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Response to EPA 104(e)

Material Safety Data Sheets
Volume 1, part 2

September 4, 1998

3M General Offices
3M Center
St Paul Minnesota 55144-1000
612/733-1110

RECEIVED
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LORIN G. HEWITT

MATERIAL SAFETY DATA SHEET

DIVISION: ELECTRICAL SPECIALTIES DIV
TRADE NAME: SCOTCH BRAND ELECTRICAL TAPES-THERMOSET ADHESIVE

ISSUED: FEBRUARY 23, 1995
SUPERSEDES: JULY 25, 1994
DOCUMENT: 06-0776-2

1. INGREDIENT	C.A.S. NO.	PERCENT
TAPE BACKING	UNKNOWN	50 - 75
PRESSURE SENSITIVE ADHESIVE	UNKNOWN	25 - 50

NOTE: Tape backings include epoxy film, polyester film, polytetrafluoroethylene film, polyimide film, acetate cloth, glass cloth, paper, composite film/fiber, and composite film/nonwoven. Adhesvies used include rubber resin and silicone.

2. PHYSICAL DATA

BOILING POINT: N/A
VAPOR PRESSURE: N/A
VAPOR DENSITY: N/A
EVAPORATION RATE: N/A
SOLUBILITY IN WATER: N/A
SP. GRAVITY: N/A
PERCENT VOLATILE: N/A
VOLATILE ORGANICS: N/A
VOC LESS H2O & EXEMPT SOLVENT: N/A
PH: N/A
VISCOSITY: N/A
MELTING POINT: n/D
APPEARANCE AND ODOR: Roll of tape

3. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: N/A
FLAMMABLE LIMITS - LEL: N/A
FLAMMABLE LIMITS - UEL: N/A
AUTOIGNITION TEMPERATURE: N/D
EXTINGUISHING MEDIA:
Water spray, Carbon dioxide, Dry Chemical, Foam
SPECIAL FIRE FIGHTING PROCEDURES:
Wear full protective clothing, including helmet, self-contained, positive pressure or pressure demand breathing apparatus, bunker coat and pants, bands around arms, waist and legs, face mask, and protective covering for exposed areas of the head.
UNUSUAL FIRE AND EXPLOSION HAZARDS:
None Known
NFPA-HAZARD-CODES: HEALTH 0 FIRE 0 REACTIVITY 0
UNUSUAL REACTION HAZARD: none
OSHA FIRE HAZARD CLASS: Not Applicable

4. REACTIVITY DATA

STABILITY: Stable
INCOMPATIBILITY - MATERIALS TO AVOID:
None Known
HAZARDOUS POLYMERIZATION: Will Not Occur
HAZARDOUS DECOMPOSITION PRODUCTS:
Carbon Monoxide and Carbon Dioxide, Hydrocarbons, Toxic Vapors, Gases or Particulates.

5. ENVIRONMENTAL INFORMATION

SPILL RESPONSE:
Not Applicable.

RECOMMENDED DISPOSAL:

Provided By Electrical Insulation Suppliers Inc.

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SKIN CONTACT:
Skin Burns (thermal, from contact with hot material): signs/symptoms can include burning pain, red and swollen skin, and blisters.

INHALATION:
Vapors of heated material may cause respiratory system irritation.

IF SWALLOWED:
Ingestion is not a likely route of exposure to this product.

Abbreviations: N/D - Not Determined N/A - Not Applicable

The information of this Data Sheet represents our current data and best opinion as to the proper use in handling of this material under normal conditions. Any use of the material which is not in conformance with this Data Sheet or which involves using the material in combination with any other material or any other process is the responsibility of the user.

3M GENERAL OFFICES
3M CENTER
ST. PAUL, MINNESOTA
55144-1000
612/733-1110
DUNS NO.: 00-617-3082

Adhesive

125

for Job 55140

MATERIAL SAFETY
DATA SHEET

DIVISION: INDUSTRIAL SPECIALTIES

TRADE NAME:
SCOTCH-GRIP (TM) 826 PLASTIC ADHESIVE

3M I.D. NUMBER: 62-0826-5530-9 62-0826-6530-8 62-0826-8530-6
62-0826-9530-5

ISSUED: MAY 22, 1990
SUPERSEDES: APRIL 12, 1990
DOCUMENT: 10-2459-5

1. INGREDIENTS	C.A.S. #	PERCENT	EXPOSURE LIMITS VALUE	UNIT	TYPE	AUTH
ETHYL ACETATE	141-78-6	50 - 60	400	PPM	TWA	ACGIH
PHENOLIC RESIN	9039-25-2	10 - 20	NONE	NONE	NONE	NONE
ACRYLONITRILE-BUTADIENE POLYMER	9003-18-3	10 - 20	NONE	NONE	NONE	NONE
METHYL ETHYL KETONE	78-93-3	1 - 10	200	PPM	TWA	ACGIH
ETHYL ALCOHOL	64-17-5	1 - 10	1000	PPM	TWA	ACGIH
METHYL ALCOHOL	67-56-1	0.1 - 1	200	PPM	TWA	ACGIH
METHYL ISOBUTYL KETONE	108-10-1	0.01 - 0.1	50	PPM	TWA	ACGIH

SOURCE OF EXPOSURE LIMIT DATA:
- ACGIH: AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS
- NONE: NONE ESTABLISHED

PRODUCT CONTAINS THE FOLLOWING TOXIC CHEMICAL OR CHEMICALS SUBJECT TO THE [illegible]PTING REQUIREMENTS OF SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND [illegible]UTHORIZAITION ACT OF 1986 AND 40 CFR PART 372:
METHYL ETHYL KETONE
METHYL ALCOHOL
METHYL ISOBUTYL KETONE

2. PHYSICAL DATA
BOILING POINT:.....171 F (ETHYL ALCOHOL)
VAPOR PRESSURE:.....74.1 MMHG @ 68 F
VAPOR DENSITY (AIR = 1):.....3
EVAPORATION RATE (ETHER = 1):....3
SOLUBILITY IN WATER: 0.1-1.0%
SPECIFIC GRAVITY (WATER = 1): ...0.94
PERCENT VOLATILE: .....CA. 73 % BY WEIGHT
VOLATILE ORGANICS: .....CA. 682 GM/LITER
PH: .....N/D
VISCOSITY: .....CA. 2000 CENTISTOKE

APPEARANCE AND ODOR: LIGHT AMBER, LIQUID, SOLVENT ODOR

3. FIRE AND EXPLOSION HAZARD DATA
FLASH POINT: .....35 F SETAFLASH
FLAMMABILITY LIMIT - LEL:.....2.2 %
FLAMMABILITY LIMIT - UEL:.....19 %
AUTOIGNITION TEMPERATURE:.....

EXTINGUISHING MEDIA:
CO2, FOAM, DRY CHEMICAL

SPECIAL FIRE FIGHTING PROCEDURES:
FIRE FIGHTERS SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS WHEN FIGHTING FIRES INVOLVING THIS MATERIAL.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
OVERHEATED, CLOSED CONTAINERS ADJACENT TO FIRE COULD EXPLODE DUE TO PRESSURE BUILDUP.

NFPA HAZARD CODES: HEALTH: 1 FIRE: 3 REACTIVITY: 0

PROVIDED BY ELECTRICAL INSULATION SUPPLIERS INC

4. REACTIVITY DATA
STABILITY: STABLE
INCOMPATABILITY - MATERIALS TO AVOID:
[redacted]
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.
HAZARDOUS DECOMPOSITION PRODUCTS:
[redacted]

5. ENVIRONMENTAL DATA
SPILL RESPONSE:
EXTINGUISH ALL IGNITION SOURCES. VENILATE THE AREA. OBSERVE PRECAUTIONS FROM OTHER SECTIONS. CONTAIN THE SPILL. COVER WITH ABSORBENT MATERIALS AS NEEDED. COLLECT THE SPILLED MATERIAL USING NON-SPARKING TOOLS. PLACE IN A U.S. DEPARTMENT OF TRANSPORTATION APPROVED METAL CONTAINER, AND SEAL.

RECOMMENDED DISPOSAL:
INCINERATE ABSORBED AND BULK MATERIAL AFTER MIXING WITH FLAMMABLE MATERIAL IN A LICENSED HAZARDOUS WASTE FACILITY. DISPOSAL SHOULD BE IN ACCORDANCE WITH APPLICABLE REGULATIONS.
U.S. HAZARDOUS WASTE NO.: D001 (INGITABLE).

ENVIRONMENTAL DATA:
VOLATILE ORGANIC COMPOUND (VOC):
[redacted]
MAXIMUM VOC MINUS WATER MINUM SOLVENT EXEMPT SOLVENTS = 682 GM/LITER.
VOC'S WERE CALCULATED ACCORDING TO RULE 443.1 OF THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD).

SARA HAZARD CLASS:
[redacted]

6. SUGGESTED FIRST AID

EYE CONTACT:
[redacted]

IN CONTACT:
[redacted]

INHALATION:
[redacted]

INGESTION:
[redacted]

7. PRECAUTIONARY INFORMATION
FOR INDUSTRIAL AND PROFESSIONAL USE ONLY. KEEP AWAY FROM HEAT, SPARKS, FLAME AND OTHER SOURCES OF IGNITION. THE VAPORS/SPRAY RELEASED BY THIS PRODUCT CAN BE IGNITED EASILY. AVOID PROLONGED BREATHING OF VAPORS. USE ONLY WITH SUFFICIENT VENTILATION TO MAINTAIN VAPOR/SPRAY CONCENTRATIONS BELOW RECOMMENDED EXPOSURE LIMITS. KEEP CONTAINER CLOSED WHEN NOT IN USE. AVOID CONTACT WITH EYES AND SKIN. WEAR EYE AND SKIN PROTECTIVE EQUIPMENT WHEN HANDLING THIS PRODUCT, I.E., IMPERVIOUS GLOVES AND CHEMICAL SAFETY GOGGLES. KEEP OUT OF THE REACH OF CHILDREN.

ADDITIONAL EXPOSURE LIMITS

	EXPOSURE LIMITS			
INGREDIENTS	VALUE	UNIT	TYPE	ACGIH
ETHYL ACETATE	1400	MG/M3	TWA	ACGIH
ETHYL ACETATE	400	PPM	TWA	OSHA
ETHYL ACETATE	1400	MG/M3	TWA	OSHA
METHYL ETHYL KETONE	590	MG/M3	TWA	ACGIH
METHYL ETHYL KETONE	300	PPM	STEL	ACGIH
METHYL ETHYL KETONE	885	MG/M3	STEL	ACGIH
METHYL ETHYL KETONE	200	PPM	TWA	OSHA
METHYL ETHYL KETONE	590	MG/M3	TWA	OSHA
METHYL ETHYL KETONE	300	PPM	STEL	OSHA
METHYL ETHYL KETONE	885	MG/M3	STEL	OSHA
ETHYL ALCOHOL	1900	MG/M3	TWA	ACGIH

ETHYL ALCOHOL	1000	PPM	TWA	OSHA
ETHYL ALCOHOL	1900	MG/M3	TWA	OSHA
METHYL ALCOHOL	260	MG/M3	TWA	ACGIH
METHYL ALCOHOL	250	PPM	STEL	ACGIH
METHYL ALCOHOL	310	MG/M3	STEL	ACGIH
METHYL ALCOHOL	200	PPM	TWA	OSHA
METHYL ALCOHOL	260	MG/M3	TWA	OSHA
METHYL ALCOHOL	250	PPM	STEL	OSHA
METHYL ALCOHOL	310	MG/M3	TEL	OSHA
METHYL ISOBUTYL KETONE	205	MG/M3	TWA	ACGIH
METHYL ISOBUTYL KETONE	75	PPM	STEL	ACGIH
METHYL ISOBUTYL KETONE	300	MG/M3	STEL	ACGIH
METHYL ISOBUTYL KETONE	50	PPM	TWA	OSHA
METHYL ISOBUTYL KETONE	205	MG/M3	TWA	OSHA
METHYL ISOBUTYL KETONE	75	PPM	STEL	OSHA
METHYL ISOBUTYL KETONE	300	MG/M3	STEL	OSHA

SOURCE OF EXPOSURE LIMIT DATA:
- ACGIH: AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS
- OSHA: OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

8. HEALTH HAZARD DATA

[redacted]

SECTION CHANGE DATES

THE HEADER SECTION HAS BEEN CHANGED SINCE APRIL 12, 1990

THE INFORMATION ON THIS DATA SHEET REPRESENTS OUR CURRENT DATA AND BEST OPINION AS TO THE PROPER USE IN HANDLING OF THIS MATERIAL UNDER NORMAL CONDITIONS. ANY USE OF THE MATERIAL WHICH IS NOT IN CONFORMANCE WITH THIS DATA SHEET OR WHICH INVOLVES USING THE MATERIAL IN COMBINATION WITH ANY OTHER MATERIAL OR ANY OTHER PROCESS IS THE RESPONSIBILITY OF THE USER.

ABBREVIATIONS: N/D - NOT DETERMINED N/A - NOT APPLICABLE

00-03
1329

3M General Offices
3M Center
St. Paul, Minnesota 55144-1000
612/733-1110
Duns No.: 00-617-3082

104

MATERIAL SAFETY
DATA SHEET

3M

DIVISION: AUTOMOTIVE TRADES
TRADE NAME:
3M Super Weatherstrip and Gasket Adhesive PART NOS. 08001 / 08003 / 08004
3M I.D. NUMBER: 62-2140-2609-8 62-2140-5509-7 62-2140-6509-6 62-2140-9909-5 62-4900-9909-0 62-9814-9909-8

ISSUED: APRIL 12, 1990
SUPERSEDES: DECEMBER 30, 1989
DOCUMENT: 10-2665-7

1. INGREDIENT	C.A.S. NO.	PERCENT	EXPOSURE LIMITS VALUE	UNIT	TYPE	AUTH
petroleum distillate	64742-88-7	30.0 - 40.0	100	ppm	TWA	CMRG
methyl ethyl ketone (MEK)	78-93-3	20.0 - 30.0	200	ppm	TWA	ACGI
polychloroprene	9010-98-4	10.0 - 20.0	NONE	NONE	NONE	NONE
magnesium resinate	68611-24-5	10.0 - 20.0	NONE	NONE	NONE	NONE
toluene	108-88-3	1.0 - 10.0	100	ppm	TWA	ACGI

SOURCE OF EXPOSURE LIMIT DATA:
- ACGIH: American Conference of Governmental Industrial Hygienists
- CMRG: Chemical Manufacture Recommended Guidelines
- NONE: None Established

NOTE: Product is also component of 5-part kit sold as 3M Gasketing System Kit PART NO. 08900; (3M ID NO. 62-9814-9908).

THIS PRODUCT CONTAINS THE FOLLOWING TOXIC CHEMICAL OR CHEMICALS SUBJECT TO THE REPORTIN REQUIREMENTS OF SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATIO ACT OF 1986 AND 40 CFR PART 372:
methyl ethyl ketone (MEK)
toluene

2. PHYSICAL DATA

BOILING POINT:..... 140.00 F
(petroleum distillate)
VAPOR PRESSURE:..... 120.0000 mmHg
@ 68F
VAPOR DENSITY: ..... 3.00 Air = 1
EVAPORATION RATE:..... > 2.50 Ether = 1
SOLUBILITY IN WATER: ..... Slight
SP. GRAVITY:..... 0.880 Water = 1
PERCENT VOLATILE: ..... ca. 63.00 %
VOLATILE ORGANICS: ..... 548.00 gm/l
pH: ..... N/D
VISCOSITY: ..... 4000.0-6800.0 centistokes
APPEARANCE AND ODOR: Yellow, medium syrup, sweet petroleum odor

3. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT:..... -14.00 F T.C.C.
(petroleum distillate)
FLAMMABLE LIMITS - LEL: ..... 1.00 %
FLAMMABLE LIMITS - UEL: ..... 11.50 %
AUTOIGNITION TEMPERATURE: ... N/D
EXTINGUISHING MEDIA:
CO2, foam, dry chemical

Abbreviations: N/D - Not Determined N/A - Not Applicable

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3M General Offices
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Duns No.: 00-617-3082

MATERIAL SAFETY
DATA SHEET

3M

MSDS: 3M Super Weatherstrip and Gasket Adhesive PART NOS. 08001 / 08003 / 08004
APRIL 12, 1990

3. FIRE AND EXPLOSION HAZARD DATA (continued)

SPECIAL FIRE FIGHTING PROCEDURES:
Fire fighters should be equipped with self-contained breathing apparatus when fighting fires involving this material.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
Extremely Flammable The vapors released by this product can easily be ignited. Overheated, closed containers adjacent to fire could explode due to internal pressure buildup.

NFPA-HAZARD-CODES: HEALTH 2 FIRE 3 REACTIVITY 0

UNUSUAL REACTION HAZARD: None

4. REACTIVITY DATA

STABILITY: Stable

INCOMPATIBILITY - MATERIALS TO AVOID:
N/A

HAZARDOUS POLYMERIZATION: Will Not Occur

HAZARDOUS DECOMPOSITION PRODUCTS:
Thermal decomposition or burning may produce CO, CO2 and chlorinated decomposition products with the possibility of trace amounts of phosgene and chlorine.

5. ENVIRONMENTAL INFORMATION

SPILL RESPONSE:
Extinguish all ignition sources. Ventilate the area. Observe precautions from other sections. Contain the spill. Cover with absorbent materials as needed. Collect the spilled material using non-sparking tools. Place in a U.S. Department of Transportation - approved metal container, and seal.

RECOMMENDED DISPOSAL:
Incinerate absorbed and bulk product after mixing flammable material in a licensed hazardous waste facility. Disposal should be in accordance with applicable regulations. U.S. EPA Hazardous Waste Number: D001 (Ignitable).

ENVIRONMENTAL DATA:
Volatile Organic Compound (VOC):
Maximum VOC = 548 grams/liter.
Maximum VOC minus Water minus Exempt Solvents = 548 grams/liter.
VOC's were calculated according to Rule 443.1 of the South Coast Air Quality Management District (SCAQMD).

SARA HAZARD CLASS:
FIRE HAZARD: Yes PRESSURE: No REACTIVITY: No ACUTE: Yes CHRONIC: Yes

6. SUGGESTED FIRST AID

EYE CONTACT:
Flush eyes immediately with large amounts of water for at least 10

Abbreviations: N/D - Not Determined N/A - Not Applicable

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MATERIAL SAFETY
DATA SHEET

3M

6. SUGGESTED FIRST AID (continued)

minutes. Call a physician.

SKIN CONTACT:
Wash affected area with soap and water.

INHALATION:
Remove person to uncontaminated air. If breathing difficulties persist, call a physician.

IF SWALLOWED:
Do not induce vomiting. If conscious, drink two glasses of milk or water. Call a physican or poison control center.

OTHER FIRST AID:
NONE

7. PRECAUTIONARY INFORMATION

Keep away from heat, sparks, flame and other sources of ignition. The vapors released by this product can be ignited easily. Use only in areas with sufficient ventilation to maintain vapor concentrations below recommended exposure limits. Avoid contact with eyes and skin; wear protective equipment such as chemical goggles or safety glasses and impervious gloves when handling product. Avoid prolonged breathing of vapors. Keep container tightly capped when not in use. Keep out of the reach of children.

ADDITIONAL EXPOSURE LIMITS

INGREDIENTS	EXPOSURE LIMITS VALUE	UNIT	TYPE	AUTH
methyl ethyl ketone (MEK)	590	mg/m3	TWA	ACGIH
methyl ethyl ketone (MEK)	300	ppm	STEL	ACGIH
methyl ethyl ketone (MEK)	885	mg/m3	STEL	ACGIH
methyl ethyl ketone (MEK)	200	ppm	TWA	OSHA
methyl ethyl ketone (MEK)	590	mg/m3	TWA	OSHA
methyl ethyl ketone (MEK)	300	ppm	STEL	OSHA
methyl ethyl ketone (MEK)	885	mg/m3	STEL	OSHA
toluene	375	mg/m3	TWA	ACGIH
toluene	150	ppm	STEL	ACGIH
toluene	560	mg/m3	STEL	ACGIH
toluene	100	ppm	TWA	OSHA
toluene	375	mg/m3	TWA	OSHA
toluene	150	ppm	STEL	OSHA
toluene	560	mg/m3	STEL	OSHA

SOURCE OF EXPOSURE LIMIT DATA:
- ACGIH: American Conference of Governmental Industrial Hygienists
- OSHA: Occupational Safety and Health Administration

00-03
1332

3M General Offices
3M Center
St. Paul, Minnesota 55144-1000
612/733-1110
Duns No.: 00-617-3082

MATERIAL SAFETY
DATA SHEET

3M

MSDS: 3M Super Weatherstrip and Gasket Adhesive PART NOS. 08001 / 08003 / 08004
APRIL 12, 1990

8. HEALTH HAZARD DATA

EYE CONTACT: Vapor and liquid may cause eye irritation. Symptoms may include smarting, tearing, redness, and swelling.

SKIN CONTACT: May cause irritation. Petroleum distillate may be absorbed through the skin in harmful amounts. Symptoms include dryness and cracking of the skin.

INHALATION: Vapor overexposure may cause respiratory system irritation and temporary nervous system impairment (light-headedness). Petroleum distillate may contain n-hexane. Repeated or extreme overexposure to n-hexane vapor may cause nervous system damage. Exposure to methyl ethyl ketone (MEK) and n-hexane in combination may cause a greater potential for peripheral nerve damage. Symptoms of overexposure may include dizziness, weakness, fatigue, nausea, headache, facial numbness, visual disorders, incoordination, decreased reaction time, anemia, narcosis and in the extreme, asphxiation.

INGESTION: May cause digestive system irritation. Symptoms include nausea, vomiting and diarrhea. Solvent aspiration into the lungs by vomiting may cause lung damage, which can be harmful or fatal.

SECTION CHANGE DATES

HEADING	SECTION CHANGED SINCE DECEMBER 30, 1989 ISSUE

Abbreviations: N/D - Not Determined N/A - Not Applicable

The information on this Data Sheet represents our current data and best opinion as to the proper use in handling of this material under normal conditions. Any use of the material which is not in conformance with this Data Sheet or which involves using the material in combination with any other material or any other process is the responsibility of the user.

3M General Offices 3M Center
St. Paul, MN 55144-1000
612 733 1110

TERIAL SAFETY DATA SHEET

DIVISION: INDUSTRIAL TAPE AND SPECIALTIES DIVISION
TRADE NAME: 3M Super 77 Spray Adhesive (Obsolete)

3M I.D. NUMBER: 62-4434-3725-6 62-4434-3726-4 62-4434-4030-0 62-4434-4933-5
62-4434-4935-0 62-4434-4936-8

ISSUED: JANUARY 12, 1995
SUPERSEDES: JANUARY 11, 1995
DOCUMENT: 10-3312-5
INACTIVE

****

1. INGREDIENT	C.A.S. NO.	PERCENT		
NON-VOLATILE COMPONENTS - N.J. TRADE SECRET (T.S.) REGISTRY NO. 04499600-5452P++	TradeSecret	1.0	-	30.0
HEXANE (OTHER ISOMERS)	None	10.0	-	20.0
CYCLOHEXANE	110-82-7	10.0	-	20.0
N-HEXANE	110-54-3	10.0	-	20.0
ISOBUTANE	75-28-5	10.0	-	20.0
DIMETHYL ETHER	115-10-6	10.0	-	20.0
OPANE	74-98-6	10.0	-	20.0

NOTE: ++ rosin, synthetic polymer, resin and antioxidant. Not hazardous according to Canadian WHMIS criteria. Non-WHMIS controlled.

THIS PRODUCT CONTAINS THE FOLLOWING TOXIC CHEMICAL OR CHEMICALS SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III OF THE EMERGENCY PLANNING ANDCOMMUNITY RIGHT-TO-KNOW ACT OF 1986 AND 40 CFR PART 372:
CYCLOHEXANE

****

2. PHYSICAL DATA

****

BOILING POINT: Compressed gas
VAPOR PRESSURE: Compressed gas
VAPOR DENSITY: 2.97
EVAPORATION RATE: 1.9
SOLUBILITY IN WATER: Nil
SP. GRAVITY: 0.702 Water = 1
PERCENT VOLATILE: ca. 75 % by wt
VOLATILE ORGANICS: ca. 75 % (527 g/l) SCAQMD Rule 443.1,calculated
VOC LESS H2O & EXEMPT SOLVENT ca 75 % (527 g/l) SCAQMD Rule 443.1,calculated

Abbreviations: N/D - Not Determined N/A - Not Applicable

pH: N/A
VISCOSITY: N/A
MELTING POINT N/D
APPEARANCE AND ODOR: liquid in aerosol container, light cream colored, sweet/fruity odor.

****
3. FIRE AND EXPLOSION HAZARD DATA
****
FLASH POINT: -50.00 F T.C.C.
Propellant
FLAMMABLE LIMITS - LEL: N/A
FLAMMABLE LIMITS - UEL: Flamm. Gas
AUTOIGNITION TEMPERATURE: N/D
EXTINGUISHING MEDIA: Carbon dioxide, Dry chemical, Foam
SPECIAL FIRE FIGHTING PROCEDURES: Wear full protective clothing, including helmet, self-contained, positive pressure or pressure demand breathing apparatus, bunker coat and pants, bands around arms, waist and legs, face mask, and protective covering for exposed areas of the head.
UNUSUAL FIRE AND EXPLOSION HAZARDS: Closed containers exposed to heat from fire may build pressure and explode. Vapors may travel long distances along the ground or floor to an ignition source and flash back.
NFPA-HAZARD-CODES: HEALTH 2 FIRE 4 REACTIVITY 0
UNUSUAL REACTION HAZARD: none

****
4. REACTIVITY DATA
****
STABILITY: Stable
INCOMPATIBILITY - MATERIALS TO AVOID: Heat.
HAZARDOUS POLYMERIZATION: Will Not Occur
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon Monoxide and Carbon Dioxide, Toxic Vapors, Gases or Particulates.

****
5. ENVIRONMENTAL INFORMATION
****
SPILL RESPONSE: Refer to other sections of this MSDS for information regarding physical and health hazards, respiratory protection, ventilation, and personal protective equipment. In the U.S.A., call (612) 733-1110 or (612) 733-6100 for 24-hour spill assistance. Ventilate area. Extinguish all ignition sources. Cover with absorbent material. Collect using non-sparking tools. Place in a U.S. DOT-approved container.
RECOMMENDED DISPOSAL: Incinerate in a permitted hazardous waste incinerator in the presence of a combustible material. Facility must be capable of handling aerosol cans. Dispose of empty cans in a sanitary landfill. Dispose of waste product in a facility permitted to accept chemical waste.
ENVIRONMENTAL DATA: Not determined.

Abbreviations: N/D - Not Determined N/A - Not Applicable

REGULATORY INFORMATION: Since regulations vary, consult applicable regulations or authorities before disposal. U.S. EPA Hazardous Waste Number = D001 (Ignitable)
PCRA HAZARD CLASS: FIRE HAZARD: Yes PRESSURE: Yes REACTIVITY: No ACUTE: Yes CHRONIC: Yes

****
6. SUGGESTED FIRST AID
****
EYE CONTACT: Immediately flush eyes with large amounts of water. Get immediate medical attention.
SKIN CONTACT: Flush skin with large amounts of water. If irritation persists, get medical attention.
INHALATION: Remove person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, get immediate medical attention.
IF SWALLOWED: Do not induce vomiting. Drink two glasses of water. Call a physician.

****
7. PRECAUTIONARY INFORMATION
****
EYE PROTECTION: Avoid eye contact with vapor, spray, or mist. Wear vented goggles. Wear safety glasses with side shields.
SKIN PROTECTION: Avoid skin contact. Wear appropriate gloves when handling this material. A pair of gloves made from the following material(s) are recommended: nitrile rubber, polyethylene/ethylene vinyl alcohol, polyvinyl alcohol, polytetrafluoroethylene (Teflon), fluoroelastomer (Viton).
VENTILATION PROTECTION: Use in a well-ventilated area. Provide sufficient ventilation to maintain emissions below recommended exposure limits. If exhaust ventilation is not adequate, use appropriate respiratory protection.
RESPIRATORY PROTECTION: Avoid breathing of vapors, mists or spray. Select one of the following NIOSH approved respirators based on airborne concentration of contaminants and in accordance with OSHA regulations: half-mask organic vapor respirator.
PREVENTION OF ACCIDENTAL INGESTION: Do not ingest.
RECOMMENDED STORAGE: Store at temperatures below 120 degrees F (49 degrees C). Keep out of the reach of children.
FIRE AND EXPLOSION AVOIDANCE: Aerosol container contains flammable gas under pressure. Keep away from heat, sparks, open flame, and other sources of ignition. Extremely flammable liquid and vapor. Do not pierce or burn container, even after use. Avoid static discharge.

Abbreviations: N/D - Not Determined N/A - Not Applicable

EXPOSURE LIMITS

INGREDIENTS	VALUE	UNIT	TYPE	AUTH	SKIN*
NON-VOLATILE COMPONENTS - N.J. TRADE SECRET (T.S.) REGISTRY NO. 04499600-5452P ++	NONE	NONE	NONE	NONE	
HEXANE (OTHER ISOMERS)	NONE	NONE	NONE	NONE	
CYCLOHEXANE	300	ppm	TWA	ACGIH	
CYCLOHEXANE	300	ppm	TWA	OSHA	
N-HEXANE	50	ppm	TWA	ACGIH	
N-HEXANE	50	ppm	TWA	OSHA	
ISOBUTANE	NONE	NONE	NONE	NONE	
DIMETHYL ETHER	1000	ppm	TWA	CMRG	
DIMETHYL ETHER	500	ppm	TWA	AIHA	
DIMETHYL ETHER	942	mg/m3	TWA	AIHA	
PROPANE	1000	ppm	TWA	OSHA	
PROPANE	NONE	NONE	NONE	ACGIH	
	Simple asphyxiant				

* SKIN NOTATION: Listed substances indicated with "Y" under SKIN refer to the potential contribution to the overall exposure by the cutaneous route including mucous membrane and eye, either by airborne or, more particularly, by direct contact with the substance. Vehicles can alter skin absorption.

SOURCE OF EXPOSURE LIMIT DATA:
- ACGIH: American Conference of Governmental Industrial Hygienists
- AIHA: American Industrial Hygine Assoc. Workplace Environmental Exposure Level G
- OSHA: Occupational Safety and Health Administration
- CMRG: Chemical Manufacture Recommended Guidelines
- NONE: None Established

****
8. HEALTH HAZARD DATA
****

EYE CONTACT: Moderate Eye Irritation: signs/symptoms can include redness, swelling, pain, tearing, and hazy vision.

SKIN CONTACT: Mild Skin Irritation (after prolonged or repeated contact): signs/symptoms can include redness, swelling, and itching.
May be absorbed through the skin in harmful amounts.

INHALATION: Intentional concentration and inhalation may be harmful or fatal.
Central Nervous System Depression: signs/symptoms can include headache, dizziness, drowsiness, incoordination, slowed reaction time, slurred speech, giddiness and unconsciousness.
Irritation (upper respiratory): signs/symptoms can include soreness of the nose and throat, coughing and sneezing.
WHILE THE FOLLOWING EFFECTS ARE ASSOCIATED WITH ONE OR MORE OF THE

INDIVIDUAL INGREDIENTS IN THIS PRODUCT AND ARE REQUIRED TO BE INCLUDED ON THE MSDS BY THE U.S. OSHA HAZARD COMMUNICATION STANDARD, THEY ARE NOT EXPECTED EFFECTS DURING FORESEEABLE USE OF THIS PRODUCT.
Peripheral Neuropathy: signs/symptoms can include tingling of extremities, incoordination, numbness, weakness and tremors.

IF SWALLOWED: Ingestion is not a likely route of exposure to this product. WHILE THE FOLLOWING EFFECTS ARE ASSOCIATED WITH ONE OR MORE OF THE INDIVIDUAL INGREDIENTS IN THIS PRODUCT AND ARE REQUIRED TO BE INCLUDED ON THE MSDS BY THE U.S. OSHA HAZARD COMMUNICATION STANDARD, THEY ARE NOT EXPECTED EFFECTS DURING FORESEEABLE USE OF THIS PRODUCT.
Ingestion may cause: Irritation of Gastrointestinal Tissues: signs/symptoms can include pain, vomiting, abdominal tenderness, nausea, blood in vomitus, and blood in feces.

Abbreviations: N/D - Not Determined N/A - Not Applicable

The information on this Data Sheet represents our current data and best opinion as to the proper use in handling of this material under normal conditions. Any use of the material which is not in conformance with this Data Sheet or which involves using the material in combination with any other material or any other process is the responsibility of the user.

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3M General Offices
3M Center
St. Paul, Minnesota 55144-1000
612/733-1110
Dune No.: 00-617-3082

MATERIAL SAFETY
DATA SHEET

3M

DIVISION: INDUSTRIAL ABRASIVES
TRADE NAME:
PRODUCTS W/ALUMINUM OXIDE MINERAL
3M I.D. NUMBER: - - -

ISSUED: NOVEMBER 1, 1990
SUPERSEDES: AUGUST 23, 1990
DOCUMENT: 10-6754-5

RECEIVED
JAN 21 1992
PHOENIX SERVICE SHOP

1. INGREDIENT	C.A.S. NO.	PERCENT	EXPOSURE LIMITS VALUE	UNIT	TYPE	A
MINERAL - ALUMINUM OXIDE	1344-28-1	10.0 - 30.0	10	mg/m3	A1 TWA	AC
BACKING - PAPER OR CLOTH OR FIBER OR FILM	NONE	45.0 - 70.0	NONE	NONE	NONE	NO
CURED ADHESIVE - ORGANIC GLUE OR RESIN OR COMBINATION	NONE	5.0 - 30.0	NONE	NONE	NONE	NO

SOURCE OF EXPOSURE LIMIT DATA:
- ACGIH: American Conference of Governmental Industrial Hygienists
- NONE: None Established

2. PHYSICAL DATA

BOILING POINT:..... N/A
VAPOR PRESSURE:..... N/A
VAPOR DENSITY: ..... N/A
EVAPORATION RATE:..... N/A
SOLUBILITY IN WATER: ..... N/A
SP. GRAVITY:..... N/A
PERCENT VOLATILE: ..... N/A
VOLATILE ORGANICS: ..... N/D
pH: ..... N/A
VISCOSITY: ..... N/A
APPEARANCE AND ODOR: SOLID ABRASIVE PRODUCT, NO ODOR

3. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT:..... N/A
FLAMMABLE LIMITS - LEL: ..... N/A
FLAMMABLE LIMITS - UEL: ..... N/A
AUTOIGNITION TEMPERATURE: ... N/D
EXTINGUISHING MEDIA:
WATER, CARBON DIOXIDE, FOAM
SPECIAL FIRE FIGHTING PROCEDURES:
NONE
UNUSUAL FIRE AND EXPLOSION HAZARDS:
NONE
NFPA-HAZARD-CODES: HEALTH 1 FIRE 0 REACTIVITY 0
UNUSUAL REACTION HAZARD: NONE

4. REACTIVITY DATA

STABILITY: Stable
INCOMPATIBILITY - MATERIALS TO AVOID:
N/D
HAZARDOUS POLYMERIZATION: Will Not Occur
HAZARDOUS DECOMPOSITION PRODUCTS:
THERMAL DEGRADATION WILL PRODUCE CO, CO2, AND SMOKE PARTICULATES.

3M General Offices
3M Center
St. Paul, Minnesota 55144-1000
612/733-1110
Duns No.: 00-617-3082

MATERIAL SAFETY
DATA SHEET

3M

MSDS: PRODUCTS W/ALUMINUM OXIDE MINERAL
NOVEMBER 1, 1990

B. HEALTH HAZARD DATA (continued)

INHALATION: OVEREXPOSURE TO DUST FROM ABRADED SURFACE MAY CAUSE RESPIRATORY SYSTEM IRRITATION. HAZARD DEGREE BASED ON MATERIAL BEING ABRADED.
INGESTION: NO ADVERSE HEALTH EFFECTS EXPECTED.

SECTION CHANGE DATES

FIRE & EXP. DATA	SECTION CHANGED SINCE	AUGUST 23, 1990 ISSUE
ENVIRON. DATA	SECTION CHANGED SINCE	AUGUST 23, 1990 ISSUE

Abbreviations: N/D - Not Determined N/A - Not Applicable

The information on this Data Sheet represents our current data and best opinion as to the proper use in handling of this material under normal conditions. Any use of the material which is not in conformance with this Data Sheet or which involves using the material in combination with any other material or any other process is the responsibility of the user.

MATERIAL SAFETY
DATA SHEET

3M
3M Center
St. Paul, Minnesota
55144-1000
(612) 733-1110

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DIVISION: INDUSTRIAL TAPE AND SPECIALTIES DIVISION
TRADE NAME:
3M 90 High Strength Adhesive
ID NUMBER/U.P.C.:

62-4441-4830-8	00-21200-85852-9	62-4441-4925-6	00-21200-82219-3
62-4441-4930-6	00-21200-82219-3	62-4441-4932-2	00-21200-89352-0
62-4441-4935-5	- - -		

ISSUED: November 14, 1996
SUPERSEDES: August 26, 1996
DOCUMENT: 11-0881-0

1. INGREDIENT

INGREDIENT	C.A.S. NO.	PERCENT
DIMETHYL ETHER (PROPELLANT)	115-10-6	50.0 - 60.0
PENTANE	109-66-0	10.0 - 20.0
ACETONE	67-64-1	10.0 - 20.0
NON-VOLATILE COMPONENTS - NEW JERSEY TRADE SECRET (T.S.) REGISTRY NO. 04499600-5548P ++	TradeSecret	7.0 - 13.0
CYCLOHEXANE	110-82-7	3.0 - 7.0

++ synthetic elastomers, hydrocarbon resin, antioxidant, and u.v. absorber. Not hazardous according to Canadian WHMIS criteria. Non-WHMIS controlled.

This product contains the following toxic chemical or chemicals subject to the reporting requirements of Section 313 of Title III of the Emergency Planning and Community Right-To-Know Act of 1986 and 40 CFR Part 372:
CYCLOHEXANE

2. PHYSICAL DATA

BOILING POINT: Compressed gas
VAPOR PRESSURE: Compressed gas
VAPOR DENSITY: N/D
EVAPORATION RATE: N/D
SOLUBILITY IN WATER: Nil
SPECIFIC GRAVITY: ca. .7 Water=1

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

2. PHYSICAL DATA (continued)

PERCENT VOLATILE:..... ca. 89 % by wt
pH:..... N/A
VISCOSITY:..... N/A - aerosol
MELTING POINT:..... N/D

APPEARANCE AND ODOR:
Clear liquid in aerosol, solvent odor

3. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT:..... <-40F (Closed Cup/Propellant)
FLAMMABLE LIMITS - LEL:..... N/A
FLAMMABLE LIMITS - UEL:..... Flammable Gas
AUTOIGNITION TEMPERATURE:..... N/D

EXTINGUISHING MEDIA:
Water spray, Carbon dioxide, Dry chemical, Foam

SPECIAL FIRE FIGHTING PROCEDURES:
Wear full protective clothing, including helmet, self-contained, positive pressure or pressure demand breathing apparatus, bunker coat and pants, bands around arms, waist and legs, face mask, and protective covering for exposed areas of the head. Water may not effectively extinguish fire; however, it should be used to keep fire-exposed containers and surfaces cool and prevent explosive rupture.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
Closed containers exposed to heat from fire may build pressure and explode. Vapors may travel long distances along the ground or floor to an ignition source and flash back.

NFPA HAZARD CODES: HEALTH: 2 FIRE: 4 REACTIVITY: 1 AEROSOL STORAGE: 3
UNUSUAL REACTION HAZARD: none

4. REACTIVITY DATA

STABILITY: Stable

INCOMPATIBILITY - MATERIALS/CONDITIONS TO AVOID:
Heat.

HAZARDOUS POLYMERIZATION: Hazardous polymerization will not occur.

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

4. REACTIVITY DATA (continued)

HAZARDOUS DECOMPOSITION PRODUCTS:
Carbon Monoxide and Carbon Dioxide, Aldehydes, Ketones, Hydrocarbons.

5. ENVIRONMENTAL INFORMATION

SPILL RESPONSE:
Refer to other sections of this MSDS for information regarding physical and health hazards, respiratory protection, ventilation, and personal protective equipment. In the U.S.A., call (612) 733-1110 or (612) 733-6100 for 24-hour spill assistance. Ventilate area. Extinguish all ignition sources. Cover with absorbent material. Collect using non-sparking tools. Place in a U.S. DOT-approved container.

RECOMMENDED DISPOSAL:
Incinerate in a permitted hazardous waste incinerator in the presence of a combustible material. Facility must be capable of handling aerosol cans. Dispose of empty cans in a sanitary landfill. Dispose of completely absorbed waste product in a facility permitted to accept chemical wastes.

RECYCLE EMPTY AEROSOL CONTAINERS WHERE AVAILABLE.

ENVIRONMENTAL DATA:
Not determined.

REGULATORY INFORMATION:
Volatile Organic Compounds: ca. 77 % calculated per SCAQMD rule 443.1.
Volatile Organic Compounds: ca. 540 gms/liter calculated per SCAQMD rule 443.1.
VOC Less H2O & Exempt Solvents: ca. 600 % calculated per SCAQMD rule 443.1.
Hazardous Air Pollutants: ca. 0 #/# solids calculated.

Since regulations vary, consult applicable regulations or authorities before disposal. U.S. EPA Hazardous Waste Number = D001 (Ignitable)

EPCRA HAZARD CLASS:
FIRE HAZARD: Yes PRESSURE: Yes REACTIVITY: No ACUTE: Yes CHRONIC: Yes

6. SUGGESTED FIRST AID

EYE CONTACT:
Immediately flush eyes with large amounts of water. Get immediate medical attention.

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

6. SUGGESTED FIRST AID (continued)

SKIN CONTACT:
Flush skin with large amounts of water. If irritation persists, get medical attention.

INHALATION:
Remove person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, get immediate medical attention.

IF SWALLOWED:
Do not induce vomiting. Drink two glasses of water. Call a physician.

7. PRECAUTIONARY INFORMATION

EYE PROTECTION:
Avoid eye contact with vapor, spray, or mist. Wear safety glasses with side shields.

SKIN PROTECTION:
Avoid prolonged or repeated skin contact.

RECOMMENDED VENTILATION:
Do not use in a confined area or areas with little or no air movement. If exhaust ventilation is not adequate, use appropriate respiratory protection. Provide ventilation adequate to control vapor concentrations below recommended exposure limits and/or control spray or mist.

RESPIRATORY PROTECTION:
Avoid breathing of vapors, mists or spray. Select one of the following NIOSH approved respirators based on airborne concentration of contaminants and in accordance with OSHA regulations: half-mask organic vapor respirator.

PREVENTION OF ACCIDENTAL INGESTION:
Do not ingest.

RECOMMENDED STORAGE:
Store at temperatures below 120 degrees F (49 degrees C). Store out of direct sunlight. Keep out of the reach of children.

FIRE AND EXPLOSION AVOIDANCE:
Aerosol container contains flammable gas under pressure. Keep away from heat, sparks, open flame, and other sources of ignition. Extremely flammable liquid and vapor. Do not pierce or burn container, even after use. No smoking while handling this material. Avoid static discharge.

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

7. PRECAUTIONARY INFORMATION (continued)

EXPOSURE LIMITS

INGREDIENT	VALUE	UNIT	TYPE	AUTH	SKIN*
DIMETHYL ETHER (PROPELLANT).....	1000	PPM	TWA	CMRG	
DIMETHYL ETHER (PROPELLANT).....	500	PPM	TWA	AIHA	
DIMETHYL ETHER (PROPELLANT).....	942	MG/M3	TWA	AIHA	
PENTANE.....	600	PPM	TWA	ACGIH	
PENTANE.....	750	PPM	STEL	ACGIH	
PENTANE.....	600	PPM	TWA	OSHA	
PENTANE.....	750	PPM	STEL	OSHA	
ACETONE.....	750	PPM	TWA	ACGIH	
ACETONE.....	1000	PPM	STEL	ACGIH	
ACETONE.....	750	PPM	TWA	OSHA	
ACETONE.....	1000	PPM	STEL	OSHA	
NON-VOLATILE COMPONENTS - NEW JERSEY TRADE SECRET (T.S.) REGISTRY NO. 04499600-5548P ++.....	NONE	NONE	NONE	NONE	
CYCLOHEXANE.....	300	PPM	TWA	ACGIH	
CYCLOHEXANE.....	300	PPM	TWA	OSHA	

* SKIN NOTATION: Listed substances indicated with 'Y' under SKIN refer to the potential contribution to the overall exposure by the cutaneous route including mucous membrane and eye, either by airborne or, more particularly, by direct contact with the substance. Vehicles can alter skin absorption.

SOURCE OF EXPOSURE LIMIT DATA:
- ACGIH: American Conference of Governmental Industrial Hygienists
- OSHA: Occupational Safety and Health Administration
- CMRG: Chemical Manufacturer Recommended Exposure Guidelines
- NONE: None Established
- AIHA: American Industrial Hygiene Assoc. Workplace Environmental Exposure Level Guideline

8. HEALTH HAZARD DATA

EYE CONTACT:
Moderate Eye Irritation: signs/symptoms can include redness, swelling, pain, tearing, and hazy vision.

SKIN CONTACT:
Mild Skin Irritation (after prolonged or repeated contact): signs/symptoms can include redness, swelling, and itching.

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

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8. HEALTH HAZARD DATA (continued)

INHALATION:
Intentional concentration and inhalation may be harmful or fatal.

Kidney Effects: signs/symptoms can include reduced urine volume, blood in urine and back pain.

Liver Effects: signs/symptoms can include yellow skin(jaundice) and tenderness of upper abdomen.

Central Nervous System Depression: signs/symptoms can include headache, dizziness, drowsiness, incoordination, slowed reaction time, slurred speech, giddiness and unconsciousness.

Irritation (upper respiratory): signs/symptoms can include soreness of the nose and throat, coughing and sneezing.

IF SWALLOWED:
Ingestion is not a likely route of exposure to this product.

WHILE THE FOLLOWING EFFECTS ARE ASSOCIATED WITH ONE OR MORE OF THE INDIVIDUAL INGREDIENTS IN THIS PRODUCT AND ARE REQUIRED TO BE INCLUDED ON THE MSDS BY THE U.S. OSHA HAZARD COMMUNICATION STANDARD, THEY ARE NOT EXPECTED EFFECTS DURING FORESEEABLE USE OF THIS PRODUCT.

Irritation of Gastrointestinal Tissues: signs/symptoms can include pain, vomiting, abdominal tenderness, nausea, blood in vomitus, and blood in feces.

SECTION CHANGE DATES

PHYSICAL DATA	SECTION CHANGED SINCE August 26, 1996	ISSUE

Abbreviations: N/D - Not Determined N/A - Not Applicable CA - Approximately

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AIR LIQUIDE AMERICA CORPORATION
P.O. Box 3047
HOUSTON, TX 77253

MATERIAL SAFETY DATA SHEET

SECTION I GENERAL INFORMATION

PRODUCT NAME: ARGON
STILL CURRENT

EMERGENCY TELEPHONE NO. 713-868-0302
MANUFACTURERS NAME: AIR LIQUIDE AMERICA CORP.
TRADE NAME/SYNONYMS: ACETYLENE WELDING GAS
CHEMICAL NAME AND SYNONYMS: ACETYLENE ETHANE
REVISION DATE: 08/23/89 PRODUCT NO: 1001 FORMULA: AR
CHEMICAL FAMILY: RARE GAS CAS FAMILY: 7440-37-1

SECTION NOTES

MSDS INFORMATION NUMBER: (713) 696-2140

II HAZARDOUS INGREDIENTS

HAZARDOUS MIXTURES OF LIQUIDS AND GASES:

ARGON	O/C	TLV
NONE ESTABLISHED	100	**

III PHYSICAL DATA

ILING POINT: -302.6 F 185.9 C) @ 1 ATM
SPECIFIC GRAVITY (AIR = 1): 1.38 @ 70 f (21.1 c) & 1 AT,
VAPOR PRESSURE: N/A
DENSITY: 0.1034 LB/CU FT @ 70F (21.1C) @1ATM
EVAPORATION RATE: N/A (GAS)
MATERIAL AT NORMAL CONDITION: GAS
EXPANSION RATIO LIQUID TO GAS: N/A (GAS)
APPEARANCE AND ODOR: COLORLESS, ODORLESS, TASTELESS GAS.

IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: N/A
FLASH METHOD (METHOD USED):
FLAMMABILITY LIMITS IN AIR: (0/0 BY VOL) LOWER: N/A UPPER: N/A
EXTINGUISHING MEDIA: MATERIAL IS NONFLAMMABLE. ARGON NEITHER BURNS NOR SUPPORTS COMBUSTION. USE EXTINGUISHING MEDIA APPROPRIATE FOR SURROUNDING FIRE.
SPECIAL FIRE FIGHTING PROCEDURES: NONE. ARGON WILL ACT AS A SIMPLE ASPHYXIANT IF IT DISPLACES OXYGEN. IF POSSIBLE, REMOVE ARGON CYLINDERS FROM FIRE AREA OR COOL WITH WATER TO AVOID EXCESSIVE PRESSURE BUILDUP. SELF-CONTAINNED BREATHING APPARATUS MAY BE REQUIRED FOR RESCUE WORKERS. PRESSURE CAN BUILD UP DUE TO HEAT AND CYLINDER MAY EXPLODE IF PRESSURE RELIEF DEVICES SHOULD

AUTOIGNITION TEMPERATURE: N/A
ELECTRICAL CLASSIFICATION: CLASS 1, GROUP A

V HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: NONE ESTABLISHED
UNUSUAL CHRONIC TOXICITY: *SEE OVEREXPOSURE SECTION*
CARCINOGENICITY: NOT LISTED BY IARC* NTP* OR OSHA
ROUTES OF EXPOSURE: INHALATION
EFFECTS OF OVEREXPOSURE: ARGON IS NONTOXIC, BUT SUFFOCATION BY DISPLACING THE OXYGEN IN THE AIR. EXPOSURE TO OXYGEN-DEFICIENT ATMOSPHERES MAY CAUSE DIZZINESS, NAUSEA, VOMITING, DIMINISHED MENTAL ALERTNESS, LOSS OF CONSCIOUSNESS, AND DEATH. IT SHOULD BE RECOGNIZED THAT COLLAPSE AND ASPHYXIATION MAY OCCUR WITHOUT EXPERIENCING ANY OF THE ABOVE SYMPTOMS.
TOXICOLOGICAL PROPERTIES: ARGON IS A SIMPLE ASPHYXIANT.
EMERGENCY AND FIRST AID PROCEDURES: PERSONS SUFFEREING FROM LACK OF OXYGEN SHOULD BE MOVED INTO FRESH AIR. IF VICTIM IS NOT BREATHING, ADMINISTER ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT. ADMINISTER OXYGEN. OBTAIN PROMPT MEDICAL ATTENTION. RESCUE PERSONNEL MAY REQUIRE SELF-CONTAINED BREATHING APPARATUS AND SHOULD BE COGNIZANT OF THE EXTREME FIRE AND EXPLOSION HAZARD.

VI REACTIVITY DATA

STABILITY: UNSTABLE
CONDITIONS TO AVOID: NONE. ARGON IS A STABLE GAS. CHARACTERIZED BY ITS EXTREME LACK OF CHEMICAL ACTIVITY.
INCOMPATABILITY: (MATERIALS TO AVOID): NONE
HAZARDOUS DECOMPOSITION PRODUCTS: NONE
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
CONDITIONS TO AVOID: N/A

VII SPILL AND DISPOSAL PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: EVACUATE IMMEDIATE AREA USE APPROPRIATE PROTECTIVE EQUIPMENT; ELIMINATE ANY POSSIBLE SOURCES OF IGNITION AND FOLLOW MAXIMUM EXPLOSION-PROOF VENTILATION SHUT OFF SOURCE OF ACETYLENE IF POSSIBLE. ISOLATE ANY LEAKING CYLINDER. IF LEAKING FROM CYLINDER VALVE OR SAFETY PLUG CONTACT THE CLOSEST BIG THREE INDUSTRIES LOCATION OR YOUR LOCAL SUPPLIER.
WASTE DISPOSAL METHOD: DO NOT ATTEMPT TO DISPOSE OF RESIDUAL OR UNUSED QUANTITIES RETURN TO YOUR SUPPLIER FOR DISPOSAL

VIII SPECIAL PROTECTIVE INFORMATION

RESPIRATORY PROTECTION (SPECIFY TYPE): USE SELF-CONTAINED BREATHING APPARATUS OR POSITIVE PRESSURE AIR LINE WITH MASK FOR OXYGEN-DEFICIENT ATMOSPHERES. RESPIRATORS WILL NOT FUNCTION.
INHALATION: *SEE NOTES*
PROTECTIVE GLOVES: N/A
EYE PROTECTION: SAFETY GLASSES ARE RECOMMENDED WHEN WORKING WITH ACETYLENE.

OTHER PROTECTIVE EQUIPMENT: SAFETY SHOES WHEN HANDLING CYLINDERS.

SECTION NOTES

EQUATE TO AVOID LOWERING OXYGEN CONTENT TO BELOW 19.5% (OXYGEN- DEFICIENT TMOSPHERE).

LOCAL EXHAUST: YES
MECHANICAL YES

IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: STORE AND USE WITH ADEQUATE VENTILATION. ARGON IS HEAVIER. CONFINED SPACES CAUSING SUFFOCATION WITHOUT WARNING. CYLINDERS SHOULD BE STORED UPRIGHT WITH VALVE PROTECTION CAP IN PLACE AND FIRMLY SECURED TO PREVENT FALLING OR BEING KNOCKED OVER. PROTECT CYLINDERS FROM PHYSICAL DAMAGE; DO NOT DRAG, ROLL, SLIDE OR DROP. USE A SUITABLE HAND TRUCK FOR CYLINDER MOVEMENT. DO NOT ALLOW THE TEMPERATURE WHERE CYLINDERS ARE STORED TO EXCEED 125 F (52 C).
D.O.T. LABELING: FLAMMABLE GAS - NONFLAMMABLE GAS - GREEN LABEL
VALVE CONNECTION: 580
OTHER PRECAUTIONS: NEVER STRIKE A WELDING ARC ON ANY COMPRESSED GAS CYLINDER. REFILLINNG CYLINDERS WITHOUT THE CONSENT OF THE CYLINDER OWNER IS A VIOLATIONN OF FEDERAL LAW (49 CFR).
DOT PLACARD: NONFLAMMABLE GAS
DOT PROPER SHIPPING NAME: ARGON COMPRESSED
MISCELLANEOUS INFORMATION: FURTHER INFORMATION ABOUT ACETYLENE CAN BE FOUND IN THE FOLLOWING PAMPHLETS PUBLISHED BY THE COMPRESSED GAS ASSOCIATION (CGA) 1235 JEFFERSON DAVIS HIGHWAY, ARLINGTON, VA 22202 (703) 979-4341 G-11.1: "COMMODITY SPECIFICATION FOR ACETYLENE" P-1: "SAFE HANDLING OF COMPRESSED GASES IN CONTAINERS P-9: THE INERT GASES ARGON. NITROGEN, AND HELIUM P-14: ACCIDENT PREVENTION IN OXYGEN-RICH AND OXYGEN-DEFICIENT ATMOSPHERES SB-2: OXYGEN-DEFICIENT ATMOSPHERES

SAFETY RATINGS
HEALTH: 0
FLAMMABILITY: 0
REACTIVITIES 0

INMIS RATINGS:
HEALTH: 0
FLAMMABILITY 0
REACTIVITY: 0

CERCLA RATINGS:
HEALTH: 0
FIRE: 0
REACTIVITY: 0
PERSISTENCE: 3

LISTED IN TSCA INVENTORY: YES

THIS PRODUCT SAFETY DATA SHEET IS OFFERED SOLELY FOR YOUR INFORMATION. 29 CFR

IMPLIED.

AIR LIQUIDE AMERICA CORPORATION
P.O. Box 3047
HOUSTON, TX 77253

MATERIAL SAFETY DATA SHEET

SECTION I GENERAL INFORMATION

PRODUCT NAME: CARBON DIOXIDE

EMERGENCY TELEPHONE NO. 713-868-0302
MANUFACTURERS NAME: AIR LIQUIDE AMERICA CORP.
TRADE NAME/SYNONYMS: CARBON DIOXIDE
CHEMICAL NAME AND SYNONYMS: CARBON DIOXIDE, CARBONIC ANHYDRIDE
REVISION DATE: 01/31/94 PRODUCT NO: 1013 FORMULA: C02
CHEMICAL FAMILY: OXIDES OF CARBON CAS FAMILY: 124-38-9

SECTION NOTES

MSDS INFORMATION NUMBER: (713) 896-2140

II HAZARDOUS INGREDIENTS

HAZARDOUS MIXTURES OF LIQUIDS AND GASES

	0/0	TLV
CARBON DIOXIDE	100	**

CARBON DIOXIDE IS A COMPOUND OF CARBON AND OXYGEN. THE AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH)

THRESHOLD LIMIT VALUES ARE:
TWA - 5,000 PPM
STEL = 30,000 PPM

III PHYSICAL DATA

BOILING POINT: *SEE NOTES*
SPECIFICAT GRAVITY (AIR=1): 1.522 @ 70 f (21.1C) & 1 ATM
VAPOR PRESSURE: 838 PSIG @ 70 F (21.1 C) & 1 ATM
PERCENT VOLATILE BY VOLUME: (0/0) N/A
DENSITY GAS: 0.1144 LB/CU FT @ 70 f (21.1c) & 1 ATM
SATURATED LIQ: 47.6 LB/CU FT @ 70 F (21.1C)
EVAPORATION RATE: N/A
SOLUBILITY IN WATER: 171.3SCC/100CC H20 @ 32 F (OC)
MATERIAL AT NORMAL CONDITION: GAS
EXPANSION RATIO (LIQUID TO GAS): 1:414.8
APPEARANCE AND ODOR: COLORLESS, ODORLESS, SLIGHTLY ACIDIC GAS

SECTION NOTES

SUBLIMATION POINT: -109.3f (-78.5c) @ 1 ATM

IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: N/A
FLASH POINT (METHOD USED): FLAMMABILITY LIMITS IN AIR (O/O BY VOL) LOWER N/A UPPER N/A
EXTINGUISHING MEDIA: MATERIAL IS NONFLAMMABLE. CARBON DIOXIDE NEITHER BURNS NOR SUPPORTS COMBUSTION; IN FACT, IT IS USED AS A FIRE EXTINGUISHING AGENT. USE EXTINGUISHING MEDIA APPROPRIATE FOR THE SURROUNDING FIRE.
SPECIAL FIRE FIGHTING PROCEDURES: NONE. CARBON DIOXIDE WILL ACT AS A SIMPLE ASPHYXIANT IF IT DISPLACES OXYGEN. IF POSSIBLE, REMOVE CARBON DIOXIDE CYLINDERS FROM FIRE AREA OR COOL WITH WATER TO AVOID EXCESSIVE PRESSURE BUILDUP. SELF-CONTAINED BREATHING APPARATUS MAY BE REQUIRED FOR RESCUE WORKERS.
UNUSUAL FIRE AND EXPLOSION HAZARD: PRESSURE CAN BUILD UP DUE TO HEAT AND CYLINDER MAY EXPLODE IF PRESSURE RELIEF DEVICES SHOULD FAIL TO RELIEVE PRESSURE.
AUTOIGNITION TEMPERATURE: NONE
ELECTRICAL CLASSIFICATION: NONHAZARDOUS

V HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: 5,000 TLV AND 5,000 TWA
UNUSUAL CHRONIC TOXICITY: *SEE OVEREXPOSURE SECTION*
CARCINOGENICITY: NOT LISTED BY IARC* NTP* OR OSHA
ROUTES OF EXPOSURE: INHALATION
EFFECTS OF OVEREXPOSURE: IN HIGH CONCENTRATIONS CARBON DIOXIDE CAN PARALYZE THE RESPIRATORY CENTER. AN INCREASE OF CCO2 IN AIR WILL ACCELEATE BREATHING RATE. (2%=50% INCREASE) (5% = 300% INCREASE) 12-15% = CAUSE UNCONSCIOUSNESS). HIGH CONCENTRATIONS WILL CAUSE SUFFOCATION BY DISPLACING THE OXYGEN IN THE AIR. CONTACT WITH LIQUID CO2 CAN CAUSE FROSTBITE.
TOXICOLOGICAL PROPERTIES: CARBON DIOXIDE IS A SIMPLE ASPHYXIANT.
EMERGENCY AND FIRST AID PROCEDURES: ELIMINATE ALL SOURCES OF IGNITION. PERSONS SUFFERING FROM LACK OF OXYGEN SHOULD BE MOVED INTO FRESH AIR. IF VICTIM IS NOT BREATHING, ADMINISTER ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, ADMINISTER OXYGEN. OBTAIN PROMPT MEDICAL ATTENTION. RESCUE PERSONNEL MAY REQUIRE SELF-CONTAINED BREATHING APPARATUS AND SHOULD BE COGNIZANT OF THE EXTREME FIRE AND EXPLOSION HAZARD. IF CONTACT WITH LIQUID CARBON DIOXIDE HAS CAUSED FROSTBITE, DO NOT RUB THE AFFECTED AREA, AS TISSUE DAMAGE MAY OCCUR. FLUSH THE AFFECTED AREAS WITH WARM WATER. DO NOT USE HOT WATER. OBTAIN PROMPT MEDICAL ATTENTION.

VI REACTIVITY DATA

STABILITY: STABLE
CONDITIONS TO AVOID: NONE
INCOMPATABILITY (MATERIALS TO AVOID): NONE
HAZARDOUS DECOMPOSITION PRODUCTS: NONE
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
CONDITIONS TO AVOID: N/A

VII SPILL AND DISPOSAL PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR *SPILLED: EVACUATE IMMEDIATE* AREA USE APPROPRIATE PROTECTIVE EQUIPMENT; ELIMINATE ANY POSSIBLE SOURCES OF IGNITION AND FOLLOW MAXIMUM EXPLOSION-PROOF VENTILATION SHUT OFF SOURCE OF ACETYLENE IF POSSIBLE. ISOLATE ANY LEAKING CYLINDER. IF LEAKING FROM CYLINDER VALVE OR SAFETY PLUG CONTACT THE CLOSEST BIG THREE INDUSTRIES LOCATION OR YOUR LOCAL SUPPLIER.

.STE DISPOSAL METHOD: DO NOT ATTEMPT TO DISPOSE OF RESIDUAL OR UNUSED QUANTITIES RETURN TO YOUR SUPPLIER FOR DISPOSAL. FOR EMERGENCY DISPOSAL, SECURE CYLINDER AND VENT SLOWLY TO THE ATMOSPHER IN A WELL-VENTILATED AREA OR OUTDOORS

VIII SPECIAL PROTECTIVE INFORMATION

RESPIRATORY PROTECTION (SPECIFY TYPE): USE SELF-CONTAINED BREATHING APPARATUS OR POSITIVE PRESSURE AIR LINE WITH MASK FOR OXYGEN-DEFICIENT ATMOSPHERES. RESPIRATORS WILL NOT FUNCTION.

VENTILATION: *SEE NOTES*

PROTECTIVE GLOVES: SEE NOTES

EYE PROTECTION: SEE NOTES

OTHER PROTECTIVE EQUIPMENT: SAFETY SHOES WHEN HANDLING CYLINDERS.

SECTION NOTES

ADEQUATE TO AVOID LOWERING OXYGEN CONTENT TO BELOW 19.5% (OXYGEN- DEFICIENT ATMOSPHERE).

LOCAL EXHAUST: SUFFICIENT TO MEET TLV REQUIREMENTS

MECHANICAL: SUFFICIENT TO MEET TLV REQUIREMENTS

GLOVES: THERMAL INSULATED OR LEATHER FOR LIQUID HANDLING

EYES: SAFETY GLASSES ARE RECOMMENDED WHEN HANDLING HIGH PRESSURE CYLINDERS. SAFETY GLASSES AND FACE SHIELD ARE RECOMMENDED FOR LIQUID HANDLING.

IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: STORE AND USE WITH ADEQUATE VENTILATION DO NOT STORE IN 20 FEET OF OXYGEN OR ANY OTHER OXIDIZER. CYLINDERS SHOULD BE STORED UPRIGHT WITH VALVE PROTECTION CAP IN PLACE AND FIRMLY SECURED TO PREVENT FALLING OR BEING KNOCKED OVER. PROTECT CYLINDERS FROM PHYSICAL DAMAGE; DO NOT GRAB SIDE OR TOP. USE A SUITABLE HAND TRUCK FOR CYLINDER MOVEMENT. POST "NO SMOKING OR OPEN FLAMES" SIGNS IN THE STORAGE AND USE AREAS. THERE SHOULD BE NO SOURCES OF IGNITION. ALL ELECTRICAL EQUIPMENT SHOULD BE EXPLOSION PROOF IN THE STORAGE AND USE AREA. STORAGE AREAS MUST MEET ALL ELECTRIC CODES FOR CLASS I HAZARDOUS AREAS.

D.O.T. LABELING: NONFLAMMABLE GAS - GREEN LABEL

VALVE CONNECTION: 320 OR 940 (PIN INDEXED)

OTHER PRECAUTIONS: PRESSURE REGULATORS SHOULD NEVER BE PLACED ON "SIPHON" OR "DIP TUBE" CYLINDERS THAT ARE DESIGNATED TO DISPENSE LIQUID. NEVER STRIKE A WELDING ARC ON ANY COMPRESSED GAS CYLINDER. REFILLING CYLINDERS WITHOUT THE CONSENT OF THE CYLINDER OWNER IS A VIOLATION OF FEDERAL LAW (49 CRF).

DOT PLACARD: NONFLAMMABLE GAS

DOT PROPER SHIPPING NAME: CARBON DIOXIDE

MISCELLANEOUS INFORMATION: FURTHER INFORMATION ABOUT *ACETYLENE CAN BE FOUND IN* THE FOLLOWING PAMPHLETS PUBLISHED BY THE COMPRESSED GAS ASSOCIATION (CGA)
1235 JEFFERSON DAVIS HIGHWAY,
ARLINGTON, VA 22202
(703) 979-4341

6.2: "COMMODITY SPECIFICATION FOR ACETYLENE"
G-6: ACETYLENE"
G-6.3: "SAFE HANDLING OF COMPRESSED GASES IN CONTAINERS
P-1: HANDLING ACETYLENE CYLINDERS IN FIRE SITUATIONS
P-14: ACCIDENT PREVENTION IN OXYGEN-RICH AND OXYGEN-DEFICIENT ATMOSPHERES
SB-2: "OXYGEN-DEFICIENT ATMOSPHERES"

SAFETY RATINGS
HEALTH: 0
FLAMMABILITY: 0
REACTIVITIES 0

INMIS RATINGS:
HEALTH: 0
FLAMMABILITY 0
REACTIVITY: 0

CERCLA RATINGS:
HEALTH: 0
FIRE: 0
REACTIVITY: 0
PERSISTENCE: 0

LISTED IN TSCA INVENTORY: YES

THIS PRODUCT SAFETY DATA SHEET IS OFFERED SOLELY FOR YOUR INFORMATION. 29 CFR AIR LIQUIDE AMERICA CORPORATION PROVIDES NO WARRANTIES EITHER EXPRESS OR IMPLIED.

Industrial Gas Division
Air Products and Chemicals, Inc.
Allentown, PA 18195
Tel. (215)481-4911 TWX 510-651-3686
ble-AIRPROD - Telex 847416
x (215) 481-5900

Acetylene Material Safety Data Sheet

EMERGENCY PHONE: 800-523-9374 IN PENNSYLVANIA: 800-322-9092
TRADE NAME AND SYNONYMS: Acetylene, Ethyne, Ethine
CHEMICAL NAME AND SYNONYMS: Acetylene, Ethyne, Ethine
ISSUE DATE: Issued: 31 January 1978
FORMULA: C2H2 MW: 26.04
CHEMICAL FAMILY: Alkynes CAS#74-86-2
REVISIONS: Rev: 1 June 1990

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HEALTH HAZARD DATA

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EXPOSURE LIMITS: OSHA: None established. ACGIH: Simple Asphyxiant. Acetylene is not listed as a carcinogen by NTP, IARC or OSHA.

SYMPTOMS IF INGESTED, CONTACTED WITH SKIN, OR VAPOR INHALED: Symptoms such as headaches, dizziness, shortness of breath, and loss of consciousness may occur if the gas is present in quantities sufficient to dilute the oxygen concentration in air. Symptoms of anoxia occur only when the gas concentrations are within the flammable range and the mixture has not ignited. (DO NOT ENTER AREAS WITHIN THE FLAMMABLE RANGE DUE TO THE IMMEDIATE FIRE AND EXPLOSION HAZARD.) Use a suitable flammable gas meter (explosimeter) calibrated for cetylene to measure concentrations of gas in the air.

TOXICOLOGICAL PROPERTIES: Acetylene is a simple asphyxiant, irritant, and anesthetic. About 100 mg per liter may be tolerated for 0.5-1.0 hour. There is no experimental evidence of chronic harmful effects.

RECOMMENDED FIRST AID TREATMENT: First degree and minor second degree thermal burns from fires should be immersed in cool water for 30 minutes. Major second and third degree burns should be covered in the cleanest material available. Seek immediate aid of a physician. Persons suffering from lack of oxygen should be moved to areas with normal atmosphere. Assisted respiration and supplemental oxygen should be given if the victim is not breathing.

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FIRE AND EXPLOSION HAZARD DATA

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FLASH POINT (Method used):OF (- 18C) (CC)
AUTO IGNITION TEMP: 581 F (305C)
FLAMMABLE LIMITS: In air @ 1 atm

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LEL: 2.50% UEL:

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical, Halon
ELECTRICAL CLASSIFICATION GROUP: Class 1, Group A
SPECIAL FIRE FIGHTING PROCEDURES: Stop gas flow and fight fire conventionally. Use water spray to keep cylinders or other containers cool if exposed to fire. Keep personnel well away since containers can rupture violently when exposed to fire. For additional information, see Compressed Gas Association Safety Bulletin SB-4.
UNUSUAL FIRE AND EXPLOSION HAZARDS: ACETYLENE IS EXTREMELY FLAMMABLE AND EXPLOSIVE. IT MAY DECOMPOSE VIOLENTLY IN ITS FREE STATE UNDER PRESSURE IN EXCESS OF 15 PSIG. It burns with an intensely hot flame. Potential explosion hazard exists from reignition if fire is extinguished without shutting off acetylene source. Ignites very easily due to low minimum ignition energy; very wide flammable limits. Acetylene gas has an approximate specific gravity of 1.0 and tends to stay in pockets rather than dissipate.

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PHYSICAL DATA

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BOILING POINT (F.): @ 1 atm - 119.2F (- 84.0C)
FREEZING POINT (F): @ 1 atm - 113.4F (-80.8C)
VAPOR PRESSURE (psia): @ 62.2F (16.8C) 590 psia (40 atm)
SOLUBILITY IN WATER: @ 64F (18C)@ 1 atm 1.0 CuFt/CuFtH20
VAPOR DENSITY (lb/cu ft):@ 68F (20C), 1 atm 0.0681
SPECIFIC GRAVITY (AIR= 1): @ 68F (20C), 1 atm 0.906
LIQUID DENSITY (lb/cu ft):@ - 116F (-82C), 1 atm 38.76
SPECIFIC GRAVITY (H20 = 1): @ -116F (-82C), 1 atm 0.621
APPEARANCE AND ODOR: Pure acetylene is colorless and odorless. Impurities in carbide generated acetylene impart a characteristic garlic-like odor.

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REACTIVITY DATA

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STABILITY: UNSTABLE
CONDITIONS TO AVOID: Never utilize free gas outside the cylinder at pressures in excess of 15 psig. Avoid mechanical shocks to containers of acetylene. Never expose cylinder or acetylene systems to sources of heat.
INCOMPATIBILITY (Materials to avoid): Oxidizers such as oxygen, and halogens. Forms explosive compounds with copper, brass, copper salts, Mercury, and Mercury salts, Potassium, Silver and Silver salts, and HN03.
HAZARDOUS DECOMPOSITION PRODUCTS: Acetylene will decompose into elemental carbon and hydrogen under the above conditions.
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
CONDITIONS TO AVOID: None known

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SPILL OR LEAK PROCEDURES

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STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Ventilate area to prevent flammable mixture from forming. Remove sources of ignition, heat, sparks, etc. Avoid entering area of flammable atmosphere. Carefully remove cylinders with slow leaks to a remote, outdoor location. Contact Air Products for assistance.

WASTE DISPOSAL METHOD: Do not attempt to dispose of residual gas in cylinders. Return cylinders to Air Products for disposal.

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SPECIAL PROTECTION INFORMATION

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RESPIRATORY PROTECTION (Specify type): Oxygen-deficient atmospheres are in the flammable range. DO NOT ENTER. Air purifying respirators will not function.

VENTILATION: Natural or mechanical where gas is present.

LOCAL EXHAUST: As necessary

SPECIAL: Mechanical ventilation for enclosed storage areas must meet National Electrical Code requirements for Class 1 , Group A

MECHANICAL (General): As necessary

OTHER: As necessary

PROTECTIVE GLOVES: Ordinary leather work gloves are recommended for handling. Welders gloves required for cutting and welding operations.

EYE PROTECTION: Safety glasses are recommended for handling cylinders. Welder goggles, etc., required for cutting and welding.

OTHER PROTECTIVE EQUIPMENT: Leather sleeves, leather apron and other standard protective equipment for cutting and welding.

****

SPECIAL PRECAUTIONS*

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SPECIAL LABELING INFORMATION: DOT Shipping Name: Acetylene. DOT Hazard Class: Flammable Gas. DOT Shipping Label: Flammable Gas. I.D. Number: UN 1001.

SPECIAL HANDLING RECOMMENDATIONS: Use only in well ventilated areas. Acetylene gas cylinders contain gas at high pressure and should be handled with care. Use a pressure-reducing regulator set at less than 15 psig. Always keep acetylene cylinders upright and secure cylinders when in use. Never expose an acetylene cylinder to heat. Always open and close acetylene valves slowly. Return cylinders to Air Products with positive pressure and cylinder valve closed. Avoid dragging, rolling, or sliding cylinders, even for a short distance. Use a suitable hand truck. For additional handling recommendations on compressed gas cylinders, consult Compressed Gas Association Pamphlet P-1.

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SPECIAL STORAGE RECOMMENDATIONS: Storage o less is permissible within buildings. Storage in excess of 2500 cubic feet must be outdoors or in well ventilated special rooms or buildings. Keep cylinders away from source of heat. Storage should not be in heavy traffic areas to prevent accidental knocking over or damage from passing or falling objects. Valve caps should remain on cylinders not connected for use. Segregate full and empty cylinders. Keep acetylene cylinders storage areas away from storage of oxygen and other oxidizers. Storage areas should be free of combustible material. Avoid exposure to areas where salt or other corrosive chemicals are present. Store acetylene cylinders with the valve end up. See Compressed Gas Association Pamphlet P-1 and National Fire Protection Association Standard No. 51 for additional storage recommendations.

SPECIAL PACKAGING RECOMMENDATIONS: Acetylene is packed in cylinders meeting DOT specifications 8 or 8AL. The cylinder contains a porous filler saturated with acetone. The acetylene stored in the cylinder is dissolved in acetone. A full cylinder should not exceed 250 psig @ 70F.

OTHER RECOMMENDATIONS OR PRECAUTIONS: Acetylene cylinders should be stored and used in an upright position. When using acetylene, close the cylinder valve before shutting off the regulator to permit the gas to bleed from the regulator. Avoid hazardous mixtures and sources of ignition. Formation of explosive copper acetylides can be avoided by using copper alloys proved successful through use in industry. Compressed gas cylinders should not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder filled without the permission of the owner is a violation of Federal Law.

*Various Government agencies (i.e., Department of Transportation, Occupational Safety and Health Administration, Food and Drug Administration and others) may have specific regulations concerning the transportation, handling, storage or use of this product which will not be reflected in this data sheet. The customer should review these regulations to ensure that s/he is in full compliance.

Material Safety Data Sheet for coatings, resins and other industrial related material. Complies with Food and Drug Administration Act and complies with 29CFR 1910.1200 The Hazard Communication Standard

DATE OF PREPARATION: 07/05/95 **EMERGENCY PHONE NO.:** 1-800-662-0023

MANUFACTURERS NAME: AMAX Corporation Industrial Products Group
CORPORATE STREET ADDRESS: 960 S. Third Street
CITY: Louisville **STATE:** Kentucky **ZIP:** 40203
PREPARERS IDENT: Sam Donalds **DEPT. CODE:** 3438
EMERGENCY AND INFORMATION PHONE NUMBER: 1-800-662-0023

LEMON SPIRIT CLEANER

SECTION 1 - PRODUCT IDENTIFICATION

Product Name: Aerosol Solvent Cleaner and Degreaser 378GE **Product Code No.:** 378GE
Product Class: biodegradeable kerosene subs., industrial cleaning solvent
Product Description and Uses: **Designed with safety in mind! Hard working and safe!** A degreaser that will strip rubber, lube oil, grease, minerals, coal, ink, carbon, waxes, chemical residue and light tar. Will not strip machine paint or decals. Substitute for kerosene, diesel fuel, mineral spirits and trichlor. Contains no chlorinated or hazardous solvents. Safe for all metals and plastic. Great for removing grease deposits or oil stains from concrete floors. This will clean bearings, valves, scrapers, haul units, gear reducers, pumps, dies, lathes, presses, engines, transmissions, chains, fan housings and turbines. Thi will have no adverse effect either physical or dielectric, upon the paper insulation, plastics or metals found in electrical motors, transformers, and generators. Excellent for use as an adhesive remover.

SECTION 2 - NON-HAZARDOUS INGREDIENTS

Chemical	CAS No.	Weight %	ACGIH TLV (mg/m3)	OSHA PEL (mg/m3)	Carcinogenicity NPT	IARC	OSHA
d- limonene	5989-27-5	97%	NA	NA	total non-carcinogen		

Contains no hazardous ingredients. This product is non-hazardous for storage and transport according to the US Department of Transportation Regulations.

NA=Not Applicable NK=Not Known NE=Not Established

SECTION 3 - PHYSICAL DATA

Boiling Point:678F **Vapor density** ___ **heavier** _X_ **lighter than air.** **Ph: 7.0 neutral**
Evaporation Rate:_____**Faster** _XX_ **Slower than Ether. Percent Volatile by Volume:** 0% **Weight per gallon:** 9.3lbs
Appearance and Odor: Clear liquid, with citrus odor

HMIS Rating Information:

Health: 1 **Flammability:** 0 **Reactivity:** 0 **Personal Protection:** A

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

Flammability Classification: None **DOT:** Not Regulated **Flash Point:** None **LEL:** 1.8
Extinguishing Method: CO2, foam or dry chemical **Unusual Fire and Explosion Hazards:** None Required
Special Fire Fighting Procedures: Water, CO2, dry chemical

SECTION 5 - HEALTH HAZARD DATA

Permissible Exposure Level: Not Applicable **Threshold Limit Value:** Not Applicable
Precautionary Measures: No special requirements under normal use conditions
Eye Protection: Reasonable eye protection should always be used to avoid eye contact where splashing may occur.
Skin Protection: No special precautions required; rinse completely from skin after contact.
Respiratory Protection: No special precautions required

First Aid Treatment:
Eye Contact: Immediately rinse the eye with large quantities of cool water; continue 10-15 minutes or until the material has bee removed. Get medical attention if irritation persists.
Skin contact: No effects, if any rinse with water.
Swallowing: Non-toxic. Give several glasses of water to dilute; do not induce vomiting.
Inhalation: Non-toxic. Exposures to concentrate or mist may cause mild irritation; remove to fresh air.

LEMON SPRAY CLEANER

SECTION 6 - REACTIVITY DATA

Stability: ____ unstable _XX_ stable **Hazardous Polymerization:** ____ may occur _XX_ will not occur
Hazardous Decomposition Products: Carbon dioxide **Conditions to Avoid:** Strong oxidizing agents **Incompatibility (Materials to Avoid):** None

SECTION 7 - SPILL OR LEAK PROCEDURES

Steps to be taken if material is released or spilled: Recover usable material by convenient method; residual may be remove by wipe or wet mop.
Waste Disposal Method: Biodegradeable. Will not harm sewage treatment micro-organisms if disposed by sewer or drain.

SECTION 8 - SAFE HANDLING AND USE INFORMATION

Respiratory Protection: None **Ventilation:** Normal room ventilation is adequate. Use fans in enclosed areas where large quantities of product are used. **Protective Gloves:** Yes **Eye Protection:** Safety glasses
Other Protective Clothing: None **Hygenic Practices:** Wash hands after using. Do not eat while using product.

SECTION 9 - SPECIAL PRECAUTIONS

Precautions to be taken in Handling and Storing: Protect from freezing. **Other Precautions:** NONE

This product contains no ozone-depleting chemicals. Complies with 40 CFR 82.100 and 40 CFR 82.104.

Aerosol Solvent Cleaner and Degreaser 378GE has several key advantages over common industrial cleaners: it contains no petroleum distillates, it is highly concentrated, it is completely biodegradeable and environmentally safe, and greatly diminishes health risks to workers who handle it.

Meets following Military Specifications:
Cleaning compound, Heavy Duty Liquid O-C-1824; Cleaning compound, Electrical and Electrical Components MIL-C-22542A/AS; Carbon removing compound P-C-111D; Carbon removing compound for agitating tank MIL-C-19653B/C

[illegible]tes and Approvals: Aerosol Solvent Cleaner and Degreaser 378GE has compound authorization as an approved degreaser [illegible] use in Federal inspected plants operating under the Food and Drug Administration and the Meat and Poultry Inspection Programs.

All ingredients conform to FDA Act CFR 176.170 and CFR 176.180; Meets all Right-to-Know Law Regulations; American Institut of Plant Engineers Approved (AIPE); Paper Industry Management Association Approved (PIMA); Ford Motor Company Tox. No. C2-047010; Kimberly Clark Corporation Item # 287562; Government Services Association (GSA) Approved for factories dealing with government contracts and installations.

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END

adi american dry ice corp

MATERIAL SAFETY DATA SHEET

Carbon Dioxide, Solid
DOT: UN 2187
Haz. Cl: Division 9
Label: Class 9

24 Hour Emergency Phone Numbers: (800) 598-0049
CHEMTRIC: (800) 424-9300

SECTION I - PRODUCT IDENTIFICATION

CHEMICAL NAME: Solid Carbon Dioxide
COMMON NAME AND SYNONYMS: Dry Ice, Carbonice
CHEMICAL FAMILY: Carbonate FORMULA: CO_2

SECTION II - HAZARDOUS INGREDIENTS

MATERIAL	VOLUME %	CAS NO. 1990-91 ACGIH TLV UNITS	
Solid Carbon Dioxide	99+%	124-38-9	5,000 Molar PPM
		STEL -	30,000 " "
		OSHA 1989 TWA -	10,000 " "
		STEL -	30,000 " "

SECTION III - PHYSICAL DATA

BOILING POINT (O DEGREES F): SUBLIMES @ -109 degrees F
VAPOR PRESSURE: N/A SOLID
VAPOR DENSITY (AIR=1) @ 59 DEGREES F. = 1.6
SOLUBILITY IN WATER: VAPOR IS SOLUBLE
APPEARANCE AND ODOR: WHITE, OPAQUE SOLID
EMITTING COLORLESS GAS
SPECIFIC GRAVITY (H_2O=1) SOLID DENSITY = 95.6 LB/FT3
% VOLATILE BY VOLUME: 100%
EVAPORATION RATE (BUTYL ACETATE=1): N/A SOLID

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED): N/A
FLAMMABLE LIMITS: LEL=N/A UEL=N/A
EXTINGUISHING MEDA: NON-FLAMMABLE SOLID
SPECIAL FIRE FIGHTING PROCEDURES: NON-FLAMMABLE SOLID
UNUSUAL FIRE AND EXPLOSION HAZARDS: NON-FLAMMABLE SOLID

SECTION V - HEALTH HAZARD DATA

Route(s) of Entry: ***Inhalation?*** Yes ***Skin?*** Frostbite ***Ingestion?*** Not Common

Carcinogenicity: ***NTP?*** No ***IARC Monograph?*** No ***OSHA?*** No

EFFECTS OF OVEREXPOSURE:

Inhalation: Low (3-5%) concentrations in inhaled air cause increased respiration and headache. Higher concentrations cause nausea, vomiting and eventually unconsciousness leading to coma and death.

SKIN CONTACT:

Continuous dermal contact with solid CO_2 could cause frostbite or cryogenic "burns". Persons in ill health where such illness would be aggravated by exposure to solid carbon dioxide should not b e allowed to work with or handle this product.

EMERGENCY AND FIRST AID PROCEDURES:

If inhaled: Remove to fresh air. If unconscious or breathing is difficult, administer artificial respiration with supplemental oxygen. Keep warm and at rest.

Skin Contact: Flush affected area with tepid (105-115 degree f.) water. Seek medial help for thermal injury.

SECTION VI - REACTIVITY DATA

STABILITY: (UNSTABLE)	Sublimes in Air
CONDITIONS TO AVOID:	Do not store in air-tight containers
INCOMPATIBILITY (MATERIALS TO AVOID)	None
HAZARDOUS DECOMPOSITION PRODUCTS:	Carbon dioxide vapor
HAZARDOUS POLYMERIZATION:	(Won't occur)
CONDITIONS TO AVOID:	N/A

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Be certain there is adequate ventilation. Place outside in protected area with good ventilation and allow to sublime. Avoid prolonged contact with skin.

WASTE DISPOSAL METHOD: See above

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:
Self-contained breathing apparatus should be available for emergency use.
VENTILATION:
Local and Mechanical Exhaust to prevent accumulation above the TWA.
PROTECTIVE GLOVES: Yes**(insulated)** EYE PROTECTION: N/A
OTHER PROTECTIVE EQUIPMENT: N/A

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:
Solid carbon dioxide is generally delivered to customers in kraft-paper-wrapped blocks which weight approximately up to 60 pounds and can be up to 1/2 cubic foot in volume. The products should be stored in insulated containers which open from the top having loose fitting lids so that the carbon dioxide vapor from sublimation of the solid may be allowed to escape into the atmosphere.

OTHER PRECAUTIONS:
The insulated storage container should be located in an area where there is adequate ventilation so as to prevent the accumulation of carbon dioxide vapors above the TWA. Carbon dioxide vapors are approximately one and one-half times heavier that air.

Reporting under SARA, TITLE III, Section 313 not required.

NFPA 704 NO. for solid carbon dioxide = 2 0 0

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AMERICAN
OXYLANCE

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American Oxylance, Inc.
1600 Third St. W.
P.O. Box 5487
Birmingham, AL 35207
EMERGENCY NO.: (205) 322-9906

MATERIAL SAFETY DATA SHEET

This MSDS applies to the following products:
Oxylances, Oxygen Lance Pipe, Oxylance Jr's., Burning Bars, Lancing Rods, Cutting Rod, Tapping Pipe, etc.

GENERIC INGREDIENTS

INGREDIENT	CAS	PERCENT	PEL (OSHA)	TLV (ACGIH)
IRON	7439-89-6	97 - 99.5	5 MG/M³	5 MG/M³
CARBON	7440-44-0	-.06 - .14	N/E	N/E
SILICON	7440-21-3	1.8 - 4.0	15 MG/CU.M	10 MG/CU.M
MANGANESE	7439-96-5	1.2	C5 MG/CU.M as dust	C5 MG/CU.M as dust
NICKEL	7440-02-0	0.01 - 1.5	1 MG/CU.M	1 MG/CU.M
CHROMIUM	7440-47-3	0.02 - 0.13	.1 MG/CU.M	.5 MG/CU.M
CHROMIUM (hexavalent)			N/E	.05 MG/CU.M
MOLYBDENUM	7439-98-7	0.01 - 0.75	15 MF/CU.M	10 MG/CU.M
SULFUR	7704-34-9	0.02	N/E	N/E
PHOSPHORUS	7723-14-0	0.05	.1 MG/CU.M	.1 MG/CU.M
ALUMINUM	7429-90-5	0.003 - 0.06	N/E	10 MG/CU.M

PHYSICAL DATA/CHEMICAL CHARACTERISTICS

N/A LOW CARBON STEEL

HEALTH HAZARD DATA

EXPOSURE by inhalation of fumes from burning or welding, dusts from grinding or cutting.

EFFECTS OF EXPOSURE:

ACUTE: Excessive inhalation of fumes from many metals can produce an acute reaction known as (metal fume fever). Very similar and easily confused with flu symptoms.

CHRONIC: Chronic inhalation of fumes may lead to siderosis and reduce pulmonary function.

OTHER HAZARDS: The most obvious and immediate hazard comes from the intense burning action of the listed products under normal usage and conditions. Airborne, molten particles propelled by oxygen pressure can burn the persons or person using these equipments or in the immediate vicinity. (Please reference the Personal Protection section of this MSDS). Molten particles may also ignite combustibles in the area. Flash fires could result from oxygen, or fuel gas leaks. To attempt cutting a potential combustible or vessel containing combustibles or traces of same could result in violent fires or explosions. Also using any of the products covered in this MSDS that are found to be defective or contaminated by oils, solvents, grease, or any other chemical substances could result in serious bodily injury from an explosion and or fire. Please consult your distributor or the factory for complete operating instructions. These products are intended to be used by experienced or competently trained personnel **ONLY!!**

EMERGENCY AND FIRST AID PROCEDURES

EXCESSIVE INHALATION: Remove victim from adverse environment. Administer oxygen if breathing, artificial respiration if not breathing. Treat skin areas exposed to burns. Always send for medical aid immediately for any industrial accident.

PERSONAL PROTECTION INFORMATION

VENTILATION: If natural ventilation is deemed insufficient, local exhaust ventilation should be used to keep worker exposures within allowable limits during operation.

RESPIRATORY PROTECTION: Use NIOSH approved gas and vapor respirator, or Power Air Purifying, when ventilation does not keep fume exposure below allowable limits. When engineering or administrative controls are not feasible to control overexposure or while they are being instituted, NIOSH approved respirators should be used.

PROTECTIVE CLOTHING: Always wear full body, flame and heat resistant clothing and gloves. Head protection, full face shield and leather or flame resistant boots.

EYE PROTECTION: Wear goggles under clear shield or tinted full face shield. Goggle and tinted shield should be fitted with the correct shade lens.

SPILL AND LEAK PROCEDURES

CLEAN UP: N/A

WASTE DISPOSAL: Always discard any products, residues, or bi-product accumilation in an environmentally acceptable manner; in full compliance with all local, state, and federal regulations.

CARCINOGENIC ASSESSMENT

Both Chromium and Nickel have been identified as suspect carcinogens.

FIRE AND EXPLOSION DATA

FLASH POINT: N/A

FLAMMABLE LIMITS: N/A

Metal products are not a fire hazard. However dust generated by cutting or grinding may present a fire or explosion hazard. Some conditions could present a fire or explosion hazard. Reference the Health Hazard Data section of this MSDS.

REACTIVITY DATA

STABILITY: Stable under normal conditions of handling and use.

CONDITIONS TO AVOID: Contamination during storage or handling, with grease, oils, or chemicals that could react with oxygen, during normal operation.

HAZARDOUS DECOMPOSITION PRODUCTS: Metal fume containing materials listed in the Generic Ingredients section of this MSDS. NOTE: During normal operation the fumes emitted will also contain ingredients originating from the oxidation and reaction of the material being cut.

SPECIAL PRECAUTIONS

The metal itself does not present a health hazard unless it is welded, burned, ground, or cut. During these procedures, it is possible that excessive amounts of fumes or dust may be generated. It is advised that your particular operation be evaluated by a competent health professional to determine whether a hazard exist.

This information is taken from sources or based upon data believed to be reliable; however, American Oxylance, makes no warranty as to the absolute correctness or sufficiency of any of the foregoing or that additional other measures may not be required under particular conditions.

MATERIAL SAFETY DATA SHEET

(attachment)

1. ALUMINUM

EFFECTS OF EXPOSURE: Fumes are a low health risk by inhalation. Defined as a nuisance by (ACGIH)

EMERGENCY & FIRST AID TREATMENT: No medical treatment necessary.

2. ANTIMONY

EFFECTS OF EXPOSURE: May cause irritation to skin/contact dermatitis. Inhalation can cause inflammation of the upper & lower respiratory tracts. Chronic poisoning symptoms are dryness of throat, nausea, headaches, sleeplessness, loss of appetite and dizziness. In acute severe poisoning there may be death from circulatory or respiratory failure or toxic hepatitis.

EMERGENCY & FIRST AID TREATMENT: Remove from exposure and have biological monitoring under direction of a physician.

3. BERYLLIUM

EFFECTS OF EXPOSURE: Enters the body almost entirely by inhalation and can cause systemic disease of long duration. Symptoms are weakness, easy fatigue and weight loss.

EMERGENCY & FIRST AID TREATMENT: Remove from exposure. On overexposure obtain prompt medical care by a physician.

4. CADMIUM

EFFECTS OF EXPOSURE: Inhalation may lead to chemical pneumonititis and in severe cases pulmonary edema. Symptoms are influenza-like similar to metal-fume fever and generally occur within an 8 hour period. In severe cases death can occur after 4 to 7 days. It should be stressed that cadmium induced kidney damage is irreversible.

EMERGENCY & FIRST AID TREATMENT: Remove from exposure and give oxygen therapy if necessary. Obtain prompt medical care.

5. CARBON

EFFECTS OF EXPOSURE: Low health risk by inhalation.

EMERGENCY & FIRST AID TREATMENT: No medical treatment necessary in its pure form.

6. CHROMIUM

EFFECTS OF EXPOSURE: Can cause skin and mucous membrane irritation, dermatitis and chrome ulceration.

EMERGENCY & FIRST AID TREATMENT: Wash skin thoroughly after contact. Obtain medical care for chrome ulceration.

7. COBALT

EFFECTS & EXPOSURE: Inhalation of fume will produce systemic poisoning with myocardial disorders and irritant effects on the airways, eyes and digestive tract. Symptoms range from shortness of breath to coughing.

EMERGENCY & FIRST AID TREATMENT: No antidote exists. Monitoring by a physician with particular attention to the cardiovascular system advisable.

8. COPPER

EFFECTS & EXPOSURE: Fumes can cause nausea, gastric pain, diarrhea and irritation to the upper respiratory tract. Symptoms are often a metallic taste.

EMERGENCY & FIRST AID TREATMENT: Remove from exposure.

9. IRON

EFFECTS OF EXPOSURE: Inhalation of oxide or dust can result in siderosis which causes a shortness of breath and coughing tendencies.

EMERGENCY & FIRST AID TREATMENT: Remove from exposure & obtain medical attention.

10. LEAD

EFFECTS & EXPOSURE: Short term exposure symptoms may include stomach cramps, persistent vomiting, sévere anemia, peipheral neuropathy and acute encephalopathy followed by coma, cardiorespiratory arrest and death. Long term exposure symptoms are the above with a metallic taste in mouth. Weakness of extensor muscles of the wrist & ankles is noticeable in serious cases.

EMERGENCY & FIRST AID TREATMENT: No immediate first aid is generally necessary. Biological monitoring under the direction of a physician is required in accordance with OSHA regulations.

11. MAGNESIUM

EFFECTS OF EXPOSURE: Heavy exposure to fume may be irritating to eyes, nose & throat. Can cause metal-fume fever.

EMERGENCY & FIRST AID TREATMENT: Eye wash station facilities should be used immediately. No contact lenses should be worn in this area.

12. MANGANESE

EFFECTS OF EXPOSURE: Moderately toxic. May cause nose to bleed. Irritation to the throat and skin. Prolonged exposure can effect the central nervous system.

EMERGENCY & FIRST AID TREATMENT: On irritation wash thoroughly. On ingestion induce vomiting. Obtain medical attention.

13. NICKEL

EFFECTS & EXPOSURE: Often causes allergic dermatitis. Inhalation can cause hypertrophic rhinitis and nasal sinusitis. In extreme cases it is suspected of causing cancer of the nasal cavities, lungs and other organ.

EMERGENCY & FIRST AID TREATMENT: Annual medical monitoring by a physician is recommended in areas where concentrations are greater than 15 UGNI/M3 TWA for a 40 hour work week.

14. PHOSPHOROUS

EFFECTS & EXPOSURE: Inhalation may cause osteomyelitis of the jaw bone. Skin contact by burning phosphorous slivers will cause severe burns.

EMERGENCY & FIRST AID TREATMENT: Douse burning slivers with a 1-5% solution of aquerous copper sulphate. Then remove slivers with large quantities of water. Medical advise need be sought in cases of osteomyelitis.

15. SILICON

EFFECTS & EXPOSURE: In a cold state silicon is not dangerous.

EMERGENCY & FIRST AID TREATMENT: None Necessary

16. SILVER

EFFECTS & EXPOSURE: Localized argyria is caused by silver particles on the skin. Except for a bluish cosmetic disfigurement it is generally considered benign.

EMERGENCY & FIRST AID TREATMENT: None Necessary

17. TIN

EFFECTS & EXPOSURE: Tin powder is moderately irritant to the eyes and airways.

EMERGENCY & FIRST AID TREATMENT: Remove from exposure.

18. ZINC

EFFECTS & EXPOSURE: Exposure to zinc oxide fume can cause metal-fume fever. Symptoms resemble influenza w/chills & nausea.

EMERGENCY & FIRST AID TREATMENT: Usually lasts less than 24 hours with no known treatment or lasting ill effects.

THE ABOVE INFORMATION IS PROVIDED FOR THE SOLE PURPOSE OF COMPLYING WITH THE U.S. OSHA HAZARD COMMUNICATION STANDARD, 19 CFR 1910.1200. THE INFORMATION IS GIVEN IN GOOD FAITH AND IS BELIEVED TO BE CORRECT, BUT WITHOUT GUARANTEE. WE DO NOT ASSSUME RESPONSIBILITY FOR THE RESULTS OF ITS USE.

SOME OF THE SOURCES YOU MAY WISH TO CONSULT:

"Handbook of Hazardous Materials" (2nd Edition . . . Alliance of American Insurers

"Encyclopedia of Occupational Health & Safety" (Vol I & II) International Labor Office

"Threshold Limit Values For Chemical Substances In Work Environment" . . . ACGIH

"Metals Handbook" . . . Properties of Metal (8th Ed. Vol I) . . . American Society for Metals

"Standards Handbook" (Part 7) . . . Copper Development Association Inc.

MATERIAL SAFETY DATA SHEET (MSDS)

This MSDS should be attached or kept with the respective product with which it is associated.

MATERIAL SAFETY DATA SHEET 7S331
PC'Y - TEMP TM 4X227
T THREAD SEAL TAPE 4X543,5X584
STOCK #(s):16030,16035,16050

SECTION I - PRODUCT IDENTIFICATION
MANUFACTURE: ANTI-SEIZE TECHNOLOGY
2345 N. 17th. Ave.
FRANKLIN PARK, IL. 60131
EMERGENCY TELEPHONE #: 708-455-2300
CHEMICAL FAMILY: POLYTETRAFLUOROETHANE
D.O.T. SHIPPING CLASS: NOT HAZARDOUS

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENT (CAS #)	OSHA PEL	TLV	SARA III	PROP 65	PERCENT
POLYTETRAFLUROETHANE (9002-84-0)	NOT ESTABLISHED	NO	NO		100

"TEFLON" (DuPONT TRADEMARK)

SECTION III - PHYSICAL PROPERTIES
BOILING POINT: DOES NOT APPLY
SOLUBILITY IN WATER: NONE
MELTING POINT: OVER 500 F
REACTIVITY IN WATER: NONE
VAPOR PRESSURE: 0
SPECIFIC GRAVITY: NO DATA
EVAPORATION RATE: 0
PERCENT VOLATILE: 0
APPEARANCE AND ODOR: WHITE PLASTIC LIKE TAPE

SECTION IV - FIRE AND EXPLOSION DATA
FLASH POINT AND METHOD USED: DOES NOT APPLY. DOES NOT BURN
FLAMMABLE LIMITS: LEL: NO DATA UEL: NO DATA
EXTINGUISHING MEDIA: FOAM, CO2, DRY CHEMICAL
SPECIAL FIRE FIGHTING PROCEDURES: MAY EMIT TOXIC FUMES IN A FIRE. DOES NOT BURN WITHOUT AN EXTERNAL SOURCE OF FUEL. WEAR A " N.I.O.S.H." APPROVED ORGANIC VAPOR RESPIRATOR.
UNUSUAL FIRE AND EXPLOSION HAZARDS: DENSE SMOKE AND NOXIOUS OR TOXIC FUMES MAY BE GENERATED IN A FIRE. FIRE FIGHTERS SHOULD WEAR A SELF CONTAINED BREATHING APPARATUS.

SECTION V- PHYSICAL HAZARDS
STABILITY: (X) STABLE ( ) UNSTABLE
CONDITIONS TO AVOID: TEMPERATURE OVER 500F
INCOMPATIBILITY,(MATERIALS TO AVOID): ALKALI METALS, INTERHALOGEN COMPOUNDS.
HAZARDOUS DECOMPOSITION PRODUCTS: IF THE SERVICE TEMPERATURE EXCEEDS 750 F. THEN "TEFLON" WILL BEGIN TO UNDERGO THERMAL DECOMPOSITION. AT THESE TEMPERATURES "TEFLON" CAN EMIT ACUTELY TOXIC VAPORS. THESE VAPORS CAN INCLUDE HEXAFLUOROPROPYLENE, PERFLUOROISOBUTYLENE AND CARBONYL FLUORIDE.
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

SECTION VI - HEALTH HAZARDS AND FIRST AID
ROUTES OF ENTRY: ____ SKIN _____ EYES _____ INHALATION
____ INGESTION
HEALTH HAZARDS: "TEFLON" IS RELATIVELY NON-TOXIC. THE PRIMARY HAZARD ASSOCIATED WITH "TEFLON" IS EXTREMELY HIGH TEMPERATURE THERMAL DECOMPOSITION BYPRODUCTS. DO NOT USE PRODUCT IN APPLICATIONS WHERE THE TEMPERATURE IS EXPECTED TO EXCEED 550F. IF TOBACCO PRODUCTS ARE CONTAMINATED WITH "TEFLON" THEN A CONDITION KNOWN AS "POLYMER FUME FEVER" CAN OCCUR. THE EFFECTS ARE REVERSIBLE.
EMERGENCY FIRST AID PROCEDURES
SKIN: WASH WITH SOAP AND WATER
EYES: UNLIKELY
INGESTION: IF INGESTED THIS PRODUCT IS NOT EXPECTED TO CAUSE AN ACUTE REACTION. CALL A POISON CONTROL CENTER OR A PHYSICIAN.
INHALATION: NOT LIKELY UNDER NORMAL CONDITIONS OF USE. IF USING IN HIGH TEMPERATURE APPLICATIONS WHERE THERMAL DECOMPOSITION IS LIKELY, USE A LOCAL EXHAUST TO REMOVE FUMES. IF DIZZINESS OR IRRITATION OCCURS, SEEK FRESH AIR.
CHEMICAL(S) LISTED AS CARCINOGENS
NTP ?: NO I.A.R.C. ? : NO OSHA ? : NO

SECTION VII - SPECIAL PRECAUTIONS AND SPILL PROCEDURES
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: NONE REASONABLY FORESEEN.
OTHER PRECAUTIONS: KEEP AWAY FROM CHILDREN.
SPILL/LEAKAGE PROCEDURES: DOES NOT APPLY
WASTE DISPOSAL: DISPOSE OF IN A RESPONSIBLE MANNER. FOLLOW LOCAL, STATE AND FEDERAL GUIDELINES. INCINERATION IS THE PREFERRED METHOD OF DISPOSAL, ALTHOUGH IT MAY BE LANDFILLED AT AN APPROVED FACILITY.

SECTION VIII - SPECIAL PROTECTION INFORMATION
RESPIRATORY PROTECTION: NORMALLY NOT REQUIRED. IF THIS PRODUCT IS BEING USED IN HIGH TEMPERATURE APPLICATIONS WHERE THE PRODUCT "SMOKES" USE A LOCAL EXHAUST OR VENTILATE THE AREA TO MAINTAIN THE AIR QUALITY. A "N.I.O.S.H." APPROVED ORGANIC VAPOR RESPIRATOR IS ALSO ACCEPTABLE.
PROTECTIVE GLOVES: NOT REQUIRED.
EYE PROTECTION: NOT REQUIRED.
WORK/HYGIENIC PRACTICES: USE GOOD STANDARD PRACTICES WHEN USING THIS MATERIAL. DO NOT SMOKE WHILE USING.

