	DATE/TIME ISSUED	
		VESSEL PIC SIGNATURE	Ricky Stall
TRANSFER FACILITY:	CES ENVIRONMENTAL SERVICES, INC.	DATE/TIME RETURNED	
LOCATION:	Paulis	FACILITY PIC SIGNATURE	

The following list refers to requirements set forth in detail 33 CFR 156.150 and 46 CFR 35.35-30

The spaces adjacent to items on the list are provided to indicate that the detailed requirement has been met.

		INITIAL	
		FACILITY	VESSEL
1.	Communication System/Language Fluency. (156.120 (q) (154.560) (155.785) (156.120V))		RS
2.	Warning Signs and red Warning Signal. (35.35-30)		RS
3.	Adequate Vessels Mooring. (156.120 (a))		RS
4.	Transfer System Alignment. (156.120 (d))		RS
5.	Transfer System; unused components. (156.120 (e) (f) (154.120) (155.805))		RS
6.	Transfer System; fixed piping. (156.120 (g))		RS
7.	Overboard. Discharges/Sea Suction Lashed Valves. (156.120 (h))		RS
8.	Hoses or Loading Arms condition. (156.120 (i) (j) (154.500) (154.510))		RS
9.	Hoses; length and support. (156.120 (b) (c))		RS
10.	Connections. (156.120 (k) (p) (156.130))		RS
11.	Monitoring Devices. (156.120 (l) (154.525))		RS
12.	Discharge Containment System Capacity Maintained. (156.120 (m) (n) (p) (154.530) (155.310) (155.320) (154.545))		RS
13.	Scuppers or Drains. (156.120 (o) (155.310))		RS
14.	Emergency Shutdown. (156.120 (r) (154.550) (155.780))		RS
15.	Repair Work Authorization. (35.35-30)		RS
16.	Boiler and Galley Fires Safety. (35.35-30)		RS
17.	Fires or Open Flames. (35.35-30)		RS
18.	Lighting (sunset to sunrise). (156.120 (y) (z) (154.570) (155.790))		RS
19.	Safe Smoking Spaces. (35.35-30)		RS
20.	Spill and Emergency shutdown procedures. (156.120 (w))		RS
21.	Sufficient Personnel. (156.120 (s) (156.115 (u))		RS
22.	Pre-Transfer Conference - refer to the reverse side for the items to be discussed. (156.120 (w))		RS
23.	Agreement to begin Transfer. (156.120 (x))		RS
24.	Persons-in-Charge immediate vicinity/positioned to observe and supervise transfer. (156.160)		RS
25.	Cargo Information Card - Reviewed and Issued. (151.45-2 (e) (3))		RS
26.	Inert Gas System - Operating Properly. (32.53)		RS

I do certify that I have personally inspected this facility or vessel with reference to the requirements set forth in section 35.35-30 and that opposite each of them I have indicated by my initials that the regulations have been complied with.

FACILITY	SIGNATURE		VESSEL	SIGNATURE	Ricky Stall
	TITLE			TITLE	TKMPIC
	TIME AND DATE			TIME AND DATE	

I certify that I have read the above declaration and detailed requirements and all conditions remain satisfactory.

SUBSEQUENT FACILITY PERSON-IN-CHARGE			SUBSEQUENT VESSEL PERSON-IN-CHARGE		
SIGNATURE/TITLE	TIME	DATE	SIGNATURE/TITLE	TIME	DATE
TRANSFER START			TRANSFER COMPLETE		

EPAPA008001419

DECLARATION OF INSPECTION

DECLARATION OF INSPECTION PRIOR TO BULK CARGO TRANSFER		RADIO NO.	
VESSEL:	CCL 26 Trailer Cawsti	DATE/TIME ISSUED	
		VESSEL PIC SIGNATURE	Ricky Scott
TRANSFER FACILITY:	CES ENVIRONMENTAL SERVICES, INC.	DATE/TIME RETURNED	
LOCATION:	Paves	FACILITY PIC SIGNATURE	

The following list refers to requirements set forth in detail 33 CFR 156.150 and 46 CFR 35.35-30

The spaces adjacent to items on the list are provided to indicate that the detailed requirement has been met.

		INITIAL	
		FACILITY	VESSEL
1.	Communication System/Language Fluency. (156.120 (q) (154.560) (155.785) (156.120V))		RS
2.	Warning Signs and red Warning Signal. (35.35-30)		RS
3.	Adequate Vessels Mooring. (156.120 (a))		RS
4.	Transfer System Alignment. (156.120 (d))		RS
5.	Transfer System; unused components. (156.120 (e) (l) (154.120) (155.805))		RS
6.	Transfer System; fixed piping. (156.120 (g))		RS
7.	Overboard. Discharges/Sea Suction Lashed Valves. (156.120 (h))		RS
8.	Hoses or Loading Arms condition. (156.120 (l) (j) (154.500) (154.510))		RS
9.	Hoses; length and support. (156.120 (b) (c))		RS
10.	Connections. (156.120 (k) (p) (156.130))		RS
11.	Monitoring Devices. (156.120 (l) (154.525))		RS
12.	Discharge Containment System Capacity Maintained. (156.120 (m) (n) (p) (154.530) (155.310) (155.320) (154.545))		RS
13.	Scuppers or Drains. (156.120 (o) (155.310))		RS
14.	Emergency Shutdown. (156.120 (r) (154.550) (155.780))		RS
15.	Repair Work Authorization. (35.35-30)		RS
16.	Boiler and Galley Fires Safety. (35.35-30)		RS
17.	Fires or Open Flames. (35.35-30)		RS
18.	Lighting (sunset to sunrise). (156.120 (y) (z) (154.570) (155.790))		RS
19.	Safe Smoking Spaces. (35.35-30)		RS
20.	Spill and Emergency shutdown procedures. (156.120 (w))		RS
21.	Sufficient Personnel. (156.120 (s) (156.115 (u))		RS
22.	Pre-Transfer Conference - refer to the reverse side for the items to be discussed. (156.120 (w))		RS
23.	Agreement to begin Transfer. (156.120 (x))		RS
24.	Persons-in-Charge immediate vicinity/positioned to observe and supervise transfer. (156.160)		RS
25.	Cargo Information Card - Reviewed and Issued. (151.45-2 (e) (3))		RS
26.	Inert Gas System - Operating Properly. (32.53)		RS

I do certify that I have personally inspected this facility or vessel with reference to the requirements set forth in section 35.35-30 and that opposite each of them I have indicated by my initials that the regulations have been complied with.