SECTION IX - DISCLAIMER
THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THE DATA OR THE RESULTS OBTAINED FROM THE USE OF THIS PRODUCT. THEREFORE, BECAUSE THE PRODUCT MAY BE USED UNDER CONDITIONS BEYOND OUR CONTROL, WE ASSUME NO LIABILITY FOR ITS USE.

DATE PREPARED:11/12/93

M A T E R I A L S A F E T Y D A T A S H E E T

SECTION I

Astro Chemical Company, Inc.
Mill Road, P.O. Box 200
Ballston Lake, New York 12019-0200
Information: (518) 399-5338 or CHEMTREC: (800) 424-9300
EFFECTIVE DATE: 01/24/95 PREPARED BY: Astro Chemical Company MSDS Dept
PRODUCT NAME: Astro 2530
HMIS: Health - 2, Fire - 1, Reactivity - 0
FORMULA OR CHEMICAL NAME: Modified Epoxy Resin Material

SECTION II HAZARDOUS INGREDIENTS OF MIXTURES

PRINCIPAL HAZARDOUS COMPONENT(S)	CAS No.	Wt.%	ACGIH TLV	OSHA PEL
Epichlorohydrin - BisA Epoxy Resin	25068-38-6	77	N/E	N/E
Boron Triflouride Monoethylamine	75-23-3	03	1 ppm	1 ppm
Silica	14808-60-7	20	.1 mg/m3	.1 mg/M3

N/E = None Established N/A = Not Applicable, N/D = Not Detaimined

SECTION III PHYSICAL DATA

INITIAL BOILING RANGE: > 400'F
VAPOR PRESSURE: .03 mmHg @ 77'C
VAPOR DENSITY: N/A
SOLUBILITY IN WATER: Negligible
SPECIFIC GRAVITY: 1.2
VOLATILE BY WEIGHT: N/A
EVAPORATION RATE: N/A
APPEARANCE AND ODOR: Grey-opaque semi paste, negligible odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT & METHOD: 480 OF (PMCC) FLAMMABLE LIMITS:
LEL: NIE UEL: N/E
EXTINGUISHING MEDIA: Water fog, foam, carbon dioxide, or dry chemical.
SPECIAL FIRE FIGHTING PROCEDURES: Do not breath vapors.
UNUSUAL FIRE AND EXPLOSION PROCEDURES: Closed containers could rupture under extreme heat conditions.

SECTION V HEALTH HAZARD DATA

PRIMARY ROUTE OF ENTRY: Skin contact, eye contact
TOXICITY: Oral LD50: Rats >11.4 g/kg, Dermal LD50: Rabbits >20 ml/kg, Inhalation LC50: No deaths in Sat'd air, 8 HR.
EFFECTS OF ACUTE OVEREXPOSURE:
- INHALATION: Sensitization of the respiratory tract not likely unless material is heated to high or combustion temperatures.
- INGESTION: Low acute oral toxicity.
- SKIN CONTACT: May cause dermatitis, skin sensitization.
- EYE CONTACT: Moderate to severe irritation. No corneal injury likely.

EMERGENCY AND FIRST AID PROCEDURES:
- INHALATION: Remove to fresh air. Consult a physician.
- INGESTION: Do not induce vomiting. Consult a physician.
- SKIN CONTACT: Wash immediately with soap and water. If irritation occurs, get medical attention.
- EYE CONTACT: Flush eyes with plenty of water for 15 minutes while holding eyelids open. Get medical attention.

CARCINOGENICITY: No components of this product are reported carcinogens by NTP, IARC, or OSHA.

SECTION VI REACTIVITY DATA

ABILITY: Stable
NCOMPATIBILITY (Materials to Avoid): Strong oxidizing agents, strong Lewis or mineral acids, bases, and amines.
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, various aldehydes and other irritating products.
HAZARDOUS POLYMERIZATION: Will not occur by itself, but masses of more than one (1) pound of product plus an elevated temperature (>170'F) will cause irreversible polymerization with considerable heat buildup.
CONDITIONS TO AVOID: Elevated temperatures, contamination with; acids, bases, and strong oxidizers.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN WHEN MATERIAL -TS RELEASED OR SPILLED: Scrape up excess and wash area with soap and water.
WASTE DISPOSAL: COMPLY WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS when disposing of waste material.

SECTION VIII SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Use NIOSH/MSHA approved respirator suitable for organic vapors when appropriate.
VENTILATION: Good room ventilation usually adequate for most operations

LOCAL EXHAUST: Preferred	SPECIAL: None
MECHANICAL: None	OTHER: None

OTECTIVE GLOVES: Impervious
E PROTECTION: Chemical splash goggles
THER PROTECTIVE EQU-TPMENT: As required to prevent personal contact. An emergency eye wash station should be available for use.

SECTION IX SPECIAL PRECAUTIONS

HANDLING AND STORAGE PRECAUTIONS: Store in a ventilated area at less than 100'F. Keep away from open flames and high temperatures. Practice good caution and personal cleanliness to avoid skin and eye contact. Avoid breathing vapors of heated material. Keep containers closed when not in use.
OTHER PRECAUTIONS: Wash with soap and water after handling.

SECTION X GOVERNMENTAL INFORMATION

STATE R-TGHT-TO-KNOW INFORMATION: This product does not contain any STATE-R-T-K chemicals.
SARA TITLE -III SECTION 313 -INFORMATION: This product does not contain any Sara Title 313 chemicals.

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET

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Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME: Astro Chemical Co. Inc.	EMERGENCY TELEPHONE NO.: 518-399-5338
ADDRESS (Number, Street, City, State, and ZIP Code): 3 Mill Road, Box 200, Ballston Lake, New York 12019	
CHEMICAL NAME AND SYNONYMS: Epoxy Resin W/amido-amine	TRADE NAME AND SYNONYMS: Astro Special 3104
CHEMICAL FAMILY: Epoxide	FORMULA: 3104 A&B

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST	33		ALLOYS		
VEHICLE	67		METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)		SPECIFIC GRAVITY (H_2O=1)	1.1
VAPOR PRESSURE (mm Hg.)		PERCENT, VOLATILE BY VOLUME (%)	
VAPOR DENSITY (AIR=1)		EVAPORATION RATE (_____ =1)	
SOLUBILITY IN WATER	partial		

APPEARANCE AND ODOR: clear/reddish liquid - amonical odor

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used): 450 ° F COC		FLAMMABLE LIMITS	Lel	Uel

EXTINGUISHING MEDIA: CO_2, foam, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS: none

(Continued on reverse side)

3104 A-B

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE

EFFECTS OF OVEREXPOSURE
May be a skin sensitizer

EMERGENCY AND FIRST AID PROCEDURES
Wash contacted areas with soap and water immediately. Do not wear contaminated clothing.

SECTION VI - REACTIVITY DATA

STABILITY			CONDITIONS TO AVOID
	UNSTABLE		
	STABLE	X	

INCOMPATABILITY *(Materials to avoid)*

HAZARDOUS DECOMPOSITION PRODUCTS
CO, CO_2

HAZARDOUS POLYMERIZATION			CONDITIONS TO AVOID
	MAY OCCUR		
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Soak up and discard in approved manner.

WASTE DISPOSAL METHOD
Bury or incinerate.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)* Air mask if in confined area.

VENTILATION			
	LOCAL EXHAUST	Preferable	SPECIAL
	MECHANICAL *(General)*	Acceptable	OTHER

PROTECTIVE GLOVES	EYE PROTECTION
Yes	Safety glasses or goggles

OTHER PROTECTIVE EQUIPMENT

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Avoid contact with skin and clothing

OTHER PRECAUTIONS

GPO 932-540

Form OSHA-2
Rev. May 72

MATERIAL SAFETY DATA SHEET

SECTION I

Astro Chemical Company, Inc.
3 Mill Road, P.O. Box 200
Ballston Lake, New York 12019-0200
Information: (518) 399-5338 or CHEMTREC: (800) 424-9300

EFFECTIVE DATE: 03/25/93 *PREPARED BY:* Astro Chemical Company - MSDS Dept.
PRODUCT NAME: Astro 3366 (Part A), (G.E. Spec. A50A403 Pt 1)
FORMULA OR CHEMICAL NAME: Epoxy/Ketone Solution
NFPA CODES: Health - 1, Flammability - 3, Reactivity - 0

SECTION II HAZARDOUS INGREDIENTS OF MIXTURES

PRINCIPAL HAZARDOUS COMPONENT(s)	CAS No.	%(Wt.)	ACGIH TLV	OSHA PEL
Catechol	120-80-9	T	N/E	N/E
Novalac	9003-35-4	37	N/E	N/E
Methyl Ethyl Ketone	78-93-3	48	200 PPM	200 PPM
Graphite	7782-42-5	T	N/E	N/E

N/E - None Established, N/A - Not Applicable, T - Trade secret

SECTION III PHYSICAL DATA

INITIAL BOILING POINT: 175°F
VAPOR PRESSURE: 70 mmHg @ 68°F
VAPOR DENSITY: 2.5 (Air=1)
SPECIFIC GRAVITY: 1.18
VOLATILE BY WEIGHT: 46%
EVAPORATION RATE: 5.7 (Butyl Acetate=1)
SOLUBILITY IN WATER: Very slight
APPEARANCE AND ODOR: Black liquid with ketone odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT & METHOD: 23°F TCC
FLAMMABLE LIMITS: 70°C
LEL: 2.0% *UEL:* Unknown
EXTINGUISHING MEDIA: Alcohol foam, carbon dioxide, or dry chemical.
SPECIAL FIRE FIGHTING PROCEDURES: Self contained breathing apparatus with a full facepiece operated in pressure-demand or other positive pressure mode.
UNUSUAL FIRE AND EXPLOSION PROCEDURES: Vapors are heavier than air and may travel along the ground or may be moved by ventilation and ignited by pilot lights, other flames, sparks, heaters, smoking, electric motors, or other ignition sources at location distant from material handling point. Material is highly volatile.

SECTION V HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: 200 PPM *PERMISSIBLE EXPOSURE LIMIT:* 200 PPM
EFFECTS OF OVEREXPOSURE:
INHALATION: Excessive inhalation of vapors can cause nasal and respiratory irritation, dizziness, weakness, fatigue, nausea, headache, possible unconsciousness, and even asphyxiation.
INGESTION: Can cause gastrointestinal irritation, nausea, vomiting, diarrhea.
SKIN CONTACT: Prolonged or repeated contact can cause moderate irritation, defatting, dermatitis.
EYE CONTACT: Can cause severe irritation, redness, tearing, blurred vision.
EMERGENCY AND FIRST AID PROCEDURES:
INHALATION: If affected, remove individual to fresh air. If breathing is difficult, administer oxygen. If breathing has stopped give artificial respiration. Keep person warm, quiet and get medical attention.

INGESTION: Do Not induce vomiting, keep person warm, quiet and GET MEDICAL ATTENTION. Aspiration of this material into the lungs due to vomiting can cause chemical pneumonitis which can be fatal.
SKIN CONTACT: Thoroughly wash exposed area with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse.
EYE CONTACT: Flush with large amounts of water, lifting upper and lower lids occasionally, GET MEDICAL ATTENTION.

This product does not contain any ingredient designated by IARC, NTP, ACGIH or OSHA as a probable human carcinogen.

----------SECTION VI REACTIVITY DATA----------

STABILITY: Stable
INCOMPATIBILITY (Materials to Avoid): Avoid contact with strong oxidizing agents (E.G. Nitric acid, Permanganates)
HAZARDOUS DECOMPOSITION PRODUCTS: May form toxic materials:, Carbon Dioxide and Carbon Monoxide, various Hydrocarbons, etc.
HAZARDOUS POLYMERIZATION: Cannot occur.
CONDITIONS TO AVOID: Keep away from pilot lights, other flames, sparks, heaters smoking, electric motors etc.

----------SECTION VII SPILL OR LEAK PROCEDURES----------

STEPS TO BE TAKEN WHEN MATERIAL IS RELEASED OR SPILLED: Absorb liquid on paper, vermiculite, floor absorbent, or other absorbent material and transfer to hood.
LIQUID SPILL PROCEDURE: Same.
WASTE DISPOSAL: COMPLY WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS. Allow volatile material to evaporate in hood. Allow sufficient time for vapors to completely clear hood duct work. Destroy remaining material by burning in an iron pan.

----------SECTION VIII SPECIAL PROTECTION INFORMATION----------

RESPIRATORY PROTECTION: If TLV of the product or any component is exceeded, a NIOSH/MESA jointly approved self-contained breathing apparatus with a full face piece operated in a pressure demand or other positive pressure mode is advised. However, OSHA regulations also permit other NIOSH/MESA respirators under specified conditions.
VENTILATION: Provide sufficient ventilation to maintain exposure below TLV(s).
LOCAL EXHAUST: As required to meet TLV(s) SPECIAL: As required to meet TLV(s)
OTHER: As required to meet TLV(s) MECHANICAL: As required to meet TLV(s)
PROTECTIVE GLOVES: Wear resistant gloves such as: natural rubber, neoprene.
EYE PROTECTION: Chemical splash goggles in compliance with OSHA regulations are advised. However, Osha regulations also permit other types of safety glasses.
OTHER PROTECTIVE EQUIPMENT: As required to prevent personal contact.

----------SECTION IX SPECIAL PRECAUTIONS----------

HANDLING AND STORAGE PRECAUTIONS: Containers of this material may be hazardous when emptied. Since emptied containers retain product residues, all hazard precautions given in this data sheet must be observed.
OTHER PRECAUTIONS: None

----------SECTION X GOVERNMENTAL INFORMATION----------

STATE RIGHT-TO-KNOW INFORMATION: This product contains Catechol (CAS# 120-80-9), which is listed on the following states lists: CT,FL,IL,LA,MA,NJ,PA,and RI.
SARA TITLE III SECTION 313 INFORMATION: This product contains Catechol (CAS# 120-80-9) and Methyl Ethyl Ketone (CAS# 78-93-3) which are reportable under SARA Title III.

MATERIAL SAFETY DATA SHEET

SECTION I

Astro Chemical Company, Inc.
3 Mill Road, P.O. Box 200
Ballston Lake, New York 12019-0200
Information: (518) 399-5338 or CHEMTREC: (800) 424-9300

EFFECTIVE DATE: 03/26/93 *PREPARED BY:* Astro Chemical Company - MSDS Dept.
PRODUCT NAME: Astro 3366 Part B (G.E. Spec. A50A403 Part 2)
FORMULA OR CHEMICAL NAME: Titanate/Ketone Solution
NFPA CODES: Health - 1, Flammability - 3, Reactivity - 0

SECTION II HAZARDOUS INGREDIENTS OF MIXTURES

PRINCIPAL HAZARDOUS COMPONENT(s)	CAS No.	%(Wt.)	ACGIH TLV	OSHA PEL
Octylene glycol titanate	5575-43-9	25-40	N/E	N/E
Methyl Ethyl Ketone	78-93-3	60-75	200 PPM	200 PPM

N/E - None Established, N/A - Not Applicable

SECTION III PHYSICAL DATA

INITIAL BOILING POINT: 175°F
VAPOR PRESSURE: 70 mmHg @ 20°C
VAPOR DENSITY: 2.5 (Air=1)
SOLUBILITY IN WATER: Very slight.
APPEARANCE AND ODOR: Clear liquid with ketone odor.
SPECIFIC GRAVITY: .84
VOLATILE BY WEIGHT: 88%
EVAPORATION RATE: 5.7 (Butyl Acetate=1)

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT & METHOD: 23°F TCC
FLAMMABLE LIMITS: Most volatile
LEL: 2.0% *UEL:* NA
EXTINGUISHING MEDIA: Alcohol foam, carbon dioxide, or dry chemical.
SPECIAL FIRE FIGHTING PROCEDURES: Self contained breathing apparatus with a full facepiece operated in pressure-demand or other positive pressure mode.
UNUSUAL FIRE AND EXPLOSION PROCEDURES: Vapors are heavier than air and may travel along the ground or may be moved by ventilation and ignited by pilot lights, other flames, sparks, heaters, smoking, electric motors, or other ignition sources at location distant from material handling point. Material is highly volatile and readily gives off vapors.

SECTION V HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: 200 PPM *OSHA STEL:* 300 PPM
EFFECTS OF OVEREXPOSURE:
INHALATION: Excessive inhalation of vapors can cause nasal and respiratory irritation, dizziness, weakness, fatigue, nausea, headache, possible unconsciousness, and even asphyxiation.
INGESTION: Can cause gastrointestinal irritation, nausea, vomiting, diarrhea.
SKIN CONTACT: Prolonged or repeated contact can cause moderate irritation, defatting, dermatitis.
EYE CONTACT: Can cause severe irritation, redness, tearing, blurred vision.
EMERGENCY AND FIRST AID PROCEDURES:
INHALATION: If affected, remove individual to fresh air. If breathing is difficult, administer oxygen. If breathing has stopped give artificial respiration. Keep person warm, quiet and get medical attention.
INGESTION: Do Not induce vomiting, keep person warm, quiet and GET MEDICAL ATTENTION. Aspiration of this material into the lungs due to vomiting can cause chemical pneumonitis which can be fatal.
SKIN CONTACT: Thoroughly wash exposed area with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse.

EYE CONTACT: Flush with large amounts of water, lifting upper and lower lids occasionally, get medical attention.

This product does not contain any ingredient designated by IARC, NTP, ACGIH, or OSHA as a probable human carcinogen.

SECTION VI REACTIVITY DATA

STABILITY: Stable
INCOMPATIBILITY (Materials to Avoid): Avoid contact with strong oxidizing agents.
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon dioxide, phenolic compounds, acids and other hydrocarbons.
HAZARDOUS POLYMERIZATION: Not likely.
CONDITIONS TO AVOID: Keep away from pilot lights, other flames, sparks, heaters smoking, electric motors etc.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN WHEN MATERIAL IS RELEASED OR SPILLED: Absorb liquid on paper, vermiculite, floor absorbent, or other absorbent material and transfer to hood.
LIQUID SPILL PROCEDURE: Same.
WASTE DISPOSAL: COMPLY WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS. Allow volatile material to evaporate in hood. Allow sufficient time for vapors to completely clear hood duct work. Destroy remaining material by burning in an iron pan.

SECTION VIII SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: If TLV of the product or any component is exceeded, a NIOSH/MESA jointly approved self-contained breathing apparatus with a full face piece operated in a pressure demand or other positive pressure mode is advised.
VENTILATION: Provide sufficient ventilation to maintain exposure below TLV(s).
LOCAL EXHAUST: As required to meet TLV(s) SPECIAL: As required to meet TLV(s)
OTHER: As required to meet TLV(s) MECHANICAL: As required to meet TLV(s)
PROTECTIVE GLOVES: Wear resistant gloves such as: natural rubber, neoprene.
EYE PROTECTION: Chemical splash goggles in compliance with OSHA regulations are advised.
OTHER PROTECTIVE EQUIPMENT: As required to prevent personal contact.

SECTION IX SPECIAL PRECAUTIONS

HANDLING AND STORAGE PRECAUTIONS: Containers of this material may be hazardous when emptied. Since emptied containers retain product residues, all hazard precautions given in this data sheet must be observed. Materials should be stored away from sources of ignition.
OTHER PRECAUTIONS: Avoid contact with eyes and skin and clothing. Wash thoroughly after use.

SECTION X GOVERNMENTAL INFORMATION

STATE RIGHT-TO-KNOW INFORMATION: No information has been established for this product.
SARA TITLE III SECTION 313 INFORMATION: This product contains Methyl Ethyl Ketone (CAS# 78-93-3) which is a reportable chemical.

M A T E R I A L S A F E T Y D A T A *S H E E T*

SECTION I

Astro Chemical Company, Inc.
3 Mill Road, P.O. Box 200
llston Lake, New York 12019-0200
formation: (518) 399-5338 or CHEMTREC: (800) 424-9300
FECTIVE DATE: 08/04/94 PREPARED BY: Astro Chemical Company - MSDS Dept
PRODUCT NAME: Astro 3376 (Part 1), GE Spec. - 61686-3 Part 1
HMIS: Health - 2, Fire -1, Reactivity - 0
FORMULA OR CHEMICAL NAME: Bisphenol A/Epichlorohydrin Based Epoxy Resin

SECTION II HAZARDOUS INGREDIENTS OF MIXTURES

PRINCIPAL HAZARDOUS COMPONENT(S)	CAS No.	Wt. %	ACGIH TLV	OSHA PEL
BisA/epichlorohydrin Epoxy Resin	25068-38-6	100	N/E	N/E

N/E = None Established N/A = Not Applicable, N/D = Not Determined

SECTION III PHYSICAL DATA

INITIAL BOILING RANGE: > 400'F
SPECIFIC GRAVITY: 1.17
VAPOR PRESSURE: .03 mmHg @ 77'C
VOLATILE BY WEIGHT: N/A
VAPOR DENSITY: N/A
EVAPORATION RATE: N/A
SOLUBILITY IN WATER: Negligible
APPEARANCE AND ODOR: Straw colored liquid with no significant odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT & METHOD: 480'F (PMCC)
FLAMMABLE LIMITS:
LEL: N/E UEL: N/E
TINGUISHING MEDIA: Water fog, foam, carbon dioxide, dry chemical.
ECIAL FIRE FIGHTING PROCEDURES: Do not breath vapors.
UNUSUAL FIRE AND EXPLOSION PROCEDURES: Closed containers could rupture under extreme heat conditions.

SECTION V HEALTH HAZARD DATA

ACUTE TOXICITY DATA: Oral LDSO - 11.4 g/kg (RAT), Dermal LD50 - >20 ml/kg (RBT), INHALATION LC50 - No deaths in Sat'd air, 8 HR.
PRIMARY ROUTE OF ENTRY: Skin Contact
EFFECTS OF OVEREXPOSURE:
- INHALATION: Sensitization of the respiratory tract not likely unless resin is heated to high or combustion temperatures.
- INGESTION: Low acute oral toxicity.
- SKIN CONTACT: May cause dermatitis, skin sensitization.
- EYE CONTACT: Moderate to severe irritation. No corneal injury likely.

EMERGENCY AND FIRST AID PROCEDURES:
- INHALATION: Remove to fresh air. Consult a physician if necessary.
- INGESTION: Do not induce vomiting. Consult physician.
- SKIN CONTACT: Wash immediately with soap and water. If irritation occurs consult a physician.
- EYE CONTACT: Flush with plenty of water for 15 minutes while holding eyelids open. Get medical attention.

CARCINOGENICITY: No components of this product are reported carcinogens by NTP, IARC, or OSHA.

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SECTION VI REACTIVITY DATA

ABILITY: Stable
COMPATIBILITY (Materials to Avoid): Acids, bases, and amines.
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, various aldehydes and irritating products.
HAZARDOUS POLYMERIZATION: Will not occur by itself, but masses of more than one (1) pound of product plus an aliphatic amine will cause irreversible polymerization with considerable heat buildup.
CONDITIONS TO AVOID: Acids, bases, and oxidizers

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN WHEN MATERIAL IS RELEASED OR SPILLED: Scrape up excess and wash area with soap and water.
WASTE DISPOSAL: COMPLY WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS when disposing of waste material.

SECTION VIII SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Use NIOSH/MSHA approved respirator suitable for organic vapors, if required.
VENTILATION: Good room ventilation usually adequate for most operations
LOCAL EXHAUST: Preferred
MECHANICAL: None
SPECIAL: None
OTHER: None
PROTECTIVE GLOVES: Impervious
EYE PROTECT-TON: Chemical splash goggles
OTHER PROTECTIVE EQUIPMENT: As required to prevent personal contact.

SECTION IX SPECIAL PRECAUTIONS

HANDLING AND STORAGE PRECAUTIONS: Store in a ventilated area at less than 100'F. Practice good caution and personal cleanliness to avoid skin and eye contact. Avoid breathing vapors of heated material.
OTHER PRECAUTIONS: Wash thoroughly after use.

SECTION X GOVERNMENTAL INFORMATION

STATE RIGHT-TO-KNOW INFORMATION: This product does not contain any STATE-R-T-K chemicals.
SARA TITLE III SECTION 313 -INFORMATION: This product does not contain any Sara Title 313 chemicals.

MATERIAL SAFETY DATA SHEET

SECTION I

Astro Chemical Company, Inc.
3 Mill Road, P.O. Box 200
Ballston Lake, New York 12019-0200
Information: (518) 399-5338 or CHEMTREC: (800) 424-9300

EFFECTIVE DATE: 02/27/95 *PREPARED BY:* Astro Chemical Company - MSDS Dept
PRODUCT NAME: Astro 6200 (Part 1), G.E. Spec. A50A225 Part 1
HMIS: Health - 2, Fire - 1, Reactivity - 0
FORMULA OR CHEMICAL NAME: Epichlorohydrin - Bisphenol A Epoxy Resin

SECTION II HAZARDOUS INGREDIENTS OF MIXTURES

PRINCIPAL HAZARDOUS COMPONENT(s)	CAS No.	Wt.%	ACGIH TLV	OSHA PEL
Epichlorohydrin - BisA Epoxy Resin	25068-38-6	<55	N/E	N/E
Silicon Dioxide	67762-90-7	<05	N/E	N/E
Silica	14808-60-7	<45	.1 mg/M^3*	.1 mg/M^3*

N/E = None Established, N/A = Not Applicable, N/D - Not Determined, * = Respirable Dust

SECTION III PHYSICAL DATA

INITIAL BOILING RANGE: > 500°F
VAPOR PRESSURE: .03 mmHg @ 77 °C
VAPOR DENSITY: N/A
SOLUBILITY IN WATER: Negligible
SPECIFIC GRAVITY: N/D
VOLATILE BY WEIGHT: N/A
EVAPORATION RATE: N/A
APPEARANCE AND ODOR: Greyish Paste with no significant odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT & METHOD: 480 °F (PMCC)
FLAMMABLE LIMITS:
LEL: N/E *UEL:* N/E
EXTINGUISHING MEDIA: Water fog, foam, carbon dioxide, or dry chemical.
SPECIAL FIRE FIGHTING PROCEDURES: Do not breath vapors.
UNUSUAL FIRE AND EXPLOSION PROCEDURES: Closed containers could rupture under extreme heat conditions.

SECTION V HEALTH HAZARD DATA

ACUTE TOXICITY DATA: Oral LD50: >11.4 g/kg (RAT), Dermal LD50: >20 ml/kg (RBT), Inhalation LC50: No deaths in Sat'd air, 8 HR.
PRIMARY ROUTE OF ENTRY: Skin contact.
EFFECTS OF OVEREXPOSURE:
INHALATION: Sensitization of the respiratory tract not likely unless resin is heated to high or combustion temperatures.
INGESTION: Low acute oral toxicity.
SKIN CONTACT: May cause dermatitis, skin sensitization.
EYE CONTACT: Moderate to severe irritation. No corneal injury likely.
EMERGENCY AND FIRST AID PROCEDURES:
INHALATION: Remove to fresh air. Consult a physician if breathing is difficult.
INGESTION: Do not induce vomiting. Consult a physician.
SKIN CONTACT: Remove contaminated clothing and wipe excess from skin. Flush skin with water. Follow by washing with soap and water. If irritation occurs, get medical attention.
EYE CONTACT: Flush with plenty of water while holding eyelids open. Get medical attention.
CARCINOGENICITY: This product does contain silica which has been found to be carcinogenic by NTP and IARC. However, this should only be taken into consideration when the final product is being ground or subjected to grinding action which may release the silica into the atmosphere.

SECTION VI REACTIVITY DATA

STABILITY: Stable
CONDITIONS AND MATERIALS TO AVOID: Can react vigorously with strong oxidizing agents, strong Lewis or mineral acids, and strong mineral and organic bases. Reaction with some curing agents may produce considerable heat.
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, various aldehydes, acids, and other organic substances may be formed during combustion or elevated temperature degradation (>500°F).
HAZARDOUS POLYMERIZATION: Will not occur by itself, but masses of more than one (1) pound of product plus an aliphatic amine will cause irreversible polymerization with considerable heat buildup.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN WHEN MATERIAL IS RELEASED OR SPILLED: Scrape up excess and wash area with soap and water.
WASTE DISPOSAL: COMPLY WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS when disposing of waste material.

SECTION VIII SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Not ordinarily required. When necessary use a NIOSH approved respirator for organic vapors and dusts.
VENTILATION: Good room ventilation usually adequate for most operations.

LOCAL EXHAUST: Preferred	SPECIAL: None
MECHANICAL: None	OTHER: None

PROTECTIVE GLOVES: Chemical Resistant Gloves.
EYE PROTECTION: Chemical splash goggles.
OTHER PROTECTIVE EQUIPMENT: As required to prevent personal contact. An emergency eye wash station should be available for use.

SECTION IX SPECIAL PRECAUTIONS

HANDLING AND STORAGE PRECAUTIONS: Store in a cool, dry place. Keep away from open flames and high temperatures. Practice good caution and personal cleanliness to avoid skin and eye contact. Avoid prolonged or repeated contact with skin. Avoid breathing vapors of heated material.
OTHER PRECAUTIONS: Launder contaminated clothing before reuse. Avoid vapors of material when combined with a curing agent. Care should be taken when grinding the cured product.

SECTION X GOVERNMENTAL INFORMATION

STATE RIGHT-TO-KNOW INFORMATION: This product contains the following chemicals which are specifically listed by individual states:
Diglycidyl Ether (CAS#: 2238-07-5) - 2 ppm -> MA, Phenyl Glycidyl Ether (CAS#: 122-60-1) - 5 ppm -> CA65
SARA TITLE III SECTION 313 INFORMATION: This product is not subject to reporting requirements under this regulation.

MATERIAL SAFETY DATA SHEET

SECTION I

Astro Chemical Company, Inc.
3 Mill Road, P.O. Box 200
Ballston Lake, New York 12019-0200
Information: (518) 399-5338 or CHEMTREC: (800) 424-9300

EFFECTIVE DATE: 04/01/93 *PREPARED BY:* Astro Chemical Company - MSDS Dept.
PRODUCT NAME: Astro 6200 Part 2, A50A225A Part 2
FORMULA OR CHEMICAL NAME: Polyamide Mixture
HMIS: Health - 2, Fire - 1, Reactivity - 0

SECTION II HAZARDOUS INGREDIENTS OF MIXTURES

PRINCIPAL HAZARDOUS COMPONENT(s)	CAS No.	%(Wt.)	ACGIH TLV	OSHA PEL
Dimer/TOFA, Reaction products w/TETA	68082-29-1	>88	N/E	N/E
Triethylenetetramine	112-24-3	<02	N/E	N/E
Silica	112945-52-5	10	20 *mppcf**	20 *mppcf**

** - Aspirable Dust*
N/E - None Established, N/A - Not Applicable, N/D - Not Determined

SECTION III PHYSICAL DATA

INITIAL BOILING POINT: N/D
VAPOR PRESSURE: <1 @ 25°C
VAPOR DENSITY: N/D
SOLUBILITY IN WATER: Slight
SPECIFIC GRAVITY: 1.08
VOLATILE BY WEIGHT: N/A
EVAPORATION RATE: N/D
APPEARANCE AND ODOR: Amber colored viscous paste with amoniacal odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT & METHOD: 392°F PMCC
FLAMMABLE LIMITS:
LEL: N/E *UEL:* N/A
EXTINGUISHING MEDIA: Alcohol foam, Water spray, dry chemical, or Carbon Dioxide. Ignition will give rise to a Class B fire.
SPECIAL FIRE FIGHTING PROCEDURES: Toxic fumes will be evolved when this material is involved in a fire. Self-contained breathing should be available for fire fighters. Cool fire - exposed containers with water.
UNUSUAL FIRE AND EXPLOSION PROCEDURES: May generate toxic or irritating combustion products.

SECTION V HEALTH HAZARD DATA

TOXICITY: Oral LD_{50} - >2.0 g/Kg (RAT), Dermal LD_{50} - >2.0 g/Kg (RBT)
EFFECTS OF OVEREXPOSURE:
INHALATION: High concentrations of vapor can cause respiratory irritation.
INGESTION: May cause nausea unless treated promptly.
SKIN CONTACT: May cause irritation, redness and discomfort which is transient.
EYE CONTACT: May cause irritation, redness and discomfort which is transient.

EMERGENCY AND FIRST AID PROCEDURES:
INHALATION: Remove to fresh air if exposed to high concentration of vapors. Consult a physician.
INGESTION: If swallowed, call a physician immediately. Remove stomach contents by gastric suction or induce vomiting only as directed by medical personnel.
SKIN CONTACT: Wash thoroughly with water while removing contaminated clothing and shoes.GET MEDICAL ATTENTION if effects such as swelling or reddening occur.
EYE CONTACT: Flush with water for at least 15 minutes, while holding eyelids open. GET MEDICAL ATTENTION.

SECTION VI REACTIVITY DATA

STABILITY: Stable under normal storage conditions.
CONDITIONS AND MATERIALS TO AVOID: Avoid bringing into contact with strong oxidizing materials or epoxy resins under uncontrolled conditions. Avoid excessive heat.
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, carbon dioxide, oxides of nitrogen.
HAZARDOUS POLYMERIZATION: Will not occur.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN WHEN MATERIAL IS RELEASED OR SPILLED: Eliminate ignition sources. Dike spill to minimize contamination. Completely absorb with inert material (sand, vermiculite, etc.), sweep or scoop up and put in disposal container. Flush area with plenty of water; prevent washings from entering sewers and waterways.
LIQUID SPILL PROCEDURE: Same as above.
WASTE DISPOSAL: COMPLY WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS. Dispose of in a permitted waste management facility if incineration or landfill is not practicable.

SECTION VIII SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Not required under normal conditions. For emergency situations use self-contained breathing apparatus with pressure demand mode.
VENTILATION:

LOCAL EXHAUST: Recommended when appropriate to control exposure.	SPECIAL: NA
MECHANICAL: Not recommended as sole means of controlling exposure.	OTHER: NA

PROTECTIVE GLOVES: Nitrile rubber gloves.
EYE PROTECTION: Splash-proof eye goggles.
OTHER PROTECTIVE EQUIPMENT: As required to prevent personal contact

SECTION IX SPECIAL PRECAUTIONS

HANDLING AND STORAGE PRECAUTIONS: Keep away form oxidizers, heat or flames. Keep in cool, dry, ventilated storage and in closed containers. Avoid contact with skin or eyes. Avoid breathing of vapors. Handle in well ventilated work space.
OTHER PRECAUTIONS: Emergency showers and eye wash stations should be readily accessible. Adhere to work practice rules established by government regulations.

SECTION X GOVERNMENTAL INFORMATION

STATE RIGHT-TO-KNOW INFORMATION: This product does not contain any State R-T-K chemicals.
SARA TITLE III SECTION 313 INFORMATION: This product does not contain any SARA reportable chemicals.

ASTRO

MATERIAL SAFETY DATA SHEET

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SECTION I
****
tro Chemical Company, Inc. 3 Mill Road, P.O. Box 200 Ballston Lake, New York 12019-0200

Information: (518) 399-S338 or CHEMTREC: (800) 424-9300
EFFECTIVE DATE: 04/02/93 PREPARED BY: Astro Chemical Company - MSDS Dept
PRODUCT NAME: Astro 6922 Part 1, G.E. Spec. A50A535B Part 1, 74004 Buff Paint
HMIS: Health - 2, Fire - 3, Reactivity - 0
FORMULA OR CHEMICAL NAME: Epoxy Pigmented Paint

****
SECTION II HAZARDOUS INGREDIENTS OF MIXTURES
****

PRINCIPAL HAZARDOUS COMPONENT(S)	CAS No.	% Wt.	ACGIH TLV	OSHA PEL
Epoxy Resin	25036-25-3	65-70	N/E	N/E
Xylene	1330-20-7	9.1	100 PPM	100 PPM
Cellosolve	110-80-5	8.8	5 PPM	200 PPM
Methyl Isobutyl Ketone	108-10-1	8.8	50 PPM	100 PPM
N-Butanol	71-36-3	0.4	50 PPM	100 PPM
Zinc Compound	7440-66-6	1.2	15 Mg/M3	N/E
Black Iron Oxide	1317-61-9	0.3	N/E	15 PPM
Hydrated Magnesium Silicate	14807-96-6	5.7	20 PPM	N/E

N/E- Not Establishad N/A - Not Available

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SECTION III PHYSICAL DATA
****
INITIAL BOILING POINT: 241F
VAPOR PRESSURE: N/A
VAPOR DENSITY: heavier than air
SOLUBILITY IN WATER: Negligible
APPEARANCE AND ODOR: Beige Paint
SPECIFIC GRAVITY: 1.36
VOLATILE BY VOLUME: 42.8%
EVAPORATION RATE: Slower than ether

****
SECTION IV FIRE AND EXPLOSION HAZARD DATA
****
FLASH POINT & METHOD: 61F PMCC
FLAMMABLE LIMITS: Most volatile
LEL: 1.0 UEL: N/A
EXTINGUISHING MEDIA: Alcohol foam, carbon dioxide, dry chemical
SPECIAL FIRE FIGHTING PROCEDURES: Water may be ineffective, however, water may be used to cool closed containers that are exposed to heat. Fire fighting personnel should wear self-contained breathing apparatus.
UNUSUAL FIRE AND EXPLOSION PROCEDURES: Vapors are heavier than air and may travel along the ground or may be moved by ventilation and ignited by pilot lights, other flames, sparks, heaters, smoking, electric motors, or other ignition sources at location distant from material handling point.

Pressure may build up in closed containers that are exposed to heat.

****
'CTION V HEALTH HAZARD DATA
****
THRESHOLD LIMIT VALUE: See section II.
EFFECTS OF OVEREXPOSURE: INHALATION: Excessive inhalation of vapors can cause nasal and respiratory irritation, dizziness, weakness, fatigue, nausea, headache.
INGESTION: Can cause gastrointestinal irritation, nausea, vomiting, diarrhea.
SKIN CONTACT: Prolonged or repeated contact can cause moderate irritation, defatting, dermatitis.
EYE CONTACT: Can cause severe irritation, redness, tearing, blurred vision.
CARCINOGENICITY: No components of this product are reported carcinogens.
EMERGENCY AND FIRST AID PROCEDURES: INHALATION: If affected, remove individual to fresh air. If breathing is difficult, administer oxygen. If breathing has stopped give artificial respiration. Keep person warm, quiet and get medical attention.
INGESTION: DO NOT INDUCE VOMITING, keep person warm, quiet and GET MEDICAL ATTENTION. Aspiration of material into the lungs due to vomiting can cause chemical pneumonitis which can be fatal.
SKIN CONTACT: Thoroughly wash exposed area with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse.
EYE CONTACT: Flush with large amounts of water, lifting upper and lower lids occasionally, GET MEDICAL ATTENTION.

****
CTION VI REACTIVITY DATA
****
STABILITY: Normally Stable
INCOMPATIBILITY (Materials to Avoid): Avoid contact with strong acids and bases.
HAZARDOUS DECOMPOSITION PRODUCTS: Normal products of incomplete combustion.
HAZARDOUS POLYMERIZATION: Will not occur.
CONDITIONS TO AVOID: Keep away from pilot lights, other flames, sparks, heaters smoking, electric motors etc.

****
SECTION VII SPILL OR LEAK PROCEDURES
****
STEPS TO BE TAKEN WHEN MATERIAL IS RELEASED OR SPILLED: Provide adequate ventilation. Remove all possible ignition sources. Absorb and dispose into containers using non-sparking tools. Flush area with water to remove residue.
WASTE DISPOSAL: COMPLY WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS. Dispose of using an approved incineration process or in accordance with applicable regulations regarding health and pollution.

****
SECTION VIII SPECIAL PROTECTION INFORMATION
****
RESPIRATORY PROTECTION: Use NIOSH/MESA approved chemical-mechanical respirators designed to remove both particulate and vapor.
VENTILATION: Provide sufficient ventilation to maintain exposure below TLV(s).
LOCAL EXHAUST: As required to meet TLV(S) SPECIAL: As required to meet TLV(S)
OTHER: As required to meet TLV(S) MECHANICAL: As required to meet TLV(S)
PROTECTIVE GLOVES: Wear resistant gloves such as: natural rubber, neoprene.
EYE PROTECTION: Chemical splash goggles in compliance with OSHA regulations.
OTHER PROTECTIVE EQUIPMENT: As required to prevent personal contact.

****
SECTION IX SPECIAL PRECAUTIONS
****
HANDLING AND STORAGE PRECAUTIONS: Store in a cool dry place away from heat, sparks and open flame. Keep containers closed and upright to prevent leakage. Inside storage should be in a standard flammable liquid storeroom or cabinet. Do not reuse product container for any purpose.
OTHER PRECAUTIONS: None

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SECTION X GOVERNMENTAL INFORMATION
****
STATE RIGHT-TO-KNOW INFORMATION: Not Available.
SARA TITLE III SECTION 313 INFORMATION: The following chemicals are reportable under SARA Title III; Zinc Compound (CAS#:7440-66-6), Cellosolve (CAS#:110-80-5), MIBK (CAS#:108-10-1), Titanium Dioxide (CAS#:13463-67-7), Xylene (CAS#:1330-20-7)

MATERIAL SAFETY DATA SHEET

****
SECTION I
****
stro Chemical Company, Inc. 3 Mill Road, P.O. Box 200 Ballston Lake, New York 12019-0200
Information: (518) 399-5338 or CHEMTREC: (800) 424-9300
EFFECTIVE DATE: 01/17/95 PREPARED BY: Astro Chemical Company - MSDS Dept.
PRODUCT NAME: Astro 6928 Part 2, G.E. Spec. A50A535C Part 2, 74010 Hardener
FORMULA OR CHEMICAL NAME: Epoxy Curing Agent Mixture
HMIS: Health - 4, Fire - 3, Reactivity - 0

****
SECTION II HAZARDOUS INGREDIENTS OF MIXTURES
****

PRINCIPAL HAZARDOUS COMPONENT(S)	CAS No.	% wt.	ACGIH TLV	OSHA PEL
Epoxy Resin/Diethylenetriamine Adduct	68610-56-0	16	75 PPM	N/E
Propylene Glycol Monomethyl Ether	107-98-2	07	100 PPM	100 PPM
Methyl Isobutyl Ketone	108-10-1	07	50 PPM	50 PPM
Xylene	1330-20-7	06	100 PPM	100 PPM
Diethylenetriamine (DETA)	111-40-0	02	1 PPM*	1 PPM
Butanol	71-36-3	<35	50 PPM	50 PPM
Toluene	108-88-3	<35	50 PPM	100 PPM

N/E - Not Established N/A - Not Applicable, * - Skin

****
CTION III PHYSICAL DATA
****
BOILING POINT: 232F
VAPOR PRESSURE: 4.4 mmHg @ 68C
VAPOR DENSITY: 3.2
SOLUBILITY IN WATER: Partial
APPEARANCE AND ODOR: Amber liquid with ketone odor
SPECIFIC GRAVITY: .90
VOLATILE BY WEIGHT: 84
EVAPORATION RATE: N/E

****
SECTION IV FIRE AND EXPLOSION HAZARD DATA
****
FLASH POINT & METHOD: 45F (TCC) FLAMMABLE LIMITS: (LEL): 1.0% (UEL): 7.0%
EXTINGUISHING MEDIA: Alcohol foam, carbon dioxide, dry chemical, or water fog.
SPECIAL FIRE FIGHTING PROCEDURES: Self contained breathing apparatus with a full facepiece operated in pressure-demand or other positive pressure mode.
UNUSUAL FIRE AND EXPLOSION PROCEDURES: Vapors are heavier than air and may travel along the ground or may be moved by ventilation and ignited by pilot lights, other flames, sparks, heaters, smoking, electric motors, or other ignition sources at location distant from material handling point. Containers exposed to intense heat from fires should be cooled with water to prevent vapor pressure buildup which could result in container rupture.

****
SECTION V HEALTH HAZARD DATA
****
TOXICITY: Oral LD50 - 2 g/Kg (RAT), Dermal LD50 - 1.1 ml/Kg (RBT), Inhalation LC50 - >300 PPM/8Hr. (RAT).

EFFECTS OF ACUTE OVEREXPOSURE: INHALATION: Excessive inhalation of vapors can cause nasal and respiratory irritation, central nervous system effects including dizziness, weakness, fatigue, nausea, headache, and possible unconsciousness, and even death.

INGESTION: Can cause gastrointestinal irritation, nausea, vomiting, diarrhea. Aspiration of material into the lungs can cause chemical pneumonitis which can be fatal.

SKIN CONTACT: Product may be corrosive to the skin. May cause skin sensitization. Repeated contact can cause skin irritation and dermatitis.

EYE CONTACT: May be corrosive to the eyes and may cause severe damage. Liquid or vapor may cause eye irritation.

EFFECTS OF CHRONIC OVEREXPOSURE: Overexposure to this material (or its components) has been suggested as a cause of the following effects in humans: Kidney damage, cardiac sensitization. Toluene may be harmful to the human fetus based on positive test results with laboratory animals. Case studies reveal that prolonged intentional abuse of toluene during pregnancy may cause birth defects in humans.

CARCINOGENICITY: No components of this product are reported carcinogens.

PRIMARY ROUTE OF ENTRY: Inhalation, skin contact, skin absorption, eye contact.

EMERGENCY AND FIRST AID PROCEDURES: INHALATION: Remove individual to fresh air and provide oxygen if breathing is difficult. Give artificial respiration if not breathing. GET MEDICAL ATTENTION.

INGESTION: DO NOT INDUCE VOMITING. This material is an aspiration hazard. If individual is drowsy or unconscious, place on left side with the head down. Seek medical attention. If possible, do not leave individual unattended.

SKIN CONTACT: Remove contaminated clothing. Flush exposed area with large amounts of water. If skin is damaged, seek immediate medical attention. If skin is not damaged and symptoms persist, seek medical attention.

EYE CONTACT: Immediately flush with plenty of water for at least 15 minutes while holding eyelids open. Rinse continuously while on way to get medical attention.

****
SECTION VI REACTIVITY DATA
****
STABILITY: Stable

CONDITIONS AND MATERIALS TO AVOID: Avoid heat, sparks, flame and contact with strong oxidizing agents. This material reacts with water; avoid all contact with water including moist atmospheres.

HAZARDOUS DECOMPOSITION PRODUCTS: Nitrogen oxides, carbon monoxide and unidentified organic compounds may be formed during combustion.

HAZARDOUS POLYMERIZATION: Will not occur.

****
SECTION VII SPILL OR LEAK PROCEDURES
****
STEPS TO BE TAKEN WHEN MATERIAL IS RELEASED OR SPILLED: Eliminate all ignition sources. Absorb liquid on paper, vermiculite, floor absorbent, or other absorbent material and transfer to a container for proper disposal.
WASTE DISPOSAL: COMPLY WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS when disposing of waste material.

****
SECTION VIII SPECIAL PROTECTION INFORMATION
****
RESPIRATORY PROTECTION: If TLV of the product or any component is exceeded, a NIOSH/MESA jointly approved self-contained breathing apparatus with a full face piece operated in a pressure demand or other positive pressure mode is advised.
VENTILATION: Use explosion proof ventilation to maintain exposure below TLV(S)'
LOCAL EXHAUST: As required to meet TLV(S) SPECIAL: As required to meet TLV(S)
OTHER: As required to meet TLV(S) MECHANICAL: As required to meet TLV(S)
PROTECTIVE GLOVES: Wear chemical resistant gloves. (nitrile rubber)
EYE PROTECTION: Wear chemical goggles if there is potential contact with eyes.
OTHER PROTECTIVE EQUIPMENT: Avoid contact with skin and clothing. An eye wash station should be available for emergency use.

****
SECTION IX SPECIAL PRECAUTIONS
****
HANDLING AND STORAGE PRECAUTIONS: Keep liquid away from heat, sparks, and flame. Surfaces that are sufficiently hot may ignite even liquid product in the absence of sparks or flame. Extinguish pilot lights, cigarettes and turn off other sources of ignition prior to use and until all vapors are gone. Keep containers closed when not in use. Use with adequate ventilation. Empty containers may be hazardous.
OTHER PRECAUTIONS: Avoid contact with eyes, skin and clothing. Avoid breathing vapors. Wash with soap and water after use.

****
SECTION X GOVERNMENTAL INFORMATION
****
STATE RIGHT-TO-KNOW INFORMATION: The following chemicals are specifically listed by individual states;

Propylone Glycol Monomethyl Ether (CAS#:107-98-2)-CA,FL,IL,LA,MA,ME,MN,NJ PA,RI. Methyl Isobutyl Ketone (CAS#:108-10-1), Xylene (CAS#:1330-20-7), Diethylenetriamine (CAS#:111-40-0)- CA,FL,IL,MA,ME,MN,NJ,PA,RI.

SARA TITLE III SECTION 313 INFORMATION: The following chemicals are SARA reportable chemicals; N-Butanol (CAS#:71-36-3), and Toluene (CAS#:108-88-3).

MATERIAL SAFETY DATA SHEET

SECTION I

adhesive

1.30

tro Chemical Company, Inc.
Mill Road, P.O. Box 200
Ballston Lake, New York 12019-0200
Information: (518) 399-5338 or Off Hours: (518) 399-7432

EFFECTIVE DATE: 09/29/86
PRODUCT NAME: Astro RW-205 Part B
FORMULA OR CHEMICAL NAME: Organic Peroxide

SECTION II HAZARDOUS INGREDIENTS OF MIXTURES

PRINCIPAL HAZARDOUS COMPONENT(s)	CAS No.	%(Wt.)	TLV (Units)
MEK Peroxide	1338-23-4	100	.2 PPM

SECTION III PHYSICAL DATA

INITIAL BOILING POINT: NA
VAPOR PRESSURE: 0.33 mmHg
VAPOR DENSITY: Unknown
SOLUBILITY IN WATER: Insoluable
APPEARANCE AND ODOR: Light yellow liquid, mild aromatic odor

SPECIFIC GRAVITY: 1.1
VOLATILE BY WEIGHT: NA
EVAPORATION RATE: =1, NA

SECTION IV FIRE AND EXPLOSION HAZARD DATA

ASH POINT & METHOD: 130°F Setaflash
FLAMMABLE LIMITS:
LEL: Unknown UEL: Unknown
EXTINGUISHING MEDIA: Dry chemical, carbon dioxide or foam
SPECIAL FIRE FIGHTING PROCEDURES: Evacuate the area and fight fire from a safe distance.
UNUSUAL FIRE AND EXPLOSION PROCEDURES: Can decompose with force if confined during exposure to fire.

SECTION V HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: See Section II
EFFECTS OF OVEREXPOSURE:
INHALATION: Milo irritaion
INGESTION: Extremely dangerous if ingested. Could be fatal.
SKIN CONTACT: Extremely irritating
EYE CONTACT: Etremely irritaing
EMERGENCY AND FIRST AID PROCEDURES:
INHALATION: Remove to fresh air
INGESTION: Take large amounts of milk ot water and seek medical help immediately
SKIN CONTACT: Wash with mild soap and water for 15 minutes.
EYE CONTACT: Flush with clean water for 15 minutes.

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Par TA+B
adhesive

SECTION VI REACTIVITY DATA

STABILITY: Stable if stored below 100°F
INCOMPATIBILITY (Materials to Avoid): Strong oxidizing and reducing agents
HAZARDOUS DECOMPOSITION PRODUCTS: Decomposition products are flammable
HAZARDOUS POLYMERIZATION: Will not occur unless contaminated with polymerizable material.
CONDITIONS TO AVOID: Extended exposure to 100°F or higher temperatures may lead to rapid decomposition with burning

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN WHEN MATERIAL IS RELEASED OR SPILLED: Spilled material should be absorbed with non-combustible absorbant such as vermiculite or perlite. Sweep or scoop up, using non-sparking utensils, bag in polyethylene, and store in containers below 100°F.
LIQUID SPILL PROCEDURE: Same
WASTE DISPOSAL - COMPLY WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS:

SECTION VIII SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: To meet TLV requirements
VENTILATION:
LOCAL EXHAUST: Recommended SPECIAL: NA
MECHANICAL: Required OTHER: NA
PROTECTIVE GLOVES: NBR Nitrile Rubber type
EYE PROTECTION: Chemical splash goggles and face shield
OTHER PROTECTIVE EQUIPMENT: As required to prevent personal contact

SECTION IX SPECIAL PRECAUTIONS

HANDLING AND STORAGE PRECAUTIONS: Store in cool area below 90°F and away from sources of heat and flame in original sealed container.
OTHER PRECAUTIONS: Store below 90°F to maintain active oxygen content of 9%.

BAY-1

ABRASIVE

Material Safety Data Sheet

("Essentially Similar" to Form OSHA 20)

BAY STATE ABRASIVES DRESSER

SECTION I

NAME AND ADDRESS:
BAY STATE ABRASIVES
DIVISION OF DRESSER INDUSTRIES
12 UNION STREET
WESTBORO, MA 01581

EMERGENCY TELEPHONE NUMBER:
(617) 366-4431

CHEMICAL NAME AND SYNONYMS:

Vitrified Aluminum Oxide Abrasive Products

TRADE NAME AND SYNONYMS:

Vitreous Bonded Alumina Abrasive Products, "A" Abrasive Wheels

CHEMICAL FAMILY:

Oxide
Glass

FORMULA:

Aluminum Oxide
Silicate base oxide glass

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENT	CAS#	%	TLV
Aluminum Oxide Abrasive	1344-28-1	+50%	10 mg/cu.M
Glass		+4%	10 mg/cu.M
May contain one or more of the following as solid treatments:			
Graphite	7782-45-5	+1%	15 mg/cu.M
Sulfur	7704-34-9	+1%	10 mg/cu.M
Paraffin or Wax	8002-74-2	+1%	2 mg/cu.M
Cured Resin	NA	+1%	10 mg/cu.M
Silicate	NA	+1%	10 mg/cu.M

SECTION III - PHYSICAL DATA

BOILING POINT (Deg F): NA
VAPOR PRESSURE (mm HG): NA
VAPOR DENSITY (Air = 1): NA
SOLUBILITY IN WATER NA
SPECIFIC GRAVITY (H2O = 1): Varies
PERCENT VOLATILES BY VOLUME (%): 0
EVAPORATION RATE (_____=1): NA
APPEARANCE AND ODOR: Red, Pink, Brown, Blue, Gray or White Solid, No Odor

BAY-1

BAY STATE ABRASIVES DRESSER

RECEIVED
AUG 17 1992

* * * * * SECTION IV - FIRE AND EXPLOSION HAZARD DATA * * * * * *

FLASH POINT (METHOD USED): NA FLAMMABLE LIMITS: NA
EXTINGUISHING MEDIA: NA
SPECIAL FIRE FIGHTING PROCEDURES: NA

UNUSUAL FIRE AND EXPLOSION HAZARD: Does not burn or explode.

* * * * * * * * * SECTION V - HEALTH HAZARD DATA * * * * * * * * *

THRESHOLD LIMIT VALUE: 10 mg/cu.M - Alumina
EFFECTS OF OVER-EXPOSURE: Grinding wheels break down during use and the resulting dust is classified by OSHA as inert or nuisance dust and would have the pulmonary effects of inert dust.
EMERGENCY AND FIRST AID PROCEDURES: If inhalation overexposure occurs, remove to fresh air and contact physician if necessary.

* * * * * * * * * SECTION VI - REACTIVITY DATA * * * * * * * * * *

STABILITY: Stable CONDITIONS TO AVOID: NA
INCOMPATIBILITY (MATERIALS TO AVOID): None Known
HAZARDOUS DECOMPOSITION PRODUCTS: None
HAZARDOUS POLYMERIZATION: Will Not Occur

* * * * * * * SECTION VII - SPILL OR LEAK PROCEDURES * * * * * * *

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Ventilate area and collect material in most convenient and safe manner for reclaimation or disposal.

WASTE DISPOSAL METHOD:
Sealed containers disposed of in a secured sanitary landfill and in accordance with federal, state and local regulations.

* * * * * SECTION VIII - SPECIAL PROTECTION INFORMATION * * * * *

RESPIRATORY PROTECTION: MSHA or NOISH Approved Dust Respirators may be required. See Section IX
VENTILATION: Utilize local exhaust to keep dust below TLV.
PROTECTIVE GLOVES: May be required in grinding operations.
EYE PROTECTION: Required OTHER PROTECTIVE EQUIPMENT: If Applicable

* * * * * * * * SECTION IX - SPECIAL PRECAUTIONS * * * * * * * * *

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:
Take measures to insure against mechanical damage.

OTHER PRECAUTIONS:
1. Store in accordance with ANSI B7.1.
2. Respiratory protection may be required in an extremely dusty environment. Refer to ANSI Z43.1 for additional recommendations.
3. Use according to instructions packed with the wheels.

PREPARED: 11/14/85

"Information contained within was obtained from authoritative sources and is believed to be accurate for the manner in which the product is intended to be used. Other uses could result in ramifications which are not included within this document.

MATERIAL SAFETY DATA SHEET

ACRYL FIBERGLASS SLEEVING
IDENTITY (TRADE NAME AS USED ON LABEL)

MANFACTURER: BENTLEY-HARRIS MFG. CO.
241 WELSH POOL ROAD
LIONVILLE,PA. 19353
TELEPHONE: 215-363-2600

DATE: 11/15/94

SECTION 1- MATERIAL IDENTIFICATION AND INFORMATION

COMPONENTS- CHEMICAL NAME AND COMMON NAME

HAZARDOUS COMPONENTS 1% OR GREATER; CARCINOGENS 01.% OR GREATER)	%	OSHA PEL	ACGIH TLV	OTHER LIMITS RECOMMENDED
CONTINUOUS FILAMENT FIBERGLASS (CAS # 65997-17-3	85	5MG/M3		
ACRYLIC LATEX (NON-HAZ)	15			
TOTAL	100			

SECTION 2- PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT	N/A	SPECIFIC GRAVITY (H2O=1)	
VAPOR PRESSURE MM HG AND TEMPERATURE	N/A	MELTING POINT	155 DEGREES C
VAPOR DENSITY (AIR=1)	N/A	EVAPORATION RATE (=D)	N/A
SOLUBILITY IN WATER	INSOLUBLE	WATER REACTIVE	

APPEARANCE AND ODOR: TUBULAR BRAIDED PRODUCT OF VARIOUS COLORS- SMOOTH TEXTURE- NO ODOR

SECTION 3- FIRE AND EXPLOSION HAZARD DATA

FLASH POINT AND METHOD USED	NON-BURNING	AUTO IGNITION TEMPERATURE	N/A	FLAMMABILITY LIMITS IN AIR % BY VOLUME	LEL N/A / UEL N/A	
EXTINGUISHER MEDIA	NONE					
SPECIAL FIRE FIGHTING PROCEDURES	IN A SUBSTAINED FIRE, SELF CONTAINED BREATHING APPARATUS IS RECOMMENDED.					
UNUSUAL FIRE AND EXPLOSION HAZARD	NONE					

SECTION 4- REACTIVITY HAZARD DATA

STABILITY STABLE CONDITIONS TO AVOID NONE

INCOMPATABILITY MATERIALS TO AVOID: NONE

HAZARDOUS DECOMPOSITION PRODUCTS: CO2, CO, OXIDES OF NITROGEN SMALL AMOUNTS AROMATIC/ALIPHATIC HYDROCARBON FROM BURNING DRY POLYMER.

HAZARDOUS POLYMERIZATION MAY OCCUR / WILL NOT OCCUR: CONDITIONS TO AVOID WHEN BURNING MATERIAL AVOID FUMES.

SECTION 5- HELATH HAZARD DATA

PRIMARY ROUTES OF ENTRY: INHALATION (X)
SKIN ABSORPTION (X)

HEALTH HAZARDS: ACUTE: MAY BE IRRITATING TO SKIN, MOUTH, NOSE AND EYES.
CHRONIC: SEE ATTACHED.

SIGNS AND SYMPTOMS OF EXPOSURES: RASH- ITCHING- CONJUNCTIVITS

EMERGENCY FIRST AID PROCEDURES

SEEK MEDICAL ASSISTANCE FOR FURTHER TREATMENT,OBSERVATION & SUPPORT IF NECESSARY.

EYE CONTACT: FLUSH EYES THOROUGHLY WITH CLEAR WATER FOR 15 MINUTES. IF SYMPTOMS PERSIST, SEEK MEDICAL ATTENTION.

SKIN CONTACT: RINSE AREA WITH COOL WATER AND USE A MILD SOAP. AVOID SCRATCHING AND RUBBING IRRITATED AREAS.

INHALATION : IF OVERCOME BY FUMES, GET TO WELL-VENTILATED AREA.

SECTION 6 CONTROL AND PROTECTIVE MEASURES

RESPIRATORY PROTECTION SPECIFY TYPE: IF CUTTING OR BURNING MATERIAL, USE NIOSH APPROVED RESPIRATOR.

PROTECTIVE GLOVES: ANY TYPE

EYE PROTECTION: SAFETY GLASSES WHEN CUTTING.

VENTILATION TO BE USED: (X) LOCAL EXHAUST

HYGIENIC WORK PRACTICES: WASH HANDS THOROUGHLY BEFORE EATING OR SMOKING.

SECTION 7 PRECAUTIONS FOR SAFE HANDLING AND USE/LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS SPILLED OR RELEASED: NONE

Provided By Electrical Insulation Suppliers Inc.

WASTE DISPOSAL METHOS	UNDER FEDERAL, STATE AND LOCAL GUIDELINES
PRECATUIONS TO BE TAKEN IN HANDLING AND STORAGE	NONE
OTHER PRECAUTIONS AND/ /OR SPECIAL HAZARDS	NONE

NFPA RATING HEALTH 1 FLAMMABILITY O REACTIVITY O

BENTLEY HARRIS
PRODUCT SAFETY DATA AND INFORMATION

HEALTH EFFECTS/SYMPTOMS OF EXPSOURE:
NO HEALTH HAZARDS ARE EXPECTED IN THE FORM PROVIDED. HOWEVER, FIBERGLASS FIBERS ARE KNOW TO CAUSE IRRITATION AND ITCHING OF THE SKIN AND EYES. INHALED FIBERS MAY CAUSE LUNG IRRITATION.

CHRONIC HEALTH EFFECTS:
IN JUNE 1987, THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC) CATEGORIZED FIBERGLASS CONTINUOUS FILAMENT YARN AS NOT CLASSIFIABLE AS A HUMAN CARCINOGEN. A NUMBER OF EPIDEMIOLOGY STUIDES, DONE OVER MANY YEAR, OF WORKERS WITH UP TO FORTY YEARS OF SERVICE IN THE MANUFACTURING OF CONTINUOUS FILAMENT FIBERGLAS HAVE SHOWN NO EVIDENCE OF INCREASES IN MALIGNANT OR NON-MALIGNANT RESPIRATORY DISEASE ATTRIBUTED TO FIBERGLAS EXPOSURE.
HOWEVER, RECENT STUDIES HAVE SHOWN SLIGHT INCREASES IN LUNG CANCER AMONG WORKERS EMPLOYED IN THE MANUFACTURE OF GLASS WOOL AND MINERAL WOOL INSULATION PRODUCTS. THOSE SAME STUDIES SHOW NO EVIDENCE OF A SIMILAR EFFECT AMONG CONTINUOUS FILAMENT FIBERGLASS WORKERS. THIS PRODUCT IS MADE OF CONTINUOUS FILAMENT FIBERLGASS.

CARCINOGENICITY STATUS: NOT LISTED BY IARC, NTP OR OSHA .

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:
PERSONS WITH A HISTORY OF CHRONIC RESPIRATORY OR SKIN CONDITIONS THAT ARE AGGRAVATED BY IRRITANTS MAY BE AT INCREASED RISK FOR WORSENING THEIR CONDITION FROM EXPOSURE DURING USE OF THIS PRODUCT.

*** MANUFACTURER'S INFORMATION ***

MANUFACTURED BY:
INSULATING MATERIALS INCORPORATED
1 CAMPBELL ROAD
SCHENECTADY, NEW YORK 12306

EMERGENCY TELEPHONE:
24 HRS (518) 395-3310
REVISED: 10/22/96
PREPARER: A L DRAKE

*** I PRODUCT IDENTIFICATION ***

PRODUCT IDENTIFICATION: 77520
CHEMICAL FAMILY: ELECTRICAL TAPE AND SHEETS
CHEMICAL NAME: MICA/EPOXY/CHLORINATED PHOSPHATE
FORMULA: MIXTURE

*** II PRODUCT COMPONENTS ***

HAZARDOUS PRODUCT COMPOSITION	APPROX. WT %	ACGIH TVL	OSHA PEL	UNITS	CAS REG. NO.
MICA	60-100	3	3	MG/M3	12001-26-2
TRIDICHLOROISOPROPYL PHOSPHATE	3-7	NA	NA	NA	13674-87-8
EPOXY RESIN	1-5	NA	NA	NA	25036-25-3

*COMPANY RECOMMENDED VALUE
FORMULATION INFORMATION:
CA PROP 65:
115-96-8 TRIS(2-CHLOROETHYL)
PHOSPHATE 0.09%

*** III PHYSICAL DATA ***

**PRODUCT INFORMATION

BOILING POINT	: NA (F) NA (C)	% VOLATILE BY VOLUME	: 0
VAPOR PRESSURE(20C)	: NA MM HG	EVAPORATION RATE	: NA
VAPOR DENSITY(AIR=1	: NA	(BUTYL ACETATE = 1)	
FREEZING POINT	: NA (F) NA (C)	SPECIFIC GRAVITY	: NA
MELTING POINT	: NA (F) NA (C)	(WATER=1 @ 25C)	
PHYSICAL STATE	: SOLID	DENSITY	: NA
ODOR	: MILD EPOXY ODOR	ACIDITY/ALKALINITY	: NA

ODOR THRESHOLD : UNK (PPM)
COLOR : GRAY PH : NA
SOLUBILITY IN WATER (20C): NEGLIGIBLE
SOLUBILITY IN ORGANIC SOLVENT: NA
(STATE SOLVENT)

MICA
BOILING POINT: NA (F) NA (C)
VAPOR PRESSURE: (20 C) NA MM HG
VAPOR DENSITY: (AIR=1) NA

TRIDICHLOROISOPROPYL PHOSPHATE
BOILING POINT: 392(F) 200(C)
VAPOR PRESSURE: (20 C) NA MM HG
VAPOR DENSITY: (AIR=1) NA

EPOXY RESIN
BOILING POINT: NA (F) NA (C)
VAPOR PRESSURE: (20 C) NA MM HG
VAPOR DENSITY: (AIR=1) NA

*** IV FIRE AND EXPLOSION DATA ***

FLASH POINT: NA (F) NA (C) BY NA
IGNITION TEMPERATURE: NA (F) NA (C)
FLAMMABLE LIMITS IN AIR (%): LOWER NA UPPER NA
SENSITIVITY TO MECHANICAL IMPACT (Y/N): N
SENSITIVITY TO STATIC DISCHARGE:
SENSITIVITY TO STATIC DISCHARGE IS NOT EXPECTED.
EXTINGUISHING MEDIA
CARBON DIOXIDE
DRY CHEMICAL
FOAM
WATER MIST
SPECIAL FIREFIGHTING PROCEDURES
POSITIVE PRESSURE, SELF-CONTAINED BREATHING APPARATUS
TOXIC VAPORS ARE EMITTED IN A FIRE CONDITION.

Provided By Electrical Insulation Suppliers Inc.

*** V REACTIVITY DATA ***

STABILITY:
X STABLE _ UNSTABLE
HAZARDOUS
POLYMERIZATION WILL NOT OCCUR
HAZARDOUS DECOMPOSITION/COMBUSTION PRODUCTS
CARBON MONOXIDE.
CARBON DIOXIDE.
TOXIC FUMES.
HYDROGEN CHLORIDE.
PHOSGENE.
OXIDES OF PHOSPHORUS
INCOMPATIBILITY (MATERIALS TO AVOID)
AVOID CONTACT WITH ACIDIC,BASIC OR OXIDIZING AGENTS.
CONDITIONS TO AVOID
KEEP AWAY FROM HEAT,SPARKS AND FLAME.

*** VI HEALTH HAZARD DATA ***

ACUTE SIGNS/EFFECTS OF OVEREXPOSURE
INGESTION
HARMFUL IF SWALLOWED.
SKIN CONTACT
MAY CAUSE AN ALLERGIC SKIN REACTION.
MAY CAUSE A RASH AND ITCHING OF THE SKIN.
SKIN IRRITATION IS NOT EXPECTED, BUT MAY OCCUR IN CERTAIN SENSITIVE INDIVIDUALS.
CONTAINS A COMPONENT WHICH IS A KNOWN OR SUSPECTED SKIN SENSITIZER.
INHALATION
MAY CAUSE MILD RESPIRATORY IRRITATION.
MICA DUST, WHICH PRODUCES PNEUMOCONIOSIS WOULD ONLY BE PRESENT IF THE MATERIAL WAS SANDED, SAWED, ETC.
EYE CONTACT
MAY CAUSE MILD EYE IRRITATION.
MEDICAL CONDITIONS AGGRAVATED
LIVER, KIDNEY
DERMAL AILMENTS.
OTHER
NONE KNOWN.
CHRONIC EFFECTS OF OVEREXPOSURE
DERMATITIS.
LIVER AND KIDNEY DAMAGE.
EMERGENCY AND FIRST AID PROCEDURES
INGESTION
IF SWALLOWED INDUCE VOMITING IMMEDIATELY BY GIVING TWO GLASSES OF WATER AND STICKING FINGERS DOWN THROAT; NEVER GIVE ANYTHING TO AN UNCONSCIOUS PERSON. GET MEDICAL ATTENTION.
SKIN
WASH WITH SOAP AND WATER.
GET MEDICAL ATTENTION IF IRRITATION PERSISTS.
INHALATION
MOVE PERSON TO FRESH AIR.
EYES
IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES AND GET MEDICAL ATTENTION IF IRRITATION PERSISTS.
NOTE TO PHYSICIAN
NONE KNOWN.

TOXICITY: MICA
ACUTE ORAL LD50: NA MG/KG
ACUTE DERMAL LD50: NA MG/KG
ACUTE INHALATION: NA
OTHER: NONE.
AMES TEST: UNKNOWN

TOXICITY: TRIDICHLOROISOPROPYL PHOSPHATE
ACUTE ORAL LD50: 2830 (RAT) MG/KG
ACUTE DERMAL LD50: >23900 (RBT) MG/KG
ACUTE INHALATION: >9.8 MG/L (RAT)
OTHER: MILDLY IRRITATING TO SKIN (RBT).
AMES TEST: POSITIVE

TOXICITY: EPOXY RESIN

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ACUTE ORAL LD50: 30,000 (RAT) MG/KG
ACUTE DERMAL LD50: >3000 (RAT) MG/KG
ACUTE INHALATION: NA
OTHER: NONE.
AMES TEST: UNKNOWN
PRINCIPALS ROUTES OF EXPOSURE
DERMAL - SKIN.
EYES.
THIS PRODUCT OR ONE OF ITS INGREDIENTS PRESENT 0.1% OR MORE IS NOT LISTED AS A CARCINOGEN OR SUSPECTED CARCINOGEN BY NTP, IARC, OR OSHA
PRODUCTS/INGREDIENTS
IARC. NTP AND OSHA DO NOT CONSIDER TRI(B,B-DICHLOROISOPROPYL) PHOSPHATE TO BE A CARCINOGEN. STAUFFER HAS REPORTED THAT IN A LIFETIME FEEDING STUDY IN RATS, HOWEVER, THE PRODUCT IN HIGH DOSES PRODUCED BENIGN AND CARCINOGENIC TUMORS OF THE LIVER AND KIDNEYS.

*** VII SPECIAL PROTECTIVE EQUIPMENT ***

RESPIRATORY PROTECTION
USE IN A WELL VENTILATED AREA.
PROTECTIVE GLOVES
NONE KNOWN.
EYE AND FACE PROTECTION
SAFETY GLASSES.
OTHER PROTECTIVE EQUIPMENT
NONE KNOWN.
VENTILATION
USE ONLY IN WELL VENTILATED AREA.

*** VIII SPILL, LEAK AND DISPOSAL PROCEDURE ***

ACTION TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED
SCRAPE OR GATHER MATERIAL AND PLACE IN A SUITABLE CONTAINER FOR DISPOSAL.
DISPOSAL METHOD
DISPOSAL SHOULD BE MADE IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.

*** IX SPECIAL PRECAUTIONS ***

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
USE ONLY IN A WELL VENTILATED AREA.
KEEP AWAY FROM FOOD AND SMOKING MATERIALS.
WASH HANDS BEFORE EATING AND SMOKING.
ENGINEERING CONTROLS
USE IN A WELL VENTILATED AREA.

*** X SHIPPING AND REGULATORY CLASSIFICATION DATA ***

DOT SHIPPING NAME: MICA SHEET OR BUILT UP

DOT HAZARD CLASS: NOT REGULATED
DOT LABEL(S): NONE
UN/NA NUMBER: NONE
PLACARDS: NONE
EPA HAZARD WASTE: NOT REGULATED
OSHA HAZARD CLASS: SENSITIZER
WHMIS HAZARD CLASS:
D2B TOXIC MATERIALS
NMFC CLASSIFICATION: CLASS 85
TRANSPORTATION CLASS: IMDG NOT REGULATED
RAR (IATA) NOT REGULATED
NFPA/HMIS CLASSIFICATION: FLAMMABILITY 1 , REACTIVITY 0 , HEALTH 2
ADDITIONAL INFORMATION
THESE DATA ARE OFFERED IN GOOD FAITH AS TYPICAL VALUES AND NOT AS A PRODUCT SPECIFICATION. NO WARRANTY, EITHER EXPRESSED OR IMPLIED, IS MADE. THE RECOMMENDED HANDLING PROCEDURES ARE BELIEVED TO BE GENERALLY APPLICABLE. HOWEVER, EACH USER SHOULD REVIEW THESE RECOMMENDATIONS IN THE SPECIFIC CONTEXT OF THE INTENDED USE.....
.....
THIS MATERIAL IS CONSIDERED AN ARTICLE AND EXEMPT FROM REGISTRATION UNDER THE EUROPEAN INVENTORY OF EXISTING COMMERCIAL CHEMICALS (EINECS).....
.....

Provided By Electrical Insulation Suppliers Inc.

C =	CEILING LIMIT	NEGL =	NEGLIGIBLE
EST=	ESTIMATED	NF =	NONE FOUND
NA =	NOT APPLICABLE	UNKN =	UNKNOWN
NE =	NONE ESTABLISHED	REC =	RECOMMENDED
ND =	NONE DETERMINED	V =	RECOMM. BY VENDOR
BY-PRODUCT =	REACTION BY-PRODUCT, TSCA INVENTORY STATUS NOT REQUIRED UNDER 40 CFR PART 720.30(H-2)	SKN =	SKIN
		TS =	TRADE SECRET
		R =	RECOMMENDED
		MST =	MIST

.....

THIS PRODUCT CONTAINS A MATERIAL THAT IS ON THE CALIFORNIA PROPOSITION 65 LIST OF CHEMICALS.
WARNING! THIS PRODUCT CONTAINS A CHEMICAL KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.....

Provided By Electrical Insulation Suppliers Inc.

RECEIVED
MAR 24 1997
LORIN G. HEWITT

0400012
GENERAL ELECTRIC SERVICE
1401 EAST VALENCIA ROAD

TUCSON, AZ 85706-0000

ELECTRICAL INSULATION SUPPLIERS
1255 COLLIER RD.
ATLANTA, GA 30318

PHONE # (404)355-1651
FAX # (404)609-6084

MATERIAL SAFETY DATA SHEET INFORMATION:

PLEASE FIND ENCLOSED MATERIAL SAFETY DATA SHEETS (MSDS) COVERING ITEMS PURCHASED FROM ELECTRICAL INSULATION SUPPLIERS (EIS). OSHA REGULATIONS REQUIRE MSDS INFORMATION BE MADE AVAILABLE TO ALL PERSONNEL WHO MAY BE EXPOSED TO HAZARDOUS MATERIALS IN THE WORK PLACE.

UNDER THE "EMERGENCY PLANNING COMMUNITY RIGHT-TO-KNOW ACT OF 1986" INVENTORY AND LOCATION INFORMATION, CONCERNING HAZARDOUS MATERIALS mr30nfgJOB SITE, MAY NEED TO BE REPORTED TO THE LOCAL FIRE DEPARTMENT, THE LOCAL EMERGENCY PLANNING COMMITTEE AND THE STANDARD RESPONSE COMMISSION. YOU MAY WANT TO REFERENCE 40 CFR PART 372 FOR ADDITIONAL INFORMATION. MANUFACTURERS MUST REPORT ANNUAL RELEASES OF LISTED TOXIC CHEMICALS INTO THE ENVIRONMENT, ACCORDING TO SARA TITLE III.

ACCORDING TO 29 CFR PART 1910.1200 PARAGRAPH (g)(6) OF THE HAZARD COMMUNICATION STANDARD, A MSDS IS TO BE PROVIDED THE FIRST TIME THE CUSTOMER BUYS AN ITEM REQUIRING A MSDS. IF AT ANY TIME THE MSDS IS UPDATED OR CHANGED, THE UPDATED MSDS MUST BE SUPPLIED WITH THE FIRST SHIPMENT AFTER THE MSDS UPDATE HAS OCCURRED.

IF YOU NEED FURTHER INFORMATION CONCERNING YOUR SITUATION, YOU MAY CONTACT THE EPA IN WASHINGTON, D.C. THEIR TOLL FREE NO. IS (800)535-0202; THE RCRA/SUPERFUND HOT LINE IS (800)424-9346 OR (703)920-9810; THE TSCA HOT LINE IS (202)554-1404.

BY PROVIDING THIS DOCUMENTATION, EIS IS COMPLYING WITH FEDERAL LAWS GOVERNING MSDS INFORMATION, AS IS KNOWN TO US. THIS IS A SERVICE AIMED AT HELPING YOUR BUSINESS TO ALSO COMPLY WITH GOVERNMENT REGULATIONS.

DAVE SHARPE

"SEE THE REVERSE SIDE FOR DOCUMENT NAME AND P.O. NUMBER"

33983/GENERAL ELECTRIC SERVICE

	MSDS DOCUMENT	SHIP DATE	CUSTOMER PURCHASE ORDER NUMBER
BLR240	BHACRYL	03/20/97	GL4096-005498
BLR240	IMI77520	03/20/97	GL4096-005498

Provided By Electrical Insulation Suppliers Inc.

Material Safety Data Sheet

Required under USDL Safety and Health Regulations for Shipyard Employment (29 CFR 1915)

U.S. Department of Labor

Occupational Safety and Health Administration

OMB No. 1218-0074
Expiration Date 05/31/86

235 ABRASIVE

Section I

Manufacturer's Name: Blanchard Abrasives; Oerlikon Motch Corporation

Emergency Telephone Number: [redacted]

Address (Number, Street, City, State, and ZIP Code): 77 Fawcett Street, Cambridge, MA 02138

Chemical Name and Synonyms:

Trade Name and Synonyms: Grinding Wheels, Segments, and Burr Busters

Chemical Family:

Formula:

Section II - Hazardous Ingredients

Paints, Preservatives, and Solvents	%	TLV (Units)	Alloys and Metallic Coatings	%	TLV (Units)
Pigments: NA			Base Metal: NA		
Catalyst: NA			Alloys: NA		
Vehicle: NA			Metallic Coatings: NA		
Solvents: NA			Filler Metal Plus Coating or Core Flux: NA		
Additives: NA			Others: None		
Others: None					

Hazardous Mixtures of Other Liquids, Solids or Gases

	%	TLV (Units)
NA		

Section III - Physical Data

Boiling Point (°F)	NA	Specific Gravity (H_2O=1) gm/cc	2 to 5
Vapor Pressure (mm Hg.)	NA	Percent Volatile by Volume (%)	Nil
Vapor Density (AIR=1)	NA	Evaporation Rate ____ =1)	Nil

Solubility in Water: Nil

Appearance and Odor:

Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	Lel	Uel
There are no			

Extinguishing Media: fire or explosion hazards connected

Special Fire Fighting Procedures: with this material.

Unusual Fire and Explosion Hazards:

Form OSHA-20 (Rev. 3/84)

Section V - Health Hazard Data

Threshold Limit Value

*50 MPPCF for total dust; 15 MPPCF for respirable dust fraction.

Effects of Overexposure

Choking sensation in extremely dusty atmosphere.

Emergency First Aid Procedures

Remove to dust free area.

*See OSHA table G-3 for inert or nuisance dust

Section VI - Reactivity Data

Stability	Unstable		Conditions to Avoid
	Stable	X	

Incompatability (Materials to Avoid)

Hazardous Decomposition Products

NONE

Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur	X	

Section VII - Spill or Leak Procedures

Steps to be Taken in Case Material is Released or Spilled

No special precautions required.

Waste Disposal Method

No special precautions required.

Section VIII - Special Protection Information

Respiratory Protection (Specify Type)

Approved dust respirators if TLV is exceeded.

Ventilation	Local Exhaust	Special
	Recommended	
	Mechanical (General)	Other
	Recommended	

Protective Gloves	Eye Protection
	Recommended

Other Protective Equipment

Section IX - Special Precautions

Precautions to be Taken in Handling and Storing

Follow requirements of ANSI B.7.1 "Safety Precautions for Use, Care and Protection of Abrasive Wheels.

Other Precautions

MATERIAL SAFETY DATA SHEET

BE SAFE! READ THIS PRODUCT SAFETY INFORMATION

BORTZ PRODUCTS
P.O. Box 2163
Santa Fe Springs, Ca. 90670
Business Day Phone Number: 1-310-696-8079
Emergency 24 Hour Phone: 1-800-424-9300 (Chemtrec)

This MSDS complies with 29CFR 1910.1200 (Hazard Communication Standard). IMPORTANT: **Read this MSDS before handling and disposing of this product.** PASS THIS INFORMATION ON TO EMPLOYEES, CUSTOMER AND USERS OF THIS PRODUCT.

SECTION 1 - CHEMICAL PRODUCT IDENTIFICATION

BOILED LINSEED OIL

5 Gallon	Product I.D. number (UPC)	28236 06050
Gallon	Product I.D. number (UPC)	28236 06010
Quart	Product I.D. number (UPC)	28236 06040
Pint	Product I.D. number (UPC)	28236 06080

SECTION 2 - INGREDIENT & REGULATORY INFORMATION

SARA TITLE III SECTION 313 SUPPLIER NOTIFICATION

This product contains the indicated (*) toxic chemical's subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right To Know Act of 1986 and of 40 CFR 372. This information must be included in all MSDS's that are copied and distributed for this material.

MATERIAL	*CAS#*	*WT%*	*RQ (LBS)*
Boiled Linseed Oil	Mixture	100	395

SARA TITLE III INGREDIENTS

MATERIAL	*CAS#*	*WT%*	*REG. SECTION*
Cobalt Carboxylate*	7440-48-4	0.05	(311,312,313)
Manganese Carboxylate*	7439-96-5	0.05	(311,312,313)

SARA SECTION 312/313 HAZARDS: Acute Health, Chronic Health, Fire

MATERIAL	*CAS#*	*TWA+ (OSHA)*	*TLV (ACGIH)*
Cobalt Carboxylate	7440-48-4	.05 mg/m3	.05 mg/m3
Manganese Carboxylate	7439-96-5	1.0 mg/m3	1.0 mg/m3

HAZARDS: HEALTH CODE: 1, FLAMMABILITY CODE: 1, REACTIVITY CODE: 0
HAZARD RATINGS: LEAST-0, SLIGHT-1, MODERATE-2, HIGH-3, EXTREME-4

SECTION 3. HAZARD IDENTIFICATION

ACUTE HAZARDS

EYE & SKIN CONTACT: Product causes minor skin irritations and definite eye irritation

INHALATION: Breathing of high vapor concentrations may produce narcosis.

SECTION 4. FIRST AID MEASURES AND PROCEDURES

EYE CONTACT: For eyes, immediately flush with plenty of water for at least 15 minutes. If irritation continues call Physician.

SKIN CONTACT: If irritating to the skin, wash thoroughly with water. If irritation persists get medical attention.

INHALATION: Remove to fresh air. Apply artificial respiration, if necessary. Call physician immediately.

SECTION 5. FIRE FIGHTING MEASURES

FLAMMABLE LIMIT IN AIR (% by volume) 212 DEG F
FLASH POINT (test method) : >250 DEG F (Seta flash)
EXTINGUISHING MEDIA: Use foam, carbon dioxide or chemical fire fighting apparatus.

SPECIAL FIRE FIGHTING PROCEDURES: Wet material is slippery. Avoid contact with material. Firefighters should wear a self contained breathing apparatus. Water spray may be used for cooling containers to prevent possible pressure build-up and auto-ignition or explosion when exposed to extreme heat. Avoid spreading burning liquid with water used for cooling.

UNUSUAL EXPLOSION PROCEDURES: Keep containers tightly closed, isolate from heat, electrical equipment, sparks and open flame. Rags/waste paper containing this material may burn spontaneously. Store wiping rags containing this material in metal cans with tight lids.

SECTION 6. ACCIDENTAL RELEASE MEASURES

CAUTION: Vapor is heavier than air and may travel a considerable distance to a source of ignition and flashback.

WASTE DISPOSAL METHOD: Recycle or dispose of observing local, state and federal health, safety and pollution laws. If questions exist, contact the appropriate agencies.

SECTION 7. HANDLING AND STORAGE

HANDLING AND STORAGE: Avoid spontaneous combustion of contaminated rags and other easily ignitable accumulations (example: spray booth residue) by immediate immersion in water. Store in a cool dry area. Always keep cover on when not in use. Should always ground equipment to reduce electrical sparking hazards. Do not take internally; avoid prolonged contact or inhalation. Containers, even those that have been emptied, will retain product residue and vapors. Always obey hazard warnings and handle empty containers as if they are full.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS: Not normally needed. Use self-contained breathing apparatus where vapor concentrations may be above TLV limits.

VENTILATION: Local exhaust preferred.

PROTECTIVE GLOVES: Neoprene rubber gloves

EYE PROTECTION: Safety goggles or glasses to guard against splashes.

PERSONAL PROTECTIONS: Prevent repeated or prolonged skin contact, wear impervious clothing and boots.

SECTION 9. PHYSICAL DATA

APPEARANCE:	Amber liquid
ODOR:	Mild
BOILING POINT:	211-384 F
EVAPORATION RATE	1.14
GRAVITY @ 60F	
SPECIFIC GRAVITY (water=1)	.939
VOLATILE ORGANIC COMPOUNDS (TVOC) (G/L)	>1
VAPOR PRESSURE (mm of hg) @68F	3.28
VAPOR DENSITY (air = 1)	3.459
WATER SOLUBILITY	>5

SECTION 10. REACTIVITY DATA

STABILITY.

Spontaneous combustion can occur. See Section 5

CONDITIONS TO AVOID:

Excessive heat, sparks or open flames. High surface area exposure to oxygen can result in polymerization and release of heat.

MATERIALS TO AVOID:

Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS

Thermal decomposition may yield carbon dioxide and/or carbon monoxide. Aldehydes (including acrolein) may be produced from atmospheric oxidation and/or thermal degradation under severe pressure.

HAZARDOUS POLYMERIZATION

Will not occur

NOTICE: The supplier disclaims all expressed or implied warranties of merchant ability or fitness for a specific use, with respect to the product or the information provided herein, except for conformation to contracted specifications. All information appearing herein is based upon data obtained from manufacturer's and/or recognized technical sources. While the information is believed to be accurate, we make no representations as to its accuracy or sufficiency. Conditions of use are beyond our control, and therefore users are responsible for verifying the data under their own operating conditions to determine whether the product is suitable for their particular purposes and they assume all risks of their use, handling, and disposal of the product. Users also assume all risks in regards to publication or use of, or reliance upon, information contained herein. This information relates only to the product designation herein, and does not relate to its use in combination with any other material or process.

[redacted]
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MATERIAL SAFETY DATA SHEET

Section I

Supplier's Name **CAL GAS CORPORATION** Emergency Phone Number *916-423-2010*

Address *8401 Gerber Road PO Box 28397, Sacramento, CA 95828*

Chemical Name *Liquefied Petroleum Gas or Propane* CAS Registry No. *74-98-6*

Chemical Family *Hydrocarbon* Formula C_3H_8

Section II **HAZARDOUS INGREDIENTS**

Hazardous Mixtures *Air with 2.15 to 9.60 percent propane*

Section III **PHYSICAL DATA**

Boiling Point *-44°F* Specific Gravity (H_2O = 1) *0.51* Vapor Pressure (mm HG) at 100°F *9825* Percent, Volatile by Volume (%) *100* Vapor Density (Air = 1) *1.52* Evaporative Rate *None* Solubility in Water *Slightly* Appearance and Odor *Clear—unpleasant odor (caused by odorant)**

Section IV **FIRE AND EXPLOSION HAZARD DATA**

Flammable Limits

Flash Point *N/A* Classification *Flammable Gas UN 1075* LEL *2.15* UEL *9.60*

Extinguishing Media *Water Spray: Class A-B-C or BC Fire Extinguishers*

Special Fire Fighting Procedures *Stop flow of gas. Use water to keep fire-exposed containers cool. Use water spray to disperse unignited gas or vapor. If ignition has occurred and no water available, tank metal may weaken from overheating. Evacuate area. If gas has not ignited, LP-gas liquid vapor may be dispersed by water spray or flooding.*

Section V **HEALTH HAZARD**

Threshold Limit Value *1,000 PPM* Effects of Overexposure *Inhalation—concentration can lead to symptoms ranging from dizziness to anesthesia and respiratory arrest. Eyes—moderate irritation.*

Emergency & First Aid Procedures *Inhalation—Remove to fresh air. Guard against self-injury. Apply artificial respiration if breathing has stopped.*

Section VI **REACTIVITY DATA**

Stable *X* Unstable ____ Hazardous Decomposition Products *None*

Incompatibility (materials to avoid) *Mixing with oxygen or air, except at burner*

Hazardous Polymerization: May occur ____ Will not occur *X*

Section VII **SPILL OR LEAK PROCEDURES**

Steps to be taken in case material is released: *Keep public away. Shut off supply of gas. Eliminate sources of ignition. Ventilate the area. Disperse with water spray. Contact between skin and these gases in liquid form can cause freezing of tissue causing injury similar to thermal burn.* Waste Disposal Method *Controlled burning. Contact supplier.*

Section VIII **SPECIAL PROTECTION INFORMATION**

Respiratory Protection *Stay out of gas or vapor (because of fire hazard).*

Ventilation *Explosion-proof motors and keep sources of ignition at safe distances.*

Personal Protective Equipment and Apparel *Leather or equivalent gloves, goggles for protection against accidental release of Pressurized products.*

Section IX **SPECIAL PRECAUTIONS**

Precautions to be taken when handling and storing *Keep containers away from heat sources and store in upright position. Containers should not be dropped. Keep container valve closed when not in use.*

Other Precaution *Install protective caps when not connected for use.*

Section X **TOXICOLOGICAL INFORMATION**

OSHA Carcinogen Classification (29 CFR 1910) Not listed/applicable *X*

Category I Carcinogen ____ Category II Carcinogen ____

Listed as Possible Category I ____ Listed as Possible Category II ____

Section XI **DOT LABELING INFORMATION (49 CFR 100–199)**

Proper Shipping Name *Liquefied Petroleum Gas* Hazardous Classification *Flammable Gas*

Identification No. *UN 1075* Label(s) Required *Flammable, Class 2*

Date of Preparation or Last Change: *11-15-85*

This is for information only and does not constitute a warranty.

LBY-1

MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT INFORMATION PAGE 1

Trade Name and Synonyms: All CARBOLOY® or SECO® cemented carbides, grade powders / powder sludges, and brazed tools

Chemical Name: Cemented Carbide Product with Cobalt Binder
Cemented Carbide Product with Nickel/Chromium binder (Grade 616)
Cemented Carbide Product with Chromium/Cobalt binder (Grades 657, 6012, 7109)
Brazed Tools using Brazing Filler Metal

Chemical Family: Refractory Metal Carbide

Molecular Weight: N/A

NFPA Hazard Rating: HEALTH 3; FLAMMABILITY 0; REACTIVITY 0; PERSONAL PROTECTION 1.

SECTION 2 HAZARDOUS INGREDIENTS

Material (CAS #)	Percent by Weight	OSHA PEL-TWA	ACGIH TLV-TWA
Tungsten Carbide (12070-12-1)	37.6 - 97 *	5 mg/m³ (as W)	5 mg/m³ (as W)
Cobalt (7440-48-4)	3 - 25 *	0.05 mg/m³	0.05 mg/m³
Tantalum Carbide (12070-06-3)	0 - 56.4 *	5 mg/m³ (as Ta)	5 mg/m³ (as Ta)
Titanium Carbide (12070-08-5)	0 - 12.6 *	15 mg/m³ **	---
Niobium Carbide (12011-99-3)	0 - 4.3 *	15 mg/m³ **	---
Nickel (7440-02-0)	16.0 †	1 mg/m³	1 mg/m³
Chromium, trivalent (7440-47-3)	2 - 2.5 ††	0.5 mg/m³	0.5 mg/m³
Aluminum Oxide Coating (1344-28-1)	0 - 0.5 *	15 mg/m³ **	10 mg/m³
Titanium Carbide Coating (12070-08-5)	0 - 0.5 *	15 mg/m³ **	---
Titanium Nitride Coating (25583-20-4)	0 - 0.5*	15 mg/m³ **	---
Silver (7440-22-4)	50.0 †††	0.01 mg/m³	0.1 mg/m³
Cadmium Dust (7440-43-9)	16.0 †††	0.2 mg/m³	0.05 mg/m³
Copper Dust (7440-50-8)	15.5 †††	1 mg/m³	1 mg/m³
Zinc Dust (as Zn Oxide)(1314-13-2)	15.5 †††	5 mg/m³	5 mg/m³
Nickel Dust (7440-02-0)	3.0 †††	1 mg/m³	1 mg/m³

* Depends on Grade Specifications
** Permissible Exposure Limit for Nuisance Dust
† Grade 616
†† Grade 616, 657, 6012, and 7109
††† For brazing filler metal on brazed tools. Filler metals are hazardous only in powder form as metal or metal oxide dust.

Issued Aug 1 '92

carboloy

SECTION 3 PHYSICAL DATA

Appearance and Odor:	Dark Gray Metal Solid Odorless	Specific Gravity ($H_2O=1$):	11.85 - 15.35* 9.52†
Boiling Point:	N/A		
Vapor Pressure (mm Hg):	N/A	Percent Volatile by Volume:	0
Vapor Density (Air=1):	N/A	Evaporation Rate:	N/A
Solubility in Water:	Insoluble	How Best Monitored:	Air Sample

* Depends on Grade Specifications
† Brazing Filler Metal

SECTION 4 FIRE AND EXPLOSION HAZARD

Flash Point: N/A Flammable Limits: N/A LEL: N/A UEL: N/A

Hard Cemented Carbide Product is not a fire hazard. Dusts generated in grinding operations or present in powders or sludges may ignite if allowed to accumulate and are subjected to an ignition source.

Extinguishing Media: For powder fires, smother with dry sand, dry dolomite, ABC type fire extinguisher, or flood with water.

Special Fire Fighting Procedures: For a powder fire confined to a small area, use a respirator approved for toxic dusts and fumes. For a large fire involving this material, fire fighters should use a self-contained breathing apparatus.

Unusual Fire and Explosion Hazards: Dusts may present a fire or explosion hazard under rare favoring conditions of particle size, dispersion and strong ignition source. However, this is not expected to be a problem under normal handling conditions.

SECTION 5 REACTIVITY DATA

Stability:	Unstable Stable X	Conditions to Avoid:	N/A
Incompatibility:	Contact of dust with strong oxidizers may cause fire or explosions.	Materials to Avoid:	Strong Acids
Hazardous Decomposition Products:	None	Hazardous Polymerization:	May Occur Will Not Occur X
Conditions to Avoid:	N/A		

SECTION 6 TOXICOLOGICAL PROPERTIES AND HEALTH HAZARD EFFECTS

NOTE: During normal operation and usage, cemented carbide products do not present inhalation, ingestion, or other chemical hazards of any kind. However, operations such as grinding, cutting, burning, and welding of such products may release dusts, fumes, or vapors which may present health hazards if the exposure limits described in Section 2 are exceeded. The health hazards described below relate to these non-routine operations, as well as exposure to components of powder or sludge.

Primary Routes of Entry: Inhalation; Skin Contact

Wet or dry grinding of cemented carbide products or handling powders or sludges will produce dusts or mists of potentially hazardous ingredients which can be inhaled, swallowed, or come in contact with the skin or eyes.

Acute Health Effects from Overexposure to Dusts, Fumes, and Vapors:

Dust from grinding or handling powders or sludges can cause irritation of the nose, throat, lungs, eyes, and mucous membranes. Exposure to fumes or dusts from braze filler metal may cause central nervous system effects, irritation of the eyes, lungs, mucous membranes, and metal fume fever (metallic taste in mouth, throat irritation, and influenza like symptoms).

Chronic Health Effects from Overexposure to Dusts, Fumes, and Vapors:

Chronic exposure to dusts, fumes and mists containing Cobalt carry the potential to cause permanent respiratory diseases, including occupational asthma, interstitial pneumonitis and fibrosis (hard-metal disease), and emphysema. Symptoms include productive cough, wheezing, dyspnea upon exertion, pleuritic chest pain, and weight loss. Skin sensitization is also noted in a small percentage of cases. Reports outside the industry suggest that ingestion of significant amounts of cobalt can cause blood, heart, and other organ problems.
Chronic exposure to Cadmium dusts and fumes may cause mild anemia, inflammation of the nose and throat, behavioral disorders (sleeplessness, loss of appetite, etc.), and significant renal peritubular damage. Cadmium has exhibited teratogenic effects in rats, mice, and hampsters; whether it does so in humans is not known.
Chronic exposure to Nickel dusts and fumes may cause pulmonary irritation and pneumonitis or sensitization dermatitis.
Individuals with Wilson's disease may wish to limit occupational exposure to copper dust.

Chromium and Nickel are listed by IARC and NTP as Human Carcinogens. Cadmium dust is listed by IARC and NTP as a Probable Human Carcinogen. Cobalt is listed by IARC and ACGIH as a possible animal carcinogen.

SECTION 7 FIRST AID MEASURES

Inhalation: - If symptoms of pulmonary involvement develop (coughing, wheezing, dyspnea, etc.), remove from exposure and seek medical attention.

Skin Contact: - If irritation or rash occurs, thoroughly wash affected area with soap and water and isolate from exposure. If irritation or rash persists, seek medical attention.

Eye Contact: - If irritation occurs, flush eyes with water for at least ten minutes. If irritation persists, seek medical attention.

Ingestion: - If swallowing of greater than trace amounts is suspected, dilute by drinking large amounts of water. If substantial quantities are ingested, induce vomiting with Syrup of Ipecac, and seek additional medical attention.

SECTION 8 PREVENTIVE MEASURES AND SAFE HANDLING INFORMATION

NOTE: Under normal operating conditions, the use of cemented carbide products does not require special safety precautions beyond normal safety procedures for handling cutting tools, such as safety glasses and gloves. However, operations such as grinding, cutting, burning, and welding of cemented carbide products may generate dusts, fumes, or vapors which may require special handling procedures. The procedures described below relate to these non-routine operations, as well as handling powders and sludges.

Personal Protection - Always wear safety glasses with side shields when grinding or cutting cemented carbide products. Use a NIOSH approved respirator with high efficiency particulate air (HEPA) cartridge whenever airborne concentrations of hazardous components exceed exposure limits listed in Section 2. Wear protective gloves (leather or rubber) or Barrier Cream, and clothing (cloth or rubber) to prevent skin contact with dusts and fumes.

Ventilation - Use adequate local (preferably) or general exhaust ventilation to ensure that concentrations of dusts, fumes, or vapors do not exceed exposure limits.

Hygienic Practices - Wash hands thoroughly after handling, and before eating or smoking. Wash exposed skin at the end of the work shift. Smoking and consumption of food or beverages should be restricted from areas where hazardous components may be present. Do not shake clothing, rags, or other items to remove dust. Dust should be removed by laundering or vacuuming (with appropriate filters) the clothing, rags, or other items.

SECTION 9 SPILL AND DISPOSAL INFORMATION

Steps to be Taken in Case Material is Released or Spilled: Ventilate area of the spill. Decontaminate and/or clean up area using methods which avoid dust generation such as a high efficiency particulate air (HEPA) vacuum, wet dust mop, or wet clean-up. If airborne dust is generated, use an appropriate NIOSH approved respirator.

Waste Disposal Method: Dispose of in accordance with appropriate government regulations. May be sold as scrap for reclamation.

SECTION 10 SPECIAL PRECAUTIONS

Precautions to be Taken in Handling and Storage: Maintain good housekeeping procedures to prevent dust accumulation during grinding. Avoid dust inhalation and direct skin contact with dust.

Other Precautions: Clean up using methods which avoid dust generation such as a HEPA vacuum, wet dust mop, or wet clean-up. If airborne dust is generated, use an appropriate NIOSH approved respirator.

Periodic medical monitoring is recommended for individuals regularly exposed to dust or fumes, with particular attention paid to any potential sensitization effects of such substances.

SECTION 11 REGULATORY COMPLIANCE (United States)

Regulation	Cadmium	Chromium (3+)	Cobalt	Copper	Nickel	Silver	Zinc
CERCLA	RQ-10#	RQ-5000#		RQ-5000#	RQ-100#	RQ-1000#	RQ-1000#
SARA Title III § 313	X	X	X	X	X	X	X
RCRA Waste #	D006	D007				D011	
Banned California List (Land Ban Disposal)	X	X			X	X	
CWA 307	X	X		X	X	X	X
MI Critical Material	X	X	X	X	X	X	X
CA Prop 65	X		X		X		

SECTION 12 USER'S RESPONSIBILITIES

This Material Safety Data Sheet provides information consistent with recommended applications of this product and anticipated non-routine activities involving the product. It is the user's responsibility to identify and protect against health and safety hazards presented by modification of cemented carbide products, powders or sludges after manufacture. Individuals handling cemented carbide products, powders or sludges should be informed of all relevant hazards and recommended safety precautions, and should have access to the information contained in this MSDS.

SECTION 13 DISCLAIMER

The information contained herein is based upon data provided by manufacturers and suppliers of raw materials used in the manufacture of cemented carbide products, powders or sludges. The information is offered in good faith as accurate and correct, but no representations, guarantees, or warranties of any kind are made as to its accuracy or completeness, suitability for particular applications, hazards connected with the use of the product, or the results to be obtained from the use thereof. User assumes all risk and liability of any use or handling of any material beyond Carboloy Inc's. control. Variations in methods, conditions, equipment used to store, handle, or process the material, and hazards connected with the use of the product are solely the responsibility of the user and remain at its sole discretion.

When applicable, the products described in this MSDS are considered to be "articles" within the meaning of Title 29 of the Code of Federal Regulations, Section 1910.1200 *et seq.* This MSDS is intended to be used solely for the purpose of satisfying informational requests made pursuant to that requirement. It is not intended to pre-empt, replace, or expand the terms contained in the Carboloy Inc. Conditions of Sale. Compliance with all applicable federal, state, and local laws and regulations remains the responsibility of the user, and the user has the responsibility to provide a safe workplace, to examine all aspects of its operation, and to determine if or where precautions, in addition to those described herein, are required. This information may not be valid for these products when manufactured with alternate materials meeting the special requirements of a particular user.

CARBOLOY INC. MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

In case of questions, please call:

Tim Krochta, CSP
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TO: ~~Patrick Haver~~
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QUICK IDENTIFIER

MATERIAL SAFETY DATA SHEET

CARBON BRUSH (MATRIX- E)

Manufacturer's Name
Carbon Products Operation inc.
Address
100 Stokes Ave.
East Stroudsburg, Pa. 18301
Prepared by: Thomas H. Sparaga

Emergency (717) 476-9054
Telephone (717) 421-9921

Date 7/26/88
Review Date: 2/4/94

SECTION 1 - IDENTITY

Common Name ELECTROGRAPHITIC BRUSH

Cas No. NONE

Chemical Name NONE

Chemical Family NONE

Formula - PROPRIETARY

SECTION 2 - HAZARDOUS INGREDIENTS

Principal Hazardous Components	%	T L V
WILL CONTAIN ONE OR BOTH OF THE LISTED INGREDIENTS IN VARYING %'S		
ZINC*		10 MG/M^3
GRAPHITE		10 MG/M^3

*Noted ingredients are subject to the reporting requirements of SARA Title III, Section 313.

SECTION 3 - PHYSICAL & CHEMICAL CHARACTERISTICS (Fire & Explosion)

Boiling Point NONE

Specific Gravity N/A

Vapor Pressure N/A

Percent Volatile by Volume(%) N/A

Vapor Density N/A

Evaporation Rate N/A

Solubility in Water N/A

Reactivity in Water N/A

Appearance & Odor - GREYISH/BLACK BLOCKS IN VARIOUS SIZES & SHAPES - MOST WITH HARDWARE ATTACHED. NO ODOR

Flash Point NONE

Flammable Limits N/A

Auto-Ignition Temperature NONE

Special Fire Fighting Procedures WILL NOT SUPPORT COMBUSTION

Unusual Fire and Explosion Hazards NONE

SECTION 4 - REACTIVITY DATA (MATRIX E)

Stability- STABLE

Incompatibility - NONE

Hazardous Decomposition - NONE

Hazardous Polymerization - WILL NOT OCCUR

SECTION 5 - HEALTH HAZARDS

Threshold Limit Value - SEE SECTION 2
Signs and Symptoms 1) Acute-NORMAL WEAR CAUSES MINUTE DUSTING. THE TLV's OF HAZARDOUS INGREDIENTS WOULD NOT BE EXPECTED TO BE EXCEEDED.
2) Chronic NONE KNOWN

Medical Conditions Generally Aggravated by Exposure ASTHMA, EMPHYSEMA

Chemical Listed as or Potential Carcinogen ZINC & GRAPHITE HAVE NOT BEEN IDENTIFIED AS CARCINOGEN BY NTP, IARC, OR OSHA

OSHA Permissible Exposure Limit	10 mg/m3 total dust	ACGIH Threshold Limit Value	10 mg/m3	Other Exposure Limit Used	N/A

Emergency and First Aid

1. Inhalation REMOVE TO FRESH AIR GET MEDICAL HELP FOR DIFFICULTY IN BREATHING
2. Eyes RINSE WITH WATER
3. Skin WASH WITH SOAP & WATER AFTER HANDLING MATERIAL
4. Ingestion GIVE SEVERAL GLASSES OF WATER TO DRINK. IF LARGE AMOUNT GET MEDICAL ADVICE.

SECTION 6 - SPECIAL PROTECTION INFORMATION

Respiratory- NIOSH/MSHA APPROVED RESPIRATOR WHEN BLOWING OUT MACHINE HOLDERS, ETC. OR WORKING NEAR ROTATING EQUIPMENT
Gloves- PREFERRED Eyes- SAFETY GLASSES Protective Clothing-N/A
Exhaust-PREFERRED

SECTION 7 - SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

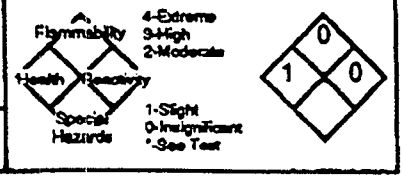
Handling & Storage- STORE IN CLEAN, DRY PLACE. OBSERVE GOOD HOUSEKEEPING

Spills/leaks- UNLIKELY

Waste Disposal- SUBJECT TO LOCAL, STATE & FEDERAL REGULATIONS.

CARBORUNDUM

MATERIAL SAFETY DATA SHEET

24-HOUR EMERGENCY ASSISTANCE	GENERAL ASSISTANCE	NFPA FIRE HAZARD SYMBOL*
BP America: 800-321-8642 CHEMTREC Assist: 800-424-9300	716-278-2183	
MSDS Number > 251/M0022		

MANUFACTURER/SUPPLIER: The Carborundum Company - Fibers Division
ADDRESS: P.O. Box 808, Niagara Falls, New York 14302

PRODUCT IDENTIFICATION

TRADE NAME:

FIBERFRAX ® DURABLANKET ® S

CAS NUMBER: 142844-00-6
SYNONYM(S): CERAMIC FIBER; REFRACTORY FIBER; MMVF; REFRACTORY CERAMIC FIBER; RCF
CHEMICAL FAMILY: VITREOUS ALUMINOSILICATE FIBERS
MOLECULAR FORMULA: Al2O3.SiO2 (Amorphous)
MOLECULAR WEIGHT: NA
PRODUCT CODE: NA **HIERARCHY:** NA

PRODUCT HAZARD SUMMARY

HEALTH
WARNING!
POSSIBLE CANCER HAZARD BY INHALATION
MAY BE HARMFUL IF INHALED
(Hazard depends on duration and level of exposure)
MAY BE IRRITATING TO THE SKIN, EYES AND RESPIRATORY TRACT

FLAMMABILITY NON-COMBUSTIBLE

REACTIVITY STABLE

PRODUCT HEALTH HAZARD INFORMATION

INGESTION:
Ingestion is unlikely. If ingested in sufficient quantity, may cause gastrointestinal disturbances. Symptoms may include irritation, nausea, vomiting, abdominal pain and diarrhea.

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This reprinted material is not the complete and official position of the NFPA on the referenced subject, which is represented only by the standard in its entirety.

SKIN:
SLIGHTLY TO MODERATELY IRRITATING. May cause irritation, inflammation and rash.

EYE:
SLIGHTLY TO MODERATELY IRRITATING. Abrasive action may cause damage to the outer surface of the eye.

INHALATION:
May cause respiratory tract irritation. Pre-existing medical conditions may be aggravated by exposure; specifically, bronchial hyper-reactivity and chronic bronchial or lung disease.

SPECIAL TOXIC EFFECTS:
The existing toxicology and epidemiology data bases for RCF's are still preliminary. Carborundum is continuing to support the necessary investigations and will make all data available to all interested parties. Information will be updated as studies are completed and reviewed. The following is a review of the results to date:

EPIDEMIOLOGY

At this time there are no known published reports demonstrating negative health outcomes of workers exposed to refractory ceramic fiber (RCF). Epidemiologic investigations of RCF production workers are ongoing.

The preliminary evidence, obtained from employees in RCF manufacturing facilities, is as follows:

1) There is no evidence of any fibrotic lung disease (interstitial fibrosis) whatsoever on X-ray.

2) There is no evidence of any lung disease among those employees exposed to RCF that had never smoked.

3) A statistical "trend" was observed in the exposed population between the duration of exposure to RCF and a decrease in some measures of pulmonary function. These observations are clinically insignificant. In other words, if these observations were made on an individual employee, the results would be interpreted as being within the normal range.

4) Pleural plaques (thickening along the chest wall) have been observed in a small number of employees who had a long duration of employment. There are several occupational and non-occupational causes for pleural plaque. It should be noted that plaques are not "pre-cancer" nor are they associated with any measurable effect on lung function.

TOXICOLOGY

A number of studies on the health effects of inhalation exposure of rats and hamsters are available. Rats were exposed to RCF in a series of life-time nose-only inhalation studies. The animals were exposed to 30, 16, 9, and 3 mg/m3, which corresponds with approximately 200, 150, 75, and 25 fibers/cc.

Animals exposed to 30 and 16 mg/m3 were observed to have developed a pleural and parenchymal fibrosis; animals exposed to 9 mg/m3 had developed a mild parenchymal fibrosis; animals exposed to the lowest dose were found to have had the response typically observed any time a material is inhaled into the deep lung. While a statistically significant increase in lung tumors was observed following exposure to the highest dose, there was no excess lung cancers at the other doses. Two rats exposed to 30 mg/m3 and one

ND = No Data
NA = Not Applicable

rat exposed to 9 mg/m3 developed mesotheliomas.

The International Agency for Research on Cancer (IARC) reviewed the carcinogenicity data on man-made vitreous fibers (including ceramic fiber, glasswool, rockwool, and slagwool) in 1987. IARC classified ceramic fiber, fibrous glasswool and mineral wool (rockwool and slagwool) as possible human carcinogens (Group 2B).

FIRST AID

INGESTION:
Ingestion is unlikely. If ingested, the preferred method of elimination is through natural gastrointestinal elimination. Drink extra water. Get medical attention if gastrointestinal symptoms develop, for example, irritation, nausea, vomiting, abdominal pain and diarrhea.

SKIN CONTACT:
Remove contaminated clothing. Wash area of contact thoroughly with soap and water. Do not rub or scratch exposed skin. Using a skin cream or lotion after washing may be helpful. Get medical attention if irritation persists.

EYE CONTACT:
Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Do not rub eyes. Get medical attention if irritation persists.

INHALATION:
Remove person from source of exposure and move to fresh air. Some people may be sensitive to a fiber induced irritation of the respiratory tract. If symptoms such as shortness of breath, cough, wheezing or chest pain develop, seek medical attention. If person experiences continued breathing difficulties, administer oxygen until medical assistance can be rendered.

NOTES TO PHYSICIAN

NA

PERSONAL PROTECTION INFORMATION

The following personal protective guidelines should be followed. However, when the material has been exposed to temperatures greater than 1800 F, more extensive precautions are required as outlined in the "Special Precautions/Supplemental Information" section.

EYE PROTECTION:
Wear safety glasses or chemical goggles to prevent eye contact. Contact lenses should not be worn unless chemical goggles are also used and care is taken not to touch the eyes with contaminated body parts or materials. Have eye washing facilities readily available where eye contact can occur.

SKIN PROTECTION:
Wear gloves, hats and full body covering to prevent skin irritation as necessary (see Special Precautions/Supplemental Information Section).

RESPIRATORY PROTECTION:
Properly designed and operated engineering controls are the most effective methods for

minimizing airborne dust and fiber. If exposures exceed our Recommended Exposure Guideline of 1 fiber/cc of air (8-hour TWA) and engineering controls are not feasible, respiratory protection (as described below) must be used. Respiratory protection must also be used if respiratory irritation is experienced, when airborne concentrations are unknown, or the material has been exposed to temperatures greater than 1800 F (see Special Precautions/Supplemental Information Section). When handling RCF products in monitored areas, Carborundum recommends that NIOSH/MSHA approved respirators be worn as outlined in the following table:

Concentration (8-hour TWA)	Minimum Acceptable Respirator Type
0 - 1 fiber/cc	Optional disposable dust respirator (e.g. 3M 9970 or equivalent).
1 - 5 fibers/cc	Half-face, air-purifying respirator equipped with high-efficiency particulate air (HEPA) filter cartridges (e.g. 3M 6000 series with 2040 filter or equivalent).
5 - 25 fibers/cc	Full face, air-purifying respirator with high-efficiency particulate air (HEPA) filter cartridges (e.g. 3M 7800S with 7255 filters or equivalent) or powered air-purifying respirator (PAPR) equipped with HEPA filter cartridges (e.g. 3M W3265S with W3267 filters or equivalent).
Greater than 25 fibers/cc	Full face, positive pressure supplied air respirator (e.g. 3M 7800S with W9435 hose and W3196 low pressure regulator kit or W3061 high pressure regulator kit or equivalent connected to Grade D air supply).

If airborne fiber levels are not known, as minimum protection, use half-mask air-purifying respirator equipped with high-efficiency particulate air (HEPA) filter cartridges. If respiratory protection is used, the employer must establish a respiratory protection program as described in 29 CFR 1910.134.

PHYSICAL PROPERTIES

BOILING POINT: NA
SPECIFIC GRAVITY: 2.73 G/CM3
MELTING POINT: 1790 C (3260 F)
% VOLATILE: NA
VAPOR PRESSURE: NA
EVAPORATION RATE (WATER=1): NA
VAPOR DENSITY (AIR=1): NA
VISCOSITY: NA
% SOLUBILITY IN WATER: NA
OCTANOL/WATER PARTITION COEFFICIENT: ND
POUR POINT: NA
pH: NA
APPEARANCE/ODOR: WHITE ODORLESS TEXTILE, WOVEN TAPE, WOVEN FABRIC, FELT, OR BULK FIBERS.

ND = No Data
NA = Not Applicable

FIRE AND EXPLOSION DATA

FLASH POINT: NONE
AUTOIGNITION TEMPERATURE: NONE
FLAMMABILITY LIMITS IN AIR (% BY VOL.) LOWER: NA
FLAMMABILITY LIMITS IN AIR (% BY VOL.) UPPER: NA

BASIC FIREFIGHTING PROCEDURES:
Use extinguishing agent suitable for type of surrounding fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
None.

REACTIVITY DATA

STABILITY/INCOMPATIBILTY:
Stable under conditions of normal use. Soluble in hydrofluoric acid, phosphoric acid and concentrated alkali.

HAZARDOUS REACTIONS/DECOMPOSITION PRODUCTS:
None.

ENVIRONMENTAL INFORMATION

Spill or Leak Procedure:
Use vacuum suction with HEPA filters to clean up spilled material. Use wet sweeping or a dust suppressant where sweeping is necessary. Avoid clean up procedures that may result in water pollution. Personal safety, handling and exposure recommendations described elsewhere in this data sheet apply to exposure during clean up of spilled material and must be followed.

WASTE DISPOSAL:
This substance, when discarded or disposed of, is not specifically listed as a hazardous waste in Federal regulations; however it could be characteristically hazardous if it is considered toxic, corrosive, ignitable, or reactive according to Federal definitions (40 CFR 261). Additionally, it could be designated as hazardous according to state regulations. This substance could also become a hazardous waste if it is mixed with or comes in contact with a hazardous waste. Check 40 CFR 261 to determine whether it is a hazardous waste. If it is a hazardous waste, regulations at 40 CFR 262, 263, 264, 268 and 270 apply. Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate.

The transportation, storage, treatment, and disposal of this waste material must be conducted in compliance with all applicable Federal, state, and local regulations, and in such a manner as to assure no discharge to a source of drinking water.

SARA TITLE III INFORMATION:
Listed below are the hazard categories for the Superfund Amendments and Reauthorization Act (SARA) Section 311/312 (40 CFR 370):

Immediate Hazard: - **Delayed Hazard:** X **Fire Hazard:** - **Pressure Hazard:** - **Reactivity Hazard:** -

ND = No Data
NA = Not Applicable

This product does not contain toxic chemicals (in excess of the applicable de minimis concentration) that are subject to the annual toxic chemical release reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 313 (40 CFR 372).

ADDITIONAL ENVIRONMENTAL REGULATORY INFORMATION:
There may be specific regulations at the local, regional or state level that pertain to this material.

REGULATORY INFORMATION

This product is manufactured in compliance with TSCA. While refractory ceramic fiber has been assigned a CAS number, it is a simple mixture and therefore not listed on the TSCA inventory. All components of this product are listed on the Canadian DSL Inventory.

This product contains the following substance(s) listed by the State of California on Proposition 65, the Safe Drinking Water and Toxic Enforcement Act of 1986:

- ceramic fibers (airborne particles of respirable size)

The following Canadian Workplace Hazardous Materials Information System (WHMIS) categories apply to this product:

Compressed Gas	-	Flammable/Combustible	-	Oxidizer	-	Acutely Toxic	-
Other Toxic Effects	X	BioHazardous	-	Corrosive	-	Dangerously Reactive	-

SPECIAL PRECAUTIONS/SUPPLEMENTAL INFORMATION

HANDLING/STORAGE:
The toxicologic data indicate that ceramic fiber should be handled with caution. The handling practices described in this MSDS must be strictly followed (see section on Personal Protection Information). In particular, when handling refractory ceramic fiber in any application, special caution should be taken to avoid unnecessary cutting and tearing of the material to minimize generation of airborne dust.

It is recommended that full body clothing be worn to reduce the potential for skin irritation. Washable or disposable clothing may be used. Do not take unwashed work clothing home. Work clothes should be washed separately from other clothing. Rinse washing machine thoroughly after use. If clothing is to be laundered by someone else, inform launderer of proper procedure. Work clothes and street clothes should be kept separate to prevent contamination.

Product which has been in service at elevated temperatures (greater than 1800 F) may undergo partial conversion to cristobalite, a form of crystalline silica. This reaction occurs at the furnace lining hot face. As a consequence, this material becomes more friable; special caution must be taken to minimize generation of airborne dust. The amount of cristobalite present will depend on the temperature and length in service.

IARC has recently reviewed the animal, human and other relevant experimental data on silica in order to critically evaluate and classify the cancer causing potential. Based on its review, IARC classified crystalline silica as a group 2A carcinogen (probable human carcinogen).

The OSHA permissible exposure limit (PEL) for cristobalite is 0.05 mg/M3 (respirable dust). The ACGIH threshold limit value (TLV) for cristobalite is 0.05 mg/M3 (respirable

dust) (ACGIH 1991-92). Use NIOSH or MSHA approved equipment when airborne exposure limits may be exceeded. The minimum respiratory protection recommended for given airborne cristobalite concentrations are:

Concentration	Minimum Acceptable Respirator Type
Up to 5 fibers/cc or up to 10 times the OSHA PEL for cristobalite	Half face, air-purifying respirator equipped with high-efficiency particulate air (HEPA) filter cartridges (e.g. 3M 6000 series with 2040 filter or equivalent).
Up to 25 fibers/cc or 50 times the OSHA PEL for cristobalite (2.5 mg/m3)	Full face, air-purifying respirator with high-efficiency particulate air (HEPA) filter cartridges (e.g. 3M 7800S with 7255 filters or equivalent) or powered air-purifying respirator (PAPR) equipped with HEPA filter cartridges (e.g. 3M W3265S with W3267 filters or equivalent).
Greater than 25 fibers/cc or 50 times the OSHA PEL for cristobalite (2.5 mg/m3)	Full face, positive pressure supplied air respirator (e.g. 3M 7800S with W9435 hose and W3196 low pressure regulator kit or W3061 high pressure regulator kit connected to clean air supply or equivalent).

If airborne fiber or cristobalite concentrations are not known, as minimum protection, use NIOSH/MSHA approved half face, air-purifying respirator with HEPA filter cartridges.

Insulation surfaces should be lightly sprayed with water before removal to suppress airborne dust. As water evaporates during removal, additional water should be sprayed on surfaces as needed. Only enough water should be sprayed to suppress dust so that water does not run onto the floor of the work area. To aid the wetting process, a surfactant can be used.

After RCF removal is completed, dust-suppressing cleaning methods, such as wet sweeping or vacuuming, should be used to clean the work area. If dry vacuuming is used, the vacuum must be equipped with a HEPA filter. Air blowing or dry sweeping should not be used. Dust-suppressing components can be used to clean up light dust.

EMPTY CONTAINERS:
Product packaging may contain product residue. Do not reuse.

TRANSPORTATION REQUIREMENTS

D.O.T. PROPER SHIPPING NAME (49 CFR 172.101):	NA
D.O.T. HAZARD CLASS (49 CFR 172.101):	NA
UN/NA CODE (49 CFR 172.101):	NA
PACKING GROUP (49 CFR 172.101):	NA
BILL OF LADING DESCRIPTION (49 CFR 172.202):	PRODUCT NAME
D.O.T. LABELS REQUIRED (49 CFR 172.101):	NA
D.O.T. PLACARDS REQUIRED (49 CFR 172.504):	NA

ND = No Data
NA = Not Applicable

INGREDIENTS/HEALTH HAZARD INFORMATION

COMPONENT	CAS NO.	%	EXPOSURE LIMITS - REF.
Aluminosilicate (vitreous)	142844-00-6	99.50-100	1 fiber/cc 8-hr. TWA (Carborundum)*
Remaining components not determined hazardous and/or hazardous components present at less and 1.0% (0.1% for carcinogens).	NA	Trace	NA

*No OSHA or ACGIH exposure limits have been established for these materials. Pending the results of long-term health effects studies, airborne exposures should be controlled at or below the Carborundum Recommended Exposure Guidelines listed above.

REVISION DATE: 12-mar-1993 REPLACES SHEET DATED: 30-mar-1992
COMPLETED BY: CARBORUNDUM HSEQ DEPARTMENT

NOTICE: The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet. However, no warranty or representation, express or implied, is made as to the accuracy or completeness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. In addition, no responsibility can be assumed by vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices, or from any hazards inherent in the nature of the product.

ND = No Data
NA = Not Applicable

PREPARED BY DISTRIBUTOR:

Castle Metals®

A. M. CASTLE & CO.
3400 N. Wolf Road
Franklin Park, IL 60131

MATERIAL SAFETY DATA SHEET

ISSUE DATE: November 25, 1985

REVISED: April 1, 1986

INFORMATION AND EMERGENCY NUMBER:
(312) 455-7111 (8am - 5pm Mon-Fri)
(312) 455-8966 (After Hour Emergency)

SECTION 1 - PRODUCT IDENTIFICATION

MANUFACTURER'S NAME: Various

PRODUCT NAME / TRADE NAME: Alloy Steel - HR & CR
Alloy Leaded Steel

COMMON NAME / GRADE: Alloy Steel i.e. 4130,4140,4340,8620
Alloy Leaded i.e. 86L20

SECTION 2 - HAZARDOUS INGREDIENTS

NOTE: PRODUCTS UNDER NORMAL CONDITIONS DO NOT REPRESENT AN INHALATION, INGESTION OR CONTACT HEALTH HAZARD.

BASE METAL, ALLOYING ELEMENTS AND METALLIC COATINGS	CAS #	WT % (1)	OSHA PEL	ACGIH TLV (mg/m³) (2)
Base Metal				
Iron (Fe)	7439-89-6	86-99	10	5 (As Iron Oxide)
Alloying Elements				
Nickel (Ni)	7440-02-0	<5	1	1
Chromium (Cr)	7440-47-3	<5	.5	.5
Silicon (Si)	7740-21-3	<5	15	10 (Total Dust)
Manganese (Mn)	7439-96-5	<2	5	5 (As Dust-Ceiling)
Carbon (C)	7440-44-0	<2	N.E.	N.E.
Molybdenum (Mo)	7439-98-7	<2	15	10 (Insoluble Compound)
Vanadium (V)	7440-62-2	<2	.5	.05 (Respirable Dust)
Aluminum (Al)	7429-90-5	<2	N.E.	10
Sulfur (S)	7704-34-9	<2	13	5 (As SO_2)
Phosphorus (P)	7723-14-0	<1	.1	.1 (Yellow)
Bismuth (Bi)	7440-69-9	<1	N.E.	N.E.
Copper (Cu)	7440-50-8	<1	1	1 (Dust & Mist)
Leaded Alloy				
Lead (Pb)	7439-92-1	<1	.05	.15 (Dust & Fume)

(1) % OF ALLOYING MATERIAL VARIES WITH GRADE OF MATERIAL.

(2) 1985-1986 ACGIH THRESHOLD LIMIT VALUE.

SECTION 3 - PHYSICAL DATA

MATERIAL IS (AT NORMAL CONDITIONS): Solid

APPEARANCE AND ODOR: Gray-Black, Odorless

MELTING POINT (BASE METAL): >2500° F

SPECIFIC GRAVITY: Approximately 7

SECTION 4 - FIRE AND EXPLOSION

EXTINGUISHING MEDIA: NA

SPECIAL FIRE FIGHTING PROCEDURES: Steel products in the solid state present no fire or explosion hazard.

UNUSUAL FIRE AND EXPLOSION HAZARDS: NA

SECTION 5 - REACTIVITY DATA

STABILITY: Stable

INCOMPATABILITY (MATERIALS TO AVOID): Reacts with strong acids to provide hydrogen gas.

CONDITIONS TO AVOID: NA

HAZARDOUS DECOMPOSITION PRODUCTS: Metallic dust or fumes may be produced during welding, burning, grinding and possibly machining. Refer to ANSI Z49.1

PRODUCT Alloy

SECTION 6 - HEALTH HAZARD DATA

NOTE: STEEL PRODUCTS IN THE NATURAL STATE DO NOT PRESENT AN INHALATION, INGESTION OR CONTACT HAZARD. HOWEVER, OPERATIONS SUCH AS BURNING, WELDING, SAWING, BRAZING AND GRINDING MAY RELEASE FUMES AND/OR DUSTS WHICH MAY PRESENT HEALTH HAZARDS IF TLV'S ARE EXCEEDED.

MAJOR EXPOSURE HAZARD:

☒ INHALATION ☒ SKIN CONTACT ☐ SKIN ABSORPTION ☐ EYE CONTACT ☒ INGESTION

EFFECTS OF OVEREXPOSURE

Short term exposure to fumes/dust may produce irritation of eyes and respiratory system. Inhalation of high concentrations of freshly formed oxide fumes of iron, manganese, copper and lead may cause metal fume fever, characterized by a metallic taste in the mouth, dryness and irritation of the throat and influenza-like symptoms.

Chronic inhalation of high concentrations of iron oxide fumes or dust may lead to a benign pneumoconiosis (siderosis). Inhalation of high concentrations of feric oxide may possibly enhance the risk of lung cancer development in workers exposed to pulmonary carcinogens.

Inhalation or ingestion of lead particles may result in lead induced systemic toxicity. Symptoms of lead poisoning include abdominal cramps, anemia, muscle weakness and headache. Prolonged exposure can cause behavioral changes, kidney damage, CNS damage and reproductive effects.

Chromium and nickel and their compounds are listed in the 3rd Annual Report on carcinogens, as prepared by the National Toxicology Program (NTP). Exposure to high concentrations of dust and fumes can cause sensitization dermatitus, inflammation and/or ulceration of upper respiratory tract and possible cancer of nasal passages and lungs.

Recent epidemiological studies of workers melting and working alloys containing nickel/chromium have found no increased risk of cancer.

Suspected Cancer Agent? ____NO: This product's ingredients are not found in the lists below.
__X__YES: ____Federal OSHA __X__NTP ____IARC

EMERGENCY AND FIRST AID PROCEDURES

If exposed to excessive levels of metal fumes, remove to fresh air, seek medical aid immediately.

Eyes - Flush with water for at least 15 minutes.

SECTION 7 - SPILL OR LEAK PROCEDURES

SPILL OR LEAK PROCEDURES

NA

WASTE DISPOSAL METHODS

According to local, state and federal regulations.

SECTION 8 - SPECIAL PROTECTION

RESPIRATORY

NIOSH/MSHA - Approved dust and fume, respirator should be used to avoid excessive inhalation of particulates when exposure exceeds TLV's.

VENTILATION

Local exhaust ventilation should be utilized when welding, burning, sawing, brazing, grinding or machining when exposure exceeds TLV's.

EYE PROTECTION AND PROTECTIVE CLOTHING

Safety glasses or goggles should be utilized as required by exposure. Other protective equipment should be utilized as required by the welding standards.

SECTION 9 - SPECIAL PRECAUTIONS

In welding, precautions should be taken for airborne contaminants which may originate from components of the welding rod.

Arc or spark generated when welding or burning could be a source of ignition for combustable and flammable materials.

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Franklin Park, IL 60131

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MATERIAL SAFETY DATA SHEET

ISSUE DATE: November 25, 1985

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INFORMATION AND EMERGENCY NUMBER
(312) 455-7111 (8am - 5pm Mon-Fri)
(312) 455-8886 (After Hour Emergency)

SECTION 1 - PRODUCT IDENTIFICATION

MANUFACTURER'S NAME: Various

PRODUCT NAME / TRADE NAME: Aluminum Alloys
Aluminum Alloys Containing Lead

COMMON NAME / GRADE: 1XXX thru 7XXX Series
Leaded 2011 & 6262

SECTION 2 - HAZARDOUS INGREDIENTS

NOTE: PRODUCTS UNDER NORMAL CONDITIONS DO NOT REPRESENT AN INHALATION, INGESTION OR CONTACT HEALTH HAZARD.

BASE METAL, ALLOYING ELEMENTS AND METALLIC COATINGS	CAS #	WT % (1)	OSHA PEL	ACGIH TLV (mg/m³) (2)
Base Metal				
Aluminum (Al)	7429-90-5	80-99.7	N.E.	10 (Metal & Oxide)
Alloying Elements				
Copper (Cu)	7440-50-8	<10	1	1 (Dust & Mist)
Magnesium (Mg)	1309-48-4	<10	15	10
Zinc (Zn)	7440-66-6	<10	N.E.	5 (As Fume)
Cobalt (Co)	7440-48-4	<2	.1	.1 (Dust & Fume)
Iron (Fe)	7439-89-6	<2	10	5 (As Iron Oxide)
Manganese (Mn)	7439-96-5	<2	5	5 (As Dust-Ceiling)
Silicon (Si)	7440-21-3	<2	15	10 (Total Dust)
Tin (Sn)	7440-31-5	<2	2	2
Chromium (Cr)	7440-47-3	<.5	.5	.5
Nickel (Ni)	7440-02-0	<.5	1	1
Leaded Alloys 2011 & 6262				
Lead (Pb)	7439-92-1	<1	.05	.15 (Dust & Fume)

(1) % OF ALLOYING MATERIAL VARIES WITH GRADE OF MATERIAL.

(2) 1985-1986 ACGIH THRESHOLD LIMIT VALUE.

SECTION 3 - PHYSICAL DATA

MATERIAL IS (AT NORMAL CONDITIONS): Solid

APPEARANCE AND ODOR: Silver-Metallic, Odorless

MELTING POINT (BASE METAL): 440-1220 F

SPECIFIC GRAVITY: >2

SECTION 4 - FIRE AND EXPLOSION

EXTINGUISHING MEDIA: Dry Powder (Class D) or Sand

SPECIAL FIRE FIGHTING PROCEDURES: Do not use water or halogen on dust fires.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Damp aluminum dust may spontaneously heat with liberation of hydrogen to form explosive mixtures. Molten may explode on contact with water.

SECTION 5 - REACTIVITY DATA

STABILITY: Stable

INCOMPATABILITY (MATERIALS TO AVOID): Anhydrous Bromine. Also see NFPA #491M

CONDITIONS TO AVOID: See Special Precautions. See Fire and Explosion Section.

HAZARDOUS DECOMPOSITION PRODUCTS: See Special Precautions. See Fire and Explosion Section.

PRODUCT
Aluminum

SECTION 6 - HEALTH HAZARD DATA

NOTE. STEEL PRODUCTS IN THE NATURAL STATE DO NOT PRESENT AN INHALATION, INGESTION OR CONTACT HAZARD. HOWEVER, OPERATIONS SUCH AS BURNING, WELDING, SAWING, BRAZING AND GRINDING MAY RELEASE FUMES AND/OR DUSTS WHICH MAY PRESENT HEALTH HAZARDS IF TLV'S ARE EXCEEDED.

MAJOR EXPOSURE HAZARD:

☒ INHALATION ☒ SKIN CONTACT ☐ SKIN ABSORPTION ☐ EYE CONTACT ☒ INGESTION

EFFECTS OF OVEREXPOSURE

Aluminum dust should be treated as a nuisance dust and high exposure may produce irritation of eyes and respiratory system. The potential for overexposure to copper fume may exist when welding, flame cutting, etc. on alloys containing high amounts of copper >2.5%. These alloys include 2XXX, 7XXX and 4145 wrought alloys. Overexposure to copper fume can result in respiratory irritation, nausea and metal fume fever.

Nickel and chromium are contained in certain alloys at levels of 0.1% or more. Chromium and nickel and their compounds are listed in the 3rd Annual Report on Carcinogens, as prepared by the National Toxicology Program (NTP). Their presence in Aluminum alloys, however, should not present a carcinogenic or health concern due to either their low concentrations or the chemical form in which they are present.

Inhalation or ingestion of lead particles may result in lead-induced systemic toxicity. Symptoms of lead poisoning include abdominal cramps, anemia, muscle weakness and headache. Prolonged exposure can cause behavioral changes, kidney damage, CNS damage and reproductive effects.

Plasma arc cutting or welding aluminum can generate ozone. Overexposures to ozone can result in mucous membrane irritation, as well as pulmonary changes including irritation, congestion and edema.

Suspected Cancer Agent? ____ NO: This product's ingredients are not found in the lists below.

X YES: ____ Federal OSHA X NTP ____ IARC

EMERGENCY AND FIRST AID PROCEDURES

If exposed to excessive levels of metal fumes, remove to fresh air, seek medical aid immediately.

Eyes - Flush with water for at least 15 minutes.

SECTION 7 - SPILL OR LEAK PROCEDURES

SPILL OR LEAK PROCEDURES

NA

WASTE DISPOSAL METHODS

According to local, state and federal regulations.

SECTION 8 - SPECIAL PROTECTION

RESPIRATORY

NIOSH/MSHA - Approved dust and fume, respirator should be used to avoid excessive inhalation of particulates when exposure exceeds TLV's.

VENTILATION

Local exhaust ventilation should be utilized when welding, burning, sawing, brazing, grinding or machining when exposure exceeds TLV's.

EYE PROTECTION AND PROTECTIVE CLOTHING

Safety glasses or goggles should be utilized as required by exposure. Other protective equipment should be utilized as required by the welding standards.

SECTION 9 - SPECIAL PRECAUTIONS

1. Halogen acids and sodium hydroxide in contact with aluminum may generate mixtures of hydrogen.
2. Finely divided aluminum will form explosive mixtures in air. It will also form explosive mixtures in air in the pressence of bromates, iodates or ammonium nitrate.
3. When remelting aluminum scrap, entrapped moisture or the presence of strong oxidizers such as ammonium nitrate could cause an explosion. This applies to the collection of moisture in sow cavities as well. Moisture must be driven off prior to remelting.
4. Do not touch cast aluminum metal or heated aluminum product without knowing metal temperature. Aluminum experiences no color change during heating. If metal is hot and touched, burns can result.
5. Hard alloy ingots in the 2000 and 7000 series must be stress-relieved to prevent explosion when sawed.
6. The welding of aluminum alloys may generate carbon monoxide, carbon dioxide, ozone, nitrogen oxides, infra-red radiation and ultra-violet radiation.

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MATERIAL SAFETY DATA SHEET

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(312) 455-7111 (8am - 5pm Mon-Fri)
(312) 455-8986 (After Hour Emergency)

SECTION 1 - PRODUCT IDENTIFICATION

MANUFACTURER'S NAME: Various

PRODUCT NAME / TRADE NAME: Brass

COMMON NAME / GRADE: Half Hard, Soft, Shim, HR Naval, Muntz Free Cutting Leaded

SECTION 2 - HAZARDOUS INGREDIENTS

NOTE. PRODUCTS UNDER NORMAL CONDITIONS DO NOT REPRESENT AN INHALATION, INGESTION OR CONTACT HEALTH HAZARD.

BASE METAL, ALLOYING ELEMENTS AND METALLIC COATINGS	CAS #	WT % (1)	OSHA PEL	ACGIH TLV (mg/m^3) (2)
Base Metal				
Copper (Cu)	7440-50-8	60-70	1	1 (Dust & Mist)
Alloying Elements				
Zinc (Zn)	7440-66-6	30-40	N.E.	5 (As Fume)
Tin (Sn)	7440-31-5	<1	2	2
Free Cutting Leaded				
Lead (Pb)	7439-92-1	<4	.05	.15 (Dust & Fume)

(1) % OF ALLOYING MATERIAL VARIES WITH GRADE OF MATERIAL.

(2) 1985-1986 ACGIH THRESHOLD LIMIT VALUE.

SECTION 3 - PHYSICAL DATA

MATERIAL IS (AT NORMAL CONDITIONS): Solid

APPEARANCE AND ODOR: Gold/Yellow Colored, Odorless

MELTING POINT (BASE METAL): >1600 F

SPECIFIC GRAVITY: >8

SECTION 4 - FIRE AND EXPLOSION

EXTINGUISHING MEDIA: NA

SPECIAL FIRE FIGHTING PROCEDURES: Steel products in the solid state present no fire or explosion hazard.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Dust hazard exists under favoring conditions of small practice size. Dispersion in air and strong ignition source may result in an explosion.

SECTION 5 - REACTIVITY DATA

STABILITY: Stable

INCOMPATABILITY (MATERIALS TO AVOID): Mercury, Ammonia, Acetylene, Acids

CONDITIONS TO AVOID: Exposure during storage to strong acids, bases or oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS: Toxic gases, aerosols, and vapors may be released in a fire involving copper alloys if fumes of other compounds or other contacting materials are involved.

PRODUCT Brass

SECTION 6 - HEALTH HAZARD DATA

NOTE. STEEL PRODUCTS IN THE NATURAL STATE DO NOT PRESENT AN INHALATION, INGESTION OR CONTACT HAZARD. HOWEVER, OPERATIONS SUCH AS BURNING, WELDING, SAWING, BRAZING AND GRINDING MAY RELEASE FUMES AND/OR DUSTS WHICH MAY PRESENT HEALTH HAZARDS IF TLV'S ARE EXCEEDED

MAJOR EXPOSURE HAZARD:

☒ INHALATION ☒ SKIN CONTACT ☐ SKIN ABSORPTION ☐ EYE CONTACT ☒ INGESTION

EFFECTS OF OVEREXPOSURE

Short term exposure to fumes/dust may provide irritation of eyes and respiratory system. Inhalation of high concentrations of freshly formed oxide fumes of copper,zinc and lead may cause metal fume fever characterized by a metallic taste in the mouth, dryness and irritation of the throad and influenza-like symptoms.

Inhalation or ingestion of lead particles may result in lead-induced systemic toxicity. Symptoms of lead poisoning include abdominal cramps, anemia, muscle weakness and headache. Prolonged exposure can cause behavioral changes, kidney damange, CNS damage and reproductive effects.

Suspected Cancer Agent? X NO: This product's ingredients are not found in the lists below.

____ YES: ____ Federal OSHA ____ NTP ____ IARC

EMERGENCY AND FIRST AID PROCEDURES

If exposed to excessive levels of metal fumes, remove to fresh air, seek medical aid immediately.

Eyes - Flush with water for at least 15 minutes.

SECTION 7 - SPILL OR LEAK PROCEDURES

SPILL OR LEAK PROCEDURES

NA

WASTE DISPOSAL METHODS

According to local, state and federal regulations.

SECTION 8 - SPECIAL PROTECTION

RESPIRATORY

NIOSH/MSHA - Approved dust and fume, respirator should be used to avoid excessive inhalation of particulates when exposure exceeds TLV's.

VENTILATION

Local exhaust ventilation should be utilized when welding, burning, sawing, brazing, grinding or machining when exposure exceeds TLV's.

EYE PROTECTION AND PROTECTIVE CLOTHING

Safety glasses or goggles should be utilized as required by exposure. Other protective equipment should be utilized as required by the welding standards.

SECTION 9 - SPECIAL PRECAUTIONS

In welding, precautions should be taken for airborne contaminants which may originate from components of the welding rod.

Arc or spark generated when welding or burning could be a source of ignition for combustable and flammable materials.

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(312) 455-7111 (8am - 5pm Mon-Fri)
(312) 455-8986 (After Hour Emergency)

SECTION 1 - PRODUCT IDENTIFICATION

MANUFACTURER'S NAME: Various

PRODUCT NAME / TRADE NAME: Bronze

COMMON NAME / GRADE: Silicon Bronze, Leaded Bronze, Aluminum Bronze

SECTION 2 - HAZARDOUS INGREDIENTS

NOTE. PRODUCTS UNDER NORMAL CONDITIONS DO NOT REPRESENT AN INHALATION, INGESTION OR CONTACT HEALTH HAZARD.

BASE METAL, ALLOYING ELEMENTS AND METALLIC COATINGS	CAS #	WT % (1)	OSHA PEL	ACGIH TLV (mg/m^3) (2)
Base Metal				
Copper (Cu)	7440-50-8	70-99	1	1 (Dust & Mist)
Alloying Elements				
Nickel (Ni)	7440-02-0	0-14	1	1
Aluminum (Al)	7429-90-5	0-14	N.E.	10
Iron (Fe)	7439-89-6	<5	10	5 (As Iron Oxide)
Silicon (Si)	7740-21-3	<4	15	10 (Total Dust)
Manganese (Mn)	7439-96-5	<4	5	5 (As Dust-Ceiling)
Cobalt (Co)	7440-48-4	<2	.1	.1
Tin (Sn)	7440-31-5	<1	2	2
Zinc (Zn)	7440-66-6	<1	N.E.	5 (As Fume)
Leaded Alloys				
Lead (Pb)	7439-92-1	<1	.05	.15 (Dust & Fume)

(1) % OF ALLOYING MATERIAL VARIES WITH GRADE OF MATERIAL.

(2) 1985-1986 ACGIH THRESHOLD LIMIT VALUE.

SECTION 3 - PHYSICAL DATA

MATERIAL IS (AT NORMAL CONDITIONS): Solid

APPEARANCE AND ODOR: Red-Gold Metallic, Odorless

MELTING POINT (BASE METAL): >1700 F

SPECIFIC GRAVITY: >7

SECTION 4 - FIRE AND EXPLOSION

EXTINGUISHING MEDIA: NA

SPECIAL FIRE FIGHTING PROCEDURES: Products in the solid state present no fire or explosion hazard.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Dust hazards exist under favoring conditions of small practice size. Dispersion in air and strong ignition source may result in an explosion.

SECTION 5 - REACTIVITY DATA

STABILITY: Stable

INCOMPATABILITY (MATERIALS TO AVOID): Mercury, Ammonia, Acetylene

CONDITIONS TO AVOID: Exposure during storage to strong acids, bases or oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS: Toxic gases, aerosols and vapors may be released in a fire involving copper alloys if fume of other compounds or other contacting materials are involved.

PRODUCT Bronze

SECTION 6 - HEALTH HAZARD DATA

NOTE. STEEL PRODUCTS IN THE NATURAL STATE DO NOT PRESENT AN INHALATION, INGESTION OR CONTACT HAZARD HOWEVER, OPERATIONS SUCH AS BURNING, WELDING, SAWING, BRAZING AND GRINDING MAY RELEASE FUMES AND/OR DUSTS WHICH MAY PRESENT HEALTH HAZARDS IF TLV'S ARE EXCEEDED.

MAJOR EXPOSURE HAZARD:

☒ INHALATION ☒ SKIN CONTACT ☐ SKIN ABSORPTION ☐ EYE CONTACT ☒ INGESTION

EFFECTS OF OVEREXPOSURE

Short term exposure to fumes/dust may produce irritation of eyes and respiratory system. Inhalation of high concentrations of freshly formed oxide fumes of copper and lead may cause metal fume fever characterized by a metallic taste in the mouth, dryness of the throat and influenza-like symptoms.

Inhalation or ingestion of lead particles may result in lead-induced systemic toxicity. Symptoms of lead poisoning include abdominal cramps, anemia, muscle weakness and headache. Prolonged exposure can cause behavioral changes, kidney damage, CNS damage, and reproductive effects.

Nickel is listed in the 3rd Annual Report on carcinogens as prepared by the National Toxicology Program (NTP). Exposure to high concentrations of dust and fumes can cause sensitization dermatitis, inflammation and/or ulceration of upper respiratory tract and possibly cancer of nasal passages and lungs.

Recent epidemiological studies of workers melting and working alloys containing nickel/chromium have found no increased risk of cancer.

Suspected Cancer Agent? ____NO: This product's ingredients are not found in the lists below.
__X__YES. ____Federal OSHA __X__NTP ____IARC

EMERGENCY AND FIRST AID PROCEDURES

If exposed to excessive levels of metal fumes, remove to fresh air, seek medical aid immediately.

Eyes - Flush with water for at least 15 minutes.

SECTION 7 - SPILL OR LEAK PROCEDURES

SPILL OR LEAK PROCEDURES

NA

WASTE DISPOSAL METHODS

According to local, state and federal regulations.

SECTION 8 - SPECIAL PROTECTION

RESPIRATORY

NIOSH/MSHA - Approved dust and fume, respirator should be used to avoid excessive inhalation of particulates when exposure exceeds TLV's.

VENTILATION

Local exhaust ventilation should be utilized when welding, burning, sawing, brazing, grinding or machining when exposure exceeds TLV's.

EYE PROTECTION AND PROTECTIVE CLOTHING

Safety glasses or goggles should be utilized as required by exposure. Other protective equipment should be utilized as required by the welding standards.

SECTION 9 - SPECIAL PRECAUTIONS

In welding, precautions should be taken for airborne contaminants which may originate from components of the welding rod.

Arc or spark generated when welding or burning could be a source of ignition for combustable and flammable materials.

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MATERIAL SAFETY DATA SHEET

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(312) 455-7111 (8am - 5pm Mon-Fri)
(312) 455-8986 (After Hour Emergency)

SECTION 1 - PRODUCT IDENTIFICATION

MANUFACTURER'S NAME: Various

PRODUCT NAME / TRADE NAME: Carbon Steel - HR & CR
Leaded Carbon

COMMON NAME / GRADE: Carbon Steel i.e. A36,1018,1010,1040
Pressure Vessel Quality
Leaded Carbon i.e. 10L42

SECTION 2 - HAZARDOUS INGREDIENTS

NOTE: PRODUCTS UNDER NORMAL CONDITIONS DO NOT REPRESENT AN INHALATION, INGESTION OR CONTACT HEALTH HAZARD.

BASE METAL, ALLOYING ELEMENTS AND METALLIC COATINGS	CAS #	WT % (1)	OSHA PEL	ACGIH TLV (mg/m³) (2)
Base Metal				
Iron	7439-89-6	97-99	10	5 (As Iron Oxide)
Alloying Elements				
Manganese (Mn)	7439-96-5	<2	5	5 (As Dust-Ceiling)
Carbon (C)	7440-44-0	<2	N.E.	N.E.
Aluminum (Al)	7429-90-5	<1	N.E.	10 (Yellow)
Phosphorus (P)	7723-14-0	<1	.1	.1
Sulfur (S)	7704-34-9	<1	13	5 (As SO_2)
Silicon (Si)	7740-21-3	<1	15	10 (Total Dust)
Vanadium (V)	7440-62-2	<1	.5	.05 (As Respirable Dust)
Colombian (Cb)	7440-03-1	<1	N.E.	N.E.
Bismuth (Bi)	7440-69-9	<1	N.E.	N.E.
Lead Carbon i.e. 10L42				
Lead (Pb)	7439-92-1	<1	.05	.15 (Dust-Fume)

(1) % OF ALLOYING MATERIAL VARIES WITH GRADE OF MATERIAL.

(2) 1985-1986 ACGIH THRESHOLD LIMIT VALUE.

SECTION 3 - PHYSICAL DATA

MATERIAL IS (AT NORMAL CONDITIONS): Solid

APPEARANCE AND ODOR: Gray-Black, Odorless

MELTING POINT (BASE METAL): >2500° F

SPECIFIC GRAVITY: Approximately 7

SECTION 4 - FIRE AND EXPLOSION

EXTINGUISHING MEDIA: NA

SPECIAL FIRE FIGHTING PROCEDURES: Steel products in the solid state present no fire or explosion hazard.

UNUSUAL FIRE AND EXPLOSION HAZARDS: NA

SECTION 5 - REACTIVITY DATA

STABILITY: Stable

INCOMPATABILITY (MATERIALS TO AVOID): Reacts with strong acids to produce hydrogen gas.

CONDITIONS TO AVOID: NA

HAZARDOUS DECOMPOSITION PRODUCTS: Metallic dust or fumes may be produced during welding, burning, grinding and possibly machining. Refer to ANSI Z49.1

PRODUCT
Carbon

SECTION 6 - HEALTH HAZARD DATA

NOTE. STEEL PRODUCTS IN THE NATURAL STATE DO NOT PRESENT AN INHALATION, INGESTION OR CONTACT HAZARD. HOWEVER, OPERATIONS SUCH AS BURNING, WELDING, SAWING, BRAZING AND GRINDING MAY RELEASE FUMES AND/OR DUSTS WHICH MAY PRESENT HEALTH HAZARDS IF TLV'S ARE EXCEEDED

MAJOR EXPOSURE HAZARD.

☒ INHALATION ☒ SKIN CONTACT ☐ SKIN ABSORPTION ☐ EYE CONTACT ☒ INGESTION

EFFECTS OF OVEREXPOSURE

Short term exposure to fumes/dust may produce irritation of eyes and respiratory system. Inhalation of high concentrations of freshly formed oxide fumes of iron, manganese, and lead may cause metal fume fever, characterized by a metallic taste in the mouth, dryness and irritation of the throat and influenza-like symptoms.

Chronic inhalation of high concentrations of iron oxide fumes or dust may lead to benign pneumoconiosis (siderosis). Inhalation of high concentrations of ferric oxide may possibly enhance the risk of lung cancer development in workers exposed to pulmonary carcinogens.

Inhalation or ingestion of lead particles may result in lead-induced systemic toxicity. Symptoms of lead poisoning include abdominal cramps, anemia, muscle weakness and headache. Prolonged exposure can cause behavioral changes, kidney damage, CNS damage and reproductive effects.

Suspected Cancer Agent? _X_ NO: This product's ingredients are not found in the lists below.
____ YES: ____ Federal OSHA ____ NTP ____ IARC

EMERGENCY AND FIRST AID PROCEDURES

If exposed to excessive levels of metal fumes, remove to fresh air, seek medical aid immediately.

Eyes - Flush with water for at least 15 minutes.

SECTION 7 - SPILL OR LEAK PROCEDURES

SPILL OR LEAK PROCEDURES

NA

WASTE DISPOSAL METHODS

According to local, state and federal regulations.

SECTION 8 - SPECIAL PROTECTION

RESPIRATORY

NIOSH/MSHA - Approved dust and fume, respirator should be used to avoid excessive inhalation of particulates when exposure exceeds TLV's.

VENTILATION

Local exhaust ventilation should be utilized when welding, burning, sawing, brazing, grinding or machining when exposure exceeds TLV's.

EYE PROTECTION AND PROTECTIVE CLOTHING

Safety glasses or goggles should be utilized as required by exposure. Other protective equipment should be utilized as required by the welding standards.

SECTION 9 - SPECIAL PRECAUTIONS

In welding, precautions should be taken for airborne contaminants which may originate from components of the welding rod.

Arc or spark generated when welding or burning could be a source of ignition for combustable and flammable materials.

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PREPARED BY DISTRIBUTOR:

Castle Metals®

A. M. CASTLE & CO.
3400 N. Wolf Road
ranklin Park, IL 60131

MATERIAL SAFETY DATA SHEET

ISSUE DATE November 25, 1985

REVISED April 1, 1986

INFORMATION AND EMERGENCY NUMBER:
(312) 455-7111 (8am - 5pm Mon-Fri)
(312) 455-8986 (After Hour Emergency)

SECTION 1 - PRODUCT IDENTIFICATION

MANUFACTURER'S NAME: Various

PRODUCT NAME / TRADE NAME: Copper - CR & HR
Copper Leadtex Sheet

COMMON NAME / GRADE: Copper Sheet, Oxygen Free, Hard Drawn
Electrolytic Tough Pitch

SECTION 2 - HAZARDOUS INGREDIENTS

NOTE. PRODUCTS UNDER NORMAL CONDITIONS DO NOT REPRESENT AN INHALATION, INGESTION OR CONTACT HEALTH HAZARD.

BASE METAL, ALLOYING ELEMENTS AND METALLIC COATINGS	CAS #	WT % (1)	OSHA PEL	ACGIH TLV (mg/m^3) (2)
Base Metal				
Copper (Cu)	7440-50-8	>99.9	1	1 (Dust & Mist)
Trace Less Than .1% Phosphorus, Antimony, Selenium Bismuth				
Coating - Leadtex				
Lead (Pb)	7439-92-1	15 lbs./100 sq ft	.05	.15 (Dust & Fume)

(1) % OF ALLOYING MATERIAL VARIES WITH GRADE OF MATERIAL.

(2) 1985-1986 ACGIH THRESHOLD LIMIT VALUE.

SECTION 3 - PHYSICAL DATA

MATERIAL IS (AT NORMAL CONDITIONS): Solid

APPEARANCE AND ODOR: Copper Metallic, Odorless

MELTING POINT (BASE METAL): >1800° F

SPECIFIC GRAVITY: >8

SECTION 4 - FIRE AND EXPLOSION

EXTINGUISHING MEDIA: NA

SPECIAL FIRE FIGHTING PROCEDURES: Products in the solid state present no fire or explosion hazard.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Dust hazard exists under favoring conditions of small practice size. Dispersion in air and strong ignition source may result in an explosion.

SECTION 5 - REACTIVITY DATA

STABILITY: Stable

INCOMPATABILITY (MATERIALS TO AVOID): Mercury, Ammonia, Acetylene, Acids

CONDITIONS TO AVOID: Exposure during storage to strong acids, bases or oxidizing agents.

ZARDOUS DECOMPOSITION PRODUCTS: Toxic gases, aerosols and vapors may be released in a fire involving copper alloys if fumes of other compounds or other contacting materials are involved.

PRODUCT Copper

SECTION 6 - HEALTH HAZARD DATA

NOTE: STEEL PRODUCTS IN THE NATURAL STATE DO NOT PRESENT AN INHALATION, INGESTION OR CONTACT HAZARD. HOWEVER, OPERATIONS SUCH AS BURNING, WELDING, SAWING, BRAZING AND GRINDING MAY RELEASE FUMES AND/OR DUSTS WHICH MAY PRESENT HEALTH HAZARDS IF TLV'S ARE EXCEEDED.

MAJOR EXPOSURE HAZARD:

☒ INHALATION ☒ SKIN CONTACT ☐ SKIN ABSORPTION ☐ EYE CONTACT ☒ INGESTION

EFFECTS OF OVEREXPOSURE

Short term exposure to fumes/dust may produce irritation of eyes and respiratory system. Inhalation of high concentrations of freshly formed oxide fumes of copper and lead may cause metal fume fever characterized by a metallic taste in the mouth and irritation of the throat and influenza-like symptoms.

Inhalation or ingestion of lead particles may result in lead-induced systemic toxicity. Symptoms of lead poisoning include abdominal cramps, anemia, muscle weakness and headache. Prolonged exposure can cause behavioral changes, kidney damage, CNS damage and reproductive effects.

Suspected Cancer Agent? X NO: This product's ingredients are not found in the lists below.

____ YES: ____ Federal OSHA ____ NTP ____ IARC

EMERGENCY AND FIRST AID PROCEDURES

If exposed to excessive levels of metal fumes, remove to fresh air, seek medical aid immediately.

Eyes - Flush with water for at least 15 minutes.

SECTION 7 - SPILL OR LEAK PROCEDURES

SPILL OR LEAK PROCEDURES

NA

WASTE DISPOSAL METHODS

According to local, state and federal regulations.

SECTION 8 - SPECIAL PROTECTION

RESPIRATORY

NIOSH/MSHA - Approved dust and fume, respirator should be used to avoid excessive inhalation of particulates when exposure exceeds TLV's.

VENTILATION

Local exhaust ventilation should be utilized when welding, burning, sawing, brazing, grinding or machining when exposure exceeds TLV's.

EYE PROTECTION AND PROTECTIVE CLOTHING

Safety glasses or goggles should be utilized as required by exposure. Other protective equipment should be utilized as required by the welding standards.

SECTION 9 - SPECIAL PRECAUTIONS

In welding, precautions should be taken for airborne contaminants which may originate from components of the welding rod.

Arc or spark generated when welding or burning could be a source of ignition for combustable and flammable materials.

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PREPARED BY DISTRIBUTOR:

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7400 N. Wolf Road
Franklin Park, IL 60131

MATERIAL SAFETY DATA SHEET

ISSUE DATE: November 25, 1985

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INFORMATION AND EMERGENCY NUMBER:
(312) 455-7111 (8am - 5pm Mon-Fri)
(312) 455-8986 (After Hour Emergency)

SECTION 1 - PRODUCT IDENTIFICATION

MANUFACTURER'S NAME: Various

PRODUCT NAME / TRADE NAME: Nickel Based Alloy Steel

COMMON NAME / GRADE: Nickel 2XX, Monel Alloy 4XX, Inconel Alloy 6XX & 7XX Incoloy Alloy 8XX

SECTION 2 - HAZARDOUS INGREDIENTS

NOTE: PRODUCTS UNDER NORMAL CONDITIONS DO NOT REPRESENT AN INHALATION, INGESTION OR CONTACT HEALTH HAZARD.

Base and Alloying Elements

Ingredients	CAS #	PEL	TLV(2)	Ingredients	CAS #	PEL	TLV(2)
Aluminum (Al)	7429-90-5	N.E.	10	Nickel (Ni)	7440-02-0	1	1
Chromium (Cr)	7440-47-3	.5	.5	Niobium (Nb)	7440-03-1	5	5 (Tantalum)
Cobalt (Co)	7440-48-4	.1	.1 (Dust & Fume)	Silicon (Si)	7740-21-3	15	10 (Total Dust)
Copper (Cu)	7440-50-8	1	1 (Dust & Mist)	Tantalum (Ta)	7440-25-7	5	5
Iron (Fe)	7439-89-6	10	5 (As Iron Oxide)	Titanium (Ti)	7440-32-6	15	10 (Total Dust)
Manganese (Mn)	7439-96-5	5	5 (As Dust-Ceiling)	Tungsten (W)	7440-37-7	N.E.	5
Molybdenum (Mo)	7439-98-7	15	10 (Insoluble Comp.)	Yittrium (Y)	7440-65-5	1	1

% Alloying Elements (1)

UNS Numbers	Al	Cr	Co	Cu	Fe	Mn	Mo	Ni	Nb	Si	Ta	Ti	W	Y
N02200 Series (Commerically Pure Ni Alloy)		<2				<5		95-99				<5	<5	
N04400 - N05500 Series (Ni-Cu Alloy)	<5	<1		27-68	<1	<5		31-67		<1	<2			
N06600 - N07700 Series (Ni-Cr Alloy)	<5	15-48	0-13		1-40	<5	2-10	39-80	<5		<2	<3	<5	<1
N08800 - N09900 Series (Ni-Fe-Cr Alloy)	<5	.1-30	0-15	<2	30-84	<1	<5	.1-42	<5			<3		<1

(1) % OF ALLOYING MATERIAL VARIES WITH GRADE OF MATERIAL.

(2) 1985-1986 ACGIH THRESHOLD LIMIT VALUE.

SECTION 3 - PHYSICAL DATA

MATERIAL IS (AT NORMAL CONDITIONS): Solid

APPEARANCE AND ODOR: Gray-Black, Odorless

MELTING POINT (BASE METAL): >2300 F

SPECIFIC GRAVITY: Approximately 7

SECTION 4 - FIRE AND EXPLOSION

EXTINGUISHING MEDIA: NA

SPECIAL FIRE FIGHTING PROCEDURES: Steel products in the solid state present no fire or explosion hazard.

UNUSUAL FIRE AND EXPLOSION HAZARDS: NA

SECTION 5 - REACTIVITY DATA

STABILITY: Stable

INCOMPATABILITY (MATERIALS TO AVOID): Reacts with strong acids to produce hydrogen gas.

CONDITIONS TO AVOID: NA

HAZARDOUS DECOMPOSITION PRODUCTS: Metallic dust or fumes may be produced during welding, burning, grinding and possibly machining. Refer to ANSI Z49.1

PRODUCT
Nickel

SECTION 6 - HEALTH HAZARD DATA

NOTE: STEEL PRODUCTS IN THE NATURAL STATE DO NOT PRESENT AN INHALATION, INGESTION OR CONTACT HAZARD. HOWEVER, OPERATIONS SUCH AS BURNING, WELDING, SAWING, BRAZING AND GRINDING MAY RELEASE FUMES AND/OR DUSTS WHICH MAY PRESENT HEALTH HAZARDS IF TLV'S ARE EXCEEDED.

MAJOR EXPOSURE HAZARD:

☒ INHALATION ☐ SKIN CONTACT ☐ SKIN ABSORPTION ☐ EYE CONTACT ☐ INGESTION

EFFECTS OF OVEREXPOSURE

Short term exposure to fumes/dust may produce irritation of eyes and respiratory system. Inhalation of high concentrations of freshly formed oxide fumes of iron, manganese and copper may cause metal fume fever characterized by a metallic taste in the mouth, dryness and irritation of the throat and influenza-like symptoms.

Chronic inhalation of high concentrations of iron oxide fumes or dust may lead to a benign pneumoconiosis (siderosis). Inhalation of high concentrations of ferric oxide may possibly enhance the risk of lung cancer development in workers exposed to pulmonary carcinogens.

Chromium and nickel and their compounds are listed in the 3rd Annual Report on carcinogens, as prepared by the National Toxicology Program (NTP). Exposure to high concentrations of dust and fumes can cause sensitization dermatitis, inflammation and/or ulceration of upper respiratory tract and possibly cancer of nasal passages and lungs.

Recent epidemiological studies of workers melting and working alloys containing nickel/chromium have found no increased risk of cancer.

Suspected Cancer Agent? ____NO: This product's ingredients are not found in the lists below.
_X_ YES: ____Federal OSHA _X_ NTP ____IARC

EMERGENCY AND FIRST AID PROCEDURES

If exposed to excessive levels of metal fumes, remove to fresh air, seek medical aid immediately.

Eyes - Flush with water for at least 15 minutes.

SECTION 7 - SPILL OR LEAK PROCEDURES

SPILL OR LEAK PROCEDURES

NA

WASTE DISPOSAL METHODS

According to local, state and federal regulations.

SECTION 8 - SPECIAL PROTECTION

RESPIRATORY

NIOSH/MSHA - Approved dust and fume, respirator should be used to avoid excessive inhalation of particulates when exposure exceeds TLV's.

VENTILATION

Local exhaust ventilation should be utilized when welding, burning, sawing, brazing, grinding or machining when exposure exceeds TLV's.

EYE PROTECTION AND PROTECTIVE CLOTHING

Safety glasses or goggles should be utilized as required by exposure. Other protective equipment should be utilized as required by the welding standards.

SECTION 9 - SPECIAL PRECAUTIONS

In welding, precautions should be taken for airborne contaminants which may originate from components of the welding rod.

Arc or spark generated when welding or burning could be a source of ignition for combustable and flammable materials.

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MATERIAL SAFETY DATA SHEET

ISSUE DATE: November 25, 1985

REVISED: April 1, 1986

INFORMATION AND EMERGENCY NUMBER
(312) 455-7111 (8am - 5pm Mon-Fri)
(312) 455-8986 (After Hour Emergency)

SECTION 1 - PRODUCT IDENTIFICATION

MANUFACTURER'S NAME: Various

PRODUCT NAME / TRADE NAME: Stainless Steel

COMMON NAME / GRADE: 3XX Series, 4XX Series

SECTION 2 - HAZARDOUS INGREDIENTS

NOTE: PRODUCTS UNDER NORMAL CONDITIONS DO NOT REPRESENT AN INHALATION, INGESTION OR CONTACT HEALTH HAZARD.

BASE METAL, ALLOYING ELEMENTS AND METALLIC COATINGS	CAS #	WT % (1)	OSHA PEL	ACGIH TLV (mg/m³) (2)
Base Metal				
Iron (Fe)	7439-89-6	60-88	10	5 (As Iron Oxide)
Alloying Elements				
Chromium (Cr)	7440-47-3	10-30	.5	.5
Nickel (Ni)	7440-02-0	0-27	1	1
Manganese (Mn)	7439-96-5	<6	5	5 (As Dust-Ceiling)
Molybdenum (Mo)	7439-98-7	<6	15	10 (Insoluble Compound)
Copper (Cu)	7440-50-8	<6	1	1 (Dust & Mist)
Titanium (Ti)	7440-32-6	<6	15	10 (Total Dust)
Carbon (C)	7440-44-0	<2	N.E.	N.E.
Phosphorus (P)	7723-14-0	<2	.1	.1 (Yellow)
Sulfur (S)	7704-34-9	<2	13	5 (As SO_2)
Silicon (Si)	7740-21-3	<2	15	10 (Total Dust)
Cobalt (Co)	7440-48-4	<2	.1	.1 (Dust & Fume)
Niobium (Nb)	7440-03-1	<2	5	5 (Tantalum)
Tin (Sn)	7440-31-5	<2	2	2

(1) % OF ALLOYING MATERIAL VARIES WITH GRADE OF MATERIAL.

(2) 1985-1986 ACGIH THRESHOLD LIMIT VALUE.

SECTION 3 - PHYSICAL DATA

MATERIAL IS (AT NORMAL CONDITIONS): Solid

APPEARANCE AND ODOR: Gray-Black, Odorless

MELTING POINT (BASE METAL): >2500 F

SPECIFIC GRAVITY: Approximately 7

SECTION 4 - FIRE AND EXPLOSION

EXTINGUISHING MEDIA: NA

SPECIAL FIRE FIGHTING PROCEDURES: Steel products in the solid state present no fire or explosion hazard.

UNUSUAL FIRE AND EXPLOSION HAZARDS: NA

SECTION 5 - REACTIVITY DATA

STABILITY: Stable

INCOMPATABILITY (MATERIALS TO AVOID): Reacts with strong acids to produce hydrogen gas.

CONDITIONS TO AVOID: NA

HAZARDOUS DECOMPOSITION PRODUCTS: Metallic dust or fumes may be produced during welding, burning, grinding and possibly machining. Refer to ANSI Z49.1

PRODUCT Stainless

SECTION 6 - HEALTH HAZARD DATA

NOTE: STEEL PRODUCTS IN THE NATURAL STATE DO NOT PRESENT AN INHALATION, INGESTION OR CONTACT HAZARD. HOWEVER, OPERATIONS SUCH AS BURNING, WELDING, SAWING, BRAZING AND GRINDING MAY RELEASE FUMES AND/OR DUSTS WHICH MAY PRESENT HEALTH HAZARDS IF TLV'S ARE EXCEEDED.

MAJOR EXPOSURE HAZARD:

☒ INHALATION ☐ SKIN CONTACT ☐ SKIN ABSORPTION ☐ EYE CONTACT ☐ INGESTION

EFFECTS OF OVEREXPOSURE

Short term exposure to fumes/dust may produce irritation of eyes and respiratory system. Inhalation of high concentrations of freshly formed oxide fumes or iron, manganese and copper may cause metal fume fever characterized by a metallic taste in the mouth, dryness and irritation of the throat and influenza-like symptoms.

Chronic inhalation of high concentrations of iron oxide fumes or dust may lead to a benign pneumoconiosis (siderosis). Inhalation of high concentrations of ferric oxide may possibly enhance the risk of lung cancer development in workers exposed to pulmonary carcinogens.

Chromium and nickel and their compounds are listed in the 3rd Annual Report on carcinogens, as prepared by the National Toxicology Program (NTP). Exposure to high concentrations of dust and fumes can cause sensitization dermatitis, inflammation and/or ulceration of upper respiratory tract and possibly cancer of nasal passages and lungs.

Recent epidemiological studies of workers melting and working alloys containing nickel/chromium have found no increased risk of cancer.

Suspected Cancer Agent? ____ NO: This product's ingredients are not found in the lists below.
X YES: ____ Federal OSHA X NTP ____ IARC

EMERGENCY AND FIRST AID PROCEDURES

If exposed to excessive levels of metal fumes, remove to fresh air, seek medical aid immediately.

Eyes - Flush with water for at least 15 minutes.

SECTION 7 - SPILL OR LEAK PROCEDURES

SPILL OR LEAK PROCEDURES

NA

WASTE DISPOSAL METHODS

According to local, state and federal regulations.

SECTION 8 - SPECIAL PROTECTION

RESPIRATORY

NIOSH/MSHA - Approved dust and fume, respirator should be used to avoid excessive inhalation of particulates when exposure exceeds TLV's.

VENTILATION

Local exhaust ventilation should be utilized when welding, burning, sawing, brazing, grinding or machining when exposure exceeds TLV's.

EYE PROTECTION AND PROTECTIVE CLOTHING

Safety glasses or goggles should be utilized as required by exposure. Other protective equipment should be utilized as required by the welding standards.

SECTION 9 - SPECIAL PRECAUTIONS

In welding, precautions should be taken for airborne contaminants which may originate from components of the welding rod.

Arc or spark generated when welding or burning could be a source of ignition for combustable and flammable materials.

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MATERIAL SAFETY DATA SHEET

079 issue 192

Machine

ISSUE DATE: November 25, 1985

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INFORMATION AND EMERGENCY NUMBER:
(312) 455-7111 (8am - 5pm Mon-Fri)
(312) 455-8986 (After Hour Emergency)

SECTION 1 - PRODUCT IDENTIFICATION

MANUFACTURER'S NAME: Various

PRODUCT NAME / TRADE NAME: Titanium

COMMON NAME / GRADE: Titanium CP, Titanium 6-4, etc.

SECTION 2 - HAZARDOUS INGREDIENTS

NOTE: PRODUCTS UNDER NORMAL CONDITIONS DO NOT REPRESENT AN INHALATION, INGESTION OR CONTACT HEALTH HAZARD.

BASE METAL, ALLOYING ELEMENTS AND METALLIC COATINGS	CAS #	WT % (1)	OSHA PEL	ACGIH TLV (mg/m^3) (2)
Base Metal				
Titanium	7440-32-6	46-99	15	10 (Total Dust)
Alloying Elements				
Aluminum (Al)	7429-90-5	0-6	N.E.	10
Vanadium (V)	7440-62-2	0-10	.5	.05 (Respirable Dust)
Iron (Fe)	7439-89-6	0-48	10	5 (As Iron Oxide)
Molybdenum (Mo)	7439-98-7	0-6	15	10 (Insoluble Compound)
Tin (Sn)	7440-31-5	0-5	2	2
Zirconium (Zr)	7440-67-2	0-4	10	5
Manganese (Mn)	7439-96-5	0-5	5	5 (As Dust-Ceiling)
Tantalum (Ta)	7440-25-7	<1	5	5
Titanium 6-2-2-2 + 5-2-2-4-4 + 3-8-6-4-4				
Chromium (Cr)	7440-47-3	2-6	.5	.5
Titanium 2.5 + 6-2-1-1				
Copper (Cu)	7440-50-8	2-2.5	1	1 (Dust and Mist)
Titanium .3 - .8				
Nickel (Ni)	7440-02-0	.8	1	1

(1) % OF ALLOYING MATERIAL VARIES WITH GRADE OF MATERIAL.

(2) 1985-1986 ACGIH THRESHOLD LIMIT VALUE.

SECTION 3 - PHYSICAL DATA

MATERIAL IS (AT NORMAL CONDITIONS): Solid

APPEARANCE AND ODOR: Gray Metallic, Odorless

MELTING POINT (BASE METAL): 1560-1840° C

SPECIFIC GRAVITY: NA

SECTION 4 - FIRE AND EXPLOSION

EXTINGUISHING MEDIA: See Special Precautions

SPECIAL FIRE FIGHTING PROCEDURES: See Special Precautions

UNUSUAL FIRE AND EXPLOSION HAZARDS:
This product does not burn, however, grinding or polishing this product in the absence of oxygen, such as under water, can result in a finely divided waste which is ignitable.

SECTION 5 - REACTIVITY DATA

STABILITY: Stable

INCOMPATABILITY (MATERIALS TO AVOID): Nitric Acid

CONDITIONS TO AVOID:
Corrosion caused by red fuming nitric acid will explode on exposure to friction or heat. See Special Precautions.

HAZARDOUS DECOMPOSITION PRODUCTS:
Metallic dust or fumes may be produced during welding, burning, grinding and possibly machining. Refer to ANSI Z49.1

PRODUCT Titanium

SECTION 6 - HEALTH HAZARD DATA

NOTE: STEEL PRODUCTS IN THE NATURAL STATE DO NOT PRESENT AN INHALATION, INGESTION OR CONTACT HAZARD. HOWEVER, OPERATIONS SUCH AS BURNING, WELDING, SAWING, BRAZING AND GRINDING MAY RELEASE FUMES AND/OR DUSTS WHICH MAY PRESENT HEALTH HAZARDS IF TLV'S ARE EXCEEDED.

MAJOR EXPOSURE HAZARD:

☒ INHALATION ☐ SKIN CONTACT ☐ SKIN ABSORPTION ☐ EYE CONTACT ☐ INGESTION

EFFECTS OF OVEREXPOSURE

The toxicity of titanium dioxide has been found to be relatively inert. Skin contact with titanium dust may cause physical abrasian. Eye contact with pure material has shown particulate irritation.

Aluminum and molybdenum dust/fines and fumes are low health risk by inhalation and should be treated as a nuisance dust.

Inhalation of high concentrations of freshly formed oxide fumes of iron, manganese and copper may cause metal fume fever, characterized by a metallic taste in the mouth, dryness and irritation of the throat and influenza-like symptoms.

Chromium and nickel and their compounds are listed in the 3rd Annual Report on carcinogens, as prepared by the National Toxicology Program (NTP). Exposure to high concentrations of dust and fumes can cause sensitization dermatitus, inflammation and/or ulceration of upper respiratory tract and possible cancer of nasal passages and lungs.

Recent epidemiological studies of workers melting and working alloys containing nickel/chromium have found no increased risk of cancer.

Suspected Cancer Agent? ____ NO: This product's ingredients are not found in the lists below.
X YES: ____ Federal OSHA X NTP ____ IARC

EMERGENCY AND FIRST AID PROCEDURES

If exposed to excessive levels of metal fumes, remove to fresh air, seek medical aid immediately.

Eyes - Flush with water for at least 15 minutes.

SECTION 7 - SPILL OR LEAK PROCEDURES

SPILL OR LEAK PROCEDURES

NA

WASTE DISPOSAL METHODS

According to local, state and federal regulations.

SECTION 8 - SPECIAL PROTECTION

RESPIRATORY

NIOSH/MSHA - Approved dust and fume, respirator should be used to avoid excessive inhalation of particulates when exposure exceeds TLV's.

VENTILATION

Local exhaust ventilation should be utilized when welding, burning, sawing, brazing, grinding or machining when exposure exceeds TLV's.

EYE PROTECTION AND PROTECTIVE CLOTHING

Safety glasses or goggles should be utilized as required by exposure. Other protective equipment should be utilized as required by the welding standards.

SECTION 9 - SPECIAL PRECAUTIONS

If ignitable waste is generated, special precautions and firefighting procedures should be followed:

1) Keep work areas free of the waste.
2) Store wet and keep away from heat and open flame - maintain humidity above 50% to prevent an electrostatic build-up.
3) No smoking in area.
4) Use non-sparking metal equipment.
5) Extinguishing media: dry chemical powders, salts or inert gas. Do not use water or liquid: explosion hazard could result.

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CASTROL INDUSTRIAL INC.

MATERIAL SAFETY DATA SHEET

Emergency Phone No.: (708) 241-4000

Information Phone No.: (708) 241-4000

FIRE 1 HEALTH 1 0 REACTIVITY 0 SPECIAL

I. MATERIAL IDENTIFICATION

PRODUCT TRADE NAME: MOLY-DEE** TAPPING FLUID
MANUFACTURER: CASTROL INDUSTRIAL INC.
ADDRESS: 1001 WEST 31ST STREET DOWNERS GROVE IL, 60515-1280
MFG. FACILITY ADDRESS:
Preparer: Andrew Lum Preparation Date: 08/30/1993

II. HAZARDOUS INGREDIENTS

MATERIAL OR COMPONENTS	%	CAS No.	TLV (ACGIH)	PEL (OSHA)
Alkanes, chloro	30-50	61788-76-9	See Section IX	See Section IX
Distillates (petroleum), solvent-refined heavy naphthenic	10-30	64741-96-4	5mg/K3 (mist)	5 mg/M3 (mist)

Contains no other ingredients now known to be hazardous as defined by OSHA 29 CFR 1910.1000 (subpart z) and OSHA CFR 29 1910.1200.

III. PHYSICAL PROPERTIES

APPEARANCE & ODOR: Dark grey oil, slight oily odor.
BOILING POINT 'F ('C): >500 >259.97
MELTING POINT 'F ('C): N/A
SPECIFIC GRAVITY (H20=1): 1.05 t 0.01
VAPOR PRESSURE: Negligible @ 70'F
VAPOR DENSITY (AIR=1): N/A
EVAPORATION RATE (BUTYL ACETATE=1): Negligible
%VOLATILES BY VOLUME: Negligible
VOC: 053.45 g/L 00.446 Lbs/gaLLon
SOLUBILITY IN H20: Insoluble
pH AS IS: N/A
pH (DILUTE): N/A @ 0 %

IV. FIRE AND EXPLOSION HAZARDS

FLASHPOINT (method used)
310'F >154.43' CDC
FLAMMABLE LIMITS
LEL NA UEL NA
EXTINGUISHING MEDIA: Carbon dioxide, dry chemical, foam.
SPECIAL FIRE FIGHTING PROCEDURES:
Treat as mineral oil fire. Wear self contained breathing apparatus when fire fighting in a confined space. CooL fire exposed containers with waterspray to prevent rupture.
UNUSUAL FIRE & EXPLOSION HAZARDS: None known.
CONTAINER HANDLING: DO NOT CUT OR WELD EMPTY DRUMS UNLESS THOROUGHLY CLEANED.

SDS NUMBER: molydee REVISED: 02/15/1995
Registered in the U.S. Patent & Trademark Office

V. REACTIVITY DATA

TABILITY:
abLe under normal conditions.
CONVITIONS TO AVOID: None Known.
INCOMPATIBILITES:
Strong oxidizing agents.
HAZARDOUS DECOMPOSITION: Potential combustion products are HCL (gas) and oxides of carbon and sulfur.
HAZARDOUS POLYMERIZATION: Will Not Poymerize

VI. HEALTH HAZARD SUMMARY

ROUTES OF EXPOSURE AND EFFECTS OF OVEREXPOSURE
EYES:
May cause eye irritation.

SKIN ABSORPTION:
No acute effects expected.

SKIN CONTACT:
May cause skin irritation.

INHALATION:
TLV for product not established. Refer to Hazardous Materials List for ingredient TLV'S.

INGESTION:
al LD50 not established. Do not ingest.

CHRONIC EFFECTS:
Prolonged or repeated contact with petroLeLn oil may remove natural oils and fats from the skin.

THRESHOLD LIMIT VALUE: Not established for this product.
CONTAINS KNOWN CARCINOGENS: no NTP: no IARC: no OSHA: no

EMERGENCY AND FIRST AID PROCEDURES
EYES:
In case of contact, flush eyes with plenty of water. Get medical attention if irritation persists.

SKIN:
Wash skin with soap and water. If irritation occurs, get medical attention. Wash clothing before reuse.

INHALATION:
If respiratory discomfort or irritation occurs, move the person to fresh air. See a doctor if discomfort or irritation continues.
INGESTION:
Do not induce vomiting; get medical attention immediately.

VII. CONTROL MEASURES

RESPIRATORY PROTECTION:
Good industrial hygiene practices recommend that engineering controls be used to reduce environmental concentrations to the threshold limit value (TLV) or permissible exposure limit (PEL). If any associated TLV or PEL is exceeded, provide NIOSH approved respiratory protection.

GLOVES:
Impervious gloves such as rubber should be used when handling this product.

EYE PROTECTION:
Safety glasses with side shield or chemical goggles.

OTHER:
Eyewash facility. Appropriate clothing to avoid skin contact.

VIII. PRECAUTIONS

CONTAINMENT PROCEDURES:
Recover free liquid or absorb spill with inert material (e.g. dry sand or earth) then place in chemical waste container. Keep product out of streams and waterways by diking or impounding. Advise authorities if product has entered or may enter sewers, watercourses or extensive land areas.
WASTE DISPOSAL PROCEDURES:
Dispose of in accordance with local, state and federal regulations. Disposal of this material to the land may be banned by federal Law (40 CFR 268).

STORAGE AND HANDLING PROCEDURES:
Avoid contact with skin and eyes. Avoid breathing mists. Do not take internally. Keep container closed when not in use. Bring product to room temperature before use. Do not store near heat, flame or strong oxidizing agents.

RCRA HAZARDOUS WASTE DESIGNATION:
This material is regulated as used oil by the EPA. Under the Used Oil Management Standards (40 CFR 279) effective 3/8/93, EPA presumes used oil will be recycled. If it is, no characteristic determination is rea'uired provided all parties handling the used oil comply with part 279. These management standards apply to used oil until it is disposed of or sent for disposal. Individual state regulations may differ from the federal regulations. Refer to applicable state & Local regulations for proper handling procedures.
CERCLA REPORTABLE QUANTITY:
This product does not contain any CERCLA regulated materials.

IX. OTHER HAZARD INFORMATION

PETROLEUM OIL: STEL = 10 mg/M3. Using terminology of the International Agency for Research on Cancer (IARC), the petroleum distillates Listed in Section II are classified by the supplier as severely processed. Not all those listed in Section II may be present. The supplier has stated that these distillates do not require a carcinogen label as defined by OSHA 29 CFR 1910.1200.

IX. OTHER HAZARD INFORMATION (CONT.)

Chlorinated Paraffin
The specific chlorinated paraffin included in this product has not been tested or proven to cause adverse health effects. Other chlorinated paraffins have been tested and show evidence of carcinogenicity in laboratory animals via ingestion.

X. ADDITIONAL REGULATORY INFORMATION

OCCUPATIONAL SAFETY and HEALTH ADMINISTRATION (OSHA)
29 CFR 1910.1200 Hazardous Chemical: yes
SUPERFUND AMENDMENT AND REAUTHORIZATION ACT Of 1966 (SARA)
Section 302, Extremely Hazardous Substance: no
Section 311, Hazardous Chemical: yes
Immediate: no Delayed: yes Fire: no Sudden ReLease: no Reactive: no
Section 313, Toxic Chemical: yes
Chlorinated Paraffin, CAS No. 61788-76-9, 3%
TOXIC SUBSTANCES CONTROL ACT (TSCA)
This product is a mixture and is NOT Listed in the TSCA inventory. The individual ingredients in the product are Listed in the TSCA Inventory.

DEPARTMENT OF TRANSPORTATION (DOT)
PROPER SHIPPING NAME : NOT REGULATED (IN CONTAINERS < 110 GALLONS)
HAZARD CLASS (49 CFR 172.101): N/A (IN CONTAINERS < 110 GALLONS)
HAZARD ID NUMBER: N/A (IN CONTAINERS < 110 GALLONS)
FREIGHT CLASS
NMFC 155250, PETROLEUM OILS, GREASES & RELATED PRODUCTS, NOI CLASS 65

DISCLAIMER
Information presented herein has been compiled from information provided to us by our suppliers and other sources considered to be dependable and is accurate and reliable to the best of our knowledge and belief but is not guaranteed to be so. Nothing herein is to be construed as recommending any practice or the use of any product in violation of any patent or in violation of any Law or regulation. It is the users' responsibility to determine the suitability of any material for a specific purpose and to adopt such safety precautions as may be necessary. We make no warranty as to the results to be obtained in using any material and since conditions of use are not under our control, we must necessarily disclaim all liability with respect to the use of any material supplied by us.

 MATERIAL SAFETY DATA SHEET (M S D S) Printed : 02/20/95
For Oils, Greases and Related Lubricating Materials
Revised : 10/08/90

SECTION I - PRODUCT IDENTIFICATION

Manufacturer: CATO OIL AND GREASE CO. Information Phone: 405-270-6200
P.O. BOX 26868 Emergency Phone: 800-424-9300
915 M.L. KING BLVD. CHEMTREC Phone: 800-424-9300
OKLAHOMA CITY OK 73126

Trade Name MYSTIK JT-6 MULTI-PURPOSE GREASE
Product Class: PETROLEUM HYDROCARBONS

! Hazard Ratings: Health - 1
! none -> extreme Fire - 1
! 0 --- > 4 Reactivity - 0
Product Code : 5484B-001 !
C.A.S. Number: COMPLEX MIXTURE ! Personal Protection - B

SECTION II - HAZARDOUS INGREDIENTS

Ingredients	CAS	Weight %	Exposure Limits ACGIH/TLV		OSHA/PEL		VP mm HG
PETROLEUM HYDROCARBON	64742-53-6	20-50	5	mg/M3	5	mg/M30	
		STEL-	10		10		
PETROLEUM HYDROCARBON	64742-53-6	5-20	5	mg/M3	5	mg/M30	
		STEL-	10		10		
CALCIUM STEARATE	3159-62-4	5-20		PPM	NONE	ppm 0	
		STEL-			NONE		
*ORGANIC ANTIMONY COMP	UNKNOWN	1-5	0.5	mg/M3	0.5	mg/M3N/AV	
POLYMER SOLUTION	PROPRIETARY	50-75	5	mg/M3	5	mg/M30	
		STEL-	10		10		

THIS ORGANIC ANTIMONY COMPOUND INGREDIENT CONTAINS 50% ANTIMONY COMPOUND-CONTAINS 6.8% ANTIMONY AND IS SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT.

ALL Ingredients in this product are listed in the T.S.C.A. Inventory.
SARA 311/312 CATEGORY - HEALTH HAZARD IMMEDIATE.
SARA 313- CONTAINS ORGANOMETALLIC ANTIMONY COMPOUND; SEE SECTION II FOR DETAILS.
INGREDIENTS ARE PROPRIETARY. POTENTIAL HAZARDS HAVE BEEN EVALUATED AND PERTINENT INFORMATION HAS BEEN INCLUDED IN SECTIONS III-IX. EACH PROPRIETARY MATERIAL IS EITHER: 1. HELD A TRADE SECRET FROM CATO, 2. OSHA-NON-HAZARDOUS OR BELOW 1% IF OSHA HAZARDOUS AND 3. BELOW 0.1% IF POTENTIALLY CARCINOGENIC.
These items are listed on the SARA TITLE III Section 313 inventory

SECTION III - PHYSICAL DATA

Boiling Range: N/A Deg. F
Vapor Density: Heavier than Air.
Evap. Rate: Slower than n-Butyl Acetate
Liquid Density: Lighter than Water.
Volatiles volume: N/AV %
Wgt per gallon: 7.4 Pounds.
Spec. Gravity: 0.89
Appearance: AMBER GREASE
V.O.C.: N/A

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flammability Class: 1 Flash Point: N/A LEL: N/AV

-EXTINGUISHING MEDIA:
CARBON DIOXIDE, DRY CHEMICAL OR FOAM.
-SPECIAL FIREFIGHTING PROCEDURES:
WATER STREAM MAY SPREAD FIRE, USE WATER SPRAY ONLY TO COOL CONTAINERS NOT ON FIRE.
-UNUSUAL FIRE & EXPLOSION HAZARDS:
WILL NOT FLASH SPONTANEOUSLY. MAY IGNITE IF EXPOSED TO OPEN FLAME.
BURNING OF ORGANIC ANTIMONY COMPONENT MAY PRODUCE OXIDES OF ANTIMONY, SULFUR AND NITROGEN.

SECTION V - HEALTH HAZARD DATA

-PERMISSIBLE EXPOSURE LEVEL:
TWA = 5 MG/M3; STEL = 10 MG/M3--AS OIL MIST--RESPIRATORY IRRITANT. SEE SECTION II FOR CONCISE INFORMATION CONCERNING INGREDIENTS HAVING A PEL. ALSO NOTE ANTIMONY COMPOUNDS HAVE A TWA OF 0.5 MG/M3 AS ANTIMONY.
-EFFECTS OF OVEREXPOSURE:
INHALATION: NOT EXPECTED TO BE ACUTELY TOXIC BY INHALATION. BREATHING PETROLEUM OIL MIST AT CONCENTRATIONS IN AIR THAT EXCEED THE RECOMMENDED EXPOSURE STANDARD CAN CAUSE RESPIRATORY IRRITATION OR DISCOMFORT. LIKEWISE, BREATHING ANTIMONY VAPORS ABOVE THE RECOMMENDED EXPOSURE STANDARD MAY BE HARMFUL.

SKIN: MAY CAUSE IRRITATION BASED ON DATA FROM COMPONENTS. PRIMARY HAZARD ASSOCIATED WITH GREASE IN HIGH PRESSURE GUN. IF INJECTED UNDER SKIN, NECROSIS COULD RESULT.
EYES: MAY CAUSE EYE IRRITATION BASED ON DATA FROM COMPONENTS.
SWALLOWING/INGESTION: MAY CAUSE IRRITATION, NAUSEA OR DIARRHEA. POSSIBLE ASPIRATION HAZARD.
MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: NONE KNOWN, BUT MAY AGGRAVATE PREVIOUSLY EXISTING SKIN DISORDERS.
LISTED AS A POTENTIAL CARCINOGEN OR CARCINOGEN? NOT LISTED BY IARC, NTP, OR OSHA.
ORGANIC ANTIMONY COMPONENT MAY CAUSE EYE OR SKIN IRRITATION.

-FIRST AID:
INHALATION: IF RESPIRATORY DISCOMFORT OR IRRITATION OCCURS, MOVE PERSON TO FRESH AIR. IF BREATHING HAS STOPPED, GIVE ARTIFICIAL RESPIRATION AND GET MEDICAL ATTENTION IMMEDIATELY.

SKIN: WASH EXPOSED PORTION WITH SOAP AND WATER. LAUNDER SOILED CLOTHES BEFORE REUSE. IF INJECTED UNDER THE SKIN, GET MEDICAL ATTENTION IMMEDIATELY.

EYES: IMMEDIATELY FLUSH EYES WITH WATER FOR A MINIMUM OF 15 MINUTES OCCASIONALLY LIFTING THE LOWER AND UPPER LIDS. IF FILM OR IRRITATION PERSISTS, SEEK MEDICAL ATTENTION.

SWALLOWING/INGESTION: DO NOT INDUCE VOMITING; CONTACT A PHYSICIAN.

SECTION VI REACTIVITY DATA

STABILITY: [ ] Unstable [x] Stable
HAZARDOUS POLYMERIZATION: May occur [x] Will not occur
-INCOMPATIBILITY
STRONG OXIDIZERS.
-CONDITIONS TO AVOID:
AVOID CONDITIONS THAT COULD GENERATE AN OIL MIST. DO NOT EXPOSE THE PRODUCT TO STRONG OXIDIZERS OR EXCESSIVE HEAT.
-HAZARDOUS DECOMPOSITION PRODUCTS:
INCOMPLETE COMBUSTION CAN YIELD CARBON (SMOKE), CARBON MONOXIDE, VARIOUS HYDROCARBONS AND OXIDES OF ANTIMONY. OTHER TOXIC GASES, VAPORS AND SOLID RESIDUES MAY EVOLVE ON BURNING.

SECTION VII - SPILL OR LEAK PROCEDURES

-STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
PICK UP AND PLACE IN CONTAINER FOR DISPOSAL.
-WASTE DISPOSAL METHOD:
EPA HAZARDOUS WASTE? NO
EPA HAZARDOUS WASTE CODE NUMBER--NOT APPLICABLE
EPA WASTE CHARACTERISTIC OR HAZARD CODE--NOT APPLICABLE

UTILIZE LICENSED WASTE DISPOSAL COMPANY. CONSIDER RECYCLING OR CONTROLLED INCINERATION. UTILIZE PERMITTED INDUSTRIAL WASTE DISPOSAL SITE. FOLLOW ALL LOCAL, STATE AND FEDERAL GUIDELINES.

SECTION VIII - SPECIAL PROTECTION INFORMATION:

RESPIRATORY PROTECTION:
UP To 25 MG/M3, HALF-MASK ORGANIC VAPOR RESPIRATOR. UP TO
, MG/m3, FULL-FACE ORGANIC VAPOR RESPIRATOR OR FULL-FACE
SELF-CONTAINED RESPIRATOR. GREATER THAN 50 MG/M3, FIRE
FIGHTING OR UNKNOWN CONCENTRATION, USE SELF-CONTAINED
BREATHING APPARATUS WITH POSITIVE PRESSURE.
-VENTILATION:
MAINTAIN LOCAL OR DILUTION VENTILATION TO KEEP AIR CONCENTRATION
BELOW PEL/TLV. REQUEST ASSISTANCE OF SAFETY AND INDUSTRIAL
HYGIENE PERSONNEL TO DETERMINE AIR CONCENTRATION.
-PROTECTIVE GLOVES:
FOR PROLONGED CONTACT OR REPEATED CONTACT, USE NITRILE,
NEOPRENE GLOVES OR OTHER MATERIAL RESISTANT TO
PETROLEUM OILS.
-EYE PROTECTION:
SAFETY GLASSES, CHEMICAL GOGGLES OR FACE SHIELD AS APPROPRIATE
FOR EXPOSURE.
-OTHER PROTECTIVE EQUIPMENT:
NONE NORMALLY REQUIRED.

SECTION IX - SPECIAL PRECAUTIONS

-PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:
STORE CLEAN, DRY, BELOW 120'F (50'C) TO PRESERVE FOR INTENDED
USE. DO NOT STORE WITH STRONG OXIDIZERS.

OID BREATHING OIL MISTS OR OTHER VAPORS. AVOID CONTACT
TH SKIN AND EYES. USE WITH ADEQUATE VENTILATION.
THER PRECAUTIONS:
DOT HAZARDOUS MATERIAL? NO
DOT SHIPPING NAME AND NUMBER - NOT APPLICABLE
DOT HAZARD CLASS - NOT APPLICABLE

RECOMMENDED CUSTOMER WARNING:
WARNING: CONTAINS PETROLEUM HYDROCARBON LUBRICANT AND ORGANIC
ANTIMONY COMPOUND. MAY CAUSE EYE OR SKIN IRRITATION. WASH
SKIN WITH SOAP AND WATER. FLUSH EYES WITH WATER FOR A MINIMUM
OF 15 MINUTES, OCCASIONALLY LIFTING THE LOWER AND UPPER LIDS.
IF FILM OR IRRITATION PERSISTS, SEEK MEDICAL ATTENTION. MAY
BE HARMFUL IF INHALED OR SWALLOWED. USE ONLY WITH ADEQUATE
VENTILATION. IF INGESTED, DO NOT INDUCE VOMITING, CONTACT
A PHYSICIAN. KEEP AWAY FROM CHILDREN.
RECOMMENDED OSHA WARNING: CONTAINS PETROLEUM HYDROCARBON LUBRICANT AND ORGANIC
ANTIMONY COMPOUND. MAY CAUSE EYE OR SKIN IRRITATION. MAY BE
HARMFUL IF INHALED OR SWALLOWED. USE ONLY WITH ADEQUATE
VENTILATION.
FIRST AID: SKIN CONTACT - WASH EXPOSED PORTIONS WITH SOAP AND
WATER. INHALATION - REMOVE TO FRESH AIR. IF BREATHING HAS
STOPPED, GIVE ARTIFICIAL RESPIRATION AND GET MEDICAL ATTENTION
IMMEDIATELY. INGESTION - DO NOT INDUCE VOMITING; CONTACT A

-OTHER PRECAUTIONS: (cont.)
PHYSICIAN. EYE CONTACT - FLUSH WITH WATER FOR AT LEAST 15 MINUTES. IF FILM OR IRRITATION PERSISTS, SEEK MEDICAL ATTENTION.
CAUTION: EMPTY CONTAINERS RETAIN RESIDUE. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE THIS CONTAINER TO HEAT, FLAME, SPARKS OR OTHER SOURCES OF IGNITION. DO NOT ATTEMPT TO CLEAN. EMPTY DRUMS SHOULD BE COMPLETELY DRAINED, PROPERLY BUNGED, AND PROMPTLY RETURNED TO A DRUM RECONDITIONER.

KEEP AWAY FROM CHILDREN.

REFER TO THE MATERIAL SAFETY DATA SHEET FOR ADDITIONAL INFORMATION.

DISCLAIMER

THE INFORMATION AND RECOMMENDATIONS CONTAINED IN THIS PUBLICATION HAVE BEEN COMPILED FROM SOURCES BELIEVED TO BE RELIABLE AND TO REPRESENT THE BEST CURRENT OPINION ON THE SUBJECT AT THE TIME OF PUBLICATION. SINCE WE CANNOT ANTICIPATE OR CONTROL THE MANY DIFFERENT CONDITIONS UNDER WHICH THIS INFORMATION OR OUR PRODUCTS MAY BE USED, WE MAKE NO GUARANTEE THAT THE RECOMMENDATIONS WILL BE ADEQUATE FOR ALL INDIVIDUALS OR SITUATIONS. EACH USER OF THE PRODUCT DESCRIBED HEREIN SHOULD DETERMINE THE SUITABILITY OF THE DESCRIBED PRODUCT FOR HIS PARTICULAR PURPOSE AND SHOULD COMPLY WITH ALL FEDERAL, STATE AND LOCAL RULES AND REGULATIONS CONCERNING THE DESCRIBED PRODUCT.

ABBREVIATIONS:

N/A	NOT APPLICABLE		PEL PERMISSIBLE EXPOSURE LIMIT
N/K	NOT KNOWN		TWA TIME WEIGHTED AVERAGE
+I/AV	NOT AVAILABLE		TLV THRESHOLD LIMIT VALUE
coc	CLEVELAND OPEN	CUP	STEL SHORT TERM EXPOSURE LIMIT
PMCC	PENSKI-MARTENS	CLOSED CUP	
G	GRAM	DOT DEPARTMENT OF TRANSPORTATION	
MG	MILLIGRAM	OSHA OCCUPATIONAL SAFETY & HEALTH ADMIN.	
M3	CUBIC METER	SARA SUPERFUND AMEND. & REAUTHORIZ. ACT	
LD 50	LETHAL DOSE 50%		
LC 50	LETHAL CONCENTRATION 50%		
EPA	ENVIRONMENTAL PROTECTION AGENCY		
SAE	SOCIETY OF AUTOMOTIVE ENGINEERS		
ISO	INTERNATIONAL STANDARDS ORGANIZATION		

MSDS SP-V12

HMIS RATING

HEALTH	:2	least	:0
FLAMMABILITY	:3	slight	:1
REACTIVITY	:0	moderate	:2
		high	:3
		extreme	:4

PERSONAL PROTECTION: GOGGLES, SOLVENT RESISTANT GLOVES, RESPIRATOR AS REQUIRED.

MATERIAL SAFETY DATA SHEET

MANUFACTURER:

CHEMICAL COATINGS & ENGINEERING CO., INC. PHONE: (215) 566-7470
221 BROOKE ST. MEDIA, PA 19063 DATE OF PREPARATION: 12/18/85

SECTION I - PRODUCT IDENTIFICATION

PRODUCT NUMBER: SP-V12 (GE DESIGNATION A50CD498) COMPONENT I
PRODUCT NAME: SP-V12 FLUORELASTER COATING
PRODUCT CLASS: FLUOROELASTOMER SEALANT FOR ELECTRICAL APPLICATIONS

SECTION II HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT BY WT.	C.A.S. REGISTRY NO.	OCCUPATIONAL EXPOSURE LIMITS TLV-TWA
METHYL ETHYL KETONE	46	78-93-3	200ppm
METHYL ISOBUTYL KETONE	25.8	108-10-1	100ppm

SECTION III PHYSICAL DATA

BOILING RANGE 175° VAPOR DENSITY- HEAVIER THAN AIR
EVAPORATION RATE(n-butyl acetate=1) 5.6
% VOLATILE (VOLUME) 86.6 WT/GAL 8.1LBS.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY CLASSIFICATION OSHA FLAMMABLE LIQUID - CLASS IB
DOT FLAMMABLE LIQUID
FLASH POINT 21°F (TCC) LEL %VOLUME IN AIR 1.4 UEL 10

EXTINQUISHING MEDIA: USE WATER SPRAY TO COOL FIRE EXPOSED SURFACES, PROTECT PERSONNEL, AND DISPERSE VAPORS. EXTINQUISH WITH ALCOHOL TYPE FOAM AND/OR DRY CHEMICAL. TRY TO COVER SPILLS WITH FOAM.

UNUSUAL FIRE OR EXPLOSION HAZARDS: VAPORS ARE HEAVIER THAN AIR AND MAY ACCUMULATE IN LOW AREAS OR AREAS INADEQUATELY VENTILATED.

SPECIAL FIREFIGHTING PROCEDURES: EVACUATE HAZARD AREA OF UNPROTECTED PERSONNEL. WEAR PROPER PROTECTIVE CLOTHING INCLUDING A NOISH APPROVED SELF-CONTAINED BREATHING APPARATUS. COOL FIRE-EXPOSED CONTAINERS WITH WATER.
KEEP CONTAINERS TIGHTLY CLOSED
ISOLATE FROM HEAT SPARKS, ELECTRICAL EQUIPMENT, AND OPEN FLAME
DO NOT APPLY TO HOT SURFACES

SECTION V HEALTH HAZARD DATA

EYE CONTACT: IF NOT REMOVED PROMPTLY WILL INJURE EYE TISSUE WHICH MAY RESULT IN PERMANENT DAMAGE

SKIN CONTACT: PROLONGED AND REPEATED CONTACT CAN CAUSE DEFATTING AND DRYING OF THE SKIN WHICH MAY RESULT IN SKIN IRRITATION AND DERMATITIS.

INGESTION: NOT A PROBABLE SOURCE OF CONTACT

EMERGENCY AND FIRST AID PROCEDURES:

EYE CONTACT: IMMEDIATELY FLUSH WITH LARGE AMOUNTS OF WATER FOR 15 MINUTES WHILE HOLDING EYELID OPEN. GET PROMPT MEDICAL ATTENTION.

SKIN CONTACT: WASH WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING AND DO NOT REUSE UNTIL CLEANED. IF PERSISTENT IRRITATION OCCURS GET MEDICAL ATTENTION.
INGESTION: DO NOT INDUCE VOMITING. GET MEDICAL ATTENTION.

SECTION VI REACTIVITY DATA

STABILITY: STABLE HAZARDOUS POLYMERIZATION WILL NOT OCCUR

HAZARDOUS DECOMPOSITION PRODUCTS: HYDROGEN FLUORIDE AND TOXIC FLUOROCARBON OLEFINS EVOLVED ABOVE 200°C AND DURING COMBUSTION. CO, CO_2.
CONDITIONS TO AVOID: TEMPERATURES ABOVE 200°C (vulcanized compound). DO NOT APPLY NEAR SOURCES OF IGNITION. DO NOT APPLY NEAR WELDING.
INCOMPATIBILITY (MATERIALS TO AVOID): STRONG OXIDIZING AGENTS, CAUSTICS, AMMONIA, CHLORINATED COMPOUNDS

SECTION VII SPILL AND LEAK PROCEDURES

ELIMINATE ALL SOUCES IF IGNITION: SUCH AS FLAME, ELECTRICAL SPARKS, OPEN LIGHTS, PILOT LIGHTS, ETC.
SCRAPE UP SPILL USING NON-SPARKING TOOLS.
WASTE DISPOSAL METHOD: DISPOSAL SHOULD BE DONE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS.

SECTION VIII SAFE HANDLING AND USE INFORMATION

IN RESTRICTED VENTILATION AREAS PROVIDE ADEQUATE VENTILATION. IF THE EXPOSURE MAY OR DOES EXCEED OCCUPATIONAL EXPOSURE LIMITS (SECTION II) USE A NOISH APPROVED RESPIRATOR TO PREVENT OVEREXPOSURE. IN ACCORD WITH 29 CFR 1910.134 USE EITHER AN ATMOSPHERE-SUPPLYING RESPIRATOR OR AN AIR-PURIFYING RESPIRATOR FOR ORGANIC VAPORS.
PROTECTIVE CLOTHING: WEAR IMPERVIOUS GLOVES AND PROTECTIVE CLOTHING AS REQUIRED TO PREVENT SKIN CONTACT. WEAR CHEMICAL GOGGLES TO PREVENT EYE CONTACT.
USE EXPLOSION PROOF VENTILATION AS REQUIRED TO CONTROL VAPOR CONCENTRATION.
WASH HANDS THOROUGHLY BEFORE EATING, HANDLING FOOD, OR SMOKING.
PERSONAL HYGIENE: MINIMIZE BREATHING VAPOR OR MIST, AVOID PROLONGED CONTACT WITH SKIN. REMOVE CONTAMINATED CLOTHING; LAUNDER OR DRY-CLEAN BEFORE REUSE. REMOVE CONTAMINATED SHOES AND THOROUGHLY CLEAN AND DRY BEFORE REUSE.
CLEANSE SKIN THOROUGHLY AFTER CONTACT, BEFORE BREAKS AND MEALS, AND AT THE END OF THE WORK DAY.

SECTION IX SPECIAL PRECAUTIONS

DO NOT STORE NEAR FIRE OR FLAME. DO NOT STORE ABOVE 90°F
KEEP CONTAINERS TIGHTLY CLOSED. STORE IN WELL VENTILATED AREAS
FOR INDUSTRIAL USE ONLY. KEEP AWAY FROM CHILDREN.
DO NOT APPLY IN THE VICINITY OF WELDING. DO NOT APPLY TO HOT SURFACES.
CONTAINERS MAY RUPTURE IF EXPOSED TO FIRE CONDITIONS.

THE INFORMATION AND RECOMMENDATIONS CONTAINED HEREIN ARE, TO THE BEST OF OUR KNOWLEDGE AND BELIEF, ACCURATE AND RELIABLE AS OF THE DATE ISSUED. CC&E DOES NOT WARRANT OR GUARANTEE THEIR ACCURACY OR RELIABILITY, AND CC&E SHALL NOT BE LIABLE FOR ANY LOSS OR DAMAGE OUT OF THE USE THEREOF.

THE INFORMATION AND RECOMMENDATIONS ARE OFFERED FOR THE USER'S CONSIDERATION AND EXAMINATION, AND IT IS THE USER'S RESPONSIBILITY TO SATISFY ITSELF THAT THEY ARE SUITABLE AND COMPLETE FOR ITS PARTICULAR USE.

S SP-V12 (ACTIVATOR)

HMIS RATING

HEALTH	:2	least	:0
FLAMMABILITY	:3	slight	:1
REACTIVITY	:0	moderate	:2
		high	:3
		extreme	:4

PERSONAL PROTECTION: GOGGLES, SOLVENT RESISTANT GLOVES, RESPIRATOR AS REQUIRED.