FACILITY	SIGNATURE		VESSEL	SIGNATURE	Ricky Scott
	TITLE			TITLE	TKMP's Co.
	TIME AND DATE			TIME AND DATE	

I certify that I have read the above declaration and detailed requirements and all conditions remain satisfactory.

SUBSEQUENT FACILITY PERSON-IN-CHARGE			SUBSEQUENT VESSEL PERSON-IN-CHARGE		
SIGNATURE/TITLE	TIME	DATE	SIGNATURE/TITLE	TIME	DATE
TRANSFER START			TRANSFER COMPLETE		

EPAPA008001420

DECLARATION OF INSPECTION

DECLARATION OF INSPECTION PRIOR TO BULK CARGO TRANSFER		RADIO NO.	
VESSEL:	CCL 26 Trailer Canstic	DATE/TIME ISSUED	
		VESSEL PIC SIGNATURE	Ricky Scott
TRANSFER FACILITY:	CES ENVIRONMENTAL SERVICES, INC.	DATE/TIME RETURNED	
LOCATION:	Paves	FACILITY PIC SIGNATURE	

The following list refers to requirements set forth in detail 33 CFR 156.150 and 46 CFR 35.35-30

The spaces adjacent to items on the list are provided to indicate that the detailed requirement has been met.

		INITIAL	
		FACILITY	VESSEL
1.	Communication System/Language Fluency. (156.120 (q) (154.560) (155.785) (156.120V))		RS
2.	Warning Signs and red Warning Signal. (35.35-30)		RS
3.	Adequate Vessels Mooring. (156.120 (a))		RS
4.	Transfer System Alignment. (156.120 (d))		RS
5.	Transfer System; unused components. (156.120 (e) (f) (154.120) (155.805))		RS
6.	Transfer System; fixed piping. (156.120 (g))		RS
7.	Overboard. Discharges/Sea Suction Lashed Valves. (156.120 (h))		RS
8.	Hoses or Loading Arms condition. (156.120 (i) (j) (154.500) (154.510))		RS
9.	Hoses; length and support. (156.120 (b) (c))		RS
10.	Connections. (156.120 (k) (p) (156.130))		RS
11.	Monitoring Devices. (156.120 (l) (154.525))		RS
12.	Discharge Containment System Capacity Maintained. (156.120 (m) (n) (p) (154.530) (155.310) (155.320) (154.545))		RS
13.	Scuppers or Drains. (156.120 (o) (155.310))		RS
14.	Emergency Shutdown. (156.120 (r) (154.550) (155.780))		RS
15.	Repair Work Authorization. (35.35-30)		RS
16.	Boiler and Galley Fires Safety. (35.35-30)		RS
17.	Fires or Open Flames. (35.35-30)		RS
18.	Lighting (sunset to sunrise). (156.120 (y) (z) (154.570) (155.790))		RS
19.	Safe Smoking Spaces. (35.35-30)		RS
20.	Spill and Emergency shutdown procedures. (156.120 (w))		RS
21.	Sufficient Personnel. (156.120 (s) (156.115 (u))		RS
22.	Pre-Transfer Conference - refer to the reverse side for the items to be discussed. (156.120 (w))		RS
23.	Agreement to begin Transfer. (156.120 (x))		RS
24.	Persons-in-Charge immediate vicinity/positioned to observe and supervise transfer. (156.160)		RS
25.	Cargo Information Card - Reviewed and Issued. (151.45-2 (e) (3))		RS
26.	Inert Gas System - Operating Properly. (32.53)		RS

I do certify that I have personally inspected this facility or vessel with reference to the requirements set forth in section 35.35-30 and that opposite each of them I have indicated by my initials that the regulations have been complied with.

FACILITY	SIGNATURE		VESSEL	SIGNATURE	Ricky Scott
	TITLE			TITLE	TKM Rig
	TIME AND DATE			TIME AND DATE	

I certify that I have read the above declaration and detailed requirements and all conditions remain satisfactory.

SUBSEQUENT FACILITY PERSON-IN-CHARGE			SUBSEQUENT VESSEL PERSON-IN-CHARGE		
SIGNATURE/TITLE	TIME	DATE	SIGNATURE/TITLE	TIME	DATE
TRANSFER START			TRANSFER COMPLETE		

EPAPA008001421

DECLARATION OF INSPECTION

DECLARATION OF INSPECTION PRIOR TO BULK CARGO TRANSFER		RADIO NO.	
VESSEL:	CCL 26 Trailer	DATE/TIME ISSUED	
	Caustic	VESSEL PIC SIGNATURE	Richard Stott
TRANSFER FACILITY:	CES ENVIRONMENTAL SERVICES, INC.	DATE/TIME RETURNED	
LOCATION:	Paces	FACILITY PIC SIGNATURE	

The following list refers to requirements set forth in detail 33 CFR 156.150 and 46 CFR 35.35-30

The spaces adjacent to items on the list are provided to indicate that the detailed requirement has been met.

		INITIAL	
		FACILITY	VESSEL
1.	Communication System/Language Fluency. (156.120 (q) (154.560) (155.785) (156.120V))		RS
2.	Warning Signs and red Warning Signal. (35.35-30)		RS
3.	Adequate Vessels Mooring. (156.120 (a))		RS
4.	Transfer System Alignment. (156.120 (d))		RS
5.	Transfer System; unused components. (156.120 (e) (f) (154.120) (155.805))		RS
6.	Transfer System; fixed piping. (156.120 (g))		RS
7.	Overboard. Discharges/Sea Suction Lashed Valves. (156.120 (h))		RS
8.	Hoses or Loading Arms condition. (156.120 (i) (j) (154.500) (154.510))		RS
9.	Hoses; length and support. (156.120 (b) (c))		RS
10.	Connections. (156.120 (k) (p) (156.130))		RS
11.	Monitoring Devices. (156.120 (l) (154.525))		RS
12.	Discharge Containment System Capacity Maintained. (156.120 (m) (n) (p) (154.530) (155.310) (155.320) (154.545))		RS
13.	Scuppers or Drains. (156.120 (o) (155.310))		RS
14.	Emergency Shutdown. (156.120 (r) (154.550) (155.780))		RS
15.	Repair Work Authorization. (35.35-30)		RS
16.	Boiler and Galley Fires Safety. (35.35-30)		RS
17.	Fires or Open Flames. (35.35-30)		RS
18.	Lighting (sunset to sunrise). (156.120 (y) (z) (154.570) (155.790))		RS
19.	Safe Smoking Spaces. (35.35-30)		RS
20.	Spill and Emergency shutdown procedures. (156.120 (w))		RS
21.	Sufficient Personnel. (156.120 (s) (156.115 (u))		RS
22.	Pre-Transfer Conference - refer to the reverse side for the items to be discussed. (156.120 (w))		RS
23.	Agreement to begin Transfer. (156.120 (x))		RS
24.	Persons-in-Charge immediate vicinity/positioned to observe and supervise transfer. (156.160)		RS
25.	Cargo Information Card - Reviewed and Issued. (151.45-2 (e) (3))		RS
26.	Inert Gas System - Operating Properly. (32.53)		RS

I do certify that I have personally inspected this facility or vessel with reference to the requirements set forth in section 35.35-30 and that opposite each of them I have indicated by my initials that the regulations have been complied with.

	SIGNATURE			SIGNATURE	Richard Stott
FACILITY	TITLE		VESSEL	TITLE	PIC
	TIME AND DATE			TIME AND DATE	

I certify that I have read the above declaration and detailed requirements and all conditions remain satisfactory.

SUBSEQUENT FACILITY PERSON-IN-CHARGE			SUBSEQUENT VESSEL PERSON-IN-CHARGE		
SIGNATURE/TITLE	TIME	DATE	SIGNATURE/TITLE	TIME	DATE
TRANSFER START			TRANSFER COMPLETE		

EPAPA008001422

DECLARATION OF INSPECTION

DECLARATION OF INSPECTION PRIOR TO BULK CARGO TRANSFER		RADIO NO.	
VESSEL:	CCL 26 Trailer	DATE/TIME ISSUED	
	Caustic	VESSEL PIC SIGNATURE	Ricky Stall
TRANSFER FACILITY:	CES ENVIRONMENTAL SERVICES, INC.	DATE/TIME RETURNED	
LOCATION:	Paulsboro	FACILITY PIC SIGNATURE	

The following list refers to requirements set forth in detail 33 CFR 156.150 and 46 CFR 35.35-30

The spaces adjacent to items on the list are provided to indicate that the detailed requirement has been met.

		INITIAL	
		FACILITY	VESSEL
1.	Communication System/Language Fluency. (156.120 (q) (154.560) (155.785) (156.120V))		RS
2.	Warning Signs and red Warning Signal. (35.35-30)		RS
3.	Adequate Vessels Mooring. (156.120 (a))		RS
4.	Transfer System Alignment. (156.120 (d))		RS
5.	Transfer System; unused components. (156.120 (e) (l) (154.120) (155.805))		RS
6.	Transfer System; fixed piping. (156.120 (g))		RS
7.	Overboard. Discharges/Sea Suction Lashed Valves. (156.120 (h))		RS
8.	Hoses or Loading Arms condition. (156.120 (l) (j) (154.500) (154.510))		RS
9.	Hoses; length and support. (156.120 (b) (c))		RS
10.	Connections. (156.120 (k) (p) (156.130))		RS
11.	Monitoring Devices. (156.120 (l) (154.525))		RS
12.	Discharge Containment System Capacity Maintained. (156.120 (m) (n) (p) (154.530) (155.310) (155.320) (154.545))		RS
13.	Scuppers or Drains. (156.120 (o) (155.310))		RS
14.	Emergency Shutdown. (156.120 (r) (154.550) (155.780))		RS
15.	Repair Work Authorization. (35.35-30)		RS
16.	Boiler and Galley Fires Safety. (35.35-30)		RS
17.	Fires or Open Flames. (35.35-30)		RS
18.	Lighting (sunset to sunrise). (156.120 (y) (z) (154.570) (155.790))		RS
19.	Safe Smoking Spaces. (35.35-30)		RS
20.	Spill and Emergency shutdown procedures. (156.120 (w))		RS
21.	Sufficient Personnel. (156.120 (s) (156.115 (u))		RS
22.	Pre-Transfer Conference - refer to the reverse side for the items to be discussed. (156.120 (w))		RS
23.	Agreement to begin Transfer. (156.120 (x))		RS
24.	Persons-in-Charge immediate vicinity/positioned to observe and supervise transfer. (156.160)		RS
25.	Cargo Information Card - Reviewed and Issued. (151.45-2 (e) (3))		RS
26.	Inert Gas System - Operating Properly. (32.53)		RS

I do certify that I have personally inspected this facility or vessel with reference to the requirements set forth in section 35.35-30 and that opposite each of them I have indicated by my initials that the regulations have been complied with.

FACILITY	SIGNATURE		VESSEL	SIGNATURE	Ricky Stall
	TITLE			TITLE	TKMPIC
	TIME AND DATE			TIME AND DATE	

I certify that I have read the above declaration and detailed requirements and all conditions remain satisfactory.