MATERIAL SAFETY DATA SHEET

MANUFACTURER:

CHEMICAL COATINGS & ENGINEERING CO., INC. PHONE: (215) 566-7470
221 BROOKE ST. MEDIA, PA 19063 DATE OF PREPARATION: 12/18/85

SECTION I - PRODUCT IDENTIFICATION

PRODUCT NUMBER: SP-V12 (GE DESIGNATION A50CD498) COMPONENT II
PRODUCT NAME: SP-V12 ACTIVATOR
PRODUCT CLASS: FLUOROELASTOMER SEALANT FOR ELECTRICAL APPLICATIONS

SECTION II HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT BY WT.	C.A.S. REGISTRY NO.	OCCUPATIONAL EXPOSURE LIMITS TLV-TWA
METHYL ETHYL KETONE	46	78-93-3	200ppm
METHYL ISOBUTYL KETONE	25.8	108-10-1	100ppm

SECTION III PHYSICAL DATA

BOILING RANGE 175° VAPOR DENSITY- HEAVIER THAN AIR
EVAPORATION RATE(n-butyl acetate=1) 5.6
% VOLATILE (VOLUME) 86.6 WT/GAL 8.1LBS.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY CLASSIFICATION OSHA FLAMMABLE LIQUID - CLASS IB
DOT FLAMMABLE LIQUID
FLASH POINT 21°F (TCC) LEL %VOLUME IN AIR 1.4 UEL 10
EXTINQUISHING MEDIA: USE WATER SPRAY TO COOL FIRE EXPOSED SURFACES, PROTECT PERSONNEL, AND DISPERSE VAPORS. EXTINQUISH WITH ALCOHOL TYPE FOAM AND/OR DRY CHEMICAL. TRY TO COVER SPILLS WITH FOAM.

UNUSUAL FIRE OR EXPLOSION HAZARDS: VAPORS ARE HEAVIER THAN AIR AND MAY ACCUMULATE IN LOW AREAS OR AREAS INADEQUATELY VENTILATED.

SPECIAL FIREFIGHTING PROCEDURES: EVACUATE HAZARD AREA OF UNPROTECTED PERSONNEL. WEAR PROPER PROTECTIVE CLOTHING INCLUDING A NOISH APPROVED SELF-CONTAINED BREATHING APPARATUS. COOL FIRE-EXPOSED CONTAINERS WITH WATER.

KEEP CONTAINERS TIGHTLY CLOSED
ISOLATE FROM HEAT SPARKS, ELECTRICAL EQUIPMENT, AND OPEN FLAME
NOT APPLY TO HOT SURFACES

ASOCD498 Component II

SECTION V HEALTH HAZARD DATA

EYE CONTACT: IF NOT REMOVED PROMPTLY WILL INJURE EYE TISSUE WHICH MAY RESULT IN PERMANENT DAMAGE
SKIN CONTACT: PROLONGED AND REPEATED CONTACT CAN CAUSE DEFATTING AND DRYING OF THE SKIN WHICH MAY RESULT IN SKIN IRRITATION AND DERMATITIS.
INGESTION: NOT A PROBABLE SOURCE OF CONTACT

EMERGENCY AND FIRST AID PROCEDURES:
EYE CONTACT: IMMEDIATELY FLUSH WITH LARGE AMOUNTS OF WATER FOR 15 MINUTES WHILE HOLDING EYELID OPEN. GET PROMPT MEDICAL ATTENTION.
SKIN CONTACT: WASH WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING AND DO NOT REUSE UNTIL CLEANED. IF PERSISTENT IRRITATION OCCURS GET MEDICAL ATTENTION.
INGESTION: DO NOT INDUCE VOMITING. GET MEDICAL ATTENTION.

SECTION VI REACTIVITY DATA

STABILITY: STABLE HAZARDOUS POLYMERIZATION WILL NOT OCCUR

HAZARDOUS DECOMPOSITION PRODUCTS: HYDROGEN FLUORIDE AND TOXIC FLUOROCARBON OLEFINS EVOLVED ABOVE 200°C AND DURING COMBUSTION. CO, CO_2.
CONDITIONS TO AVOID: TEMPERATURES ABOVE 200°C (vulcanized compound). DO NOT APPLY NEAR SOURCES OF IGNITION. DO NOT APPLY NEAR WELDING.
INCOMPATIBILITY (MATERIALS TO AVOID): STRONG OXIDIZING AGENTS, CAUSTICS, AMMONIA, CHLORINATED COMPOUNDS.

SECTION VII SPILL AND LEAK PROCEDURES

ELIMINATE ALL SOUCES IF IGNITION: SUCH AS FLAME, ELECTRICAL SPARKS, OPEN LIGHTS, PILOT LIGHTS, ETC.
SCRAPE UP SPILL USING NON-SPARKING TOOLS.
WASTE DISPOSAL METHOD: DISPOSAL SHOULD BE DONE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS.

SECTION VIII SAFE HANDLING AND USE INFORMATION

IN RESTRICTED VENTILATION AREAS PROVIDE ADEQUATE VENTILATION. IF THE EXPOSURE MAY OR DOES EXCEED OCCUPATIONAL EXPOSURE LIMITS (SECTION II) USE A NOISH APPROVED RESPIRATOR TO PREVENT OVEREXPOSURE. IN ACCORD WITH 29 CFR 1910.134 USE EITHER AN ATMOSPHERE-SUPPLYING RESPIRATOR OR AN AIR-PURIFYING RESPIRATOR FOR ORGANIC VAPORS.
PROTECTIVE CLOTHING: WEAR IMPERVIOUS GLOVES AND PROTECTIVE CLOTHING AS REQUIRED TO PREVENT SKIN CONTACT. WEAR CHEMICAL GOGGLES TO PREVENT EYE CONTACT.
USE EXPLOSION PROOF VENTILATION AS REQUIRED TO CONTROL VAPOR CONCENTRATION.
WASH HANDS THOROUGHLY BEFORE EATING, HANDLING FOOD, OR SMOKING.
PERSONAL HYGIENE: MINIMIZE BREATHING VAPOR OR MIST, AVOID PROLONGED CONTACT WITH SKIN. REMOVE CONTAMINATED CLOTHING: LAUNDER OR DRY-CLEAN BEFORE REUSE. REMOVE CONTAMINATED SHOES AND THOROUGHLY CLEAN AND DRY BEFORE REUSE. CLEANSE SKIN THOROUGHLY AFTER CONTACT, BEFORE BREAKS AND MEALS, AND AT THE END OF THE WORK DAY.

SECTION IX SPECIAL PRECAUTIONS

DO NOT STORE NEAR FIRE OR FLAME. DO NOT STORE ABOVE 90°F
KEEP CONTAINERS TIGHTLY CLOSED. STORE IN WELL VENTILATED AREAS
FOR INDUSTRIAL USE ONLY. KEEP AWAY FROM CHILDREN.

ASDC0498 Enclosure II

DO NOT APPLY IN THE VICINITY OF WELDING. DO NOT APPLY TO HOT SURFACES. CONTAINERS MAY RUPTURE IF EXPOSED TO FIRE CONDITIONS.

THE INFORMATION AND RECOMMENDATIONS CONTAINED HEREIN ARE, TO THE BEST OF OUR KNOWLEDGE AND BELIEF, ACCURATE AND RELIABLE AS OF THE DATE ISSUED. CC&E DOES NOT WARRANT OR GUARANTEE THEIR ACCURACY OR RELIABILITY, AND CC&E SHALL NOT BE LIABLE FOR ANY LOSS OR DAMAGE OUT OF THE USE THEREOF.

THE INFORMATION AND RECOMMENDATIONS ARE OFFERED FOR THE USER'S CONSIDERATION AND EXAMINATION, AND IT IS THE USER'S RESPONSIBILITY TO SATISFY ITSELF THAT THEY ARE SUITABLE AND COMPLETE FOR ITS PARTICULAR USE.

Balancing

NPCA 1-

MATERIAL SAFETY DATA SHEET

FOR COATINGS, RESINS AND RELATED MATERIALS

Approved by U.S. Department of Labor Essentially Similar to Form OSHA-201

DATE OF PREP 5/12/77

73

Section I

MANUFACTURER'S NAME
Commercial Chemical Company

STREET ADDRESS
1021 Summer St.

CITY STATE AND ZIP CODE
Cincinnati, Ohio 45204

EMERGENCY TELEPHONE NO
513-921-8600

PRODUCT CLASS
Petro Chemical

MANUFACTURERS CODE IDENTIFICATION
Bisphenol A and Epichlorohydrin

TRADE NAME
EPO Dynaweight

Section II — HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT	TLV PPM	TLV mg M³	LEL	VAPOR PRESSURE
Silicates and Sulphates	75 & 95				
Polyamides		20 - 40			
Epoxy Resin		35 - 45			
[illegible]ber Filler		10 - 30			
Zinc		5 - 25			

Section III — PHYSICAL DATA

BOILING RANGE 500° F

VAPOR DENSITY [N/A] HEAVIER [ ] LIGHTER THAN AIR

EVAPORATION RATE [N/A] FASTER [ ] SLOWER THAN ETHER

PERCENT VOLATILE BY VOLUME None

WEIGHT PER GALLON Specific Gravity 3.15

Section IV — FIRE AND EXPLOSION HAZARD DATA

DOT CATEGORY
N.O.I.B.N.

FLASH POINT
470° F C.O.C.

LEL

EXTINGUISHING MEDIA
Self Extinguishing ASTM D635-68 Passed

UNUSUAL FIRE AND EXPLOSION HAZARDS

N/A

SPECIAL FIRE FIGHTING PROCEDURES

N/A

Form No. LS9-COS-4

CONAP INC.

CONTROLLED MATERIALS APPLICATIONS
Allegany, New York 14706

MATERIAL SAFETY DATA SHEET

128

SECTION I

MANUFACTURER'S NAME: CONAP, INC.

EMERGENCY TELEPHONE NO.: [redacted]

ADDRESS (Number, Street, City, State, and ZIP Code): 1405 Buffalo Street, Olean, New York 14760

CHEMICAL NAME AND SYNONYMS: Epoxide

TRADE NAME AND SYNONYMS: EASYPOXY K-20 Part A CLEAR

CHEMICAL FAMILY: Filled Epoxy Resin

FORMULA: Proprietary

SECTION II HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)
Epichlorohydrin-polyglycol reaction product		

SECTION III PHYSICAL DATA

BOILING POINT (°F.)		SPECIFIC GRAVITY (H_2O=1)	
VAPOR PRESSURE (mm Hg.)		PERCENT VOLATILE BY VOLUME (%)	
VAPOR DENSITY (AIR=1)		EVAPORATION RATE (_____=1)	
SOLUBILITY IN WATER			

APPEARANCE AND ODOR: Amber paste, characteristic odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS	Lel	Uel

EXTINGUISHING MEDIA
Foam, CO_2, or Dry Chemical

SPECIAL FIRE FIGHTING PROCEDURES
Use water to reduce intensity of flame.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Form No. LSB-OOS-4

CONAP INC.

CONTROLLED MATERIALS APPLICATIONS
Allegany, New York 14706

MATERIAL SAFETY DATA SHEET

127

SECTION I

MANUFACTURER'S NAME: CONAP, INC.	EMERGENCY TELEPHONE NO. [redacted]
ADDRESS (Number, Street, City, State, and ZIP Code): 1405 Buffalo Street, Olean, New York 14760	
CHEMICAL NAME AND SYNONYMS: Amines	TRADE NAME AND SYNONYMS: EASYPOXY K-20 Part B CLEAR
CHEMICAL FAMILY: Filled Amine Hardener	FORMULA: Proprietary

SECTION II HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)
Ammonium compounds		

SECTION III PHYSICAL DATA

BOILING POINT (°F.)		SPECIFIC GRAVITY (H_2O=1)	
VAPOR PRESSURE (mm Hg.)		PERCENT VOLATILE BY VOLUME (%)	
VAPOR DENSITY (AIR=1)		EVAPORATION RATE (_____=1)	
SOLUBILITY IN WATER			

APPEARANCE AND ODOR: Amber paste, ammoniacal odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS	Lel	Uel

EXTINGUISHING MEDIA: CO_2, Dry Chemical or Foam

SPECIAL FIRE FIGHTING PROCEDURES: Use water to reduce flame intensity.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

MATERIAL SAFETY DATA SHEET

CONAP(R)

MSDS No : 6017
DATE : 12/17/93
Supersedes: 07/20/93

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LORIN G. HEWITT

SECTION I - PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: EASYPOXY(R) K-20 Part A Adhesive
SYNONYMS: None
CHEMICAL FAMILY: Mixture of epoxy resins and fillers
MOLECULAR FORMULA: Mixture
MOLECULAR WEIGHT: Mixture
CONAP, Inc., a wholly owned subsidiary of American Cyanamid Company.
1405 BUFFALO STREET, ORLEAN, NEW YORK 14760
716-372-9650
EMERGENCY PHONE: For product emergency involving spill, leak, fire, exposure or accident call CHEMTREC: 1-800-424-9300. Outside the USA and Canada call 202-483-7616.

SECTION II - COMPOSITION/INFORMATION ON INGREDIENTS

OSHA REGULATED COMPONENTS

COMPONENT	CAS NO.	%	TWA/CEILING	REFERENCE
Silica, quartz	014808-60-7	25 - 30	0.1 mg/M3 respirable	OSHA/ACGIH NTP IARC
Silica, amorphous	007631-86-9	< 4.0	6 mg/M3 10 mg/M3	OSHA ACGIH
Glycerine	000056-81-5	< 1.0	10 mg/M3 total 5 mg/M3 respirable	OSHA/ACGIH OSHA

SECTION III - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
APPEARANCE AND ODOR : Tan paste, characteristic odor
STATEMENTS OF HAZARD:
WARNING! MAY CAUSE ALLERGIC SKIN REACTION
MAY CAUSE EYE IRRITATION

CHRONIC HAZARD WARNING:
CHRONIC TOXICITY HAZARD. CONTAINS MATERIAL WHICH MAY CAUSE LUNG DAMAGE. POSSIBLE CANCER HAZARD BASED ON LABORATORY ANIMAL TESTS.
Risk depends on duration and level of exposure.

POTENTIAL HEALTH EFFECTS
EFFECTS OF OVEREXPOSURE:
The estimated acute oral (rat) LD50, acute dermal (rabbit) LD50 and 4-hour inhalation (rat) LC50 values for this material are > 5,000 mg/kg, > 2,000 mg/kg and > 2,500 ppm, respectively.
Allergic skin reactions or primary skin irritation may be produced by prolonged or repeated dermal contact with epoxy resins. Overexposure to vapor during heat curing may cause irritation or injury of the respiratory tract and eye irritation.
Direct contact with this material may cause mild eye irritation.
Inhalation overexposure to this product mixture is not likely under normal use conditions due to its physical form.
Refer to Section XI for toxicology information on the OSHA regulated components of this product.

SECTION IV - FIRST AID MEASURES

In case of skin contact, wash affected areas with soap and plenty of water. Remove contaminated clothing and shoes. Obtain medical attention. Destroy or thoroughly clean shoes before reuse. Do not reuse contaminated clothing without laundering.
In case of eye contact, immediately irrigate with plenty of water for 15 minutes.

SECTION V - FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

Provided By Electrical Insulation Suppliers Inc.

FLASH POINT : > 200 F; 93 C
METHOD : Tag Closed Cup
FLAMMABLE LIMITS (% BY VOL.): Not available
AUTOIGNITION TEMP. : Not available
DECOMPOSITION TEMP. : Not available

EXTINGUISHING MEDIA AND FIRE FIGHTING INSTRUCTIONS: Use water spray, carbon dioxide or dry chemical to extinguish fires. Use water to keep containers cool. Wear self-contained, positive pressure breathing apparatus and full fire-fighting protective clothing. See Section VIII (Exposure Controls/Personal Protection) for special protective clothing.

SECTION VI - ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Where exposure level is not known, wear NIOSH approved, positive pressure, self-contained respirator. Where exposure level is known, wear NIOSH approved respirator suitable for level of exposure. In addition to the protective clothing/equipment in Section VIII (Exposure Controls/Personal Protection), wear impervious boots. Cover spills with some inert absorbent material; sweep up and place in a waste disposal container. Flush area with water.

SECTION VII - HANDLING AND STORAGE

Avoid prolonged or repeated contact with skin. Avoid contact with eyes. Wash thoroughly after handling.

SECTION VIII - EXPOSURE/CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS AND PERSONAL PROTECTIVE EQUIPMENT (PPE)

Where this material is not used in a closed system, good enclosure and local exhaust ventilation should be provided to control exposure when spraying or curing at elevated temperatures. Food, beverages and tobacco products should not be carried, stored or consumed where this material is in use. Before eating, drinking or smoking, wash face and hands with soap and water. Avoid skin contact. Protective clothing such as impervious gloves, apron, work pants, long sleeve work shirt or disposable coveralls are recommended to prevent skin contact. Barrier creams may be used in conjunction with the gloves to provide additional skin protection. For operations where eye or face contact can occur, wear eye protection such as chemical splash proof goggles or face shield. Eyewash equipment and safety shower should be provided in areas of potential exposure. Where exposures are below the Permissible Exposure Limit (PEL), no respiratory protection is required. Where exposures exceed PEL, use respirator approved by NIOSH for the material and level of exposure. A full facepiece respirator will provide eye and face protection . Cutting, grinding or sanding of parts fabricated after curing of this material may create respirable dust particles. Respiratory protection appropriate for this dust may be required. Refer to Section II (Composition/Information on ingredients) for potential hazardous components in the dust. See "GUIDE TO INDUSTRIAL RESPIRATORY PROTECTION" (NIOSH).

Shower after completion of work shift. Launder work clothing at end of work shift prior to reuse. Store street clothing separately from work clothing and protective equipment. Work clothing and shoes must not be taken home.

SECTION IX - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR : Tan paste, characteristic odor
BOILING POINT : Not available
MELTING POINT : Not available
VAPOR PRESSURE : Not available
SPECIFIC GRAVITY : 1.28
VAPOR DENSITY : Not available
% VOLATILE (BY WT) : Not available
pH : Not applicable
SATURATION IN AIR (% BY VOL): Not available
EVAPORATION RATE : < 1
SOLUBILITY IN WATER : Not available

SECTION X - STABILITY AND REACTIVITY

STABILITY : Stable
CONDITIONS TO AVOID : Avoid excessive heating over long periods of time.
POLYMERIZATION : May Occur
CONDITIONS TO AVOID : Avoid contact with acids, oxidizing agents, bases or amines.
INCOMPATIBLE MATERIALS : Acids, bases and strong amines.
HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition or combustion may produce carbon monoxide, carbon dioxide and/or oxides of nitrogen.

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0500007
GENERAL ELECTRIC SERVICE
1401 EAST VALENCIA ROAD

TUCSON, AZ 85706-0000

ELECTRICAL INSULATION SUPPLIERS
1255 COLLIER RD.
ATLANTA, GA 30318

PHONE # (404)355-1651
FAX # (404)609-6084

MATERIAL SAFETY DATA SHEET INFORMATION:

PLEASE FIND ENCLOSED MATERIAL SAFETY DATA SHEETS (MSDS) COVERING ITEMS PURCHASED FROM ELECTRICAL INSULATION SUPPLIERS (EIS). OSHA REGULATIONS REQUIRE MSDS INFORMATION BE MADE AVAILABLE TO ALL PERSONNEL WHO MAY BE EXPOSED TO HAZARDOUS MATERIALS IN THE WORK PLACE.

UNDER THE "EMERGENCY PLANNING COMMUNITY RIGHT-TO-KNOW ACT OF 1986" INVENTORY AND LOCATION INFORMATION, CONCERNING HAZARDOUS MATERIALS mr30nfgJOB SITE, MAY NEED TO BE REPORTED TO THE LOCAL FIRE DEPARTMENT, THE LOCAL EMERGENCY PLANNING COMMITTEE AND THE STANDARD RESPONSE COMMISSION. YOU MAY WANT TO REFERENCE 40 CFR PART 372 FOR ADDITIONAL INFORMATION. MANUFACTURERS MUST REPORT ANNUAL RELEASES OF LISTED TOXIC CHEMICALS INTO THE ENVIRONMENT, ACCORDING TO SARA TITLE III.

ACCORDING TO 29 CFR PART 1910.1200 PARAGRAPH (g)(6) OF THE HAZARD COMMUNICATION STANDARD, A MSDS IS TO BE PROVIDED THE FIRST TIME THE CUSTOMER BUYS AN ITEM REQUIRING A MSDS. IF AT ANY TIME THE MSDS IS UPDATED OR CHANGED, THE UPDATED MSDS MUST BE SUPPLIED WITH THE FIRST SHIPMENT AFTER THE MSDS UPDATE HAS OCCURRED.

IF YOU NEED FURTHER INFORMATION CONCERNING YOUR SITUATION, YOU MAY CONTACT THE EPA IN WASHINGTON, D.C. THEIR TOLL FREE NO. IS (800)535-0202; THE RCRA/SUPERFUND HOT LINE IS (800)424-9346 OR (703)920-9810; THE TSCA HOT LINE IS (202)554-1404.

BY PROVIDING THIS DOCUMENTATION, EIS IS COMPLYING WITH FEDERAL LAWS GOVERNING MSDS INFORMATION, AS IS KNOWN TO US. THIS IS A SERVICE AIMED AT HELPING YOUR BUSINESS TO ALSO COMPLY WITH GOVERNMENT REGULATIONS.

DAVE SHARPE

"SEE THE REVERSE SIDE FOR DOCUMENT NAME AND P.O. NUMBER"

	MSDS DOCUMENT	SHIP DATE	CUSTOMER PURCHASE ORDER NUMBER
BLR240	CONK20AB	01/25/96	GL4096-003097

Provided By Electrical Insulation Suppliers Inc.

Copper and Brass Sales — INC —

MATERIAL SAFETY DATA SHEET
ALUMINUM ALLOYS

COMPANY	RE-ISSUE DATE	IDENTIFICATION NUMBER
Copper and Brass Sales, Inc. 17401 Ten Mile Road Eastpointe, Michigan 48021	June 1, 1995	N/A
TRADE NAME (Common Name or Synonym)	**EMERGENCY PHONE NUMBER**	
Aluminum Alloys	810-775-7710	
CHEMICAL NAME	**FORMULA**	**DOT IDENTIFICATION NUMBER**
Aluminum (does not include lithium and nickel alloys)	Al	N/A

I. INGREDIENTS

MATERIAL OR COMPONENT

BASE METAL	CAS NUMBER	% COMPOSITION BY WEIGHT	ACGIH TWA (mg/m³)	OSHA 1910.1000 TWA (mg/m³)	WISHA PEL (mg/m³)
Aluminum, Al	7429-90-5	80.0-99.7	10.0, as metal dust and oxide 5.0, as welding fume	15.0, as total dust 5.0, as respirable fraction	10.0, as metal dust and oxide 5.0, as welding fume

ALLOYING ELEMENT	CAS NUMBER	MAXIMUM % COMPOSITION BY WEIGHT 0.1-1.0	1.0-10.0	10.0-20.0	ACIGIH TWA (mg/m³)	OSHA 1910.1000 TWA (mg/m³)	WISHA PEL (mg/m³)
Chromium, Cr	7440-47-3	W, P			0.5, as metal	1.0, as metal	0.5, as metal
Cobalt, Co	7440-48-4	P	W		0.05, as dust and fume	0.05, as fume and dust	0.05, as fume and dust
Copper, Cu	7440-50-8		W	P	0.2, as fume 1.0, as dust	0.1, as fume 1.0, as dust	0.1, as fume 1.0, as dust
Iron, Fe	1309-37-1		W, P		5.0, as oxide fume	10.0, as oxide dust and fume	5.0, as oxide dust and fume
Lead, Pb	7439-92-1		W, P		0.15, as dust and fume	0.05	0.05
Magnesium, Mg	1309-48-4		W	P	10.0, as oxide fume	10.0, as total dust oxide fume 5.0, as respirable fraction oxide fume	10.0, as total dust oxide fume 5.0, as respirable oxide fume
Manganese, Mn	7439-96-5		W		1.0, as fume 3.0, STEL, as fume 5.0, as dust	1.0, as fume	5.0, Ceiling
Silicon, Si	7440-21-3			W, P	10.0, as total dust	10.0, as total dust 5.0, as respirable fraction	10.0, as total dust 5.0, as respirable fraction
Silver, Ag	7440-22-4	P			0.1, as metal	0.01, as metal dust and fume	.01, as metal
Tin, Sn	7440-31-5		P		2.0, as oxide and metal	2.0, as oxide	2.0, as oxide fume
Zinc, Zn	1314-13-2		W, P		5.0, as oxide fume 10.0 STEL as oxide fume 10.0, as total dust	5.0, as oxide fume 10.0, as zinc oxide total dust 5.0, as zinc oxide respirable fraction	5.0, as oxide fume 10.0 STEL, as oxide fume

Key:
W = Wrought aluminum (fabricated products)
P = Prime and ingot hardener aluminum
STEL = Short Term Exposure Limit
TWA = Time Weighted Average
PEL = Permissible Exposure Limit

Note: Aluminum alloys may be comprised of all or variations of the alloys shown here. In addition, the welding of aluminum alloys may produce the products listed in Section VII, #7. See Section VII, #8 for comments concerning aluminum scrap.

II. PHYSICAL DATA

MATERIAL IS (At Normal Conditions):	APPEARANCE AND ODOR
☐ Liquid ☒ Solid ☐ Gas ☐ Other	Metallic appearance; no odor

ACIDITY/ALKALINITY			VAPOR PRESSURE (mm Hg at 20°C)
pH = NA	Melting Point 440-1215 °F Boiling Point NA °F	Specific Gravity (H_2O = 1) 2.5 - 2.9 Solubility in water (% by weight) nil	NA

III. PERSONAL PROTECTIVE EQUIPMENT

Appropriate personal protective equipment is required when melting, casting, machining, forging, or otherwise processing. The nature of the processing activity will determine what form of equipment is necessary, i.e., glasses, respirator, protective clothing, and ear protection.

IV. EMERGENCY MEDICAL PROCEDURES

For skin contact, remove particles by thoroughly washing with soap and water.

For eye contact, flush with water for at least 15 minutes. Get medical attention if irritation persists.

For inhalation, remove from exposure. Get medical attention if experiencing breathing difficulty.

V. HEALTH/SAFETY INFORMATION

Health

Inhalation: Not likely unless material machined, welded or remelted. Short term overexposure to welding fumes may result in discomfort such as dizziness, nausea, or dryness or irritation of throat and nose. Exposure to zinc oxide fume can result in "zinc chills" (metal fume fever). The temporary symptoms can include fever, chills, nausea, vomiting, and muscular pain. Recovery is usually complete in 24 to 48 hours. Overexposure to copper fume can cause upper respiratory tract irritation. Chromium is listed in the 6th Annual Report on Carcinogens, as prepared by the National Toxicology Program (NTP). Overexposure to Lead over an extended period of time can result in such toxic effects as central nervous system disturbances, renal changes, peripheral neuropathy, gastrointestinal disturbances, anemia, birth defects and reproductive harm. Lubricants containing polycyclic aromatic hydrocarbons are listed in the International Agency for Research on Cancer (IARC) Monograph on Mineral Oils. Its presence in this product is not expected to present a carcinogenic risk due to the low concentration in which it is present.

Ingestion: Not likely.

Skin: Not likely.

Eyes: May irritate eyes when welding or plasma cutting. See under Section VII Additional Information.

THRESHOLD LIMIT VALUE

See Ingredients Section.

Fire and Explosion

Flash Point	AUTO IGNITION TEMPERATURE	FLAMMABLE LIMITS IN AIR	EXTINGUISHING MEDIA
NA °F	NA °F	Lower % Upper NA %	Dry powder or sand.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Damp aluminum dust may spontaneously heat with liberation of hydrogen to form explosive air mixtures. SEE ADDITIONAL INFORMATION

EXTINGUISHING MEDIA NOT TO BE USED

Do not use water or halogen on dust fires.

Reactivity

STABILITY

☒ Stable ☐ Unstable

INCOMPATABILITY (Materials to Avoid)

Anhydrous bromine.

CONDITIONS TO AVOID

See Fire and Explosion Section. SEE ADDITIONAL INFORMATION.

HAZARDOUS DECOMPOSITION PRODUCTS

See Fire and Explosion Section. SEE ADDITIONAL INFORMATION.

VI. ENVIRONMENTAL

SPILL OR LEAK PROCEDURES

NA

WASTE DISPOSAL METHODS*

Used or unused product should be tested to determine hazard status and disposal requirements under federal, state, or local laws and regulations.

*Disposer must comply with Federal, State and Local disposal or discharge laws.

VII. ADDITIONAL INFORMATION

1. Halogen acids and sodium hydroxide in contact with aluminum may generate explosive mixtures of hydrogen.
2. Finely divided aluminum will form explosive mixtures in air. It will also form explosive mixtures in air in the presence of bromates, iodates, or ammonium nitrate.
3. When remelting aluminum scrap, entrapped moisture or the presence of strong oxidizers such as ammonium nitrate could cause an explosion. This applies to the collection of moisture in sow cavities as well. Moisture must be driven off prior to remelting.
4. Do not touch cast aluminum metal or heated aluminum product without knowing metal temperature. Aluminum experiences no color change during heating. If metal is hot and touched, burns can result.
5. Aluminum powder must be packaged and shipped as a Flammable Solid, UN1396.
6. Hard alloy ingots in the 2000 and 7000 series must be stress-relieved to prevent explosion when sawed.
7. The welding of aluminum alloys may generate carbon monoxide, carbon dioxide, ozone, nitrogen oxides, infra-red radiation and ultra-violet radiation.
8. Some aluminum scrap may be contaminated with oil at levels greater than 1%. Melting of aluminum scrap may generate oil vapors which are irritating to the eyes and upper respiratory tract. Prolonged or repeated skin contact with oil may cause skin irritation.
9. Vapor degreaser must be properly maintained to limit the accumulation of aluminum fines. The accumulation of aluminum fines could result in a potential degreaser fire or explosion.
10. Beryllium, Chromium, Lead, Cadmium, Nickel and lubricant based oils, listed on California's Proposition 65 list of "Chemicals Known to the State to cause Cancer or Reproductive Harm, may exist in this product at the following maximum concentrations by weight -- Beryllium (0.055%), Chromium (0.10%), Lead (0.07%), Cadmium (0.05%), Nickel (0.05%) and Lubricant Based Oils (surface residue only).

The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any representation or warranty, express or implied, regarding the accuracy or correctness.

The conditions or methods of handling storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.

Data sheets of individual manufacturers may be obtained by contacting Copper & Brass Sales, Inc., 17401 Ten Mile Rd., Eastpointe, MI 48021

Copper and Brass Sales INC

MATERIAL SAFETY DATA SHEET
MICARTA

COMPANY	RE-ISSUE DATE	IDENTIFICATION NUMBER
Copper and Brass Sales, Inc. 17401 Ten Mile Road Eastpointe, Michigan 48021	June 1, 1995	N/A

TRADE NAME (Common Name or Synonym)	EMERGENCY PHONE NUMBER
Micarta	810-775-7710

CHEMICAL NAME	FORMULA	DOT IDENTIFICATION NUMBER
N/A	Glass cloth, paper, silicon, phenolic, melamine opoxy composite	N/A

SECTION II — HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS		%	TLV (Units)	ALLOYS AND METALLIC COATINGS		%	TLV (Units)
PIGMENTS	N/A			BASE METAL	N/A		
CATALYST	N/A			ALLOYS	N/A		
VEHICLE	N/A			METALLIC COATINGS	N/A		
SOLVENTS	N/A			FILLER METAL PLUS COATING OR CORE FLUX	N/A		
ADDITIVES	N/A			OTHERS	N/A		
OTHERS	N/A						

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)
N/A		

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	N/A		SPECIFIC GRAVITY ($H_2O = 1$)	N/A	
VAPOR PRESSURE (mm Hg.)	N/A		PERCENT, VOLATILE BY VOLUME (%)	N/A	
VAPOR DENSITY (AIR = 1)	N/A		EVAPORATION RATE (_____ = 1)	N/A	
SOLUBILITY IN WATER	N/A				

APPEARANCE AND ODOR Flat sheet or shape - Natural tan in color - slight phenolic odor.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS	Lel	Uel
N/A			

EXTINGUISHING MEDIA
CO^2 water foam - same as for wood fire.

SPECIAL FIRE FIGHTING PROCEDURES
Same as for wood fire - Do not breathe fumes from burning laminate.

UNUSUAL FIRE AND EXPLOSION HAZARDS
No explosion hazards

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
N/A

EFFECTS OF OVEREXPOSURE
N/A

EMERGENCY AND FIRST AID PROCEDURES
Prolonged skin exposure to dust may cause skin irritation. Wash exposed skin with soap and water.

SECTION VI - REACTIVITY DATA

STABILITY			CONDITIONS TO AVOID
	UNSTABLE		N/A
	STABLE	X	N/A

INCOMPATABILITY (Materials to avoid)
N/A

HAZARDOUS DECOMPOSITION PRODUCTS
Fumes with obnoxious odor produced if overheat

HAZARDOUS POLYMERIZATION			CONDITIONS TO AVOID
	MAY OCCUR		N/A
	WILL NOT OCCUR	X	N/A

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
N/A

WASTE DISPOSAL METHOD
Conform to local, state and federal regulations for disposal of thermoset laminates - solids.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)
3-M No. 8710 non-toxic particle mask when machining.

VENTILATION	LOCAL EXHAUST	SPECIAL
		N/A
	MECHANICAL (General)	OTHER
	Dust collector ventilation system	N/A

PROTECTIVE GLOVES	EYE PROTECTION
Ordinary gloves	Safety glasses while machining.

OTHER PROTECTIVE EQUIPMENT

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Use correct saw blade, blade RPM and feed speed to prevent overheating of thin laminates - use wet saw for laminates over 1" thick - use eye protection.

OTHER PRECAUTIONS
Use good dust collecting system. Use ordinary precautions as in sawing or machining of wood and similar materials.

The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any representation or warranty, express or implied, regarding the accuracy or correctness.

The conditions or methods of handling storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.

Data sheets of individual manufacturers may be obtained by contacting Copper & Brass Sales, Inc., 17401 Ten Mile Rd., Eastpointe, MI 48021.

MATERIAL SAFETY DATA SHEET

COPPER AND BRASS SALES, INC.
17401 Ten Mile Road
Eastpointe, Michigan 48021
(810) 775-7710

June 1, 1995

SECTION I. MATERIAL IDENTIFICATION
Copper/Copper Alloys

See attached alloy composition sheets for alloy presence and percentages of alloying ingredients.

SECTION II. HAZARDOUS INGREDIENTS
Copper/Copper Alloys

	CAS Number		OSHA-PEL 8-hr TWA	ACGIH-TLV 8-HR TWA (1988-89)	ACGIH STEL (1988-89)
Aluminum #	(7429-90-5)	(Dust)	15 mg/m³	10 mg/m³	--
		(Fume)	5 mg/m³	5 mg/m³	--
Antimony #	(7440-36-0)		0.5 mg/m³	0.5 mg/m³	--
Arsenic #	(7440-38-2)		0.5 mg/m³	0.02 mg/m³	--
Beryllium #	(7440-41-7)		0.002 mg/m³	0.002 mg/m³	0.005*
Bismuth telluride	(1304-82-1)	(Dust)	15 mg/m³	15 mg/m³	--
Boron oxide	(1303-86-2)	(Dust)	15 mg/m³	10 mg/m³	--
Cadmium #	(7440-43-9)	(Dust)	0.2 mg/m³	0.05 mg/m³	--
		(Fume)	0.1 mg/m³	0.05 mg/m³*	--
Calcium oxide	(1305-78-8)		5 mg/m³	5 mg/m³	--
Carbonblack	(1333-86-4)		3.5 mg/m³	--	--
Chromium #	(7440-47-3)		1 mg/m³	0.5 mg/m³	--
Cobalt #	(7440-48-4)		0.05 mg/m³	0.1 mg/m³	--
Copper #	(7440-50-8)	(Dust)	1 mg/m³	1 mg/m³	--
		(Fume)	0.1 mg/m³	0.2 mg/m³	--
Iron	(1309-37-1)		10 mg/m³	5 mg/m³ (As iron oxide fume)	--
Lead # ③	(7439-92-1)		0.05 mg/m³	0.15 mg/m³	--
Lithium hydride	(7580-67-8)		0.025 mg/m³	.025 mg/m³	--
Manganese #	(7439-96-5)	(Dust)	5 mg/m³*	5 mg/m³*	--
		(Fume)	--	1 mg/m³	3 mg/m³
Magnesium oxide	(1309-48-4)	(Dust)	15 mg/m³	10 mg/m³	--
Nickel #	(7440-02-0)		1 mg/m³	1 mg/m³	--
Phosphorus #	(7723-14-0)		0.1mg/m³	0.1 mg/m³	--
Selenium	(7782-49-2)		0.2 mg/m³	0.2 mg/m³	--
Silicon	(7440-21-3)	(Dust)	10 mg/m³	10 mg/m³①	--
		(Fume)	5 mg/m³	--	--
Silver #	(7440-22-4)		0.01 mg/m³	0.1 mg/m³	--
Sulphur Dioxide #	(7446-09-5)		5 mg/m³	5 mg/m³	5/10 mg/m³
Tellurium #	(13494-80-9)		0.1 mg/m³	0.1 mg/m³	--
Tin ②	(7440-31-5)		2 mg/m³	2 mg/m³	0.2 mg/m³ (contemplated)
Titanium dioxide	(13463-67-7)	(Dust)	15 mg/m³	10 mg/m³	--
Zinc #	(1314-13-2)	(Dust) ①	10 mg/m³	10 mg/m³	--
		(Fume)	5 mg/m³	5 mg/m³	10 mg/m³
Zirconium	(7440-67-7)		5 mg/m³	5 mg/m³	10 mg/m³

*Ceiling Limit

Note: antimony trioxide, beryllium, cadmium, chromium, cobalt-chromium alloy, lead and nickel have been identified as potential human carcinogens. # denotes a toxic chemical or chemicals subject to reporting requirements of Section 313 of Title III of the S.A.R.A. of 1986 and CFR Part 372.

① Value is for total dust containing no asbestos and less than 1% free silicon.

② Contemplated change to 0.2 STEL and 0.1 TWA.

③ Under court remand.

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SECTION III. PHYSICAL DATA

Physical Form:	Solid	Specific Gravity:	7.45 – 9.00
Boiling Point:	Not Applicable	Vapor Density	Not Applicable
Freeze–Melt Temperature:	Approximately 1290° – 2260°F	Solubility in H_2O:	Insoluble
Vapor Pressure:	Not Applicable	Color:	Silver or Yellow to Red
Evaporation Rate:	Not Applicable	Odor:	None

SECTION IV. FIRE AND EXPLOSION DATA

Flash Point: (Method Used) Not Applicable

Extinguishing Media: See Below

Flammable Limits (LEL-UEL) Not Applicable

Auto Ignition Temp.-Not Applicable

Special Fire Fighting Procedures: Solid massive form is not combustible. Fire and explosion hazards are moderate when material is in the form of dust and exposed to heat, flames, chemical reaction, or in contact with powerful oxidizers. Use special mixtures of dry chemical or sand. Firefighters should wear NIOSH/MSHA self-contained breathing apparatus and protective clothing. Molten metal may react violently with water.

SECTION V. REACTIVITY DATA

Stability: Stable

Conditions to Avoid: Stable under normal conditions of transport and storage. Molten metal may react violently with water.

Incompatibility (Materials to Avoid): Acids, bases, and oxidizers.

Hazardous Decomposition or Byproducts: Metal fume.

Hazardous Polymerization: Will not occur.

SECTION VI. HEALTH HAZARD DATA

Permissible exposure limits and threshold limit values. See Section II.

Route(s) of Entry: Inhalation: Yes; Skin: Yes; Ingestion: Yes

Under normal handling conditions the solid alloy presents no significant health hazards. Processing of the alloy by dust or fume producing operation (grinding, buffing, heating, welding, etc.) may result in the potential for exposure to airborne metal particulates or fume. The exposure levels in Section II are relevant to fumes and dusts.

Effects of Overexposure:

Aluminum—Excessive exposure to aluminum fume and dust has been associated with lung disease, but this effect is probably due to simultaneous silica exposure.

Antimony—Antimony and its compounds are irritating to the skin and mucous membranes and are systemic poisons. Effects are reported to include metallic taste in the mouth, vomiting, colic, loss of appetite and weight, cardiac problems, and diarrhea. In addition, dermatitis may result which starts as an inflammation of the hair follicles and can progress through pus formation and sloughing to leave a contracted scar.

Beryllium—Inhalation of beryllium dust or fume may result in the production of an acute or chronic systemic disease depending upon the level of exposure and the beryllium compound involved. Granulomatous lesions of the skin, liver, kidneys, spleen, and lymph nodes have been reported.

Damage to the lungs may be in both the acute and chronic forms, both of which have similar signs and symptoms. These include a relatively non-productive cough, progressive difficulty in breathing, loss of appetite, and loss of weight. The major difference between the two is the suddenness of onset and the rate of progression. In the acute form, the symptoms appear in several hours to several weeks after exposure and there is usually rapid progression of signs including dyspnea, anorexia, and extreme weight loss. Complete recovery is possible and fatal cases usually result from acute heart disease. In chronic beryllium disease, the symptoms or signs are generally delayed in their onset and are persistent in nature. They may be triggered or aggravated by stresses such as pregnancy, respiratory infection, and thyrotoxicosis. In the progression of the disease, symptoms of heart disease may occur.

Beryllium is also a suspected human carcinogen and has caused cancer in laboratory animals.

Cadmium—Inhalation of cadmium fumes may cause respiratory irritation with a sore, dry throat and a metallic taste followed by a cough, chest pain, and difficulty in breathing. Bronchitis, pneumonitis, and pulmonary edema have been reported as a result of the irritation of the fumes. Headaches, dizziness, loss of appetite, and weight loss have also been reported and the liver, kidneys and bone marrow may be injured by the presence of the metal.

Continued exposure to lower levels of cadmium has resulted in chronic poisoning characterized by irreversible lung damage and kidney damage. A single, high level exposure to cadmium can cause severe lung irritation which may be fatal. Cadmium is also a suspected human carcinogen.

Chromium—In some workers, chromium compounds act as allergens and may cause dermatitis and may also produce pulmonary sensitization. Chromic acid and chromates have a direct corrosive effect on the skin and the mucous membranes of the upper respiratory tract. Although rare, there may be the possibility of skin and pulmonary sensitization. IARC has determined that there is sufficient evidence of increased lung cancer among workers in the chromate-producing industry and possible chromium alloy workers. This determination is supported by sufficient evidence for carcinogenicity to animals and possible mutagenicity testing of Cr VI compounds.

Cobalt—Cobalt has been reported as causing hypersensitization type dermatitis in individuals who are susceptible. Animal studies have shown that particulate cobalt is an acutely irritating substance and industrial exposures, possibly combined with small amounts of silica, are reported capable of producing serious pneumoconiosis which is initially of an insidious nature.

Copper—Melting, grinding, cutting of copper may produce fumes or dust exposure and breathing these fumes or dust may present potentially significant health hazards. Fumes of copper may cause metal fume fever with flu-like symptoms and skin and hair discoloration. While industrial dermatitis has not been reported, keratinization of the hands and the soles of the feet has been reported. Systemically as well, copper dust and fume cause irritation of the upper respiratory tract, metallic taste in the mouth, and nausea.

Iron—The inhalation of iron oxide fumes or dust may cause an apparent benign pneumoconiosis which is called siderosis. This disease is reported to be disabling, but makes x-ray diagnosis of other lung conditions difficult or impossible.

Lead—Short term exposure: Lead is an accumulative poison. Inhalation effects of exposure to fumes or dust of inorganic lead may not develop quickly. Symptoms may include decreased physical fitness, fatigue, sleep disturbance, headache, aching bones and muscles, constipation, abdominal pains, and decreasing appetite. The effects are reversible and complete recovery is possible. Inhalation of large amounts of lead may lead to seizures, coma, and death.

Lead—Long term exposure: Long term exposure can result in a buildup of lead in the body and more severe symptoms. These include anemia, pale skin, a blue line at the gum margin, decreased handgrip strength, abdominal pain, severe constipation, nausea, vomiting, and paralysis of the wrist joint. Prolonged exposure may also result in kidney damage. If the nervous system is affected, usually due to very high exposures, the resulting effects include severe headache, convulsions, coma, delirium, and death. Alcohol ingestion and physical exertion may bring on symptoms. Continued exposure can result in decreased fertility and/or increased chances of miscarriage or birth defects.

Manganese—Chronic manganese poisoning may result from inhalation of dust or fume. The central nervous system is the chief site of the injury, and there also may be adverse blood and kidney effects. Chronic manganese poisoning is not a fatal disease although it is extremely disabling. Some individuals may be hypersusceptible to manganese. Freshly formed manganese fume has caused fever and chills similar to metal fume fever.

Nickel—The most common ailment arising from contact with nickel or its compounds is an allergic dermatitis known as "nickel itch" which usually occurs when the skin is moist. Generally nickel and most salts of nickel do not cause systemic poisoning, but nickel has been identified as a suspected carcinogen. There can also be adverse effects to the lungs and nasal cavities.

Silicon—Accumulation in lungs may be responsible for benign pneumoconiosis, but is not considered to be responsible for pulmonary functional impairment or respiratory symptoms.

Tin—The inhalation of inorganic tin fumes or dust may cause an apparent benign pneumoconiosis called stannosis which is reported not to be disabling.

Zinc (as Oxide)—Zinc is very low in toxicity but inhalation of fumes may cause "metal fume fever." Onset of symptoms may be delayed 4–12 hours and include irritation of the nose, mouth and throat, cough, stomach pain, headache, nausea, vomiting, metallic taste, chills, fever, pains in the muscles and joints, thirst, bronchitis or pneumonia and a bluish tint to the skin. These symptoms go away in 24–48 hours and leave no effect.

* * * *

NOTE: Antimony trioxide, beryllium, cadmium, chromium, cobalt-chromium alloy, lead and nickel have been identified as potential human carcinogens.

EMERGENCY FIRST AID PROCEDURES:

Eye Contact Flush well with running water to remove particulate. Get medical attention.

Skin Contact Vacuum off excess dust. Wash well with soap and water.

Inhalation Remove to fresh air. Get medical attention.

Ingestion Seek medical attention if large quantities of material have been ingested.

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SECTION VII. PRECAUTIONS FOR SAFE HANDLING OR USE

Steps to be Taken in Case Material is Released or Spilled: No special precautions are necessary for spills of bulk material. If large quantities of dust are spilled, remove by vacuuming or wet sweeping to prevent heavy concentration of airborne dust. If liquids (acids or bases) containing solubilized metal are spilled evacuate unprotected personnel from area. Absorb liquid by means of vermiculite, dry sand or similar material. Follow federal, state, and local regulations concerning the disposal of waste.

Waste Disposal Method: Dispose of in accordance with federal, state, and local regulations. Cleanup personnel should wear respirators and protective clothing. Ventilate area of release.

Precautions to be Taken in Handling and Storing: Store material away from incompatible materials and keep dust from sources of ignition.

Other Precautions: See all other sections of this MSDS.

SECTION VIII. CONTROL MEASURES

Respiratory Protection: If exposure above the PEL or TLV, NIOSH/MSH approved respirator for fume or dust, dependent upon the source of airborne contaminant.

Ventilation: Required if dust or fume created in handling or working on this material.

Local Exhaust: Required if dust or fume created in handling or working on this material and threshold limits are being approached.

Mechanical (general): As above to reduce airborne dust or fume levels.

Protective Gloves: Required for melt, grind, cut or weld operations. Select glove approved for the specific operation.

Eye Protection: Required for melt, grind, cut, or weld operations. Minimum requirement of safety glasses with side shields for these operations. Melting and welding may require special eye protection including face shields and specially tinted glass. Grinding operations may also require face shields.

Other Protective Clothing or Equipment: As required for the work done on or with the metal.

Work/Hygiene Practices: As required for the work done with lead bearing materials. Meet requirements of the OSHA lead standard where necessary. Always evaluate the jobs done on this product in accordance with OSHA or relevant state, federal, or local standards.

IMPORTANT

LIABILITY DISCLAIMER

The information contained in this Material Safety Data Sheet (MSDS) is believed to be correct as it was obtained from sources we believe are reliable, including: "Threshold Limit Values & Biological Exposure Indices for 1988–89" (American Conference of Government & Industrial Hygienists), Air Contaminates—Permissible Exposure Limits (Title 29, Code of Federal Regulations, part 1910.1000—OSHA), and OSHA (Cleveland Area Office) letter of 6/15/89. However, no representations, guarantees or warranties of any kind are made as to its accuracy, suitability for particular applications, hazards connected with the use of the material, or the results to be obtained from the use thereof. User assumes all risks and liability of any use, processing or handling of any material, variations in methods, conditions and equipment used to store, handle or process the material and hazards connected with the use of the material are solely the responsibility of the user and remain at his sole discretion.

Compliance with all applicable federal, state, and local laws and regulations remains the responsibility of the user, and the user has the responsibility to provide a safe work place, to examine all aspects of its operation and to determine if or where precautions, in addition to those described herein, are required.

Note: The copper and copper alloy products are in solid form and will not result in an environmental exposure in such form. We cannot anticipate all the processes or applications to which this product might be subjected or which might create exposures. The information supplied has been furnished by our suppliers and consequently, our company assumes no responsibility for the accuracy or completeness of the data contained herein.

Copper and Brass Sales INC

MATERIAL SAFETY DATA SHEET
NICKEL/ALLOY

COMPANY	RE-ISSUE DATE	IDENTIFICATION NUMBER
Copper and Brass Sales, Inc. 17401 Ten Mile Road Eastpointe, Michigan 48021	June 1, 1995	N/A
TRADE NAME (Common Name or Synonym)	EMERGENCY PHONE NUMBER	
Nickel Base Alloy	810-775-7710	
CHEMICAL NAME	FORMULA	DOT IDENTIFICATION NUMBER
Nickel	N/A	N/A

I. INGREDIENTS

MATERIAL OR COMPONENT

Base Metal	CAS Number	% Composition by Weight
Nickel	7440-02-0	99.2
Alloying Element	**CAS Number**	**Maximum % Composition by Weight**
Cobalt	7440-48-4	13.0
Chromium	7440-47-3	48.0
Molybdenum	7439-98-7	16.0
Tungsten	7440-33-7	5.0
Iron	7439-89-6	44.0
Silicon	7440-21-3	2.0
Manganese	7439-96-5	5.0
Carbon	7440-90-5	2.0
Aluminum	7249-90-5	5.0
Titanium	7440-32-6	5.0
Copper	7440-50-8	45.0
Boron	7440-42-8	.004
Tantalum	7440-25-7	5.0
Tungsten	7440-37-7	5.0
Niobium	7440-03-1	5.0
Yittrium	7440-65-5	1.0

NOTE: Nickel alloys may consist of all or any combination thereof of items listed.

II. PHYSICAL DATA

MATERIAL IS (At Normal Conditions)	APPEARANCE AND ODOR
☐ Liquid ☒ Solid ☐ Gas ☐ Other	Grayish to black sheet, strip, plate, bar, structural shape, pipe or tubing.
ACTIVITY/ALKALINITY	VAPOR PRESSURE
Melting point F(C): Greater than 2300 (1260)	(mm Hg at 20 C)

III. PERSONAL PROTECTIVE EQUIPMENT

Flashpoint F(C): Not Applicable Extinguishing Media: Use methods applicable to surrounding area. Special fire fighting procedures: Use self-contained breathing apparatus for protection against degradation products and fire fighting technique or agent(s) applicable to surrounding materials. Nickel based alloy steels in the solid state present no fire or explosion hazard.

IV. REACTIVITY DATA

Stability: Stable Incompatability (materials to avoid) Reacts with strong acid to hydrogen gas Hazardous decompositon products: Metallic dust or fumes may be produced during welding, burning, grinding and possibly machining. Refer to ANSI Z49.1.

PRODUCT
Nickel

SECTION 6 - HEALTH HAZARD DATA

NOTE STEEL PRODUCTS IN THE NATURAL STATE DO NOT PRESENT AN INHALATION, INGESTION OR CONTACT HAZARD. HOWEVER, OPERATIONS SUCH AS BURNING, WELDING, SAWING, BRAZING AND GRINDING MAY RELEASE FUMES AND/OR DUSTS WHICH MAY PRESENT HEALTH HAZARDS IF TLV'S ARE EXCEEDED

MAJOR EXPOSURE HAZARD

X INHALATION ☐ SKIN CONTACT ☐ SKIN ABSORPTION ☐ EYE CONTACT ☐ INGESTION

EFFECTS OF HUMAN EXPOSURE

Short term exposure to fumes/dust may produce irritation of eyes and respiratory system. Inhalation of high concentrations of freshly formed oxide fumes or iron, manganese and copper may cause metal fume fever characterized by a metallic taste in the mouth, dryness and irritation of the throat and influenza-like symptoms.

Chronic inhalation of high concentrations of iron oxide fumes or dust may lead to a benign pneumoconiosis (siderosis). Inhalation of high concentrations of ferric oxide may possibly enhance the risk of lung cancer development in workers exposed to pulmonary carcinogens.

Chromium and nickel and their compounds are listed in the 3rd Annual Report on carcinogens, as prepared by the National Toxicology Program (NTP). Exposure to high concentrations of dust and fumes can cause sensitization dermatitis, inflammation and/or ulceration of upper respiratory tract and possibly cancer of nasal passages and lungs.

Recent epidemiological studies of workers melting and working alloys containing nickel/chromium have found no increased risk of cancer.

EMERGENCY AND FIRST AID PROCEDURES

If exposed to excessive levels of metal fumes, remove to fresh air, seek medical aid immediately.

Eyes - flush with water for at least 15 minutes.

SECTION 7 - SPILL OR LEAK PROCEDURES

SPILL OR LEAK PROCEDURES

WASTE DISPOSAL METHODS

According to local, state and federal regulations.

SECTION 8 - SPECIAL PROTECTION

RESPIRATORY

NIOSH/MSHA - Approved dust and fume respirator should be used to avoid excessive inhalation of particulates when exposure exceeds TLV's.

VENTILATION

Local exhaust ventilation should be utilized when welding, burning, sawing, brazing, grinding or machining when exposure exceeds TLV's.

EYE PROTECTION AND PROTECTIVE CLOTHING

Safety glasses or goggles should be utilized as required by exposure. Other protective equipment should be utilized as required by the welding standards.

SECTION 9 - SPECIAL PRECAUTIONS

In welding, precautions should be taken for airborne contaminants which may originate from components of the welding rod.

Arc or spark generated when welding or burning could be a source of ignition for combustible and flammable materials.

The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any representation or warranty, express or implied, regarding the accuracy or correctness.

The conditions or methods of handling storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.

Data sheets of individual manufacturers may be obtained by contacting Copper & Brass Sales, Inc., 17401 Ten Mile Rd., Eastpointe, MI 48021.

Copper and Brass Sales INC

MATERIAL SAFETY DATA SHEET
STAINLESS STEEL

COMPANY	RE-ISSUE DATE	IDENTIFICATION NUMBER
Copper and Brass Sales, Inc. 17401 Ten Mile Road Eastpointe, Michigan 48021	June 1, 1995	N/A

TRADE NAME (Common Name or Synonym)	EMERGENCY PHONE NUMBER
Stainless Steel	810-775-7710

CHEMICAL NAME	FORMULA	DOT IDENTIFICATION NUMBER
Stainless	N/A	N/A

SECTION 2 - HAZARDOUS INGREDIENTS

NOTE: PRODUCTS UNDER NORMAL CONDITIONS DO NOT REPRESENT AN INHALATION, INGESTION OR CONTACT HEALTH HAZARD.

BASE METAL, ALLOYING ELEMENTS AND METALLIC COATINGS	% COMPOSITION BY WEIGHT (1)	ACGIH TLV (mg/m³) (2)
Base Metal		
Iron (Fe)	60-88	5 (As Iron Oxide)
Alloying Elements		
Chromium (Cr)	10-30	.5
Nickel (Ni)	0-27	1
Manganese (Mn)	<6	5 (As Dust-Ceiling)
Molybdenum (Mo)	<6	10 (Insoluble Compound)
Copper (Cu)	<6	1 (Dust & Mist)
Titanium (Ti)	<6	10 (Total Dust)
Carbon (C)	<2	None Established
Phosphorus (P)	<2	None Established
Sulfur (S)	<2	5 (As SO_2)
Silicon (Si)	<2	10 (Total Dust)
Cobalt (Co)	<2	.1 (Dust & Fume)
Niobium (Nb)	<2	None Established
Nitrogen (N)	<2	6 (As NO_2)
Tin (Sn)	<2	2

(1) % OF ALLOYING MATERIAL VARIES WITH GRADE OF MATERIAL. (2) 1985-1986 ACGIH THRESHOLD LIMIT VALUE.

SECTION 3 - PHYSICAL DATA

MATERIAL IS (At Normal Conditions)	APPEARANCE AND ODOR
Solid	Gray-Black, Odorless
MELTING POINT (Base Metal)	**SPECIFIC GRAVITY**
>2500	Approximately 7

SECTION 4 - FIRE AND EXPLOSION

EXTINGUISHING MEDIA

NA

SPECIAL FIRE FIGHTING PROCEDURES

Steel products in the solid state present no fire or explosion hazard.

UNUSUAL FIRE AND EXPLOSION PROCEDURES

NA

SECTION 5 - REACTIVITY DATA

STABILITY	INCOMPATABILITY (Materials To Avoid)
Stable	Reacts with strong acids to produce hydrogen gas.

CONDITIONS TO AVOID

NA

HAZARDOUS DECOMPOSITON PRODUCTS

Metallic dust or fumes may be produced during welding, burning, grinding and possibly machining. Refer to ANSI Z49.1

PRODUCT
Stainless

SECTION 6 - HEALTH HAZARD DATA

NOTE: STEEL PRODUCTS IN THE NATURAL STATE DO NOT PRESENT AN INHALATION, INGESTION OR CONTACT HAZARD. HOWEVER, OPERATIONS SUCH AS BURNING, WELDING, SAWING, BRAZING AND GRINDING MAY RELEASE FUMES AND/OR DUSTS WHICH MAY PRESENT HEALTH HAZARDS IF TLV'S ARE EXCEEDED.

MAJOR EXPOSURE HAZARD

☒ INHALATION ☐ SKIN CONTACT ☐ SKIN ABSORPTION ☐ EYE CONTACT ☐ INGESTION

EFFECTS OF OVEREXPOSURE

Short term exposure to fumes/dust may produce irritation of eyes and respiratory system. Inhalation of high concentrations of freshly formed oxide fumes or iron, manganese and copper may cause metal fume fever characterized by a metallic taste in the mouth, dryness and irritation of the throat and influenza-like symptoms.

Chronic inhalation of high concentrations of iron oxide fumes or dust may lead to a benign pneumoconiosis (siderosis). Inhalation of high concentrations of ferric oxide may possibly enhance the risk of lung cancer development in workers exposed to pulmonary carcinogens.

Chromium and nickel and their compounds are listed in the 3rd Annual Report on carcinogens, as prepared by the National Toxicology Program (NTP). Exposure to high concentrations of dust and fumes can cause sensitization dermatitis, inflammation and/or ulceration of upper respiratory tract and possibly cancer of nasal passages and lungs.

Recent epidemiological studies of workers melting and working alloys containing nickel/chromium have found no increased risk of cancer.

EMERGENCY AND FIRST AID PROCEDURES

If exposed to excessive levels of metal fumes, remove to fresh air, seek medical aid immediately.

Eyes - flush with water for at least 15 minutes.

SECTION 7 - SPILL OR LEAK PROCEDURES

SPILL OR LEAK PROCEDURES

This material may be reclaimed for reuse.

WASTE DISPOSAL METHODS

According to local, state and federal regulations.

SECTION 8 - SPECIAL PROTECTION

RESPIRATORY

NIOSH/MSHA - Approved dust and fume respirator should be used to avoid excessive inhalation of particulates when exposure exceeds TLV's.

VENTILATION

Local exhaust ventilation should be utilized when welding, burning, sawing, brazing, grinding or machining when exposure exceeds TLV's.

EYE PROTECTION AND PROTECTIVE CLOTHING

Safety glasses or goggles should be utilized as required by exposure. Other protective equipment should be utilized as required by the welding standards.

SECTION 9 - SPECIAL PRECAUTIONS

In welding, precautions should be taken for airborne contaminants which may originate from components of the welding rod. Plasma arc cutting or welding can generate ozone. Overexposure can result in mucuous membrane irritation, as well as pulmonary changes including irritation, congestion and edema.

Arc or spark generated when welding or burning could be a source of ignition for combustible and flammable materials.

The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any representation or warranty, express or implied, regarding the accuracy or correctness.

The conditions or methods of handling storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.

Data sheets of individual manufacturers may be obtained by contacting Copper & Brass Sales, Inc., 17401 Ten Mile Rd., Eastpointe, MI 48021.

Copper and Brass Sales
-INC-
Corporate Services Division
17401 Ten Mile Road
Eastpointe, MI 48021-1256

Phone: (810) 775-7710
Fax: (810) 775-5078

Material Safety Data Sheet Notification

To: Copper and Brass Sales, Inc., Customers

Attn: Manager of Safety, Health, and/or Regulatory Affairs

In accordance with OSHA standard 1910.1200 (g) (6):

> (7) (i) "Distributors shall ensure that material safety data sheets, and updated information are provided to other distributors and employers with their initial shipment and with the first shipment after a material safety data sheet is updated:"
>
> (7) (ii) "The distributor shall either provide material safety data sheets with the shipped containers, or send them to the other distributor or employer prior to or at the time of the shipment;"

Enclosed are Material Safety Data Sheets covering the products you purchase from Copper and Brass Sales, Inc. The information contained in the Material Safety Data Sheets (MSDS) should enable your company to use our products in a safe and environmentally sound manner as American industry has for over sixty years.

Material Safety Data Sheets are provided for employee health and education training and are not intended to serve as a technical resource. Additional information concerning the precision processed metals that we sell can be found in our company literature.

We appreciate the opportunity to be of service, and if you need additional information, please contact me at your convenience.

Lawrence J. Switaj
Lawrence J. Switaj
Manager of Administrative Services

®
One Call Gets It All!
(800) 926-2600

Aluminum • Bronze • Stainless Steel • Nickel • Precision Processing

ALLOY (NOMINAL) COMPOSITION SHEET

COPPER AND BRASS SALES, INC.
17401 TEN MILE ROAD
EASTPOINTE, MICHIGAN 48021
810-775-7710

Copper Alloy UNS No.	Name	Copper, %	Zinc, %	Lead, %	Manganese, %	Tin, %	Phosphorus, %	Arsenic, %	Tellurium, %	Chromium, %	Cadmium, %	Sulfur, %	Zirconium, %	Silicon, %	Silver %	Beryllium %
C10100	Oxygen Free Electronic Copper	99.99+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C10200	OF Copper	99.95+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C10300	Oxygen Free Extra Low Phosphorus	99.95+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C10400	Silver Bearing OFHC Copper	99.9+	-	-	-	-	.003	-	-	-	-	-	-	-	8-12 oz*	-
C10700	Silver Bearing OFHC Copper	99.9+	-	-	-	-	-	-	-	-	-	-	-	-	25-30 oz*	-
C10800	Oxygen Free Low Phosphorus	99.95+	-	-	-	-	.008	-	-	-	-	-	-	-	0.01(B)	-
C11000	Electolytic Tough Pitch Copper	99.9+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C11300	Silver Bearing Copper	99.9	-	-	-	-	-	-	-	-	-	-	-	-	8 oz*	-
C11400	Silver Bearing Copper	99.9	-	-	-	-	-	-	-	-	-	-	-	-	10-15 oz*	-
C11500	Silver Bearing Copper	99.9	-	-	-	-	-	-	-	-	-	-	-	-	16 oz*	-
C11600	Silver Bearing Copper	99.9	-	-	-	-	-	-	-	-	-	-	-	-	25-30 oz*	-
C12000	Phosphorized Copper DLP	99.9+	-	-	-	-	.008	-	-	-	-	-	-	-	-	-
C12200	Phosphorized Copper	99.98	-	-	-	-	0.02	-	-	-	-	-	-	-	-	-
C14200	Arsenical Copper DPA	99.68	-	-	-	-	0.02	0.03	-	-	-	-	-	-	-	-
C14500	Tellurium Copper	99.49	-	-	-	-	0.01	-	0.50	-	-	-	-	-	-	-
C14700	OFHC° Sulfur Copper	99.70	-	-	-	-	-	-	-	-	-	0.30	-	-	-	-
C15000	Amzirc° (Zirconium Copper)	99.83	-	-	-	-	-	-	-	-	-	-	0.17	-	-	-
C16200	Cadmium Copper	99.0	-	-	-	-	-	-	-	-	1.00	-	-	-	-	-
C16500	Cadmium Copper	98.58	-	-	-	0.60	-	-	-	-	0.80	-	-	0.02	-	-
C17000	Beryllium Copper	98.3	-	-	-	-	-	-	-	-	-	-	-	-	-	1.70
C[illegible]	Beryllium Copper	98.1	-	-	-	-	-	-	-	-	-	-	-	-	-	1.90
C[illegible]0	Beryllium Copper	97.7	-	0.40	-	-	-	-	-	-	-	-	-	-	-	1.90
C17500	Beryllium Copper	96.9	-	-	-	-	-	-	-	-	-	-	-	-	-	0.60
C18200	Chromium Copper	99.14	-	-	-	-	-	-	-	0.85	-	-	-	0.01	-	-
C18700	Leaded Copper	99.00	-	1.00	-	-	-	-	-	-	-	-	-	-	-	-
C21000	Gilding	95.00	5.00	-	-	-	-	-	-	-	-	-	-	-	-	-
C22000	Commercial Bronze	90.00	10.00	-	-	-	-	-	-	-	-	-	-	-	-	-
C22600	Jewelry Bronze	87.50	12.50	-	-	-	-	-	-	-	-	-	-	-	-	-
C23000	Red Brass	85.00	15.00	-	-	-	-	-	-	-	-	-	-	-	-	-
C24000	Low Brass	80.00	20.00	-	-	-	-	-	-	-	-	-	-	-	-	-
C26000	Cartridge Brass	70.00	30.00	-	-	-	-	-	-	-	-	-	-	-	-	-
C26800	Yellow Brass	66.00	34.00	-	-	-	-	-	-	-	-	-	-	-	-	-
C27000	Yellow Brass	65.00	35.00	-	-	-	-	-	-	-	-	-	-	-	-	-
C27200	Yellow Brass	63.00	37.00	-	-	-	-	-	-	-	-	-	-	-	-	-
C27400	Yellow Brass	62.00	38.00	-	-	-	-	-	-	-	-	-	-	-	-	-
C28000	Muntz Metal	60.00	40.00	-	-	-	-	-	-	-	-	-	-	-	-	-
C31400	Leaded Commercial Bronze	89.00	9.10	1.90	-	-	-	-	-	-	-	-	-	-	-	-
C31600	High Strength Commercial Bronze	89.50	7.65	1.75	-	-	0.10	-	-	-	-	-	-	-	1.00 (Ni)	-
C32000	Hardware Bronze	85.00	13.25	1.75	-	-	-	-	-	-	-	-	-	-	-	-
C33000	Low Leaded Tube Brass	66.50	33.00	0.50	-	-	-	-	-	-	-	-	-	-	-	-
C33100	Leaded Tube Brass	66.00	33.00	1.00	-	-	-	-	-	-	-	-	-	-	-	-
C33200	Free Cutting Tube Brass	66.50	31.90	1.60	-	-	-	-	-	-	-	-	-	-	-	-
C33500	Low Leaded Brass	65.00	34.50	0.50	-	-	-	-	-	-	-	-	-	-	-	-
C34000	Medium Leaded Brass	65.00	34.00	1.00	-	-	-	-	-	-	-	-	-	-	-	-

*Silver content is expressed in troy ounces per avoirdupois ton (1 oz. per ton is equivalent to 0.0034 per cent).
°Trademark of American Metal Climax, Inc.

ALLOY (NOMINAL) COMPOSITION SHEET

COPPER AND BRASS SALES, INC.
17401 TEN MILE ROAD
EASTPOINTE, MICHIGAN 48021
810-775-7710

Copper Alloy No.	Name	Copper, %	Zinc, %	Lead, %	Tin, %	Phosphorus, %	Arsenic, %	Iron, %	Antimony, %	Aluminum, %
[illegible]	[illegible]	[illegible]	34.00	2.00	-	-	-	-	-	-
[illegible]	[illegible]	[illegible]	35.25	1.75	-	-	-	-	-	-
[illegible]	[illegible]	[illegible]	36.90	1.10	-	-	-	-	-	-
[illegible]	[illegible]	[illegible]	36.70	1.80	-	-	-	-	-	-
C35000	Extra High Leaded Brass	62.50	35.00	2.50	-	-	-	-	-	-
C35300	Free Cutting Brass	61.50	35.25	3.25	-	-	-	-	-	-
C36500	Leaded Muntz Metal	60.00	39.35	0.65	-	-	-	-	-	-
C37000	Free Cutting Muntz Metal	60.00	39.00	1.00	-		-	-	-	-
C37700	Forging Brass	60.00	38.00	2.00	-		-	-	-	-
C38500	Architectural Bronze	57.00	40.00	3.00	-		-	-	-	-
C41100	Bearing Bronze	90.00	9.50	-	0.50	-	-	-	-	-
C42500	Contact Bronze	88.50	9.30	-	2.00	0.20	-	-	-	-
C43500	Trumpet Metal	81.00	18.10	-	0.90	-	-	-	-	-
C44300	Arsenical Admiralty	71.00	27.96	-	1.00	-	0.04	-	-	-
C44400	Antimonial Admiralty	71.00	28.00	-	1.00	-	-	-	-	-
C44500	Phosphorized Admiralty	71.00	27.96	-	1.00	0.04	-	-	-	-
C46200	Naval Brass	63.50	35.75	-	0.75	-	-	-	-	-
C46400	Naval Brass	60.00	39.25	-	0.75	-	-	-	-	-
C46500	Arsenical Naval Brass	60.00	39.70	-	0.80	-	0.06	-	-	-
C48200	Leaded Naval Brass	60.00	38.55	0.70	0.75	-	-	-	-	-
C48500	Leaded Naval Brass	60.00	37.50	1.75	0.75	-	-	-	-	-
C50500	Phosphor Bronze (E)	98.70	-	-	1.30	0.16	-	-	-	-
C51000	Phosphor Bronze (A)	94.80	-	-	5.00	0.20	-	-	-	-
C51100	Phosphor Bronze	95.60	-	-	4.20	0.20	-	-	-	-
C52100	Phosphor Bronze (C)	91.75	-	-	8.00	0.25	-	-	-	-
C52400	Phosphor Bronze (D)	89.75	-	-	10.00	0.25	-	-	-	-
C53400	Phosphor Bronze (B-1)	93.90	-	1.00	5.00	0.10	-	-	-	-
C54400	Phosphor Bronze (B-2)	87.90	4.00	4.00	4.00	0.10	-	-	-	-
C61000	Aluminum Bronze	92.00	-	-	-	-	-	-	-	8.00
C61400	Aluminum Bronze (D)	90.25	-	-	-	-	-	2.75	-	7.00

ALLOY (NOMINAL) COMPOSITION SHEET

COPPER AND BRASS SALES, INC.
17401 TEN MILE ROAD
EASTPOINTE, MICHIGAN 48021
810-775-7710

Copper Alloy UNS No.	Name	Copper, %	Zinc, %	Lead, %	Tin, %	Phos, phorus, %	Ar- senic, %	Man- ganese, %	Iron, %	Sili- con, %	Nickel, %	Alumi- num, %
C63000	Aluminum Nickel Bronze	82.00	-	-	-	-	-	1.00	2.50	-	5.00	9.50
C64200	Aluminum Bronze	90.75	-	-	-	-	-	-	-	1.85	-	6.95
C65100	Low Silicon Bronze (B)	98.25	-	-	-	-	-	0.25	-	1.50	-	-
C65500	High Silicon Bronze (A)	95.80	-	-	-	-	-	1.10	-	3.10	-	-
C66700	Manganese Brass	70.00	28.80	-	-	-	-	1.20	-	-	-	-
C68700	Aluminum Brass-Arsenical	77.50	20.46	-	-	-	0.04	-	-	-	-	2.00
C69400	Silicon Red Brass	81.50	14.50	-	-	-	-	-	-	4.00	-	-
C70600	Cupro Nickel, 10%	88.35	-	-	-	-	-	0.40	1.25	-	10.00	-
C71000	Cupro Nickel, 20%	78.75	-	-	-	-	-	0.50	0.75	-	20.00	-
C71500	Cupro Nickel, 30%	68.90	-	-	-	-	-	0.60	0.50	-	30.00	-
C72500	Cupro Nickel, 9%	88.20	-	-	2.30	-	-	-	-	-	9.50	-
C74500	Nickel Silver, 10%	65.00	24.75	-	-	-	-	0.25	-	-	10.00	-
C75200	Nickel Silver, 18%	64.50	17.25	-	-	-	-	0.25	-	-	18.00	-
C75700	Nickel Silver, 12%	65.00	22.75	-	-	-	-	0.25	-	-	12.00	-
C[illegible]00	Nickel Silver, 12%	59.00	28.75	-	-	-	-	0.25	-	-	12.00	-
[illegible]00	Nickel Silver, 18%	55.00	26.75	-	-	-	-	0.25	-	-	18.00	-
C77300	Nickel Silver	48.58	41.00	-	-	0.02	-	-	-	0.15	10.25	-
C78200	Leaded Nickel Silver	65.00	25.00	2.00	-	-	-	-	-	-	8.00	-
C79200	Leaded Nickel Silver, 12%	61.50	25.50	1.00	-	-	-	-	-	-	12.00	-
C79600	Leaded Nickel Silver, 10%	45.00	42.00	1.00	-	-	-	2.00	-	-	10.00	-
C93200	Bearing Bronze	82.00	2.75	7.00	6.50	0.15	-	-	0.20	.005	1.00	.005
C95400	Aluminum Bronze	83.50	-	-	-	-	-	0.50	4.00	-	1.50	10.50

*Antimony 0.32 - Sulfur 0.07)

Chemical analysis has not been performed by or for Copper and Brass Sales, Inc. with respect to the items listed in this MSDS alloy composition sheet. Data supplied is furnished by our various suppliers, ASTM or CDA. If an alloy is not listed please contact Copper and Brass Sales, Inc. for MSDS information.

Alloy sheets are not to be used for material design specifications. Refer to ASTM or CDA for alloy composition.

MATERIAL SAFETY DATA SHEET (MSDS)

This MSDS should be attached or kept with the respective product with which it is associated.

31"
31

[redacted]L SAFETY DATA SHEET
[redacted] USED TO COMPLY WITH
[redacted] HAZARD COMMUNICATION
STANDARD, 29 CFR 1910.1200.
STANDARD MUST BE CONSULTED FOR
SPECIFIC REQUIREMENTS.

U.S. DEPARTMENT OF LABOR
OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
(NON-MANDATORY FORM)
FORM APPROVED
OMB NO. 1218-0072

IDENTITY (AS USED ON LABEL AND LIST):
"COTTO-WAXO" SANDED OIL BASE

NOTE: BLANK SPACES ARE NOT PERMITTED. IF ANY ITEM IS NOT APPLICABLE, OR NO INFORMATION IS AVAILABLE, THE SPACE MUST BE MARKED TO INDICATE THAT.

SECTION I

MANUFACTURER'S NAME:
COTTO-WAXO COMPANY

ADDRESS (NUMBER, STREET, CITY, STATE, AND ZIP CODE):
3330 N. BROADWAY
ST. LOUIS, MISSOURI 63147

EMERGENCY TELEPHONE NUMBER:
314/436-0300

TELEPHONE NUMBER FOR INFORMATION:
314/436-0300

DATE PREPARED: AUGUST 17, 1995

SIGNATURE OF PREPARER (OPTIONAL)

SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

HAZARDOUS COMPONENTS (SPECIFIC CHEMICAL IDENTITY; COMMON NAME(S))	OSHA PEL	ACGIH TLV	OTHER LIMITS RECOMMENDED	%(OPTIONAL)
A. WOODFIBRE: SAWDUST +	CAS # NONE		PEL: 5 MG/M3	
B. SILICA SAND +	CAS # 14808-60-7		PEL: 10 MG/M3	(RESPIRABLE)
C. PETROLEUM HYDROCARBON:	CAS # 64742-46-7		PEL: 5 MG/M3	
INDUSTRIAL OIL	CAS # 64742-53-6		PEL: 5 MG/M3	
D. COLOR +	CAS # 1103-38-4 & 5281-04-9		(RED)	
	CAS # 147-14-8 (BLUE/GREEN)		PEL: NONE ESTABLISHED	

+ AIRBORNE DUSTING CONDITIONS OF THIS MATERIAL DO NOT EXIST BECAUSE OF A UNIFORM COAGULATED COMPOUND MIX.

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT: N/A
VAPOR PRESSURE (MM HG.): N/A
VAPOR DENSITY (AIR=1): N/A
SOLUBILITY IN WATER: NO
APPEARANCE AND ODOR: HOMOGENEOUS MIXTURE; RED OR GREEN COLOR; LUBE OIL SMELL

SPECIFIC GRAVITY (H2O=1): N/A
MELTING POINT: N/A
EVAPORATION RATE (BUTYL ACETATE=1): N/A

[redacted]N IV - FIRE AND EXPLOSION HAZARD DATA

[redacted] POINT (METHOD USED): GREATER THAN 200 F/PENSKY-MARTEN
FLAMMABLE LIMITS: N/A LEL: N/A UEL: N/A
EXTINGUISHING MEDIA: WATER, WATER SPRAY, FOAM CO2, DRY CHEMICALS
SPECIAL FIRE FIGHTING PROCEDURES: NONE
UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE

SECTION V - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID: N/A
YES	STABLE	X	

INCOMPATIBILITY (MATERIALS TO AVOID): NONE

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: NONE

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID: N/A
NONE	WILL NOT OCCUR	X	

SECTION VI - HEALTH HAZARD DATA

ROUTE(S) OF ENTRY: INHALATION? N/A SKIN? WIPE EXCESS FROM SKIN FLUSH SKIN WITH SOAP AND WATER INGESTION? N/A

HEALTH HAZARDS (ACUTE AND CHRONIC): NONE

CARCINOGENICITY: NTP? N/A IARC MONOGRAPHS? N/A OSHA REGULATED? N/A
NONE

SIGNS AND SYMPTOMS OF EXPOSURE: NONE

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: NONE

EMERGENCY AND FIRST AID PROCEDURES: NONE

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: RECOVER FREE MATERIAL-NO SPECIAL METHOD

WASTE DISPOSAL METHOD: INCINERATE OR BURY

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: NONE

OTHER PRECAUTIONS: NONE

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION (SPECIFY TYPE): NONE

VENTILATION:
LOCAL EXHAUST: NONE
MECHANICAL (GENERAL): NONE
SPECIAL: NONE
OTHER: NONE

PROTECTIVE GLOVES: YES
EYE PROTECTION: SAFETY EYE WEAR
OTHER PROTECTIVE CLOTHING OR EQUIPMENT: NONE
WORK/HYGIENIC PRACTICES: WASH HANDS WITH SOAP AND WATER AFTER USE

CTW

MATERIAL SAFETY DATA SHEET

COMPANY NAME: CLEVELAND TWIST DRILL CO.
Address: P.O. BOX 6656
CLEVELAND, OHIO 44101

Telephone No.: 216-431-3120

251

Chemical Name: Cemented Carbide Product with Cobalt binder.

Trade Name and Synonyms: All Cleveland Carbide Grades

Chemical Family: Refractory Metal Carbide

Molecular Weight: N/A

PHYSICAL DATA

Appearance and Odor:	Dark Gray Metal/No Odor		
Boiling Point:	N/A	Specific Gravity (H_2O = 1):	11.0 to 15.5
Vapor Pressure (mm Hg):	N/A	Percent Volatile by Volume:	0
Vapor Density (Air = 1):	N/A	Evaporation rate:	N/A
Solubility in Water:	Insoluble	How Best Monitored:	Air Sample

HAZARDOUS INGREDIENTS

Material	Percent by Weight		OSHA PEL	ACGIH TLV
Tungsten Carbide (limits for Tungsten dust)	41 - 97%	•	----	5 mg/m^3
Cobalt	3 - 30%	•	0.1 mg/m^3	0.1 mg/m^3
Tantalum Carbide (limits for Tantalum dust)	0.0 - 16.5%	•	5 mg/m^3	5 mg/m^3
Chromium Carbide (limits for Chromium (+3) dust)	0.0 - 5.1%	•	1 mg/m^3	0.5 mg/m^3
Chromium (+3)	0.0 - 4.5%	•	1 mg/m^3	0.5 mg/m^3
Titanium Carbide (limits for Titanium dust)	0.0 - 16.5%	•	----	5 mg/m^3

Depends on grade specifications

HEALTH HAZARD DATA

Routes of Exposure:
Grinding cemented carbide product will produce dust of potentially hazardous ingredients which can be inhaled, swallowed or come in contact with the skin or eyes.

Effects of Overexposure:

Inhalation - Dust from grinding can cause irritation of the nose and throat. It also has the potential for causing transient or permanent respiratory disease, including occupational asthma and interstitial fibrosis, in a small percentage of exposed individuals. It is reported that cobalt dust is the most probable cause of such respiratory diseases. Symptoms include productive cough, wheezing, shortness of breath, chest tightness and weight loss. Interstitial fibrosis (lung scarring) can lead to permanent disability or death. Certain pulmonary conditions may be aggravated by exposure.

Skin Contact - Can cause irritation or an allergic skin rash due to cobalt sensitization. Certain skin conditions, such as dry skin, may be aggravated by exposure.

Eye Contact - Can cause irritation.

Ingestion - Reports outside the industry suggest that ingestion of significant amounts of cobalt has the potential for causing blood, heart and other organ problems.

Emergency and First Aid Procedures: Applicable for dusts or mists

Inhalation - If symptoms of pulmonary involvement develop (coughing, wheezing, shortness of breath, etc.), remove from exposure and seek medical attention.

Skin Contact - If irritation or rash occurs, thoroughly wash affected area with soap and water and isolate from exposure. If irritation or rash persists, seek medical attention.

Eye Contact - If irritation occurs, flush with copious amounts of water. If irritation persists, seek medical attention.

Ingestion - If substantial quantities are swallowed, dilute with a large amount of water, induce vomiting and seek medical attention.

Carcinogenic Assessment (NTP Annual Report, IARC Monographs, other):
None of the components of this material have been identified as known or suspected carcinogens by NTP, IARC or OSHA.

FIRE AND EXPLOSION HAZARD DATA

Flash Point: N/A **Test Method Used:** --- **Flammable Limits:** N/A **LEL:** --- **UEL:** ---

d Cemented Carbide Product is not a fire hazard. Dusts generated in grinding operations may ignite if allowed to accumulate, and ted to an ignition source.

Ex. guishing Media: For powder fires use dry sand, dry dolomite, ABC type fire extinguisher, or flood with water.

Special Fire Fighting Procedures: For a powder fire confined to a small area, use a respirator approved for toxic dusts and fumes. For a large fire, fire fighters should use self-contained breathing apparatus.

Unusual Fire and Explosion Hazards: Dusts may present a fire or explosion hazard under rare favoring conditions of particle size, dispersion and strong ignition source. However, this is not expected to be a problem under normal handling conditions.

4

CTD 1

CHEMICAL NAME: **Cemented Carbide Product with Cobalt binder.**

REACTIVITY DATA

Stability: Unstable

Stable X

Conditions to Avoid: N/A

Incompatibility: Contact of dust with strong oxidizers may cause fire or explosions.

Materials to Avoid: Strong acids

Hazardous Decomposition Products: None

Hazardous Polymerization: May Occur

Will Not Occur X

Conditions to Avoid: N/A

SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled: Ventilate area of spill. Clean up using methods which avoid dust generation such as vacuum (with appropriate filter to prevent airborne dust levels which exceed the PEL or TLV), wet dust mop or wet clean-up. If airborne dust is generated, use an appropriate NIOSH approved respirator.

Waste Disposal Method: Dispose of in accordance with appropriate government regulations. May be sold as scrap for reclaim.

SPECIAL PROTECTION INFORMATION

Respiratory Protection: Use an appropriate NIOSH approved respirator if airborne dust concentrations exceed the appropriate PEL or TLV. All appropriate requirements set forth in 29 CFR 1910.134 should be met.

Ventilation: Use local exhaust ventilation which is adequate to limit personal exposure to airborne dust to levels which do not exceed the PEL or TLV. If such equipment is not available use respirators as specified above.

Protective Gloves: Protective Gloves or Barrier cream are recommended when contact with dust or mist is likely. Prior to applying the Barrier cream or use of protective gloves, wash thoroughly.

Eye Protection: Safety glasses with side shields or goggles are recommended.

Other Protective Equipment: N/A

SPECIAL PRECAUTIONS

Precautions to be taken in handling and storage: Maintain good housekeeping procedures to prevent dust accumulation during grinding. Avoid dust inhalation and direct skin contact with dust.

Other Precautions: Clean up using methods which avoid dust generation such as vacuum (with appropriate filter to prevent airborne dust levels which exceed the PEL or TLV), wet dust mop or wet clean-up. If airborne dust is generated, use an appropriate NIOSH approved respirator.

Wash hands thoroughly after handling, before eating or smoking. Wash exposed skin at the end of work shift. Do not shake clothing, rags or other items to remove dust. Dust should be removed by washing or vacuuming (with appropriate filters) the clothing, rags, or other items.

Periodic medical examinations are recommended for individuals regularly exposed to dust or mist.

In case of questions please call: George Kiss

Company Name: Cleveland Twist Drill Co.

Title of Individual: Div. Quality Assurance Mgr.

Telephone Number: 216-431-3120

Issue Date: 11/25/85

Supersedes: N/A

Although Cleveland Twist Drill Co. has attempted to provide current and accurate information herein, Cleveland Twist Drill Co. makes no representations regarding the accuracy or completeness of the information and assumes no liability for any loss, damage, injury of any kind which may result from or arise out of the use of or reliance on the information by any person.

MATERIAL SAFETY DATA SHEET

Tools CTD 1

I. PRODUCT IDENTIFICATION

MANUFACTURER'S NAME: CLEVELAND TWIST DRILL CO. TELEPHONE NO.: (216) 431-3120

ADDRESS: P.O. BOX 6656
CLEVELAND, OHIO 44101

DATE PREPARED: November, 1985

TRADE NAME: (Label Identity): CLEVELAND TWIST DRILL CO. FERROUS CUTTING TOOL PRODUCTS

234

CHEMICAL NAME: (Generic): Ferrous Alloys

COMMON NAME: High Speed, Tool & Die, Carbon and Stainless Steels

II. HAZARDOUS INGREDIENTS

The terms "hazardous" and "hazardous materials" as used within this MSDS should be interpreted as defined by, and in accordance with, the OSHA Hazard Communication Standard (29 CFR Part 1910, 1200) including cited Appendices, Lists, References, etc., all of which are hereby incorporated by reference.

MATERIAL OR COMPONENT	PERCENT BY WEIGHT	CAS NO.		OSHA PEL (Mg/M3)		ACGIH TLV (Mg/M3)	
COBALT	0.0 - 12.5%	7440-48-4		0.1		0.1	
CHROMIUM	0.0 - 18.0%	7440-47-3		1.0		.50	
IRON	60.0 - 99.5%	1309-37-1		10		5	
MANGANESE	.10 - 2.5%	7439-96-5	(Dust)	5	(Ceiling)	5	(Ceiling)
			(Fume)	— —		1	
MOLYBDENUM	0.0 - 10.0%	7439-98-7		15		10	
NICKEL	0.0 - 16.0%	7440-02-0		1		1	
VANADIUM	0.0 - 6.0%	1314-62-1	(Dust)	.5	(Ceiling)	.05	
			(Fume)	.1	(Ceiling)	.05	
TITANIUM	0.0 - 1.0%	13463-67-7		15		5	
CARBON	0.10 - 3.00%	1333-86-4		3.5	5	3.5 (As Carbon Black)	
TUNGSTEN	0.0 - 18.0%	7440-33-7		— —	—	5	
SILICON	0.0 - 3.5%	7440-21-2	(Dust)	— —	—	5.0	
ALUMINUM	0.0 - 2.0%	7429-90	(Dust)	— —	—	10	
			(Fume)	— —	—	5	

REFER TO GRADE CHART ATTACHED

III. PHYSICAL DATA

BOILING POINT:	5000 °F	MELTING POINT:	Approx. 2500 °F
SPECIFIC GRAVITY ($H_2O = 1$):	Approx. 7.8 - 8.2 (60 °F)	VAPOR PRESSURE:	N/A
VAPOR DENSITY (AIR = 1):	N/A	SOLUBILITY IN H_2O:	Insoluble
% VOLATILES BY VOLUME:	N/A	EVAPORATION (BUTYL ACETATE = 1):	N/A
APPEARANCE & ODOR:	Various Shapes, Solid, Odorless Metal		

IV. FIRE AND EXPLOSION DATA

FLASH POINT: None FIRE POINT: None

V. HEALTH HAZARD INFORMATION

WE DO NOT CONSIDER THIS PRODUCT IN THE FORM IT IS SOLD TO CONSTITUTE A PHYSICAL HAZARD OR A HEALTH HAZARD. SUBSEQUENT OPERATIONS SUCH AS ABRADING, MELTING, WELDING, CUTTING OR PROCESSING IN ANY OTHER FASHION MAY PRODUCE POTENTIALLY HAZARDOUS DUST OR FUME WHICH CAN BE INHALED, SWALLOWED, OR COME IN CONTACT WITH THE SKIN OR EYES.

PRIMARY ROUTES OF ENTRY:		EMERGENCY FIRST AID:
	Inhalation	Remove to fresh air, if condition continues, consult physician.
	Eye Contact	Flush well with running water to remove particulate. Get medical attention.
	Skin Contact	Brush off excess dust. Wash area well with soap & water.
	Ingestion	Seek medical help if large quantities of material have been ingested.

EFFECTS OF EXPOSURE: No toxic effects would be expected from exposure to the solid form of specialty steel. Prolonged, repeated exposure to fumes or dusts generated during heating, cutting, brazing or welding may or may not cause adverse health effects associated with the listed constituents in excess of OSHA permissible exposure limits established in 29 CFR Subpart Z. (See Section II).

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CTD 1

V. HEALTH HAZARD INFORMATION (CONT'D)

EXPOSURE LIMITS: Section II lists specific ingredients and permissible exposure limits.

IMPORTANT: Determine actual exposure by industrial hygiene monitoring.

POSSIBLE SIGNS AND SYMPTOMS OF EXPOSURE TO DUST, WELDING FUME AND GASES:

SHORT TERM EXPOSURE: Metallic taste; nausea, tightness of chest; fever; irritation of eyes, nose, throat and skin; loss of consciousness/death due to welding gases or lack of oxygen.

LONG TERM EXPOSURE: There are no adverse effects from the products in their solid form. Adverse effects may or may not result from long-term (chronic) exposure to dust, fume, gases, etc. that occur by way of subsequent operations on the product. Some studies would associate one (or more) of the constituents (per Section II) with the potential for neurologic, pulmonary, respiratory, skin or other disease. Chromium, cobalt and nickel in various chemical compounds have been identified as suspect human carcinogens by the I.A.R.C., N.T.P. Annual Report. We believe there are no reliable scientific studies which show that workers exposed to operations upon our alloys suffer increased incidence of lung cancer or other disease because of their exposure to the forms of chromium, nickel or other elements in our products.

AGGRAVATION OF PREEXISTING RESPIRATORY OR ALLERGIC CONDITIONS MAY OCCUR IN SOME WORKERS.

VI. REACTIVITY DATA

STABILITY:	Chemically Stable
INCOMPATIBILITY:	Reacts with Strong Acids to Generate Hydrogen Gas
HAZARDOUS DECOMPOSITION PRODUCTS:	Metallic Oxides

VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE OF RELEASE OR SPILL: N/A

WASTE DISPOSAL METHOD: Solids - Sale as Scrap for Reuse
Dust, etc. - Follow Federal, State and Local Regulations Regarding Disposal

VIII. SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS:	General - Recommended (To keep airborne concentration of dust and fumes below ACGIH TLV's)
	Local - As Required
PERSONAL PROTECTIVE EQUIPMENT:	
Respiratory Protection:	If Fumes, misting or dust condition occurs and T.L.V. as indicated in Section II is exceeded, provide NIOSH approved respirators.
Eye Protection:	Recommend approved safety glasses or goggles when working with dusty material.
Gloves:	As Required
Other Clothing or Equipment:	As Required

IX. SPECIAL PRECAUTIONS

USE GOOD HOUSEKEEPING PRACTICES TO PREVENT ACCUMULATIONS OF DUSTS AND TO KEEP AIRBORNE DUST CONCENTRATIONS AT A MINIMUM.

THIS MATERIAL IS POTENTIALLY CONTAMINATED WITH COATINGS SUCH AS OILS FOR PRESERVATIVES AND OTHER CONTAMINANTS. IF THE MATERIAL IS CONTAMINATED, SPECIAL PRECAUTIONS (SUCH AS PROCESS CONTROL AND PERSONAL PROTECTIVE EQUIPMENT APPROPRIATE TO THE NATURE OF THE SUSPECTED CONTAMINANTS SHOULD BE TAKEN TO AVOID RESULTING EXPOSURES WHEN HANDLING, CUTTING (THERMAL OR MECHANICAL) AND/OR HEATING OR MELTING.

While the information set forth on this material safety data sheet is believed to be accurate, as of the effective date, Cleveland Twist Drill Co. makes no representations regarding the accuracy or completeness of the information and assumes no liability for any loss, damage, or injury of any kind which may result from or arise out of the use or reliance on the information by any person.

N/A = NOT APPLICABLE

CTWI 3

MATERIAL SAFETY DATA SHEET

COMPANY NAME: CLEVELAND TWIST DRILL CO.
Address: P.O. BOX 6656
CLEVELAND, OHIO 44101

Telephone No.: 216-431-3120

Chemical Name: Cemented Carbide Product with Cobalt binder.

Trade Name and Synonyms: All Cleveland Carbide Grades

Chemical Family: Refractory Metal Carbide

Molecular Weight: N/A

PHYSICAL DATA

Appearance and Odor:	Dark Gray Metal/No Odor		
Boiling Point:	N/A	Specific Gravity (H_2O = 1):	11.0 to 15.5
Vapor Pressure (mm Hg):	N/A	Percent Volatile by Volume:	0
Vapor Density (Air = 1):	N/A	Evaporation rate:	N/A
Solubility in Water:	Insoluble	How Best Monitored:	Air Sample

HAZARDOUS INGREDIENTS

Material	Percent by Weight		OSHA PEL	ACGIH TLV
Tungsten Carbide (limits for Tungsten dust)	41 - 97%	*	----	5 mg/m^3
Cobalt	3 - 30%	*	0.1 mg/m^3	0.1 mg/m^3
Tantalum Carbide (limits for Tantalum dust)	0.0 - 16.5%	*	5 mg/m^3	5 mg/m^3
Chromium Carbide (limits for Chromium (+3) dust)	0.0 - 5.1%	*	1 mg/m^3	0.5 mg/m^3
Chromium (+3)	0.0 - 4.5%	*	1 mg/m^3	0.5 mg/m^3
Titanium Carbide (limits for Titanium dust)	0.0 - 16.5%	*	----	5 mg/m^3

*Depends on grade specifications

HEALTH HAZARD DATA

Routes of Exposure:
Grinding cemented carbide product will produce dust of potentially hazardous ingredients which can be inhaled, swallowed or come in contact with the skin or eyes.

Effects of Overexposure:

Inhalation - Dust from grinding can cause irritation of the nose and throat. It also has the potential for causing transient or permanent respiratory disease, including occupational asthma and interstitial fibrosis, in a small percentage of exposed individuals. It is reported that cobalt dust is the most probable cause of such respiratory diseases. Symptoms include productive cough, wheezing, shortness of breath, chest tightness and weight loss. Interstitial fibrosis (lung scarring) can lead to permanent disability or death. Certain pulmonary conditions may be aggravated by exposure.

Skin Contact - Can cause irritation or an allergic skin rash due to cobalt sensitization. Certain skin conditions, such as dry skin, may be aggravated by exposure.

Eye Contact - Can cause irritation.

Ingestion - Reports outside the industry suggest that ingestion of significant amounts of cobalt has the potential for causing blood, heart and other organ problems.

Emergency and First Aid Procedures: Applicable for dusts or mists

Inhalation - If symptoms of pulmonary involvement develop (coughing, wheezing, shortness of breath, etc.), remove from exposure and seek medical attention.

Skin Contact - If irritation or rash occurs, thoroughly wash affected area with soap and water and isolate from exposure. If irritation or rash persists, seek medical attention.

Eye Contact - If irritation occurs, flush with copious amounts of water. If irritation persists, seek medical attention.

Ingestion - If substantial quantities are swallowed, dilute with a large amount of water, induce vomiting and seek medical attention.

Carcinogenic Assessment (NTP Annual Report, IARC Monographs, other):
None of the components of this material have been identified as known or suspected carcinogens by NTP, IARC or OSHA.

FIRE AND EXPLOSION HAZARD DATA

Flash Point: N/A **Test Method Used:** --- **Flammable Limits:** N/A **LEL:** --- **UEL:** ---

Hard Cemented Carbide Product is not a fire hazard. Dusts generated in grinding operations may ignite if allowed to accumulate, and [illegible]cted to an ignition source.

E[illegible]ishing Media: For powder fires use dry sand, dry dolomite, ABC type fire extinguisher, or flood with water.

Special Fire Fighting Procedures: For a powder fire confined to a small area, use a respirator approved for toxic dusts and fumes. For a large fire, fire fighters should use self-contained breathing apparatus.

Unusual Fire and Explosion Hazards: Dusts may present a fire or explosion hazard under rare favoring conditions of particle size, dispersion and strong ignition source. However, this is not expected to be a problem under normal handling conditions.

4

CTD 1 4

CHEMICAL NAME: **Cemented Carbide Product with Cobalt binder.**

REACTIVITY DATA

Stability: Unstable — **Conditions to Avoid:** N/A

Stable X

Incompatibility: Contact of dust with strong oxidizers may cause fire or explosions. — **Materials to Avoid:** Strong acids

Hazardous Decomposition Products: None

Hazardous Polymerization: May Occur — **Conditions to Avoid:** N/A

Will Not Occur X

SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled: Ventilate area of spill. Clean up using methods which avoid dust generation such as vacuum (with appropriate filter to prevent airborne dust levels which exceed the PEL or TLV), wet dust mop or wet clean-up. If airborne dust is generated, use an appropriate NIOSH approved respirator.

Waste Disposal Method: Dispose of in accordance with appropriate government regulations. May be sold as scrap for reclaim.

SPECIAL PROTECTION INFORMATION

Respiratory Protection: Use an appropriate NIOSH approved respirator if airborne dust concentrations exceed the appropriate PEL or TLV. All appropriate requirements set forth in 29 CFR 1910.134 should be met.

Ventilation: Use local exhaust ventilation which is adequate to limit personal exposure to airborne dust to levels which do not exceed the PEL or TLV. If such equipment is not available use respirators as specified above.

Protective Gloves: Protective Gloves or Barrier cream are recommended when contact with dust or mist is likely. Prior to applying the Barrier cream or use of protective gloves, wash thoroughly.

Eye Protection: Safety glasses with side shields or goggles are recommended.

Other Protective Equipment: N/A

SPECIAL PRECAUTIONS

Precautions to be taken in handling and storage: Maintain good housekeeping procedures to prevent dust accumulation during grinding. Avoid dust inhalation and direct skin contact with dust.

Other Precautions: Clean up using methods which avoid dust generation such as vacuum (with appropriate filter to prevent airborne dust levels which exceed the PEL or TLV), wet dust mop or wet clean-up. If airborne dust is generated, use an appropriate NIOSH approved respirator.

Wash hands thoroughly after handling, before eating or smoking. Wash exposed skin at the end of work shift. Do not shake clothing, rags or other items to remove dust. Dust should be removed by washing or vacuuming (with appropriate filters) the clothing, rags, or other items.

Periodic medical examinations are recommended for individuals regularly exposed to dust or mist.

In case of questions please call: George Kiss
Company Name: Cleveland Twist Drill Co.
Title of Individual: Div. Quality Assurance Mgr.
Telephone Number: 216-431-3120

Issue Date: 11/25/85

Supersedes: N/A

Although Cleveland Twist Drill Co. has attempted to provide current and accurate information herein, Cleveland Twist Drill Co. makes no representations regarding the accuracy or completeness of the information and assumes no liability for any loss, damage, injury of any kind which may result from or arise out of the use of or reliance on the information by any person.

MATERIAL SAFETY DATA SHEET

CRC Industries, Inc. 885 Louis Drive Warminster, PA 18974
(215) 674-4300

PRODUCT NAME 3-36 AEROSOL #MSDS03004
PRODUCT- 3004, 3005, 3005T

****

1. INGREDIENTS

	CAS #	ACGIH TLV	OSHA PEL	OTHER LIMITS	%
Petroleum Distillate	64742-47-8	ND	400 ppm	100 ppm	67
Inhibited Paraffinic Oil	NA	5 mg/m3	5mg/m3	(mist)	29
Carbon Dioxide	124-38-9	5000 ppm	10000		4

****

2. PHYSICAL DATA

****

:without propellant
Specific Gravity 0.8167 Vapor Pressure: 0.23 mm
% Volatile: 70
Boiling Point: 380 F (initial)
Evaporation Rate: slow .01 (toluene=1)
Freezing Point: ND Vapor Density: > air
Appearance and Odor: Blue liquid, pleasant odor.
pH: NA
Solubility: Negligible in water. Dissolves in most organic solvents

****

FIRE AND EXPLOSION DATA

****

Flashpoint : 175 F Method : COC
Flammable Limits: ND LEL: UEL:
Extinguishing Media: C02, dry chemical, or foam.
Unusual Hazards: Aerosol containers may explode when heated above 120 F.

****

4. REACTIVITY AND STABILITY

****

Stability : stable
Hazardous decomposition products: C02 and carbon monoxide (fire)
Materials to avoid : Strong oxidizers

****

5. PROTECTION INFORMATION

****

Ventilation: Adequate to maintain oil mist below PEL.
Respiratory: NIOSH approved respirator for high mist concentration.
Gloves: Solvent resistant Eye & Face : Safety glasses
Other Protective Equipment: Not normally required with aerosol product usage.

MATERIAL SAFETY DATA SHEET

PRODUCT NAIAE 3-36 AEROSOL #MSDS03004
PRODUCTS- 3004, 3005, 3005T
MANUFACTURED BY CRC INDUSTRIES, INC. PHONE (215) 674-4300
885 LOUIS DRIVE, WARMINSTER, PA. 18974

****
6. HEALTH HAZARD DATA
****
Primary Routes of Entry : Inhalation, skin
Signs and Symptoms of Exposure:

1. Acute Overexposure: May cause burning/irritation of eyes. Skin contact will cause dryness. Inhalation of mist may cause breathing problems. Vapors may cause headaches, nausea, dizziness.
2. Chronic overexposure: Prolonged exposure to skin may cause development of dermatitis.

Medical Conditions Generally Aggravated by Exposure: : NA

Chemical Listed as Carcinogen	No	National Toxicology Program
or Potential Carcinogen:	No	IARC Ifonographs
	No	OSHA

Emergency and First Aid Procedures: (If symptoms persist, call a physician)

1. Inhalation: Remove to fresh air. Apply artificial respiration if necessary.
2. Eyes: Flush with large amounts of water for 15 minutes.
3. Skin: Remove contaminated clothing. Wash area with soap and water.
4. Ingestion: DO NOT induce vomiting. Call a physician.

****
7. SPILL OR LEAK PROCEDURES
****
Precautions to be taken in Handling and Storage: Store in a cool, dry area.
Steps to be taken in case material is released or spilled: Ventilate area. Absorb spill with an inert material and place in closed containers.
Waste Disposal: All used and unused Product should be disposed of in conformance with local, state and federal regulations.

****
8. SPECIAL PRECAUTIONS AND USE DIRECTIONS
****
Additives are primarily fatty acids and fatty acid esters. Aerosol cans may explode if heated above 120F. Vapors are heavier than air and will collect in low areas.
OSHA sort term exposure limit (STEL) is 10 mg/m3.

****
9. NFPA HAZARD RATINGS Health:1 Flammability:2 Reactivity:0
****
****
10. SARA Information
****
This product contains NO chemicals that are subject to release reporting under section 313 of SARA Title III.
PREPARED BY: Adam Selisker ORIGINAL DATE or DATE OF REVISION: 11/11/94

MATERIAL SAFETY DATA SHEET (MSDS)

This MSDS should be attached or kept with the respective product with which it is associated.

2'

[redacted]ERIAL SAFETY DATA SHEET SIL00

CRC INDUSTRIES, INC.
885 LOUIS DRIVE
WARMINSTER, PA 18974
(215) 674-4300

PRODUCT NAME SP-400 AEROSOL #-MSDS03282
PRODUCT-3282

1. INGREDIENTS	CAS #	ACGIH TLV	OSHA PEL	OTHER LIMITS	%
METAL ALKYL ARYL SULFONATE		NA	NA		1-10
OXYGENATED HYDROCARBON		NA	NA		10-20
PETROLEUM DISTILLATE	64742-88-7	NA	400 PPM	100 PPM	15-25
N-HEXANE	110-54-3	50 PPM	50 PPM		1-5
PROPANE	74-98-6	NA	1000 PPM		10-20
ISOBUTANE	75-28-5	NA	NA	1000 PPM	10-20
ISOHEXANES	107-83-5	500 PPM	500 PPM		5-15
DICHLOROMETHANE	75-09-2	50 PPM	500 PPM		20-30

2. PHYSICAL DATA: WITHOUT PROPELLANT

SPECIFIC GRAVITY: 0.9196
VAPOR PRESSURE: ND
% VOLATILE: 74
BOILING POINT: 104 F
EVAPORATION RATE: NA
FREEZING POINT: ND
VAPOR DENSITY: > AIR
APPEARANCE AND ODOR: DARK AMBER VISCOUS LIQUID. PETROLEUM ODOR.
SOLUBILITY: NEGLIGIBLE IN WATER.
PH: NA

3. FIRE AND EXPLOSION DATA

FLASHPOINT: <20 F METHOD: TOC

FLAMMABLE LIMITS: PROPELLANT
LEL: 1.8 UEL: 9.5

EXTINGUISHING MEDIA: CO2, DRY CHEMICAL, FOAM.

UNUSUAL HAZARDS: AEROSOL CONTAINERS MAY EXPLODE WHEN HEATED ABOVE 120 F.

4. [redacted]EACTIVITY AND STABILITY

STABILITY: STABLE

HAZARDOUS DECOMPOSITION PRODUCTS:
THERMAL--CARBON MONOXIDE AND CARBON DIOXIDE.

MATERIALS TO AVOID: STRONG OXIDIZERS

5. PROTECTION INFORMATION

VENTILATION: MAINTAIN VAPOR CONCENTRATION BELOW TLV. USE MECHANICAL VENTILATION IF NECESSARY.

RESPIRATORY: SELF CONTAINED BREATHING APPARATUS ABOVE TLV

GLOVES: SOLVENT RESISTANT

EYE & FACE: SAFETY GLASSES

OTHER PROTECTIVE EQUIPMENT: NOT NORMALLY REQUIRED WITH AEROSOL PRODUCT USAGE.

6. HEALTH HAZARD DATA

PRIMARY ROUTES OF ENTRY: INHALATION, SKIN

SIGNS AND SYMPTOMS OF EXPOSURE:
1. ACUTE OVEREXPOSURE:
   INHALATION: HEADACHES, DIZZINESS, NAUSEA, ANESTHETIC EFFECTS, DROWSINESS, UNCONSCIOUSNESS & OTHER CENTRAL NERVOUS SYSTEM EFFECTS.
   SKIN: MILD IRRITATION.
   EYES: BURNING AND IRRITATION.

2. CHRONIC OVEREXPOSURE:
   REPEATED OVEREXPOSURE MAY CAUSE HARM TO THE PERIPHERAL NERVOUS SYSTEM.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:
PRE-EXISTING LUNG PROBLEMS.

CHEMICAL LISTED AS CARCINOGEN: YES NATIONAL TOXICOLOGY PROGRAM
OR POTENTIAL CARCINOGEN : YES IARC MONOGRAPHS
: YES OSHA

EMERGENCY AND FIRST AID PROCEDURES: (IF SYMPTOMS PERSIST, CALL A PHYSICIAN)

1. INHALATION: REMOVE TO FRESH AIR. APPLY ARTIFICIAL RESPIRATION IF NECESSARY.

2. EYES: FLUSH WITH LARGE AMOUNTS OF WATER FOR 15 MINUTES.

3. SKIN: WASH AREA WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING.

4. [redacted]STION: DO NOT INDUCE VOMITING. CALL A PHYSICIAN.

7. SPILL OR LEAK PROCEDURES

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:
STORE IN A COOL, DRY AREA.

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
REMOVE SOURCES OF IGNITION. VENTILATE AREA. PICK UP MATERIAL WITH INERT ABSORBENT AND PLACE IN A CLOSED CONTAINER.

WASTE DISPOSAL:
ALL USED AND UNUSED PRODUCT SHOULD BE DISPOSED OF IN CONFORMANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.

8. SPECIAL PRECAUTIONS AND USE DIRECTIONS

PROPANE AND ISOBUTANE ARE AEROSOL PROPELLANTS. PRESSURE = 45 PSIG @ 70 F. AEROSOL CONTAINERS MAY EXPLODE IF HEATED ABOVE 120 F. VAPORS ARE HEAVIER THAN AIR AND WILL COLLECT IN LOW AREAS.

9. NFPA HAZARD RATINGS

HEALTH: 2
FLAMMABILITY: 4
REACTIVITY: 0

10. SARA INFORMATION

THIS PRODUCT CONTAINS THE FOLLOWING CHEMICALS THAT ARE SUBJECT TO RELEASE REPORTING UNDER SECTION 313 OF SARA TITLE III.

CHEMICAL NAME	CAS - #	PERCENT
DICHLOROMETHANE	75-09-2	20-30

PREPARED BY: IRENE CAMPBELL
ORIGINAL DATE OR DATE OF REVISION: 05/26/94

HAZARDOUS MATERIAL WARNING (HAZMAT)