SUBSEQUENT FACILITY PERSON-IN-CHARGE			SUBSEQUENT VESSEL PERSON-IN-CHARGE		
SIGNATURE/TITLE	TIME	DATE	SIGNATURE/TITLE	TIME	DATE

TRANSFER START	TRANSFER COMPLETE

EPAPA008001423

DECLARATION OF INSPECTION

DECLARATION OF INSPECTION PRIOR TO BULK CARGO TRANSFER		RADIO NO.	
VESSEL:	CCL 26 Trailer Caustic	DATE/TIME ISSUED	
		VESSEL PIC SIGNATURE	Ricky Stall
TRANSFER FACILITY:	CES ENVIRONMENTAL SERVICES, INC.	DATE/TIME RETURNED	
LOCATION:	Paves	FACILITY PIC SIGNATURE	

The following list refers to requirements set forth in detail 33 CFR 156.150 and 46 CFR 35.35-30

The spaces adjacent to items on the list are provided to indicate that the detailed requirement has been met.

		INITIAL FACILITY	INITIAL VESSEL
1.	Communication System/Language Fluency. (156.120 (q) (154.560) (155.785) (156.120V))		RS
2.	Warning Signs and red Warning Signal. (35.35-30)		RS
3.	Adequate Vessels Mooring. (156.120 (a))		RS
4.	Transfer System Alignment. (156.120 (d))		RS
5.	Transfer System; unused components. (156.120 (e) (f) (154.120) (155.805))		RS
6.	Transfer System; fixed piping. (156.120 (g))		RS
7.	Overboard. Discharges/Sea Suction Lashed Valves. (156.120 (h))		RS
8.	Hoses or Loading Arms condition. (156.120 (l) (j) (154.500) (154.510))		RS
9.	Hoses; length and support. (156.120 (b) (c))		RS
10.	Connections. (156.120 (k) (p) (156.130))		RS
11.	Monitoring Devices. (156.120 (l) (154.525))		RS
12.	Discharge Containment System Capacity Maintained. (156.120 (m) (n) (p) (154.530) (155.310) (155.320) (154.545))		RS
13.	Scuppers or Drains. (156.120 (o) (155.310))		RS
14.	Emergency Shutdown. (156.120 (r) (154.550) (155.780))		RS
15.	Repair Work Authorization. (35.35-30)		RS
16.	Boiler and Galley Fires Safety. (35.35-30)		RS
17.	Fires or Open Flames. (35.35-30)		RS
18.	Lighting (sunset to sunrise). (156.120 (y) (z) (154.570) (155.790))		RS
19.	Safe Smoking Spaces. (35.35-30)		RS
20.	Spill and Emergency shutdown procedures. (156.120 (w))		RS
21.	Sufficient Personnel. (156.120 (s) (156.115 (u))		RS
22.	Pre-Transfer Conference - refer to the reverse side for the items to be discussed. (156.120 (w))		RS
23.	Agreement to begin Transfer. (156.120 (x))		RS
24.	Persons-in-Charge immediate vicinity/positioned to observe and supervise transfer. (156.160)		RS
25.	Cargo Information Card - Reviewed and Issued. (151.45-2 (e) (3))		RS
26.	Inert Gas System - Operating Properly. (32.53)		RS

I do certify that I have personally inspected this facility or vessel with reference to the requirements set forth in section 35.35-30 and that opposite each of them I have indicated by my initials that the regulations have been complied with.

	SIGNATURE			SIGNATURE	Ricky Stall
FACILITY	TITLE		VESSEL	TITLE	TKMPIC
	TIME AND DATE			TIME AND DATE	

I certify that I have read the above declaration and detailed requirements and all conditions remain satisfactory.

SUBSEQUENT FACILITY PERSON-IN-CHARGE			SUBSEQUENT VESSEL PERSON-IN-CHARGE		
SIGNATURE/TITLE	TIME	DATE	SIGNATURE/TITLE	TIME	DATE
TRANSFER START			TRANSFER COMPLETE		

EPAPA008001424

DECLARATION OF INSPECTION

DECLARATION OF INSPECTION PRIOR TO BULK CARGO TRANSFER		RADIO NO.	
VESSEL:	CCL 26 Trailer 420 Coastie	DATE/TIME ISSUED	5-1-09 1515
		VESSEL PIC SIGNATURE	Ricky Hall
TRANSFER FACILITY:	CES ENVIRONMENTAL SERVICES, INC.	DATE/TIME RETURNED	5-1-09 1520
LOCATION:	Pasco	FACILITY PIC SIGNATURE	Tony

The following list refers to requirements set forth in detail 33 CFR 156.150 and 46 CFR 35.35-30

The spaces adjacent to items on the list are provided to indicate that the detailed requirement has been met.

		INITIAL	
		FACILITY	VESSEL
1.	Communication System/Language Fluency. (156.120 (q) (154.560) (155.785) (156.120V))	T	RH
2.	Warning Signs and red Warning Signal. (35.35-30)	"	"
3.	Adequate Vessels Mooring. (156.120 (a))	"	"
4.	Transfer System Alignment. (156.120 (d))	"	"
5.	Transfer System; unused components. (156.120 (e) (f) (154.120) (155.805))	"	"
6.	Transfer System; fixed piping. (156.120 (g))	"	"
7.	Overboard. Discharges/Sea Suction Lashed Valves. (156.120 (h))	"	"
8.	Hoses or Loading Arms condition. (156.120 (i) (j) (154.500) (154.510))	"	"
9.	Hoses; length and support. (156.120 (b) (c))	"	"
10.	Connections. (156.120 (k) (p) (156.130))	"	"
11.	Monitoring Devices. (156.120 (l) (154.525))	"	"
12.	Discharge Containment System Capacity Maintained. (156.120 (m) (n) (p) (154.530) (155.310) (155.320) (154.545))	"	"
13.	Scuppers or Drains. (156.120 (o) (155.310))	"	"
14.	Emergency Shutdown. (156.120 (r) (154.550) (155.780))	"	"
15.	Repair Work Authorization. (35.35-30)	"	"
16.	Boiler and Galley Fires Safety. (35.35-30)	"	"
17.	Fires or Open Flames. (35.35-30)	"	"
18.	Lighting (sunset to sunrise). (156.120 (y) (z) (154.570) (155.790))	"	"
19.	Safe Smoking Spaces. (35.35-30)	"	"
20.	Spill and Emergency shutdown procedures. (156.120 (w))	"	"
21.	Sufficient Personnel. (156.120 (s) (156.115 (u))	"	"
22.	Pre-Transfer Conference - refer to the reverse side for the items to be discussed. (156.120 (w))	"	"
23.	Agreement to begin Transfer. (156.120 (x))	"	"
24.	Persons-in-Charge immediate vicinity/positioned to observe and supervise transfer. (156.160)	"	"
25.	Cargo Information Card - Reviewed and Issued. (151.45-2 (e) (3))	"	"
26.	Inert Gas System - Operating Properly. (32.53)	"	"