This HAZMAT WARNING should be attached or kept with the respective product with which it is associated.

```
**      ***********************************************************************
        ! SHIPPING INFORMATION
        : 2F143
        IT CODE :   800
DOT PROPER SHIPPING NAME:   CONSUMER COMMODITY
HAZARDOUS CLASS NUMBER:   -
UN ID#:   UN-0000
PACKING GROUP:   -
LIMITED QUANTITY:   N
SHIPPING LABEL:   ORM-D
HAZMAT CARTON #:   USE GRAINGER "S" CARTON 200 LB. BURST STRENGTH
SP QTY:   0001
RQ:      N
EXCEPTION:    Y ORM-D PACKAGING
EXEMPTION:    N
COMMENTS:   DO NOT SHIP AIR!!
ERG TO ACCOMPANY SHIPMENT

INTERNATIONAL INFORMATION BELOW

INTERNATIONAL -  IATA  - AIR SHIPMENTS
DOT SHIP NAME:
HAZ CLASS     :
UN ID #       :
PACKING GROUP:
LABEL         :

INTERNATIONAL -  IMCO  - WATER SHIPMENTS
DOT SHIP NAME:
HAZ CLASS     :
UN ID #       :
PACKING GROUP:
LABEL         :
*****************************************************************************
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MATERIAL SAFETY DATA SHEET (MSDS)

Please retain for your records.

MATERIAL SAFETY DATA SHEET 75528
2F147
'CT NAME: NON-CHLOR. BRAKLEEN (AEROSOL)
TS- 5088
505088
FACTURED BY: CRC INDUSTRIES, INC.
885 LOUIS DRIVE, WARMINSTER, PA 18974
Phone: (215) 674-4300

1. INGREDIENTS

Ingredients (CAS #)	ACGIH TLV	OSHA PEL	OTHER LIMITS	%
Acetone (67-64-1)	750 ppm	750 ppm		13-18
Heptane (142-82-5)	400 ppm	400 ppm		40-50
Methanol (67-56-1)	200 ppm	200 ppm		2-4
Xylene (1330-20-7)	100 ppm	100 ppm		25-30
Carbon Dioxide (124-38-9)	5000ppm	5000ppm		4-7

2. PHYSICAL DATA: without propellant
Specific Gravity: 0.762
Boiling Point: 131 F (initial)
Freezing Point: ND
Vapor Pressure: ND
% Volatile: 100
Evaporation Rate: Fast
Vapor Density: ND
pH: NA
Appearance and Odor: Clear, water white liquid.
Solubility: Partially soluble in water. Soluble in most organic liquids.

3. FIRE AND EXPLOSION DATA
Flashpoint: <20 F
Method: TCC
Flammable Limits: estimated
LEL: 1.0
UEL: 13.0
Extinguishing Media: CO2, foam, fog
Unusual Hazards:
Aerosols may explode when heated above 120 F.

4. REACTIVITY AND STABILITY
Stability: Stable
Hazardous decomposition products: CO2, carbon monoxide
Materials to avoid: Strong oxidizing agents and sources of ignition.

5. PROTECTION INFORMATION
Ventilation:
Use mechanical means to insure vapor conc. below the TLV.
Respiratory:
Use self-contained breathing apparatus above TLV.
Gloves: Solvent resistant
Eye & Face: Safety glasses
Other Protective Equipment:
Not normally required for aerosol product usage.

6. HEALTH HAZARD DATA
Primary Routes of Entry: Inhalation, Skin
and Symptoms of Exposure:
te Overexposure:
ation: dizziness, breathing difficulties, anesthetic effects, nausea, may irritate upper respiratory tract, headaches, central nervous system effects, irr. heartbeats & unconsciousness.
Eyes: irritation.
Skin: dermatitis.
2. Chronic Overexposure:
Chronic overexposure have caused liver and kidney effects in laboratory animals.
Medical Conditions Generally Aggravated by Exposure:
Breathing problems
Chemical Listed as Carcinogen or Potential Carcinogen:
National Toxicology Program: No
IARC Monographs: No
OSHA: No
Emergency and First Aid Procedures (if symptoms persist, call a physician)
1. Inhalation:
Remove to fresh air. Apply artificial respiration if necessary.
2. Eyes:
Flush with large amounts of water for 15 minutes.
3. Skin:
Wash with water- Remove contaminated clothing.
4. Ingestion:
DO NOT induce vomiting. Call a physician.

7. SPILL OR LEAK PROCEDURES
Precautions to be taken in Handling and Storage:
Store in a cool, dry area.
Steps to be taken in case Material is released or spilled:
Usually not a problem with aerosols. Area should be ventilated and an absorbent used to pick up excess material.
Waste Disposal:
All used and unused Product should be disposed of in conformance with local, state and federal regulations.

8. SPECIAL PRECAUTIONS AND USE DIRECTIONS
Aerosol containers may explode when heated above 120 F. Vapors will collect in low areas- be sure to maintain adequate ventilation and use in areas with no sources of ignition.

9. NFPA HAZARD RATINGS
Health: 2
Flammability: 3
Reactivity: 0

10. SARA Information
This product contains the following chemicals that are subject to release reporting under Section 313 of SARA Title III.

Chemical Name:	CAS-#:	Percent:
Acetone	67-64-1	13-18
Methanol	67-56-1	2-4
X	1330-20-7	25-30

ARED BY: Jon Brown
GINAL DATE or DATE OF REVISION: 04/28/93

MATERIAL SAFETY DATA SHEET (MSDS)
Please retain for your records.

MATERIAL SAFETY DATA SHEET 7S528
2F147
'CT NAME: NON-CHLOR. BRAKLEEN (AEROSOL)
TS- 5088
505088
OFACTURED BY: CRC INDUSTRIES, INC.
885 LOUIS DRIVE, WARMINSTER, PA 18974
Phone: (215) 674-4300

1. INGREDIENTS

Ingredients (CAS #)	ACGIH TLV	OSHA PEL	OTHER LIMITS	%
Acetone (67-64-1)	750 ppm	750 ppm		13-18
Heptane (142-82-5)	400 ppm	400 ppm		40-50
Methanol (67-56-1)	200 ppm	200 ppm		2-4
Xylene (1330-20-7)	100 ppm	100 ppm		25-30
Carbon Dioxide (124-38-9)	5000ppm	5000ppm		4-7

2. PHYSICAL DATA: without propellant
Specific Gravity: 0.762
Boiling Point: 131 F (initial)
Freezing Point: ND
Vapor Pressure: ND
% Volatile: 100
Evaporation Rate: Fast
Vapor Density: ND
pH: NA
Appearance and Odor: Clear, water white liquid.
Solubility: Partially soluble in water. Soluble in most organic liquids.

3. FIRE AND EXPLOSION DATA
Flashpoint: <20 F
Method: TCC
Flammable Limits: estimated
LEL: 1.0
UEL: 13.0
Extinguishing Media: CO2, foam, fog
Unusual Hazards:
Aerosols may explode when heated above 120 F.

4. REACTIVITY AND STABILITY
Stability: Stable
Hazardous decomposition products: CO2, carbon monoxide
Materials to avoid: Strong oxidizing agents and sources of ignition.

5. PROTECTION INFORMATION
Ventilation:
Use mechanical means to insure vapor conc. below the TLV.
Respiratory:
Use self-contained breathing apparatus above TLV.
Gloves: Solvent resistant
Eye & Face: Safety glasses
Other Protective Equipment:
Not normally required for aerosol product usage.

6. HEALTH HAZARD DATA
Primary Routes of Entry: Inhalation, Skin
and Symptoms of Exposure:
te Overexposure:
ation: dizziness, breathing difficulties, anesthetic ects, nausea, may irritate upper respiratory tract, headaches, central nervous system effects, irr. heartbeats & unconsciousness.
Eyes: irritation.
Skin: dermatitis.
2. Chronic Overexposure:
Chronic overexposure have caused liver and kidney effects in laboratory animals.
Medical Conditions Generally Aggravated by Exposure:
Breathing problems
Chemical Listed as Carcinogen or Potential Carcinogen:
National Toxicology Program: No
IARC Monographs: No
OSHA: No
Emergency and First Aid Procedures (if symptoms persist, call a physician)
1. Inhalation:
Remove to fresh air. Apply artificial respiration if necessary.
2. Eyes:
Flush with large amounts of water for 15 minutes.
3. Skin:
Wash with water- Remove contaminated clothing.
4. Ingestion:
DO NOT induce vomiting. Call a physician.

7. SPILL OR LEAK PROCEDURES
Precautions to be taken in Handling and Storage:
Store in a cool, dry area.
Steps to be taken in case Material is released or spilled:
Usually not a problem with aerosols. Area should be ventilated and an absorbent used to pick up excess material.
Waste Disposal:
All used and unused Product should be disposed of in conformance with local, state and federal regulations.

8. SPECIAL PRECAUTIONS AND USE DIRECTIONS
Aerosol containers may explode when heated above 120 F. Vapors will collect in low areas- be sure to maintain adequate ventilation and use in areas with no sources of ignition.

9. NFPA HAZARD RATINGS
Health: 2
Flammability: 3
Reactivity: 0

10. SARA Information
This product contains the following chemicals that are subject to release reporting under Section 313 of SARA Title III.

Chemical Name:	CAS-#:	Percent:
Acetone	67-64-1	13-18
Methanol	67-56-1	2-4
X	1330-20-7	25-30

==========
RED BY: Jon Brown
INAL DATE or DATE OF REVISION: 04/28/93

NOT

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MATERIAL SAFETY DATA SHEET

October 25, 1979

SECTION I

MANUFACTURER'S NAME Crown Industrial Products Company	EMERGENCY TELEPHONE NO. 815-648-2424
ADDRESS 100 State Line Road, Hebron, Illinois 60034	FORMULA NO. 138,050AY
TRADE NAME & PRODUCT NO. Fault Finder Cleaner 1011 - Group 1A	CHEMICAL FAMILY

SECTION II - HAZARDOUS COMPONENTS (SEE REVERSE SIDE FOR DEFINITIONS)

MATERIAL	%	TLV
1,1,1, Trichloroethane	80	100-350 ppm
Propane	10.0	1000 ppm
Isobutane	10.0	1000 ppm

SECTION III - PHYSICAL DATA

BOILING POINT Concentrate	165.4° F	SPECIFIC GRAVITY ($H_2O=1$)	1.3[illegible]
VAPOR PRESSURE Aerosol 70° F	35 PSIG	PERCENT VOLATILE	100%
VAPOR DENSITY (Air=1)	> 1	EVAPORATION RATE	0.37
SOLUBILITY IN WATER 0.07g/100 g	water		
APPEARANCE & ODOR Colorless - somewhat ethereal			

SECTION IV - FIRE & EXPLOSION HAZARD DATA

		PROPELLENT LEL	PROPELLENT UEL
FLASH POINT (See attached sheet)	FLAMMABLE LIMITS	1.8	9.5

EXTINGUISHING MEDIA CO_2; Dry chemical; Foam

SPECIAL FIRE FIGHTING PROCEDURES NONE

UNUSUAL FIRE & EXPLOSION HAZARDS ....Treat as cylinders of compressed gas.

SECTION V - HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE..Toxic by inhalation, by prolonged or repeated contact with skin or mucous membranes, or when taken by mouth.

EMERGENCY FIRST AID PROCEDURES ...Induce vomiting by drinking mustard water, lukewarm salt water, or warm soapy water. Repeat three (3) times. Then give a tablespoon of epsom salts.

NOTE TO Physician: NEVER GIVE ADRENALINE!

SECTION VI - REACTIVITY DATA

UNSTABLE		CONDITIONS TO AVOID. . . . Open flames or sparks
STABLE	X	

INCOMPATIBILITY (Materials to avoid)

HAZARDOUS DECOMPOSITION PRODUCTS

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID Open flames or sparks
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED . . . . Soak up with rags or mops. Provide adequate ventilation.

WASTE DISPOSAL METHOD

SECTION VIII - SPECIAL PROTECTION INFORMATION

VENTILATION	LOCAL EXHAUST Adequate	SPECIAL
	MECHANICAL	OTHER

PROTECTIVE GLOVES | EYE PROTECTION

OTHER PROTECTIVE EQPT.

SECTION IX - SPECIAL PRECAUTIONS

HANDLING & STORAGE PRECAUTIONS . . Aerosol container: DO NOT store in direct sunlight or at temperature exceeding 120° F.

OTHER PRECAUTIONS . . . AVOID EXCESSIVE INHALATION.

Every effort has been made to insure that the information contained herein is correct. This product formulation is subject to change without notice. In case of accident, please use the emergency telephone number provided.

Name (print)	Philip T. Miller
Signature	Philip T. Miller
Title	Laboratory Manager
Date:	. . . October 25, 1979

A HAZARDOUS INGREDIENT IS ONE WHICH MEETS ONE OR MORE OF THE FOLLOWING CRITERIA:

1. It is listed in the annual registry of toxic effects of chemical substances, or is known to be toxic within the parameters of that registry, and is present at a level of 1% or greater. DOT poisons are listed if present at any level.
2. It has an OSHA established Threshold Limit Value (TLV) or Ceiling Concentration (C) or an American Conference of Governmental Industrial Hygenist's (ACGIH) TLV or C, and by the nature of the product or its known use, is likely to become airborn.
3. It contributes to one or more of the following hazards to the product: A - Flashpoint below 200°F. (CC), or subject to spontaneous heating or decomposition; B - Causes skin burns (DOT); C - Strong oxidizing agent (DOT); D - Subject to hazardous polymerization.

Each hazardous ingredient should be listed by chemical, generic, or proprietary name, its level in the product should be expressed as 1% or less, 1-10%, 11-30%, 31-50%, 51-70%, or greater than 70%, or by other means if such information is proprietary. Recommended ACGIH or registry of toxic effects of chemical substances TLV or C values are only listed with appropriate notation, where OSHA values are not available.

NDT

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MATERIAL SAFETY DATA SHEET

December 29, 1980

SECTION I

#1012

MANUFACTURER'S NAME Crown Industrial Products Company	EMERGENCY TELEPHONE NO. 815-648-2424
ADDRESS 100 State Line Road, Hebron, Illinois 60034	FORMULA NO. 147,005AN
TRADE NAME & PRODUCT NO Fault Finder Penetrant Group 1A #1012	CHEMICAL FAMILY

SECTION II - HAZARDOUS COMPONENTS (SEE REVERSE SIDE FOR DEFINITIONS)

MATERIAL	%	TLV	Cas No.
Synthetic Lubricant	>10	N. A.	
Aromatic Hydrocarbon	<60	200 ppm	
Surface Active Agent	< 1	N. A.	
Oil Red Dye	< 2	N. A.	
Isobutane	15	1000 ppm	
Propane	15	1000 ppm	

SECTION III - PHYSICAL DATA

BOILING POINT	> 300°F	SPECIFIC GRAVITY (H_2O=1)	< 1
VAPOR PRESSURE	N. A.	PERCENT VOLATILE	Unknown
VAPOR DENSITY (Air=1)	> 1	EVAPORATION RATE Toluene=1	< 1
SOLUBILITY IN WATER	Negative		
APPEARANCE & ODOR	Red/Aromatic Odor		

SECTION IV - FIRE & EXPLOSION HAZARD DATA

FLASH POINT	See Attached Page	FLAMMABLE LIMITS	Propellent Only LEL-1.8 UEL-9.5

EXTINGUISHING MEDIA Foam, CO_2, Dry Chemical

SPECIAL FIRE FIGHTING PROCEDURES Treat as Class "B" fire.

UNUSUAL FIRE & EXPLOSION HAZARDS Treat as cylinders of compressed gas.

SECTION V - HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE - Excessive inhalation may cause headache, dizziness, nausea, severe eye irritation. Drying of skin.

EMERGENCY FIRST AID PROCEDURES - Inhalation: Remove to fresh air. Call Physician. DO NOT induce vomiting. DO NOT administer epinephrine or similar drugs. Eye contact: Flush with water. Skin contact: Wash with mild soap. Apply skin cream.

SECTION VI - REACTIVITY DATA

UNSTABLE		CONDITIONS TO AVOID DO NOT spray into open flame.
STABLE	XX	

INCOMPATIBILITY (Materials to avoid) - Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS - Thermal decomposition may yield carbon monoxide and other toxic materials in small quantities.

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	XX	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED - Ventilate area, and clean with chlorinated solvent.

WASTE DISPOSAL METHOD - Aerosol container: DO NOT puncture or incinerate can. When liquid is all expelled, continue to depress button until all gas is all evacuated.

SECTION VIII - SPECIAL PROTECTION INFORMATION

VENTILATION	LOCAL EXHAUST	Adequate	SPECIAL
	MECHANICAL		OTHER

PROTECTIVE GLOVES

EYE PROTECTION - Only under conditions where spray might get into eyes.

OTHER PROTECTIVE EQPT.

SECTION IX - SPECIAL PRECAUTIONS

HANDLING & STORAGE PRECAUTIONS - DO NOT store in direct sunlight, near open flame or radiators. DO NOT store at temperatures in excess of 120°F. Avoid contact with skin.

OTHER PRECAUTIONS - Use only as directed, intentional misuse by deliberately concentratin vapors and inhaling contents can be harmful or fatal.

Every effort has been made to insure that the information contained herein is correct. This product formulation is subject to change without notice. In case of accident, please use the emergency telephone number provided.

Name (print)	Philip T. Miller
Signature	Philip T. Miller
Title	Laboratory Manager
Date:	December 29, 1980

A HAZARDOUS INGREDIENT IS ONE WHICH MEETS ONE OR MORE OF THE FOLLOWING CRITERIA:

1. It is listed in the annual registry of toxic effects of chemical substances, or is known to be toxic within the parameters of that registry, and is present at a level of 1% or greater. DOT poisons are listed if present at any level.
2. It has an OSHA established Threshold Limit Value (TLV) or Ceiling Concentration (C) or an American Conference of Governmental Industrial Hygenist's (ACGIH) TLV or C, and by the nature of the product or its known use, is likely to become airborn.
3. It contributes to one or more of the following hazards to the product: A - Flashpoint below 200°F. (CC), or subject to spontaneous heating or decomposition; B - Causes skin burns (DOT); C - Strong oxidizing agent (DOT); D - Subject to hazardous polymerization.

Each hazardous ingredient should be listed by chemical, generic, or proprietary name, its level in the product should be expressed as 1% or less, 1-10%, 11-30%, 31-50%, 51-70%, or greater than 70%, or by other means if such information is proprietary. Recommended ACGIH or registry of toxic effects of chemical substances TLV or C values are only listed with appropriate notation, where OSHA values are not available.

MATERIAL SAFETY DATA SHEET

NDT

September 28, 1979 | SECTION I | 1013

MANUFACTURER'S NAME Crown Industrial Products Company	EMERGENCY TELEPHONE NO. 815-648-2424
ADDRESS State Line Road - Hebron, Illinois 60034	FORMULA NO. 142,097 Dy
TRADE NAME & PRODUCT NO. Fault Finder Developer 1013	CHEMICAL FAMILY Group 1A

Crown Fault Finder Developer 1013 - Clr.

SECTION II - HAZARDOUS COMPONENTS (SEE REVERSE SIDE FOR DEFINITIONS)

MATERIAL	%	TLV
Metal salts	6	NA
Chlorinated	64.0	350 ppm
Propane	15.0	1000 ppm
Isobutane	15.0	1000 ppm

SECTION III - PHYSICAL DATA

BOILING POINT Liquid	166° F	SPECIFIC GRAVITY (H_2O=1)	1.40
VAPOR PRESSURE @25° C	50 PSIG	PERCENT VOLATILE	94.0
VAPOR DENSITY (Air=1)	4.54	EVAPORATION RATE Ether	6.0
SOLUBILITY IN WATER	0.07g/100g	H_2O	
APPEARANCE & ODOR	Colorless, with a sweet odor.		

SECTION IV - FIRE & EXPLOSION HAZARD DATA

FLASH POINT (see attached sheet) | FLAMMABLE LIMITS

EXTINGUISHING MEDIA CO_2 Dry Chemical; foam

SPECIAL FIRE FIGHTING PROCEDURES None - Self contained respiratory protection should be provided for fighting fires where stored.

UNUSUAL FIRE & EXPLOSION HAZARDS AEROSOL: Treat as cylinders of compressed gas.

SECTION V - HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE - Toxic by inhalation, by prolonged or repeated contact with the skin, or mucous membrane, or when taken orally.

EMERGENCY FIRST AID PROCEDURES - Induce vomiting by drinking lukewarm salt water. Call a Physician. If conscious, tea or coffee may be given. ADRENALINE should never be given!

SECTION VI - REACTIVITY DATA

UNSTABLE		CONDITIONS TO AVOID
STABLE	X	Open flame, or electric arc.

INCOMPATIBILITY (Materials to avoid) Strong alkalies, and alkali metals

HAZARDOUS DECOMPOSITION PRODUCTS Thermal decomposition may yield small amounts of HCl and other toxic products.

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Soak up spills with rags or mops. Rags and mops should be placed in closed containers, or in a safe place out-of-doors, until fully dried.

WASTE DISPOSAL METHOD

AEROSOL CONTAINER: DO NOT puncture or incinerate. When liquid is all expelled, continue to depress button until gas is all expelled.

SECTION VIII - SPECIAL PROTECTION INFORMATION

VENTILATION	LOCAL EXHAUST	Adequate	SPECIAL
	MECHANICAL		OTHER

PROTECTIVE GLOVES	EYE PROTECTION

OTHER PROTECTIVE EQPT.

SECTION IX - SPECIAL PRECAUTIONS

HANDLING & STORAGE PRECAUTIONS - AEROSOL CONTAINER: DO NOT store in direct sunlight, near open flame or radiators, or at temperatures in excess of 120°F.

OTHER PRECAUTIONS AVOID EXCESSIVE INHALATION!

Every effort has been made to insure that the information contained herein is correct. This product formulation is subject to change without notice. In case of accident, please use the emergency telephone number provided.

Name (print)	Philip T. Miller
Signature	Philip T. Miller
Title	Laboratory Manager
Date:	9/11/79

A HAZARDOUS INGREDIENT IS ONE WHICH MEETS ONE OR MORE OF THE FOLLOWING CRITERIA:

1. It is listed in the annual registry of toxic effects of chemical substances, or is known to be toxic within the parameters of that registry, and is present at a level of 1% or greater. DOT poisons are listed if present at any level.
2. It has an OSHA established Threshold Limit Value (TLV) or Ceiling Concentration (C) or an American Conference of Governmental Industrial Hygenist's (ACGIH) TLV or C, and by the nature of the product or its known use, is likely to become airborn.
3. It contributes to one or more of the following hazards to the product: A - Flashpoint below 200°F. (CC), or subject to spontaneous heating or decomposition; B - Causes skin burns (DOT); C - Strong oxidizing agent (DOT); D - Subject to hazardous polymerization.

Each hazardous ingredient should be listed by chemical, generic, or proprietary name, its level in the product should be expressed as 1% or less, 1-10%, 11-30%, 31-50%, 51-70%, or greater than 70%, or by other means if such information is proprietary. Recommended ACGIH or registry of toxic effects of chemical substances TLV or C values are only listed with appropriate notation, where OSHA values are not available.

Devcon. P

30 ENDICOTT STREET/DANVERS, MASSACHUSETTS 01923/(617) 777-1100

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MATERIAL SAFETY DATA SHEET

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind expressed or implied is made with respect to the information contained herein.

SECTION 1.

TRADE NAME	Devcon A Hardener	CHEMICAL NAME	
CHEMICAL FAMILY	Modified amine	FORMULA	Proprietary

SECTION 2. HAZARDOUS INGREDIENTS

INGREDIENTS	NATURE OF HAZARD	%	TLV (UNITS)
Aliphatic polyamines and adducts	Eye and skin irritant.	100	n.a.
	Skin sensitizer.		

SECTION 3. PHYSICAL DATA

BOILING POINT (°F.)	> 450	SOLUBILITY IN WATER	appreciable
MELTING POINT (°F.)	n.a.	SPECIFIC GRAVITY	0.98
VAPOR PRESSURE (mm Hg.)	< 0.01 at 20°C	PERCENT VOLATILE BY VOLUME (%)	n.a.
VAPOR DENSITY (AIR=1)	> 1	EVAPORATION RATE (BuAc = 1)	n.a.
APPEARANCE AND ODOR	Straw colored gel - mild ammoniacal odor.		

SECTION 4. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (°F.) (Method Used)	> 200°F	FLAMMABLE LIMITS IN AIR	LEL n.a.	UEL n.a.
EXTINGUISHING MEDIA	Carbon dioxide or dry chemical.			
SPECIAL FIRE FIGHTING PROCEDURES	Air-supplied respirators should be available to fire fighters			
UNUSUAL FIRE AND EXPLOSION HAZARDS	None			

SECTION 5. REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	
INCOMPATIBILITY (Materials to Avoid)	Contamination with acids, strong oxidizers		
HAZARDOUS DECOMPOSITION PRODUCTS	Oxides of nitrogen and carbon		
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION 6. HEALTH HAZARD DATA

ORAL: LD_{50}	not known
DERMAL: LD_{50}	not known
IRRITATION: SKIN	moderate to severe irritant
SENSITIZATION: SKIN	can cause sensitization
EYE	severe irritation or injury if not washed out promptly
THRESHOLD LIMIT VALUE	not established
RESPIRATORY	Vapors may cause irritation.
EFFECTS OF OVEREXPOSURE	Nausea, irritation of the eyes, skin, and respiratory tract.
	Allergic skin sensitization may result.
EMERGENCY & FIRST AID PROCEDURES	
	Inhalation: Remove to fresh air.
	Eye contact: Immediately flush with clear water for
	at least 15 minutes. Get medical attention
	immediately.
	Skin contact: Remove contamination and wash with soap and water.

SECTION 7. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Prevent skin contact. Remove contaminated clothing. Discard contaminated leather articles such as shoes and belts. Absorb spilled material with sweeping compound or absorbent material and discard.

WASTE DISPOSAL METHOD Burial in approved chemical landfill or in accordance with state and Federal regulations.

SECTION 8. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify Type)	None necessary in normal use with proper ventilation.
PROTECTIVE CLOTHING	Rubber or disposable impervious gloves.
EYE PROTECTION	Safety glasses with side shields. Splash proof goggles for frequent use or large quantities.
VENTILATION	Local exhaust recommended. Good mechanical ventilation is adequate for occasional use.

SECTION 9. SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING, STORING, ETC.

Store in a cool, dry place.
Wash hands thoroughly after use.
Keep hands away from eyes when handling or before washing after use.
Use with adequate ventilation and avoid breathing vapors.

D.O.T. HAZARD CLASS -Stock #'s 10110 & 10120-ORM-D:Stock 10130 -Corrosive Liquid NOS UN#1760

DATE: August 17, 1982 SIGNATURE: Paul C Briggs

Dr. Paul C. Briggs
Director of Research

Devcon

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MATERIAL SAFETY DATA SHEET

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SECTION 1.

TRADE NAME Devcon B Hardener	CHEMICAL NAME
CHEMICAL FAMILY Modified amine	FORMULA Proprietary

SECTION 2. HAZARDOUS INGREDIENTS

INGREDIENTS	NATURE OF HAZARD	%	TLV (UNITS)
Aliphatic polyamines and adducts	Eye and skin irritant.	100	n.a.
	Skin sensitizer.		

SECTION 3. PHYSICAL DATA

BOILING POINT (°F.)	>450	SOLUBILITY IN WATER	appreciable
MELTING POINT (°F.)	n.a.	SPECIFIC GRAVITY	0.98
VAPOR PRESSURE (mm Hg.)	<0.01 at 20°C	PERCENT VOLATILE BY VOLUME (%)	n.a.
VAPOR DENSITY (AIR=1)	>1	EVAPORATION RATE (BuAc = 1)	n.a.
APPEARANCE AND ODOR	Straw colored liquid, mild ammoniacal odor.		

SECTION 4. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (°F.) (Method Used)	>200°F	FLAMMABLE LIMITS IN AIR	LEL n.a.	UEL n.a.
EXTINGUISHING MEDIA	Carbon dioxide or dry chemical.			
SPECIAL FIRE FIGHTING PROCEDURES	Air-supplied respirators should be available to fire fighters			
UNUSUAL FIRE AND EXPLOSION HAZARDS	None			

SECTION 5. REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	
COMPATIBILITY (Materials to Avoid)	Contamination with acids, strong oxidizers		
HAZARDOUS DECOMPOSITION PRODUCTS	Oxides of nitrogen and carbon		
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION 6. HEALTH HAZARD DATA

ORAL: LD_{50}	not known
DERMAL: LD_{50}	not known
IRRITATION: SKIN	moderate to severe irritant
SENSITIZATION: SKIN	can cause sensitization
EYE	severe irritation or injury if not washed out promptly
THRESHOLD LIMIT VALUE	not established
RESPIRATORY	Vapors may cause irritation.
EFFECTS OF OVEREXPOSURE	Nausea, irritation of the eyes, skin, and respiratory tract.
	Allergic skin sensitization may result.
EMERGENCY & FIRST AID PROCEDURES	
	Inhalation: Remove to fresh air.
	Eye contact: Immediately flush with clear water for
	at least 15 minutes. Get medical attention
	immediately.
	Skin contact: Remove contamination and wash with soap and water.

SECTION 7. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED	Prevent skin contact. Remove contaminated clothing. Discard contaminated leather articles such as shoes and belts. Absorb spilled material with sweeping compound or absorbent material and discard.
WASTE DISPOSAL METHOD	Burial in approved chemical landfill or in accordance with state and Federal regulations.

SECTION 8. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify Type)	None necessary in normal use with proper ventilation.
PROTECTIVE CLOTHING	Rubber or disposable impervious gloves.
EYE PROTECTION	Safety glasses with side shields. Splash proof goggles for frequent use or large quantities.
VENTILATION	Local exhaust recommended. Good mechanical ventilation is adequate for occasional use.

SECTION 9. SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING, STORING, ETC.

Store in a cool, dry place.
Wash hands thoroughly after use.
Keep hands away from eyes when handling or before washing after use.
Use with adequate ventilation and avoid breathing vapors.

D.O.T. HAZARD CLASS – Stock #'s10210 &10220-ORM-D:Stock #10230-Corrosive Liquid NOS UN#1760

DATE: August 17, 1982 SIGNATURE: Paul C Briggs

Dr. Paul C. Briggs
Director of Research

Revised from Form OSHA-20 in compliance with the guidelines set forth by OSHA for "essentially similar form."

Printed in U.S.A.

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Devcon

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MATERIAL SAFETY DATA SHEET

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind expressed or implied is made with respect to the information contained herein.

SECTION 1.

TRADE NAME	Devcon WR-2 Hardener	CHEMICAL NAME	
CHEMICAL FAMILY	Modified amine	FORMULA	Proprietary

SECTION 2. HAZARDOUS INGREDIENTS

INGREDIENTS	NATURE OF HAZARD	%	TLV (UNITS)
Aliphatic polyamines and adducts	Eye and skin irritant.	100	n.a.
	Skin sensitizer.		

SECTION 3. PHYSICAL DATA

BOILING POINT (°F.)	> 450	SOLUBILITY IN WATER	appreciable
MELTING POINT (°F.)	n.a.	SPECIFIC GRAVITY	0.98
VAPOR PRESSURE (mm Hg.)	< 0.01 at 20°C	PERCENT VOLATILE BY VOLUME (%)	n.a.
VAPOR DENSITY (AIR=1)	> 1	EVAPORATION RATE (BuAc = 1)	n.a.
APPEARANCE AND ODOR	straw colored gel - mild ammoniacal odor.		

SECTION 4. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (°F.) (Method Used)	> 200°F	FLAMMABLE LIMITS IN AIR	LEL	UEL
			n.a.	n.a.
EXTINGUISHING MEDIA	Carbon dioxide or dry chemical.			
SPECIAL FIRE FIGHTING PROCEDURES	Air-supplied respirators should be available to fire fighters			
UNUSUAL FIRE AND EXPLOSION HAZARDS	None			

SECTION 5. REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	
INCOMPATIBILITY (Materials to Avoid)	Contamination with acids, strong oxidizers		
HAZARDOUS DECOMPOSITION PRODUCTS	Oxides of nitrogen and carbon		
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION 6. HEALTH HAZARD DATA

ORAL: LD_{50}	not known
DERMAL: LD_{50}	not known
IRRITATION: SKIN	moderate to severe irritant
SENSITIZATION: SKIN	can cause sensitization
EYE	severe irritation or injury if not washed out promptly
THRESHOLD LIMIT VALUE	not established
RESPIRATORY	Vapors may cause irritation.
EFFECTS OF OVEREXPOSURE	Nausea, irritation of the eyes, skin, and respiratory tract.
	Allergic skin sensitization may result.
EMERGENCY & FIRST AID PROCEDURES	
	Inhalation: Remove to fresh air.
	Eye contact: Immediately flush with clear water for
	at least 15 minutes. Get medical attention
	immediately.
	Skin contact: Remove contamination and wash with soap and water.

SECTION 7. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Prevent skin contact. Remove contaminated clothing. Discard contaminated leather articles such as shoes and belts. Absorb spilled material with sweeping compound or absorbent material and discard.

WASTE DISPOSAL METHOD Burial in approved chemical landfill or in accordance with state and Federal regulations.

SECTION 8. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify Type)	None necessary in normal use with proper ventilation.
PROTECTIVE CLOTHING	Rubber or disposable impervious gloves.
EYE PROTECTION	Safety glasses with side shields. Splash proof goggles for frequent use or large quantities.
VENTILATION	Local exhaust recommended. Good mechanical ventilation is adequate for occasional use.

SECTION 9. SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING, STORING, ETC.

Store in a cool, dry place.
Wash hands thoroughly after use.
Keep hands away from eyes when handling or before washing after use.
Use with adequate ventilation and avoid breathing vapors.

D.O.T. HAZARD CLASS -Stock #'s 11410 & 11420-ORM-D:Stock 11430 -Corrosive Liquid NOS UN#1760

DATE: August 17, 1982 SIGNATURE: Paul C Briggs

Dr. Paul C. Briggs
Director of Research

Revised from Form OSHA-20 in compliance with the guidelines set forth by OSHA for "essentially similar form."

Printed in U.S.A.

PLASTIC STEEL® PUTTY (A)

Devcon®

PRODUCT DATA BULLETIN

A steel-filled epoxy putty for general maintenance and repairs. For filling, rebuilding, and bonding metal surfaces.

- Applies easily, needs no special tools
- Bonds to most metals, concrete
- Use conventional metalworking tools to machine finished repairs
- Excellent resistance to oil, gasoline, water, and many chemicals
- Qualified under Mil. Spec. DOD-C-24176B

RECOMMENDED APPLICATIONS:

- Repairs cracks and breaks in equipment, machinery, or castings
- Patches and rebuilds blow holes or pits in castings
- Rebuilds worn equipment
- Rebuilds pump and valve bodies
- Restores bearing journals and races

PRODUCT DATA

Typical Properties: **All samples tested after fully cured for 7 days @ 75°F.**

Color	Dark gray
Mixed Viscosity	Putty
% solids by Volume	100
Cured Density	2.33 gm/cc
Cure Shrinkage, ASTM D 2566	0.0006 in/in.
Specific Volume,	11.9 in³/lb.
Pot Life @75°F	45 minutes
Compressive Strength, ASTM D 695	8,260 psi
Adhesive Tensile Shear, ASTM D 1002	2,800 psi
Cured Hardness Shore D, ASTM 2240	85D
Dielectric Strength, volts/mil, ASTM D 149	30
Coverage	48 sq.in. @ 1/4"
Temperature Resistance	Wet 100°F Dry 250°F

Chemical Resistance: 7 days room temperature cure, (30 days immersion)

Kerosene	VG	Methanol	U
10% Hydrochloric acid	VG	Toluene	F
Chlorinated solvent	VG	Ammonia	VG
10% Sulfuric acid	VG	10% Sodium Hydroxide,	VG

Key: E=Excellent, VG=Very Good, F=Fair, U=Unsatisfactory

Epoxies are very good in water, saturated salt solution, leaded gasoline, mineral spirits, ASTM #3 oil and propylene glycol. Epoxies are generally not recommended for long-term exposure to concentrated acids and organic solvents.
PLEASE CONSULT FACTORY FOR OTHER CHEMICALS.

ITW **Devcon**, 30 Endicott St., Danvers, MA 01923 · Technical Service: 800-933-8266 · Fax: 800-765-4329

APPLICATION INFORMATION

Surface Preparation:

Proper surface preparation is essential to a successful application. The following procedures should be considered:

- First, degrease the surface by using anyone of Devcon's Industrial Cleaners. All oil, grease, and dirt must be removed before applying any epoxy material.
- All surfaces must be roughened ideally by grit blasting (8-40 mesh grit), or by grinding with a coarse wheel or abrasivedisc pad. An abrasive disc may be used provided white metal is revealed. This creates increased surface area for better adhesion. A 3-5 mil profile is desired for an application. Do not "feather edge" epoxy material. Epoxy material must be "locked" in by defined edges and a good 3-5 mil profile.
- Metal that has been handling sea water or other salt solutions should be grit blasted and high pressure water blasted and left overnight to allow any salts in the metal to "sweat" to the surface; repeat blasting to "sweat out" all the soluble salts. A test for chloride contamination should be performed prior to any epoxy application. The maximum soluble salts left on the substrate should be no more than 40 p.p.m. (parts per million).
- All abrasive preparation should be followed by chemical cleaning with any of Devcon's Industrial Cleaners. This will help to remove all traces of sandblasting grit, oil, grease, dust, or other foreign substances.
- Under cold working conditions, heating the repair area to 100-110°F immediately before applying any of Devcon's Metal-filled Epoxies is recommended. This procedure dries off any moisture, and assists the epoxy in achieving maximum adhesion to the substrate.
- All prepared surfaces should be repaired as soon as possible, to eliminate any changes or surface contaminants.

MIXING: Mix Ratio - Weight. 9:1, Volume 2.5:1
Add hardener to resin. Mix thoroughly with a screwdriver or similar tool until a uniform consistency is obtained, about 4 minutes. Be sure to mix material from the bottom and sides of the container.

APPLICATION:

For best results, product should be kept and applied at room temperature. Plastic Steel Putty can be applied when temperatures are between 55°F and 90°F. When temperatures are below 70°F, cure and potlife will be longer, and above room temperature, cure and potlife will be shorter. Spread Plastic steel Putty over prepared surface with applicator (enclosed) or putty knife. Press firmly to ensure maximum surface contact and avoid entrapping air. To bridge large gaps or holes use fiberglass, expanded metal or other mechanical fasteners.

MACHINING: Allow Plastic Steel to cure at least 8 hours. Machine the piece immediately after the putty is cured. If you wait more than 24 hours the material will wear your tools. Machine using these guidelines:

- Lathe Seed: 150 ft./minute
- Cut: Dry
- Tools: Carbide or high speed steel bits
- Feed Rate: Rough @ 1/2" - 3" @ .020 cut/rev
  Finishing @ 1/2" @ .0101 cut/rev
- Polishing: Use 400 to 650 emery paper wet to polish surface. It should polish to a 25-50 micron finish

CURE:

A 1/2" thick section of Devcon Plastic Steel(R) Putty (A) will harden at 75°F in 4 hours. The material will be fully cured for chemical immersion in 16 hours at which time the material can be machined, drilled, or painted. The actual cure time of epoxy is determined by the size of the mass of epoxy and the temperature. Plastic Steel A will stay on a vertical surface up to 1/4" thick without sagging.

PRECAUTION:

For complete safety and handling information, please refer to the appropriate Material Safety Data Sheets prior to using this product.

For technical assistance, please call 1-800-933-8266.

Warranty:
Devcon will replace any material found to be defective. Because the storage, handling and application of this material is beyond our control, we can accept no liability for the results obtained.

ORDERING INFORMATION:

Stock No.	Unit Size
10110	1 lb.
10120	4 lb.
10130	25 lb.

10/16/95

=2SH11A= 70

MATERIAL SAFETY DATA SHEET

/CON PLASTIC STEEL 5-MINUTE PUTTY (SF) HARDENER — Index STOCK NO. 10240

ITW Devcon Corporation, 30 Endicott St., Danvers, Massachusetts 01923
Emergency Telephone No.: (800) 424-9300 (CHEMTREC); Other calls: (508) 777-1100

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM RATINGS: HEALTH: 2* FLAMMABILITY: 1 REACTIVITY: 1 0211

5A455

REVISED: January 8, 1990

SECTION 1. PRODUCT IDENTITY

TRADENAME: PLASTIC STEEL 5-MINUTE PUTTY (SF) HARDENER
CHEMICAL FAMILY: Polymercaptan/polyamine mixture

OTHER PRODUCT INFORMATION: The following information applies to the hardener component of the two-part kit and to freshly mixed resin and hardener. After curing, Plastic Steel 5-Minute Putty is not hazardous.

SECTION 2. HAZARDOUS INGREDIENTS

INGREDIENT(S)	WEIGHT PCT.	CAS NO.	TLV-TWA1,2	Notes
2,4,6-Tri(dimethylaminomethyl)phenol (DMP) Severe eye irritant; possible sensitizer.	5-10	90722	n/e	

1. "TLV" means the Threshold Limit Value exposure (8-hour time-weighted average, unless otherwise noted) established by ACGIH. "OSHA PEL" refers to the Permissible Exposure Limits for airborne contaminants as specified in 29 CFR 1900.1000.
2. "N/E" indicates that neither TLV nor OSHA Permissible Exposure Limit has been established.

NOTES: A1--human carcinogen. A2--suspect carginogen. C--ceiling limit (not a TWA). D--the TLV applies to dusts; this ingredient is not a dust as sold in our product. S--absorption through skin may be a significant route of exposure. "TC" indicates a "Toxic Chemical" subject to the reporting requirements of SARA Section 313 (40 CFR Sec. 372).

SECTION 3. PHYSICAL PROPERTIES

BOILING POINT (F): n/d
MELTING POINT (F): n/d
PERCENT SOLIDS BY WEIGHT: 100
pH (5% by weight in water): 9.5
VAPOR DENSITY (Air=1): n/d
SPECIFIC GRAVITY: 1.52
APPEARANCE AND ODOR: White paste with sulfurous odor.
EVAPORATION RATE (BuAc=1): n/d
SOLUBILITY IN WATER: Negligible
VAPOR PRESSURE (mmHg): <<1 at 70 F

VOLATILE ORGANIC COMPOUNDS (VOC): 0 lbs/gal (EPA Reference Method 24)

NOTE: "n/d" = "not determined".

SECTION 4. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: 300 F; METHOD: TCC
EXPLOSIVE LIMITS IN AIR: Lower--n/d; Upper--n/d

EXTINGUISHING MEDIA:	Water	CO2	Dry chemical	Foam	Alcohol foam
		yes	yes	yes	

SPECIAL FIREFIGHTING PROCEDURES: Firefighters should wear self-contained breathing apparatus and protective clothing.
UNUSUAL FIRE AND EXPLOSION HAZARDS: None

SECTION 5. HEALTH HAZARD DATA

EMERGENCY AND FIRST AID PROCEDURES--

EYES: Flush eye with clean water for at least 15 minutes while gently holding eyelids open. Get immediate medical attention.
SKIN: Remove contaminated clothing and shoes. Wash thoroughly with soap and warm water. Consult a physician if irritation develops.
INHALATION: Remove patient to fresh air.
INGESTION: Do not induce vomiting. Consult a physician.

SECTION 5: HEALTH HAZARD DATA (cont'd)

TOXICITY DATA--Oral LD50 (rat): DMP: 1653 mg/kg
Dermal LD50 (rabbit): DMP: 1350 mg/kg
Inhalation LC50 (rat): DMP: >0.5 mg/liter; Exposure time: hours

SYMPTOMS OF ACUTE OVEREXPOSURE--

EYES: Animal tests indicate that the hardener can cause moderate to severe eye irritation.
SKIN: Animal tests indicate that the hardener will cause little or no skin irritation.
INHALATION: DMP vapor can cause irritation of the respiratory tract.
INGESTION: DMP is slightly toxic by ingestion; symptoms include fatigue, muscle weakness, labored breathing, and gastric irritation.

EFFECTS OF CHRONIC OVEREXPOSURE: Prolonged or severe overexposure to DMP vapor can cause delayed lung damage and chemical pneumonia. Prolonged or repeated contact with the hardener may cause skin irritation.

MEDICAL CONDITIONS WHICH EXPOSURE MAY AGGRAVATE: None reported.

CARCINOGENICITY--OSHA regulated? no
National Toxicology Program? no
Ingredient(s) listed: Tripoli
ACGIH? no
International Agency for Research on Cancer? yes

SECTION 6. REACTIVITY DATA

STABILITY: Chemically stable
Conditions to avoid: Open flame and extreme heat.
Materials to avoid: Strong oxidizing agents.
Hazardous decomposition products: Oxides of carbon, oxides of sulfur, oxides of nitrogen.

HAZARDOUS POLYMERIZATION: will not occur.
Conditions to avoid: When this hardener is mixed with an epoxy resin heat is generated; be careful when mixing more than an ounce or so.

SECTION 7. SPILL OR LEAK PROCEDURES

SPILL CONTROL: Absorb spill on inert material such as sand or vermiculite and transfer to an impermeable container.

WASTE DISPOSAL: Remove to a waste disposal facility operating in compliance with state and local regulations.

Applicable CERCLA/RCRA Hazardous Waste Codes: None
Reportable Quantity under CERCLA, in pounds: --

SECTION 8. PROTECTIVE EQUIPMENT

EYES: Safety glasses with side shields.
SKIN: Chemical resistant rubber gloves.
RESPIRATORY: None required in normal use with proper ventilation.
VENTILATION: Local exhaust is recommended for confined areas. General mechanical ventilation is adequate for normal use.

SECTION 9. PRECAUTIONS FOR STORAGE, HANDLING, ETC.

---Store well closed in a cool, dry place.
---Keep hands away from eyes when handling this hardener, or before washing after use.
---Wash thoroughly after using, particularly before eating or smoking.

If the material is sanded or machined after curing, take appropriate precautions against inhalation of nuisance particulates of Silica Quartz, a suspected human carcinogen. A TLV of 0.1 mg/m3 should be observed.

PROPER SHIPPING NAME: Not regulated
D.O.T. HAZARD CLASS: None

ITW Devcon Corporation bases the information and recommendations in this document on data believed to be correct. No warranty of any kind, however, is made as to the information in this document.

MATERIAL SAFETY DATA SHEET

Index STOCK NO. 10120

PUTTY HARDENER 0200

ITW Devcon, 30 Endicott St., Danvers, Massachusetts 01923
Emergency Telephone No.: (800) 424-9300 (CHEMTREC); Other calls: (508) 777-1100

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM RATINGS: HEALTH: 3* FLAMMABILITY: 1 REACTIVITY: 1 0200

REVISED: May 11, 1992

SECTION 1. PRODUCT IDENTITY

TRADENAME: PUTTY HARDENER 0200
CHEMICAL FAMILY: Polyamines and modified polyamines

OTHER PRODUCT INFORMATION: The following data pertain to the hardener only; properly mixed and cured epoxies are not hazardous.

SECTION 2. HAZARDOUS INGREDIENTS

INGREDIENT(S)	WEIGHT PCT.	CAS NO.	TLV-TWA1,2	Notes
Triethylenetetramine (TETA) Skin and eye irritant; respiratory irritant; sensitizer	30-60	112243	n/e	
Polyamide of C18 fatty-acid dimers and TETA Severe eye irritant	30-60	68082291	n/e	
Aminoethyl piperazine adduct Skin irritant; eye irritant	10-30	70776306	n/e	
Aminoethylpiperazine (AEP) Skin irritant; severe eye irritant	1-5	140318	n/e	
Nonyl phenol Skin irritant; severe eye irritant	1-5	84852153	n/e	

1. "TLV" means the Threshold Limit Value exposure (8-hour time-weighted average, unless otherwise noted) established by ACGIH. "OSHA PEL" refers to the Permissible Exposure Limits for airborne contaminants as specified in 29 CFR 1900.1000.
2. "N/E" indicates that neither TLV nor OSHA Permissible Exposure Limit has been established.

NOTES: A1--human carcinogen. A2--suspect carginogen. C--ceiling limit (not a TWA). D--the TLV applies to dusts; this ingredient is not a dust as sold in our product. S--absorption through skin may be a significant route of exposure. "TC" indicates a "Toxic Chemical" subject to the reporting requirements of SARA Section 313 (40 CFR Sec. 372).

SECTION 3. PHYSICAL PROPERTIES

BOILING POINT (F): >450
MELTING POINT (F): n/d
PERCENT SOLIDS BY WEIGHT: 100
pH (5% by weight in water): 10-11
VAPOR DENSITY (Air=1): >1
SPECIFIC GRAVITY: 0.98
APPEARANCE AND ODOR: White paste with mild ammonia-like odor.
EVAPORATION RATE (BuAc=1): <<1
SOLUBILITY IN WATER: 30-60%
VAPOR PRESSURE (mmHg): <0.01 at 68 F

VOLATILE ORGANIC COMPOUNDS (VOC): 0 lbs/gal (EPA Reference Method 24)

NOTE: "n/d" = "not determined".

SECTION 4. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: >200 F; METHOD: TCC

EXPLOSIVE LIMITS IN AIR: Lower--n/d; Upper--n/d

EXTINGUISHING MEDIA:	Water	CO2	Dry chemical	Foam	Alcohol foam
	yes	yes	yes	no	no

SPECIAL FIREFIGHTING PROCEDURES: Firefighters should wear self-contained breathing apparatus and sufficient protective gear to prevent all skin and eye contact with this material.
UNUSUAL FIRE AND EXPLOSION HAZARDS: None

SECTION 5. HEALTH HAZARD DATA

EMERGENCY AND FIRST AID PROCEDURES--

EYES: Immediately flush with clean water for at least 15 minutes while gently holding eyelids open. Get medical help as soon as possible.
SKIN: Immediately remove contaminated clothing and shoes and wash well with soap and warm water. See a doctor if irritation developes.
INHALATION: Remove patient to fresh air. Give oxygen or artificial respiration if needed. See a doctor if symptoms persist.
INGESTION: Do not induce vomiting. Dilute with lots of milk or water and get immediate medical help.

SECTION 5. HEALTH HAZARD DATA (cont'd)

TOXICITY DATA--Oral LD50 (rat): 2460 mg/kg (TETA); 2140 mg/kg (AEP)
Dermal LD50 (rabbit): 820 mg/kg (TETA); 880 mg/kg (AEP)
Inhalation LC50 (rat): No data; Exposure time: hours

SYMPTOMS OF ACUTE OVEREXPOSURE--

EYES: Severe irritant
SKIN: Moderate irritant.
INHALATION: Irritation of nose and throat; nausea and vomiting in severe cases
INGESTION: May cause irritation of mouth and throat and gastrointestinal tract.

EFFECTS OF CHRONIC OVEREXPOSURE: Repeated skin contact or inhalation of fumes can cause sensitization, with itching, rashes, or swelling of the skin or an asthma-like respiratory reaction on later exposure to the product.

MEDICAL CONDITIONS WHICH EXPOSURE MAY AGGRAVATE: Asthma, bronchitis, or skin irritations

CARCINOGENICITY--OSHA regulated? no ACGIH? no Other?
National Toxicology Program? no International Agency for Research on Cancer? no
Ingredient(s) listed: None

SECTION 6. REACTIVITY DATA

STABILITY: Chemically stable
Conditions to avoid: Extreme heat or open flame
Materials to avoid: Strong oxidizers, acids, and chlorinated organic compounds
Hazardous decomposition products: Acrid and toxic fumes with organic amines, ammonia, oxides of carbon and nitrogen

HAZARDOUS POLYMERIZATION: will not occur.
Conditions to avoid: Heat is released when this product is mixed with epoxy resins; use care when mixing large quantities.

SECTION 7. SPILL OR LEAK PROCEDURES

SPILL CONTROL: Prevent skin and eye contact; remove contaminated clothing and shoes. Absorb spill on inert material such as vermiculite; scrape up and transfer to impervious containers. Scrub spill area with strong detergent and water.

WASTE DISPOSAL: Keep out of public water supplies. Incinerate in approved facility where permitted by state and local regulation.

Applicable CERCLA/RCRA Hazardous Waste Codes: None
Reportable Quantity under CERCLA, in pounds: ---

SECTION 8. PROTECTIVE EQUIPMENT

EYES: Safety glasses with sideshields
SKIN: Chemical-resistant rubber (for example, neoprene) gloves and other protective gear as needed to prevent skin contact
RESPIRATORY: None needed in normal use with proper ventilation. In poorly ventilated areas use NIOSH-approved organic vapor respirator.
VENTILATION: General mechanical ventilation is adequate for occasional use. For prolonged or repeated use, local exhaust is recommended.

SECTION 9. PRECAUTIONS FOR STORAGE, HANDLING, ETC.

---Store well-closed in a cool, dry place.
---Remove contaminated clothing and launder thoroughly before using. Contaminated leather articles (shoes, belts) cannot be decontaminated and should be destroyed.
---Prolonged or repeated overexposure may cause sensitization and allergic response. Those so affected should consult a physician and avoid further exposure to the material if sensitization is confirmed.
---If this product is sanded or machined after curing, take appropriate precautions against inhalation of nuisance particulates. A TLV-TWA of 10 mg/m3 should be observed.
---This product has been tested for corrosivity in accordance with DOT regulations and is not corrosive.

PROPER SHIPPING NAME: Not regulated
D.O.T. HAZARD CLASS: None

ITW Devcon Corporation bases the information and recommendations in this document on data believed to be correct. No warranty of any kind, however, is made as to the information in this document.

Machining

MATERIAL SAFETY DATA SHEET

SAFETAP PASTE **Index STOCK NO. 71908**

ITW Devcon Corporation, Fluid Products Group ; 30 Endicott St., Danvers, Massachusetts 01923
Emergency Telephone No.: (800) 424-9300 (CHEMTREC); Other calls: (508) 777-1100

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM RATINGS: HEALTH: 0
FLAMMABILITY: 1
REACTIVITY: 0

REVISED: April 5, 1991

SECTION 1. PRODUCT IDENTITY

TRADENAME: SAFETAP PASTE
CHEMICAL FAMILY: Fatty alcohol paste

OTHER PRODUCT INFORMATION: Machine shop fluid.

SECTION 2. HAZARDOUS INGREDIENTS

INGREDIENT(S)	WEIGHT PCT.	CAS NO.	TLV-TWA1,2	Notes
No hazardous ingredients				

1. "TLV" means the Threshold Limit Value exposure (8-hour time-weighted average, unless otherwise noted) established by ACGIH. "OSHA PEL" refers to the Permissible Exposure Limits for airborne contaminants as specified in 29 CFR 1900.1000.
2. "N/E" indicates that neither TLV nor OSHA Permissible Exposure Limit has been established.

NOTES: A1--human carcinogen. A2--suspect carginogen. C--ceiling limit (not a TWA). D--the TLV applies to dusts; this ingredient is not a dust as sold in our product. S--absorption through skin may be a significant route of exposure. "TC" indicates a "Toxic Chemical" subject to the reporting requirements of SARA Section 313 (40 CFR Sec. 372).

SECTION 3. PHYSICAL PROPERTIES

BOILING POINT (F): >425
MELTING POINT (F): n/d
PERCENT SOLIDS BY WEIGHT: 99.9
pH (5% by weight in water): 6-7
VAPOR DENSITY (Air=1): >1
SPECIFIC GRAVITY: 0.85
APPEARANCE AND ODOR: Light amber paste with very slight odor.
EVAPORATION RATE (BuAc=1): <1
SOLUBILITY IN WATER: Insoluble
VAPOR PRESSURE (mmHg): < 1 at 68 F

VOLATILE ORGANIC COMPOUNDS (VOC): 0 lbs/gal (EPA Reference Method 24)

NOTE: "n/d" = "not determined".

SECTION 4. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: > 200 F; METHOD: PMCC

EXPLOSIVE LIMITS IN AIR: Lower--n/d; Upper--n/d

EXTINGUISHING MEDIA:	Water	CO2	Dry chemical	Foam	Alcohol foam
	yes	yes	yes	yes	no

SPECIAL FIREFIGHTING PROCEDURES: Fire fighters should wear self-contained breathing apparatus in confined areas.
UNUSUAL FIRE AND EXPLOSION HAZARDS: None.

SECTION 5. HEALTH HAZARD DATA

EMERGENCY AND FIRST AID PROCEDURES--

EYES: Flush with plenty of water in a gentle stream for at least 15 minutes.
SKIN: Wash with soap and water. Soaked clothing should be changed.
INHALATION: Remove patient to fresh air.
INGESTION: Do not induce vomiting. Give 2 glasses of water to dilute. Consult physician.

XXX

SECTION 5. HEALTH HAZARD DATA (cont'd)

TOXICITY DATA--Oral LD50 (rat): No data
Dermal LD50 (rabbit): No data
Inhalation LC50 (rat): No data; Exposure time: -- hours

SYMPTOMS OF ACUTE OVEREXPOSURE--

EYES: Slight irritation
SKIN: Non-irritating
INHALATION: None
INGESTION: Slight irritation.

EFFECTS OF CHRONIC OVEREXPOSURE: None reported

MEDICAL CONDITIONS WHICH EXPOSURE MAY AGGRAVATE: none reported

CARCINOGENICITY--OSHA regulated? no
National Toxicology Program? no
Ingredient(s) listed: None
ACGIH? no
International Agency for Research on Cancer? no

SECTION 6. REACTIVITY DATA

STABILITY: Chemically stable
Conditions to avoid: None
Materials to avoid: Strong acids and oxidizers.
Hazardous decomposition products: Oxides of carbon and nitrogen.

HAZARDOUS POLYMERIZATION: will not occur.
Conditions to avoid: None.

SECTION 7. SPILL OR LEAK PROCEDURES

SPILL CONTROL: Stop spill at source and dike area to prevent spreading. Pump liquid to salvage tank. Absorb remaining liquid on absorbent material and shovel into a suitable container.

WASTE DISPOSAL: Incineration is the recommended disposal method for all non-hazardous chemical waste. This product is not considered a hazardous waste under current federal regulations.

Applicable CERCLA/RCRA Hazardous Waste Codes: None
Reportable Quantity under CERCLA, in pounds: ---

SECTION 8. PROTECTIVE EQUIPMENT

EYES: None required.
SKIN: None required.
RESPIRATORY: None needed in normal use.
VENTILATION: General mechanical ventilation is adequate.

SECTION 9. PRECAUTIONS FOR STORAGE, HANDLING, ETC.

---Avoid freezing or high temperature which could cause full containers to burst.

PROPER SHIPPING NAME: Not regulated
D.O.T. HAZARD CLASS: None

ITW Devcon Corporation, Fluid Products Group, bases the information and recommendations in this document on data believed to be correct. No warranty of any kind, however, is made as to the information in this document.

MATERIAL SAFETY DATA SHEET

Machining

Index STOCK NO. 19900

WORK SHIELD

ITW Devcon, 30 Endicott St., Danvers, Massachusetts 01923
Emergency Telephone No.: (800) 424-9300 (CHEMTREC); Other calls: (508) 777-1100

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM RATINGS: HEALTH: 1
FLAMMABILITY: 0
REACTIVITY: 0
19900

REVISED: June 3, 1992

SECTION 1. PRODUCT IDENTITY

TRADENAME: WORK SHIELD
CHEMICAL FAMILY: Emulsion of fatty-acid derivatives

OTHER PRODUCT INFORMATION: A skin cream for protection from casual contact with industrial irritants; not intended as a barrier to solvent absorption through the skin of highly toxic materials.

SECTION 2. HAZARDOUS INGREDIENTS

INGREDIENT(S)	WEIGHT PCT.	CAS NO.	TLV-TWA1,2	Notes
No hazardous ingredients				

1. "TLV" means the Threshold Limit Value exposure (8-hour time-weighted average, unless otherwise noted) established by ACGIH. "OSHA PEL" refers to the Permissible Exposure Limits for airborne contaminants as specified in 29 CFR 1900.1000.
2. "N/E" indicates that neither TLV nor OSHA Permissible Exposure Limit has been established.

NOTES: A1--human carcinogen. A2--suspect carginogen. C--ceiling limit (not a TWA). p--the TLV applies to dusts; this ingredient is not a dust as sold in our product. S--absorption through skin may be a significant route of exposure. "TC" indicates a "Toxic Chemical" subject to the reporting requirements of SARA Section 313 (40 CFR Sec. 372).

SECTION 3. PHYSICAL PROPERTIES

BOILING POINT (F): n/d
MELTING POINT (F): <32
PERCENT SOLIDS BY WEIGHT: 40-70
pH (5% by weight in water): 7.5
VAPOR DENSITY (Air=1): n/d
SPECIFIC GRAVITY: 0.97
APPEARANCE AND ODOR: White cream with little odor.
EVAPORATION RATE (BuAc=1): n/d
SOLUBILITY IN WATER: Miscible
VAPOR PRESSURE (mmHg): n/d at -- F

VOLATILE ORGANIC COMPOUNDS (VOC): 0 lbs/gal (EPA Reference Method 24)

NOTE: "n/d" = "not determined".

SECTION 4. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: n/d (aqueous) F; METHOD: --

EXPLOSIVE LIMITS IN AIR: Lower--n/d; Upper--n/d

EXTINGUISHING MEDIA:	Water	CO2	Dry chemical	Foam	Alcohol foam
	yes	yes	yes	yes	yes

SPECIAL FIREFIGHTING PROCEDURES: None
UNUSUAL FIRE AND EXPLOSION HAZARDS: None

SECTION 5. HEALTH HAZARD DATA

EMERGENCY AND FIRST AID PROCEDURES--

EYES: Flush generously with clean water in a gentle stream. Consult a physician
SKIN: None needed
INHALATION: Unlikely route of exposure.
INGESTION: Oral toxicity is very low. Consult a physician

SECTION 5. HEALTH HAZARD DATA (cont'd)

TOXICITY DATA--Oral LD50 (rat): >5000 mg/kg
Dermal LD50 (rabbit): No data
Inhalation LC50 (rat): No data; Exposure time: -- hours

SYMPTOMS OF ACUTE OVEREXPOSURE--

EYES: May cause mild irritation.
SKIN: Not an irritant--see comments below.
INHALATION: No data
INGESTION: No toxicity found on administration of a single dose of 5000 mg/kg to rats--see comments below.

EFFECTS OF CHRONIC OVEREXPOSURE: None reported

MEDICAL CONDITIONS WHICH EXPOSURE MAY AGGRAVATE: None reported

CARCINOGENICITY--OSHA regulated? no ACGIH? no Other?
National Toxicology Program? no International Agency for Research on Cancer? no
Ingredient(s) listed: None

SECTION 6. REACTIVITY DATA

STABILITY: Chemically stable
Conditions to avoid: None
Materials to avoid: None
Hazardous decomposition products: No data

HAZARDOUS POLYMERIZATION: will not occur.
Conditions to avoid: None

SECTION 7. SPILL OR LEAK PROCEDURES

SPILL CONTROL: Wipe spill with cloth or sponge. Flush spill area with water, using detergent if needed to avoid leaving a slippery floor.

WASTE DISPOSAL: Dispose of as non-hazardous solid.

Applicable CERCLA/RCRA Hazardous Waste Codes: None
Reportable Quantity under CERCLA, in pounds: ---

SECTION 8. PROTECTIVE EQUIPMENT

EYES: None needed in anticipated applications
SKIN: None
RESPIRATORY: None
VENTILATION: None needed in anticipated applications.

SECTION 9. PRECAUTIONS FOR STORAGE, HANDLING, ETC.

No special precautions needed. Keep containers closed to avoid drying or spilling the product.

NOTE: Toxicological tests on Work Shield following standards set under the Federal Hazardous Substances Act gave the following results:

Eye irritation--Four of six rabbits tested showed irritation of the eyelid 24 hours after administration of the sample to one eye. All adverse symptoms had disappeared at 72 hours. Work Shield is therefore a mild to moderate eye irritant. Skin irritation--No irritation was found in test animals when Work Shield was kept in continuous contact with abraded skin for twenty-four hours. Ingestion--No toxic effects were attributed to Work Shield after it was given as a single oral dose at 5000 mg/kg to albino rats. Copies of the test reports are available on request.

PROPER SHIPPING NAME: Not regulated
D.O.T. HAZARD CLASS: None

ITW Devcon Corporation bases the information and recommendations in this document on data believed to be correct. No warranty of any kind, however, is made as to the information in this document.

DVC 27

DEVCON ZIP GRIP SUPER GLUE 4404

Material Safety Data Sheet Index stock no. **14140**

ITW Devcon Corporation, 30 Endicott St., Danvers, Massachusetts 01923
Emergency telephone no.: (508) 777-1100; other calls: (508) 777-1100

Hazardous Materials Identification System ratings: Health: 2
Flammability: 2
Reactivity: 2

Revised: September 30, 1988 5120

Section 1. Product Identity

147

Tradename: ZIP GRIP SUPER GLUE 4404
Chemical family: 2-Cyanoacrylate Ester
Other product information:

Section 2. Hazardous Ingredients

Ingredient	Weight pct.	CAS no.	TLV-TWA[1,2]	Notes
Methyl-2-cyanoacrylate Skin and eye irritant. Bonds skin and eye immediately.	>60	137053	2 ppm	
Poly(methyl methacrylate) (PMMA) Tumerigenic in animals when implanted beneath the skin.	5-10	9011147	n/e	

1. "TLV" means the Threshold Limit Value exposure (8-hour time-weighted average, unless otherwise noted) established by ACGIH. "OSHA PEL" refers to the Permissible Exposure Limits for airborne contaminants as specified in 29 CFR 1900.1000.
2. "n/e" indicates that neither TLV nor OSHA Permissible Exposure Limit has been established.
Notes: A1--human carcinogen. A2--suspect carginogen. C--ceiling limit (not a TWA). S--absorption through skin may be a significant route of exposure. "TC" indicates a "Toxic Chemical" subject to the reporting requirements of SARA Section 313 (40 CFR Sec. 372).

Section 3. Physical Properties

Boiling point (F): 140 at 3 mmHg **Vapor density (Air=1):** >1 **Evaporation rate(BuAc=1):** <1
Melting point (F): n/d **Specific gravity:** 1.08-1.12 **Solubility in water:** Insoluble, Reacts
Vapor pressure (mmHg): 0.3 at 70 F **Percent volatile by volume:** <1
Appearance and odor: Clear liquid with pungent odor. **pH (5% by weight in water):** Reacts
Note: "n/d" = "not determined".

Section 4. Fire and Explosion Hazard Data

Flash point: 181 (80C) F; method: COC **Explosive limits in air (%):** lower--n/d; upper--n/d
Extinguishing media--Water-- CO2--yes Dry chemical--yes Foam-- Alcohol foam--
Special firefighting procedures: Wear self-contained breathing apparatus and protective clothing.
Unusual fire and explosion hazards: Cloths used to wipe up spills may cause rapid polymerization that could result in auto-ignition.

Section 5. Health Hazard Data

Emergency and first aid procedures--
EYES: Immediately flush with water for at least 30 minutes. Do not attempt to force lids open. Get medical attention.
SKIN: Soak hands immediately in warm water. Remove cured adhesive with hot soapy water.
INHALATION: Move victim to fresh air.
INGESTION: Will probably polymerize and adhere to the mouth before ingestion. Position patient to prevent ingestion of the solid.

Toxicity data--Oral LD50 (rat): no data
Dermal LD50 (rabbit): no data
Inhalation LC50 (rat): no data; exposure time: hours

Symptoms of acute overexposure--
EYES: Bonds eyelids or eyelid to eyeball; lachrymator, double vision. Vapor at concentrations above about 5 ppm can cause eye irritation.
SKIN: Bonds skin rapidly. Large quantities may cause burns.
INHALATION: Irritation of the mucous membranes and upper respiratory tract at concentrations above about 3 ppm. Odor threshhold is 1 to 3 ppm.
INGESTION: Could produce symptoms of inhalation. Will rapidly polymerize to a solid on contact with body moisture.

Effects of chronic overexposure: PMMA has been shown to cause tumors when implanted beneath the skin of laboratory animals.

Medical conditions which exposure may aggravate: None known.

Carcinogenicity--OSHA regulated? no
National Toxicology Program? no
Ingredient(s) listed: PMMA
ACGIH? no
International Agency for Research on Cancer? yes

Section 6. Reactivity Data

Stability: Chemically unstable
Conditions to avoid: High humidity, high temperatures, alkalines and water.
Materials to avoid: Water, alkaline materials.
Hazardous decomposition products: CO, CO2, oxides of nitrogen.
Hazardous polymerization: may occur.
Conditions to avoid: See note at end of report.

Section 7. Spill or Leak Procedures

Spill control: SMALL SPILLS: Wipe up with cloth. Immediately soak cloth with water to polymerize adhesive. Caution: Cloth containing adhesive may undergo auto-ignition if not soaked with water. LARGE SPILLS: See note below.
Waste disposal: Incinerate or solid adhesive can be landfilled in accordance with all appicable Federal, State and local environmental regulations. Do not pour down the drain.
Applicable CERCLA/RCRA hazardous waste codes: None
Reportable quantity under CERCLA, in pounds: --

Section 8. Protective Equipment

EYES--Safety glasses must be worn.
SKIN--Polyethylene gloves. Do not wear rubber or cloth gloves.
RESPIRATORY--Under normal use, none needed. See section 7 for spills. Local exhaust should be used to control vapors in work area below specified TLV
VENTILATION--Under normal use, not needed. See Section 7 for spills. Local exhaust should be used to control vapors in work area below specified TLV.

Section 9. Precautions for storage, handling, etc.

---Store in a cool, dry place.
---Keep away from heat or open flames. Use with adequate ventilation.
---Avoid contact with skin, eyes or clothing.
---Read instructions carefully.
HAZARDOUS POLYMERIZATION CONDITIONS TO AVOID: Contamination with water, alkaline materials or peroxides can result in rapid polymerization with an uncontrollable rise in temperature and buildup of pressure in a closed container.

PROCEDURE FOR LARGE SPILLS: Flood area with water. When cured, remove cured film with a scraper. Wear NIOSH approved respirator for organic or self-contained breathing apparatus, if needed, and protective clothing.
Proper shipping name: Not regulated
D.O.T. hazard class:

Devcon Corporation bases the information and recommendations in this document on data believed to be correct. No warrenty of any kind, however, is made as to the information in this document.

NATIONAL SANITARY SUPPLY CO.
13217 S. Figueroa Street
Los Angeles, California 90061

Manufacturer:
THE DIAL CORPORATION
111 WEST CLARENDON AVE.
PHOENIX, AZ 85077
Emergency Tel. No. 602/253-3334
Telephone No. 602-991-3000

MATERIAL SAFETY DATA SHEET

SECTION 1. IDENTIFICATION OF PRODUCT*

Product Name: BORAXO HEAVY DUTY HAND SOAP

Date Issued: 05/02/89
Supercedes: 11/15/85
National Item # 1241XX

SECTION 2. INGREDIENTS

INGREDIENTS	CAS NUMBER	PERCENT	EXPOSURE LIMITS IN AIR OSHA PEL	ACGIH TLV	OTHER
FINISH PRODUCTS:			OSHA (PEL)-N/A	ACGIH (TLV)-NA	
HAZARDOUS COMPONENTS:					
CHEMICAL / COMMON NAME			PEL/TLV - SOURCE		
SODIUM TETRABORATE DECAHYDRATE/BORAX	1303-96-4		OSHA 8-hr TWA Pel, 10mg/m3	ACGIH TLV-TWA, 5 mg/m	

*VALUES WERE SET TO PROTECT WORKERS FROM ACUTE IRRIATANT EFFECTS ON SKIN AND MUCOUS MEMBRANES OF THE EYES, NOSE, AND OTHER SITES.

SECTION 3. PHYSICAL DATA

Boiling Point (F): ND
Vapor Pressure (mm Hg.): ND
Vapor Density (Air=1): ND
Solubility in Water: APPROX. 5% AT 20C
Appearance and Odor: WHITE, GRANULAR POWDER, SLIGHTLY PERFUMED.

Specific Gravity(Water=1): 0.898
Volatile By Weight (%): ND
Evaporation Rate (*=1): ND
*Butyl Acetate

Section 4. FIRE AND EXPLOSION HAZARD DATA

Flash Point (Test Method): NONE
Flammable Limits: NONE LEL= UEL=
Extinguishing Media: NOT REQUIRED. PRODUCT IS INHERENT FIRE RETARDANT.

Special Fire Fighting Proceaures: NONE

Unusual Fire & Explosion Hazards: NONE

SECTION 5. REACTIVITY DATA

Stability: STABLE

Chemical Incompatibility - : NONE

Hazardous Polymerization: WILL NOT OCCUR

Conditions to Avoid: NONE

Hazardous Decomposition Products: NONE

SECTION 6. PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be taken in case material is released or spilled:

Eye Protection - NONE NECESSARY UNLESS DIRECT EYE CONTACT WITH THE PRODUCT IS EXPECTED OR LUNLESS HIGH DUST LEVELS OF THE PRODUCT ARE PRODUCED. IN SUCH SITUATIONS, WEAR GLASSES OR GOGGLES AS APPROPRIATE.
Skin Protection - ONE NECESSARY LUNLESS PROLONGED OR EXTENSIVE EXPOSURE TO THE PRODUCT IS EXPECTED OR UNLESS SKIN IS DAMAGED OR DISEASED. IN SUCH SITUATIONS, WEAR BORAX IMPERMEABLE GLOVES, GRAMENTS, OR SHOES AS APPROPRIATE.
Respiratory Protection - NONE NECESSARY EXCEPT IN AREAS WHERE AIRBORN DUST CONCENTRATIONS OF SODIUM BORAX EXCEED ESTABLISHED WORKPLACE LIMITS. IN SUCH SITUATIONS, WEAR BORAX IMPERMEABLE GLOVES, GARMENTS OR SHOES AS APPROPRIATE.

Handling: RETAIN PACKAGE INTEGRITY.
Storage: DRY INDOOR STORAGE.
Normal Clean Up: SWEEP OR VACUM. RINSE AREA WITH WATER.
Waste Disposal: SANITARY SEWER OR SOLID WASTE. NOT A HAZARDOUS WASTE.

SECTION 7. HEALTH HAZARD DATA

Route Of Entry: Inhalation - UNLIKELY UNDER ORMAL USE CONDITIONS
Skin - LIKELY
Ingestion - UNLIKELY UNDER NORMAL USE CONDITIONS
Eye - UNLIKELY UNDER NORMAL USE CONDITIONS

Health Hazards (Acute and Chronic):

Acute:

Inhalation - RESPIRATORY TRACT IRRITATION HAS BEEN REPORTED AMONG INDIVIDUALS EXPOSED TO HIGH DUST LEVELS OF SODIUM TETRABORATES.

Ingestion - THE ACUTE ORAL LD50 FOR THE PRODUCT IN RATS IS GREATER THAN 6.81g/kg BODY WEIGHT. THIS VALUE IS CONSISTENT WITH THE ACUTE ORAL TOXICITY IN RATS OF THE PRODUCT'S PREDOMINANT INGREDIENTS, BORAX AND SOAP. SEE PARAGRAPH BELOW FOR ADDITIONAL INFORMATION ON BORATE TOXICITY FOLLOWING EXPOSURE BY THIS AND OTHER ROUTES, WHICH ARE CONSIDERED RELEVANT FOR PREDICTING BORATE TOXICITY BY THIS ROUTE.

Skin - ALTHOUGH THE PRIMARY SKIN IRRITATION INDEX OF THE PRODUCT IN RABBITS IS 0, NO EFFECT (16 CFR 1500.41), PROLONGED CONTACT WITH AQUEOUS SOLUTIONS OF IT WOULD BE EXPECTED TO BE IRRITATING TO RABBIT, AND PROBABLY HUMAN, SKIN BECAUSE UNDER SIMILAR CONDITIONS SODIUM TETRABORATE AND SOAP ARE IRRITATING TO RABBIT SKIN. ALSO, OCCUPATIONAL EXPERIENCE WITH SODIUM TETRABORATES, SUGGEST PROLONGED SKIN CONTACT WITH THE DRY PRODUCT, WHICH CONTAINS A HIGH CONCENTRATION OF BORAX, WOULD BE IRRITATING OR DRYING TO THE SKIN.
THE ACUTE DERMAL LD50 FOR THE PRODUCT IN RABBITS IS GREATE THAN 2.0 g/kg BODY WEIGHT (16 CFR 1500.40). SEE PARAGAPH BELOW FOR ADDITIONAL INFORMATION ON BORATE TOXICITY FOLLOWING EXPOSURE BY THIS AND OTHER ROUTES, WHICH ARE CONSIDERED RELEVANT FOR PREDICTING BORATE TOXICITY BY THIS ROUTE.

Eyes - THE PRODUCT PRODUCES REVERSIBLE CONJUNCTIVITIS WHEN INSTILLED IN THE EYES OF RABBITS (16 CFR 1500.40). THIS EFFECT IS CONSISTENT WITH THE OCULAR EFFECTS OF SODIUM TETRABORATES AND SOAP.

Chronic: NO FOR PRODUCT.

BORATE SYSTEMIC TOXICITY. ACUTE AND CHRONIC EXPOSURE TO SODIUM BORATES OR BORIC ACID, WHICH IS CHEMICALLY AND TOXICOLOGICALLY SIMILAR TO SODIUM BORATES, PRODUCE GASTROINTESTINAL, CENTRAL NERVOUS SYSTEM, SKIN, RENAL AND HEPATIC TOXICITY, AND DEATH IN HUMANS. CHRONIC EXPOSURE TO THESE COMPOUNDS PRODUCE GROWTH SUPPRESSIONM TESTICULAR DEGENERATION, INFERTILITY, DEATH AND, POSSIBLY RED BLOOD CELL TOXICITY IN ANIMALS.

MOST BOATE POISONINGS AMONG HUMANS HAVE FOLLOWED INGESTION, INSTILLATION INTO A BODY CAVITY, OR APPLICATION TO DAMAGED OR DISEASED SKIN. MANY OF THE REPORTED CASES INVOLVED INFATS, WHO MAY BE A SENSITIVE POPULATION TO BORATE TOXICITY. ALSO, RECENT PURLISHED LITERATURE ON BORIC ACID INGESTIONS INDICATE THE TOXIC POTENCY OF THESE COMPOUNDS MAY BE DRAMATICALLY LESS THAN INDICATED IN SOME OF THE OLDER PRIMARY LITERATURE OR RECENT SECONDARY SOURCES.

Carcinogenicity*:	NTP	IARC Monographs	OSHA Regulated
	NL	NO	NO

*THE PRODUCT HAS NOT BEEN TESTED FOR THIS EFFECT.

Effects of Overexposure:

Inhalation - DRYNESS OF MOUTH, NOSE, AND THROAT, NOSE AND THORAT IRRITATION, NOSEBLEEDS, DRY COUGH, CHEST TIGHTNESS, SHORTNESS OF BREATH, AND DYSPNEA HAVE BEEN REPORTED AMONG WORKERS EXPOSED TO HIGH DUST LEVELS OF SODIUM TETRABORATES.

Ingestion - NAUSEA, ABDOMINAL PAIN, VOMITING, DIARRHEA, HEADACHE, LETHARGY, LIGHTHEADEDNESS, DELIRIUM, CONVULSIONS, COMA, DIMINISHED URINE OUTPUT, ALOPECIA, AND AN ERYTHEMATOUS DESQUAMATING RASH HAVE BEEN REPORTED AMONG INDIVIDUALS POISONED BY SODIUM TETRABORATES OR BORIC ACID.

Skin - IRRITATION AND CHAPPING.

Eyes - TEMPORARY BURNING, STINGING, OR IRRITATION.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: NONE

SECTION 8. FIRST AID & MEDICAL EMERGENCY PROCEDURES

Eye: FLUSH EYES WITH TEPID TER, OCCASIONALLY LITING LIDS, UNTIL ALL VISIBLE

MATERIAL HAS BEEN REMOVED. IF ANYMORE THAN TRANSITORY IRRITATION OR DISCOMFORT OCCUR, CALL A PHYSICIAN, PREFERABLY AN OPHTHALMOLOGIST.
Skin: RINSE ALL MATERIAL FROM THE SKIN.
Inhalation: REMOVE TO FRESH AIR.
Ingestion: REQUIRES IMMEDIATE MEDICAL MANAGEMENT. DRINK MILK OR WATER AND GET MEDICAL ADVICE. VOMITING SHOULD BE INDUCED ONLY ON RECOMMENDATION OF MEDICAL PERSONNEL.

SECTION 9. CONTROL MEASURES - OCCUPATIONAL

Respiratory Protection: (SPECIFY TYPE): WEAR APPROPRIATE NIOSH - APPROVED DUST RESPIRATOR IN AREAS WHERE AIRBORNE DUST CONCENTRATIOS OF BORAX EXCEED ESTABLISHED WORKPLACE LIMITS.
Ventilation: AS NECESSARY TO PREVENT AIRBORNE CONCENTRATIOS OF BORAX FROOM EXCEEDING APPLICABLE WORKPLACE LIMITS.
Protection Gloves: NONE NECESSSARY UNLESS PROLONGED EXPOSURE TO THE PRODUCT IS EXPECTED OR UNLESS SKIN IS DMAGED OR DISEASED. IN SUCH SITUATIONS, WEAR BORAX IMPERMEABLE GLOVES.
Eye Protection: NONE NECESSARY UNLESS DIRECT EYE CONTACT WITH THE PRODUCT IS EXPECTED OR UNLESS HIGH DUST LEVELS OF THE PRODUCT ARE PRODUCED. IN SUCH SITUATIONS, WEAR GLASSES OR GOGGLES AS APPROPRIATE.
Other Protective Clothing/Equipment: NONE NECESSARY UNLESS PROLONGED OR EXTENSIVE SKIN CONTACT IS EXPECTED OR UNLESS SKIN IS DAMAGED OR DISEASED. IN SUCH SITUATIONS, WEAR APPROPRIATE BORAX IMPERMEABLE GRAMENTS OR SHOES.
WORK/HYGIENIC PRACTICES: DO NOT EAT OR DRINK IN WORK AREA.
REFERENCES:

American Conference of Governmental Industrial Hygienists. (1988). THRESHOLD LIMIT VALUES AND BIOLOGICAL EXPOSURE INDICES FOR 1988-1989. AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS, CINCINNATI, HO.
American Conferencee of Governmental Industrial Hygienists. DOCUMENTATION OF THE THRESHOLD LIMIT VALUES AND BIOLOGICAL EXPOSURE INDICES. FIFTH ED. AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTIAL HYGIOENISTS, INC., CINCINNATI, HC.
Cosmetic Ingredient Review. (1983). FINAL REPORT ON THE SAFETY ASSESSMENT OF SODIUM BORATE AND BORIC ACID. .AM.COLL. TOXICOL. 2 (7), 87-125.
Litovitz, T. Klein-nSchwartz, W. Oderda, G., and Schmitz, B. (1988). CLINICAL MANIFESTATIONS OF TOXICITY IN A WERIES OF 784 BORIC ACID INGESTIONS. AM.J.EMERG. MED. 6 (3), 290-212.
Pfeiffer, C.C. and Jenney, E.H. (1950). THE PHARMACOLOGY OF BORIC ACID AND VORON COMPOUNDS. BULL. NAT. FORM. COMM. 18, 57-80.
Stokinger, H.E. (1981). THE HALOGENS AND THE NONMETALS BORON AND SILICON. IN: PATTY'S INDUSTRIAL HYGIENE AND TOXICOLOGY. 3RD ED., (G.D.CLAYTON AND F.E. CLAYTON EDS.) VOL. IIB. CHAP. 40, PP. 2984-2987. JOHN WILEY AND SONS, INC., NEW YOPK.
United States Occupational Safety and Health Administation.(1989). AIR CONTAMINANTS. BORATES, TETRA, SODIUM SALTS (ANHYDROUS, PENTAHYDRATE, AND DECAHYDRATE). FED. REG. 54 (12), 2451-2452.

SECTION 10. ENVIROMENTAL IMPACT

Applicable Regulations: 16 CFR 500
DOT/EPA Hazard Class: NONE SHIPPING NANE: SEE PRODUCT NAME
EPA - SARA TITLE III SECTION 313: TOXIC CHEMICAL -NO
Note: N/A=NOT APPLICABLE ND=NOT DETERMINED NL=NOT LISTED
NIF=NO INFORMATION FOUND NE=NONE ESTABLISHED
SARA TITLE III H&P RATINGS: Acute, YES; Chronic, NO; Fire, NO
Press. Release, NO; Reactive, NO;
NFPA RATINGS: HEALTH -1 FIRE -0 REACTIVITY -0 SPECIFIC -0

THE INFORMATION CONTAINED HEREIN IS PROVIDED IN GOOD FAITH AND IS BELIEVED TO BE CORRECT AS OF THE DATE HEREOF. HOWEVER, THE DIAL CORPORATION MAKES NO REPRESENTATION AS TO THE COMPREHENSIVENESS OR ACCURACY OF THE INFORMATION. IT IS EXPECTED THAT INDIVIDUALS RECEIVING THE INFORMATION WILL EXERCISE THEIR INFEPENDENT JUDGMENT IN DETERMINING ITS APPROPRIATENESS FOR A PARTICULAR PURPOSE. ACCORDINGLY, THE DIAL CORPORATION WILL NOT BE RESPONSIBLE FOR DAMAGES OF ANY KIND RESULTING FORM THE USE OF OR RELIANCE UPON SUCH INFORMATION. NO REPRESETATIONS, OR WARRANTIES, EITHER EXPRESSED OR IMPLIED OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PRUPOSE OR OF ANY OTHER ATURE ARE MADE HEREUNDER WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR TO THE PRODUCT TO WHICH THE INFORMATION REFERS.
DATE PREPARED: 05/02/89
CHANGE: NEW ISSUE

AMAX Cleaners

ERIAL SAFETY DATA SHEET

QUICK IDENTIFIER ISW-24 192

E-8:00-5:00 EST-MON-FRI 1-800-543-4906

MEDICAL(COLLECT) 303-592-1024
CHEMTREC 1-800-424-9300

APPARATUS SERV DEPT
TUCSON SERVICE CENTER
1401 EAST VALENCIA ROAD
TUCSON AZ 85706

MANUFACTURER
DIVERSEY CORP.
12025 TECH CENTER DRIVE
LIVONIA, MICHIGAN 48150
PREPARED BY: REGULATORY
ON 06/12/90

EMERGENCY PHONE NO. 313-458-5000

REFERENCE B/L# 103920-00

ABBREVIATIONS ....C-CEILING....MP-MAXIMUM PEAK....N/A-NOT APPLICABLE....N/K-NOT KNOWN....P-POTENTIAL....PEL-PERMISSIBLE EXPOSURE LIMIT ....PM-PENSKY MARTENS....S-SKIN....ST-SHORT TERM....TLV-THRESHOLD LIMIT VAULE....TWA-TIME WEIGHT AVERAGE....

1 COMMON NAME USED ON LABEL ISW-24 CODE 02447

CHEMICAL FAMILY ALUMINUM SAFE SPRAY CLEANER

2

PRINCIPAL HAZARDOUS COMPONENT(S) CHEMCIAL & COMMON NAME	%	EXPOSURE LIMITS (TWA 8 HOURS UNLESS OTHERWISE SPECIFIED)	UNITS
NONE			

Drum

~~#~~ 32

3 BOILING POINT 215 °F SPECIFIC GRAVITY 1.315 VAPOR PRESSURE 17.5 mmHg@ 20 °C VOLATILE BY VOLUME 60 %

VAPOR DENSITY AIR=1 N/A EVAPORATION RATE n-BUTYL ACETATE=1) >1 SOLUBILITY IN WATER 100 % REACTIVITY IN WATER / HEAT EVOLUTION NONE

APPEARANCE & ODOR CLEAR LIQUID; MILD ODOR.

FLASH POINT NONE °F FLAME EXTENSION N/A in. FLAMMABLE LIMITS IN AIR BY VOLUME LOWER NONE UPPER NONE AUTO IGNITION TEMPERATURE N/A °F

EXTINGUISHER MEDIA CO2, FOAM, DRY CHEMICALS

FIREFIGHTING SPECIAL PROCEDURES NONE

UNUSUAL FIRE AND EXPLOSION HAZARDS NONE

4 ITY STABLE POLYMERIZATION NONE

INCOMPATIBLE WITH CONCENTRATED MINERAL ACIDS

DECOMPOSITION PRODUCTS CO, H20 WITH INCOMPLETE COMBUSTION

5 PRIMARY ROUTES OF ENTRY INHALATION NO SKIN NO INGESTION YES

SIGNS AND SYMPTOMS OF OVEREXPOSURE

1. ACUTE DEFATS SKIN; MAY IRRITATE EYES.

2. CHRONIC SAME AS ACUTE

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE SENSITIVE SKIN

LISTED CARCINOGEN NONE NTP NO IARC NO OSHA NO

EMERGENCY AND FIRST AID PROCEDURES

1. INHALATION N/A IN NORMAL OPERATION

2. EYES FLUSH THOROUGHLY WITH FRESH WATER, GET MEDICAL ATTENTION

3. SKIN FLUSH WITH FRESH WATER, WASH WITH SOAP AND WATER
REMOVE CONTAMINATED CLOTHES AND SHOES

4. INGESTION GIVE MILK OR WATER, INDUCE VOMITING. GET MEDICAL ATTENTION.
NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

N-6 IATORY PROTECTION NONE

VENTILATION LOCAL YES

VENTILATION MECHANICAL NO SPECIAL NONE

PROTECTIVE GLOVES ALKALI RESISTANT WHEN HANDLING

EYE PROTECTION FACE SHIELD WHEN HANDLING

OTHER PROTECTIVE CLOTHING/EQUIPMENT NONE

N-7 HANDLING AND STORAGE DO NOT PRESSURE CONTAINER TO EMPTY. STORE ABOVE 40 F; KEEP COVER ON CONTAINER.

WASTE DISPOSAL METHODS	USE UNTIL LESS THAN 1 INCH REMAINS IN CONTAINER, EMPTY CONTAINER TRIPLE RINSE WITH WATER, ADD TO OPERATION REMOVE OR DEFACE LABEL BEFORE SELLING CONTAINER OR DISPOSAL PH ADJUSTMENT AND SEPARATION OF SOLIDS; CONTAINS PHOSPHATES.

HMIS RATING	HEALTH	1	FLAMMABILITY	0	REACTIVITY	0	PERSONAL PROTECTION	B

A
III
ON

NONE

OF

N/A

ATION

TERIAL SAFETY DATA SHEET

QUICK IDENTIFIER: DEPRESS PLUS 194

RE-8:00-5:00 EST-MON-FRI 1-800-543-4906

MEDICAL(COLLECT) 303-592-1024
CHEMTREC 1-800-424-9300

E APPARATUS SERV DEPT
CSON SERVICE CENTER
401 EAST VALENCIA ROAD
TUCSON AZ 85706

MANUFACTURER: DIVERSEY CORP.
12025 TECH CENTER DRIVE
LIVONIA, MICHIGAN 48150
PREPARED BY: REGULATORY
ON 09/10/91

EMERGENCY PHONE NO. 313-458-5000

REFERENCE B/L# 103920-00

ABBREVIATIONS ....C-CEILING....MP-MAXIMUM PEAK....N/A-NOT APPLICABLE....N/K-NOT KNOWN....P-POTENTIAL....PEL-PERMISSIBLE EXPOSURE LIMIT ....PM-PENSKY MARTENS....S-SKIN....ST-SHORT TERM....TLV-THRESHOLD LIMIT VAULE....TWA-TIME WEIGHT AVERAGE....

I-1 COMMON NAME USED ON LABEL: DEPRESS PLUS — CODE: 01150

CHEMICAL FAMILY: FOAM STABILIZER

I-2

PRINCIPAL HAZARDOUS COMPONENT(S) CHEMCIAL & COMMON NAME	%	EXPOSURE LIMITS (TWA 8 HOURS UNLESS OTHERWISE SPECIFIED)	UNITS
PETROLEUM SOLVENT 64742-47-8	<45	TLV 300 RECOMMENDED	PPM

16 33

I-3 BOILING POINT >300 °F — SPECIFIC GRAVITY 0.97 — VAPOR PRESSURE <1 mmHg@ 20 °C — VOLATILE BY VOLUME <10%

VAPOR DENSITY AIR=1 >1 — EVAPORATION RATE (n-BUTYL ACETATE=1) <1 — SOLUBILITY IN WATER <30 % — REACTIVITY IN WATER / HEAT EVOLUTION NONE

APPEARANCE & ODOR: OFF-WHITE MILKY LIQUID, MILKY HYDROCARBON ODOR

FLASH POINT 172 °F — FLAME EXTENSION N/A in. — FLAMMABLE LIMITS IN AIR BY VOLUME LOWER 1.0 UPPER 6.0 — AUTO IGNITION TEMPERATURE N/A °F

EXTINGUISHER MEDIA: CO2, DRY CHEMICAL, FOAM, WATER FOG

FIREFIGHTING SPECIAL PROCEDURES: WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING. CAUTION: FOOTING WILL BE VERY SLIPPERY IF MATERIAL IS RELEASED OR SPILLED.

UNUSUAL FIRE AND EXPLOSION HAZARDS: OIL MISTS MAY PRESENT AN EXPLOSION HAZARD.

I-4 STABILITY: STABLE — POLYMERIZATION: NONE KNONWN

INCOMPATIBLE WITH: STRONG OXIDIZERS.

DECOMPOSITION PRODUCTS: OXIDES OF CARBON AND NITROGEN, HYDROCARBON RESIDUE

I-5 PRIMARY ROUTES OF ENTRY — INHALATION YES — SKIN YES — INGESTION NO

SIGNS AND SYMPTOMS OF OVEREXPOSURE

1. ACUTE: MAY CAUSE SEVERE EYE IRRITATION. MAY CAUSE SKIN DRYNESS AND IRRITATION. PROLONGED SKIN CONTACT WIL LEAD TO DERMATITIS. INHALATION OF VAPOR MAY CAUSE DIZZINESS AND IRRITATE RESPIRATORY.

2. CHRONIC: SKIN CONTACT MAY AGGRAVATE ON EXISTING DERMATITIS.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: SENSITIVE SKIN.

LISTED CARCINOGEN: NONE — NTP NO — IARC NO — OSHA NO

EMERGENCY AND FIRST AID PROCEDURES

1. INHALATION: REMOVE TO FRESH AIR.

2. EYES: FLUSH THOROUGHLY WITH FRESH WATER FOR AT LEAST 15 MINUTES, GET MEDICAL ATTENTION.

3. SKIN: FLUSH WITH FRESH WATER, WASH WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHES AND SHOES.

4. INGESTION: GIVE MILK OR WATER- DO NOT INDUCE VOMITING. GET MEDICAL ATTENTION.

I-6 RESPIRATORY PROTECTION: N/A IN NORMAL USE.

VENTILATION LOCAL: YES

VENTILATION MECHANICAL: NORMAL AIR DILUTION — SPECIAL: NONE

PROTECTIVE GLOVES: CHEMICAL RESISTANT

EYE PROTECTION: FACE SHIELD OR GOGGLES

OTHER PROTECTIVE CLOTHING/EQUIPMENT: NEOPRENE PROTECTIVE APRON.

I-7 HANDLING AND STORAGE PRECAUTIONS: STORE AWAY FROM STRONG OXIDIZERS. WEAR PERSONAL PROTECTIVE EQUIPMENT AND WASH THOROUGHLY AFTER HANDLING CHEMICALS. KEEP CONTAINER CLOSED. STORE BETWEEN 40F AND 120F.

DOT CLASS: NOT REGULATED IN LESS THAN 110 GAL OTHERWISE

SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES	IF MATERIAL IS RELEASED/SPILLED	COLLECT SMALL SPILLS WITH NON-BIODEGRADABLE ABSORBANT AND PLACE IN PROPER CONTAINER FOR DISPOSAL TO APPROVED LANDFILL. COLLECT AND RETURN LARGE AMOUNTS TO CONTAINER.
	WASTE DISPOSAL METHODS	PH ADJUSTMENT; EMULSION BREAKING AND SEPARATION OF OILS AND SOLIDS. DISPOSE OF MATERIALS BY INCINERATION, LANDFILL OR NP PERMIT COMPLYING WITH FEDERAL, STATE AND LOCAL REGULATIONS. USE UNTIL LESS THAN ONE INCH REMAINS IN CONTAINER, EMPTY CONTAINER. TRIPLE RINSE WITH WATER, ADD TO OPERATION. REMOV OR DEFACE LABEL BEFORE SELLING CONTAINER OR DISPOSAL.

HMIS RATING	HEALTH	1	FLAMMABILITY	2	REACTIVITY	0	PERSONAL PROTECTION	B

S.A.R.A TITLE III SECTION 313	N/A
STATE OF AZ RIGHT TO KNOW INFORMATION	N/A

MATERIAL SAFETY DATA SHEET

281

QUICKART:-8:00-5:00 EST-MON-FRI 1-800-543-4906

QUICK IDENTIFIER ▶ DEPRESS PLUS
MEDICAL(COLLECT) 303-592-102
CHEMTREC 1-800-424-930

NAME: OF APPARATUS SERV DEPT
TUCSON SERVICE CENTER
1401 EAST VALENCIA ROAD
TUCSON AZ 85706

MANUFACTURER: DIVERSEY CORP.
12025 TECH CENTER DRIVE
LIVONIA, MICHIGAN 48150
PREPARED BY: REGULATORY
ON 01/31/94

EMERGENCY PHONE NO. 313-458-5000

REFERENCE B/L# 404641-0

ABBREVIATIONS ..C-CEILING..MP-MAXIMUM PEAK..N/A-NOT APPLICABLE..N/K-NOT KNOWN..P-POTENTIAL..PEL-PERMISSIBLE EXPOSURE LI IT..PM-PENSKY MARTENS..S-SKIN..ST-SHORT TERM..TLV-THRESHOLD LIMIT VALUE..TWA-TIME WEIGHTED AVERAGE..

SECTION-1 IDENTITY

COMMON NAME USED ON LABEL: DEPRESS PLUS — CODE 01150

CHEMICAL FAMILY: DEFOAMER

SECTION-2 HAZARDOUS INGREDIENTS (ONLY ITEMS LISTED ARE HAZARDOUS BY TITLE 29CFR 1910. 1200)

PRINCIPAL HAZARDOUS COMPONENT(S) CHEMICAL & COMMON NAME	%	EXPOSURE LIMITS (TWA 8 HOUR UNLESS OTHERWISE SPECIFIED)	UNITS
PETROLEUM SOLVENT 64742-47-8	<45	TLV 300 RECOMMENDED	PPM

SECTION-3 PHYSICAL & CHEMICAL CHARACTERISTICS (FIRE & EXPLOSION DATA)

BOILING POINT >300 °F — SPECIFIC GRAVITY 0.84 — VAPOR PRESSURE <2 mmHg@ 20 °C — VOLATILE BY VOLUME <50

VAPOR DENSITY AIR=1 >1 — EVAPORATION RATE (n-BUTYL ACETATE=1) <1 — SOLUBILITY IN WATER <30 % — REACTIVITY IN WATER / HEAT EVOLUTION NONE

APPEARANCE & ODOR: OFF-WHITE MILKY LIQUID, MILKY HYDROCARBON ODOR

FLASH POINT 172 °F — FLAME EXTENSION N/A in. — FLAMMABLE LIMITS IN AIR BY VOLUME LOWER 1.0 UPPER 6.0 — AUTO IGNITION TEMPERATURE N/A °F

EXTINGUISHER MEDIA: CO2, DRY CHEMICAL, FOAM, WATER FOG

FIREFIGHTING SPECIAL PROCEDURES: WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING. CAUTION: FOOTING WILL BE VERY SLIPPERY IF MATERIAL IS RELEASED OR SPILLED.

UNUSUAL FIRE AND EXPLOSION HAZARDS: OIL MISTS MAY PRESENT AN EXPLOSION HAZARD.

SECTION-4 PHYSICAL HAZARDS

STABILITY: STABLE — POLYMERIZATION: NONE KNONWN

INCOMPATIBLE WITH: STRONG OXIDIZERS.

DECOMPOSITION PRODUCTS: OXIDES OF CARBON AND NITROGEN, HYDROCARBON RESIDUE

SECTION-5 HEALTH HAZARDS

PRIMARY ROUTES OF ENTRY — INHALATION YES — SKIN YES — INGESTION NO

SIGNS AND SYMPTOMS OF OVEREXPOSURE

1. ACUTE: MAY CAUSE SEVERE EYE IRRITATION. MAY CAUSE SKIN DRYNESS AND IRRITATION. PROLONGED SKIN CONTACT WIL LEAD TO DERMATITTS. INHALATION OF VAPOR MAY CAUSE DIZZINESS AND IRRITATE RESPIRATORY.

2. CHRONIC: SKIN CONTACT MAY AGGRAVATE ON EXISTING DERMATITIS.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: SENSITIVE SKIN.

LISTED CARCINOGEN: NONE — NTP NO — IARC NO — OSHA N

EMERGENCY AND FIRST AID PROCEDURES

1. INHALATION: REMOVE TO FRESH AIR.
2. EYES: FLUSH THOROUGHLY WITH FRESH WATER FOR AT LEAST 15 MINUTES, GET MEDICAL ATTENTION.
3. SKIN: FLUSH WITH FRESH WATER, WASH WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHES AND SHOES.
4. INGESTION: GIVE WATER- DO NOT INDUCE VOMITING. GET MEDICAL ATTENTION.

SECTION-6 SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: N/A IN NORMAL USE.

VENTILATION MECHANICAL: NORMAL AIR DILUTION — SPECIAL NONE — VENTILATION LOCAL YES

PROTECTIVE GLOVES: CHEMICAL RESISTANT

EYE PROTECTION: FACE SHIELD OR GOGGLES

OTHER PROTECTIVE CLOTHING/EQUIPMENT: NEOPRENE PROTECTIVE APRON.

SECTION-7 SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

HANDLING AND STORAGE PRECAUTIONS: STORE AWAY FROM STRONG OXIDIZERS. WEAR PERSONAL PROTECTIVE EQUIPMENT AND WASH THOROUGHLY AFTER HANDLING CHEMICALS. KEEP CONTAINER CLOSED. STORE BETWEEN 40F AND 120F.

OTHER PRECAUTIONS: DOT CLASS: NOT REGULATED IN LESS THAN 110 GAL. OTHERWISE, DOT CLASS: COMBUSTIBLE NA-1993

IF MATERIAL IS RELEASED/SPILLED: COLLECT SMALL SPILLS WITH NON-BIODEGRADABLE ABSORBANT AND PLACE IN PROPER CONTAINER FOR DISPOSAL TO APPROVED LANDFILL. COLLECT AND RETURN LARGE AMOUNTS TO CONTAINER.

8½ X 11 FOLD

WASTE DISPOSAL METHODS: PH ADJUSTMENT; EMULSION BREAKING AND SEPARATION OF OILS AND SOLIDS. DISPOSE OF MATERIALS BY INCINERATION, LANDFILL OR NPDES PERMIT COMPLYING WITH FEDERAL, STATE AND LOCAL REGULATIONS. USE UNTIL LESS THAN ONE INCH REMAINS IN CONTAINER, EMPTY CONTAINER. TRIPLE RINSE WITH WATER, ADD TO OPERATION. REMOVE OR DEFACE LABEL BEFORE SELLING CONTAINER OR DISPOSAL.

HMIS RATING: N/A — HEALTH 1 — FLAMMABILITY 2 — REACTIVITY 0 — PERSONAL PROTECTION B

S.A.R.A. TITLE III SECTION 313

N/A

STATE OF AZ RIGHT TO KNOW INFORMATION

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FEB 16 1994

CARE-8:00-5:00 EST-MON-FRI 1-800-543-4906

MEDICAL(COLLECT) 303-592-1024
CHEMTREC 1-800-424-9300

MANUFACTURER: DIVERSEY LEVER INC.
46701 COMMERCE CENTER DR
PLYMOUTH, MI 48170
PREPARED BY: H.S.E.
ON 11/22/95

EMERGENCY PHONE NO. 1-800-831-9889

REFERENCE

ABBREVIATIONS —C-CEILING—MP-MAXIMUM PEAK—N/A-NOT APPLICABLE—N/K-NOT KNOWN—P-POTENTIAL—PEL-PERMISSIBLE EXPOSURE LIMIT —PM-PENSKY MARTENS—S-SKIN—ST-SHORT TERM—TLV-THRESHOLD LIMIT VALUE—TWA-TIME WEIGHT AVERAGE—

SECTION-1 IDENTITY

COMMON NAME USED ON LABEL: JETTACIN — CODE: 04876

CHEMICAL FAMILY: GENERAL PURPOSE CLEANER

SECTION-2 HAZARDOUS INGREDIENTS (ONLY ITEMS LISTED ARE HAZARDOUS PER TITLE 29CFR 1910.1200)

PRINCIPAL HAZARDOUS COMPONENT(S) CHEMICAL & COMMON NAME	%	EXPOSURE LIMITS (TWA 8 HOURS UNLESS OTHERWISE SPECIFIED)	UNITS
NONYL PHENOXY POLYETHOXY ETHANOL (9016-45-9)	<6	NONE ESTABLISHED	

SECTION-3 PHYSICAL & CHEMICAL CHARACTERISTICS (FIRE & EXPLOSION DATA)

BOILING POINT: 220 °F — SPECIFIC GRAVITY: 1.03 — VAPOR PRESSURE: 17.5 mmHg @ 20 °C — VOLATILE BY VOLUME: <85%

VAPOR DENSITY AIR=1: N/A — EVAPORATION RATE (n-BUTYL ACETATE=1): <1 — SOLUBILITY IN WATER: >95 % REACTIVITY IN WATER: / — HEAT EVOLUTION: NONE

APPEARANCE & ODOR: CLEAR, YELLOW LIQUID; CITRUS ODOR

FLASH POINT: NONE °F — FLAME EXTENSION: N/A in. — FLAMMABLE LIMITS IN AIR BY VOLUME: LOWER NONE, UPPER NONE — AUTO IGNITION TEMPERATURE: N/A °F

EXTINGUISHER MEDIA: CO2, DRY CHEMICALS

FIREFIGHTING SPECIAL PROCEDURES: WEAR PROTECTIVE GEAR AND SELF CONTAINED BREATHING APPARATUS IN FIRE AREA.

UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE

SECTION-4 REACTIVITY DATA

STABILITY: STABLE — POLYMERIZATION: NONE

INCOMPATIBLE WITH: STRONG ACIDS, OXIDIZERS

DECOMPOSITION PRODUCTS: OXIDES OF CARBON, HYDROGEN, SULFUR

SECTION-5 HEALTH HAZARDS

PRIMARY ROUTES OF ENTRY: INHALATION YES — SKIN NO — INGESTION YES

SIGNS AND SYMPTOMS OF OVEREXPOSURE

1. ACUTE: MAY IRRITATE EYES.

2. CHRONIC: PROLONGED OR REPEATED SKIN EXPOSURE CAUSES SKIN DRYNESS, WHICH MAY LEAD TO DERMATITIS.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: SENSITIVE SKIN

LISTED CARCINOGEN: NONE — NTP: NO — IARC: NO — OSHA: NO

EMERGENCY AND FIRST AID PROCEDURES

1. INHALATION: REMOVE TO FRESH AIR.

2. EYES: FLUSH THOROUGHLY WITH FRESH WATER. GET MEDICAL ATTENTION IF IRRITATION CONTINUES.

3. SKIN: FLUSH WITH FRESH WATER. REMOVE CONTAMINATED CLOTHES AND SHOES.

4. INGESTION: GIVE WATER. DO NOT INDUCE VOMITING. GET MEDICAL ATTENTION. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

SECTION-6 SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: NONE USUALLY REQUIRED — VENTILATION LOCAL: NONE

VENTILATION MECHANICAL: PROVIDE NORMAL AIR DILUTION — SPECIAL: NO

PROTECTIVE GLOVES: WATER RESISTANT

EYE PROTECTION: SAFETY GLASSES

OTHER PROTECTIVE CLOTHING/EQUIPMENT: PROVIDE ADEQUATE VENTILATION AND FACE SHIELD WHEN STEAM CLEANING.

SECTION-7 SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

HANDLING AND STORAGE PRECAUTIONS: DO NOT PRESSURE CONTAINER TO EMPTY. KEEP CONTAINER CLOSED. IF FROZEN, THAW AND MIX TO MAKE USABLE.

OTHER PRECAUTIONS: DOT CLASS: COMPOUNDS, CLEANING, N.O.I, LIQUID

IF MATERIAL IS RELEASED/SPILLED: FLUSH SMALL AMOUNTS TO DRAIN. COLLECT AND RETURN LARGE AMOUNTS TO CONTAINER.

WASTE DISPOSAL METHODS: USE UNTIL LESS THAN ONE INCH REMAINS IN CONTAINER, EMPTY CONTAINER. TRIPLE RINSE CONTAINER WITH WATER, ADD TO OPERATION. REMOVE OR DEFACE CONTAINER LABEL BEFORE SELLING OR DISPOSAL.

CONTAINS NO PHOSPHATES. EMULSION BREAKING AND SEPARATION OF INSOLUBLES. DISPOSE OF MATERIALS BY INCINERATION, LANDFILL OR NPDES PERMIT COMPLYING WITH FEDERAL, STATE AND LOCAL REGULATIONS.

HMIS RATING: HEALTH 1 — FLAMMABILITY 0 — REACTIVITY 0 — PERSONAL PROTECTION B

SARA TITLE III SECTION 313

ALL CHEMICAL INGREDIENTS ARE LISTED ON THE TSCA INVENTORY.

STATE OF PA RIGHT TO KNOW INFORMATION

WATER - CAS #7732-18-5
NONYLPHENOXYPOLY (ETHYLENEOXY) ETHANOL - CAS #9016-45-9
D-LIMONENE - CAS #138-86-3
SODIUM METASILICATE - CAS #6834-92-0
SODIUM DODECYLBENZENE SULFONATE - CAS #25155-30-0

CARE-8:00-5:00 EST-MON-FRI 1-800-543-4906 | MEDICAL(COLLECT) 303-592-1024
CHEMTREC 1-800-424-9300

MANUFACTURER: DIVERSEY LEVER INC.
46701 COMMERCE CENTER DR
PLYMOUTH, MI 48170
PREPARED BY: H.S.E.
ON 11/22/95

EMERGENCY PHONE NO. 1-800-831-9889
REFERENCE

ABBREVIATIONS ...C-CEILING...MP-MAXIMUM PEAK...N/A-NOT APPLICABLE...N/K-NOT KNOWN...P-POTENTIAL...PEL-PERMISSIBLE EXPOSURE LIMIT ...PM-PENSKY MARTENS...S-SKIN...ST-SHORT TERM...TLV-THRESHOLD LIMIT VALUE...TWA-TIME WEIGHT AVERAGE...

SECTION-1 IDENTITY

COMMON NAME USED ON LABEL: JETTACIN — CODE: 04876

CHEMICAL FAMILY: GENERAL PURPOSE CLEANER

SECTION-2 HAZARDOUS INGREDIENTS (ITEMS LISTED ARE HAZARDOUS PER TITLE 29CFR 1910.1200)

PRINCIPAL HAZARDOUS COMPONENT(S) CHEMICAL & COMMON NAME	%	EXPOSURE LIMITS (TWA 8 HOURS UNLESS OTHERWISE SPECIFIED)	UNITS
NONYL PHENOXY POLYETHOXY ETHANOL (9016-45-9)	<6	NONE ESTABLISHED	

SECTION-3 PHYSICAL & CHEMICAL CHARACTERISTICS / FIRE & EXPLOSION DATA

BOILING POINT: 220 °F — SPECIFIC GRAVITY: 1.03 — VAPOR PRESSURE: 17.5 mmHg @ 20 °C — VOLATILE BY VOLUME: <85%

VAPOR DENSITY AIR=1: N/A — EVAPORATION RATE (n-BUTYL ACETATE=1): <1 — SOLUBILITY IN WATER: >95 % — REACTIVITY % IN WATER / HEAT EVOLUTION: NONE

APPEARANCE & ODOR: CLEAR, YELLOW LIQUID; CITRUS ODOR

FLASH POINT: NONE °F — FLAME EXTENSION: N/A in. — FLAMMABLE LIMITS IN AIR BY VOLUME: LOWER NONE, UPPER NONE — AUTO IGNITION TEMPERATURE: N/A °F

EXTINGUISHER MEDIA: CO2, DRY CHEMICALS

FIREFIGHTING SPECIAL PROCEDURES: WEAR PROTECTIVE GEAR AND SELF CONTAINED BREATHING APPARATUS IN FIRE AREA.

UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE

SECTION-4 REACTIVITY DATA

STABILITY: STABLE — POLYMERIZATION: NONE

INCOMPATIBLE WITH: STRONG ACIDS, OXIDIZERS

DECOMPOSITION PRODUCTS: OXIDES OF CARBON, HYDROGEN, SULFUR

SECTION-5 HEALTH HAZARDS

PRIMARY ROUTES OF ENTRY: INHALATION YES — SKIN NO — INGESTION YES

SIGNS AND SYMPTOMS OF OVEREXPOSURE

1. ACUTE: MAY IRRITATE EYES.

2. CHRONIC: PROLONGED OR REPEATED SKIN EXPOSURE CAUSES SKIN DRYNESS, WHICH MAY LEAD TO DERMATITIS.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: SENSITIVE SKIN

LISTED CARCINOGEN: NONE — NTP: NO — IARC: NO — OSHA: NO

EMERGENCY AND FIRST AID PROCEDURES

1. INHALATION: REMOVE TO FRESH AIR.

2. EYES: FLUSH THOROUGHLY WITH FRESH WATER. GET MEDICAL ATTENTION IF IRRITATION CONTINUES.

3. SKIN: FLUSH WITH FRESH WATER. REMOVE CONTAMINATED CLOTHES AND SHOES.

4. INGESTION: GIVE WATER. DO NOT INDUCE VOMITING. GET MEDICAL ATTENTION. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

SECTION-6 SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: NONE USUALLY REQUIRED — VENTILATION LOCAL: NONE

VENTILATION MECHANICAL: PROVIDE NORMAL AIR DILUTION — SPECIAL: NO

PROTECTIVE GLOVES: WATER RESISTANT

EYE PROTECTION: SAFETY GLASSES

OTHER PROTECTIVE CLOTHING/EQUIPMENT: PROVIDE ADEQUATE VENTILATION AND FACE SHIELD WHEN STEAM CLEANING.

SECTION-7 SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

HANDLING AND STORAGE PRECAUTIONS: DO NOT PRESSURE CONTAINER TO EMPTY. KEEP CONTAINER CLOSED. IF FROZEN, THAW AND MIX TO MAKE USABLE.

OTHER PRECAUTIONS: DOT CLASS: COMPOUNDS, CLEANING, N.O.I, LIQUID

IF MATERIAL IS RELEASED/SPILLED: FLUSH SMALL AMOUNTS TO DRAIN. COLLECT AND RETURN LARGE AMOUNTS TO CONTAINER.

WASTE DISPOSAL METHODS: USE UNTIL LESS THAN ONE INCH REMAINS IN CONTAINER, EMPTY CONTAINER. TRIPLE RINSE CONTAINER WITH WATER, ADD TO OPERATION. REMOVE OR DEFACE CONTAINER LABEL BEFORE SELLING OR DISPOSAL.

CONTAINS NO PHOSPHATES. EMULSION BREAKING AND SEPARATION OF INSOLUBLES. DISPOSE OF MATERIALS BY INCINERATION, LANDFILL OR NPDES PERMIT COMPLYING WITH FEDERAL, STATE AND LOCAL REGULATIONS.

HMIS RATING: HEALTH 1 — FLAMMABILITY 0 — REACTIVITY 0 — PERSONAL PROTECTION B

S.A.R.A. TITLE III SECTION 313

ALL CHEMICAL INGREDIENTS ARE LISTED ON THE TSCA INVENTORY.

STATE OF PA RIGHT TO KNOW INFORMATION

WATER - CAS #7732-18-5
NONYLPHENOXYPOLY (ETHYLENEOXY) ETHANOL - CAS #9016-45-9
D-LIMONENE - CAS #138-86-3
SODIUM METASILICATE - CAS #6834-92-0
SODIUM DODECYLBENZENE SULFONATE - CAS #25155-30-0

MATERIAL SAFETY DATA SHEET

QUICK IDENTIFIER: JETTACIN 193

DUCARE-8:00-5:00 EST-MON-FRI 1-800-543-4906 | MEDICAL(COLLECT) 303-592-102 | CHEMTREC 1-800-424-930

GE APPARATUS SERV DEPT
TUCSON SERVICE CENTER
1401 EAST VALENCIA ROAD
TUCSON AZ 85706

MANUFACTURER: DIVERSEY CORP.
12025 TECH CENTER DRIVE
LIVONIA, MICHIGAN 48150
PREPARED BY: REGULATORY
ON 12/17/91

EMERGENCY PHONE NO. 313-458-5000
REFERENCE B/L# 103920-0

ABBREVIATIONS ....C-CEILING....MP-MAXIMUM PEAK....N/A-NOT APPLICABLE....N/K-NOT KNOWN....P-POTENTIAL....PEL-PERMISSIBLE EXPOSURE LIMIT ....PM-PENSKY MARTENS....S-SKIN....ST-SHORT TERM....TLV-THRESHOLD LIMIT VAULE....TWA-TIME WEIGHT AVERAGE....

SECTION-1 IDENTITY

COMMON NAME USED ON LABEL: JETTACIN — CODE: 04876

CHEMICAL FAMILY: GENERAL PURPOSE CLEANER

SECTION-2 HAZARDOUS INGREDIENTS (ONLY ITEMS LISTED ARE HAZARDOUS BY TITLE 29CFR 1910.1200)

PRINCIPAL HAZARDOUS COMPONENT(S) CHEMCIAL & COMMON NAME	%	EXPOSURE LIMITS (TWA 8 HOURS UNLESS OTHERWISE SPECIFIED)	UNITS
NONE			

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30

SECTION-3 PHYSICAL & CHEMICAL CHARACTERISTICS (FIRE & EXPLOSION DATA)

BOILING POINT: 220 °F — SPECIFIC GRAVITY: 1.03 — VAPOR PRESSURE: 17.5 mmHg@ 20 °C — VOLATILE BY VOLUME: <85

VAPOR DENSITY AIR=1: N/A — EVAPORATION RATE (n-BUTYL ACETATE=1): <1 — SOLUBILITY IN WATER: >95 — % REACTIVITY / HEAT EVOLUTION: NONE

APPEARANCE & ODOR: CLEAR, YELLOW LIQUID; CITRUS ODOR

FLASH POINT: NONE °F — FLAME EXTENSION: N/A in. — FLAMMABLE LIMITS IN AIR BY VOLUME: LOWER NONE, UPPER NONE — AUTO IGNITION TEMPERATURE: N/A °F

EXTINGUISHER MEDIA: CO2, DRY CHEMICALS

FIREFIGHTING SPECIAL PROCEDURES: NONE

UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE

SECTION-4 PHYSICAL HAZARDS

STABILITY: STABLE — POLYMERIZATION: NONE

INCOMPATIBLE WITH: STRONG ACIDS, OXIDIZERS

DECOMPOSITION PRODUCTS: OXIDES OF CARBON, HYDROGEN, SULFUR

SECTION-5 HEALTH HAZARDS

PRIMARY ROUTES OF ENTRY — INHALATION: YES — SKIN: NO — INGESTION: YES

SIGNS AND SYMPTOMS OF OVEREXPOSURE

1. ACUTE: MAY IRRITATE EYES.

2. CHRONIC: PROLONGED OR REPEATED SKIN EXPOSURE CAUSES SKIN DRYNESS, WHICH MAY LEAD TO DERMATITIS.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: SENSITIVE SKIN

LISTED CARCINOGEN: NONE — NTP: NO — IARC: NO — OSHA: N

EMERGENCY AND FIRST AID PROCEDURES

1. INHALATION: REMOVE TO FRESH AIR.

2. EYES: FLUSH THOROUGHLY WITH FRESH WATER. GET MEDICAL ATTENTION IF IRRITATION CONTINUES.

3. SKIN: FLUSH WITH FRESH WATER. REMOVE CONTAMINATED CLOTHES AND SHOES.

4. INGESTION: GIVE MILK OR WATER. INDUCE VOMITING. GET MEDICAL ATTENTION. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

SECTION-6 SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: NONE — VENTILATION LOCAL: NONE

VENTILATION MECHANICAL: PROVIDE NORMAL AIR DILUTION — SPECIAL: NO

PROTECTIVE GLOVES: WATER RESISTANT

EYE PROTECTION: SAFETY GLASSES

OTHER PROTECTIVE CLOTHING/EQUIPMENT: PROVIDE ADEQUATE VENTILATION AND FACE SHIELD WHEN STEAM CLEANING

SECTION-7 SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

HANDLING AND STORAGE PRECAUTIONS: DO NOT PRESSURE CONTAINER TO EMPTY. KEEP CONTAINER CLOSED. IF FROZEN, THAW AND MIX TO MAKE USABLE.

OTHER PRECAUTIONS: DOT CLASS: NOT REGULATED.

IF MATERIAL IS RELEASED/SPILLED: FLUSH SMALL AMOUNTS TO DRAIN. COLLECT AND RETURN LARGE AMOUNTS TO CONTAINER.

WASTE DISPOSAL METHODS: USE UNTIL LESS THAN ONE INCH REMAINS IN CONTAINER, EMPTY CONTAINER. TRIPLE RINSE CONTAINER WITH WATER, ADD TO OPERATION. REMOVE OR DEFACE CONTAINER LABEL BEFORE SELLING OR DISPOSAL.

CONTAINS NO PHOSPHATES. EMULSION BREAKING AND SEPARATION OF INSOLUBLES. DISPOSE OF MATERIALS BY INCINERATION, LANDFILL OR NPDES PERMIT COMPLYING WITH FEDERAL, STATE AND LOCAL REGULATIONS

HMIS RATING — HEALTH: 1 — FLAMMABILITY: 0 — REACTIVITY: 0 — PERSONAL PROTECTION: B

S.A.R.A TITLE III SEC N: NONE

STATE OF AZ RIGHT TO KNOW INFORMATION: N/A

CHEMTREC 1-800-424-9300

NAME	MANUFACTURER	EMERGENCY PHONE NO.
	DIVERSEY CORP. 12025 TECH CENTER DRIVE LIVONIA, MICHIGAN 48150 PREPARED BY: REGULATORY ON 04/23/93	313-458-5000 REFERENCE

ABBREVIATIONS ..C-CEILING..MP-MAXIMUM PEAK..N/A-NOT APPLICABLE..N/K-NOT KNOWN..P-POTENTIAL..PEL-PERMISSIBLE EXPOSURE LIMIT..PM-PENSKY MARTENS..S-SKIN..ST-SHORT TERM..TLV-THRESHOLD LIMIT VALUE..TWA-TIME WEIGHTED AVERAGE..

SECTION-1 IDENTITY

COMMON NAME USED ON LABEL: JETTAGIN — CODE: 04876

CHEMICAL FAMILY: GENERAL PURPOSE CLEANER

SECTION-2 HAZARDOUS INGREDIENTS (ONLY ITEMS LISTED ARE HAZARDOUS BY TITLE 29CFR 1910.1200)

PRINCIPAL HAZARDOUS COMPONENT(S) CHEMICAL & COMMON NAME	%	EXPOSURE LIMITS (TWA 8 HOUR UNLESS OTHERWISE SPECIFIED)	UNITS
NONYL PHENOXY POLYETHOXY GLYCOL (9016-45-9)	<6	NONE ESTABLISHED	

SECTION-3 PHYSICAL & CHEMICAL CHARACTERISTICS (FIRE & EXPLOSION DATA)

BOILING POINT: 220 °F — SPECIFIC GRAVITY: 1.03 — VAPOR PRESSURE: 17.5 mmHg@20 °C — VOLATILE BY VOLUME: <85 %

VAPOR DENSITY AIR=1: N/A — EVAPORATION RATE (n-BUTYL ACETATE=1): <1 — SOLUBILITY IN WATER: >95 % — REACTIVITY IN WATER: / — HEAT EVOLUTION: NONE

APPEARANCE & ODOR: CLEAR, YELLOW LIQUID; CITRUS ODOR

FLASH POINT: NONE °F — PMCC — FLAME EXTENSION: N/A in. — FLAMMABLE LIMITS IN AIR BY VOLUME: LOWER NONE, UPPER NONE — AUTO IGNITION TEMPERATURE: N/A °F

EXTINGUISHER MEDIA: CO2, DRY CHEMICALS

FIREFIGHTING SPECIAL PROCEDURES: WEAR PROTECTIVE GEAR AND SELF CONTAINED BREATHING APPARATUS IN FIRE AREA.

UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE

SECTION-4 PHYSICAL HAZARDS

STABILITY: STABLE — POLYMERIZATION: NONE

INCOMPATIBLE WITH: STRONG ACIDS, OXIDIZERS

DECOMPOSITION PRODUCTS: OXIDES OF CARBON, HYDROGEN, SULFUR

SECTION-5 HEALTH HAZARDS

PRIMARY ROUTES OF ENTRY: INHALATION YES — SKIN NO — INGESTION YES

SIGNS AND SYMPTOMS OF OVEREXPOSURE

1. ACUTE: MAY IRRITATE EYES.

2. CHRONIC: PROLONGED OR REPEATED SKIN EXPOSURE CAUSES SKIN DRYNESS, WHICH MAY LEAD TO DERMATITIS.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: SENSITIVE SKIN

LISTED CARCINOGEN: NONE — NTP NO — IARC NO — OSHA NO

EMERGENCY AND FIRST AID PROCEDURES

1. INHALATION: REMOVE TO FRESH AIR.

2. EYES: FLUSH THOROUGHLY WITH FRESH WATER. GET MEDICAL ATTENTION IF IRRITATION CONTINUES.

3. SKIN: FLUSH WITH FRESH WATER. REMOVE CONTAMINATED CLOTHES AND SHOES.

4. INGESTION: GIVE WATER. DO NOT INDUCE VOMITING. GET MEDICAL ATTENTION. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

SECTION-6 SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: NONE USUALLY REQUIRED — VENTILATION LOCAL: NONE

VENTILATION MECHANICAL: PROVIDE NORMAL AIR DILUTION — SPECIAL: NO

PROTECTIVE GLOVES: WATER RESISTANT

EYE PROTECTION: SAFETY GLASSES

OTHER PROTECTIVE CLOTHING/EQUIPMENT: PROVIDE ADEQUATE VENTILATION AND FACE SHIELD WHEN STEAM CLEANING.

SECTION-7 SPECIAL PRECAUTIONS AND SPILL LEAK PROCEDURES

HANDLING AND STORAGE PRECAUTIONS: DO NOT PRESSURE CONTAINER TO EMPTY. KEEP CONTAINER CLOSED. IF FROZEN, THAW AND MIX TO MAKE USABLE.

OTHER PRECAUTIONS: DOT CLASS: NOT REGULATED.

IF MATERIAL IS RELEASED/SPILLED: FLUSH SMALL AMOUNTS TO DRAIN. COLLECT AND RETURN LARGE AMOUNTS TO CONTAINER.

8½ X 11 FOLD

WASTE DISPOSAL METHODS: USE UNTIL LESS THAN ONE INCH REMAINS IN CONTAINER, EMPTY CONTAINER. TRIPLE RINSE CONTAINER WITH WATER, ADD TO OPERATION. REMOVE OR DEFACE CONTAINER LABEL BEFORE SELLING OR DISPOSAL.

CONTAINS NO PHOSPHATES. EMULSION BREAKING AND SEPARATION OF INSOLUBLES. DISPOSE OF MATERIALS BY INCINERATION, LANDFILL OR NPDES PERMIT COMPLYING WITH FEDERAL, STATE AND LOCAL REGULATIONS.

HMIS RATING: HEALTH 1 — FLAMMABILITY 0 — REACTIVITY 0 — PERSONAL PROTECTION B

SARA TITLE III SECTION 313

ALL CHEMICAL INGREDIENTS ARE LISTED ON THE TSCA INVENTORY.

STATE OF PA RIGHT TO KNOW INFORMATION

WATER - CAS #7732-18-5
NONYLPHENOXYPOLY (ETHYLENEOXY) ETHANOL - CAS #9016-45-9
D-LIMONENE - CAS #138-86-3
SODIUM METASILICATE - CAS #6834-92-0
SODIUM DODECYLBENZENE SULFONATE - CAS #25155-30-0

DuBois USA

Jettacin

Non-Butylated Multi-Purpose Cleaner

Technical Data

GENERAL DESCRIPTION:

JETTACIN multi-purpose cleaner is a medium- to heavy-duty, environmentally safe, liquid detergent. A unique blend of wetting and emulsifying agents plus a natural solvent, give the JETTACIN product its superior ability to penetrate even the toughest soils. Once the bond is broken, the soil is held in suspension with no redepositing. Rinsing is rapid and complete, leaving a surface that is free from residue.

PROPERTIES:

Emulsification	Rapid
Wetting ability	Excellent
Foaming	Medium foam
Causticity	No free caustic
Odor	Mild citrus aroma
Rinsing	Complete
Stability	Stable in hard or soft water
Flash point (Pensky-Martens Closed Cup)	None to boil
pH (1%)	10.6
Density	8.6 lb./gal.
Biodegrable (Surfactant System)	Yes
Phosphates	None

USING PROCEDURE:

GENERAL-PURPOSE CLEANER DILUTION: 1:40 to 1:100 with water, depending on soil conditions.

RUBBER INDUSTRY: Banbury cleaning, 1:2 to 1:10 with water, using steam or high pressure cleaning.

PETROCHEMICAL INDUSTRY: Cleaning of various spills, especially crude oil with steam or high pressure washers, 1:5 to 1:20 with water, depending on type of soil.

GLASS CONTAINER INDUSTRY: Cleaning of the hot end equipment and floors, 1:10 to 1:25 with water, using steam, foam, gel, or high pressure equipment for dispensing the JETTACIN product.

Similar applications are achievable in many such industries.

STEAM CLEANING: 1:15 to 1:50 with water.

DEGREASING: 1:5 with water for ordinary degreasing.

HEAVILY-SOILED EXTERIOR SURFACES: 1:3 to 1:7 with water, depending on degree and type of soil.

AIRCRAFT CLEANING: 1:10 to 1:30 foam, pressure wash, or brush.

TRUCK WASHING: 1:10 to 1:100 with water.

BUS & TRUCK: Exhaust track areas — 1:5 with water.

VEHICLE WASHES: 1:20 to 1:100 with water depending on degree and type of soil.

DISPENSING:

The JETTACIN product can be applied via FOAMALL, JEL-A-MATIC, GERNI, STEAMALL or THERMO-BLAST dispensing equipment.

TITRATION:

None.

MATERIAL SAFETY:

JETTACIN cleaner is safe on most common alloys such as steel, stainless steel and nickel. It can be used on most soft metals such as aluminum alloys, copper, brass and bronze as well as on most painted surfaces. (Test painted surfaces prior to application).

STORAGE:

Keep container closed. If frozen, thaw to remix and use.

KEEP OUT OF THE REACH OF CHILDREN

CAUTION:

ALKALINE LIQUID. Do not swallow. Avoid eye and prolonged skin contact with the concentrate. For skin contact, flush thoroughly with water; for eye contact, flush thoroughly with water for at least 15 minutes and GET MEDICAL ATTENTION.

ACCEPTABILITY:

USDA authorized, Code A-8.

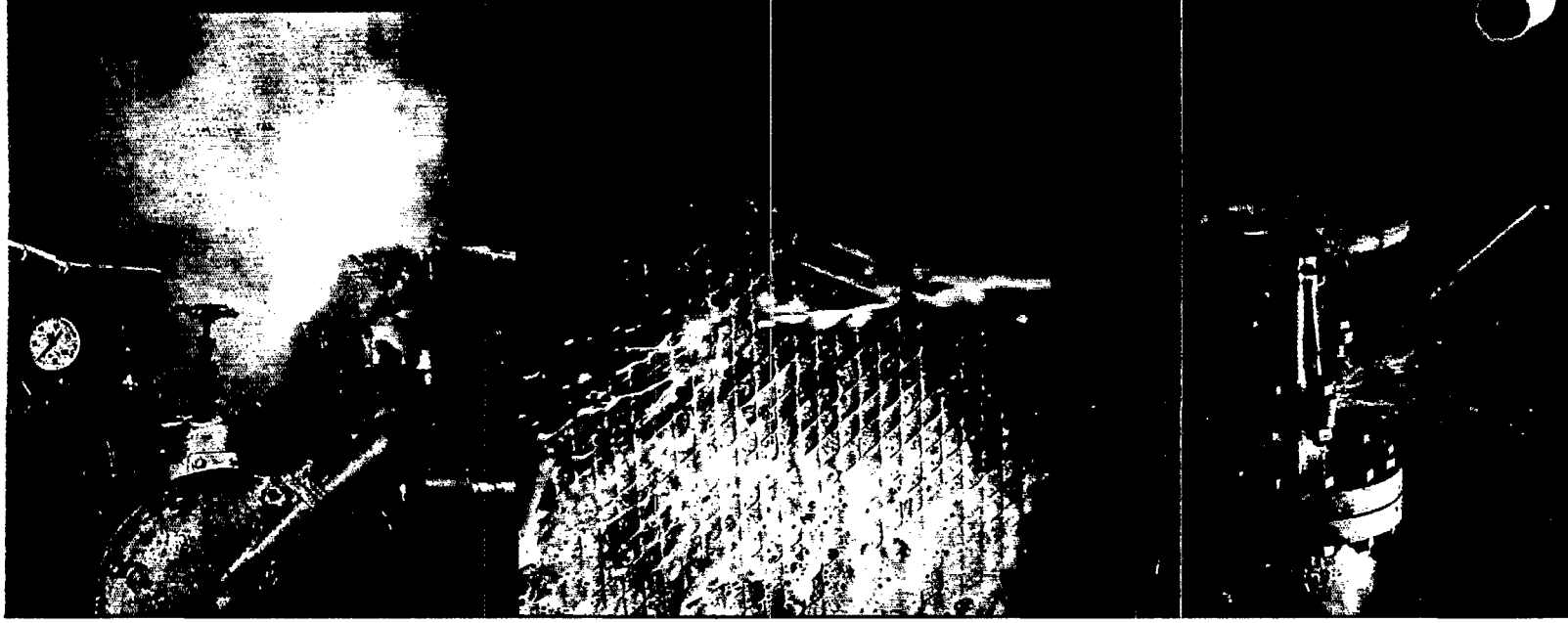
Diversey

Diversey Corp. • DuBois USA Group • 255 E Fifth St • Cincinnati OH 45202-4799

Customer Service: 800-543-4906 (In Continental U.S.A. 8 a.m. - 5 p.m. EST, Monday - Friday)
To Contact Your Representative, call our 24-Hour Message Center: 800-438-2647 (In Continental U.S.A.)

The information contained in this bulletin is to our best knowledge, true and accurate, but all recommendations or suggestions are made without guarantee, since the conditions of use are beyond our control. Diversey Corp. disclaims any liability incurred in connection with the use of these data or suggestions.

JETTACIN
Non-Butylated Multi-Purpose Cleaner



Contains No "Butyl Cellosolve" Or Other Hazardous Glycol Ethers.

The JETTACIN product is the safer-to-use, general-purpose industrial cleaner. It contains no "butyl cellosolve" or other glycol ethers which pose a health hazard to personnel. Strong detergency makes JETTACIN cleaner particularly effective in a wide variety of applications.

SAFETY

JETTACIN non-butylated cleaner is free of the objectionable chemicals which threaten the health and safety of plant personnel. The active solvent in the JETTACIN product is FDA GRAS-listed (Generally Regarded As Safe). JETTACIN cleaner has no flash point and no established Threshold Limit Valve (TLV).

PERFORMANCE

With the JETTACIN product you can clean everything from heavily-soiled off-highway vehicles to stained upholstery. Soil is held in suspension without redepositing, providing quick and complete rinsing and leaving surfaces free of residue.

VERSATILITY

As a multi-purpose cleaner, the JETTACIN product has proven effective in a wide range of applications. JETTACIN will remove grease, oil, airborne soils, soot, inks, dyes and carbonaceous soils. This cleaner can be used in high pressure hand-held washers, steam cleaners or applied by brush. It works especially well when used in DuBOIS FOAMALL, JEL-A-MATIC, GERNI, STEAMALL or THERMO-BLAST dispensing equipment.

METAL SAFE

JETTACIN cleaner is safe on most common alloys such as steel, stainless steel and nickel. It can be used on most soft metals such as aluminum alloys, copper, brass and bronze as well as on most painted surfaces. (Test painted surfaces prior to application).

ENVIRONMENTALLY SAFE

JETTACIN contains no phosphates and its surfactant system is biodegradable, making it safe for the environment and acceptable to environmental protection authorities.

PLEASANT ODOR

A mild, citrus-like aroma makes this safe-to-use product pleasant to use as well.

DuBois USA

Facilities/Vehicle Maintenance Department

2/2

MATERIAL SAFETY DATA SHEET

TELEPHONE
201-329-2333

SECTION I

MANUFACTURER'S NAME			DATE PREPARED:
JOHN C. DOLPH COMPANY			3/1/89
STREET ADDRESS			TSCA INFO.
BOX 267, NEW ROAD, MONMOUTH JUNCTION, NEW JERSEY 08852			☒ MIXTURE*
CHEMICAL FAMILY	MANUFACTURER'S PRODUCT NO.	TRADE NAME	☐ CHEM. SUB
Butadiene Polymer	CC-1120-A	Dolphon	CAS #

SECTION II — HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT BY WEIGHT	TLV TWA PPM ACGIH	OSHA	CAS #	VAPOR PRESSURE mm Hg @ 68°F
Hydroxyl Terminated Polybutadiene	65-75	N/E		69102905	LOW
Naphthenic Distillate	25-30	5.0 mg/m³		64742525	LOW
This product does not contain any SARA Title III Section 313 chemicals					

SECTION III — PHYSICAL DATA

BOILING RANGE	SOLUBILITY IN WATER	APPEARANCE & ODOR		
AP 300°C	Negligible	Clear, medium Viscosity liquid. Mild hydrocarbon odor.		
VAPOR DENSITY	EVAPORATION RATE	% VOLATILE BY VOLUME	WEIGHT PER GALLON	SPECIFIC GRAVITY
☐ HEAVIER N/A ☐ LIGHTER THAN AIR	☐ FASTER N/A ☐ SLOWER THAN ETHER	NIE	7.50	0.900

SECTION IV — FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method Used): 400°F C.O.C

FLAMMABLE LIMITS N/A — LEL: — UEL:

EXTINGUISHING MEDIA

☐ WATER-FOG ☒ FOAM ☐ OTHER
☒ CARBON DIOXIDE ☒ DRY CHEMICAL

UNUSUAL FIRE AND EXPLOSION HAZARDS

Heat from fire can generate flammable vapor. When mixed with air and exposed to ignition source, vapors can burn in open or explode if confined. Vapors may be heavier than air and travel considerable distance to an ignition source.

SPECIAL FIRE FIGHTING PROCEDURES

Firefighters should wear self contained breathing apparatus. Fight fire from safe distance/protected location.

SECTION V — REACTIVITY DATA

STABILITY: ☐ UNSTABLE ☒ STABLE

CONDITIONS TO AVOID: High temperatures

INCOMPATABILITY (MATERIALS TO AVOID): Strong oxidizers, strong acids

HAZARDOUS DECOMPOSITION PRODUCTS: Small quantities of butadiene, carbon monoxide and/or carbon dioxide

HAZARDOUS POLYMERIZATION: ☐ MAY OCCUR ☒ WILL NOT OCCUR

CONDITIONS TO AVOID: N/A

N/A—NOT APPLICABLE N/E Not Established * COMPONENTS IN TSCA INVENTORY

MATERIAL SAFETY DATA SHEET

TELEPHONE
201-329-2333

#63

SECTION I

MANUFACTURER'S NAME
JOHN C. DOLPH COMPANY

2/6/89

STREET ADDRESS
BOX 267, NEW ROAD, MONMOUTH JUNCTION, NEW JERSEY 08852

TSCA INFO.
☒ MIXTURE*
☐ CHEM. SUB
CAS #

CHEMICAL FAMILY	MANUFACTURER'S PRODUCT NO	TRADE NAME
Aromatic Isocyanate	CC-1120-B	DOLPHON

SECTION II — HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT BY WEIGHT	TLV TWA ACGIH	PEL OSHA	CAS #	VAPOR PRESSURE mm Hg @ 68°F
Diphenyl Methane Diisocyanate	20-28	0.02 ppm	0.02 ppm	26447405	Low
Higher Oligomers of MDI	20-28	N/E	N/E	9016879	Low
Hydrogenated Terphenyls	40-50	0.5 ppm	N/E	61788327	<0.1
Terphenyls	2-4	0.5 ppm	1 ppm	26140603	<0.1

This product does not contain any SARA Title III Section 313 chemicals

SECTION III — PHYSICAL DATA

BOILING RANGE	SOLUBILITY IN WATER	APPEARANCE & ODOR
406°F at 5 mm Hg	Reacts with water	Dark Brown liquid with Pungent Odc

VAPOR DENSITY	EVAPORATION RATE	% VOLATILE BY VOLUME	WEIGHT PER GALLON	SPECIFIC GRAVITY
☐ HEAVIER ☐ LIGHTER THAN AIR	Negligible ☐ FASTER ☐ SLOWER THAN ETHER	NA	8.0	1.09

SECTION IV — FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method Used)
390°F coc

FLAMMABLE LIMITS N/A
LEL UEL

EXTINGUISHING MEDIA
☐ WATER-FOG ☒ FOAM ☐ OTHER
☒ CARBON DIOXIDE ☒ DRY CHEMICAL

UNUSUAL FIRE AND EXPLOSION HAZARDS
During a fire MDI vapors and other irritating, highly toxic gases may be generated. At temperature above 400°F, polymeric MDI can polymerize and decompose which can cause pressure build-up in closed containers. Explosive rupture is possible.

SPECIAL FIRE FIGHTING PROCEDURES
Fire fighters should wear self-contained breathing apparatus. Use cold water to cool fire-exposed containers.

SECTION V — REACTIVITY DATA

STABILITY
☐ UNSTABLE ☒ STABLE

CONDITIONS TO AVOID
Will decompose rapidly above 400°F.

INCOMPATABILITY (MATERIALS TO AVOID)
Water, amines, strong bases, alcohol will cause some corrosion to copper alloys and aluminum.

HAZARDOUS DECOMPOSITION PRODUCTS
Carbon monoxide, oxides of nitrogen, traces of HCN, MDI vapors.

HAZARDOUS POLYMERIZATION
☒ MAY OCCUR ☐ WILL NOT OCCUR

CONDITIONS TO AVOID
Contact with water or materials which react with isocyanates.
Temperatures above 400°F.

N/A—NOT APPLICABLE N/E Not Established * COMPONENTS IN TSCA INVENTORY

SECTION VI — HEALTH HAZARD DATA

CC-1120-B

Primary Routes of Entry: Skin Contact, inhalation.

PTOMS OF EXPOSURE

See Addendum to Section V1 for information on primary routes of entry.

EMERGENCY AND FIRST AID PROCEDURES

See Addendum to Section V1 for emergency and first aid procedures.

SECTION VII — SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED Evacuate and ventilate spill area. Wear protective equipment. Dike spill to prevent entry into water system. Large quantities may be pumped into closed but not sealed containers. Small spills: Absorb with absorbent, shovel into unsealed containers. Neutralize with water 3-8% ammonia, 2% detergent. Allow to stand uncovered for 48 hrs to let CO_2 escape.

WASTE DISPOSAL METHOD

Dispose in accordance with applicable Local, State and Federal regulations.

SECTION VIII — SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION

Air-supplied respirator must be worn during spraying. Long term exposures, when the product is heated or in environments of concentrations above the TLV.

VENTILATION

To maintain exposure under the TLV.

PROTECTIVE GLOVES Chemical resistant gloves.

EYE PROTECTION Chemical goggles or full-face shield.

OTHER PROTECTIVE EQUIPMENT Protective clothing, eyewash station, safety showers.

SECTION IX — SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Store in tightly closed containers to prevent moisture contamination. Away from Heat.

OTHER PRECAUTIONS

The above information was extracted from Material Safety Data Sheets from out raw material suppliers and is believed to be correct as of the date hereof.

However, no warranty of merchantability, fitness for any use, or any other warranty is express or is to be implied regarding the accuracy of these data, the results to be obtained from the use of the material, or the hazards connected with such use. Since the information contained herein 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 modification of the information, we do not assume responsibility for the results of its use. This information is furnished on the condition that the person receiving it shall make his own determination as to the suitability of the material for his particular purpose and on the condition that he assume the risk of his use thereof.

HEALTH HAZARDS

INHALATION
Inhalation of vapors or mist can cause irritation of the respiratory tract, resulting in runny nose, sore throat, coughing, chest discomfort and shortness of breath. Exposure well above the TLV may lead to bronchitis, and pulmonary edema. These effects are usually reversible. As a result of a previous repeated overexposure or single large dose, certai individuals develop either temporary or permanent isocyanate sensitization, with symptoms such as chest tightness, wheezing, cough, shortness of breath or asthma attack. Overexposure may also cause permanent lung damage.

EYE CONTACT
Contact can cause tearing, reddening and swelling. If left untreated, corneal damage can occur.

SKIN CONTACT

Contact can cause irritation with symptoms as reddening, swelling, rash, scaling or blistering. Prolonged contact can cause sensitization.

INGESTION

Can result in irritation and corrosive action in the mouth, stomach tissue and digestive tract.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
Asthma, Respiratory Disorders, Skin Allergies, Eczema.

CARCINOGENICITY

MDI and Polymeric MDI are not listed as carcinogens by the NTP, IARC or OSHA.

EMERGENCY AND FIRST AID PROCEDURES

INHALATION
Remove victim to fresh air. If not breathing begin artificial respiration. Get medical attention.

EYE CONTACT
Flush with clean water for 20 minutes - get medical attention.

SKIN CONTACT
Wash thoroughly with soap and water.

INGESTION
Do not induce vomiting. Give 250 ml of milk or water to drink. Get medical attention.

ATTN CHRIS

MATERIAL SAFETY DATA SHEET

TELEPHONE
201-329-2333

SECTION I

MANUFACTURER'S NAME: JOHN C. DOLPH COMPANY			DATE PREPARED: 2/6/89
STREET ADDRESS: BOX 267, NEW ROAD, MONMOUTH JUNCTION, NEW JERSEY 08852			TSCA INFO. ☒ MIXTURE* ☐ CHEM. SUB CAS #
CHEMICAL FAMILY: Butadiene Polymer	MANUFACTURER'S PRODUCT NO: CB-1128-A	TRADE NAME: DOLPHON	

SECTION II — HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT BY WEIGHT	TLV PPM	TLV mg/m³	CAS #	VAPOR PRESSURE mm Hg @ 68°F
Hydroxyl Terminated Polybutadiene	40-50	N/A	N/A	69102905	Low
Hydrogenated Terphenyls	13-16	0.5	N/A	61788327	<0.1
Terphenyls	0.5-2	0.5	9	26140603	<0.1
This product does not contain any SARA Title III Section 313 chemicals.					

SECTION III — PHYSICAL DATA

BOILING RANGE	SOLUBILITY IN WATER	APPEARANCE & ODOR
500°F.	Negligible	Black, medium viscosity liquid with characteristic odor

VAPOR DENSITY	EVAPORATION RATE	% VOLATILE BY VOLUME	WEIGHT PER GALLON	SPECIFIC GRAVITY
☒ HEAVIER ☐ LIGHTER THAN AIR	☐ FASTER ☒ SLOWER THAN ETHER	<0.1	9.1	1.2

SECTION IV — FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method Used): 354°F. (PM)

FLAMMABLE LIMITS: LEL N/A UEL N/A

EXTINGUISHING MEDIA

☐ WATER-FOG ☒ FOAM ☐ OTHER
☒ CARBON DIOXIDE ☒ DRY CHEMICAL

UNUSUAL FIRE AND EXPLOSION HAZARDS
Heat from fire can generate flammable vapor. When mixed with air and exposed to ignition source, vapors can burn in open or explode if confined. Vapors may be heavier than air and travel considerable distance to an ignition source.

SPECIAL FIRE FIGHTING PROCEDURES
Firefighters should wear self contained breathing apparatus. Fight fire from safe distance/protected location.

SECTION V — REACTIVITY DATA

STABILITY: ☐ UNSTABLE ☒ STABLE

CONDITIONS TO AVOID: High temperatures

INCOMPATABILITY (MATERIALS TO AVOID): Strong oxidizers, strong acids

HAZARDOUS DECOMPOSITION PRODUCTS: Small quantities of butadiene, carbon monoxide and/or carbon dioxide

HAZARDOUS POLYMERIZATION: ☐ MAY OCCUR ☒ WILL NOT OCCUR

CONDITIONS TO AVOID: N/A

N/A—NOT APPLICABLE

* COMPONENTS IN TSCA INVENTORY

#69

MATERIAL SAFETY DATA SHEET

TELEPHONE
201-329-2333

SECTION I

MANUFACTURER'S NAME

JOHN C. DOLPH COMPANY

DATE PREPARED:
3/1/89

STREET ADDRESS
BOX 267, NEW ROAD, MONMOUTH JUNCTION, NEW JERSEY 08852

TSCA INFO.
X MIXTURE*
CHEM.SUB
CAS#

CHEMICAL FAMILY	MANUFACTURER'S PRODUCT NO.	TRADE NAME
EPOXY MODIFIED	CR-1035-A RESIN	DOLPHON

SECTION II—HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT BY WEIGHT	TLV ACGIH	TWA OSHA	PEL	CAS#	VAPOR PRESSURE MM HG @ 68 F
BISPHENOL A GLYCIDYL ETHER POLYMER	45-50	N/E		N/E	25068386	N/A
GLYCIDYL ETHER (CHEMICAL IDENTITY TRADE SECRET)	2-3	N/E		N/E	N/A	N/A
** DI-BUTYL PHTHALATE	10-15	5MG/M3		5M/M3	84742	N/A

**INCLUDED IN THE SARA TITLE III SECTION 313 OF CHEMICALS.

SECTION III—PHYSICAL DATA

BOILING RANGE	SOLUBILITY IN WATER	APPEARANCE & ODOR
>600°F.	NIL	RED LIQUID WITH CHARACTERISTIC ODOR

VAPOR DENSITY	EVAPORATION RATE	% VOLATILE BY VOLUME	WEIGHT PER GALLON	SPECIFIC GRAVITY
HEAVIER N/A LIGHTER THAN AIR	FASTER N/A SLOWER THAN ETHER	NIL	11.6	1/39

SECTION IV—FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED) 300 F.

FLAMMABLE LIMITS N/A
LEL UEL

EXTINGUISHING MEDIA

X WATER-FOG X FOAM OTHER

X CARBON DIOXIDE X DRY CHEMICAL

SMALL FIRES: EXTINGUISH WITH DRY CHEMICAL, CARBON DIOXIDE, FOAM OR WATER.
LARGE FIRES: USE A DRY CHEMICAL OR FOAM. WATER MAY BE INEFFECTIVE ON THIS MATERIAL.

UNUSUAL FIRE AND EXPLOSION HAZARDS

DECOMPOSITION AND COMBUSTION PRODUCTS MAY BE TOXIC.

SPECIAL FIRE FIGHTING PROCEDURES

THE USE OF SCBA IS RECOMMENDED FOR FIRE FIGHTING.

SECTION V—REACTIVITY DATA

STABILITY

UNSTABLE X STABLE

CONDITIONS TO AVOID

HIGH TEMPERATURE STORAGE.

INCOMPATABILITY
MATERIALS TO AVOID) CAN REACT VIGOROUSLY WITH STRONG OXIDIZING AGENTS, ACIDS AND BASES. REACTS WITH CERTAIN AMINE CURING AGENTS TO RELEASE CONSIDERABLE HEAT.

HAZARDOUS DECOMPOSITION PRODUCTS CARBON DIOXIDE, ALDEHYDES, NITROGEN OXIDES,