I do certify that I have personally inspected this facility or vessel with reference to the requirements set forth in section 35.35-30 and that opposite each of them I have indicated by my initials that the regulations have been complied with.

FACILITY	SIGNATURE	Tony	VESSEL	SIGNATURE	Ricky Hall
	TITLE			TITLE	TKMR Pic
	TIME AND DATE			TIME AND DATE	

I certify that I have read the above declaration and detailed requirements and all conditions remain satisfactory.

SUBSEQUENT FACILITY PERSON-IN-CHARGE			SUBSEQUENT VESSEL PERSON-IN-CHARGE		
SIGNATURE/TITLE	TIME	DATE	SIGNATURE/TITLE	TIME	DATE
TRANSFER START			TRANSFER COMPLETE		

EPAPA008001425

CES Environmental Port Arthur Dispatch Board

FOR : Saturday 5/2/2009

Job Note ID	Driver	Helper	Truck	Trailer	Misc Equipment	Customer	Job Description	Start Time	Job Length
85090	Brown Leroy		294	225		CES Environmental Services - Port Arthur	load from barge & haul to Boise Cascade.	630am	1/2 Day
85089	Dominguez Jose		278	266		CES Environmental Services - Port Arthur	load from barge & haul to Boise Cascade.	2nd	1/2 Day
85088	Dominguez Jose		278	~~285~~		CES Environmental Services - Port Arthur	load from barge & haul to Boise Cascade.	630am	1/2 Day
85107	Frias Juan		2004	269		CES Environmental Services - Port Arthur	load caustic from barge and haul to International Paper in Pineville, LA	630am	Full Day
85108	Whitehead Charles		285	267		CES Environmental Services - Port Arthur	load caustic from barge and haul to International Paper in Pineville, LA	630am	Full Day
85109	Wilson Kevin		2004	420		CES Environmental Services - Port Arthur	load caustic from barge and haul to International Paper in Pineville, LA	630am	Full Day

Report Printed 4/30/2009 3:48:43 PM

monday 7:15, 8:30

Preload FOR SAT. ~~monday~~

7:15 - JACK 239

8:30 - Quinn 237

9:45 - JACK 261

11:06 - Quinn - 419

EPAPA008001426

CES Environmental Port Arthur Dispatch Board

FOR : Friday 5/1/2009

Job Note ID	Driver	Helper	Truck	Trailer	Misc Equipment	Customer	Job Description	Start Time	Job Length
85450		Houston driver				Chemtura Company	Pick up 10 drums of product SEE INBOUND		
85344			294	224		KMTEX	load of reg w/w to np. DRIVER MUST HAVE TWIC CARD.	2nd	1/3 Day
85100		**CANCEL**				CES Environmental Services - Port Arthur	Load WHITE LIQUOR from barge as directed & haul to Boise Cascade. MAKE SURE TRAILER IS MARKED WITH SPECIAL MARKINGS!!	2nd	1/2 Day
85099		Cancel	294	225		CES Environmental Services - Port Arthur	Load WHITE LIQUOR from barge as directed & haul to Boise Cascade. MAKE SURE TRAILER IS MARKED WITH SPECIAL MARKINGS!!	2nd	1/2 Day
85345			292	224		KMTEX	load of reg w/w to np. DRIVER MUST HAVE TWIC CARD.	3rd	1/3 Day
85343			292	224		KMTEX	load of reg w/w to np. DRIVER MUST HAVE TWIC CARD.	630am	1/3 Day
85449	Brown Leroy		294	208		Conoco Phillips (Westlake LA)	pickup load of sulfuric acid from lake charles and haul to ces PA...be at conoco at 8am	630 am	1/3 Day
85084	Brown Leroy		294	225		CES Environmental Services - Port Arthur	load from barge & haul to Boise Cascade.	630am	1/2 Day
85086	Dominguez Jose		278	266		CES Environmental Services - Port Arthur	load from barge & haul to Boise Cascade.	2nd	1/2 Day
85085	Dominguez Jose		278	266		CES Environmental Services - Port Arthur	load from barge & haul to Boise Cascade.	630am	1/2 Day
85087	Frias Juan		2004	269		CES Environmental Services - Port Arthur	load from barge & haul to Boise Cascade.		1/3 Day
85540	Gipson Jack		299	419		CES Environmental Services - Port Arthur	load wastewater and haul to np make sure driver looks for batch ID		1/4 Day
85133	Mendoza Juan		2001	261		CES Environmental Services @ KMTEX	load at KMTEX @ 7:15am from tank 607 & haul to IP in Pineville	630am	Full Day
85117	Whitehead Charles		285	267		CES Environmental Services - Port Arthur	haul loaded trailer from PACES to IP - Pineville	600am	Full Day
85116	Wilson Kevin		2004	420		CES Environmental Services - Port Arthur	haul loaded trailer from PACES to IP - Pineville	600am	Full Day

Report Printed 5/1/2009 9:01:35 AM

EPAPA008001427

8/4/09
DRM
I-1

Targa Midstream Services L. P.
Transport Truck Weight Certificate
(For GNW RTS Transports)

Date: 7/6/09

Truck No. 282 Trailer No. 234

Loaded Weight 77166 LBS

Empty Weight 32623 LBS

Product Weight 44543 LBS

Truck Dock Operator A.G.P.

Authorized By: A.G.P.
Truck Dock Operator

Place Certified Scale Stamp below:

CERTIFIED SCALE

8/4/09
DRM
I-2

CES Environmental Port Arthur Dispatch Board

FOR : Monday 7/6/2009

Job Note ID	Driver	Helper	Truck	Trailer	Misc Equipment	Customer	Job Description	Start Time	Job Length
88578		Houston		260		Total Petrochemicals Inc.- Port Arthur, TX	p/u Naphthenic caustic as directed, haul to PACES**MUST BE ON TIME SEE INBOUND		
88425		HOUSTON BOARD				Targa Midstream Services LP	load LSNG w/ammonia, Haul to CES PA SEE INBOUND		
88402		Houston		266		CES Environmental Services - Port Arthur	haul loaded trailer to Evedale	2nd	1/3 Day
88411	Brown Leroy		285	261		CES Environmental Services - Port Arthur	haul loaded trailer to Evedale	2nd	1/3 Day
88410	Brown Leroy		285	261		CES Environmental Services - Port Arthur	haul loaded trailer to Evedale	3rd	1/3 Day
88412	Brown Leroy		285	261		CES Environmental Services - Port Arthur	haul loaded trailer to Evedale	600 am	1/3 Day
88393	Frias Juan		2003	420		CES Environmental Services - Port Arthur	haul loaded trailer to Evedale	2nd	1/3 Day
88409	Frias Juan		2003	420		CES Environmental Services - Port Arthur	haul loaded trailer to Evedale	700 am	1/3 Day
88417	Saylor Chris		2006	225		CES Environmental Services - Port Arthur	haul loaded trailer to Boise Cascade.	2nd	1/3 Day
88418	Saylor Chris		2006	225		CES Environmental Services - Port Arthur	haul loaded trailer to Boise Cascade.	600 am	1/3 Day
88593	Wilson Kevin		2004	237		CES Environmental Services - Port Arthur	haul loaded trailer to Boise Cascade.	2nd	1/2 Day
88594	Wilson Kevin		2004	237		CES Environmental Services - Port Arthur	haul loaded trailer to Boise Cascade.	600 am	1/2 Day

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8/4/09
DRM
I-3

CES Environmental Port Arthur Dispatch Board

FOR : Wednesday 7/1/2009

Job Note ID	Driver	Helper	Truck	Trailer	Misc Equipment	Customer	Job Description	Start Time	Job Length
88414	Wilson					CES Environmental Services - Port Arthur	haul loaded trailer to Boise Cascade.		
88413	Wilson					CES Environmental Services - Port Arthur	haul loaded trailer to Boise Cascade.		
88348	Frias					Total Petrochemicals Inc.- Port Arthur, TX	p/u Naphthenic caustic as directed, haul to PACES**MUST BE ON TIME SEE INBOUND		
88347	~~Frias~~ mendoza					Total Petrochemicals Inc.- Port Arthur, TX	p/u Naphthenic caustic as directed, haul to PACES**MUST BE ON TIME SEE INBOUND		
88258	mendoza	Houston Driver to offload in Barge				Targa Midstream Services LP	load LSNG w/ammonia, Haul to CES PA SEE INBOUND		
88173	Frias					Citgo Refinery	Load naphthenic caustic from Citgo in Lake Charles and haul to PACES. SEE INBOUND		
88399	Saylor					CES Environmental Services - Port Arthur	haul loaded trailer to Evedale		
88398	Saylor					CES Environmental Services - Port Arthur	haul loaded trailer to Evedale		
88397	Saylor					CES Environmental Services - Port Arthur	haul loaded trailer to Evedale		
88396	Brown					CES Environmental Services - Port Arthur	haul loaded trailer to Evedale		
88395	Brown					CES Environmental Services - Port Arthur	haul loaded trailer to Evedale		
88394	Brown					CES Environmental Services - Port Arthur	haul loaded trailer to Evedale		
88264	~~Frias~~ Frias	rescheduled from 6/29- MUST GO	2003	230		Afton Chemical Corporation @ Delta Chemical	return 30-50 empty afton drums form PACES, then pick up a full load of drums. Goes to PACES**fill up trailer**	600 am	Full Day

Report Printed 6/30/2009 8:37:56 AM

JUN-30-2009 08:31 CES ENVIROMENTAL 7137488664 P.001

EPAPA008001433

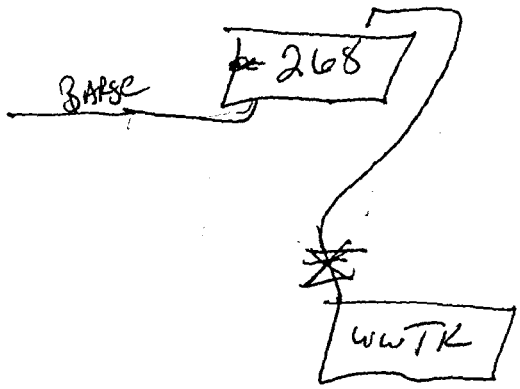
TARSA TRLS

266
267
261
237

unload into CCL-26 FIRST

254

268 → CCL-26



FLARE REPORT

Daily Log for: Jul-09

DATE	TIME	OPERATOR/SHIFT	FLAME COLOR	SMOKE?	COMMENTS
7/1/2009					
7/2/2009					
7/3/2009					
7/4/2009					
7/5/2009					
7/6/2009					
7/7/2009					
7/8/2009					
7/9/2009					
7/10/2009					
7/11/2009					
7/12/2009					
7/13/2009					
7/14/2009					
7/15/2009					
7/16/2009					
7/17/2009	0715	J. Matlock 1st	Clear	NO	
7/18/2009					
7/19/2009					
7/20/2009					
7/21/2009					
7/22/2009					
7/23/2009	0945	D Shaddix	clear	no	Purging RV-2
7/24/2009	0830	J Matlock	Clear	NO	Purging RV-2
7/25/2009					
7/26/2009					
7/27/2009					
7/28/2009					
7/29/2009					
7/30/2009					
7/30/2009					