HYDROGEN CHLORIDE AND UNIDENTIFIED ORGANIC COMPOUNDS MAY BE FORMED DURING THERMAL OR OXIDATIVE DECOMPOSITION OF COMBUSTIONS.

HAZARDOUS POLYMERIZATION	CONDITIONS TO AVOID
MAY OCCUR X WILL NOT OCCUR	N/A

N/A—NOT APPLICABLE N/E—NOT ESTABLISHED *COMPONENTS IN TSCA INVENTORY

SECTION VI — HEALTH HAZARD DATA CR-1035-A RESIN

PRIMARY ROUTE(S) OF ENTRY

SEE ADDENDUM TO SECTION VI FOR INFORMATION ON PRIMARY ROUTES OF ENTRY.

EMERGENCY AND FIRST AID PROCEDURES

SEE ADDENDUM TO SECTION VI FOR EMERGENCY AND FIRST AID PROCEDURES.

SECTION VII—SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED MAY BURN, ALTHOUGH NOT READILY IGNITABLE. USE CAUTIOUS JUDGEMENT WHEN CLEANING UP LARGE SPILLS.
LARGE SPILLS: WEAR RESPIRATOR AND PROTECTIVE CLOTHING AS APPROPRIATE. SHUT OFF SOURCES OF LEAK IF SAFE TO DO SO. DIKE AND CONTAIN. REMOVE WITH VACUUM TRUCKS OR PUMP TO STORAGE SALVAGE VESSELS. SOAK UP RESIDUE WITH 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 MATERIAL AND DISPOSE OF PROPERLY.
WASTE DISPOSAL METHOD IF THIS PRODUCT BECOMES A WASTE MATERIAL, IT WOULD NOT BE HAZARDOUS WASTE AS RCRA CRITERIA (40 CFR 261). PLACE WITH AN APPROPRIATE DISPOSAL FACILITY IN COMPLIANCE WITH LOCAL REGULATIONS.

SECTION VIII—SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION
AVOID PROLONGED OR REPEATED BREATHING OF VAPORS OR MISTS. USE A NIOSH APPROVED RESPIRATOR TO PREVENT OVEREXPOSURE. IN ACCORDANCE WITH 29 CFR 1910.134 USE EITHER A FULL-FACE, ATMOSPHERE-SUPPLYING RESPIRATOR OR AIR-PURIFYING RESPIRATOR FOR ORGANIC VAPORS.

VENTILATION
USE VENTILATION AS REQUIRED TO CONTROL VAPOR CONCENTRATION ESPECIALLY IF RESIN IS HEATED.

PROTECTIVE GLOVES WEAR CHEMICAL RESISTANT GLOVES AND PROTECTIVE CLOTHING.
EYE PROTECTION WEAR CHEMICAL GOGGLES IF THERE IS A LIKELIHOOD OF CONTACT WITH EYES.
OTHER PROTECTIVE EQUIPMENT EYE WASH FOUNTAINS AND SAFETY SHOWERS SHOULDBE AVAILABLE FOR EMERGENCY USE.

SECTION IX—SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
WARNING!! CAUSES IRRITATION. MAY CAUSE SKIN REACTION. USE OF A BARRIER CREAM RECOMMENDED. AVOID CONTACT WITH EYES, SKIN OR CLOTHING. AVOID BREATHING VAPOR, MIST OR SPRAY. USE WITH GOOD VENTILATION. WASH AFTER HANDLING.

OTHER PRECAUTIONS
STORE IN COOL, DRY AREA IN CLOSED CONTAINERS.

THE ABOVE INFORMATION WAS EXTRACTED FROM MATERIAL SAFETY DATA SHEETS FROM OUT RAW MATERIAL SUPPLIERS AND IS BELIEVED TO BE CORRECT AS OF THE DATE HEREOF. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY USE, OR ANY OTHER WARRANTY IS EXPRESS OR IS TO BE IMPLIED REGARDING THE ACCURACY OF THESE DATA, THE RESULTS TO BE OBTAINED FROM THE USE OF THE MATERIAL, OR THE HAZARDS CONNECTED WITH SUCH USE. SINCE THE INFORMATION CONTAINED HEREIN 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 MODIFICATION OF THE INFORMATION, WE DO NOT ASSUME RESPONSIBILITY FOR THE RESULTS OF ITS USE. THIS INFORMATION IS FURNISHED ON THE CONDITION THAT THE PERSON RECEIVING IT SHALL MAKE HIS OWN DETERMINATION AS TO THE SUITABILITY OF THE MATERIAL FOR HIS PARTICULAR PURPOSE AND ON THE CONDITION THAT HE ASSUME THE RISK OF HIS USE THEREOF.

SECTION VI ADDENDUM

HEALTH HAZARDS

PRIMARY ROUTES OF ENTRY

EYE CONTACT
THIS MATERIAL IS EXPECTED TO CAUSE EYE IRRITATION. DIRECT CONTACT WITH THE LIQUID MAY CAUSE BURNING, TEARING, REDNESS AND SWELLING.

SKIN CONTACT
THIS MATERIAL MAY CAUSE SKIN IRRITATION WITH CERTAIN INDIVIDUALS. THE MATERIAL IS THUS A POTENTIAL SENSITIZER. OVEREXPOSURE MAY THEN CAUSE SENSITIZATION AND DERMATITIS. PERSONS WITH EXISTING SKIN DISORDERS MAY BE MORE SUSCEPTIBLE TO THE EFFECTS OF THIS MATERIAL.

INHALATION (BREATHING)
BASED ON ITS LOW VOLATILITY, THIS MATERIAL IS NOT CONSIDERED A RESPIRATORY UNDER NORMAL CONDITIONS OF USE. EXTENDED OR REPEATED INHALATION OF VAPORS, FUMES OR MISTS FROM THE PRODUCT MAY PRODUCE CHRONIC HAZARDS.

INGESTION (SWALLOWING)
THIS MATERIAL IS EXPECTED TO BE MODERATELY TOXIC AND MAY BE HARMFUL IF SWALLOWED.

EMERGENCY & FIRST AID PROCEDURES

EYE CONTACT
FOR DIRECT CONTACT, FLUSH THE AFFECTED EYE(S) WITH CLEAN WATER FOR AT LEAST 15 MINUTES. SEEK MEDICAL ATTENTION.

SKIN CONTACT
REMOVE CONTAMINATED CLOTHING/SHOES AND WIPE EXCESS FROM SKIN. FLUSH SKIN WITH WATER. FOLLOW BY WASHING WITH SOAP AND WATER. IF IRRITATION OCCURS, GET MEDICAL ATTENTION. DO NOT RE-USE CLOTHING UNTIL CLEANED. CONTAMINATED LEATHER ARTICLES, INCLUDING SHOES, CANNOT BE DECONTAMINATED AND SHOULD BE DESTROYED.

INHALATION (BREATHING)
REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET MEDICAL ATTENTION.

INGESTION (SWALLOWING)
INDUCE VOMITING. IF VOMITING OCCURS SPONTANEOUSLY, KEEP HEAD BELOW HIPS TO PREVENT ASPIRATION INTO LUNGS. GET MEDICAL ATTENTION.

NOTE TO PHYSICIAN: IF MORE THAN 2.0 ML PER KG HAS BEEN INGESTED AND VOMITING HAS NOT OCCURRED, EMISIS SHOULD BE INDUCED WITH SUPERVISION. KEEP VICTIM'S HEAD BELOW HIP TO PREVENT ASPIRATION. IF SYMPTOMS SUCH AS GAG REFLEX, CONVULTIONS OR UNCONSCIOUSNESS OCCUR BEFORE EMISIS, GASTRIC LAVAGE USING A CUFFED ENDOTRACHEAL TUBE SHOULD BE CONSIDERED.

MATERIAL SAFETY DATA SHEET

TELEPHONE
201-329-2333

SECTION I

MANUFACTURER'S NAME

JOHN C. DOLPH COMPANY

DATE PREPARED:
3/1/89

TSCA INFO.
X MIXTURE*
CHEM.SUB
CAS#

STREET ADDRESS
BOX 267, NEW ROAD, MONMOUTH JUNCTION, NEW JERSEY 08852

CHEMICAL FAMILY	MANUFACTURER'S PRODUCT NO.	TRADE NAME
AMINE/AMIDE MIXTURE	CR-1035 REACTOR	DOLPHON

SECTION II—HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT BY WEIGHT	TLV ACGIH	TWA	PEL OSHA	CAS#	VAPOR PRESSURE MM HG @ 68 F
TRIETHYLENE TETRAMINE	80-90	N/E		N/E	112243	<1
AMIDOAMINE	10-20	N/E		N/E	N/A	<1

THIS PRODUCT DOES NOT CONTAIN ANY SARA TITLE III SECTION 313 CHEMICALS

SECTION III—PHYSICAL DATA

BOILING RANGE
531 F

SOLUBILITY IN WATER
APPRECIABLE

APPEARANCE & ODOR
AMBER LIQUID
CHARACTERISTIC AMINE ODOR

VAPOR DENSITY
X HEAVIER LIGHTER THAN AIR

EVAPORATION RATE
FASTER X SLOWER THAN ETHER

% VOLATILE BY VOLUME
NIL

WEIGHT PER GALLON
8.08

SPECIFIC GRAVITY
0.97

SECTION IV—FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED)
PMCC 275 F

FLAMMABLE LIMITS
LEL N/A UEL N/A

EXTINGUISHING MEDIA

WATER-FOG X FOAM OTHER
X CARBON DIOXIDE X DRY CHEMICAL

UNUSUAL FIRE AND EXPLOSION HAZARDS
TOXIC FUMES WILL BE EVOLVED WHEN THIS MATERIAL IS INVOLVED IN A FIRE.

SPECIAL FIRE FIGHTING PROCEDURES
FIRE FIGHTERS SHOULD WEAR SELF-CONTAINED BREATHING APPARATUS. COOL FIRE EXPOSED CONTAINERS WITH WATER.

SECTION V—REACTIVITY DATA

STABILITY
UNSTABLE X STABLE

CONDITIONS TO AVOID
TEMPERATURES OF 300 F. AND ABOVE

INCOMPATABILITY
(MATERIALS TO AVOID) ACID, OXIDIZING MATERIALS, HALOGENATED ORGANIC COMPOUNDS.

HAZARDOUS DECOMPOSITION PRODUCTS
CARBON MONOXIDE, CARBON DIOXIDE, OXIDES OF NITROGEN.

HAZARDOUS POLYMERIZATION
MAY OCCUR X WILL NOT OCCUR

CONDITIONS TO AVOID
N/A

N/A NOT APPLICABLE N/E - NOT ESTABLISHED *COMPONENTS IN TSCA INVENTORY

SECTION VI —— HEALTH HAZARD DATA

PRIMARY ROUTE(S) OF ENTRY

EYE CONTACT: EYE CONTACT CAN CAUSE SEVERE IRRITATION WITH CORNEAL INJURY WHICH MAY RESULT IN BLINDNESS.
SKIN CONTACT: CONTACT CAUSES SEVERE BURNS AND ALLERGIC SKIN REACTION.
INHALATION: INHALATION MAY CAUSE IRRITATION OF THE RESPIRATORY TRACT AND MUCOUS MEMBRANES. EXCESSIVE EXPOSURE CAN CAUSE SENSITIZATION OR ASTHMA.
INGESTION: INGESTION MAY CAUSE BURNS OF MOUTH AND THROAT, AND GASTROINTESTINAL IRRITATION.
CHRONIC EFFECTS OF OVEREXPOSURE: REPEATED EXCESSIVE EXPOSURES MAY CAUSE LIVER AND KIDNEY EFFECTS.

EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT: FLUSH WITH CLEAN WATER FOR 15 MINUTES. GET MEDICAL ATTENTION.
SKIN CONTACT: WASH CONTACT AREA WITH SOAP AND WATER. GET MEDICAL ATTENTION.
INHALATION: REMOVE VICTIM TO FRESH AIR. IF BREATHING STOPS, BEGIN ARTIFICIAL RESPIRATION. GET MEDICAL ATTENTION.
INGESTION: DO NOT INDUCE VOMITING. GIVE LARGE AMOUNTS OF WATER OR MILK IF AVAILABLE. GET MEDICAL ATTENTION.

SECTION VII—SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

LARGE SPILL: DIKE UP AND PUMP INTO APPROPRIATE CONTAINERS.

SMALL SPILLS: COVER WITH ABSORBENT MATERIAL SUCH AS CLAY, SAND, DIATOMACEOUS EARTH AND REMOVE TO DISPOSAL CONTAINERS.

WASTE DISPOSAL METHOD

DISPOSE OF IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL ENVIRONMENTAL REGULATIONS.

SECTION VIII—SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION
USE AN APPROVED RESPIRATOR TO PREVENT OVEREXPOSURE.

VENTILATION
USE VENTILATION AS REQUIRED TO CONTROL VAPOR CONCENTRATION.

PROTECTIVE GLOVES RUBBER GLOVES
EYE PROTECTION CHEMICAL GOGGLES
OTHER PROTECTIVE EQUIPMENT EYE WASH FOUNTAIN, SAFETY SHOWER, PROTECTIVE CLOTHING, PROTECTIVE SKIN CREAM.

SECTION IX—SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
CORROSIVE. AVOID CONTACT WITH EYES, SKIN OR CLOTHING. WASH AFTER HANDLING. AVOID BREATHING VAPOR OR MIST.

OTHER PRECAUTIONS
STORE IN A COOL DRY AREA IN SEALED CONTAINERS.

THE ABOVE INFORMATION WAS EXTRACTED FROM MATERIAL SAFETY DATA SHEETS FROM OUT RAW MATERIAL SUPPLIERS AND IS BELIEVED TO BE CORRECT AS OF THE DATE HEREOF. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY USE, OR ANY OTHER WARRANTY IS EXPRESS OR IS TO BE IMPLIED REGARDING THE ACCURACY OF THESE DATA, THE RESULTS TO BE OBTAINED FROM THE USE OF THE MATERIAL, OR THE HAZARDS CONNECTED WITH SUCH USE. SINCE THE INFORMATION CONTAINED HEREIN 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 MODIFICATION OF THE INFORMATION, WE DO NOT ASSUME RESPONSIBILITY FOR THE RESULTS OF ITS USE. THIS INFORMATION IS FURNISHED ON THE CONDITION THAT THE PERSON RECEIVING IT SHALL MAKE HIS OWN DETERMINATION AS TO THE SUITABILITY OF THE MATERIAL FOR HIS PARTICULAR PURPOSE AND ON THE CONDITION THAT HE ASSUME THE RISK OF HIS USE THEREOF.

CALL CHEMTREC FOR EMERGENCY INFORMATION-24 HOURS 1-800-424-9300

MATERIAL SAFETY DATA SHEET

TELEPHONE 908-329-2333

SECTION I

ACTURER'S NAME: JOHN C. DOLPH COMPANY	DATE PREPARED: 9/9/93
REET ADDRESS: BOX 267, NEW ROAD, MONMOUTH JUNCTION, NEW JERSEY 08852	TSCA INFO. ☐ MIXTURE* ☒ CHEM. SUB CAS # 1330207

IEMICAL FAMILY	MANUFACTURER'S PRODUCT NO	TRADE NAME
omatic Hydrocarbon	T-200X	DOLPH THINNER

SECTION II — HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT BY WEIGHT	TLV TWA PPM ACGIH	OSHA	CAS #	VAPOR PRESSURE mm Hg @ 68°F
*Xylene	100	100	100	1330207	6.6

* This ingredient is subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and 40 CFR 372.

SECTION III — PHYSICAL DATA

ILING RANGE	SOLUBILITY IN WATER	APPEARANCE & ODOR
280-290°F	Negligible	Clear Liquid - Aromatic Odor

VAPOR DENSITY = 1)	EVAPORATION RATE (N-Butyl Acetate = 1)	% VOLATILE BY VOLUME	WEIGHT PER GALLON	SPECIFIC GRAVITY
3.7	0.80	100	7.26	0.87

SECTION IV — FIRE AND EXPLOSION HAZARD DATA

ASH POINT (Method Used): 81°F. (TCC - ASTM D-56)

FLAMMABLE LIMITS: LEL 1.0% UEL 7.0%

TINGUISHING MEDIA

☐ WATER-FOG ☒ FOAM ☐ OTHER

☐ CARBON DIOXIDE ☒ DRY CHEMICAL

Small Fires: Extinguish with dry chemical, carbon dioxide or foam.

Large Fires: Use a dry chemical or foam. Water may be ineffective on this material.

UNUSUAL FIRE AND EXPLOSION HAZARDS

This material is flammable and may be ignited by heat, sparks, flame or static electricity.

SPECIAL FIRE FIGHTING PROCEDURES

The use of SCBA is recommended for fire fighters. Water spray may be useful to minimize vapors and cooling containers but use caution to prevent spreading of burning liquid by the cooling water.

SECTION V — REACTIVITY DATA

TABILITY: ☐ UNSTABLE ☒ STABLE

CONDITIONS TO AVOID: High temperature storage.

ICOMPATABILITY (MATERIALS TO AVOID): material is incompatible with strong acids or bases, oxidizing agents selected amines.

ARDOUS DECOMPOSITION PRODUCTS: ermal decomposition may yield carbon monoxide and/or carbon dioxide.

HAZARDOUS POLYMERIZATION: ☐ MAY OCCUR ☒ WILL NOT OCCUR

CONDITIONS TO AVOID: N/A

N/A—NOT APPLICABLE

* COMPONENTS IN TSCA INVENTORY

SECTION VI — HEALTH HAZARD DATA

T-200-X

PRIMARY ROUTES OF ENTRY

See Addendum to Section VI for information on primary routes of entry.

EMERGENCY AND FIRST AID PROCEDURES

See Addendum to Section VI for emergency and first aid procedures.

SECTION VII — SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Stay upwind and away from spill. Keep all sources of ignition and hot metal surfaces away from spill. If spill is indoors, ventilate area of spill. Foam, especially high expansion foam, may be used to suppress vapors. Keep out of drains, sewers and waterways. Use sand or other inert material to dam and contain spill. Do not flush area with water; use absorbent pads. Notify appropriate agencies.

WASTE DISPOSAL METHOD

Dispose of in accordance with local, state and federal agencies.

SECTION VIII — SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION

The use of respiratory protection is advised when concentrations exceed the established exposure limits (See Section II) Depending on the airborne concentration, use a respirator or gas mask with appropriate cartridges and cannisters (NIOSH approved, if available) or supplied air equipment.

VENTILATION If current ventilation practices are not adequate to maintain airborne concentration below the established exposure limits (See Section II), additional ventilation or exhaust systems may be required. Where explosive mixtures may be present, systems safe for such locations should be used. No smoking or open lights.

PROTECTIVE GLOVES Plastic or hydrocarbon insoluble rubber gloves recommended.

EYE PROTECTION Chemical goggles or face splash shield recommended.

OTHER PROTECTIVE EQUIPMENT Eye wash fountain. Neoprene apron.

SECTION IX — SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING Keep containers tightly closed, cool, dry and away from sources of ignition. Use and store this product with adequate ventilation. Avoid inhalation of vapors and personal contact with the product. Use good personal hygiene practice. "Empty" containers retain 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. "Empty" drums should be completely drained, properly bunged and promptly shipped to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner and in accordance with government regulations. Before working on or in tanks which contain or have contained this product, refer to OSHA Regulations and/or ANSI Z49.1 pertaining to cleaning, repairing, welding or other contemplated operations.

The above information was extracted from Material Safety Data Sheets from out raw material suppliers and is believed to be correct as of the date hereof.

However, no warranty of merchantability, fitness for any use, or any other warranty is express or is to be implied regarding the accuracy of these data, the results to be obtained from the use of the material, or the hazards connected with such use. Since the information contained herein 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 modification of the information, we do not assume responsibility for the results of its use. This information is furnished on the condition that the person receiving it shall make his own determination as to the suitability of the material for his particular purpose and on the condition that he assume the risk of his use thereof.

SECTION VI ADDENDUM T-200-X

HEALTH HAZARDS/ROUTES OF ENTRY

EYE CONTACT
This material is an irritant. Direct contact with the liquid or exposure to its vapors or mists may cause burning, tearing, redness and swelling.

SKIN CONTACT
This material may cause skin irritation. Prolonged or repeated exposure to this material may cause redness, burning, and drying and cracking of the skin. This product may be absorbed through the skin. Persons with pre-existing skin disorders may be more susceptible to the effects of this material.

INHALATION (BREATHING)
Breathing high concentrations of vapors or mists may cause irritation of the nose and throat and signs of nervous depression (e.g. drowsiness, dizziness, loss of coordination, and fatigue). Prolonged or repeated exposure to vapors or mists may cause liver damage and kidney damage. Respiratory systems associated with pre-existing lung disorders (e.g. asthma-like conditions) may be aggravated by exposure to this material.

INGESTION (SWALLOWING)
Ingestions of excessive quantities may cause irritation of the digestive tract and signs of nervous depression (e.g. drowsiness, dizziness, loss of coordination, and fatigue). Aspiration hazard - this material can enter lungs during swallowing or vomiting and cause lung inflammation and damage.

COMMENTS
This substance has not been identified as a carcinogen or probable carcinogen by NTP, IARC or OSHA.

EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT
If irritation or redness from exposure to vapors develops, move victim away from exposure and into fresh air. If irritation or redness persists, seek medical attention. For direct contact, flush the affected eye(s) with clean water for at least 15 minutes. Seek medical attention.

SKIN CONTACT
Remove contaminated clothing. Cleanse affected area(s) thoroughly by washing with mild soap and water. If irritation or redness develops and persists, seek medical attention.

INHALATION (BREATHING)
If symptoms of exposure develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek immediate medical attention. If victim is not breathing, artificial respiration should be administered. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.

INGESTION (SWALLOWING)
Seek emergency medical attention. This material is slightly toxic by ingestion and an aspiration hazard. If victim is drowsy or unconscious, place on the left side with the head down. Do not give anything by mouth. If victim is conscious and alert, vomiting should be induced for ingestions of large amounts (more than 5 ounces in an adult) preferably with syrup of Ipecac under direction from a physician or poison center. If syrup of Ipecac is not available, vomiting can be induced by gently placing two fingers in the back of the throat. If possible, do not leave victim unattended.

OVER

T-200X

SHIPPING INFORMATION

PROPER SHIPPING NAME	HAZARD CLASS	UN#	PACKING GROUP
Xylene	3	1307	III

REQUIRED LABELS:
FLAMMABLE

EMERGENCY RESPONSE GUIDE NUMBER: 27

Dolph's
EST. 1910

facsimile
TRANSMITTAL phone - 520-889-3346

[redacted]

FROM: GERRY GOVLICK

JOHN C. DOLPH COMPANY
P.O. BOX 287
MONMOUTH JCT NJ 08852

732-329-2333
Fax: 732-329-1143

To: Claudia Welch
Company: GE
Location:
Fax #: 520-889-3341
Re: MSDS for T-200X
Date: 10-28-97
Pages: _____, including cover sheet.

DU PONT
Material Safety Data Sheet

DUPONT POLYMERS

"MYLAR" POLYESTER FILMS IN SYNONYM LIST MYL001B

Revision Date : 24-SEPT-93

CHEMICAL PRODUCT/COMPANY IDENTIFICATION
MATERIAL IDENTIFICATION
"MYLAR" IS A REGISTERED TRADEMARK OF DUPONT.
TRADENAMES AND SYNONYMS
"MYLAR" OL, OL2, OL2T, OLT, P25, P25T, PB, PBM
"MYLAR" RF, RL, RP , S , SMVBT, SW, T , TMB, TR
"MYLAR" VB, VBL, VBLC, WC, WC11 , WC22
"MYLAR" XM35, XM35W, XM744MR, XM873, XM883, XM918
"MYLAR" XM963A, XM963AT, XM990, XM991, XMB, XMP25, XMPR4,
"MYLAR" XMVBR, XMVBS, XMVBT, XMVBU, XMVBV, XR930
COMPANY IDENTIFICATION
MANUFACTURER/DISTRIBUTOR
Du Pont
1007 Market Street
Wilmington, DE 19898

PHONE NUMBERS
PRODUCT INFORMATION : 1-(800)441-7515
TRANSPORT EMERGENCY : CHEMTREC 1-(800)424-9300
MEDICAL EMERGENCY : 1-(800)441-3637

COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENTS

MATERIAL	CAS NUMBER	%
POLYETHYLENE TEREPHTHALATE	25038-59-9	)99

COMPONENTS (REMARKS)
MATERIAL IS NOT KNOWN TO CONTAIN TOXIC CHEMICALS UNDER SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND 40 CFR PART 372.

HAZARDS IDENTIFICATION
POTENTIAL HEALTH EFFECTS

Before using "Mylar" Polyester Film, read the bulletin on safe handling instructions.

ACUTE OR IMMEDIATE EFFECTS: ROUTES OF ENTRY AND SYMPTOMS

INGESTION "MYLAR" was fed to male and female rats and dogs for ninety days at the 10% level in their diet. No compound releated effects were seen. "Mylar" has low ingestion toxicity.

SKIN NO animal tests have been run. However, based on many years of manufacturing these products, no skin problems are anticipated from normal handling of the film.

EYE Mechanical irritation.

INHALATION Not volatile as marketed. Fumes irritating to the eyes, nose, and throat may be produced at temperatures above 235 degrees C. The exposure may result in reddening, tearing, and itching of the eyes, soreness in the nose and throat, and coughing.

CARCINOGENICITY INFORMATION
None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

FIRST AID MEASURES

INHALATION
NO specific intervention is indicated as the compound is not

likely to be hazardous by inhalation. Consult a physician if necessary. If exposed to fumes from overheating or combustion, move to fresh air. Consult a physician if symptoms persist.

SKIN CONTACT
The compound is not likely to be hazardous by skin contact, but cleansing the skin after use is advisable. If molten polymer gets on skin, cool rapidly with cold water. Do not attempt to peel polymer from skin. Obtain medical treatment for thermal burn.

EYE CONTACT
In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

INGESTION
No specific intervention is indicated as compound is not likely to be hazardous by ingestion. Consult physician if necessary.

FIRE FIGHTING MEASURES

Flammable Properties
The solid film can be combusted only with difficulty.

Fire and Explosion Hazards:
Hazardous gases/vapors produced in a fire are carbon dioxide, carbon monoxide, organic acids, aldehydes, and alcohols.

Extinguishing Media
Water, Foam, Dry Chemical, CO2

Fire Fighting Instructions
Keep personnel removed and upwind of fire. Wear self-contained breathing apparatus. Wear full protective equipment.

ACCIDENTAL RELEASE MEASURES

Safeguards (Personnel)
NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

HANDLING AND STORAGE

Handling (Personnel)
Avoid breathing vapors and fumes produced during processing.

Storage
Store in a cool, dry place. Keep packages closed to prevent contamination.

EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls
VENTILATION Normal ventilation except at temperatures above 235 degrees C where local exhaust ventilation may be required.

Personal Protective Equipment

Eye/Face	Safety Glasses
Respirator	Not required
Protective Gloves	Wear gloves when handling hot film

Exposure Guidelines
Exposure Limits
"MYLAR" POLYESTER FILMS IN SYNONYM LIST MYL001B

PEL	(OSHA)	Particulates (Not Otherwise Classified) 15 mg/m3, 8 Hr. TWA, total dust 5 mg/m3, 8 Hr. TWA, respirabale dust
TLV	(ACGIH)	None Established

PHYSICAL AND CHEMICAL PROPERTIES

Physical Data

Melting Point	-235 C (-455F)
% Volatiles	NA
Solubility in Water	Negligible
Odor	Negligible
Form	Clear, transparent film
Color	Clear

Physical Hazards
During processing, the film can pick up a strong static charge. Avoid discharge into dust or solvent-laden air, as flash fire or explosion may result.

STABILITY AND REACTIVITY

Chemical Stability
Stable
Incompatibility with Other Materials
None reasonably foreseeable.
Decomposition
Hazardous gases/vapors produced are carbon monoxide and hydrocarbon oxidation products including organic acids, aldehydes, and alcohols.
Polymerization
Polymerization will not occur.
Other Hazards
Conditions to Avoid: Temperatures)235 deg C (455 deg F). Strong acids and bases may hydrolyze the film

DISPOSAL CONSIDERATIONS
Preferred options for disposal are (1) recycling, (2) incineration with energy recovery, and (3) landfill. The high fuel value of this product makes option 2 very desirable for material that cannot be recycled. Treatment, storage, transportation, and disposal must be in accordance with applicable federal, state/provincial, and local regulations

TRANSPORTATION INFORMATION
Shipping Information
DOT
Proper Shipping Name Not regulated
U.S. Federal Regulations
TSCA Inventory Status Reported/Included

OTHER INFORMATION
Additional Information
MEDICAL USE: CAUTION: Do not use in medical applications involving permanent implantation in the human body. For other medical applications see DUPONT CAUTION BULLETIN NO. H-50102.

STATE RIGHT-TO-KNOW LAWS

No substances on the state hazardous substances list, for the states indicated below, are used in the manufacture of products on this Material Safety Data Sheet.

SUBSTANCES ON THE PENNSYLVANIA HAZARDOUS SUBSTANCES LIST PRESENT AT A CONCENTRATION OF 1% OR MORE (0.1% FOR SPECIAL HAZARDOUS SUBSTANCES): None Known.

WARNING: SUBSTANCES KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER, BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM: None Known.

SUBSTANCES ON THE NEW JERSEY WORKPLACE HAZARDOUS SUBSTANCE LIST PRESENT AT A CONCENTRATION OF 1% OR MORE (0.1% FOR SUBSTANCES IDENTIFIED AS CARCINOGENS, MUTAGENS OR TERATOGENS): None Known

The data in this Material Safety Data Sheet related only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

Responsibilty for MSDS : T.E. SCHROER
Address DUPONT POLYMERS
CHESTNUT RUN PLAZA 115
Wilmington, DE 19880-115
Telephone 302-999-4664

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U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1367

MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME: DYKEM COMPANY	EMERGENCY TELEPHONE NO.: (314)423-0100
ADDRESS: 8501 Delport Drive, St. Louis, Missouri 63114	
CHEMICAL NAME AND SYNONYMS:	TRADE NAME AND SYNONYMS: DYKEM REMOVER & THINNER 138
CHEMICAL FAMILY: Remover and Thinner	FORMULA: Does not apply

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES & SOLVENTS		CAS REGISTRY NO.	%	TLV (Units)
Solvents	Denatured Alcohol	64-17-5	80	1000
Solvents	Butyl Acetate	123-86-4	20	150

"DYKEM" is the Registered Trade-mark of a line of Proprietary Products used by Industry since 1920. Never any harm to any of our employees who handle daily large volumes of raw materials and finished products. Containers are labeled with Caution Notices regarding flammability and use with adequate ventilation.

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	165°F	SPECIFIC GRAVITY (H_2O=1)	.824@22.5°C
VAPOR PRESSURE (mm Hg.)	43.2mm@20°C	PERCENT, VOLATILE BY VOLUME (%)	99
VAPOR DENSITY (AIR=1)	Heavier than air	EVAPORATION RATE (_____ =1)	Faster than Butyl Acetate
SOLUBILITY IN WATER	Slightly	(Butyl Acetate =1)	
APPEARANCE AND ODOR	Colorless. Mild odor		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	61°F TOC	FLAMMABLE LIMITS	Lel	Uel
		1.8-19.		

EXTINGUISHING MEDIA: Carbon Dioxide, Regular Foam, Dry Chemical

SPECIAL FIRE FIGHTING PROCEDURES: Wear self-contained breathing apparatus in enclosed areas.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Vapors are heavier than air and may travel along ground, or may be moved by ventilation and ignited by sparks, flame and other ignition sources.

(Continued on reverse side)

PROPER SHIPPING NAME: DOT: PAINT FLAMMABLE LIQUID in Quart containers or larger; CONSUMER COMMODITY, ORM-D for Spray cans and Smaller than quart containers
HAZARD CLASS: DOT: FLAMMABLE LIQUID
I. D. NUMBER: UN-1263
LABEL REQUIRED: RED FLAMMABLE LIQUID Label required for Quart containers or larger.

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: 840 (Estimated)

EFFECTS OF OVEREXPOSURE: Irritation of nose and throat, reddness and irritation of eyes. Excessive breathing of vapors can cause nausia and respiratory irritation.

EMERGENCY AND FIRST AID PROCEDURES: If swallowed, drink 2 glasses of water, induce vomiting, call Physician. Flush eye, contact with water. If exposed to excessive vapors, remove to fresh air.

SECTION VI - REACTIVITY DATA

STABILITY			CONDITIONS TO AVOID
	UNSTABLE		
	STABLE	X	None

INCOMPATIBILITY (*Materials to avoid*): Strong oxidizing agents

HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide or Carbon Dioxide

HAZARDOUS POLYMERIZATION			CONDITIONS TO AVOID
	MAY OCCUR		
	WILL NOT OCCUR	X	None

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Clean up in normal matter for flammables. Absorb in absorbent material.

WASTE DISPOSAL METHOD: No waste normally, incinerate or normal disposal for flammables, in accordance with local, state and federal regulations.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (*Specify type*): None needed under normal useage

VENTILATION				
	LOCAL EXHAUST	Ordinary	SPECIAL	None
	MECHANICAL (*General*)	Acceptable	OTHER	None

PROTECTIVE GLOVES: None needed with normal use

EYE PROTECTION: None needed under normal conditions

OTHER PROTECTIVE EQUIPMENT: None needed

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Keep away from heat and flame. Use with adequate ventilation.

OTHER PRECAUTIONS: None

Information furnished by: DYKEM COMPANY
R. Belleville

DATE: OCT 15 1985

Material Safety Data Sheet
May be used to comply with OSHA's Hazard Communication Standard 29 CFR 1910.1200. Standard must be consulted for specific requirements

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY (As Used on Label and List): DYKEM STEEL BLUE DX-100

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

Section I

Manufacturer's Name: DYKEM COMPANY

Emergency Telephone Number: (314)423-0100

Address (Number, Street, City, State, and ZIP Code): 8501 Delport Drive, St. Louis, Missouri 63114

Telephone Number for Information: (314)423-0100

Date Prepared: [illegible] 7 1989

Signature of Preparer (optional): [illegible]

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))		OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
Methyl Violet	(CAS # 8004-87-3)	*N/A	*N/A	None	1-3
N-Butyl Acetate	(CAS # 123-86-4)	150 PPM	150 PPM	None	30-40
Denatured Ethyl Alcohol	(CAS # 64-17-5)	1000 PPM	1000 PPM	None	50-60
N-Butyl Alcohol	(CAS # 71-36-3)	100 PPM	50 PPM	None	3-6
Cellulose, Nitrate	(CAS # 9004-70-0)	*N/A	*N/A	None	70% } 3% con
Isopropyl Alcohol (Rubbing Alcohol)	(CAS # 67-63-0)	400 PPM	400 PPM	None	30% } 3% con

Section III — Physical/Chemical Characteristics

Boiling Point	160°F	Specific Gravity (H_2O = 1)	.86
Vapor Pressure (mm Hg.)	36	Melting Point	Liquid
Vapor Density (AIR = 1)	> 1	Evaporation Rate (Butyl Acetate = 1)	> 1

Solubility in Water: Appreciable

Appearance and Odor: Intense blue color, sweet solvent odor.

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used): 57°F TCC

Flammable Limits: LEL 1.4 UEL 11.2

Extinguishing Media: Carbon Dioxide, Regular Foam, Dry Chemical

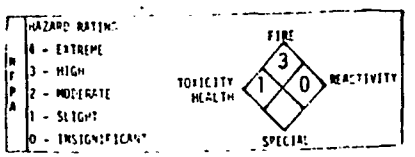
Special Fire Fighting Procedures: Wear self-contained breathing apparatus in enclosed areas. Water may be used to cool fire-exposed containers.

Unusual Fire and Explosion Hazards: Vapors are heavier than air and may travel along ground, or may be moved by ventilation and ignited by spark, flame and other ignition sources.

(Reproduce locally) *N/A = Not Applicable

OSHA 174 Sept 1985

PROPER SHIPPING NAME: (D.O.T.) PAINT
HAZARD CLASS: (D.O.T.) FLAMMABLE LIQUID
I. D. NUMBER: UN-1263



Section V — Reactivity Data

Stability			Conditions to Avoid
	Unstable		
	Stable	X	Avoid heat, sparks and open flame

Incompatibility (Materials to Avoid): Strong oxidizing agents

Hazardous Decomposition or Byproducts: Carbon Monoxide or Carbon Dioxide

Hazardous Polymerization			Conditions to Avoid
	May Occur		
	Will Not Occur	X	None

Section VI — Health Hazard Data

Route(s) of Entry: Inhalation? Yes; Skin? Possible; Ingestion? Yes

Health Hazards (Acute and Chronic): Respiratory irritation. High concentrations of vapors may produce headache, dizziness, and nausea. Eye contact causes burning and irritati Prolonged or repeated skin contact may lead to drying, irritation, and dermatitis

Carcinogenicity: NTP? No; IARC Monographs? No; OSHA Regulated? No

Signs and Symptoms of Exposure: Dizziness, nausea, irritation of skin, respiratory irritation

Medical Conditions Generally Aggravated by Exposure: Eye contact causes burning and irritation. Repeated or prolonged skin contact may lead to drying, irritation and dermatitis.

Emergency and First Aid Procedures: Flush eye contact or prolonged skin contact with large amount of water. If expos to excessive vapors, remove to fresh air. If swallowed, contact Local Poison Con Center or Physician immediately.

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled: Wear personal protective equipment. (See Section VIII). Remove heat and ignition sources. Ventilate the area; clean up with iner absorbant.

Waste Disposal Method: Waste may be burned in an approved incinerator, or dispose of according to Local, State and Federal regulations.

Precautions to Be Taken in Handling and Storing: Store cool and dry away from heat, sparks, or open flame.

Other Precautions: Use with adequate ventilation. NOTE: This product does not contai chemicals considered carcinogenic by IARC, NTP, or OSHA. Avoid prolonged s

Section VIII — Control Measures

Respiratory Protection (Specify Type): If TLV is exceeded, or for symtoms of over exposure, wear NIOSH approved organic respirat

Ventilation: Local Exhaust: Necessary under some handling or use conditions; Mechanical (General): Acceptable under normal conditions; Special: None; Other: None

Protective Gloves: None needed under normal usage conditions

Eye Protection: None under normal use condition If splash potential exists wear chemica splash goggles or face shield.

Other Protective Clothing or Equipment: Wear neoprene or chemical resistant gloves and apron as needed to prevent repeate or prolonged skin contact.

Work/Hygienic Practices: Use with adequate ventilation.

DYKEM COMPANY BELIEVES THAT THE INFORMATION CONTAINED IN THIS MSDS IS CORRECT THIS DATE. HOWEVER, BECAUSE THE MATERIAL MAY BE USED UNDER CONDITIONS OVER WH DYKEM COMPANY HAS NO CONTROL OR IN WAYS WE CANNOT ANTICIPATE, WE GIVE NO WARRA EXPRESSED OR IMPLIED, AS TO THE ACCURACY OF THE INFORMATION AND ASSUME NO RESPONSIBILITY FOR ANY DAMAGE TO PERSON, PROPERTY OR BUSINESS ARISING FROM SUC MOREOVER, IT IS THE RESPONSIBILITY OF [illegible]RCHAS[illegible] OR USER OF THIS MATERIAL T

EARLE M. JORGENSEN CO.

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Material Safety Data Sheet

Company	Issue Date	Identification
Earle M. Jorgensen Co. 10700 Alameda Street Lynwood, California 90262	November 21, 1985	AL

Trade Name (Common Name or Synonym)	Emergency Phone Number
Aluminum Alloys	(213) 567-1122 or contact your nearest Jorgensen office
Chemical Name	**Form**
Aluminum	Bar, Sheet, Plate, Tubing, Structurals, and Forgings

I. INGREDIENTS

Material or Component	CAS Number	% Weight	Exposure Limits	
			1984-85 ACGIH TLV (mg/m³)	OSHA 1910.1000 PEL (mg/m³)
Base Metal				
Aluminum (Al)	7429-90-5	90-99.7	10.0 as metal dust and oxide	Not established
Alloying Elements			5.0 as welding fume	Not established
Cobalt (Co)	7440-48-4	< 1.0 - 10.00	0.1	0.1
Copper (Cu)	7440-50-8	< 1.0 - 10.00	0.2 as fume	0.1 as fume
Iron (Fe)	1309-37-1	< 1.0 - 10.00	5.0 as fume	10.0 as fume
Lead (Pb)	7439-92-1	< 0.2 - 0.7	0.15 as dust and fume	0.05 as dust and fume
Magnesium (Mg)	1309-48-4	< 1.0 - 10.00	10.0 as fume	15.0 as fume
Manganese (Mn)	7439-96-5	< 1.0 - 10.00	1.0 as fume	5.0 ceiling
Silicon (Si)	7440-21-3	< 1.0 - 10.00	10.0 as total dust	Not established
Tin (Sn)	7440-31-5	< 1.0 - 10.00	2.0 as oxide and metal	2.0 as inorganic compounds
Zinc (Zn)	1314-13-2	< 1.0 - 10.00	5.0 as fume	5.0 as fume

Note: Aluminum alloys will be comprised of various combinations of the elements shown here. In addition, other alloying elements may be present in minute quantities.

II. PHYSICAL DATA

Material is (At Normal Conditions):	Appearance and Odor
☐ Liquid ☒ Solid ☐ Gas ☐ Other	Metallic Appearance — No odor

Acidity/Alkalinity			Vapor Pressure (mm Hg at 20°C)
ph = NA	Melting Point Approx 900-1200°F Boiling Point NA °F	Specific Gravity (H_2O = 1) — 2.5 - 2.9 Solubility in water (% by weight) — Nil	NA

III. PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection	Hands, Arms, and Body
Appropriate respirator depending upon potential airborne contaminants and their concentrations. If exposure limits are reached or exceeded use NIOSH approved respiration equipment.	Appropriate gloves, especially for sheet and coil.
Eyes and Face	**Other Clothing and Equipment**
Safety glasses or shield as appropriate.	As needed depending on operation and safety codes.

IV. EMERGENCY MEDICAL PROCEDURES

Skin Contact: Remove particles thoroughly by washing with soap and water.

Eye Contact: Flush with water thoroughly. Get medical attention if irritation persists.

V. HEALTH/SAFETY INFORMATION

HEALTH

For standard operations (e.g., melting, cutting, grinding), aluminum alloys present a low health risk by inhalation and are usually considered a nuisance dust. Toxicity by ingestion - none expected. Skin and eyes - not an irritant. Welding and plasma cutting of alloys high in copper (2000 and 7000 series) may present the potential for overexposure to copper fume which can result in upper respiratory tract irritation, nausea, and metal fume fever. Nickel and chromium are other alloying elements considered hazardous as fume; however, they do not present a carcinogenic or other health concerns due to their low concentrations of the chemical form in which they are present. Overexposure to lead fumes over an extended period of time can result in such toxic effects as central nervous system disturbances, renal changes, peripheral neuropathy, gastrointestinal disturbances, anemia, and chromosomal changes.

Occupational Exposure Limits

See Ingredients Section I.

FIRE AND EXPLOSION

Flash Point	Auto Ignition Temperature	Flammable Limits in Air	Extinguishing Media
NA °F	NA °F	Lower NA % Upper NA %	Dry powder or sand

Fire and Explosion Hazards	Extinguishing Media Not to be Used
Small chips, fine turnings, and dust may ignite readily. Damp aluminum dust may spontaneously heat with liberation of hydrogen to form explosive air mixtures. Molten aluminum may explode on contact with water or certain metal oxides (e.g., oxides of copper, iron, and lead).	Do not use water or halogen on dust fires.

REACTIVITY

Stability	Incompatibility (Materials to Avoid)
☒ Stable ☐ Unstable	Reacts with strong acids to form hydrogen gas.

Conditions to Avoid

Aluminum products under normal conditions are stable during use, storage, and transportation. Halogen acids and sodium hydroxide in contact with aluminum may generate explosive mixtures of hydrogen. Finely divided aluminum, such as small chips and fines, will form explosive mixtures in air. It will also form explosive mixtures in air in the presence of bromates, iodates, or ammonium nitrate. Strong oxidizers cause violent reactions with considerable heat generation.

Hazardous Decomposition Products

See Additional Information Section VII.

VI. ENVIRONMENTAL

Spill or leak procedures

NA

Waste Disposal Method

Used or unused product should be tested to determine hazard status and disposal requirements under federal, state, or local laws and regulations.

VII. ADDITIONAL INFORMATION

Other precautions:

1. Do not touch cast aluminum metal or heated aluminum product without knowing metal temperature. Aluminum experiences no color change during heating. Burns could result.
2. Aluminum powder must be packaged and shipped as a flammable solid.
3. Hard alloy ingots in the 2000 and 7000 Series must be stress relieved to prevent explosion when sawed.
4. The welding of aluminum alloys may generate carbon monoxide, carbon dioxide, ozone, nitrogen oxides, infrared radiation and ultraviolet radiation.

Disclaimer

The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any representation or warranty, express or implied regarding the accuracy or correctness.
The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.

EARLE M. JORGENSEN CO.

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Material Safety Data Sheet

Company	Issue Date	Identification Number
Earle M. Jorgensen Co. 10700 Alameda Street Lynwood, California 90262	November 21, 1985	C Alloy & Tool
Trade Name (Common Name of Synonym) Carbon, Alloy, and Tool Steels	**Emergency Phone Number** (213) 567-1122	or Contact your nearest Jorgensen office
Chemical Name Steel	**Form** Bar, Sheet, Plate, Tubing, Structurals, and Forgings	

I. INGREDIENTS

Material or Component	CAS Number	% Weight	Exposure Limits	
			OSHA PEL (mg/m³)	ACGIH TLV (mg/m³)
Base Metal				
Iron (Fe)	7439-89-6	Balance	10 (Fe_2O_3 Fume)	5.0 (Fe_2O_3 Fume)
Alloying Elements				
Aluminum (Al)	7429-90-5	0.10 - 1.8	None Listed	5.0 as welding fume
Carbon (C)	7440-44-0	0.01 - 1.5	None Listed	None Listed
Chromium (Cr)	7440-47-3	0.01 - 12	1.0 as chrome	0.5 as chrome
Cobalt (Co)	7440-48-4	8 Max.	0.1 as cobalt and fume	0.05 as fume
Copper (Cu)	7440-50-8	0.04 - 0.7	0.2 as copper; 1.0 as dust	0.2 as fume; 1.0 as dust
Lead (Pb)	7439-92-1	0.15 - 0.35	0.05 as fume & dust	0.15 as dust and fume
Manganese (Mn)	7439-96-5	0.05 - 2.0	5 as manganese	5 as dust; 1 as fume
Molybdenum (Mo)	7439-98-7	0.01 - 1.10	15 as insoluble compds	10 as insoluble compds
Nickel (Ni)	7440-02-0	0.01 - 10	1.0 as Nickel	1.0 as Nickel
Phosphorous (P)	7723-14-0	0.15 Max	0.1 as Phosphorous	0.1 as Phosphorous
Silicon (Si)	7440-21-3	0.15 - 2.20	None Listed	10 total dust
Sulfur (S)	7704-34-9	0.001 - 0.35	13 sulfur dioxide	5 sulfur dioxide
Tungsten (W)	7440-33-7	0 - 18	None Listed	5 insoluble compds
Vanadium (V)	7440-62-2	0.01 - 1.0	0.5 dust; 0.1 fume	0.05 dust and fume
Zinc (Zn) coating	1314-13-2	10 Max	5.0 as fume	5.0 as fume

Note: The above listing is a summary of elements used in alloying steel. Various grades of steel will contain different combinations of these elements. Trace elements may also be present in minute amounts.

II. PHYSICAL DATA

Material is (At Normal Conditions):				Appearance and Odor
☐ Liquid	☒ Solid	☐ Gas	☐ Other	Gray-Black With Metallic Lustre — Odorless

Acidity/Alkalinity			Vapor Pressure (mm Hg at 20°C)
ph = NA	Approx Melting Point 2750°F Boiling Point NA °F	Specific Gravity (H_2O = 1) — 7 Solubility in water (% by weight) — NA	NA

III. PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection	Hands, Arms, and Body
NIOSH approved dust/mist/fume respirator should be used during welding or burning if OSHA PEL or TLV is exceeded.	Use appropriate protective clothing such as welders aprons & gloves when welding or burning. Check local codes.
Eyes and Face	**Other Clothing and Equipment**
Safety glasses should always be worn when grinding or cutting; face shields should be worn when welding or burning.	As required

IV. EMERGENCY MEDICAL PROCEDURES

Inhalation:	Remove to fresh air; if condition continues, consult physician.
Eye Contact:	Immediately flush well with running water to remove particulate; get medical attention.
Skin Contact:	If irritation develops, remove clothing and wash well with soap and water. If condition persists, seek medical attention.
Ingestion:	If significant amounts of metal are ingested, seek medical attention.

V. HEALTH/SAFETY INFORMATION

HEALTH

Steel products in the natural state do not present an inhalation, ingestion, or contact health hazard. However, operations such as welding, burning, sawing, brazing, grinding, and possibly machining, which results in elevating the temperature of the product to or above its melting point or results in the generation of airborne particulates may present hazards. The above operations should be performed in well ventilated areas. The major exposure hazard is inhalation.

Effects of overexposure are as follows:

Acute: Excessive inhalation of metallic fumes and dusts may result in irritation of eyes, nose, and throat. Also high concentrations of fumes and dusts of iron-oxide, manganese, copper, zinc, & lead may result in metal fume fever. Typical symptoms consist of a metallic taste in the mouth, dryness and irritation of the throat, chills and fever, and usually last from 12 to 48 hours.

Chronic: Chronic and prolonged inhalation of high concentrations of fumes or dust of the following elements may lead to the conditions listed opposite the element:

Iron (iron-oxide) - Pulmonary effects, siderosis.

Manganese - Bronchitis, pneumonitis, lack of coordination.

Chromium - Various forms of dermatitis, inflammation and/or ulceration of upper respiratory tract, and possibly cancer of nasal passages and lungs. Based on available information, there does not appear to be any evidence that exposure to welding fume induces human cancer.

Nickel - SAME AS CHROMIUM.

Copper - Pulmonary effects.

Vanadium - No reported cases of exposure to vanadium.

Cobalt - Inhalation of cobalt dust may cause an asthma-like disease with cough and dyspnea.

Molybdenum - Pain in joints, hands, knees and feet.

Tungsten - Some evidence of pulmonary involvement such as cough.

Lead - Prolonged exposures can cause behavioral changes, kidney damage, periphery neuropathy characterized by decreased hand-grip strength and adverse reproductive effects.

Zinc - None reported.

Occupational Exposure Limits

See Section I.

FIRE AND EXPLOSION

Flash Point	Auto Ignition Temperature	Flammable Limits in Air	Extinguishing Media
NA °F	NA °F	Lower NA % Upper NA %	NA

Fire and Explosion Hazards	Extinguishing Media Not to be Used
None	NA

REACTIVITY

Stability	Incompatibility (Materials to Avoid)
☒ Stable ☐ Unstable	Reacts with strong acids to form hydrogen gas.

Conditions to Avoid

Keep Area Well Ventilated

Non-ventilated areas when cutting, welding, burning, or brazing; avoid generation of airborne dusts and fumes.

Hazardous Decomposition Products

Metallic oxides.

VI. ENVIRONMENTAL

Spill or leak procedures	
NA	Special Precautions: Use good housekeeping practices to prevent accumulation of dust and to keep airborne dust to a minimum.

Waste Disposal Method

Dust, etc. — follow federal, state, and local regulations regarding disposal.

VII. ADDITIONAL INFORMATION

Disclaimer

The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any representation or warranty, express or implied regarding the accuracy or correctness.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.

EARLE M. JORGENSEN CO.

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Material Safety Data Sheet

Company	Issue Date	Identification
Earle M. Jorgensen Co. 10700 Alameda Street Lynwood, California 90262	November 21, 1985	STLS
Trade Name (Common Name or Synonym) Stainless Steel	**Emergency Phone Number** (213) 567-1122	or contact your nearest Jorgensen Office
Chemical Name Examples: 304, 347, 17-4, 410	**Form** Bar, Sheet, Plate, Tubing, Structurals, and Forgings	

I. INGREDIENTS

Material or Component	CAS Number	% Weight	Exposure Limits	
			OSHA PEL (mg/m³)	ACGIH TLV (mg/m³)
Base Metal				
Iron (Fe)	7439-89-6	39-81	10 (Fe_2O_3 Fume)	5.0 (Fe_2O_3 Fume)
Alloying Elements				
Carbon (C)	7440-44-0	0.5 Max	None Listed	None Listed
Manganese (Mn)	7439-96-5	10.0 Max	5.0 as Manganese	1.0 as Manganese
Phosphorous (P)	7723-14-0	0.001 - 0.2	0.1 as Phosphorous	0.1 as Phosphorous
Sulfur (S)	7704-34-9	0.001 - 0.35 Max	13 (Sulfur Dioxide)	5 (Sulfur Dioxide)
Silicon (Si)	7440-21-3	2.0 Max	None Listed	None Listed
Chromium (Cr)	7440-47-3	10 - 27	1.0 as Chromium	0.5 as Chromium
Nickel (Ni)	7440-02-0	0 - 22	1.0 as Nickel	1.0 as Nickel
Selenium (Se)	7782-49-2	0 - 0.35	0.2 as Selenium	0.2 as Selenium
Columbium (Cb)	7440-03-1	10 x C % Wt	5.0 as Tantalum	5.0 as Tantalum
Tantalum (Ta)	7440-25-7			
Copper (Cu)	7440-50-8	0.04 - 4	0.2 as Copper	0.2 as Copper
Molybdenum (Mo)	7439-98-7	0 - 4	5.0 Soluble Compds	5.0 Soluble Compds
Aluminum (Al)	7429-90-5	0 - 2	None Listed	5.0 as welding fumes
Titanium (Ti)	7440-32-6	0.70 Max	15 as $Ti\ O_2$	10 as total dust

Note: The above listing is a summary of elements used to alloy stainless steels. Various grades of stainless will contain different combinations of these elements. Trace elements may also be present in minute quantities.

II. PHYSICAL DATA

Material is (At Normal Conditions):				Appearance and Odor
☐ Liquid	☒ Solid	☐ Gas	☐ Other	Gray-Black With Metallic Lustre — Odorless

Acidity/Alkalinity			Vapor Pressure (mm Hg at 20°C)
ph = NA	Melting Point Approx 2700°F Boiling Point NA °F	Specific Gravity (H_2O = 1) — Approx 8 Solubility in water (% by weight) — NA	NA

III. PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection	Hands, Arms, and Body
NIOSH approved dust/mist/fume respirator should be used during welding or burning if OSHA PEL or TLV is exceeded.	Use appropriate protective clothing such as welders aprons & gloves when welding or burning. Check local codes.
Eyes and Face	**Other Clothing and Equipment**
Safety glasses should always be worn when grinding or cutting; face shields should be worn when welding or burning.	As required

IV. EMERGENCY MEDICAL PROCEDURES

Inhalation:	Remove to fresh air; if condition continues, consult physician.
Eye Contact:	Immediately flush well with running water to remove particulate; get medical attention.
Skin Contact:	If irritation develops, remove clothing and wash well with soap and water. If condition persists, seek medical attention.
Ingestion:	If significant amounts of metal are ingested, seek medical attention.

V. HEALTH/SAFETY INFORMATION

HEALTH

Steel products in the natural state do not present an inhalation, ingestion, or contact health hazard. However, operations such as welding, burning, sawing, brazing, grinding, and possibly machining, which results in elevating the temperature of the product to or above its melting point or results in the generation of airborne particulates may present hazards. The above operations should be performed in well ventilated areas. The major exposure hazard is inhalation.

Effects of overexposure:

Acute: Excessive inhalation of all metallic fumes and dusts may result in irritation of eyes, nose, and throat. Also high concentrations of fumes and dusts of iron-oxide, manganese, copper, & selenium may result in metal fume fever. Typical symptoms consist of a metallic taste in the mouth, dryness and irritation of the throat, chills and fever, and usually last from 12 to 48 hours.

Chronic: Chronic and prolonged inhalation of high concentrations of fumes or dust of the following elements may lead to the conditions listed opposite the element:

Iron (iron-oxide) - Pulmonary effects, siderosis.

Manganese - Bronchitis, pneumonitis, lack of coordination.

Chromium - Various forms of dermatitis, inflammation and/or ulceration of upper respiratory tract, and possibly cancer of nasal passages and lungs. Based on available information, there does not appear to be any evidence that exposure to welding fume induces human cancer.

Nickel - SAME AS CHROMIUM.

Selenium - Nasal and bronchial irritation, gastro-intestinal disturbances, garlic odor of breath.

Copper - Pulmonary effects.

Vanadium - No reported cases of exposure to vanadium.

Cobalt - Inhalation of cobalt dust may cause an asthma-like disease with cough and dyspnea.

Molybdenum - Pain in joints, hands and feet.

Occupational Exposure Limits

See Section I.

FIRE AND EXPLOSION

Flash Point	Auto Ignition Temperature	Flammable Limits in Air	Extinguishing Media
NA °F	NA °F	Lower NA % Upper NA %	NA

Fire and Explosion Hazards	Extinguishing Media Not to be Used
None	NA

REACTIVITY

Stability	Incompatibility (Materials to Avoid)
☒ Stable ☐ Unstable	Reacts with strong acids to form hydrogen gas.

Conditions to Avoid

Keep Area Well Ventilated

Non-ventilated areas when cutting, welding, burning, or brazing; avoid generation of airborne dusts and fumes.

Hazardous Decomposition Products

Metallic oxides.

VI. ENVIRONMENTAL

Spill or leak procedures

NA

Special Precautions: Use good housekeeping practices to prevent accumulation of dust and to keep airborne dust to a minimum.

Waste Disposal Method

Dust, etc. — follow federal, state, and local regulations regarding disposal.

VII. ADDITIONAL INFORMATION

Disclaimer

The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any representation or warranty, express or implied regarding the accuracy or correctness.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.

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MSDS DOCUMENT GE630AB

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MATERIAL SAFETY DATA SHEET
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RTV630A

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURED BY

GE SILICONES
260 HUDSON RIVER ROAD
WATERFORD, NY 12188

EMERGENCY PHONE (24 HRS)
(518) 237-3330 (24 HRS)

SUPPLIED BY

GE SILICONES
260 HUDSON RIVER ROAD
WATERFORD, NY 12188

EMERGENCY PHONE (24 HRS)
(518) 237-3330 (24 HRS)
REVISED: 01/22/92
PREPARER: DA POLSINELLI

PRODUCT IDENTIFICATION: RTV630A
CHEMICAL FAMILY:
SILICONE RUBBER COMPOUND
CHEMICAL NAME: SILICONE POLYSILOXANE COMPOUND

FORMULA: MIXTURE

2. COMPOSITION/INFORMATION ON INGREDIENTS

PRODUCT COMPOSITION/ CAS REG NO.	APPROX. WGT %	ACGIH TLV TWA	ACGIH TLV STEL	OSHA PEL TWA	OSHA PEL STEL	UNITS
A. HAZARDOUS						
TOLUENE 108-88-3	2PPM	100	150	100	150	PPM
BENZENE 71-43-2	33PPB	10	NE	1	5	PPM
B. NON-HAZARDOUS						
VINYLPOLYDIMETHYLSILOXANE 68083-19-2	30-60	NA	NE	NA	NE	NA
TRADE SECRET COMPONENT	10-30	NE	NE	NE	NE	NA
CALCIUM CARBONATE 471-34-1	1-5	10	NE	15	NE	MG/M
QUARTZ 14808-60-7	30-60	.1	NE	.1	NE	MG/M

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
Beige Liquid
Odorless
Refer to other MSDS sections for detailed information.

POTENTIAL HEALTH EFFECTS:
INGESTION:
None known
SKIN CONTACT:
May cause mild skin irritation.
INHALATION:
None known.
EYE CONTACT:
May cause mild eye irritation.
MEDICAL CONDITIONS AGGRAVATED:
None known.
SUBCHRONIC (TARGET ORGAN) EFFECTS:
None known.
CHRONIC EFFECTS/CARCINOGENICITY:
This product or one of its ingredients present 0.1% or more is not listed as a carcinogen or suspected carcinogen by NTP, IARC, OR OSHA
PRODUCTS/INGREDIENTS
This space reserved for special use
PRINCIPLE ROUTES OF EXPOSURE:
None known.

Rinse mouth ...

KIN:
Wash with soap and water.

NHALATION:

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None known.

EYES
In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

NOTE TO PHYSICIAN:
None known.

5. FIRE FIGHTING MEASURES

FLASH POINT: >400 (F) >204 (C) BY PMCC IGNITION TEMP NA (F) NA (C)
FLAMMABLE LIMITS IN AIR(%): LOWER NA UPPER NA
SENSITIVITY TO MECHANICAL IMPACT (Y/N): NO
SENSITIVITY TO STATIC DISCHARGE:
Sensitivity to static discharge is not expected.
EXTINGUISHING MEDIA:
All standard firefighting media
SPECIAL FIREFIGHTING PROCEDURES:
None known.

6. ACCIDENTAL RELEASE MEASURES

ACTION TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:
Wipe, scrape or soak up in an inert material and put in a container for disposal.
Wash walking surfaces with detergent and water to reduce slipping hazard.

7. HANDLING AND STORAGE

ECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:
None known.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:
None known.
RESPIRATORY PROTECTION:
None known.
PROTECTIVE GLOVES
Cloth gloves.
EYE AND FACE PROTECTION
Safety glasses.
OTHER PROTECTIVE EQUIPMENT:
None known.
VENTILATION:
None known.

9. PHYSICAL AND CHEMICAL PROPERTIES

**PRODUCT INFORMATION
BOILING POINT : >500 (F) >300 (C) % VOLATILE BY VOLUME: <1.0
VAPOR PRESSURE(20 C): NEG. EVAPORATION RATE : NEG.
VAPOR DENSITY(AIR=1): NONE (BUTYL ACETATE=1)
FREEZING POINT : NA (F) NA (C) SPECIFIC GRAVITY : 1.25
MELTING POINT : NA (F) NA (C) (WATER=1)
PHYSICAL STATE : LIQUID DENSITY : UNKNWN KG/M3
ODOR : ODORLESS ACID/ALKALINITY : UNKNOWN MEQ/
COLOR : BEIGE PH : NA
ODOR THRESHOLD : UNK (PPM) VOC (EPA METH. 24) : 7
SOLUBILITY IN WATER(20C): INSOLUBLE
SOLUBILITY IN ORGANIC SOLVENT: SOLUBLE, TOLUENE
(STATE SOLVENT)

10. STABILITY AND REACTIVITY

STABILITY:
X STABLE UNSTABLE HAZARDOUS POLYMERIZATION WILL NOT OCCUR
HAZARDOUS DECOMPOSITION/COMBUSTION PRODUCTS:
Carbon dioxide.
Silicon dioxide.
Chlorine.
INCOMPATIBILITY (MATERIALS TO AVOID):
None known.

TOXICITY:

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ACUTE ORAL LD50:	UNKNOWN	MG/KG
ACUTE DERMAL LD50:	UNKNOWN	MG/KG
ACUTE INHALATION LC50:	UNKNOWN	
OTHER: None.		
AMES TEST:	UNKNOWN	

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION:
No data at this time
CHEMICAL FATE INFORMATION:
No data at this time

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD:
Disposal should be made in accordance with federal, state and local regulations.
EPA HAZARD WASTE: NONE

14. TRANSPORT INFORMATION

DOT SHIPPING NAME: NONE
DOT HAZARD CLASS: NONE
DOT LABEL(S): NONE
UN/NA NUMBER: NONE
PLACARDS:
NONE
IA:
IMO: NONE
EUROPEAN CLASS:
RID (OCTI): NONE
ADR (ECE): NONE
RAR (IATA): NONE

15. REGULATORY INFORMATION

SARA SECTION 302:
NONE FOUND
SARA (311,312) HAZARD CLASS:
NONE
SARA (313) CHEMICALS
NONE
CPAC CLASSIFICATION: NONE
WHMIS HAZARD CLASS:
NON-CONTROLLED
WHMIS TRADE SECRET:
None
EXPORT:
SCHDLE B/HTSUS:
3910.00.00003
ECCN:
1C96G

HAZARD RATING SYSTEMS					
HMIS	FLAMMABILITY	0 ;	REACTIVITY	0 ;	HEALTH
NFPA	FLAMMABILITY	0 ;	REACTIVITY	0 ;	HEALTH

CALIFORNIA PROPOSITION 65:
THIS PRODUCT CONTAINS CALIFORNIA PROPOSITION 65 CHEMICALS WHICH ARE LISTED BELOW:
BENZENE (71-43-2)
TOLUENE 108-88-3

16. OTHER INFORMATION

These data are offered in good faith as typical values and not as a product specification. No warranty, either expressed or implied, is made. The recommended handling procedures are believed to be generally applicable. However, each user should review these recommendations in the specific context of the [illegible]

C = ceiling limit
EST= estimated
NA = not applicable
NE = none established REC = recommended
NF = none found
UNKN = unknown

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ND = none determined V = recomm. By vendor
By-product = reaction by- SKN = skin
product, TSCA inventory TS = trade secret
status not required under R = recommended
40 CFR part 720.30(h-2) MST = mist
STEL = short term exposure
limit

California Proposition 65...
Warning! This product contains a chemical known to the State of California to cause cancer.

California Proposition 65...
Warning! This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

MATERIAL SAFETY DATA SHEET
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RTV630B

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURED BY:

GE SILICONES
260 HUDSON RIVER ROAD
WATERFORD, NY 12188

EMERGENCY PHONE (24 HRS)

(518) 237-3330 (24 HRS)

SUPPLIED BY:

GE SILICONES
260 HUDSON RIVER ROAD
WATERFORD, NY 12188

EMERGENCY PHONE (24 HRS)

(518) 237-3330 (24 HRS)
REVISED: 01/20/92
PREPARER: DA POLSINELLI

PRODUCT IDENTIFICATION: RTV630B
CHEMICAL FAMILY: FORMULA: MIXTURE
SILICONE POLYMER SOLUTION
CHEMICAL NAME SILICONE RUBBER COMPOUND

2. COMPOSITION/INFORMATION ON INGREDIENTS

PRODUCT COMPOSITION/ CAS REG NO.	APPROX. WGT. %	ACGIH TWA	TLV STEL	OSHA TWA	PEL STEL	UNITS
A. HAZARDOUS	.449	100	150	100	150	100
108-88-3 BENZENE	4PPM	10	NE	1	5	PPM
71-43-2 B. NON-HAZARDOUS						
POLYDIMETHYLHYDROGEN SILOXANE	30-60	NA	NE	NA	NE	NA
68988-57-8 VINYLPOLYDIMETHYLSILOXANE	30-60	NA	NE	NA	NE	NA
68083-19-2 TRADE SECRET COMPONENT	10-30	NE	NE	NE	NE	NA

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:
Blue Liquid
Mild Odor
Product generates flammable gas on contact with acids, bases or oxidizing materials.
Refer to other MSDS sections for detailed information.

POTENTIAL HEALTH EFFECTS:
INGESTION:
None known

May cause mild eye irritation.
MEDICAL CONDITIONS AGGRAVATED:
None known.
SUBCHRONIC (TARGET ORGAN) EFFECTS:

Provided By Electrical Insulation Suppliers Inc.

None known.
CHRONIC EFFECTS/CARCINOGENICITY:
This product or one of its ingredients present 0.1% or more is not listed as a carcinogen or suspected carcinogen by NTP, IARC, OR OSHA
PRODUCTS/INGREDIENTS
This space reserved for special use.
PRINCIPLE ROUTES OF EXPOSURE:
Dermal - skin.
Eyes.
OTHER:
None known.

4. FIRST AID MEASURES

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.
SKIN:
Wash with soap and water.
Get medical attention if irritation persists.
INHALATION:
None known.
EYES:
In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.
NOTE TO PHYSICIAN:
None known.

5. FIRE FIGHTING MEASURES

FLASH POINT: >200 (F) >93.3 (C) BY PMCC. IGNITION TEMP: UNK (F) UNK (C)
FLAMMABLE LIMITS IN AIR(%): LOWER NA UPPER NA
SENSITIVITY TO MECHANICAL IMPACT (Y/N): NO
SENSITIVITY TO STATIC DISCHARGE:
Sensitivity to static discharge is not expected.
EXTINGUISHING MEDIA:
All standard firefighting media
SPECIAL FIREFIGHTING PROCEDURES:
None known.

6. ACCIDENTAL RELEASE MEASURES

ACTION TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:
Wear proper protective equipment as specified in the protective equipment section.
Wipe, scrape, or soak up in an inert material and put in a container intended for flammable materials for disposal.

7. HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:
Store upright in a cool place below 30'c (85'f).
Use only in a well ventilated area.
Do not reuse this container.
Relieve any internal pressure when received and at least weekly thereafter by slowly loosening bung. Retighten bung immediatly.
Caution!
Avoid contact with eyes.
Good hygienic practices should be observed. Work clothes should be washed seperately at the end of each work day. Disposable clothing should be discarded with material.
Keep container closed when not in use to prevent contact with acidic, basic or oxidizing materials, and metallic catalysts like tin soaps and noble metals(pt, rh, etc.).

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:

Jerry Glasser

Provided By Electrical Insulation Suppliers Inc.

ENTILATION:
Use only in well ventilated area.

9. PHYSICAL AND CHEMICAL PROPERTIES

*PRODUCT INFORMATION

OILING POINT	NA (F) NA (C)	% VOLATILE BY VOLUME	<3
APOR PRESSURE(20 C)	NA MM HG	EVAPORATION RATE (BUTYL ACETATE=1)	<1
APOR DENSITY(AIR=1)	NA		
REEZING POINT	UNK (F) UNK (C)	SPECIFIC GRAVITY	1.02
ELTING POINT	NA (F) NA (C) (WATER=1)		
HYSICAL STATE	LIQUID	DENSITY	1020 KG/M3
DOR	SLIGHT	ACID/ALKALINITY	0-10PPM MEG/G
OLOR	BLUE	PH	NA
DOR THRESHOLD	UNK (PPM)	VOC (EPA METH.24)	NT G/L

OLUBILITY IN WATER(20C): INSOLUBLE
OLUBILITY IN ORGANIC SOLVENT: PARTIAL IN TOLUENE
STATE SOLVENT)

10. STABILITY AND REACTIVITY

TABILITY:
X STABLE UNSTABLE

HAZARDOUS:
POLYMERIZATION WILL NOT OCCUR

AZARDOUS DECOMPOSITION/COMBUSTION PRODUCTS:
Carbon monoxide.
Carbon dioxide.
Silicon dioxide.
Flammable hydrogen gas.

NCOMPATIBILITY (MATERIALS TO AVOID):
Avoid contact with acidic, basic, or oxidizing agents, and metallic catalysts like tin soaps and noble metals (pt, rh, etc.)

ONDITIONS TO AVOID:
Product generates flamable gas on contact with acids, bases or oxidizing materials.

11. TOXICOLOGICAL INFORMATION

TOXICITY:

		**PRODUCT INFORMATION	
ACUTE ORAL LD50:	NA		MG/KG
ACUTE DERMAL LD50:	NA		MG/KG
ACUTE INHALATION LC50:	NA		

THER: None.

AMES TEST: UNKNOWN

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION:
No data at this time

CHEMICAL FATE INFORMATION:
No data at this time

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD:
Disposal should be made in accordance with federal, state and local regulations.
Incineration recommended in approved incinerator according to federal, state, and local regulations.

EPA HAZARD WASTE: NA

14. TRANSPORT INFORMATION

DOT SHIPPING NAME: NONE
DOT HAZARD CLASS: NONE
DO ABEL(S): NONE
UN NUMBER: NONE
PL ARDS:
NONE
IATA
NA
IMO: NONE

MATERIAL SAFETY DATA SHEET

Hazard Identity

Health	Flammability
1	0
0 Contact	0 Reactivity

Date	Rev	MDS Number	Complied By	Approved By
01/23/97		CRA	J. Wilcox	Co. Safety Director

Product Identification

COLLECTOR RING ASSEMBLY

SECTION I

Manufacturer's Name: The Electric Materials Co.
Street Address: 50 South Washington Street
City, State, & Zip: North East, PA 16428

Emergency Phone#: 814-725-9621
Infor. Phone#: 814-725-9621

SECTION II - HAZARDOUS INGREDIENTS

Ingredient Chem Name	Common Name	CAS#	Percent Weight	PEL Occupational Exposure Limits	ACGIH
quartz	mica	12001-26-2	1%	3 mg/m3	NA
NA	alloy steel	NA	NA	5 mg/m3	5 mg/m3
NA	fiberglass resin banding tape	NA	NA	10 mg/m3	10 mg/m3

SECTION III - PHYSICAL DATA

Melting Range: NA
Vapor Density: NA
Heavier Than Air NA
Lighter, Than Air
Evaporation Rate: NA
Faster NA **Slower Than Ether**
Percent Volatile by Volume: NA
Soluble in Water: ____ **Yes** X **No**
Specific Gravity: NA

SECTION IV - FIRE & EXPLOSION HAZARD DATA

Flammability Classification OSHA: NA **DOT:** NA

Flash Point: NA F NA C **LEL:** NA **UN:** NA

Extinguishing Media X **Foam** ____ **Alcohol Foam** X **CO2** ____ **Dry Chemical** X **Water Fog** ____ **Other**

Unusual Fire & Explosion Hazards: None

Decomposition of Products: Acrid irritating smoke, acetic acid, allyic compounds, formaldehyde, and acrolein.

Special Fire Fighting Procedures: Self contained breathing apparatus recommended.

NA (Not Applicable)

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SECTION V - HEALTH HAZARD DATA

Effects of Overexposure:

Acute (Short Term): Mica dust is considered a nuisance particulate and may cause irritation of the skin or upper respiratory tract. Epoxy fumes are primary irritants to the skin and eyes. Exposure to epoxy dust may cause dermatitis.

Chronic (Long Term): mica dust may cause **pneumoconiosis.**

Medical Conditions Prone to Aggravation by Exposure: Allergies and respiratory conditions.

Primary Routes of Entry: _X__ **Dermal** _X__ **Inhalation** __X_ **Ingestion**

Emergency and First Aid Procedures: Eyes-flush with water;Skin-wash with soap and water;Respiratory-supply plenty of fresh air, obtain medical assistance.

SECTION VI - REACTIVITY DATA

Stability: ___ **Unstable** X__ **Stable**

Hazardous Polymerization: ___ **May Occur** X__ **Will Not Occur**

Conditions to Avoid: Moisture destroys desired properties of the product. Also contact with strong acids or oxidizing agents.

Incompatibility (Materials to Avoid): Strong acids or oxidizing agents.

SECTION VII-SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled: Sweep material up in a manner which creates the least amount of dust and store in a closed container.

Waste Disposal Method: Check with Federal,State, and Local regulations. Metals should be recycled.

SECTION VIII- SAFE HANDLING & USE PROCEDURES

Respiratory Protection: Use an OSHA approved respirator for dusty conditions.

Ventilation: Local ventailtion is recommended.

Protective Gloves: NA

Eye Protection: Safety glasses of goggles.

Other Protective Equipment: NA

Hygienic Practices: Use good personal hygiene, wash with soap and water after handling mica products.

SECTION IX - SPECIAL PRECAUTIONS

Precautions to be taken in handling & storing: Moisture damages product.

Other Precautions: Materials are not listed as human carcinogens.

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MATERIAL SAFETY DATA SHEET

Hazard Identity

Health	Flammability
1	0
0 Contact	0 Reactivity

Date	Rev	MDS Number	Complied By	Approved By
03/15/93		COMMSBC	J. Wilcox	Co. Safety Director

Product Identification

MMUTATOR (silver bearing copper)

SECTION I

Manufacturer's Name: The Electric Materials Co.
Street Address: 50 South Washington Street
City, State, & Zip: North East, PA 16428

Emergency Phone#: 814-725-9621
Infor. Phone#: 814-725-9621

SECTION II - HAZARDOUS INGREDIENTS

Ingredient: Chem Name	Common Name	CAS#	Percent Weight	PEL Occupational Exposure Limits	ACGIH
* Cu	Copper	7440-50-8	NA	1 mg/m3 0.1 mg/m3	1 mg/m3
Fe	Iron	1309-37-1	NA	5 mg/m3	5 mg/m3
Na	Mica	12001-26-2	NA	3 mg/m3	3 mg/m3
* Ag	Silver	7440-22-4	NA	0.1 mg/m3	0.1 mg/m3

***SARA Title III Section 313 chemicals.**

SECTION III - PHYSICAL DATA

Melting Range: _NA_ **Vapor Density:** _NA_
Heavier Than Air _NA_ **Lighter, Than Air**
Evaporation Rate: _NA_ **Faster** _NA_ **Slower Than Ether**
Percent Volatile by Volume: _NA_
Soluble in Water: ____ **Yes** _X_ **No** **Specific Gravity:** _NA_

SECTION IV - FIRE & EXPLOSION HAZARD DATA

Flammability Classification OSHA: _NA_ **DOT:** NA

Flash Point: _NA_ **F** _NA_ **C** **LEL:** _NA_ **UN:** _NA_

Extinguishing Media _X_ **Foam** ____ **Alcohol Foam** _X_ **CO2** _X_ **Dry Chemical** ____ **Water Fog** ____ **Other**

Unusual Fire & Explosion Hazards: None

Decomposition of Products: Epoxy and varnish materials may give off CO2, CO, phosgene gas, and a thick acrid irritating smoke.

Special Fire Fighting Procedures: None, but life support equipment is recommended.

NA (Not Applicable)

SECTION V - HEALTH HAZARD DATA

Effects of Overexposure:

Acute (Short Term): Metallic taste in the mouth,nausea,headache, and possible sever abdominal pain.Metal dust may irritate eyes,skin,and upper respiratory tract.

Chronic (Long Term): **Metal fume fever and siderosis.**

Medical Conditions Prone to Aggravation by Exposure: Allergies and respiratory conditions.

Primary Routes of Entry: ____ **Dermal** _X__ **Inhalation** __X_ **Ingestion**

Emergency and First Aid Procedures: Inhalation-get victim to plenty of fresh air. Skin-wash with soap and water. If sysptoms persist,obtain medical attention.

SECTION VI - REACTIVITY DATA

Stability: ___ **Unstable** X__ **Stable**

Hazardous Polymerization: ___ **May Occur** X__ **Will Not Occur**

Conditions to Avoid: NA

Incompatibility (Materials to Avoid): Copper is not compatible with acetylene. Metals are not compatible with strong oxidizers.

SECTION VII-SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled: In most cases materials can be picked up of swept up and placed in a secure container.

Waste Disposal Method: Metals can be recycled. Check with federal,state, and local regulations for other wastes.

SECTION VIII- SAFE HANDLING & USE PROCEDURES

Respiratory Protection: Use OSHA approved respirator for metal dust or fume.

Ventilation: Local exhaust is recommended for metal dusts.

Protective Gloves: Leather of cotton.

Eye Protection: Safety glasses of goggles.

Other Protective Equipment: Depends on operation.

Hygienic Practices: Normal personal hygiene practices--wash with soap and water after handling commutators.

SECTION IX - SPECIAL PRECAUTIONS

Precautions to be taken in handling & storing: NA

Other Precautions: Materials are not listed as carcinogenic.

MATERIAL SAFETY DATA SHEET

Hazard Identity

Health	Flammability
1	0
1 Contact	0 Reactivity

Date	Rev	MDS Number	Complied By	Approved By
'/14/93		701	J. Wilcox	Co. Safety Director

Product Identification

100 (COPPER NICKEL) ALLOY

SECTION I

Manufacturer's Name: The Electric Materials Co.
Street Address: 50 South Washington Street
City, State, & Zip: North East, PA 16428

Emergency Phone#: 814-725-9621
Infor. Phone#: 814-725-9621

SECTION II - HAZARDOUS INGREDIENTS

Ingredient Chem Name	Ingredient Common Name	CAS#	Percent Weight	PEL Occupational Exposure Limits	ACGIH
*Cu	Copper	7440-50-8	96%	1 mg/m3 (dust) 0.2 mg/m3 (fume)	1 mg/m3 0.2 mg/m3
*Ni	Nickel	7440-02-0	3.6%	1 mg/m3	1 mg/m3
*Mn	Manganese	7439-96-5	0.25%	5 mg/m3 (dust) 1 mg/m3 (fume)	5 mg/m3

***SARA Title III Section 313 chemicals.**

SECTION III - PHYSICAL DATA

Melting Range: _2050 F_____ **Vapor Density:** _NA_____
Heavier Than Air__NA_____ **Lighter, Than Air**
Evaporation Rate:__NA_____ **Faster** _NA_ **Slower Than Ether**
Percent Volatile by Volume:_NA___
Soluble in Water:____ **Yes** __X_ **No** **Specific Gravity:** _8.9 _____

SECTION IV - FIRE & EXPLOSION HAZARD DATA

Flammability Classification OSHA:_NA_____ **DOT:** NA_____

Flash Point:_NA__ F _NA__ C **LEL:**_NA_____ **UN:**_NA_____

Extinguishing Media __X **Foam** __NA **Alcohol Foam** __X **CO2** _X **Dry Chemical** __NA **Water Fog** __NA **Other**

Unusual Fire & Explosion Hazards: Never mix water or moisture with molten metal, a steam explosion may result.

Decomposition of Products: Metal dust or oxides.

Special Fire Fighting Procedures: NA

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NA (Not Applicable)

SECTION V - HEALTH HAZARD DATA

Effects of Overexposure:

Acute (Short Term): metal dust may be irritating to the skin, eyes, and upper respiratory tract. molten fumes from the metal may cause metal fume fever,with flu like symptoms, metallic taste in the mouth and nausea.Nickel dust can cause an allergic dermatitis known as nickel itch.

Chronic (Long Term): **In the dust or metal fume state, it may cause irritation of upper respiratory tract. Manganese metal fume may result in manganese poisoning affecting the central nervous system and can be disabling.Chronic copper poisoning may result in wilson's disease,hapatic cirrhosis, brain damage, and renal disease.**

Medical Conditions Prone to Aggravation by Exposure: Allergies or respiratory conditions may by aggravated.

Primary Routes of Entry: __X_ **Dermal** __X_ **Inhalation** ___X **Ingestion**

Emergency and First Aid Procedures: SKIN-wash with soap and water,INHALATION-get patient to plenty of fresh air,in all cases have individual checked by a physician.

SECTION VI - REACTIVITY DATA

Stability: ___ **Unstable** X__ **Stable**

Hazardous Polymerization: ___ **May Occur** X__ **Will Not Occur**

Conditions to Avoid: Molten metal with moisture or water can result in an explosion.

Incompatibility (Materials to Avoid): The metal is not compatible with strong organic acids or bases.

SECTION VII-SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled: Pick up or sweep up and store in a secure container.

Waste Disposal Method: Metals should be recycled.

SECTION VIII- SAFE HANDLING & USE PROCEDURES

Respiratory Protection: Depending on the physical state of material, dust or fume, use an OSHA recommended respirator.

Ventilation: Local exhaust is recommended for very dusty conditions.

Protective Gloves: Leather or cotton

Eye Protection: Safery glasses or goggles

Other Protective Equipment: NA

Hygienic Practices: Use good personal hygiene when handling material.

SECTION IX - SPECIAL PRECAUTIONS

Precautions to be taken in handling & storing: NA

Other Precautions: Nickel has been determined to be a human carcinogen.

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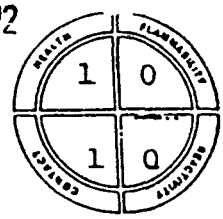
MATERIAL SAFETY DATA SHEET

Date	Rev	MSDS Number	Compiled by	Approved by
8/22/91		70100	John Wilcox	Company Safety Director



Hazard Identity

Product Identification

Nickel, Manganese, copper base alloy
(copper nickel alloy)

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SECTION I

Manufacturer's Name: The Electric Materials Co. Emergency Telephone No.: 814-725-9621

Street Address: 50 S. Washington Street Information Telephone No.: 814-725-9621

City, State and Zip Code: North East PA 16428

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENT Chemical Name	Common Name	CAS Number	Percent (Wt.)	PEL Occupational Exposure Limits	ACGIH	Vapor Pressure (mm Hg)
* Mn	Manganese	7439-96-5	0.25%	5 mg/m^3	5 mg/m^3	10 mm @ 1505° C.
* Ni	Nickel	7440-02-0	3.68%	1 mg/m^3	1 mg/m^3	-1 mm @ 1810° C.
* Cu	Copper	7440-50-8	96.07%	1 mg/m^3 (dust) 0.2 mg/m^3 (fume)	1 mg/m^3 (dust) 0.2 mg/m^3 (fume)	1 mm @ 1628° C.

* SARA Title III Section 313 chemical.

SECTION III - PHYSICAL DATA

Boiling Range: 4700° F Vapor Density: NA ___ Heavier than Air ___ Lighter than Air

Evaporation Rate: NA ___ Faster ___ Slower, than Ether Percent Volatile by Volume: NA

Soluble in Water: ___ Yes X No Weight per Gallon: NA

SECTION IV - FIRE AND EXPLOSTION HAZARD DATA

Flammability Classification: OSHA Non Flammable DOT Non Flammable

Flash Point: NA °F ___ °C LEL: NA UN NA

Extinguishing Media: NA ___ Foam ___ Alcohol Foam ___ CO_2 ___ Dry Chemical ___ Water Fog ___ Other

Unusual Fire and Explosion Hazards: No unusual hazards, reacts as most metals.

Decomposition Products: During grinding, machining, welding or melting operations metal dust, fumes and oxides are given off.

Special Fire Fighting Procedures: Life support equipment is recommended.

NA (Not Applicable)

SECTION V - HEALTH HAZARD DATA

Effects of Overexposure:

Acute (Short Term): Metal dusts or fumes may irritate skin, eyes and upper respiratory tract. Benign skin discoloration may be found in handling.

Chronic (Long Term): Manganese dust or fume may cause industrial manganese poisc a neurological disorder. May also damage liver and kidneys. Nickel dust an fumes have been reported to cause sinus and lung cancer. Copper may cause metal fume fever.

Medical Conditions Prone to Aggravation by Exposure: May be allergic. May aggravate respiratory conditions.

Primary Routes of Entry: X Dermal X Inhalation ___ Ingestion

Emergency and First Aid Procedures: Remove to fresh air. Wash skin thoroughly. If symptoms persist, obtain medical assistance.

SECTION VI - REACTIVITY DATA

Stability: ___ Unstable X Stable **Hazardous Polymerization:** ___ May Occur X Will Not Occur

Conditions to Avoid: NA

Incompatibility (Materials to Avoid): Not compatible with strong organic acids.

SECTION VII - SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled: Pick up or sweep up.

Waste Disposal Method: Recycle

SECTION VIII - SAFE HANDLING AND USE PROCEDURES

Respiratory Protection: Use OSHA approved respirator for metal dust or fume.

Ventilation: General ventilation.

Protective Gloves: Cotton gloves

Eye Protection: Wear safety glasses

Other Protective Equipment: NA

Hygienic Practices: Use good personal hygiene practices when handling material.

SECTION IX - SPECIAL PRECAUTIONS

Precautions to be Taken in Handling and Storing: Keep away from strong organic acids.

Other Precautions: NA

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Material Safety Data Sheet

May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY (As Used on Label and List) Mica

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

Section I

Manufacturer's Name: The Electric Materials Company	Emergency Telephone Number: 814/725-9621
Address (Number, Street, City, State, and ZIP Code): 50 South Washington Street North East PA 16428	Telephone Number for Information: 814/725-9621
	Date Prepared: 1/06/87
	Signature of Preparer (optional): John Wilcox, Company Safety Director

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
12001-26-2 mica <1% quartz		3 mg/m3		

Section III — Physical/Chemical Characteristics

Boiling Point	NA	Specific Gravity (H_2O = 1)	NA
Vapor Pressure (mm Hg.)	0	Melting Point	NA
Vapor Density (AIR = 1)	NA	Evaporation Rate (Butyl Acetate = 1)	NA

Solubility in Water: Insoluble

Appearance and Odor: Light gray appearance

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used): NA	Flammable Limits: solid	LEL: NA	UEL: NA

Extinguishing Media: Water spray, dry chemicals, foam, or Co_2.

Special Fire Fighting Procedures: Treat as class B fire.

Unusual Fire and Explosion Hazards: none

NA (not applicable)

Section V — Reactivity Data

Stability			Conditions to Avoid
	Unstable		moisture destroys desired properties of the produc
	Stable	X	

Incompatibility (*Materials to Avoid*) Is organic in nature

Hazardous Decomposition or Byproducts NA

Hazardous Polymerization			Conditions to Avoid
	May Occur		NA
	Will Not Occur	X	

Section VI — Health Hazard Data

Route(s) of Entry: Inhalation? lungs Skin? eyes Ingestion?

Health Hazards (*Acute and Chronic*)
Mica dust is considered a nuisance paticulate. May cause irritation of the skin, eyes, or upper respiratory tract; Pneumoconiosis.

Carcinogenicity: NTP? NA IARC Monographs? NA OSHA Regulated? NA

Signs and Symptoms of Exposure
Irritation, cough.

Medical Conditions Generally Aggravated by Exposure May be allergic, may aggravate respiratory conditions.

Emergency and First Aid Procedures
Eyes - Flush with water; skin - wash with soap and water; respiratory - supply plenty of fresh air, obtain medical assista

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled
Sweep material up in manner which creates the least amount of dust and store in a closed container.

Waste Disposal Method
Check with Federal, State and Local regulations for availabilty of land fill burial.

Precautions to Be Taken in Handling and Storing
Mica is an inert material

Other Precautions
Moisture damages product.

Section VIII — Control Measures

Respiratory Protection (Specify Type)
Use OSHA approved respirator for nuisance dust conditions.

Ventilation		
	Local Exhaust: For excessive dusty operations	Special: NA
	Mechanical (General): For moderate dust conditions	Other: NA

Protective Gloves: not required
Eye Protection: safety glasses

Other Protective Clothing or Equipment
not required

Work/Hygienic Practices
Use good personal hygiene, wash with soap and water after handling mica products.

MATERIAL SAFETY DATA SHEET

Winding

Hazard Identity

Health	Flammability
1	0
1 Contact	**0 Reactivity**

Date	Rev	MDS Number	Complied By	Approved By
06/04/93		C230	J. Wilcox	Co. Safety Director

Product Identification

000 ALLOY (RED BRASS)

SECTION I

Manufacturer's Name: The Electric Materials Co.
Street Address: 50 South Washington Street
City, State, & Zip: North East, PA 16428

Emergency Phone#: 814-725-9621
Infor. Phone#: 814-725-9621

SECTION II - HAZARDOUS INGREDIENTS

Ingredient Chem Name	Ingredient Common Name	CAS#	Percent Weight	PEL Occupational Exposure Limits	ACGIH
*Cu	Copper	7440-50-8	85%	1 mg/m3 (dust) 0.2 mg/m3 (fume)	1 mg/m3 0.2 mg/m3
*Zn	Zinc	7440-66-6	15%	5 mg/m3	5 mg/m3

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***SARA Title III Section 313 chemicals.**

SECTION III - PHYSICAL DATA

Melting Range: _1910 F_____ **Vapor Density:** _NA_____
Heavier Than Air__NA_____ **Lighter, Than Air**
Evaporation Rate:__NA_____ **Faster** _NA_ **Slower Than Ether**
Percent Volatile by Volume:_NA___
Soluble in Water:____ **Yes** __X_ **No** **Specific Gravity:** _8.78_____

SECTION IV - FIRE & EXPLOSION HAZARD DATA

Flammability Classification OSHA:_NA_____ **DOT:** NA_____

Flash Point:_NA__ **F** _NA__ **C** **LEL:**_NA_____ **UN:**_NA_____

Extinguishing Media __NA **Foam** __NA **Alcohol Foam** __NA **CO2** _NA_ **Dry Chemical** __NA **Water Fog** __NA **Other**

Unusual Fire & Explosion Hazards: Never mix water or moisture with molten metal, a steam explosion may result.

Decomposition of Products: metal dust or oxides.

Special Fire Fighting Procedures: NA

NA (Not Applicable)

SECTION V - HEALTH HAZARD DATA

Effects of Overexposure:

Acute (Short Term): Metal dust may be irritating to the skin, eyes, and upper respiratory tract.

Chronic (Long Term): **In the dust or metal fume state, it may cause irritation of upper respiratory tract; metal fume fever may result from overexposure to metal fume, with flu-like symptoms stmach pain, headache, nausea, vomiting, metallic taste, chills, fever and muscle aches. Chronic poisoning may result in Wilson's Disease.**

Medical Conditions Prone to Aggravation by Exposure: Allergies or respiratory conditions may by aggravated.

Primary Routes of Entry: __X_ **Dermal** __X_ **Inhalation** ___X **Ingestion**

Emergency and First Aid Procedures: SKIN-wash with soap and water, INHALATION-get patient to plenty of fresh air, in all cases have individual checked by a physician.

SECTION VI - REACTIVITY DATA

Stability: ___ **Unstable** X__ **Stable**

Hazardous Polymerization: ___ **May Occur** X__ **Will Not Occur**

Conditions to Avoid: In the molten stage metal should not come in contact with water or moisture.

Incompatibility (Materials to Avoid): Metal is not compatible with strong organic a or oxidizers.

SECTION VII-SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled: Pick up or sweep up and store in a secure container.

Waste Disposal Method: Metal should be recycled.

SECTION VIII- SAFE HANDLING & USE PROCEDURES

Respiratory Protection: Depending on the physical state of material, dust or fume, use an OSHA recommended respirator.

Ventilation: Local exhaust is recommended for very dusty conditions.

Protective Gloves: Leather or cotton

Eye Protection: Safery glasses or goggles

Other Protective Equipment: NA

Hygienic Practices: Use good personal hygiene when handling metal.

SECTION IX - SPECIAL PRECAUTIONS

Precautions to be taken in handling & storing: NA

Other Precautions: NA

MATERIAL SAFETY DATA SHEET

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Date	Rev	MSDS Number	Compiled by	Approved by
5/1/89		903	J. Wilcox	Co. Safety Director

HEALTH 1 | FLAMMABILITY 0 | REACTIVITY 1 | SPECIAL 0

Hazard Identity

Product Identification

Tin Bronze - C90300

SECTION I

Manufacturer's Name: The Electric Materials Co. Emergency Telephone No.: 814 725-9621

Street Address: 50 South Washington St. Information Telephone No.: 814 725-9621

City, State and Zip Code: North East, PA 16428

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENT Chemical Name	Common Name	CAS Number	Percent (Wt.)	PEL Occupational Exposure Limits	ACGIH	Vapor Press (mm Hg)
* Cu	Copper	7440-50-8	88%	0.2 mg/m^3 (fume) 1 mg/m^3 (dust)	0.2 mg/m^3 (fume) 1 mg/m^3 (dust)	NA
* Sn	Tin	7440-31-5	8%	2 mg/m^3	2 mg/m^3	NA
* Zn	Zinc	7440-66-6	4%	5 mg/m^3	5 mg/m^3	NA

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* SARA Title III Section 313 chemicals.

SECTION III - PHYSICAL DATA

~~Melting~~ ~~Boiling~~ Range: 1570-1832°F Vapor Density: NA Heavier than Air NA Lighter than

Evaporation Rate: NA Faster NA Slower, than Ether Percent Volatile by Volume: NA

Soluble in Water: ___ Yes X No Weight per Gallon: NA

SECTION IV - FIRE AND EXPLOSTION HAZARD DATA

Flammability Classification: OSHA Non Flammable DOT Non Flammable

Flash Point: NA°F ____ °C LEL: NA UN NA

Extinguishing Media: X Foam ___ Alcohol Foam ___ CO_2 ___ Dry Chemical ___ Water Fog ___ Ot

Unusual Fire and Explosion Hazards:

No unusual hazards in the solid form, but if transformed to a fine dust under optimum conditions, metal dust can cause an explosion.

Decomposition Products:

Usually metal fumes and metal oxides are given off.

Special Fire Fighting Procedures:

If involved in a fire, use of a life support system is recommended.

NA (Not Applicable)

Effects of Overexposure:
Acute (Short Term): If converted to a metal dust or fume, may cause irritation to the skin, eyes, and upper respiratory tract.

Chronic (Long Term): Metal fumes can cause metal fume fever.

Medical Conditions Prone to Aggravation by Exposure: May be allergic, may aggravate respiratory conditions.

Primary Routes of Entry: ___ Dermal X Inhalation ___ Ingestion

Emergency and First Aid Procedures: Remove to fresh air. If symptoms persist, obtain medical assistance.

SECTION VI - REACTIVITY DATA

Stability: ___ Unstable X Stable **Hazardous Polymerization:** ___ May Occur X Will Not Occur

Conditions to Avoid:

Incompatibility (Materials to Avoid): Not compatible with strong mineral acids.

SECTION VII - SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled: Pick up or sweep up.

Waste Disposal Method: Recycle metal.

SECTION VIII - SAFE HANDLING AND USE PROCEDURES

Respiratory Protection: If converted to a metal dust or metal fume, use OSHA approved respirator.

Ventilation: Local ventilation is recommended for dusty applications.

Protective Gloves: Cotton Gloves.

Eye Protection: Safety Glasses.

Other Protective Equipment: NA

Hygienic Practices: Use good personal hygiene when handling material.

SECTION IX - SPECIAL PRECAUTIONS

Precautions to be Taken in Handling and Storing: Keep away from strong mineral acids.

Other Precautions: Material is not carcinogenic.

MATERIAL SAFETY DATA SHEET

Hazard Identity

Health	Flammability
1	0
0 Contact	0 Reactivity

Date	Rev	MDS Number	Complied By	Approved By
07/28/93		304	J. Wilcox	Co. Safety Director

Product Identification

4 TROLLEY METAL

SECTION I

Manufacturer's Name: The Electric Materials Co.
Street Address: 50 South Washington Street
City, State, & Zip: North East, PA 16428

Emergency Phone#: 814-725-9621
Infor. Phone#: 814-725-9621

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SECTION II - HAZARDOUS INGREDIENTS

Ingredient Chem Name	Ingredient Common Name	CAS#	Percent Weight	PEL Occupational Exposure Limits	ACGIH
*Cu	Copper	7440-50-8	91%	1 mg/m3 (dust) 0.2 mg/m3 (fume)	1 mg/m3 0.2 mg/m3
Sn	Tin	7440-31-5	5.5%	2 mg/m3	2 mg/m3
*Zn	Zinc	1314-13-2	3.5%	5 mg/m3	5 mg/m3

*SARA Title III Section 313 chemicals.

SECTION III - PHYSICAL DATA

Melting Range: 1570 F
Vapor Density: NA
Heavier Than Air NA
Lighter, Than Air
Evaporation Rate: NA
Faster NA Slower Than Ether
Percent Volatile by Volume: NA
Soluble in Water: ____ Yes X No
Specific Gravity: NA

SECTION IV - FIRE & EXPLOSION HAZARD DATA

Flammability Classification OSHA: NA DOT: NA

Flash Point: NA F NA C LEL: NA UN: NA

Extinguishing Media: X Foam; NA Alcohol Foam; X CO2; X Dry Chemical; NA Water Fog; NA Other

Unusual Fire & Explosion Hazards: Never mix water or moisture with molten metal, a steam explosion may result.

Decomposition of Products: Metal dust or oxides.

Special Fire Fighting Procedures: NA

NA (Not Applicable)

SECTION V - HEALTH HAZARD DATA

Effects of Overexposure:

Acute (Short Term): Metal dust may be irritating to the skin, eyes, and upper respiratory tract. Benign skin discoloration may be found in handling material.

Chronic (Long Term): **In the dust or metal fume state, it may cause irritation of upper respiratory tract; metal fume fever may result from overexposure to metal fume.**

Medical Conditions Prone to Aggravation by Exposure: Allergies or respiratory conditions may by aggravated.

Primary Routes of Entry: ___ **Dermal** __X_ **Inhalation** ___X **Ingestion**

Emergency and First Aid Procedures: SKIN-wash with soap and water, INHALATION-get patient to plenty of fresh air, in all cases have individual checked by a physician.

SECTION VI - REACTIVITY DATA

Stability: ___ **Unstable** X__ **Stable**

Hazardous Polymerization: ___ **May Occur** X__ **Will Not Occur**

Conditions to Avoid: NA

Incompatibility (Materials to Avoid): Metal is not compatible with strong acids, bases, or oxidizers.

SECTION VII-SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled: Pick up or sweep up and store in a secure container.

Waste Disposal Method: Metal should be recycled.

SECTION VIII- SAFE HANDLING & USE PROCEDURES

Respiratory Protection: Depending on the physical state of the metal, dust or fume, use an OSHA recommended respirator.

Ventilation: Local exhaust is recommended for very dusty conditions.

Protective Gloves: Leather or cotton

Eye Protection: Safery glasses or goggles

Other Protective Equipment: NA

Hygienic Practices: Use good personal hygiene when handling material.

SECTION IX - SPECIAL PRECAUTIONS

Precautions to be taken in handling & storing: NA

Other Precautions: Material is not listed as a carcinogen.

MATERIAL SAFETY DATA SHEET

Hazard Identity

Health	Flammability
1	0
0 Contact	0 Reactivity

Date	Rev	MDS Number	Complied By	Approved By
05/21/93		CRA	J. Wilcox	Co. Safety Director

Product Identification

LLECTOR RING ASSEMBLY

SECTION I

Manufacturer's Name: The Electric Materials Co.
Street Address: 50 South Washington Street
City, State, & Zip: North East, PA 16428

Emergency Phone#: 814-725-9621
Infor. Phone#: 814-725-9621

SECTION II - HAZARDOUS INGREDIENTS

Ingredient Chem Name	Ingredient Common Name	CAS#	Percent Weight	PEL Occupational Exposure Limits	ACGIH
quartz	mica	12001-26-2	1%	3 mg/m3	NA
NA	alloy steel	NA	NA	5 mg/m3	5 mg/m3
NA	fiberglass resin banding tape	NA	NA	10 mg/m3	10 mg/m3

SECTION III - PHYSICAL DATA

Melting Range: __NA_____ **Vapor Density:** _NA_____
Heavier Than Air__NA_____ **Lighter, Than Air**
Evaporation Rate:__NA_____ **Faster** _NA_ **Slower Than Ether**
Percent Volatile by Volume:_NA___
Soluble in Water:____ **Yes** __X_ **No** **Specific Gravity:** _NA_____

SECTION IV - FIRE & EXPLOSION HAZARD DATA

Flammability Classification OSHA:_NA_____ **DOT:** NA_____

Flash Point:_NA__ **F** _NA__ **C** **LEL:**_NA_____ **UN:**_NA_____

Extinguishing Media __X_ **Foam** ____ **Alcohol Foam** __X_ **CO2** ____ **Dry Chemical** __X_ **Water Fog** ____ **Other**

Unusual Fire & Explosion Hazards: None

Decomposition of Products: Acrid irritating smoke, acetic acid, allyic compounds, formaldehyde, and acrolein.

Special Fire Fighting Procedures: Self contained breathing apparatus recommended.

NA (Not Applicable)

SECTION V - HEALTH HAZARD DATA

Effects of Overexposure:

Acute (Short Term): Mica dust is considered a nuisance particulate and may cause irritation of the skin or upper respiratory tract. Epoxy fumes are primary irritants to the skin and eyes. Exposure to epoxy dust may cause dermatitis.

Chronic (Long Term): mica dust may cause pneumoconiosis.

Medical Conditions Prone to Aggravation by Exposure: Allergies and respiratory conditions.

Primary Routes of Entry: _X__ **Dermal** _X__ **Inhalation** __X_ **Ingestion**

Emergency and First Aid Procedures: Eyes-flush with water;Skin-wash with soap and water;Respiratory-supply plenty of fresh air, obtain medical assistance.

SECTION VI - REACTIVITY DATA

Stability: ___ **Unstable** X__ **Stable**

Hazardous Polymerization: ___ **May Occur** X__ **Will Not Occur**

Conditions to Avoid: Moisture destroys desired properties of the product. Also contact with strong acids or oxidizing agents.

Incompatibility (Materials to Avoid): Strong acids or oxidizing agents.

SECTION VII-SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled: Sweep material up in a manner which creates the least amount of dust and store in a closed container.

Waste Disposal Method: Check with Federal,State, and Local regulations. Metals should be recycled.

SECTION VIII- SAFE HANDLING & USE PROCEDURES

Respiratory Protection: Use an OSHA approved respirator for dusty conditions.

Ventilation: Local ventailtion is recommended.

Protective Gloves: NA

Eye Protection: Safety glasses of goggles.

Other Protective Equipment: NA

Hygienic Practices: Use good personal hygiene, wash with soap and water after handling mica products.

SECTION IX - SPECIAL PRECAUTIONS

Precautions to be taken in handling & storing: Moisture damages product.

Other Precautions: Materials are not listed as human carcinogens.

MATERIAL SAFETY DATA SHEET

THE EPOXYLITE CORPORATION
9400 TOLEDO WAY
P.O. BOX 19671
IRVINE, CA 92713-9671
TELEPHONE: 714-951-3231
FAX: 714-472-0980
CHEMTREC: 800-424-9300

HAZARD RATING:
HEALTH: 1
FIRE: 1
REACTIVITY: 0
0=LEAST, 1=SLIGHT
2=MODERATE, 3=HIGH
4=EXTREME
HAZARD CODE: J

I. IDENTIFICATION

PRODUCT NAME: EPOXYLITE #234 PART A
CHEMICAL NAME: DIGLYCIDYL ETHER OF BISPHENOL A
SYNONYMS: PROPRIETARY
CHEMICAL FAMILY: EPOXY

II. HAZARDOUS INGREDIENTS

MATERIAL	%	TLV	HAZARD DATA	
DIGLYCIDYL ETHER OF	5-10	N.E.	IPR-RAT	LD50:2400MG/KB
NEOPENTYL GLYCOL			ORL-RAT	LD50:>2500 MG/KG
(CAS # 1755-23-2)			DER-RBT	LD50:>2150MG/KG
DIGLYCIDYL ETHER OF	80-85	N.E.	IPR-RAT	LD50:2400 MG/KG
BISPHENOL A			ORL-RAT	LD50:>10,000MG/KG
(CAS # 25085-99-8)			DER-RBT	LD50:>6000MG/KG
BENZYL ALCOHOL	<5	N.E.	ORL-RAT	LD50:1.23 G/KG
			SKN-RBT	LD50: 2.0 G/KG
(CAS # 100-51-6)			INH RAT	LC50:1000 PPM/8H

III. PHYSICAL DATA

BOILING POINT, 760 MMHG: N.A.
VAPOR PRESSURE AT 20'C: N.A.
VAPOR DENSITY (AIR=1): >1
SOLUBILITY IN WATER: INSOLUBLE
SPECIFIC GRAVITY (H20=1): 1.14
PERCENT VOLATILE BY VOL: NIL
EVAPORATION RATE (BUTYL ACETATE=1): N.A.
APPEARANCE: WATER WHITE TO YELLOW AMBER LIQUID
ODOR: LOW ODOR

IV. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (TEST METHOD): 220 F PMCC
FLAMMABLE LIMITS IN AIR, BY VOLUME
LOWER: NOT DETERMINED
UPPER: NOT DETERMINED
EXTINGUISHING MEDIA: FOAM C02, DRY CHEMICAL OR WATER SPRAY

PRODUCT NAME: EPOXYLITE #234 PART A

SPECIAL FIRE FIGHTING PROCEDURES: WATER SHOULD BE USED TO KEEP FIRE-EXPOSED CONTAINERS COOL. IF A LEAK OR SPILL HAS NOT IGNITED, USE WATER SPRAY TO DISPERSE THE VAPORS AND TO PROTECT PERSONS ATTEMPTING TO STOP A LEAK. DO NOT ENTER CONFINED FIRE SPACE WITHOUT SELF-CONTAINED BREATHING APPARATUS TO PROTECT FROM FUMES.

UNUSUAL FIRE AND EXPLOSION HAZARDS: NO UNUSUAL HAZARDS.

V. HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE:

EYE: MAY CAUSE MINOR TRANSIENT IRRITATION. NO CORNEAL INJURY LIKELY.

SKIN: MAY CAUSE MINOR IRRITATION, MAY CAUSE SKIN SENSITIZATION. NOT LIKELY TO BE ABSORBED IN TOXIC AMOUNTS.

INGESTION: LOW IN TOXICITY.

INHALATION: RESPIRATORY TRACT IRRITATION NOT LIKELY.

EMERGENCY FIRST AID PROCEDURES:

EYE: FLUSH WITH RUNNING WATER FOR 15 MINUTES. CONSULT PHYSICIAN.

SKIN: WASH PROMPTLY WITH SOAP AND WATER.

INGESTION: SEEK MEDICAL ASSISTANCE IMMEDIATELY.

INHALATION: REMOVE PERSON TO FRESH AIR. SEEK MEDICAL ATTENTION IF NEEDED.

NOTE TO PHYSICIAN: PREEXISTING SKIN ALLERGIES MAY INCREASE THE CHANCE OF DEVELOPING INCREASED ALLERGY SYMPTOMS FROM EXPOSURE. ALLERGY (SKIN SENSITIZATION) MAY BE EVIDENCED BY RASHES, ESPECIALLY HIVES. PREEXISTING SKIN AND EYE DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT. TREAT AS ANY CONTACT DERMATITIS. INJURY TO EYES IS UNLIKELY. STAIN FOR EVIDENCE OF CORNEAL INJURY.

SYSTEMIC EFFECTS: HUMAN EFFECTS NOT ESTABLISHED. NO SPECIFIC ANTIDOTE. TREATMENT BASED ON THE SOUND JUDGMENT OF THE PHYSICIAN AND THE INDIVIDUAL REACTIONS OF THE PATIENT.

PRIMARY ROUTES OF ENTRY: DERMAL.

VI. REACTIVITY DATA

STABILITY: STABLE

CONDITIONS TO AVOID: EXCESS HEATING OVER LONG PERIODS OF TIME DEGRADES RESIN.

INCOMPATIBILITY (MATERIALS TO AVOID): STRONG OXIDIZING AGENTS, STRONG LEWIS OR MINERAL ACIDS AND CAUSTICS.

HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS: NONE UNDER NORMAL USE. CO, ALDEHYDES AND ACIDS MAY BE FORMED DURING COMBUSTION.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR ON ITS OWN.

VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: ABSORB WITH INERT MATERIAL (CLAY, SAND, ETC.) AND PLACE IN APPROPRIATE CONTAINERS WITH NON-SPARKING TOOLS.

WASTE DISPOSAL METHOD: DISPOSE OF MATERIAL ACCORDING TO ALL FEDERAL, STATE AND LOCAL LAWS.

THE EPOXYLITE CORPORATION
PRODUCT NAME: EPOXYLITE #234 PART A

VIII. SPECIAL PROTECTION INFORMATION

SPIRATORY PROTECTION: NONE NORMALLY NEEDED. USE A NIOSH RESPIRATOR WITH VAPOR/GAS FILTER FOR PERSONAL COMFORT.
VENTILATION: GOOD ROOM VENTILATION USUALLY ADEQUATE FOR MOST OPERATION.
SKIN PROTECTION: CLEAN, BODY-COVERING CLOTHING AND WEAR IMPERVIOUS TYPE GLOVES TO MINIMIZE CONTACT.
EYE PROTECTION&. SAFETY GLASSES/ CHEMICAL GOGGLES.

IX. SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: STORE IN A COOL, DRY PLACE. KEEP AWAY FROM OPEN FLAMES AND HIGH TEMPERATURES. PRACTICE GOOD CAUTION AND PERSONAL CLEANLINESS TO AVOID SKIN AND EYE CONTACT. AVOID BREATHING VAPORS OF HEATED MATERIAL.
OTHER DATA:
DOT SHIPPING NAME: NOT REGULATED
DOT LABEL: N.A. ERG:N.A.
UPS INFO: NOT REGULATED
IATA INFO: NOT RESTRICTED
IATA LABEL: N.A. ERG:N.A.
PACKAGING GROUP: N.A.
IATA PACKAGING: N.A.
IMO CLASS: N.A.
VESSAL STOWAGE: N.A.
IMO STATEMENT: N.A.
CONTENTS OF PRECAUTIONARY LABEL: CAUTION!
MAY CAUSE EYE AND SKIN IRRITATION, POTENTIAL SKIN SENSITIZER. PREVENT CONTACT WITH EYES AND SKIN. WASH THOROUGHLY AFTER HANDLING. REMOVE AND WASH CONTAMINATED CLOTHING BEFORE REUSE. CONTAMINATED LEATHER SHOES SHOULD BE DISCARDED. SEE MSDS FOR DETAILS.
FIRST AID:
EYE CONTACT: IN CASE OF CONTACT IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER OR MINERAL OIL FOR AT LEAST 15 MINUTES [GET MEDICAL ATTENTION].
SKIN CONTACT: WIPE OFF SKIN CONTAMINATION AND PROMPTLY WASH WITH SOAP AND WATER.
INGESTION: IF CONSCIOUS, GIVE WATER AND INDUCE VOMITING BY INSERTING FINGER DOWN THROAT, OBTAIN MEDICAL TREATMENT.
INHALATION: IMMEDIATELY MOVE TO FRESH AIR, KEEP VICTIM QUIET. ADMINISTER CPR AND/OR OXYGEN AS REQUIRED, OBTAIN MEDICAL ASSISTANCE.
SPILL: WIPE UP WITH ABSORBENT MATERIAL AND DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.
FIRE FIGHTING: USE CO2, FOAM OR DRY CHEMICAL. DO NOT ENTER A CONFINED AREA WITHOUT SBCA.
PRODUCT CONTAINS: SEE SECTION II FOR HAZARDOUS INGREDIENTS
-FOR INDUSTRIAL USE ONLY-

WARNING: THIS CONTAINER HAZARDOUS WHEN EMPTY. SINCE EMPTY CONTAINERS RETAIN PRODUCT RESIDUES (VAPOR, LIQUID OR SOLIDS) ALL LABELED HAZARDOUS PRECAUTIONS MUST BE OBSERVED. DO NOT REUSE "EMPTY CONTAINER" FOR FOOD, CLOTHING OR PRODUCTS FOR HUMAN OR ANIMAL CONSUMPTION OR SKIN CONTACT WITHOUT PROFESSIONAL CLEANING.

X. DISCLAIMER

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CONTACT THE EPOXYLITE CORPORATION'S TECHNICAL DEPARTMENT FOR ANY FURTHER INFORMATION OR RECOMMENDATIONS.
DATE: 08/14/89
REVISION DATE: 01/01/95

MATERIAL SAFETY DATA SHEET

THE EPOXYLITE CORPORATION
9400 TOLEDO WAY
P.O. BOX 19671
IRVINE, CA 92713-9671
TELEPHONE: 714-951-3231
FAX: 714-472-0980
CHEMTREC: 800-424-9300

HAZARD RATING:
HEALTH: 2
FIRE: 1
REACTIVITY: 0
0=LEAST, 1=SLIGHT
2=MODERATE, 3=HIGH
4=EXTREME
HAZARD CODE: A

I. IDENTIFICATION

PRODUCT NAME: EPOXYLITE #234 PART B
CHEMICAL NAME: N (HYDROXYETHYL) DIETHYLENETRIAMINE
SYNONYMS: PROPRIETARY
CHEMICAL FAMILY: ALKYLENEAMINES

II. HAZARDOUS INGREDIENTS

MATERIAL	%	TLV	HAZARD DATA
DIETHYLENE TRIAMINE	10-15	1ppm	ORL-RAT LD50:1080MG/KG
(CAS# 111-40-0)		4MG/M3	DER-RAT LD50:1090MG/KG

III. PHYSICAL DATA

BOILING POINT, 760 MMHG: 563'F (295'C)
VAPOR PRESSURE AT 20'C: <0.1 MMHG
VAPOR DENSITY (AIR=1): 6.6
SOLUBILITY IN WATER: MISCIBLE
SPECIFIC GRAVITY (H20=1): 1.03
PERCENT VOLATILE BY VOL: NIL
EVAPORATION RATE (BUTYL ACETATE=1): <0.01
APPEARANCE: LOW VISCOSITY WATER WHITE TO AMBER LIQUID
ODOR: MILDLY AMMONIACAL ODOR.

IV. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (TEST METHOD): 250 F PMCC
FLAMMABLE LIMITS IN AIR, BY VOLUME
LOWER: NOT DETERMINED
UPPER: NOT DETERMINED
EXTINGUISHING MEDIA: CARBON DIOXIDE OR DRY CHEMICAL FOR SMALL FIRES. POLYMER FOAM FOR LARGE FIRES.
SPECIAL FIRE FIGHTING PROCEDURES: WATER SPRAY WILL REDUCE INTENSITY OF FLAMES. A SOLID STREAM OF WATER DIRECTED INTO HOT, BURNING LIQUID COULD CAUSE FROTHING. USE SELF-CONTAINED BREATHING APPARATUS.
UNUSUAL FIRE AND EXPLOSION HAZARDS: OXIDES OF CARBON WILL BE EVOLVED BY FIRE.

V. HEALTH HAZARD DATA

FECTS OF OVEREXPOSURE:
EYE: MAY CAUSE MODERATE TO SEVERE EYE INJURY.
SKIN: BRIEF CONTACT (3-5 MIN.) MODERATE TO SEVERE BURN. THIS MATERIAL MAY CAUSE SIGNIFICANT SENSITIZATION OR ALLERGIC RESPONSE MAY BE ABSORBED IN MODERATELY TOXIC AMOUNTS.
INGESTION: MAY CAUSE BURNS OF MOUTH, ESOPHAGUS AND POSSIBLY STOMACH.
INHALATION: MAY CAUSE ALLERGIC ASTHMA. VAPORS IRRITATING EFFECTS OF OVEREXPOSURE: DISAGREEABLE ODOR. IRRITATION OF EYES, NOSE, THROAT AND LUNGS. MAY CAUSE SENSITIZATION BY LIQUID OR VAPOR.
EMERGENCY FIRST AID PROCEDURES:
EYE: IMMEDIATE AND CONTINUOUS IRRIGATION WITH FLOWING WATER FOR AT LEAST 30 MIN. IS IMPERATIVE. PROMPT MEDICAL CONSULTATION ESSENTIAL.
SKIN: SKIN BURN LIKELY. IMMEDIATE, CONTINUOUS AND THOROUGH WASHING IN FLOWING WATER FOR 30 MIN. IS INDICATED. REMOVE CLOTHING IMMEDIATELY. CALL PHYSICIAN AND/OR TRANSPORT TO MEDICAL FACILITY. DESTROY CONTAMINATED SHOES. WASH CLOTHING BEFORE REUSE.
INGESTION: CORROSIVE. DO NOT INDUCE VOMITING. GIVE LARGE AMOUNTS OF WATER OR MILK IF AVAILABLE AND TRANSPORT TO MEDICAL FACILITY.
INHALATION: REMOVE TO FRESH AIR IF EFFECTS OCCUR. CALL PHYSICIAN AND/OR TRANSPORT TO MEDICAL FACILITY.
NOTE TO PHYSICIAN:
PRE-EXISTING SKIN ALLERGIES MAY INCREASE THE CHANCE OF DEVELOPING INCREASED ALLERGY SYMPTOMS FROM EXPOSURE. ALLERGY (SKIN SENSITIZATION) MAY BE EVIDENCED BY RASHES, ESPECIALLY HIVES. PRE-EXISTING SKIN AND EYE DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT. TREAT AS ANY CONTACT DERMATITIS. INJURY TO EYES IS UNLIKELY. STAIN FOR EVIDENCE OF CORNEAL INJURY. STEMIC EFFECTS: HUMAN EFFECTS NOT ESTABLISHED. NO SPECIFIC ANTIDOTE. TREATMENT BASED ON THE SOUND JUDGMENT OF THE PHYSICIAN AND THE INDIVIDUAL REACTIONS OF THE PATIENT.
PRIMARY ROUTES OF ENTRY: DERMAL.

VI. REACTIVITY DATA

STABILITY: STABLE
CONDITIONS TO AVOID: EXTREME HEAT AND FIRES.
INCOMPATIBILITY (MATERIALS TO AVOID): STRONG MINERAL ACIDS AND STRONG OXIDIZING AGENTS SUCH AS NITRIC ACID, LIQUID OXYGEN AND OZONE.
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS: THERMAL DECOMPOSITION OR BURNING MAY PRODUCE NITROGEN OXIDES, CARBON MONOXIDE AND/OR CARBON DIOXIDE.
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR BY ITSELF.

VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: (USE APPROPRIATE SAFETY EQUIPMENT): LARGE SPILL - DIKE UP AND DILUTE WITH COPIOUS QUANTITIES OF WATER. PUMP INTO APPROPRIATE CONTAINERS. SMALL SPILL - DILUTE WITH WATER. ABSORB SPILL WITH SAND, EARTH OR VERMICULITE. COLLECT INTO CLOSED CONTAINER FOR DISPOSAL.

WASTE DISPOSAL METHOD: DISPOSE OF MATERIAL ACCORDING TO ALL FEDERAL, STATE AND LOCAL LAWS.

VIII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: APPROVED RESPIRATORY PROTECTION REQUIRED IN ABSENCE OF PROPER ENVIRONMENTAL CONTROL. FOR EMERGENCIES, A POSITIVE-PRESSURE BREATHING APPARATUS OR A FULL-FACE RESPIRATOR WITH AN APPROVED ORGANIC VAPOR CANISTER IS RECOMMENDED.
VENTILATION: GENERAL EXHAUST USUALLY ACCEPTABLE. LOCAL EXHAUST MAY BE PREFERRED.
SKIN PROTECTION: RUBBER GLOVES AND CLEAN BODY-COVERING CLOTHING.
EYE PROTECTION: CHEMICAL GOGGLES. FACE SHIELD RECOMMENDED WHERE LIQUID CONTACT POSSIBLE.

IX. SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: KEEP CONTAINERS CLOSED WHEN NOT IN USE. STORE IN A DRY PLACE AWAY FROM HEAT.
OTHER DATA:
DOT SHIPPING NAME: DIETHYLENETRIAMINE SOLUTION UN2079
DOT LABEL: CORROSIVE 183 ERG:29
UPS INFO: DIETHYLENETRIAMINE SOLUTION UN2079
IATA INFO: DIETHYLENETRIAMINE SOLUTION UN2079
IATA LABEL: CORROSIVE [8] ERG:29
PACKAGING GROUP: II
IATA PACKAGING: 808[P] 812[C]
IMO CLASS: 8
VESSAL STOWAGE: 1,2[P], 1,2[C]
IMO STATEMENT: STOW 'AWAY FROM' ACIDS, COPPER, COPPER ALLOYS
CONTENTS OF PRECAUTIONARY LABEL: DANGER!
CAUSES SEVERE EYE AND SKIN BURNS, MAY CAUSE ALLERGIC DERMATITIS.
PREVENT CONTACT WITH EYES AND SKIN. WASH THOROUGHLY AFTER HANDLING. REMOVE AND WASH CONTAMINATED CLOTHING BEFORE REUSE. CONTAMINATED LEATHER SHOES SHOULD BE DISCARDED. SEE MSDS FOR DETAILS. USE ONLY WITH ADEQUATE VENTILATION.
FIRST AID:
EYE CONTACT: IN CASE OF CONTACT IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES [OBTAIN MEDICAL ATTENTION].
SKIN CONTACT: WIPE OFF SKIN CONTAMINATION AND IMMEDIATELY WASH WITH SOAP AND WATER FOR AT LEAST 15 MINUTES. [OBTAIN MEDICAL ATTENTION].
INGESTION: DO NOT INDUCE VOMITING, ADMINISTER WATER OR MILK TO DILUTE, OBTAIN IMMEDIATE MEDICAL TREATMENT.
INHALATION: IMMEDIATELY MOVE TO FRESH AIR, KEEP VICTIM QUIET. ADMINISTER CPR AND/OR OXYGEN AS REQUIRED, OBTAIN MEDICAL ASSISTANCE.
SPILL: INSURE ADEQUATE VENTILATION. WIPE UP WITH ABSORBENT MATERIAL AND DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.
FIRE FIGHTING: USE CO2, FOAM OR DRY CHEMICAL. DO NOT ENTER A CONFINED AREA WITHOUT SCBA.
PRODUCT CONTAINS: SEE SECTION II FOR HAZARDOUS INGREDIENTS

PRODUCT NAME: EPOXYLITE #234 PART B

-FOR INDUSTRIAL USE ONLY-

RNING: THIS CONTAINER HAZARDOUS WHEN EMPTY. SINCE EMPTY CONTAINERS RETAIN PRODUCT RESIDUES (VAPOR, LIQUID OR SOLIDS) ALL LABELED HAZARDOUS PRECAUTIONS MUST BE OBSERVED. DO NOT REUSE "EMPTY CONTAINER" FOR FOOD, CLOTHING OR PRODUCTS FOR HUMAN OR ANIMAL CONSUMPTION OR SKIN CONTACT WITHOUT PROFESSIONAL CLEANING.

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DATE: 08/14/89

REVISION DATE: 01/01/95

33983/GENERAL ELECTRIC SERVICE /5X

ESSEX
MATERIAL SAFETY DATA SHEET

SECTION I IDENTITY OF MATERIAL

CT NAME OR NUMBER: ALUMINUM-BASED, FILM-INSULATED MAGNET WIRE

SY YMS:

FG AR*	SOLIDON		POLYBONDEX	T BOND M	UEWN
NYFORM	MR-200		POLYBONDEX	T BOND S	HPEW
NYLON+	GP-200		POLYBONDEX	T BOND Y	HPEWN
SODEREX /130	SOLIDEX	BOND M	POLYBONDEX	A	PIW
SODERON /130	SOLIDEX	BOND S	SODERBOND	N	PEW
SODEREX L	SOLIDEX	BOND Y	ALLEX		PEWN
SODEREX /155	BONDEX		EI/AI		AIW
SODERON /155	AMIDE IMIDE		ISOMID**		EIAIW
NYTHERM	POLYBONDEX	G BOND M	UTREX	THEIC ESTER IMIDE/AMIDE IMIDE	
THERMALEX	POLYBONDEX	G BOND S	PVF		HPE EI
SOLIDEX	POLYBONDEX	G BOND Y	UEW		

ALL COLORS AND BUILDS ARE COVERED UNDER THE BASE INSULATION MSDS.

CHEMICAL FAMILY: METAL

REGULATED IDENTIFICATION: DOT PROPER SHIPPING NAME - UNREGULATED
SHIPPING ID NUMBER - NONE REQUIRED
EPA HAZARDOUS WASTE ID NUMBER - NOT APPLICABLE

HAZARDOUS INGREDIENTS:	PEL (MG/M3)	% BY WT.	CAS NUMBER
BASE METAL: ALUMINUM	NUISANCE DUST RESPIRABLE TO 5 MG/M3 TOTAL 15 MG/M3	68 TO 99	7429-90-5
BASE METAL: COOPER	FUME 0.1 DUST 1.0	88 TO 99.5	7440-50-8

THESE PRODUCTS DO NOT CONTAIN MERCURY OR ASBESTOS.

SECTION II HAZARD SPECIFICATIONS

HAZARDS UNDER 29 CFR 1910.1200

CO STIBLE	NO	ORGANIC PEROXIDE	NO	CARCINOGEN	NO
FLAMMABLE	NO	CORROSIVE MATERIAL	NO	REPRODUCTIVE TOXIN	NO
PYROPHORIC MATERIAL	NO	COMPRESSED GAS	NO	BLOOD TOXIN	NO
EXPLOSIVE MATERIAL	NO	IRRITANT	NO	NERVOUS SYSTEM TOXIN	NO
UNSTABLE MATERIAL	NO	SKIN HAZARD	NO	LUNG TOXIN	NO
WATER REACTIVE MATERIAL	NO	EYE HAZARD	NO	LIVER TOXIN	NO
OXIDIZER	NO	SENSITIZER	NO	KIDNEY TOXIN	NO

DOT HAZARD CLASS: NOT APPLICABLE
EPA HAZARD WASTE CLASS: MAGNET WIRE AS MANUFACTURED IS NOT A HAZARDOUS WASTE.

* (FORMVAR IS A REGISTERED TRADEMARK OF MONSANTO CHEMICAL CO.)
\+ (NYLON IS A REGISTERED TRADEMARK OF E.I. DU PONT DE NEMOURS & COMPANY.)
** (ISOMID IS A REGISTERED TRADEMARK OF SCHENECTADY CHEMICALS, INC.)

SECTION III SAFE USAGE DATA

PROTECTIVE EQUIPMENT TYPES: EYES - EYE PROTECTION RECOMMENDED AGAINST PHYSICAL CONTACT.
RESPIRATORY - NONE REQUIRED UNDER NORMAL CIRCUMSTANCES.
GLOVES - PROTECTION AGAINST MECHANICAL ABRASION RECOMMENDED.

VENTILATION: GENERAL MECHANICAL - WHEN MAGNET WIRE IS GROUND, HOT-STAKED OR SOLDERED, SUFFICIENT EXHAUST SHOULD BE PROVIDED TO KEEP PEL BELOW THE APPROPRIATE VALUE.
LOCAL EXHAUST - RECOMMENDED FOR GRINDING, BURNING AND MOLTEN

PRECAUTIONS: HANDLING & STORAGE - NONE

SECTION IV EMERGENCY RESPONSE DATA

FIRE: EXTINGUISHING MEDIA - COMPATIBLE WITH ALL TYPES (A,B,C). AVOID WATER ON MOLTEN METAL.
SPECIAL PROCEDURES - MATCH THE TECHNIQUE TO THE TYPE OF FIRE.
UNUSUAL HAZARDS - CONTACT OF WATER WITH MOLTEN ALUMINUM CAN CAUSE EXPLOSION.

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EXPOSURE: FIRST AID MEASURES - AFTER CONTACT WITH ALUMINUM FUMES AND DUST.
EYE CONTACT - FLUSH WITH LARGE AMOUNTS OF WATER.
INHALATION - MOVE TO FRESH AIR.
IN ALL CASES OF INHALATION OR EYE CONTACT, SEEK MEDICAL ATTENTION.
W[illegible] DISPOSAL METHOD: RECYCLE CONDUCTOR, OR SUITABLE LANDFILL.

—— SECTION V PHYSICAL HAZARD AREA ——

FLAMMABILITY: LEL = NONE FLASH POINT - NOT APPLICABLE
UEL = NONE METHOD USED - NOT APPLICABLE

STABILITY: STABLE CONDITIONS TO AVOID: NONE

HAZARDOUS DECOMPOSITION PRODUCTS - H2O, CO, CO2, OXIDES OF NITROGEN AND COMPONENT INGREDIENTS MAY BE GIVEN OFF, DEPENDING ON THE TEMPERATURE AND OXYGEN CONCENTRATION. UNDER SOME SOLDERING, HOT-STAKING OR OTHER VERY HIGH TEMPERATURE CONDITIONS, TOLUENEDI-ISOCYANATE (TDI) OR OTHER ISOCYANATE FRACTIONS MAY BE GIVEN OFF. IN ITS FOURTH ANNUAL REPORT ON CARCINOGENS, THE NTP (NATIONAL TOXICOLOGY PROGRAM) HAS LISTED TDI AS A SUBSTANCE THAT MAY REASONABLY BE ANTICIPATED TO BE A CARCINOGEN. FOR URETHANES AND LOW TEMPERATURE (155 C) RATED SOLECOATS, THERMAL DECOMPOSITION WILL NOT START AT TEMPERATURES LOWER THAN 450 F (230 C). HIGHER THERMALLY-RATED INSULATIONS WILL NOT START DECOMPOSING UNTIL MUCH HIGHER TEMPERATURES ARE REACHED.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR CONDITIONS TO AVOID: NONE
INCOMPATABILITY: MATERIALS TO AVOID - CONCENTRATED ACIDS AND BASES.

—— SECTION VI HEALTH HAZARD AREA ——

EFFECTS OF EXPOSURE
ROUTE OF ENTRY - INHALATION OF FUMES AND DUST, EYE CONTACT.

EFFECTS - INHALATION EFFECTS OF ALUMINUM DUSTS AND FUMES ABOVE THE PEL ARE UNCERTAIN WITH POSSIBLE PNEUMOCONIOSIS DEVELOPED. PARTICLES OF ALUMINUM DEPOSITED IN THE EYE MAY CAUSE NECROSIS OF THE CORNEA. DECOMPOSITION FUMES COULD CAUSE IRRITAT-ION TO MUCOUS MEMBRANES, AS WELL AS THE RESPIRATORY TRACT.

EFFECTS - COOPER FUMES & DUST MAY CAUSE IRRITATION OF UPPER RESPIRATORY TRACT, METALLIC TASTE IN THE MOUTH, NAUSEA, METAL FUME FEVER, & IN SOME INSTANCES, DISCOLORATION OR THE SKIN [illegible]R. DECOMPOSITION FUMES COULD CAUSE IRRITATION TO MUCOUS MEMBRANES, AS WELL AS THE RESPIRA-[illegible] TRACT. TDI, AT CONCENTRATIONS ABOVE THE PEL, MAY IRRITATE THE EYES, NOSE, AND/OR CAUSE SE[illegible]TIZATION IN SOME INDIVIDUALS.

CARCINOGENIC STATUS - NOT ON NTP OR IARC OR OSHA CARCINOGEN LISTS.

EMERGENCY TREATMENT: EYES - FLUSH WITH LARGE AMOUNTS OF WATER.

SKIN - WASH AFFECTED AREA W/ SOAP & WATER.

INHALATION - MOVE TO FRESH AIR.

IN ALL CASES OF INHALATION OR EYE CONTACT, SEEK MEDICAL ATTENTION.

—— SECTION VII PHYSICAL AND CHEMICAL PROPERTIES ——

INITIAL BOILING POINT: 3733 F (2056 C) FOR ALUMINUM

INITIAL BOILING POINT: 4703 F (2596 C) FOR COPPER

VAPOR PRESSURE: NONE AT ROOM TEMPERATURE PH: NOT APPLICABLE

SOLUBILITY IN WATER: NONE WILL DISSOLVE IN: INSOLUBLE

VOLATILE COMPONENTS: NONE

EVAPORATION RATE: NOT MEASURABLE

APPEARANCE: AMBER OR COLORED IS MATERIAL: PASTE POWDER
LIQUID GAS
OTHER: NONE SOLID*

—— SECTION VIII MANUFACTURER OR SUPPLIER DATA ——

FIRM'S NAME & MAILING ADDRESS: ESSEX GROUP, INC.
INDUSTRIAL PRODUCT DIVISION
1510 WALL STREET
FORT WAYNE, IN 46802-4350
NAME: FRANCOIS A. LAVALLEE

33983/GENERAL ELECTRIC SERVICE /SX

TITLE: MANAGER, POLYMER DEVELOPMENT
DATE: 4-16-90
EMERGENCY TELEPHONE NUMBER: (219) 461-4287

TNFORMATION CONTAINED HEREIN IS BASED ON DATA WHICH ESSEX GROUP, INC.,
IDERS TO BE ACCURATE. HOWEVER, THE COMPANY MAKES NO WARRANTY AS TO
TH ACCURACY OF THE DATA. ANYONE INTENDING TO USE THE INFORMATION CONTAINED
HE .N, SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR THE RESULTS OF SAID
USE, INCLUDING LOSS OR DAMAGE RESULTING FROM THE HANDLING OF THE MATERIAL.

ESSEX GROUP, INC. 1990 0-265

ESSEX GROUP, INC. INDUSTRIAL PRODUCTS DIVISION 1510 WALL STREET FORT WAYNE,
IN 46802-4350 TEL. (219) 461-4000

PROVIDED BY ELECTRICAL INSULATION SUPPLIERS INC.

ESSEX

MATERIAL SAFETY DATA SHEET 243

---- SECTION I IDENTITY OF MATERIAL ----

PRODUCT NAME OR NUMBER: COPPER-BASED, FILM-INSULATED MAGNET WIRE

SYNONYMS:

FORMVAR*	SOLIDON®	POLYBONDEX® T BOND M	UEWN
NYFORM	MR-200®	POLYBONDEX® T BOND S	HPEW
NYLON+	GP-200	POLYBONDEX® T BOND Y	HPEWN
SODEREX®/130°	SOLIDEX® BOND M	POLYBONDEX® A	PIW
SODERON®/130°	SOLIDEX® BOND S	SODERBOND® N	PEW
SODEREX® L	SOLIDEX® BOND Y	ALLEX®	PEWN
SODEREX®/155°	BONDEX®	EI/AI	AIW
SODERON®/155°	AMIDE IMIDE	ISOMID**	EIAIW
NYTHERM®	POLYBONDEX® G BOND M	UTREX®	THEIC ESTER IMIDE/AMIDE IMIDE
THERMALEX®	POLYBONDEX® G BOND S	PVF	MPE EI
SOLIDEX®	POLYBONDEX® G BOND Y	UEW	

ALL COLORS AND BUILDS ARE COVERED UNDER THE BASE INSULATION MSDS.

FORMULA: Not Applicable **CAS NUMBER:** Not Applicable

CHEMICAL FAMILY: METAL

REGULATED IDENTIFICATION:

DOT PROPER SHIPPING NAME	-	Unregulated
SHIPPING ID NUMBER	-	None required
EPA HAZARDOUS WASTE ID NUMBER	-	Not applicable

HAZARDOUS INGREDIENTS:	**PEL (mg/m^3)**	**% by wt.**	**CAS NUMBER**
BASE METAL: Copper	fume 0.1 dust 1.0	88 to 99.5	7440-50-8

THESE PRODUCTS **DO NOT** CONTAIN MERCURY OR ASBESTOS.

---- SECTION II HAZARD SPECIFICATIONS ----

KNOWN HAZARDS UNDER 29 CFR 1910.1200

COMBUSTIBLE	No	ORGANIC PEROXIDE	No	CARCINOGEN	No
FLAMMABLE	No	CORROSIVE MATERIAL	No	REPRODUCTIVE TOXIN	No
PYROPHORIC MATERIAL	No	COMPRESSED GAS	No	BLOOD TOXIN	No
EXPLOSIVE MATERIAL	No	IRRITANT	No	NERVOUS SYSTEM TOXIN	No
UNSTABLE MATERIAL	No	SKIN HAZARD	No	LUNG TOXIN	No
WATER REACTIVE MATERIAL	No	EYE HAZARD	No	LIVER TOXIN	No
OXIDIZER	No	SENSITIZER	No	KIDNEY TOXIN	No

DOT HAZARD CLASS: Not Applicable

EPA HAZARD WASTE CLASS: Magnet wire as manufactured is not a hazardous waste.

* (FORMVAR is a registered trademark of Monsanto Chemical Co.)
\+ (NYLON is a registered trademark of E. I. du Pont de Nemours & Company.)
** (ISOMID is a registered trademark of Schenectady Chemicals, Inc.)

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Essex Group, Inc. · Industrial Products Division · 1510 Wall Street · Fort Wayne, IN 46802-4350 · Tel. (219) 461-4000

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ESSEX

MATERIAL SAFETY DATA SHEET (cont.)

---- SECTION III SAFE USAGE DATA ----

PROTECTIVE EQUIPMENT TYPES:	EYES	-	Eye protection recommended against physical contact.
	RESPIRATORY	-	None required under normal circumstances.
	GLOVES	-	Protection against mechanical abrasion recommended.
VENTILATION:	GENERAL MECHANICAL	-	When magnet wire is ground, hot-staked or soldered, sufficient exhaust should be provided to keep PEL below the appropriate value.
	LOCAL EXHAUST	-	Recommended for grinding, burning and molten conditions.
PRECAUTIONS:	HANDLING & STORAGE	-	None

---- SECTION IV EMERGENCY RESPONSE DATA ----

FIRE:	EXTINGUISHING MEDIA	-	Compatible with all types (A,B,C). Avoid water on molten metal.
	SPECIAL PROCEDURES	-	Match the technique to the type of fire.
	UNUSUAL HAZARDS	-	Contact of water with molten copper can cause explosion.
EXPOSURE:	FIRST AID MEASURES	-	After contact with copper fumes and dust:
	SKIN	-	Wash with soap and water.
	EYES	-	Flush with large amounts of water.
	INHALATION	-	Move to fresh air.

In all cases of inhalation or eye contact, seek medical attention.

WASTE DISPOSAL METHOD: Recycle conductor, or suitable landfill.

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ESSEX

MATERIAL SAFETY DATA SHEET (cont.)

---- SECTION V PHYSICAL HAZARD AREA ----

FLAMMABILITY: LEL = None UEL = None

FLASH POINT - Not Applicable
METHOD USED - Not Applicable

STABILITY: Stable

CONDITIONS TO AVOID: None

HAZARDOUS DECOMPOSITION PRODUCTS - H_2O, CO, CO_2, oxides of nitrogen and component ingredients may be given off, depending on the temperature and oxygen concentration. Under some soldering, hot-staking or other very high temperature conditions, Toluenedi-isocyanate (TDI) or other isocyanate fractions may be given off. In its fourth annual report on carcinogens, the NTP (National Toxicology Program) has listed TDI as a substance that may reasonably be anticipated to be a carcinogen. For urethanes and low temperature (155°C) rated solecoats, thermal decomposition will not start at temperatures lower than 450° F (230°C). Higher thermally-rated insulations will not start decomposing until much higher temperatures are reached.

HAZARDOUS POLYMERIZATION: Will not occur **CONDITIONS TO AVOID:** None

INCOMPATABILITY: MATERIALS TO AVOID - Concentrated acids and bases. Bare conductor should not contact acetylene gas or magnesium.

---- SECTION VI HEALTH HAZARD AREA ----

EFFECTS OF EXPOSURE

ROUTE OF ENTRY - Inhalation of fumes and dust.

EFFECTS - Copper fumes and dust may cause irritation of upper respiratory tract, metallic taste in the mouth, nausea, metal fume fever, and in some instances, discoloration of the skin and hair. Decomposition fumes could cause irritation to mucous membranes, as well as the respiratory tract. TDI, at concentrations above the PEL, may irritate the eyes, nose, and/or cause sensitization in some individuals.

CARCINOGENIC STATUS - Not on NTP or IARC or OSHA carcinogen lists.

EMERGENCY TREATMENT:

SKIN - Wash affected area with soap and water.

EYES - Flush with large amounts of water.

INHALATION - Move to fresh air.

In all cases of inhalation or eye contact, seek medical attention.

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Essex Group, Inc. · Industrial Products Division · 1510 Wall Street · Fort Wayne, IN 46802-4350 · Tel. (219) 461-4000

ESSEX

MATERIAL SAFETY DATA SHEET (cont.)

---- SECTION VII PHYSICAL AND CHEMICAL PROPERTIES ----

INITIAL BOILING POINT: 4703° F (2595° C) for copper

VAPOR PRESSURE: None at room temperature **pH:** Not Applicable

SOLUBILITY IN WATER: None **WILL DISSOLVE IN:** Insoluble

VOLATILE COMPONENTS: None

EVAPORATION RATE: Not measurable

APPEARANCE: Amber or colored **IS MATERIAL:** PASTE LIQUID SOLID* POWDER GAS

ODOR: None

---- SECTION VIII MANUFACTURER OR SUPPLIER DATA ----

FIRM'S NAME & MAILING ADDRESS: ESSEX GROUP, INC.
Industrial Products Division
1510 Wall Street
Fort Wayne, Indiana 46802-4350

NAME: Francois A. Lavallee

SIGNATURE: François André Lavallée

TITLE: Manager, Polymer Development

DATE: 4-16-90

EMERGENCY TELEPHONE NUMBER: (219) 461-4287