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FLARE REPORT

Daily Log for: Jun-09

DATE	OPERATOR/SHIFT	FLAME COLOR	SMOKE?	COMMENTS
6/1/2009	Did Not Run			
6/2/2009				
6/3/2009	Did not Run			
6/4/2009				
6/5/2009	Jay Matlock	Clear	NO	8:30A
6/6/2009	Did NOT Run			
6/7/2009	Did not Run			
6/8/2009	Ricky Gall	Clear	NO	Clear Clean flame 7:15A
6/9/2009	Ricky Gall	Clear Blue	NO	Clear Clean flame 7:30A
6/10/2009	Ricky Gall	Clear	NO	7:30A
6/11/2009	Michael Rudd	Clear	no	clear ~~to~~ ~~[illegible]~~ Flame 7:30A
6/12/2009	Did not Run			
6/13/2009	Did not Run			
6/14/2009	Did not Run			
6/15/2009	Michael Rudd	clear	none	Clear to blue 7:30A
6/16/2009	Michael Rudd	Clear	None	7:30A
6/17/2009	Michael Rudd	Clear	none	Clear to blue 7:30A
6/18/2009	DNR			
6/19/2009	DNR			
6/20/2009	DNR			
6/21/2009	DNR			
6/22/2009	DNR			
6/23/2009	Ricky Gall	Clear	None	Clear 7:15A
6/24/2009	Jay Matlock	Clear	No	Clear 7:45A
6/25/2009	Dennis Shaddy	Clear	no	Clear 11:00A
6/26/2009	Dennis Shaddy	Clear	no	Clear 10:15A
6/27/2009	DNR			
6/28/2009	DNR			
6/29/2009	DNR			
6/30/2009				

FLARE REPORT

Daily Log for: May-09

DATE	OPERATOR/SHIFT	FLAME COLOR	SMOKE?	COMMENTS
5/1/2009	Michael Rudd	Clear	none	~~Did not flare Smoke~~ no smoke
5/2/2009	Michael Rudd			Did not run
5/3/2009	Michael Rudd			Did not run
5/4/2009	Michael Rudd	blue to clear	none	Clear flame
5/5/2009	Michael Rudd	Clear	non	Clear flame
5/6/2009	Michael Rudd	Clear	none	clear to blue flame
5/7/2009	Michael Rudd	Clear	none	clear to blue flame
5/8/2009	Did not Run			
5/9/2009	Did not Ran			
5/10/2009	Did not Ran			
5/11/2009	Did not Ran			
5/12/2009	Michael Rudd	Clear	none	Clean
5/13/2009	Michael Rudd	clear	none	Clean
5/14/2009	Did not Run			
5/15/2009	~~Did not Ran~~	MR. Clear	none	Clean Flame
5/16/2009	Did NOT RUN			
5/17/2009				
5/18/2009	Michael Rudd	blue to clear	none	Clean flame
5/19/2009				
5/20/2009				
5/21/2009	Michael Rudd	clear	none	Clear flame
5/22/2009	Michael Rudd	clear	none	clear flame
5/23/2009				
5/24/2009				
5/25/2009	Michael Rudd	Clear	none	Clear Flame
5/26/2009	Michael Rudd	clear to blue	none	Clear Flame
5/27/2009	Michael Rudd	clear	none	" "
5/28/2009	Michael Rudd	blue to clear	none	clear
5/29/2009	Did not	Run		
5/30/2009				
5/31/2009	Did Not	Run		

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FLARE REPORT

Daily Log for: Apr-09

DATE	OPERATOR/SHIFT	FLAME COLOR	SMOKE?	COMMENTS
4/1/2009	Michael Rudd	blue to Clear	None	Flare looks good.
4/2/2009	None			
4/3/2009	Michael Rudd	blue to clear	"	no smoke
4/4/2009	none			
4/5/2009	none			
4/6/2009	Michael Rudd	clear	none	clear to blue Flame
4/7/2009	Cody Hampton	Clear	none	no smoke
4/8/2009	Cody Hampton	clear	none	
4/9/2009	cody Hampton	blue to clear	none	
4/10/2009	none			
4/11/2009	none			
4/12/2009	none			
4/13/2009	Cody Hampton	blue to clear	none	
4/14/2009	~~close~~ none			
4/15/2009	~~Closed~~ none			
4/16/2009	none			
4/17/2009	none			
4/18/2009	none			
4/19/2009	none			
4/20/2009	Michael Rudd	clear	none	Flame looks clean
4/21/2009	Not in use	"		
4/22/2009	not in use	"		
4/23/2009	Not in use			
4/24/2009	not in use			
4/25/2009	not in use			
4/26/2009	not in use			
4/27/2009	not in use			
4/28/2009	Michael Rudd	clear	none	clear Flame
4/29/2009	not in use			
4/30/2009	Michael	clear	none	clear to blue

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FLARE REPORT

Daily Log for: Dec-08

Time	DATE	OPERATOR/SHIFT	FLAME COLOR	SMOKE?	COMMENTS
7:30	A.M. 12/1/2008	BP	Clear / Blue	No	Oil is Fine
8:00	12/2/2008	BRIAN	CLEAR	NO	
10:00	12/3/2008	BRIAN	Clear	NO	FILLED PROPANE TANK / changed propane valve
5:00	12/4/2008	BRIAN	CLEAR	NO	FINE
7:30	12/5/2008	BRIAN	CLEAR	NO	FINE
12	12/6/2008	Dennis	clear Blue	no	OK.
1030	12/7/2008	Dennis	clear	no	OK
1552	12/8/2008	Dennis	CLEAR TO Yellow	NO	ok
14:00	12/9/2008	Dennis	clear	no	OK
6:30	12/10/2008	Mike	Clear	NO	OK
8:00	12/11/2008	BRIAN	BLUE	NO	OK
6:30	12/12/2008	BRIAN	BLUE	NO	OK
	12/13/2008	Brian	BLUE	NO	
	12/14/2008	Brian	BLUE	NO	
	12/15/2008	BRIAN	OFF	NO	
	12/16/2008	~~OFF~~ BRIAN	OFF	NO	
	12/17/2008	DENNIS	Blue	no	"
	12/18/2008	Dennis	Blue	no	"
	12/19/2008	Dennis	OFF	no	"
	12/20/2008				
	12/21/2008				
	12/22/2008	Mike R	Clear	NO	Flame is a Blue to Clear
	12/23/2008	Mike R	Clear	NO	OK
	12/24/2008	Mike R	Blue	NO	"
	12/25/2008				
	12/26/2008	Mike R	clear to Blue	no	turned Flare on 6:30 - OK
	12/27/2008				
	12/28/2008				
	12/29/2008	Mike L.	OK	NO	turned on at 7:00 AM
	12/30/2008				
	12/31/2008				

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FLARE REPORT

Daily Log for: Jan-09

DATE	OPERATOR/SHIFT	FLAME COLOR	SMOKE?	COMMENTS
1/1/2009				
1/2/2009	Mike Rudd 4p	Clear	no	lite Flare 6:25 AM
1/3/2009				
1/4/2009	Michael Rudd R	Clear	no	Ok
1/5/2009	Mike Rudd R	Blue to Clear	no	Ok
1/6/2009				
1/7/2009				
1/8/2009	Mike Rudd R	Blue	no	lite Flare 6:00AM Clear to Blue
1/9/2009	Mike Rudd R	Clear	no	lite Flare 6:00 AM Clear
1/10/2009	Mike Rudd R	Clear	no	"
1/11/2009	N/A			
1/12/2009	Mike Rudd R	Clear	no	Ok
1/13/2009	Mike Rudd R	Blue	no	Ok
1/14/2009	Mike Rudd R	Blue	no	Ok
1/15/2009	Mike Rudd R	Blue	no	Ok
1/16/2009	Mike Rudd	Blue	no	"
1/17/2009				
1/18/2009	Mike Rudd	Clear	no	"
1/19/2009	Mike Rudd R	Clear	no	Flare was blue to clear
1/20/2009	Mike Rudd R	blue to clear	no	Ok
1/21/2009	Mike Rudd R	blue to clear	no	Ok
1/22/2009	Mike Rudd	blue to clear	no	Ok
1/23/2009	Mike Rudd	Clear	no	Ok
1/24/2009				
1/25/2009				
1/26/2009	Mike Rudd	Clear	no	Ok
1/27/2009	Mike Rudd R	clear	no	Ok
1/28/2009	Michael Rudd	clear	no	ok
1/29/2009	Michael Rudd	Clear	no	Ok
1/30/2009	Michael Rudd	Blue	no	Ok
1/31/2009				

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CES Environmental Port Arthur Dispatch Board

FOR : Friday 5/1/2009

Job Note ID	Driver	Helper	Truck	Trailer	Misc Equipment	Customer	Job Description	Start Time	Job Length
85450		Houston driver				Chemtura Company	Pick up 10 drums of product SEE INBOUND		
85344			294	224		KMTEX	load of reg w/w to np. DRIVER MUST HAVE TWIC CARD.	2nd	1/3 Day
85099			294	225		CES Environmental Services - Port Arthur	Load WHITE LIQUOR from barge as directed & haul to Boise Cascade. MAKE SURE TRAILER IS MARKED WITH SPECIAL MARKINGS!!	2nd	1/2 Day
85345			292	224		KMTEX	load of reg w/w to np. DRIVER MUST HAVE TWIC CARD.	3rd	1/3 Day
85343			292	224		KMTEX	load of reg w/w to np. DRIVER MUST HAVE TWIC CARD.	630am	1/3 Day
85084	Brown Leroy		294	225		CES Environmental Services - Port Arthur	load from barge & haul to Boise Cascade.	630am	1/2 Day
85086	Dominguez Jose		278	266		CES Environmental Services - Port Arthur	load from barge & haul to Boise Cascade.	2nd	1/2 Day
85085	Dominguez Jose		278	266		CES Environmental Services - Port Arthur	load from barge & haul to Boise Cascade.	630am	1/2 Day
85087	Frias Juan		2004	269		CES Environmental Services - Port Arthur	load from barge & haul to Boise Cascade.		1/3 Day
85100	Frias Juan		2004	269		CES Environmental Services - Port Arthur	Load WHITE LIQUOR from barge as directed & haul to Boise Cascade. MAKE SURE TRAILER IS MARKED WITH SPECIAL MARKINGS!!	2nd	1/2 Day
85449	Frias Juan		2004	208		Conoco Phillips (Westlake LA)	pickup load of sulfuric acid from lake charles and haul to ces PA...be at conoco at 8am	630 am	1/3 Day
85133	Mendoza Juan		2001	261		CES Environmental Services @ KMTEX	load at KMTEX @ 7:15am from tank 607 & haul to IP in Pineville	630am	Full Day
85117	Whitehead Charles		285	267		CES Environmental Services - Port Arthur	haul loaded trailer from PACES to IP - Pineville	600am	Full Day
85116	Wilson Kevin		2004	420		CES Environmental Services - Port Arthur	haul loaded trailer from PACES to IP - Pineville	600am	Full Day

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