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EUTECTIC CORPORATION
MATERIAL SAFETY DATA SHEET

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CONFIDENTIAL

SECTION I

MANUFACTURER	Eutectic Corporation	EMERGENCY TELEPHONE NO.	212-358-4000
ADDRESS	40-40 172nd Street, Flushing, NY 11358		
TRADE NAME	DuroTec 19910		
PRODUCT	Composite powder for oxy-acetylene application		

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENTS	%	TLV (Units)	INGREDIENTS	%	TLV (Units)
Chromium	10-20	0.5mg/M^3			
Iron	1-5	5mg/M^3			
Silicon	1-5	10mg/M^3			
Boron	1-5	10mg/M^3			
Nickel	>50	1mg/M^3			
Aluminum	1-5	5mg/M^3			
Phenolic Resin	1-5	5ppm	(based on free phenol)		

*AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS - 1974

SECTION III - PHYSICAL DATA Not Applicable

BOILING POINT (°F)		SPECIFIC GRAVITY (H₂O = 1)	
VAPOR PRESSURE (mm Hg)		PERCENT VOLATILE BY VOLUME (%)	
VAPOR DENSITY (AIR = 1)		EVAPORATION RATE (= 1)	
SOLUBILITY IN WATER			
APPEARANCE AND ODOR			

SECTION IV - FIRE AND EXPLOSION HAZARD DATA Not Applic

FLASH POINT (Method used)	FLAMMABLE LIMITS	Lel	Uel
EXTINGUISHING MEDIA			
SPECIAL FIRE FIGHTING PROCEDURES			

SECTION V - HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE: FAINTNESS, POSSIBLE NAUSEA

EMERGENCY & FIRST AID PROCEDURES: REMOVE TO FRESH AIR, CALL PHYSICIAN

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	

INCOMPATABILITY (MATERIALS TO AVOID): NONE

HAZARDOUS DECOMPOSITION PRODUCTS: Oxides of iron and manganese.

See AWS Publication "FUMES AND GASES IN THE WELDING ENVIRONMENT"

HAZARDOUS POLYMERIZATION: NOT APPLICABLE

SECTION VII - SPILL OR LEAK PROCEDURES

NOT APPLICABLE

SECTION VIII - SPECIAL PROTECTION INFORMATION (SEE NOTE)

Respiratory Protection (Specify Type) weld fume respirator or airline respirator for confined space or where exposures are above TLV.

VENTILATION:	LOCAL EXHAUST: YES, IN CONFINED SPACES
	MECHANICAL (GENERAL): Yes, where exposures exceed TLV

EYE PROTECTION: COLORED ADSORPTIVE LENS NO. 9 to 12

PROTECTIVE GLOVES: WELDER'S PROTECTIVE GLOVES

OTHER PROTECTIVE EQUIPMENT: PROTECTIVE CLOTHING - LEATHER APRON

SECTION IX - SPECIAL PRECAUTIONS (SEE NOTE)

OTHER PRECAUTIONS: ARC & SPARKS COULD BE SOURCE OF IGNITION OF COMBUSTIBLE PRODUCTS.

NOTE: Reference is directed, without endorsement or recommendation, to the ANSI Standard Safety in Welding & Cutting Z49.1-1973 (AMERICAN WELDING SOCIETY PUBLICATION Z49.1 - 1973)

SIGNED: _____

DATE: 4-11-83

EUTECTIC CORPORATION

40-40 172nd Street, Flushing, New York 11358-9981

MATERIAL SAFETY DATA SHEET

Complies with OSHA Hazard Communication Standard 29CFR 1910.1200

GENERAL ELECTRIC CO
ATTN: SAFETY DEPT/MSDS FILES
APPARATUS SERVICE SHOP
1401 E VALENCIA ROAD
TUCSON AZ 85706

THERMAL SPRAY POWDE

SECTION 1 - IDENTIFICATION

PRODUCT NAME OR NUMBER	1120
PRODUCT TYPE	ERIXTEC 19850
EMERGENCY TELEPHONE NO	718-358-4000

SECTION 2 - HAZARDOUS INGREDIENTS

INGREDIENT	CAS NO.	EXPOSURE LIMIT (mg/m³) OSHA PEL	ACGIH TLV
COPPER	7440-50-8	0.1 (FUME)	0.2 (FUME)
[redacted]			

This section covers the materials from which this product is manufactured. The fumes and gases produced during normal use of this product are covered by Section V. The term "hazardous" in "Hazardous Materials" should be interpreted as a term required and defined in OSHA 29 CFR 1910.1200 and does not necessarily imply the existence of any hazard.

ELECTRODES, BRAZING RODS, & FLUXES

SECTION 3 – PHYSICAL/CHEMICAL CHARACTERISTICS

Not Applicable for arc welding electrodes and brazing rods.
For fluxes and chemical aids see Section 2 above.

SECTION 4 – FIRE AND EXPLOSION HAZARD DATA

mmable. Welding arc and sparks and brazing flames can ignite combustibles and flammables. to ANSI Z49.1 for fire prevention during the use of welding and allied procedures.

SECTION 5 – REACTIVITY DATA

Hazardous Decomposition Products

Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedures, and electrodes used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating or galvanizing), the number of welders and the volume of the work area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleansing and degreasing activities).

When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 2. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section 2, plus those from the base metal and coating, etc., as noted above.

Reasonably expected constituents of the fume would include: fluorides, complex oxides of iron, manganese, silicon, chromium, nickel, molybdenum, copper, and other metals listed in Section 2.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.

ecommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample inside the welder's helmet if worn or in the worker's breathing zone. (See ANSI/AWS F1.1 available from the "American Welding Society," P.O. Box 351040, Miami, FL 33135. Also from AWS is F1.3 "Evaluating Contaminants in the Welding Environment – A Sampling Strategy Guide," which gives additional advice on sampling).

SECTION 6 – HEALTH HAZARD DATA

Threshold Limit Value.

ACGIH recommended general limit for Welding Fume NOC (Not Otherwise Classified) is n3. ACGIH-1985 (or latest date) preface states, "TLV-TWA should be used as guides in the ol of health hazards and should not be used as fine lines between safe and dangerous concentrations."

Primary Route of Entry

Fumes and gases may be inhaled. Skin or eye contact may occur with fluxes and chemical aids.

THERMAL SPRAY POWDERS

SECTION 3 – PHYSICAL/CHEMICAL CHARACTERISTICS

Not Applicable

SECTION 4 – FIRE AND EXPLOSION HAZARD DATA

Nonflammable under normal working conditions. Metal powder dust may present a fire or explosion hazard under favorable conditions of particle size, dispersion and strong ignition source. Refer to AWS C2.1 "Recommended Safe Practices For Thermal Spraying" for more detail.

SECTION 5 – REACTIVITY DATA

Hazardous Decomposition Products

Fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the material being deposited. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: the number of workers and the volume of the work area, the quality and amount of ventilation, the position of the worker's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere and on the work such as chlorinated hydrocarbon vapors from cleaning and degreasing activities.

During thermal spraying, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 2. Decomposition products of normal operation include those originating from volatilization, reaction, or oxidation of the materials shown in Section 2, plus those from the base metal and coating, etc., as noted above.

Reasonably expected constituents of the fume would include complex oxides of the metals listed in Section 2.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation.

One recommended way to determine the composition and quantity of fumes, gases and dusts to which workers are exposed is to take an air sample inside the worker's helmet if worn or in the worker's breathing zone. (See ANSI/AWS F1.1 available from the "American Welding Society," P.O. Box 351040, Miami, FL 33135. Also, from AWS is F1.3 "Evaluating Contaminants in the Welding Environment – A Sampling Strategy Guide," which gives additional advice on sampling). At a minimum the listed ingredients should be analyzed.

SECTION 6 – HEALTH HAZARD DATA

Threshold Limit Value.

The ACGIH recommended general limit for Welding Fume NOC (Not Otherwise Classified) is 5 mg/m3. ACGIH-1985 (or latest date) preface states, "The TLV-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations."

Primary Route of Entry

This material may be inhaled, come in contact with the skin or eyes, or be swallowed.

EUTECTIC CORPORATION

40-40 172nd Street, Flushing, New York 11358-9981

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MSDS NO.: 0030	REV:
DATE: 05/01/86	
CUSTOMER CODE NO.:	

MATERIAL SAFETY DATA SHEET

Complies with OSHA Hazard Communication Standard 29CFR 1910.1200

MR. TOM HAWSE
GE APPARATUS SERVICES
TUCSON SERVICE CENTER
1401 VALENCIA ROAD
TUCSON, AZ 85706

SECTION 1 - IDENTIFICATION

PRODUCT NAME OR NUMBER	XUPER XHD 66
PRODUCT TYPE	GMAW Electrode
EMERGENCY TELEPHONE NO	718-358-4000

SECTION 2 - HAZARDOUS INGREDIENTS

INGREDIENT	CAS NO.	EXPOSURE LIMIT (mg/m³) OSHA PEL	ACGIH TLV
Iron	7439-89-6	5	**
Fluorspar	14542-23-5	2.5*	2.5*
Potassium Silicate	1312-76-1	**	**
Calcium Carbonate	1317-65-3	**	10
Ferro Silicon	8049-17-0	**	**

Comment: *As F **Not Listed

This section covers the materials from which this product is manufactured. The fumes and gases produced during normal use of this product are covered by Section V. The term "hazardous" in "Hazardous Materials" should be interpreted as a term required and defined in OSHA 29 CFR 1910.1200 and does not necessarily imply the existence of any hazard.

ELECTRODES, BRAZING RODS, & FLUXES

SECTION 3 - PHYSICAL/CHEMICAL CHARACTERISTICS

Not Applicable for arc welding electrodes and brazing rods.
For fluxes and chemical aids see Section 2 above.

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

mmable. Welding arc and sparks and brazing flames can ignite combustibles and flammables. Refer to ANSI Z49.1 for fire prevention during the use of welding and allied procedures.

SECTION 5 - REACTIVITY DATA

Hazardous Decomposition Products

ing fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedures, and electrodes used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating or galvanizing), the number of welders and the volume of the work area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleansing and degreasing activities).

When electrode is consumed, the fume and gas decomposition products generated are different in form from the ingredients listed in Section 2. Decomposition products of normal operation those originating from the volatilization, reaction, or oxidation of the materials shown in Section 2, plus those from the base metal and coating, etc., as noted above.

Reasonably expected constituents of the fume would include: fluorides, complex oxides of iron, manganese, silicon, chromium, nickel, molybdenum, copper, and other metals listed in Section 2.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.

commended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample inside the welder's helmet if worn or in the worker's breathing zone. (See ANSI/AWS F1.1 available from the "American Welding Society," P.O. Box 351040, Miami, FL 33135. Also from AWS is F1.3 "Evaluating Contaminants in the Welding Environment - A Sampling Strategy Guide," which gives additional advice on sampling).

SECTION 6 - HEALTH HAZARD DATA

Threshold Limit Value.

ACGIH recommended general limit for Welding Fume NOC (Not Otherwise Classified) is 5 mg/m3. IH-1988-1989 (or latest date) preface states, "The TLV-TWA should be used as guides in the control or health hazards and should not be used as fine lines between safe and dangerous concentrations."

Primary Route of Entry

Fumes and gases may be inhaled. Skin or eye contact may occur with fluxes and chemical aids.

THERMAL SPRAY POWDERS

SECTION 3 - PHYSICAL/CHEMICAL CHARACTERISTICS

Not Applicable

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

Nonflammable under normal working conditions. Metal powder dust may present a fire or explosion hazar under favorable conditions of particle size, dispersion and strong ignition source. Refer to Chapter 1 of "Thermal Spraying", published by the American Welding Society, for more detail.

SECTION 5 - REACTIVITY DATA

Hazardous Decomposition Products

Fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the material being deposited. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: the number of workers and the volume of the work area, the quality and amount of ventilation, the position of the worker's head with respec to the fume plume, as well as the presence of contaminants in the atmosphere and on the work such as chlorinated hydrocarbon vapors from cleaning and degreasing activities.

During thermal spraying, the fume and gas decomposition products generated are different in percen and form from the ingredients listed in Section 2. Decomposition products of normal operation include those originating from volatilization, reaction, or oxidation of the materials shown in Section 2, plus those from the base metal and coating, etc., as noted above.

Reasonably expected constituents of the fume would include complex oxides of the metals listed in Section 2.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation.

One recommended way to determine the composition and quantity of fumes, gases and dusts to which workers are exposed is to take an air sample inside the worker's helmet if worn or in the worker's breathing zone. (See ANSI/AWS F1.1 available from the "American Welding Society," P.O. Box 351040 Miami, FL 33135. Also, from AWS is F1.3 "Evaluating Contaminants in the Welding Environment - A Sampling Strategy Guide," which gives additional advice on sampling). At a minimum the listed ingredients should be analyzed.

SECTION 6 - HEALTH HAZARD DATA

Threshold Limit Value.

The ACGIH recommended general limit for Welding Fume NOC (Not Otherwise Classified) is 5 mg/m3 ACGIH-1988 - 1989 (or latest date) preface states, "The TLV-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations."

Primary Route of Entry

This material may be inhaled, come in contact with the skin or eyes, or be swallowed.

EUTECTIC CORPORATION

40-40 172nd Street, Flushing, New York 11358-2799
(718) 358-4000

MSDS NO.:	1S07 REV: 1
DATE:	11/12/91
CUSTOMER CODE NO.:	238-365-9

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MATERIAL SAFETY DATA SHEET

Complies with OSHA Hazard Communictiaon Standard 29 CFR 1910.1200

GENERAL ELECTRIC COMPANY
ATTN: SAFETY DEPT/MSDS FILES
TUCSON SERVICE CENTER
1401 EAST VALENCIA ROAD
TUCSON, AZ 85706

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SECTION 1 – IDENTIFICATION

PRODUCT NAME OR NUMBER METACERAM 21022

PRODUCT TYPE THERMAL SPRAY POWDER

SECTION 2 – INGREDIENTS / HAZARD IDENTIFICATION

INGREDIENT	CAS NO.	WT %	EXPOSURE LIMIT (mg/m³) OSHA PEL	ACGIH TLV
ALUMINUM	≠ 7429-90-5	1-5	15	10
MOLYBDENUM	≠ 7439-98-7	[illegible]	10	10
NICKEL	≠ # 7440-02-0	>50	1	1
CHROMIUM	≠ # 7440-47-3	1-5	1	0.5

THIS INGREDIENT IS LISTED AS A CARCINOGEN OR POSSIBLE CARCINOGEN BY THE NTP, IARC, OR OSHA 29 CRF 1910 (Z)

≠ THIS INGREDIENT IS SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF THE EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT OF 1986 (40 CRF 372)

This Section covers the materials from which this product is manufactured. The fumes and gases produced during normal use of this product are covered by Section 6. The term "hazardous" in "Hazardous Materials" should be interpreted as a term required and defined in OSHA 29 CFR 1910.1200 and does not necessarily imply the existence of any hazard.

APPLICABILITY: This Material Safety Data Sheet (MSDS) covers all Eutectic + Castolin Arc Welding Electrodes, Brazing Rods, Solders, and Thermal Spray Powders. This MSDS also applies to other E+C welding and allied products such as Fluxes and Chemical Aids with the appropriate attachment pages.

SECTION 3: GENERAL HAZARD SUMMARY

Little or no hazards exist for arc welding electrodes and brazing rods before they are used in the welding process.

WARNING! Potential Health effects of product listed, and when used in association with welding, brazing, soldering, thermal spraying, or part preparation are listed below. See also section 10 for more detailed information on specific ingredients.

Inhalation: The fumes associated with the heating, welding, brazing, soldering or cutting metals can be dangerous to your health and overexposure can cause lung damage and/or other organ damage. Use adequate ventilation to keep below exposure limits. Keep fumes and gases from breathing zone — keep the welder's head out of the fumes. Aggravation of preexisting respiratory or allergic conditions may occur in some workers.

Eye/Skin Contact: Arc Rays and Ultraviolet light can injure the eyes and burn skin. Liquids used in fluxes and chemical aids may cause irritation or possible chemical burns. Handle with care as shown in S[illegible]3. Wear the proper eye, ear and body protection. Use chemical goggles, gloves and face shield for [illegible]es and chemical aids. Electrical Shock can kill.

Ingestion: Danger! May be harmful or fatal if swallowed.

THE PRIMARY ROUTE OF ENTRY of welding fumes, gases and dust is by inhalation. Skin, eye contact and ingestion may also occur with powders, pastes and liquids. The American Conference of Governmental Industrial Hygienists (ACGIH) recommended general limit for Welding Fume and nuisance dust, not otherwise classified, is 5 mg/m³ and 10mg/m³, respectively. The 1991-1992 ACGIH states, "The TLV-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations. **Most welding, even with primitive ventilation, does not produce exposure inside the welding helmet above 5 mg/m³. That which does, should be controlled."**

SECTION 4: EMERGENCY FIRST AID MEASURES:

Inhalation Overexposure: Move victim to fresh air source. Contact a physician and advise on ingredients listed in Section 2.

Skin Contact: Thoroughly wash hands or effected areas with soap and water to remove all residue. If rash or burn develops, consult a physician.

Eye Contact: Thoroughly flush eyes with water for at least 15 minutes to remove all residue. Obtain prompt medical advise for fluxes and chemical aids. Advise physician of ingredients listed in Section 2.

Ingestion: Call a physician and/or local Poison Control Center. Advise of ingredients listed in Section 2.

SECTION 5: FIRE AND EXPLOSION HAZARD DATA:

Refer to ANSI Z49.1 for fire prevention during the use of welding and allied processes.

Electrode/Braze/Solders: Nonflammable. Welding arc, sparks and flames can ignite combustibles and flammables.

Thermal Spray Powders: Nonflammable under normal working conditions. Metal powder dust may present a fire or explosion hazard under favorable conditions of particle size, dispersion, and strong ignition source. This is most prevalent with reactive metal powders such as aluminum. Refer to Chapter 1. 'Thermal Spraying', published by the American Welding Society, for more detail.

Fluxes: – All E+C fluxes are nonflammable and are used as deoxidizers during welding, brazing, or soldering operations.

Chemical Aids: – Some E+C Chemical Aids are flammable. Refer to section 2 and 10 of the MSDS and attachment, and read the container label. When preparing workpiece with a flammable chemical aid keep all welding sources, sparks and flames at least 20 feet from the workpiece until the flammable evaporates. Provide adequate ventilation.

Special Firefighting Procedures: Toxic fumes may be produced – use an approved Self Contained Breathing Apparatus. See Hazardous decomposition products in section 6.

Extinguishing Media: CO2, dry chemical foam type.

Unusual Fire and Explosion Hazard: Some fluxes and chemical aids may give off hydrogen chloride phosgene and chlorine gases. Cans, under pressure, and flammables may explode.

SECTION 6: REACTIVITY DATA

HAZARDOUS DECOMPOSITION PRODUCTS

The term 'hazardous' should be interpreted as a term defined in the OSHA Hazard Communication Standard (29 CFR 1910.1200) and does not necessarily imply the existence of any hazard. Welding electrodes, brazing alloys and solder solids as shipped are stable, nonflammable, nonexplosive and in most cases nonreactive. Certain fluxes and chemical aids may be reactive – see Section 5 and the attachment for these products.

Fumes, gases, and dusts given off during heating, welding, brazing, soldering, cutting or thermal spray processes cannot be classified simply. The composition and quantity of these are dependent upon the metal being welded, the process, procedures, and electrodes or other consumables used. Other conditions which also influence the composition and quantity of the fumes, gases and dusts that workers may be exposed to include: coatings on the workpiece (paint, galvanizing, plating), the number of workers and the volume of the work space, the quality and amount of ventilation, the position of the worker's head with respect to the fumes generated, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbons vapors from cleansing and degreasing activities.)

During welding, thermal spraying and allied processes, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 2. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section 2, plus those of the base metal and coating, etc, as noted above.

Reasonably expected constituents of the fume may include: complex oxides of the metals listed in Section 2; the flux coatings may produce fluoride compounds, metal oxides, carbon and silica. Gaseous reaction products may include ozone, carbon monoxide, carbon dioxide, nitrogen oxides, and certain inert gases used as shielding gases. OSHA specifies that chromium VI compounds, nickel and its compounds must be considered as carcinogens because they are so classified by the NTP or IARC. Many welding and allied products contain chromium and nickel when listed in Section 2. While certain chromium and nickel compounds have been clearly shown to be animal and human carcinogens, more study is required to actually find if these compounds are present in welding fumes. For the safety of the worker, E+C chooses to designate all chromium and nickel containing compounds as a carcinogen/or possible carcinogen by marking these ingredients with a pound sign (#) in section 2. TO our knowledge, there are no reliable scientific studies which show that workers exposed to alloys containing chromium or nickel run increased risk of lung cancer because of exposure to the forms of nickel and chromium found in the fumes.

One recommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample inside the worker's helmet if worn or in the welder's breathing zone. See ANSI/AWS f1.1 available from the American Welding Society, P.O. Box 351040, Miami, FL 33135. Also from AWS is F1.3 'Evaluating Contaminants in the Welding Environment – A Sampling Strategy Guide,' which gives additional advice on sampling.

(SIDE 1)

SECTION 7: ACCIDENTAL SPILL MEASURES

Dispose of waste material, powders, grinding, or filter residues in an environmentally sensitive manner in accordance with Federal, State and Local regulations. Use appropriate measures to keep airborne dust levels contained in accordance with exposure levels of section 2. See also section 8 for proper safe handling and storage.

SECTION 8: SAFE HANDLING AND STORAGE

Please read and understand the product label information for proper procedures and use. See ANSI Z49.1 'Safety in Welding and cutting', and Chapter 11 of 'Thermal Spraying,' published by the American Welding Society and OSHA Publication 2206 (29 CFR 1910) for more detail.

Respiratory Protection: - If the work station is not properly ventilated to exhaust all fumes, vapors and dusts below the recommended exposure limits, use a NIOSH approved respirator.

Ventilation: - Use enough general ventilation and local exhaust at the work site to keep all fumes and dust from the worker s breathing zone and the general area. Train welder to keep his/her face away from the fume/dust plume.

Eye Protection: - Wear helmet or use face shield with appropriate filter lens. Provide protective screens and flash goggles if necessary, to shield others. As a rule, start with a shade that is too dark to see the weld zone, then go to the next lighter shade which gives sufficient view of the weld zone.

Other Protective Equipment: - Wear hand, head, and body protection which help to prevent injury from radiation, sparks and electrical shock. At a minimum, this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats as well as dark, protective clothing. Train workers not to touch live electrical parts and to insulate themselves from work and electrical ground.

SECTION 9: STATEMENT OF INTENT

WHILE WE BELIEVE ALL INFORMATION PRESENTED HEREIN IS ACCURATE AND RELIABLE, THE DATA ARE NOT TO BE TAKEN AS A GUARANTEE OR REPRESENTATION OF ANY KIND FOR WHICH EUTECTIC CORPORATION ASSUMES LEGAL RESPONSIBILITY. THIS INFORMATION IS PRESENTED SOLELY FOR YOUR CONSIDERATION, INVESTIGATION, AND VERIFICATION. FOR MORE INFORMATION ABOUT THE INGREDIENTS LISTED, PLEASE REFER TO THE APPROPRIATE OSHA DOCUMENTS.

SECTION 10: CHEMICAL HAZARDS INFORMATION/EFFECTS OF OVEREXPOSURE

See Section 2 for the OSHA/ACGIH exposure limits, Sara Title III and carcinogen listing.

GENERAL WELDING FUMES: (PEL/TLV = 5mg/m³) Electric arc welding, brazing, soldering, or thermal spraying may create one or more of the following health hazards associated with the key ingredients listed in Section 2. Fumes, gases and dusts can be dangerous to your health. Certain medical studies have suggested that lung damage can result from overexposure to these fumes. Short term overexposure may result in dizziness, nausea, or dryness or irritation of nose, throat or eyes. Excessive overexposure may cause bronchial asthma, lung fibrosis, pneumoconiosis or siderosis (iron deposits in lung.) See also Section 6.

METAL FUME FEVER: Can be caused by inhalation of certain metallic compounds during the welding, heating, brazing, soldering or cutting operations. Symptoms are similar to influenza type sickness including chills, fever, head and muscle ache, tightness of chest, dryness of nose and mouth, muscular pain, nausea and vomiting. Symptoms usually occur within several hours after overexposure and may last 6-24 hours. Consult a physician immediately if any of these symptoms develop after welding operation.

GENERAL NUISANCE DUSTS: (Titanium dioxide, aluminum dioxide, zirconium oxide, calcium carbonate, bentonite, etc. LISTED AS PARTICLES NOT OTHERWISE CLASSIFIED, TLV/PEL = 10/15 mg/m³) Most nuisance dusts are inert, non toxic and chemically nonirritating. Skin contact has shown no problems other than possible drying and mechanical irritation. Eye contact can produce particulate irritation. Does not seem to be absorbed by the body through ingestion. Excessive inhalation can produce mild pulmonary irritation and possible nondisabling slight fibrosis of the lungs.

AMMONIA CHLORIDE: Overexposure to dust and fumes may be irritating to the eyes, nose, and lungs. Ingestion may be harmful. Avoid moisture and heat, hazardous decomposition products may include ammonia and hydrogen chloride. Keep away from strong acids and bases. NFPA/HMIS 100.

BARIUM COMPOUNDS: Short term overexposure to soluble barium compounds may cause aching eyes, tinnitus, frontal headache, wheezing, laryngeal spasms, salivation or anorexia. Long term overexposure to soluble barium compounds may cause nervous disorders and may have deleterious effects on the heart, circulatory system and musculature.

BORON OXIDES: (Borax, Borates, Boric Acid) Oxides of boron are white, crystalline solids that form boric acid (mild acid) in the presence of moisture. Overexposure will likely cause mild irritation of the respiratory system, eyes and on open skin wounds. Ingestion may cause nausea, vomiting, diarrhea or erythematous rash. All effects are reversible. NFPA/HMIS 000.

CADMIUM & Cd COMPOUNDS: Cadmium fume can affect the body if it is inhaled. Overexposure causes irritation of the nose and throat, if enough has been inhaled, after a delay of several hours, a person may develop metal fume fever. Death may occur in some instances. Repeated or prolonged overexposure may cause loss of smell sense, ulceration of the nose, shortness of breath, kidney damage, and mild anemia. Exposure to cadmium fume has also been reported to cause increased incidence of cancer of the prostrate in men.

CALCIUM OXIDE: Calcium oxide can affect the body if inhaled, ingested or contact with eyes or skin. Short term overexposure causes irritation to the nose, eyes, throat and skin. Severe burns may result from contact. It may also cause bronchitis and pneumonia if excessive inhalation of fumes. Repeated or prolonged overexposure may cause irritation of the skin, ulceration and perforation of the nasal septum. Calcium oxides may attack some forms of plastics, rubber, or coatings.

CHROMIUM & Cr COMPOUNDS: See also statement in section 6. Short term overexposure from the inhalation of fumes with chromium VI compounds can cause irritation of the respiratory system, lung damage and asthma like symptoms. Swallowing chromium VI salts can cause severe injury and death. Dust on skin can cause ulcers. Eyes may be burned by chromium VI compounds. Allergic reactions are likely in some people. Studies of long term overexposure to chromium VI have shown that production workers exposed to hexavalent chromium compounds have an excess of lung cancer. Chromium VI compounds are required by OSHA to be considered carcinogenic. Absorption through the skin can cause systematic poisoning primarily affecting the kidneys and liver. Good practice requires the reduction of worker exposure to chromium VI materials.

COBALT & Co COMPOUNDS: Short term overexposure may cause pulmonary irritation, cough, dermatitis, weight loss. Repeated overexposure can produce reduced pulmonary functions, diffuse nodular fibrosis of lungs and respiratory hypersensitivity.

COPPER & Cu COMPOUNDS: The inhalation of fresh copper oxide fume may cause metal fume fe No adverse long term health effects have been reported in literature.

FLUORIDE COMPOUNDS: (Such as K, Ca, Al, Na, Fluorspar, Cryolite, etc. are listed as F Fluoride dust can affect the body if inhaled or if it comes in contact with eyes or skin, or if it Short term overexposure may cause irritation of the eyes and respiratory tract. Fluorides us a soapy or salty taste and may cause nausea, vomiting, abdominal pain, bleeding of the stomach, st ness of breath, convulsions, muscular weakness or disturbed vision, if ingested. Compounds may off HF gases in fire and form strong acids in the presence of moisture. Long term overexposure cause excessive calcification of the bones, ligaments of the ribs, pelvis and spinal column. May cause skin burns and/or rash.

GLYCERINE: (As mist) Contact with eyes may cause slight transient eye irritation. Prolonged skin cor may cause mild irritation. Ingestion single oral dose toxicity is low. High temperatures may gene vapor levels sufficient to cause irritation of the respiratory system.

GRAPHITE: (Natural, Synthetic, Amorphous Graphite) Graphite may contain small amounts (0-3.5% of crystalline Silica and (4-10% wt) of Fused silica. Excess inhalation may result in irritation of the mu membranes and long term inhalation may result in silicosis. See description for SILICA. Dust may c irritation of the eyes. Graphite causes slippery conditions.

HYDROXIDES: Sodium and Potassium Hydroxides are strong alkali and are corrosive to any tissue which they come in contact. The severity of exposure will determine the health effects - mild irrit to severe burns wherever contact is made.

IRON & IRON COMPOUNDS: Overexposure to iron or iron compounds in fume may lead to general ir tion of the respiratory tract if inhaled. Long term overexposure may cause siderosis which may als fect pulmonary function. Lungs will clear in time when exposure ceases.

KAOLIN: (Aluminum Silicate) Kaolin is classified as a nuisance dust by ACGIH. Crystalline Silica is pre in trace levels (less than 1% by weight). NFPA/HMIS 000.

MAGNESIUM/Mg OXIDE: The inhalation of magnesium oxide fume may caused metal fume fever adverse long term health effects are not known.

MANGANESE: (Also Related compounds such as Manganese dioxide.) Overexposure to manganese its compounds may cause metal fume fever charactenzed by chills, fever, upset stomach, vomitin ritation of the throat and aching of body. Excessive overexposure may affect the central nerv Symptoms may include muscular weakness and tremors. Behavioral changes and changes i may also appear. Workers exposed to manganese compounds should receive quarterly medic tions for early detection of manganese poisoning.

MOLYBDENUM: Overexposure to molybdenum and insoluble molybdenum compounds may affect body if they are inhaled, ingested or if they contact the eyes. Molybdenum trioxide has caused irrita of the eyes, nose, and throat, weight loss and digestive disturbances in animals. Long term effects not known.

NICKEL & Ni COMPOUNDS: Short term effects from overexposure to the inhalation of nickel fumes include metallic taste, nausea, tightness of chest, fever, or allergic reactions. Skin and eye contact also cause allergic reactions. To prevent contact allergies, wash hands and change clothes after Long term overexposure to nickel and nickel compounds may cause lung fibrosis or pneumoconi Studies of the nickel refinery workers indicated a higher incidence of lung and nasal cancers. Nickel its compounds are required to be labeled carcinogenic by OSHA, NPT, or IARC.

POTASSIUM NITRATE: (Salt Peter) Effects of overexposure - mildly irritating to the eyes skin and mu membranes. Prolonged inhalation of dusts may cause irritation of the respiratory system. When invo in fire, can yield toxic gaseous oxides of nitrogen. Spontaneous reaction may occur with easily oxidiz material, increases flammability of any combustible material.

POTASSIUM OXALATE: (Oxalic Acid) Fumes may affect the body if inhaled or contact with eyes or s The fumes may cause mild irritation or burns depending on the amount of overexposure. Excessive halation may cause systemic poisoning with symptoms such as pain in throat, esophagus and stom.

SILICA: (Crystalline Silica, Quartz Dust, Sand, Fused Silica, Silicates) Crystalline Silica can effect the b if inhaled. Repeated overexposure to Silica dust may cause Silicosis, or scarring of the lungs with chr cough and shortness of breath. Silica has a disputed listing as a Group 2A carcinogen by the IARC ba on limited evidence in humans and sufficient evidence in animals. Silica is not listed as a ca by the NPT, OSHA, or ACGIH.

SILICON, SILICON OXIDES: (Amorphous Silica) Short term overexposure may pose as a possible irritant. Repeated inhalation of amorphous silica can cause pneumoconiosis or non disabling the lung.

SILVER: (Ag, and certain soluble silver compounds.) Can affect the body if inhaled, ingest with skin. Overexposure can cause discoloration/darkening of the eyes, nose, throat, and skin. S nitrate is strongly corrosive and can cause burns.

TIN & Sn COMPOUNDS: Tin and Tin compounds can affect the body if inhaled or if they make con with the eyes and skin. Short term overexposure toxicity is low. The compounds may cause irrita of the skin, eyes and throat. Long term overexposure affects are not known.

TUNGSTEN/W CARBIDE: Tungsten Carbide Incompatibility: - Produces violent reaction with Iodine F trafluoride and lead oxide. Burns with incandescence if heated to dull red with nitrogen oxide and fluo gases. Reacts with flame when chlorine trifluoride is present. Short term overexposure to tungsten bide dust by inhalation may cause coughing, dyspnea, soreness in the chest, weight loss, bronch and asthma. May also cause pulmonary fibrosis and radiological changes in the lung. May cause con dermatitis upon skin contact since particles are sharp. Eye contact may cause irritation. Chronic ove posure to WC by inhalation may cause hard metal lung with symptoms as described above

UREA: Urea is a weak basic compound, not usually considered hazardous in normal use. Upon expos to heat and moisture, it may hydrolyze to corrosive ammonium carbamate and toxic cyanuric acid. powder is treated as a nuisance dust. May cause mild irritation of the eyes, skin and throat. NFPA

VANADIUM/V OXIDES: The hazard information given in Section 2 for Vanadium is listed as Vanad Pentoxide dust. Overexposure may cause irritation of the eyes, nose, throat and respiratory tract. A green discoloration of the tongue may result. Repeated overexposure may produce more severe symptom as mentioned and also chronic bronchitis, or allergic skin rash.

ZINC and Zn COMPOUNDS: Zinc oxide fumes are usually given off when zinc is heated such as heat of galvanized coating and can affect the body if inhaled. Short term overexposure may cause metal fu fever (see separate description). Severe and prolonged exposure to Zinc oxide may cause pulmon edema and pneumonia.

ZIRCON: (As Zirconium fume - Ziconium Silicate) May effect the body if inhaled. Overexposure may ca irritation of the respiratory system. Zirconium silicate is insoluble and considered inert, although i possible to form granuloma in the lungs and skin. Contains 0.2% of crystalline silica, smal of which may be respirable (see Silica description)

Eutectic Castolin Castolin Eutectic

EUTECTIC CORPORATION

40-40 172nd Street, Flushing, New York 11358-9981

MSDS NO.:	E1127 REV:
DATE:	09/18/86
CUSTOMER CODE NO.:	238-365-9

MATERIAL SAFETY DATA SHEET

Complies with OSHA Hazard Communication Standard 29CFR 1910.1200

[redacted]

RECEIVED JUL 3 1990

GENERAL ELECTRIC CO
ATTN: SAFETY DEPT/MSDS FILES
APPARATUS SERVICE SHOP
1401 E VALENCIA ROAD
TUCSON AZ 85706

THERMAL SPRAY POWDE

SECTION 1 - IDENTIFICATION

PRODUCT NAME OR NUMBER		IS02
PRODUCT TYPE	METACERAM 21031	EMERGENCY TELEPHONE NC 718-358-4000

SECTION 2 - HAZARDOUS INGREDIENTS

INGREDIENT	CAS NO.	EXPOSURE LIMIT (mg/m³) OSHA PEL	ACGIH TLV
NICKEL	7440-02-0	1	1
CHROMIUM	7440-47-3	1.0	.5
ALUMINUM	7429-90-5	NOT LISTED	10
IRON	7439-89-6	5	NOT LISTED
MOLYBDENUM	7439-98-7	15	10

This section covers the materials from which this product is manufactured. The fumes and gases produced during normal use of this product are covered by Section V. The term "hazardous" in "Hazardous Materials" should be interpreted as a term required and defined in OSHA 29 CFR 1910.1200 and does not necessarily imply the existence of any hazard.

ELECTRODES, BRAZING RODS, & FLUXES

SECTION 3 - PHYSICAL/CHEMICAL CHARACTERISTICS

Not Applicable for arc welding electrodes and brazing rods.
For fluxes and chemical aids see Section 2 above.

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

Nonflammable. Welding arc and sparks and brazing flames can ignite combustibles and flammables. Refer ANSI Z49.1 for fire prevention during the use of welding and allied procedures.

SECTION 5 - REACTIVITY DATA

Hazardous Decomposition Products

[redacted] fumes and gases cannot be classified simply. The composition and quantity of both are [redacted]dent upon the metal being welded, the process, procedures, and electrodes used. Other conditions wh[redacted] also influence the composition and quantity of the fumes and gases to which workers may be [redacted] include: coatings on the metal being welded (such as paint, plating or galvanizing), the number o[redacted]ders and the volume of the work area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleansing and degreasing activities).

When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 2. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section 2, plus those from the base metal and coating, etc., as noted above.

Reasonably expected constituents of the fume would include: fluorides, complex oxides of iron, manganese, silicon, chromium, nickel, molybdenum, copper, and other metals listed in Section 2.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.

[redacted]commended way to determine the composition and quantity of fumes and gases to which workers [redacted]xposed is to take an air sample inside the welder's helmet if worn or in the worker's breathing [redacted] See ANSI/AWS F1.1 available from the "American Welding Society," P.O. Box 351040, Miami, F[redacted]35. Also from AWS is F1.3 "Evaluating Contaminants in the Welding Environment - A Sampling Strategy Guide," which gives additional advice on sampling).

SECTION 6 - HEALTH HAZARD DATA

Threshold Limit Value.

The ACGIH recommended general limit for Welding Fume NOC (Not Otherwise Classified) is 5 mg/m3. ACGIH-1988-1989 (or latest date) preface states, "The TLV-TWA should be used as guides in the control [redacted]alth hazards and should not be used as fine lines between safe and dangerous concentrations."

Primary Route of Entry

Fumes and gases may be inhaled. Skin or eye contact may occur with fluxes and chemical aids.

THERMAL SPRAY POWDERS

SECTION 3 - PHYSICAL/CHEMICAL CHARACTERISTICS

Not Applicable

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

Nonflammable under normal working conditions. Metal powder dust may present a fire or explosion hazard under favorable conditions of particle size, dispersion and strong ignition source. Refer to Chapter 11 of "Thermal Spraying", published by the American Welding Society, for more detail.

SECTION 5 - REACTIVITY DATA

Hazardous Decomposition Products

Fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the material being deposited. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: the number of workers and the volume of the work area, the quality and amount of ventilation, the position of the worker's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere and on the work such as chlorinated hydrocarbon vapors from cleaning and degreasing activities.

During thermal spraying, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 2. Decomposition products of normal operation include those originating from volatilization, reaction, or oxidation of the materials shown in Section 2, plus those from the base metal and coating, etc., as noted above.

Reasonably expected constituents of the fume would include complex oxides of the metals listed in Section 2.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation.

One recommended way to determine the composition and quantity of fumes, gases and dusts to which workers are exposed is to take an air sample inside the worker's helmet if worn or in the worker's breathing zone. (See ANSI/AWS F1.1 available from the "American Welding Society," P.O. Box 351040, Miami, FL 33135. Also, from AWS is F1.3 "Evaluating Contaminants in the Welding Environment - A Sampling Strategy Guide," which gives additional advice on sampling). At a minimum the listed ingredients should be analyzed.

SECTION 6 - HEALTH HAZARD DATA

Threshold Limit Value.

The ACGIH recommended general limit for Welding Fume NOC (Not Otherwise Classified) is 5 mg/m3. ACGIH-1988 - 1989 (or latest date) preface states, "The TLV-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations."

Primary Route of Entry

This material may be inhaled, come in contact with the skin or eyes, or be swallowed.

EUTECTIC CORPORATION

40-40 172nd Street, Flushing, New York 11358-9981

MSDS NO.: 1128	REV: 1
DATE: 10/13/88	
CUSTOMER CODE NO.:	

MATERIAL SAFETY DATA SHEET

Complies with OSHA Hazard Communication Standard 29CFR 1910.1200

MR. TOM HAWSE
GE APPARATUS SERVICES
TUCSON SERVICE CENTER
1401 VALENCIA ROAD
TUCSON, AZ 85706

SECTION 1 - IDENTIFICATION

PRODUCT NAME OR NUMBER	METACERAM 21032-S
PRODUCT TYPE	Thermal Spray Powder
EMERGENCY TELEPHONE NO	718-358-4000

SECTION 2 - HAZARDOUS INGREDIENTS

INGREDIENT	CAS NO.	EXPOSURE LIMIT (mg/m³) OSHA PEL	EXPOSURE LIMIT (mg/m³) ACGIH TLV
Nickel	7440-02-0	1	1
Iron	7439-89-6	5	*
Molybdenum	7439-98-7	15	10
Titanium	7440-32-6	*	*
Tungsten	7440-33-7	*	1
Silicon	7440-21-3	*	10

Comment: *Not listed

This section covers the materials from which this product is manufactured. The fumes and gases produced during normal use of this product are covered by Section V. The term "hazardous" in "Hazardous Materials" should be interpreted as a term required and defined in OSHA 29 CFR 1910.1200 and does not necessarily imply the existence of any hazard.

ELECTRODES, BRAZING RODS, & FLUXES

SECTION 3 - PHYSICAL/CHEMICAL CHARACTERISTICS

Not Applicable for arc welding electrodes and brazing rods.
For fluxes and chemical aids see Section 2 above.

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

Nonflammable. Welding arc and sparks and brazing flames can ignite combustibles and flammables. Refer [illegible] ANSI Z49.1 for fire prevention during the use of welding and allied procedures.

SECTION 5 - REACTIVITY DATA

Hazardous Decomposition Products

[illegible] fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedures, and electrodes used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating or galvanizing), the number of welders and the volume of the work area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleansing and degreasing activities).

When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 2. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section 2, plus those from the base metal and coating, etc., as noted above.

Reasonably expected constituents of the fume would include: fluorides, complex oxides of iron, manganese, silicon, chromium, nickel, molybdenum, copper, and other metals listed in Section 2.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides [illegible] formed by the radiation from the arc.

[illegible] recommended way to determine the composition and quantity of fumes and gases to which workers [illegible] exposed is to take an air sample inside the welder's helmet if worn or in the worker's breathing zone. (See ANSI/AWS F1.1 available from the "American Welding Society," P.O. Box 351040, Miami, FL 33135. Also from AWS is F1.3 "Evaluating Contaminants in the Welding Environment - A Sampling Strategy Guide," which gives additional advice on sampling).

SECTION 6 - HEALTH HAZARD DATA

Threshold Limit Value.

The ACGIH recommended general limit for Welding Fume NOC (Not Otherwise Classified) is 5 mg/m3. ACGIH-1988-1989 (or latest date) preface states, "The TLV-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations."

Primary Route of Entry

Fumes and gases may be inhaled. Skin or eye contact may occur with fluxes and chemical aids.

THERMAL SPRAY POWDERS

SECTION 3 - PHYSICAL/CHEMICAL CHARACTERISTICS

Not Applicable

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

Nonflammable under normal working conditions. Metal powder dust may present a fire or explosion hazard under favorable conditions of particle size, dispersion and strong ignition source. Refer to Chapter 1 of "Thermal Spraying", published by the American Welding Society, for more detail.

SECTION 5 - REACTIVITY DATA

Hazardous Decomposition Products

Fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the material being deposited. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: the number of workers and the volume of the work area, the quality and amount of ventilation, the position of the worker's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere and on the work such as chlorinated hydrocarbon vapors from cleaning and degreasing activities.

During thermal spraying, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 2. Decomposition products of normal operation include those originating from volatilization, reaction, or oxidation of the materials shown in Section 2, plus those from the base metal and coating, etc., as noted above.

Reasonably expected constituents of the fume would include complex oxides of the metals listed in Section 2.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation.

One recommended way to determine the composition and quantity of fumes, gases and dusts to which workers are exposed is to take an air sample inside the worker's helmet if worn or in the worker's breathing zone. (See ANSI/AWS F1.1 available from the "American Welding Society," P.O. Box 351040, Miami, FL 33135. Also, from AWS is F1.3 "Evaluating Contaminants in the Welding Environment - A Sampling Strategy Guide," which gives additional advice on sampling). At a minimum the listed ingredients should be analyzed.

SECTION 6 - HEALTH HAZARD DATA

Threshold Limit Value.

The ACGIH recommended general limit for Welding Fume NOC (Not Otherwise Classified) is 5 mg/m3. ACGIH-1988 - 1989 (or latest date) preface states, "The TLV-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations."

Primary Route of Entry

This material may be inhaled, come in contact with the skin or eyes, or be swallowed.

Eutectic Corporation
Customer Service Center
1515 Brook Dr., Downers Grove, Illinois 60515
Phone: 800-323-4845 Fax 708-932-9466

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MSDS NO:	IS06
REV:	002
DATE:	12.27.1994
CUSTOMER CODE NO:	238365-00
PAGE:	1

MATERIAL SAFETY DATA SHEET

Complies with OSHA Hazard Communication Standard 29 CFR 1910.1200

GENERAL ELECTRIC COMPANY
TUCSON SERVICE CENTER

1401 EAST VALENCIA ROAD
TUCSON, AZ 85706
U.S.A.

SECTION 1 - IDENTIFICATION

PRODUCT NAME OR NUMBER	METACERAM 21071
PRODUCT TYPE	Thermal Spray Powder

SECTION 2 - INGREDIENTS / HAZARD IDENTIFICATION

INGREDIENT	CAS NO	WT %	EXPOSURE LIMIT (mg/m³) OSHA PEL	EXPOSURE LIMIT (mg/m³) ACGIH TLV
Copper	* 7440-50-8	85-95	1	0.2 As Fume
Aluminum	* 7429-90-5	5-15	5 As Fume	5 As Fume
Iron	7439-89-6		15	10

*** This Ingredient is listed as a Toxic Chemical in Subpart D (40CFR372), Subject to the Reporting Requirements of Section 313 of the Emergency Planning and Community RIGHT-TO-KNOW Act. of 1986.**

SEE ATTACHMENT FOR ADDITIONAL INFORMATION.
This Section covers the materials from which this product is manufactured. The fumes and gases produced during normal use of this product are covered by Section 6. The term "hazardous" in "Hazardous Materials" should be interpreted as a term required and defined in OSHA 29 CFR 1910.1200 and does not necessarily imply the existence of any hazard.

EUTECTIC CORPORATION

40-40 172nd Street, Flushing, New York 11358-9981

218

MSDS NO.: E1140	REV:
DATE: 09/18/86	
CUSTOMER CODE NO.: 238-365-9	

MATERIAL SAFETY DATA SHEET

Complies with OSHA Hazard Communication Standard 29CFR 1910.1200

GENERAL ELECTRIC COMPANY
ATTN: SAFETY DEPT/MSDS FILES
TUCSON SERVICE CENTER
1401 EAST VALENCIA ROAD
TUCSON, AZ 85706

THERMAL SPRAY POWDE

SECTION 1 - IDENTIFICATION

PRODUCT NAME OR NUMBER	IS34
PRODUCT TYPE METACERAM 25050	EMERGENCY TELEPHONE NO 718-358-4000

SECTION 2 - HAZARDOUS INGREDIENTS

INGREDIENT	CAS NO.	EXPOSURE LIMIT (mg/m³)	
		OSHA PEL	ACGIH TLV
CHROMIUM OXIDE	1308-38-9	0.5 (CR)	0.5 (OX)

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This section covers the materials from which this product is manufactured. The fumes and gases produced during normal use of this product are covered by Section V. The term "hazardous" in "Hazardous Materials" should be interpreted as a term required and defined in OSHA 29 CFR 1910.1200 and does not necessarily imply the existence of any hazard.

ELECTRODES, BRAZING RODS, & FLUXES

SECTION 3 - PHYSICAL/CHEMICAL CHARACTERISTICS

Not Applicable for arc welding electrodes and brazing rods.
For fluxes and chemical aids see Section 2 above.

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

N "ammable. Welding arc and sparks and brazing flames can ignite combustibles and flammables. Refer SI Z49.1 for fire prevention during the use of welding and allied procedures.

SECTION 5 - REACTIVITY DATA

Hazardous Decomposition Products

Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedures, and electrodes used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be ed include: coatings on the metal being welded (such as paint, plating or galvanizing), the number ers and the volume of the work area, the quality and amount of ventilation, the position of the worker's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleansing and degreasing activities).

When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 2. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section those from the base metal and coating, etc., as noted above.

Reasonably expected constituents of the fume would include: fluorides, complex oxides of iron, manganese, silicon, chromium, nickel, molybdenum, copper, and other metals listed in Section 2.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.

One recommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample inside the welder's helmet if worn or in the worker's breathing zone. (See ANSI/AWS F1.1 available from the "American Welding Society," P.O. Box 351040, Miami, FL 33135. Also from AWS is F1.3 "Evaluating Contaminants in the Welding Environment - A Sampling Strategy Guide," which gives additional advice on sampling).

SECTION 6 - HEALTH HAZARD DATA

Threshold Limit Value.

The ACGIH recommended general limit for Welding Fume NOC (Not Otherwise Classified) is 5 mg/m3. ACGIH-1988-1989 (or latest date) preface states, "The TLV-TWA should be used as guides in the control lth hazards and should not be used as fine lines between safe and dangerous concentrations."

Primary Route of Entry

Fumes and gases may be inhaled. Skin or eye contact may occur with fluxes and chemical aids.

THERMAL SPRAY POWDERS

SECTION 3 - PHYSICAL/CHEMICAL CHARACTERISTICS

Not Applicable

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

Nonflammable under normal working conditions. Metal powder dust may present a fire or explosion hazar under favorable conditions of particle size, dispersion and strong ignition source. Refer to Chapter 1 of "Thermal Spraying", published by the American Welding Society, for more detail.

SECTION 5 - REACTIVITY DATA

Hazardous Decomposition Products

Fumes and gases cannot be classified simply. The composition and quantity of both are dependent upo the material being deposited. Other conditions which also influence the composition and quantity of th fumes and gases to which workers may be exposed include: the number of workers and the volum of the work area, the quality and amount of ventilation, the position of the worker's head with respec to the fume plume, as well as the presence of contaminants in the atmosphere and on the work suc as chlorinated hydrocarbon vapors from cleaning and degreasing activities.

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One recommended way to determine the composition and quantity of fumes, gases and dusts to whic workers are exposed is to take an air sample inside the worker's helmet if worn or in the worker breathing zone. (See ANSI/AWS F1.1 available from the "American Welding Society," P.O. Box 351040 Miami, FL 33135. Also, from AWS is F1.3 "Evaluating Contaminants in the Welding Environment - A Sampling Strategy Guide," which gives additional advice on sampling). At a minimum the listed ingredient should be analyzed.

SECTION 6 - HEALTH HAZARD DATA

Threshold Limit Value.

The ACGIH recommended general limit for Welding Fume NOC (Not Otherwise Classified) is 5 mg/m3 ACGIH-1988 - 1989 (or latest date) preface states, "The TLV-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations."

Primary Route of Entry

This material may be inhaled, come in contact with the skin or eyes, or be swallowed.

Castolin Eutectic® Eutectic Castolin
Eutectic Corporation
Customer Service Center
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OCT 2 / 1997
LORIN G. HEWITT

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MATERIAL SAFETY DATA SHEET

Complies with OSHA Hazard Communication Standard 29 CFR 1910.1200

GENERAL ELECTRIC COMPANY
TUCSON SERVICE CENTER

1401 EAST VALENCIA ROAD
TUCSON, AZ 85706
U.S.A.

SECTION 1 - IDENTIFICATION

PRODUCT NAME OR NUMBER	ROTOGUARD
PRODUCT TYPE	Chemical Aid (Clear Liquid)

SECTION 2 - INGREDIENTS / HAZARD IDENTIFICATION

INGREDIENT	CAS NO	WT %	EXPOSURE LIMIT (mg/m³) OSHA PEL	ACGIH TLV
Naphtha	8030-30-6		100 ppm	400 ppm
VM&P Naphtha	8032-32-4		1350 (mfg)	1370 (mfg)
Acrylic Resin	9003-01-4		Not Listed	Not Listed

SEE ATTACHMENT FOR ADDITIONAL INFORMATION.
This Section covers the materials from which this product is manufactured. The fumes and gases produced during normal use of this product are covered by Section 6. The term "hazardous" in "Hazardous Materials" should be interpreted as a term required and defined in OSHA 29 CFR 1910.1200 and does not necessarily imply the existence of any hazard.

Castolin Eutectic® Eutectic Castolin

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OCT 27 [illegible]

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MATERIAL SAFETY DATA SHEET ATTACHMENT

SECTION 3: GENERAL HAZARD SUMMARY

Little or no hazards exist for arc welding electrodes and brazing rods before they are used in the welding process.

WARNING! Potential health effects of product listed, and when used in association with welding, brazing, soldering, thermal spraying, or part preparation are listed below. See also Section 10 for more detailed information on the specific ingredients' exposure effects and Section 6 for hazardous decomposition products.

Inhalation: The fumes associated with the heating, welding, brazing, soldering or cutting metals can be dangerous to your health and overexposure can cause lung damage and/or other organ damage. Use adequate ventilation to keep below exposure limits. Keep fumes and gases from breathing zone- keep the welder's head out of the fumes. Aggravation of preexisting respiratory or allergic conditions may occur in some workers.

Eye / Skin Contact: Arc Rays and Ultraviolet light can injure the eyes and burn skin. Liquids used in fluxes and chemical aids may cause irritation or possible chemical burns. Handle with care as shown in Section 8. Wear the proper eye, ear and body protection. Use chemical goggles, gloves and face shield for all fluxes and chemical aids. Electrical Shock can kill.

Ingestion: Danger! May be harmful or fatal if swallowed.

PRIMARY ROUTE OF ENTRY of welding fumes, gases and dust is by inhalation. Eye contact and ingestion may also occur with powders, pastes and liquids. The American Conference of Governmental Industrial Hygienists (ACGIH) recommended general limit for Welding Fume and nuisance dust, not otherwise classified, is 5mg/m^3 and 10mg/m^3, respectively. The 1991-1992 ACGIH states, "The TLV-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations. **Most welding, even with primitive ventilation, does not produce exposure inside the welding helmet above 5mg/m^3. That which does, should be controlled."** It is recommended to monitor for ingredients listed in Section 2 and decomposition products that have exposure limits below 5mg/m^3 (cadmium, chromium, chromium VI, nickel, etc.).

SECTION 4: EMERGENCY FIRST AID MEASURES:

Inhalation Overexposure: Move victim to fresh air source. Contact a physician and advise on ingredients listed in Section 2.

Skin Contact: Thoroughly wash hands or effected areas with soap and water to remove all residue. If rash or burn develops, consult a physician.

Eye Contact: Thoroughly flush eyes with water for at least 15 minutes to remove all residue. Obtain prompt medical advice for fluxes and chemical aids. Advise physician of ingredients listed in Section 2.

Ingestion: Call a physician and/or local Poison Control Center. Advise of ingredients listed in Section 2.

SECTION 5: FIRE AND EXPLOSION HAZARD DATA

Refer to ANSI Z49.1 for fire prevention during the use of welding and allied processes.

Electrode/Braze/Solders: Generally nonflammable; welding arc, sparks and flames can ignite combustibles and flammables.

Thermal Spray Powders: Nonflammable under normal working conditions. Metal powder may present a fire or explosion hazard under favorable conditions of particle size, on, and strong ignition source. This is most prevalent with reactive metal powders s aluminum. Refer to Chapter 11 of 'Thermal Spraying', published by the American Welding Society, for more detail.

Fluxes: All E+C fluxes are nonflammable and are used as deoxidizers during welding, brazing or soldering operations.

Chemical Aids: Some E+C Chemical Aids are flammable. Refer to Section 2 and 10 of the MSDS and attachment, and read the container label. When preparing workpiece with a flammable chemical aid, keep all welding sources, sparks and flames at least 20 feet from the workpiece until the flammable evaporates. Provide adequate ventilation.

Special Firefighting Procedures: Toxic fumes may be produced-use an approved Self Contained Breathing Apparatus. See Hazardous decomposition products in Section 6.

Extinguishing Media: C02, dry chemical foam type.

Unusual Fire and Explosion Hazard: Some fluxes and chemical aids may give off hydrogen chloride, phosgene and chlorine gases. Cans, under pressure, and flammables may explode.

SECTION 6: REACTIVITY DATA HAZARDOUS DECOMPOSITION PRODUCTS

The term 'hazardous' should be interpreted as a term defined in the OSHA Hazard Communication Standard (29 CFR 1910, 1200) and does not necessarily imply the existence of any hazard. Welding electrodes, brazing alloys and solder solids as shipped are stable, nonflammable, nonexplosive and in most cases nonreactive. Certain fluxes and chemical aids may be reactive-see Section 5 and the attachment for these products. Fumes, gases and dusts given off during heating, welding, brazing, soldering, cutting or thermal spray processes cannot be classified simply. The composition and quantity of these are dependent upon the metal being welded, the process, procedures, and electrodes or other consumables used. Other conditions which also influence the composition and quantity of the fumes, gases, and dusts that workers may be exposed to include: coatings on the workpiece (paint, galvanizing, plating), the number of workers and the volume of the work space, the quality and amount of ventilation, the position of the worker's head with respect to the fumes generated, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbons vapors from cleansing and degreasing activities.)

During welding, thermal spraying and allied processes, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 2. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section 2, plus those of the base metal and coating, etc. as noted above.

Reasonably expected constituents of the fume may include: complex oxides of the metals listed in Section 2; the flux coatings may produce fluoride compounds, metal oxides, carbon and silica. Gaseous reaction products may include ozone, carbon monoxide, carbon dioxide, nitrogen oxides, and certain inert gases used as shielding gases. OSHA specifies that chromium VI compounds, nickel and its compounds must be considered as carcinogens because they are so classified by the NTP or IARC. Many welding and allied products contain chromium and nickel when listed in Section 2. While certain chromium and nickel compounds have been clearly shown to be animal and human carcinogens, more study is required to actually find if these compounds are present in welding fumes. For the safety of the worker, E+C chooses to designate all chromium and nickel containing compounds as a carcinogen/or possible carcinogen by marking these ingredients with a pound sign (#) in Section 2. See Section 10 for decomposition of chromium containing products. Monitor for chromium, nickel and cadmium compounds when they are present in Section 2 since the exposure limits may be exceeded before the 5mg/m^3 PEL/TLV for general welding fume. To our knowledge their are no reliable scientific studies which show that workers exposed to alloys containing chromium or nickel run increased risk of lung cancer because of exposure to the forms of nickel and chromium found in the fumes.

One recommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample inside the worker's helmet if worn or in the welder's breathing zone. See ANSI/AWS F1.1 available from the American Welding Society, P.O. Box 351040, Miami, FL 33135. Also from AWS is F1.3 *'Evaluating Contaminants in the Welding Environment- A Sampling Strategy Guide'*, which gives additional advice on sampling.

SECTION 7: ACCIDENTAL SPILL MEASURES

Dispose of waste material, powders, grinding, or filter residues in an environmentally sensitive manner in accordance with Federal, State and Local regulations. Use appropriate measures to keep airborne dust levels contained in accordance with exposure levels of Section 2. See also Section 8 for proper safe handling and storage.

SECTION 8: SAFE HANDLING AND STORAGE

Please read and understand the product label information for proper procedures and use. See ANSI Z49.1 'Safety in Welding and Cutting,' and chapter 11 of 'Thermal Spraying,' published by the American Welding Society and OSHA publication 2206 (29 CFR 1910) for more detail.

Respiratory Protection: If the work station is not properly ventilated to exhaust all fumes, vapors and dusts below the recommended exposure limits, use a NIOSH approved respirator.

Ventilation: Use enough general ventilation and local exhaust at the work site to keep all fumes and dust from the worker's breathing zone and the general area. Train welder to keep his/her face away from the fume/dust plume.

Eye Protection: Wear helmet or use face shield with appropriate filter lens. Provide protective screens and flash goggles if necessary, to shield others. As a rule, start with a shade that is too dark to see the weld zone, then go to the next lighter shade which gives sufficient view of the weld zone.

Other Protective Equipment: Wear hand, head, and body protection which help prevent injury from radiation, sparks and electrical shock. At a minimum, this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats as well as dark, protective clothing. Train workers not to touch live electrical parts and to insulate themselves from work and electrical ground.

SECTION 9: STATEMENT OF INTENT

WHILE WE BELIEVE THAT ALL INFORMATION PRESENTED HEREIN IS ACCURATE AND RELIABLE, THE DATA ARE NOT TO BE TAKEN AS A GUARANTEE OR REPRESENTATION OF ANY KIND FOR WHICH EUTECTIC CORPORATION ASSUMES LEGAL RESPONSIBILITY. THIS INFORMATION IS PRESENTED SOLELY FOR YOUR CONSIDERATION, INVESTIGATION, AND VERIFICATION. FOR MORE INFORMATION ABOUT THE INGREDIENTS LISTED, PLEASE REFER TO THE APPROPRIATE OSHA DOCUMENTS.

SECTION 10: CHEMICAL HAZARDS INFORMATION/EFFECTS OF OVEREXPOSURE

See Section 2 for the specific ingredients contained in this product, the OSHA/ACGIH exposure limits, SARA Title III and carcinogen listing.

GENERAL WELDING FUMES: (PEL/TLV=5mg/m³) Electric arc welding,brazing,soldering, or thermal spraying may create one or more of the following health hazards associated with the key ingredients listed in Section 2. Fumes,gases and dusts can be dangerous to your health . Certain medical studies have suggested that lung damage can result from overexposure to these fumes. Short term overexposure may result in dizziness, nausea, or dryness or irritation of nose, throat or eyes. Excessive overexposure may cause bronchial asthma, lung fibrosis, pneumoconiosis or siderosis (iron deposits in lung.) See also Section 6.

METAL FUME FEVER: Can be caused by inhalation of certain metallic compounds during the welding,heating,brazing, soldering or cutting operations. Symptoms are similar to influenza type sickness including chills,fever,head and muscle ache, tightness of chest, dryness of nose and mouth,muscular pain, nausea and vomiting. Symptoms usually occur within several hours after overexposure and may last 6-24 hours. Consult a physician immediately if any of these symptoms develop after welding operation.

GENERAL NUISANCE DUSTS: (Titanium dioxide,aluminum dioxide,zirconium oxide,calcium carbonate, volclay, etc: LISTED AS PARTICLES NOT OTHERWISE CLASSIFIED, TLV/PEL = 10/15 mg/m³) Most nuisance dusts are inert, nontoxic and chemically nonirritating. Skin contact has shown no problems other than possible drying and mechanical irritation. Eye contact can produce particulate irritation. Does not seem to be absorbed by the body through ingestion. Excessive inhalation can produce mild pulmonary irritation and possible nondisabling slight fibrosis of the lungs.

AMMONIA CHLORIDE: Overexposure to dust and fumes may be irritating to the eyes, nose and lungs. Ingestion may be harmful. Avoid moisture and heat, hazardous decomposition products may include ammonia and hydrogen chloride. Keep away from strong acids and bases. NFPA/HMIS 200.

BARIUM COMPOUNDS: Short term overexposure to soluble barium compounds may cause aching eyes, rhinitus, frontal headache, wheezing, laryngeal spasms, salivation or anorexia. Long term overexposure to soluble barium compounds may cause nervous disorders and may have deleterious effects on the heart , circulatory system and musculature.

BORON OXIDES. (Borax, Borates, Boric Acid) Oxides of boron are white, crystalline solids that form boric acid (mild acid) in the presence of moisture. Overexposure will likely cause mild irritation of the respiratory system, eyes and on open skin wounds. Ingestion may cause nausea, vomiting, diarrhea or erythematous flush. All effects are reversible.

CADMIUM & Cd COMPOUNDS: Cadmium fume can effect the body if it is inhaled. Overexposure causes irritation of the nose and throat. If enough has been inhaled, a delay of several hours, a person may develop metal fume fever. Death may occur in some instances. Repeated or prolonged overexposure may cause loss of smell sense, ulceration of the nose, shortness of breath, kidney damage and mild anemia. Exposure to cadmium fume has also been reported to cause increased incidence of cancer of the prostrate in men.

CALCIUM OXIDE: Calcium oxide can effect the body if inhaled, ingested or contact with eyes or skin. Short term overexposure causes irritation to the nose, eyes, throat and skin. Severe burns may result from contact. It may also cause bronchitis and pneumonia if excessive inhalation of fumes. Repeated or prolonged overexposure may cause irritation of the skin, ulceration and perforation of the nasal septum. Calcium oxides may attack some forms of plastics, rubber, or coatings.

CHROMIUM & Cr COMPOUNDS: See also Section 6 - Hazardous decomposition products. Chromium VI compounds may be produced during welding with chromium containing consumables. Good practice requires the reduction of worker exposure to chromium VI materials by using proper ventilation or fume removal, workers should also wash hands and change clothes after welding. Monitor for chromium VI since the TLV is 0.05mg/m³ and may be exceeded before reaching the 5mg/m³ PEL/TLV limits for general welding fume. Short term overexposure from inhalation of chromium VI can cause irritation of the respiratory system, lung damage and asthma type symptoms. Chromium VI salts can cause severe injury and death if ingested, can cause ulcers on skin, can burn eyes and cause allergic reactions. Studies of long term overexposure to Chromium VI have shown that production workers exposed to hexavelent chromium compounds have an excess of lung cancer, and these compounds are required to be listed as carcinogens by OSHA. Absorption through the skin can cause systematic poisoning primarily affecting the kidneys and liver.

COBALT & Co COMPOUNDS: Short term overexposure may cause pulmonary irritation, cough, dermatitis & weight loss. Repeated overexposure can produce reduced pulmonary functions, diffuse nodular fibrosis of lungs and respiratory hypersensitivity.

COPPER & Cu COMPOUNDS: The inhalation of fresh copper oxide fume may cause metal fume fever. No adverse long term health effects have been reported in literature.

FLUORIDE COMPOUNDS: (Such as K, Ca, Al, Na, Fluorspar, Cryolite, etc. are listed Fluoride fume.) Fluoride dust can affect the body if inhaled or if it comes in contact eyes or skin, or if it was swallowed. Short term overexposure may cause irritation of the eyes and respiratory tract. Fluorides usually have a soapy or salty taste and may cause nausea,vomiting, abdominal pain, bleeding of the stomach, shortness of breath, convulsions, muscular weakness or disturbed vision, if ingested. Compounds may give off HF gases in fire and form strong acids in the presence of moisture. Long term overexposure may cause excessive calcification of the bones, ligaments of the ribs, pelvis and spinal column. May also cause skin burns and/or rash.

GLYCERINE: (As mist) Contact with eyes may cause slight transient eye irritation. Prolonged skin contact may cause mild irritation. Ingestion single oral dose toxicity is low. High temperatures may generate vapor levels sufficient to cause irritation of the respiratory system.

GRAPHITE: (Natural, synthetic, Amorphous Graphite) Graphite may contain small amounts (0-3.5%wt) of crystalline Silica and (4-10%wt) of Fused Silica. Excess inhalation may result in irritation of the mucous membranes and long term inhalation may result in Silicosis. See description for SILICA. Dust may cause irritation of the eyes. Graphite causes slippery conditions.

HYDROXIDES: Sodium and Potassium Hydroxides are strong alkali and are corrosive to any tissue with which they come in contact. The severity of exposure will determine the health effects - mild irritation to severe burns wherever contact is made.

IRON & IRON COMPOUNDS: Overexposure to iron or iron compounds in fume may lead to general irritation of the respiratory tract if inhaled. Long term overexposure may cause siderosis which may also affect pulmonary function . Lungs will clear in time when exposure ceases.

KAOLIN: (Aluminum Silicate) Kaolin is classified as nuisance dust by ACGIH. Crystalline Silica is present in trace levels (less than 1% by weight).

MAGNESIUM/Mg OXIDE: The inhalation of magnesium oxide fume may cause metal fume fever. Long term adverse health affects are not known.

MANGANESE: (Also related compounds such as manganese dioxide.) Overexposure to manganese and its compounds may cause metal fume fever characterized by chills, fever, upset stomach, vomiting, irritation of the throat and aching of the body. Excessive overexposure may effect the central nervous system . Symptoms may include muscular weakness and tremors. Behavioral changes and changes in handwriting may also appear. Workers exposed to manganese compounds should receive quarterly medical examinations for early detection of manganese poisoning.

MOLYBDENUM: Overexposure to molybdenum and insoluble molybdenum compounds may affect the body if they are inhaled, ingested or if they contact the eyes. Molybdenum trioxide has caused irritation of the eyes, nose, and throat, weight loss and digestive disturbances in animals. Long term effects are not known.

[illegible]. & Ni COMPOUNDS: Short term effects from overexposure to the inhalation of [illegible]umes may include metallic taste, nausea, tightness of chest, fever, or allergic reactions. Skin and eye contact may also cause allergic reactions. To prevent contact allergies, wash hands and change clothes after use. Long term overexposure to nickel and nickel compounds may cause lung fibrosis or pneumoconiosis. Studies of the nickel refinery workers indicated a higher incidence of lung and nasal cancers. Nickel and its compounds are required to be labeled carcinogenic by OSHA, NTP, or IARC.

POTASSIUM NITRATE: (Salt Peter) Effects of overexposure - mildly irritating to the eyes, skin and mucous membranes. Prolonged inhalation of dusts may cause irritation of the respiratory system. When involved in fire , can yield toxic gaseous oxides of nitrogen. Spontaneous reaction may occur with easily oxidizable material, increases flammability of any combustible material.

POTASSIUM OXALATE: (Oxalic Acid) Fumes may affect the body if inhaled or contact with eyes or skin. The fumes may cause mild irritation or burns depending on the amount of overexposure. Excessive inhalation may cause systemic poisoning with symptoms such as pain in throat, esophagus and stomach.

SILICA: (Crystalline Silica, Quartz Dust, Sand, Fused Silica, Silicates) Crystalline Silica can effect the body if inhaled. Repeated overexposure to Silica dust may cause Silicosis or scaring of the lungs with chronic cough and shortness of breath. Silica has a disputed listing as a Group 2A carcinogen by the IARC based on limited evidence in humans and sufficient evidence in animals.

SILICON, SILICON OXIDES: (Amorphous Silica) Short term overexposure may pose as a possible eye irritant. Repeated inhalation of amorphous silica can cause pneumoconiosis or non disabling fibrosis of the lung.

SILVER: (Ag, and certain soluble silver compounds) Can affect the body if inhaled, ingested or contact with skin. Overexposure can cause discoloration/darkening of the eyes, nose, throat and skin. Silver nitrate is strongly corrosive and can cause burns.

TIN & Sn COMPOUNDS: Tin and Tin compounds can affect the body if inhaled or if they make contact with eyes and skin. Short term overexposure toxicity is low. The compounds may cause irritation of the skin, eyes and throat. Long term overexposure [illegible] are not known.

[illegible]TEN/W CARBIDE: Tungsten Carbide Incompatibility: - Produces violent reaction with Iodine Pentafluoride and lead oxide. Burns with incandescence if heated to dull red with nitrogen oxide and fluorine gases. Reacts with flame when chlorine trifluoride is present. Short term overexposure to Tungsten Carbide dust by inhalation may cause coughing, dyspnea, soreness in the chest, weight loss, bronchitis and asthma. May also cause pulmonary fibrosis and radiological changes in the lung. May cause contact dermatitis upon skin contact since particles are sharp. Eye contact may cause irritation. Chronic overexposure to WC by inhalation may cause 'Hard Metal Lung' with symptoms as described above.

UREA: Urea is a weak basic compound, not usually considered hazardous in normal use. Upon exposure to heat and moisture, it may hydrolyze to corrosive ammonium carbamate and toxic cyanuric acid. Fine powder is treated as a nuisance dust. May cause mild irritation to the eyes, skin and throat. NFPA/HMIS 110.

VANADIUM/V OXIDES: The hazard information given in Section 2 for Vanadium is listed as Vanadium Pentoxide dust. Overexposure may cause irritation of the eyes, nose, throat and respiratory tract. A greenish discoloration of the tongue may result. Repeated overexposure may produce more severe symptoms as mentioned and also chronic bronchitis, or allergic skin rash.

ZINC and Zn COMPOUNDS: Zinc oxide fumes are usually given off when zinc is heated such as heating of galvanized coating and can affect the body if inhaled. Short term overexposure may cause metal fume fever (see separate description). Severe and prolonged exposure to Zinc oxide may cause pulmonary edema and pneumonia.

ZIRCON: (As zirconium fume - zirconium silicate) May effect the body if inhaled. Overexposure may cause irritation of the respiratory system. Zirconium silicate is insoluble and considered inert, although it is possible to form granuloma in the lungs and skin.

MATERIAL SAFETY DATA SHEET
ADDITIONAL INFORMATION FOR
FLUXES AND CHEMICAL AIDS

This section provides additional information specifically for the hazards, handling and safe use of fluxes and chemical aids used for welding, brazing, soldering, and part preparation for welding related tasks

SECTION 6: REACTIVITY DATA

	FLUXES & INERT CHEMICAL AIDS	FLAMMABLE
STABILITY:	STABLE	STABLE
CONDITIONS TO AVOID:	NONE	HEAT, FLAME ,SPARKS
HAZARDOUS POLYMERIZATION:	NONE	NONE
INCOMPATABILITY:	STRONG ACIDS, CYANIDES,SULFIDES	N/A
HAZARDOUS DECOMPOSITION:	IN THE PRESENCE OF WATER AND HEAT FLUXES MAY GIVE OFF HCL & HF.	SEE SECTION 5

SECTION 7: ACCIDENTAL SPILL MEASURES

If a flux or chemical aid is accidentally spilled, contain spill, absorb, and sweep up. Flush area with water to an approved chemical drain. Dispose of in an evironmentally sensitive manner in accordance with Federal, State and Local regulations. Use appropriate measures to keep airborne dust levels contained in accordance with exposure levels of Section 2. See also section 8 for proper safe handling and storage.

SECTION 8: SAFE HANDLING AND STORAGE

Please read and understand the product label information for proper procedures and use.

Respiratory Protection: If the work station is not properly ventilated to exhaust all fumes, vapors and dusts below the recommended exposure limits, use a NIOSH approved respirator.
Skin Protection: Wear chemical & oil impervious gloves. Always wash hands thoroughly after use. Use full protective equipment normally used in welding/brazing operations so as to prevent skin contact.
Ventilation: Use enough general ventilation and local exhaust at the work site to keep all fumes and dust from the workers breathing zone and the general area. Train welder to keep his/her face away from the fume/dust plume.
Eye Protection: Wear chemical tight goggles. Do not wear contact lenses. Wear face shield with appropriate filter lens recommended for the specific welding operation.

SECTION 9: STATEMENT OF INTENT

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SECTION 10: CHEMICAL HAZARDS INFORMATION

(See Section 2 for the OSHA/ACGIH exposure limits, SARA III listing and carcinogen information)

CHLORIDE COMPOUNDS: (Zinc Chloride and Generally Not Listed - Calcium Chloride, Sodium Chloride, etc.) Overexposure may cause severe irritation or burns of the eyes and skin. Chloride compounds will form strong acids in the presence of water and may give off HCL gas in fire. Ingestion may cause nausea.

ETHYL ACETATE: Can affect the body if inhaled, ingested or if it comes in contact with the eyes or skin. Short term overexposure may cause irritation of the eyes, nose or throat. Severe overexposure may cause weakness, drowsiness and unconciousness. Prolonged skin contact may cause irritation.

ETHYL ALCOHOL: (ETHANOL, denatured Ethyl Alcohol) Warning - Flammable! Keep away from sparks, flame and heat. Use adequate ventilation. High vapor concentrations may cause upper respiratory tract irritation and narcosis. Liquid and vapor contact can cause eye irritation.

ETHYLENE GLYCOL: (Regular) Can affect the body if contact with eyes, open skin wounds, or if ingested. Single dose oral toxicity is moderate. Excessive ingestion may cause central nervous system effects, pulmonary and kidney effects, serious injury or even death. Inhalation of vapors may cause respiratory irritation. Ethylene Glycol is present in small percentages by weight of E + C fluxes and should pose very little problems to the welder if proper ventilation procedures are used.

HYDROCHLORIC ACID: WARNING- STRONG ACID-HANDLE WITH CARE! CAUTION- Contact with common metals, produces hydrogen, which forms explosive mixtures in air. HCL in fluxes is a reagent grade 36-38%, balance water. Corrosive liquid-may cause permanent visual and tissue burn damage. Use chemical goggles, gloves, and proper clothing. Excessive inhalation may cause pulmonary edema, circulatory failure, respiratory system failure, and collapse. If ingested, may be fatal, severe burns to the mouth, throat and stomach, nausea, vomiting. NFPA/HMIS 300.

METHANOL: (Methyl Alcohol: WARNING -FLAMMABLE!) Harmful if swallowed. Skin contact and vapors reaching the eyes can cause irritation. Swallowing or breathing high concentrations may produce headaches, nausea, weakness, drowsiness, vomiting, drunkenness, blurred vision, blindness or death. Prolonged repeated exposure can cause digestive disturbances and failure of vision, liver and kidneys.

MINERAL OIL: (As mist- petroleum based lubricants) Inhalation of large amounts of mineral oil mist may cause adverse respiratory affects. May cause pulmonary effects. Prolonged skin exposure may cause a dermatitis. Not known to be an eye irritant.

NAPHTHA: (Coal tar: WARNING -FLAMMABLE!) Keep away from heat and ignition sources. Short term overexposure to Naphtha can cause light-headedness, drowsiness, and unconciousness. It may also cause mild irritation of the eyes, nose and skin. May cause exacerbation of respiratory disease symptoms due to increased irritation. Coal tar naphtha is a non-uniform mixture of aromatic hydrocarbons and may contain benzene.

NITRIC ACID: WARNING! - STRONG ACID CORROSIVE - Handle with care! - CAUTION - Contact with common metals, produces hydrogen, which forms explosive mixtures in air. Nitrogen oxides may be given off when burned. Corrosive liquid - may cause permanent visual and tissue burn damage. Use chemical goggles, gloves, and proper clothing. Excessive inhalation may cause pulmonary edema, circulatory failure, respiratory system failure, and collapse. If ingested, may be fatal, severe burns to the mouth, throat and stomach, nausea, vomiting. NFPA/HMIS 300.

STARCH: (Pregelatinized, chemically modified potato starch) completely biodegradable. Allowed to be used in the food packaging industry as 21 CFR 178.3520 Industrial Starch, Modified. Avoid heat and flames. Products of combustion may be hazardous. Treat as nuisance dust. Used only in E+C EXFLUX 1005 flux remover.

SULFURIC ACID: WARNING! STRONG ACID CORROSIVE-HANDLE WITH CARE! CAUTION- Contact with common metals, produces hydrogen, which forms explosive mixtures in air. A violent exothermic reaction occurs with water. Sulfur dioxides may be given off when burned. Corrosive Liquid- may cause permanent visual and tissue burn damage. Use chemical goggles, gloves, and proper clothing. Excessive inhalation may cause pulmonary edema, circulatory failure, respiratory system failure, and collapse. If ingested, may be fatal, severe burns to the mouth, throat and stomach, nausea, vomiting. NFPA/HMIS 302.

TALC, non asbestos: (Soapstone, Magnesium Silicate Hydrate) Normally treated as a nuisance dust. Can affect the body if inhaled or contact with eyes. Repeated inhalation of talc dust may cause scarring of the lungs and shortness of breath, chronic cough, and heart failure.

VEE-GUM: (Magnesium Aluminum Silicate, Hydrated) Hazardous ingredients are crystalline silica present 2-4% by weight VEE-GUM amount. Because of VEE-GUM hydrated form, little or no release of silica is expected unless the application involves further grinding. See Silica for details.

VM&P NAPHTHA: (Petroleum Solvent: Warning - FLAMMABLE!) Clear water like liquid bland petroleum odor . Contains approx. 87% wt of C7-C8 saturated hydrocarbons, 5% Toluene, 6% Xylene, and 2% Ethylbenzine (see Section 2). Keep product away from ignition sources. Flammable limits in air 0.9% - 7%. High vapor concentrations are irritating to the eyes and respiratory tract and may cause headaches, dizziness, unconciousness, and other central nervous system effects, including death.

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absorbent

Material Safety Data Sheet
be used to comply with
A's Hazard Communication Standard,
CFR 1910.1200. Standard must be
ulted for specific requirements.

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY (As Used on Label and List)
ABSORBS-IT (Product Code #01037)

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

Section I

Manufacturer's Name EXCEL-MINERAL COMPANY, INC.	Emergency Telephone Number (805) 683-5321 149
Address (Number, Street, City, State, and ZIP Code) 111 S. La Patera Lane, Goleta, CA 93117	Telephone Number for Information (805) 683-5321
P.O. Box 878	Date Prepared October 30, 1988
Goleta, CA 93116	Signature of Preparer (optional) Ronald M Bailey

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
sedimentary opal clay -- a natural earth material containing on the average of less than 10% crystalline silica (SiO_2 CAS #14808607)	Based on PEL/TLV for crystalline silica, respirable dust exposure should be maintained below 1 mg/m^3			

***The Threshold Limit Value-Time Weighted Average (TLV-TWA)*—the time-weighted average concentration for a normal 8-hour workday and a 40-hour workweek, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect.

**Threshold Limit Values for Chemical Substances in the Work Environment Adopted by ACGIH, 1986-87, page 3, paragraph a)

Section III — Physical/Chemical Characteristics

Boiling Point	N/A	Specific Gravity (H_2O = 1)	2.2
Vapor Pressure (mm Hg.)	N/A	Melting Point	N/A
Vapor Density (AIR = 1)	N/A	Evaporation Rate (Butyl Acetate = 1)	N/A

Solubility in Water
Less than 1.5%

Appearance and Odor
Buff granular mineral - odorless

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	LEL	UEL
Non-flammable	Non-flammable	---	---

Extinguishing Media
N/A-(product itself may be used as an extinguisher)

Special Fire Fighting Procedures
None

Unusual Fire and Explosion Hazards
None

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MATERIAL SAFETY DATA SHEET

For chemicals, coatings and related materials

DATE PREPARED: 10-6-92
SUPERCEDES: 7-27-92
PREPARED BY: Cathy Griffith, (303)-289-5651

Manufacturer

NAME : Fel-Pro Inc.
ADDRESS: 6120 East 58th Avenue
ADDRESS: Commerce City , CO
ADDRESS:
ZIPCODE: 80022

EMERGENCY PHONE NUMBER
DAY: (303)-289-5651
NIGHT: CHEMTREC (800)-424-9300
INFORMATION PHONE NUMBER (303)-289-5651

Section I - Product

NUMBER: 0-0203
NAME : Nordbak Backing Material Hardener
CLASS : Amine Blend
US NUMBER: 99-9969

H M I S Hazard Codes
Health: 3 Serious
Flammability: 2 Moderate
Reactivity: 0 Minimal

Section II - Hazardous Ingredients

Ingredient Material Description	Percent by weight	C. A. S. Registry No.	LEL	Vapor Pressure mm Hg @ 20 C
Aliphatic Amine Blend	10-20	MIX	N/A	N/A
Diethanolamine	< 1.0	111-42-2	N/A	N/A
Diethylenetriamine (DETA)	1-10	111-40-0	1.	0.09
Triethylenetetramine	20-40	112-24-3	N/A	N/A
Aminoethylpiperazine (AEP)	60-80	140-31-8	1.	0.09

Section III - Physical Data

Boiling Range: N/A - N/A deg F
Vapor Pressure: N/A mm @ 20 deg C
Specific Gravity: 0.95
Evaporation Rate: Slower
(relative to n-butyl acetate)
Odor Threshold: no data

Freezing Point: N/A deg F
Vapor Density: Heavier than air
H2O Soluble: Appreciable (10.0-99.9%)
% Volatile by Volume: Nil %
pH: alkaline

Appearance and Odor: Blue thin liquid with moderate acrid odor

Section IV - Fire and Explosion Hazard Data

Flash point: >250 deg F
(Method Used) Tag
Autoignition temp: no data

Explosive Limits: LEL N/A, UEL (%V in air) N/A

FLAMMABILITY CLASSIFICATION
OSHA: Combustible Liquid - Class IIIB
DOT : Not regulated

EXTINGUISHING MEDIA: Foam, CO2, Dry Chemical

SPECIAL FIRE FIGHTING PROCEDURES:
Wear self-contained breathing apparatus and protective clothing. Use water to cool exposed containers. Water stream directed into fire may cause frothing with subsequent spread of fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
Irritating and/or toxic gases or fumes may be generated by thermal decomposition or combustion. Closed containers may rupture or explode (due to pressure build-up) when exposed to extreme heat.

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Section V - Toxicological Information

Ingredient / Material Description	UK MEL ppm	UK OEL ppm	OSHA PEL ppm	ACGIH TLV mg/m3	ACGIH (twa) ppm	LD50(mg/kg) (rat) ORAL	LD50(mg/kg) (rbt) DERMAL	LC50(ppm) (rat) INHAL
Aliphatic Amine Blend	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Diethanolamine	N/A	3.0	3.0	N/A	3.0	N/A	N/A	N/A
Diethylenetriamine (DETA)	N/A	1.0*	1.0*	N/A	1.0*	1070.0	1080.0	N/A
Triethylenetetramine	N/A	N/A	N/A	N/A	N/A	2500.0	805.0	N/A
Aminoethylpiperazine (AEP)	N/A	N/A	N/A	N/A	N/A	2100.0	880.0	N/A

*skin

Section VI - Health Hazard Data

EFFECTS OF OVEREXPOSURE: THRESHOLD LIMIT VALUES: See Section V

EFFECTS OF ACUTE OVEREXPOSURE

EYES: Severe irritant. Corrosive. May cause chemical burns with permanent corneal injury and even blindness.

SKIN: Severe irritant. Corrosive. May cause chemical burns and blister Repeated or prolonged overexposure may cause sensitization. May be absorbed in harmful amounts.

INHALATION: May cause irritation of respiratory tract. Overexposure may cause headache, nausea, and vomitting. Material aspirated into lungs may cause chemical pneumonitis.

INGESTION: May cause irritation/burns of mouth, throat, and stomach. Symptoms include nausea, abdominal pain and possible collapse.

***Preexisting pulmonary and dermatological disorders may be aggravated by exposure to hazardous components.

CHRONIC OVEREXPOSURE INFORMATION:

*None of the components of this product are listed as known or suspected carcinogens by NTP, IARC or OSHA.

**Studies suggest that chronic overexposure and/or systemic toxicity effects are targeted at the liver and kidneys. Repeated or prolonged inhalation of vapors may cause respiratory sensitization.

EMERGENCY AND FIRST AID PROCEDURES:

EYES: Flush with plenty of water at least 15 minutes. Obtain immediate medical attention.

SKIN: Remove contaminated clothing. Wash affected area(s) thoroughly with soap and water. Consult a physician.

INHALATION: Remove to fresh air. If breathing is difficult, give oxygen. Administer artificial respiration if not breathing. Obtain medical attention.

INGESTION: DO NOT INDUCE VOMITING. Give water or milk if victim is conscious and not drowsy. Should vomiting occur, be sure to keep victim`s head below hips to avoid aspiration of vomitus into the lungs. Obtain immediate medical attention.

Section VII - Reactivity Data

STABILITY: Stable

STABILITY CONDITIONS TO AVOID: Not Applicable

INCOMPATABILITY (MATERIALS TO AVOID CONTACT WITH):
Strong bases or oxidants. Strong Lewis or mineral acids.

HAZARDOUS DECOMPOSITION PRODUCTS:
Acrid smoke. Oxides of carbon. Toxic nitrogenous oxides. Ammonia.

HAZARDOUS POLYMERIZATION: Will not occur
POLYMERIZATION CONDITIONS TO AVOID: Reaction with large amounts of epoxy resins releases considerable heat and may release acrid fumes.

Section VIII - Spill or Leak Procedures

STEPS FOR MATERIAL SPILLAGE:
Ventilate area. Wear appropriate protective equipment during cleanup. Eliminate sources of ignition. Shut off source of leak if safe to do so. Dike or contain spill. Absorb with inert material. Sweep or shovel into containers with lids. Cover loosely and store in a well-ventilated area until disposal. Wash spill area with soap and water. Prevent washings from entering waterways.

WASTE DISPOSAL METHODS:
Review all local, state, and federal regulations concerning health and pollution for appropriate disposal procedures.

Section IX - Special Protection Information

RESPIRATORY PROTECTION:
If the TLV is exceeded, if use is performed in a poorly ventilated space or area with limited ventilation, use NIOSH-approved ammonia/amine vapor cartridge respirator in accordance with 29 CFR 1910.134. If use is performed in a confined space, use NIOSH-approved supplied-air respirator in accordance with applicable health and safety regulations. Use NIOSH-approved respirator for dusts and mists when grinding or machining cured compound. Use self-contained breathing apparatus when burning, welding, or torch cutting indoors on or near cured compound. Use positive-pressure supplied-air breathing apparatus when burning, welding, or torch cutting outdoors on or near cured compound.

VENTILATION:
Local exhaust as needed to control vapor/dust levels to below recommended limits.

PROTECTIVE GLOVES: nitrile, neoprene, natural rubber.

EYE PROTECTION: Chemical safety goggles. Face shield.

OTHER PROTECTIVE EQUIPMENT:
Accessible eye wash and safety shower.
Clean protective clothing
Rubber apron

Section X - Special Precautions

HANDLING AND STORAGE PRECAUTIONS:
FOR PROFESSIONAL USE ONLY
DO NOT TAKE INTERNALLY
AVOID CONTACT WITH EYES, SKIN, AND CLOTHING
AVOID BREATHING VAPOR/DUST/MIST
WASH THOROUGHLY AFTER HANDLING
TIGHTLY RESEAL ALL PARTIALLY USED CONTAINERS
USE ONLY WITH ADEQUATE VENTILATION
DO NOT REUSE EMPTY CONTAINER WITHOUT COMMERCIAL CLEAN OR RECONDITION
***SEE SECTION IX FOR SPECIFIC INFORMATION**

-------- 00203 Backing Material Hardener --------

OTHER INFORMATION:

*N/A = Information or data Not Available***
**NTP = National Toxicology Program
**IARC = International Agency for Research on Cancer
**NIOSH = National Institute of Occupational Safety and Health
**ACGIH = American Conference of Governmental Industrial Hygienists
**OSHA = Occupational Safety and Health Administration
***PEL = Permissable Exposure Limit (8-hr. TWA) (OSHA)
***TLV = Threshold Limit Value (8-hr. TWA) (ACGIH)
***STEL = Short Term Exposure Limit (15-min TWA) (OSHA)
***C = Ceiling Value

Section XI - Regulatory Data

VOC Content by weight (lbs/gal): 0.0
CALIFORNIA PROP 65: Not known to contain any substances listed by the State of California as known to cause cancer or reproductive harm.

TRANSPORTATION

	DOT	UN	
HAZARD CLASS :	Corrosive Material	Corrosive Liquid	
UN/NA NUMBER :	UN1719	UN1719	
SHIPPING NAME:	Alkaline Corrosive Liquid, nos (Aminoethylpiperazine, Triethylenetetramine)	Alkaline Corrosive Liquid nos (Aminoethylpiperazine, Triethylenetetramine)	
CLASS NUMBER :	8	AIR: 8	MARINE: 8
SUBSID. RISK :	N/A	AIR: N/A	MARINE: N/A
PACKING GROUP:	II	AIR: II	MARINE: II

REPORTING
CERCLA REPORTABLE QUANTITY (lbs): As product: NONE As Waste: NONE
SARA SECTION 304 EMERGENCY RESPONSE REPORTABLE QUANTITY (lbs): NONE
SARA SECTION 311/312 INVENTORY REPORTING (Y/N): Y
SARA SECTION 311/312 HAZARD CLASS(ES):

ACUTE HEALTH	DELAYED HEALTH	FIRE	REACTIVE	SUDDEN PRESSURE RELEASE
x	x			

SARA SECTION 313 ROUTINE RELEASE REPORTING CHEMICALS: NONE

CHEMICAL	MAXIMUM % BY WT.

COMPONENTS ON TSCA INVENTORY (Y/N): Y

DISPOSAL
EPA RCRA WASTE CLASS: Not Regulated
EPA RCRA WASTE NUMBER: Not Regulated
CALIFORNIA LIST LAND BAN (Y/N): Not Applicable

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REASON FOR ISSUE: ADD UK EXPOSURE LIMITS REISSUE REQD: N

--------- 00203 Regular Backing Hardener --------

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MATERIAL SAFETY DATA SHEET

For chemicals, coatings and related materials

DATE PREPARED: 6-23-92
SUPERCEDES: 9-15-91
PREPARED BY: Cathy Griffith, (303)-289-5651

Manufacturer

NAME : Fel-Pro Inc.
ADDRESS: 6120 East 58th Avenue
ADDRESS: Commerce City , CO
ADDRESS:
ZIPCODE: 80022

EMERGENCY PHONE NUMBER
DAY: (303)-289-5651
NIGHT: CHEMTREC (800)-424-9300
INFORMATION PHONE NUMBER (303)-289-5651

Section I - Product

NUMBER: 0-0205
NAME : Nordbak Locking Compound Hardener
CLASS : Amine
US KIT NUMBER: 99-9897

H M I S Hazard Codes
Health: 3 Serious
Flammability: 1 Slight
Reactivity: 0 Minimal

Section II - Hazardous Ingredients

Ingredient Material Description	Percent by weight	C. A. S. Registry No.	LEL	Vapor Pressure mm Hg @ 20 C
Nonyl Phenol	10-20	25154-54-3	N/A	0.001
Aliphatic Amine Blend	1-10	MIX	N/A	N/A
Diethanolamine	< 1.0	111-42-2	N/A	N/A
Diethylenetriamine (DETA)	1-10	111-40-0	1.	0.09
Triethylenetetramine	1-10	112-24-3	N/A	N/A
Aminoethylpiperazine (AEP)	10-30	140-31-8	1.	0.09
Polyethylene Polyamine Adduct	60-80	CONFIDENTIAL	N/A	N/A

Section III - Physical Data

Boiling Range: N/A - N/A deg F
Vapor Pressure: N/A mm @ 20 deg C
Specific Gravity: 0.97
Evaporation Rate: Slower
(relative to n-butyl acetate)
Odor Threshold: no data

Freezing Point: N/A deg F
Vapor Density: Heavier than air
H2O Soluble: Appreciable (10.0-99.9%)
% Volatile by Volume: Nil %
pH: alkaline

Appearance and Odor: Clear thin liquid with mild ammoniacal odor

Section IV - Fire and Explosion Hazard Data

Flash point: >200.0 deg F
(Method Used) Tag
Autoignition Temp: no data

Explosive Limits: LEL N/A UEL (%V in air) N/A

FLAMMABILITY CLASSIFICATION
OSHA: Combustible Liquid - Class IIIB
DOT : Not regulated

EXTINGUISHING MEDIA:
Foam, CO2, Dry Chemical

SPECIAL FIRE FIGHTING PROCEDURES:
Wear self-contained breathing apparatus and protective clothing. Use water to cool exposed containers. Water stream directed into fire may cause frothing with subsequent spread of fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
Irritating and/or toxic gases or fumes may be generated by thermal decomposition or combustion. Closed containers may rupture or explode (due to pressure build-up) when exposed to extreme heat.

Section V - Toxicological Information

----- Ingredient ----- Material Description	PEL	TLV (twa) mg/m3	TLV (twa) ppm	LD50(mg/kg) (rat) ORAL	LD50(mg/kg) (rbt) DERMAL	LC50(ppm) (rat) INHAL
Nonyl Phenol	N/A	N/A	N/A	580.0	2140.0	N/A
Aliphatic Amine Blend	N/A	N/A	N/A	N/A	N/A	N/A
Diethanolamine	3.0	N/A	3.0	N/A	N/A	N/A
Diethylenetriamine (DETA)	1.0*	N/A	1.0*	1070.0	1080.0	N/A
Triethylenetetramine	N/A	N/A	N/A	2500.0	805.0	N/A
Aminoethylpiperazine (AEP)	N/A	N/A	N/A	2100.0	880.0	N/A
Polyethylene Polyamine Adduct	N/A	N/A	N/A	N/A	N/A	N/A
	*skin					

Section VI - Health Hazard Data

EFFECTS OF OVEREXPOSURE: THRESHOLD LIMIT VALUES: See Section V

EFFECTS OF ACUTE OVEREXPOSURE

EYES: Corrosive. May cause chemical burns with permanent corneal injury and even blindness.

SKIN: Severe irritant. Corrosive. May cause chemical burns and blister Strong skin sensitizer. May be absorbed in harmful amounts.

INHALATION: May cause irritation of respiratory tract. Overexposure may cause headache, nausea, and vomitting. Material aspirated into lungs may cause chemical pneumonitis.

INGESTION: May cause irritation/burns of mouth, throat, and stomach. Symptoms include nausea, abdominal pain and possible collapse. Toxic.

***Preexisting pulmonary and dermatological disorders may be aggravated by exposure to hazardous components.

CHRONIC OVEREXPOSURE INFORMATION:

*None of the components of this product are listed as known or suspected carcinogens by NTP, IARC, or OSHA.

**Studies suggest that chronic overexposure and/or systemic toxicity effects are targeted at the liver and kidneys. Repeated or prolonged inhalation of vapors may cause respiratory sensitization.

EMERGENCY AND FIRST AID PROCEDURES:

EYES: Flush with plenty of water at least 15 minutes. Obtain immediate medical attention.

SKIN: Remove contaminated clothing. Wash affected area(s) thoroughly with soap and water. Consult a physician.

INHALATION: Remove to fresh air. If breathing is difficult, give oxygen. Administer artificial respiration if not breathing. Obtain medical attention.

INGESTION: DO NOT INDUCE VOMITING. Give water or milk if victim is conscious and not drowsy. Should vomiting occur, be sure to keep victim's head below hips to avoid aspiration of vomitus into the lungs. Obtain immediate medical attention.

Section VII - Reactivity Data

STABILITY: Stable

STABILITY CONDITIONS TO AVOID: Not Applicable

INCOMPATABILITY (MATERIALS TO AVOID CONTACT WITH):

Strong bases or oxidants. Strong Lewis or mineral acids.

HAZARDOUS DECOMPOSITION PRODUCTS:

Acrid smoke. Oxides of carbon. Toxic nitrogenous oxides. Ammonia.

-------- 00205 Locking Compound Hardener --------

HAZARDOUS POLYMERIZATION: Will not occur
POLYMERIZATION CONDITIONS TO AVOID:
Reaction with large quantities of epoxy resins releases considerable heat and may release acrid fumes.

Section VIII - Spill or Leak Procedures

STEPS FOR MATERIAL SPILLAGE:
Ventilate area. Wear appropriate protective equipment during cleanup. Shut off source of leak if safe to do so. Dike or contain spill. Absorb with inert material. Sweep or shovel into containers with lids. Cover loosely and remove to appropriate waste area. Wash spill area with soap and water.

WASTE DISPOSAL METHODS:
Review all local, state, and federal regulations concerning health and pollution for appropriate disposal procedures.

Section IX - Special Protection Information

RESPIRATORY PROTECTION:
If the TLV is exceeded, if use is performed in a poorly ventilated space or area with limited ventilation, use NIOSH-approved ammonia/amine vapor cartridge respirator in accordance with 29 CFR 1910.134. If use is performed in a confined space, use NIOSH-approved supplied-air respirator in accordance with applicable health and safety regulations. Use NIOSH-approved respirator for dusts and mists when grinding or machining cured compound. Use self-contained breathing apparatus when burning, welding, or torch cutting on or near cured compound.

VENTILATION:
Local exhaust as needed to control vapor/dust levels to below recommended limits.

PROTECTIVE GLOVES: nitrile, neoprene, natural rubber.

EYE PROTECTION: Chemical safety goggles, Face shield

OTHER PROTECTIVE EQUIPMENT:
Accessible eye wash and safety shower.
Clean protective clothing. Rubber apron

Section X - Special Precautions

HANDLING AND STORAGE PRECAUTIONS:
FOR PROFESSIONAL USE ONLY
DO NOT TAKE INTERNALLY
AVOID CONTACT WITH EYES, SKIN, AND CLOTHING
AVOID BREATHING VAPOR/DUST/MIST
WASH THOROUGHLY AFTER HANDLING
TIGHTLY RESEAL ALL PARTIALLY USED CONTAINERS
USE ONLY WITH ADEQUATE VENTILATION
DO NOT REUSE EMPTY CONTAINER WITHOUT COMMERCIAL CLEAN OR RECONDITION

OTHER INFORMATION:
*N/A = Information or data Not Available***
**NTP = National Toxicology Program
**IARC = International Agency for Research on Cancer
**NIOSH = National Institute of Occupational Safety and Health
**ACGIH = American Conference of Governmental Industrial Hygienists
**OSHA = Occupational Safety and Health Administration
***PEL = Permissable Exposure Limit (8-hr. TWA) (OSHA)
***TLV = Threshold Limit Value (8-hr. TWA) (ACGIH)
***STEL = Short Term Exposure Limit (15-min TWA) (OSHA)
***C = Ceiling Value

-------- 00205 Locking Compound Hardener --------

Section XI - Regulatory Data

VOC Content by weight (lbs/gal): 0.0
CALIFORNIA PROP 65: Not known to contain any substances listed by the State of California as known to cause cancer or reproductive harm.

TRANSPORTATION

	DOT	UN
HAZARD CLASS :	Corrosive Material	Corrosive Liquid
UN/NA NUMBER :	UN1719	UN1719
SHIPPING NAME:	Caustic Alkali Liquid, nos (Aminoethylpiperazine, Triethylenetetramine)	Caustic Alkali Liquid, nos (Aminoethylpiperazine, Triethylenetetramine)
CLASS NUMBER :	8	AIR: 8 MARINE: 8
SUBSID. RISK :	N/A	AIR: N/A MARINE: N/A
PACKING GROUP:	II	AIR: II MARINE: II

REPORTING
CERCLA REPORTABLE QUANTITY (lbs): As product: NONE As Waste: NONE
SARA SECTION 304 EMERGENCY RESPONSE REPORTABLE QUANTITY (lbs): NONE
SARA SECTION 311/312 INVENTORY REPORTING (Y/N): Y
SARA SECTION 311/312 HAZARD CLASS(ES):

ACUTE HEALTH	DELAYED HEALTH	FIRE	REACTIVE	SUDDEN PRESSURE RELEASE
x	x			

SARA SECTION 313 ROUTINE RELEASE REPORTING CHEMICALS: NONE

CHEMICAL	MAXIMUM % BY WT.

COMPONENTS ON TSCA INVENTORY (Y/N): Y

DISPOSAL
EPA RCRA WASTE CLASS: Not Regulated
EPA RCRA WASTE NUMBER: Not Regulated
CALIFORNIA LIST LAND BAN (Y/N): Not Applicable

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REASON FOR ISSUE: change name, update shipping REISSUE REQD: N

--------- 00205 Locking Compound Hardener --------

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MATERIAL SAFETY DATA SHEET

For chemicals, coatings and related materials

DATE PREPARED:	SUPERCEDES:	PREPARED BY:
6-23-92	5-22-91	Cathy Griffith, (303)-289-5651

Manufacturer

NAME : Fel-Pro, Inc.
ADDRESS: Chemical Products Division
ADDRESS: 6120 East 58th Avenue
ADDRESS: Commerce City, CO
ZIPCODE: 80022

EMERGENCY PHONE NUMBER
DAY: (303)-289-5651
NIGHT: CHEMTREC (800)-424-9300
INFORMATION PHONE NUMBER (303)-289-5651

Section I - Product

NUMBER: 10024
NAME : Nordback Locking Compound Resin
CLASS : Epoxy Resin
US KIT NO: 99-9897

H M I S Hazard Codes
Health: 2 Moderate
Flammability: 1 Slight
Reactivity: 0 Minimal

Section II - Hazardous Ingredients

Ingredient Material Description	Percent by weight	C. A. S. Registry No.	LEL	Vapor Pressure mm Hg @ 20 C
Bisphenol-A Epoxy Resin	20-30	25068-38-6	N/A	0.0001

Section III - Physical Data

Boiling Range: N/A - N/A deg F
Vapor Pressure: N/A mm @ 20 deg C
Specific Gravity: 1.08
Evaporation Rate: Slower
(relative to n-butyl acetate)
Odor Threshold: NO DATA

Freezing Point: N/A deg F
Vapor Density: Heavier than air
H2O Soluble: Negligible (< 0.1%)
% Volatile by Volume: Nil %
pH: Not Applicable

Appearance and Odor: Clear viscous liquid with little odor

Section IV - Fire and Explosion Hazard Data

Flash point: 400.0 deg F
(Method Used) Pensky-Martens
Auto-ignition Temp: no DATA

Explosive Limits: LEL N/A UEL (%V in air) N/A

FLAMMABILITY CLASSIFICATION
OSHA: Combustible Liquid - Class IIIB
DOT : Not regulated

EXTINGUISHING MEDIA:
Foam, CO2, Dry Chemical

SPECIAL FIRE FIGHTING PROCEDURES:
Wear self-contained breathing apparatus and protective clothing. Use water to cool exposed containers. Water stream directed into fire may cause frothing with subsequent spread of fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
Irritating and/or toxic gases or fumes may be generated by thermal decomposition or combustion. Closed containers may rupture or explode (due to pressure build-up) when exposed to extreme heat.

Section V - Toxicological Information

Ingredient / Material Description	PEL	TLV (twa) mg/m3	TLV (twa) ppm	LD50(mg/kg) (rat) ORAL	LD50(mg/kg) (rbt) DERMAL	LC50(ppm) (rat) INHAL
Bisphenol-A Epoxy Resin	N/A	N/A	N/A	11400	>13000	No deaths in saturated air

Section VI - Health Hazard Data

EFFECTS OF OVEREXPOSURE: THRESHOLD LIMIT VALUES: See Section V

ACUTE OVEREXPOSURE INFORMATION
EYES: Moderate irritant. May cause reversible corneal injury.
SKIN: Moderate irritant. May cause dermatitus and allergic responses. Repeated or prolonged overexposure may cause sensitization.
INHALATION: Respiratory irritant when heated to high temperatures.
INGESTION: May cause nausea and vomitting. No specific effects known.
***Preexisting pulmonary and dermatological disorders may be aggravated by exposure to hazardous components.

CHRONIC OVEREXPOSURE INFORMATION:
*None of the components of this product are listed as known or suspected carcinogens by NTP, IARC, or OSHA.
**Steelcontains low levels of heavy metals. Repeated ingestion may lead to cumulative heavy metal poisoning.

EMERGENCY AND FIRST AID PROCEDURES:
EYES: Flush with plenty of water at least 15 minutes. Obtain immediate medical attention.
SKIN: Remove contaminated clothing. Wash affected area(s) thoroughly
INHALATION: Remove to fresh air. If breathing is difficult, give oxygen. Obtain medical attention.
INGESTION: Induce vomitting if victim is conscious and not drowsy. Give water or milk if victim is conscious and not drowsy. Should vomitting occur, be sure to keep victim's head below hips to avoid aspiration of vomitus into the lungs. Obtain immediate medical attention.

Section VII - Reactivity Data

STABILITY: Stable
STABILITY CONDITIONS TO AVOID: Not Applicable

INCOMPATABILITY (MATERIALS TO AVOID CONTACT WITH):
Strong bases or oxidants. Strong Lewis or mineral acids.

HAZARDOUS DECOMPOSITION PRODUCTS:
Acrid fumes. Oxides of carbon.
Aldehydes and acids from incomplete combustion. Phenols.

HAZARDOUS POLYMERIZATION: Will not occur
POLYMERIZATION CONDITIONS TO AVOID: Reaction with amine hardeners in large amounts generates considerable heat.

Section VIII - Spill or Leak Procedures

STEPS FOR MATERIAL SPILLAGE:
Ventilate area. Wear appropriate protective equipment during cleanup. Contain spill. Absorb with inert material. Sweep or shovel into containers with lids. Cover loosely and remove to appropriate waste area. Wash spill area with soap and water.

-------- 10024 Locking Compound Resin --------

WASTE DISPOSAL METHODS:
Review all local, state, and federal regulations concerning health and pollution for appropriate disposal procedures.

Section IX - Special Protection Information

RESPIRATORY PROTECTION:
If the TLV is exceeded, if use is performed in a poorly ventilated confined space or area with limited ventilation, use NIOSH-approved organic vapor cartridge respirator in accordance with applicable health and safety regulations.Use NIOSH-approved respirator for dusts and mists when grinding or machining cured compound.

VENTILATION:
Local exhaust as needed to control vapor/dust levels to below recommended limits.

PROTECTIVE GLOVES: natural rubber, nitrile, neoprene

EYE PROTECTION:
Chemical safety goggles

OTHER PROTECTIVE EQUIPMENT:
Clean clothing to cover arms.

Section X - Special Precautions

HANDLING PRECAUTIONS:
FOR PROFESSIONAL USE ONLY
AVOID CONTACT WITH EYES, SKIN, AND CLOTHING

OTHER INFORMATION:
*N/A = Information or data Not Available***
**NTP = National Toxicology Program
**IARC = International Agency for Research on Cancer
**ACGIH = American Conference of Governmental Industrial Hygienists
**OSHA = Occupational Safety and Health Administration
***PEL = Permissable Exposure Limit (8-hr. TWA) (OSHA)
***TLV = Threshold Limit Value (8-hr. TWA) (ACGIH)

Section XI - Regulatory Data

VOC content (lbs/gal) : 0.0
California Propositon 65: Not known to contain any materials listed by the State of California as known to cause cancer or reproductive harm.

TRANSPORTATION

	DOT	UN
HAZARD CLASS :	Not Regulated	Not Regulated
UN/NA NUMBER :	Not Regulated	Not Regulated
SHIPPING NAME:	Not Regulated	Not Regulated
CLASS NUMBER :	Not Applicable	Not Applicable
SUBSID. RISK :	Not Applicable	Not Applicable
PACKING GROUP:	Not Applicable	Not Applicable

REPORTING
CERCLA REPORTABLE QUANTITY: As product: NONE As Waste: NONE
SARA SECTION 304 EMERGENCY RESPONSE REPORTABLE QUANTITY: NONE
SARA SECTION 311/312 INVENTORY REPORTING (Y/N): Y
SARA SECTION 311/312 HAZARD CLASS(ES): Acute health hazard
SARA Section 313 RELEASE REPORTING: N

COMPONENTS ON TSCA INVENTORY (Y/N): y

-------- 10024 Locking Compound Resin --------

DISPOSAL
EPA RCRA WASTE CLASS: Not Regulated
EPA RCRA WASTE NUMBER: Not Regulated
CALIFORNIA LIST LAND BAN (Y/N): Not Applicable

==========

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REASON FOR REVISION: change name REISSUE REQD: N

-------- 10024 Locking Compound Resin --------

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MATERIAL SAFETY DATA SHEET

For chemicals, coatings and related materials

DATE PREPARED:	SUPERCEDES:	PREPARED BY:
10-6-92	6-23-92	Cathy Griffith, (303)-289-5651

Manufacturer

NAME : Fel-Pro, Inc.
ADDRESS: 6120 East 58th Avenue
ADDRESS: Commerce City , CO
ADDRESS:
ZIPCODE: 80022

EMERGENCY PHONE NUMBER
DAY: (303)-289-5651
NIGHT: CHEMTREC (800)-424-9300
INFORMATION PHONE NUMBER (303)-289-5651

Distributor

NAME :
ADDRESS:
ADDRESS:
ADDRESS:
PHONE :

Section I - Product

NUMBER: 10032
NAME : Nordbak Regular Backing Resin
CLASS : Epoxy Resin
US KIT NUMBER: 99-9969

H M I S Hazard Codes
Health: 2 Moderate
Flammability: 1 Slight
Reactivity: 0 Minimal

Section II - Hazardous Ingredients

Ingredient Material Description	Percent by weight	C. A. S. Registry No.	LEL	Vapor Pressure mm Hg @ 20 C
Nonyl Phenol	1-10	25154-54-3	N/A	0.001
Butyl Glycidyl Ether	1-10	2426-08-6	N/A	2.0
Bisphenol-A Epoxy Resin	20-30	25068-38-6	N/A	0.0001

Section III - Physical Data

Boiling Range: N/A - N/A deg F
Vapor Pressure: < 0.01 mm @ 20 deg C
Specific Gravity: 1.8
Evaporation Rate: Slower
(relative to n-butyl acetate)
Odor Threshold: no data

Freezing Point: N/A deg F
Vapor Density: Heavier than air
H2O Soluble: Negligible (< 0.1%)
% Volatile by Volume: 1-10 %
pH: no data

Appearance and Odor: Brown liquid with sweet odor

Section IV - Fire and Explosion Hazard Data

Flash point: 200.0 deg F
(Method Used) Tag

Explosive Limits: LEL N/A UEL (%V in air) N/A

FLAMMABILITY CLASSIFICATION
OSHA: Combustible Liquid - Class IIIB DOT : Not regulated

EXTINGUISHING MEDIA:
Foam, CO2, Dry Chemical

SPECIAL FIRE FIGHTING PROCEDURES:
Wear self-contained breathing apparatus and protective clothing. Use water to cool exposed containers. Water stream directed into fire may cause frothing with subsequent spread of fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
Irritating and/or toxic gases or fumes may be generated by thermal decomposition or combustion. Closed containers may rupture or explode (due to pressure build-up) when exposed to extreme heat.

Section V - Toxicological Information

Ingredient / Material Description	UK OEL ppm	UK MEL ppm	OSHA PEL ppm	ACGIH TLV mg/m3	ACGIH (twa) ppm	LD50(mg/kg) (rat) ORAL	LD50(mg/kg) (rbt) DERMAL	LC50(ppm) (rat) INHAL
Nonyl Phenol	N/A	N/A	N/A	N/A	N/A	580.0	2140.0	N/A
Butyl Glycidyl Ether	25.	N/A	25.	N/A	25.0	2050.0	2500.0	1030.0
Bisphenol-A Epoxy Resin	N/A	N/A	N/A	N/A	N/A	11000.	>13000.	N/A

Section VI - Health Hazard Data

EFFECTS OF OVEREXPOSURE: THRESHOLD LIMIT VALUES: See Section V

ACUTE OVEREXPOSURE INFORMATION

EYES: Moderate irritant. May cause reversible corneal injury.

SKIN: Moderate irritant. May cause dermatitus and allergic responses. Repeated overexposure may cause sensitization.

INHALATION: May cause irritation of respiratory tract. Overexposure may cause headache, nausea, and vomitting. Material aspirated into lungs may cause chemical pneumonitis.

INGESTION: May cause irritation of mouth, throat, and stomach. Symptoms include nausea, abdominal pain and possible collapse. Slightly toxic.

***Preexisting pulmonary and dermatological disorders may be aggravated by exposure to hazardous components.

CHRONIC OVEREXPOSURE INFORMATION:

*None of the components of this product are listed as known or suspected carcinogens by NTP, IARC, or OSHA.

**Butyl Glycidyl Ether is mutagenic in vitro (test tube). Mutagenicity tests in mice gave mixed results.

EMERGENCY AND FIRST AID PROCEDURES:

EYES: Flush with plenty of water at least 15 minutes. Obtain immediate medical attention.

SKIN: Remove contaminated clothing. Wash affected area(s) thoroughly with soap and water. Consult a physician.

INHALATION: Remove to fresh air. If breathing is difficult, give oxygen. Administer artificial respiration if not breathing. Obtain medical attention.

INGESTION: Induce vomitting if victim is conscious and not drowsy. Give water or milk if victim is conscious and not drowsy. Should vomitting occur, be sure to keep victim`s head below hips to avoid aspiration of vomitus into the lungs. Obtain immediate medical attention.

Section VII - Reactivity Data

STABILITY: Stable

STABILITY CONDITIONS TO AVOID: Not Applicable

INCOMPATABILITY (MATERIALS TO AVOID CONTACT WITH):
Strong bases or oxidants. Strong Lewis or mineral acids.

HAZARDOUS DECOMPOSITION PRODUCTS: Acrid fumes. Oxides of carbon. Aldehydes and acids from incomplete combustion. Phenols.

HAZARDOUS POLYMERIZATION: Will not occur

POLYMERIZATION CONDITIONS TO AVOID:
Reaction with some amine hardeners releases considerable heat and may release acrid fumes.

-------- 10032 Backing Material Resin --------

Section VIII - Spill or Leak Procedures

STEPS FOR MATERIAL SPILLAGE:

Ventilate area. Wear appropriate protective equipment during cleanup. Shut off source of leak if safe to do so. Dike or contain spill. Absorb with inert material. Sweep or shovel into containers with lids. Cover loosely and remove to appropriate waste area. Wash spill area with soap and water.

WASTE DISPOSAL METHODS:

Review all local, state, and federal regulations concerning health and pollution for appropriate disposal procedures.

Section IX - Special Protection Information

RESPIRATORY PROTECTION:

If the TLV is exceeded, if use is performed in a poorly ventilated space or area with limited ventilation, use NIOSH-approved organic vapor cartridge respirator in accordance with 29 CFR 1910.134.
Use NIOSH-approved respirator for dusts and mists when grinding or machining cured compound. Use NIOSH-approved self-contained breathing apparatus when burning, torch cutting, or welding on or near cured compound indoors. Use NIOSH-approved positive-pressure supplied-air respirator when burning, torch cutting, or welding on or near cured compound outdoors.

VENTILATION:

Local exhaust as needed to control vapor/dust levels to below recommended limits.

PROTECTIVE GLOVES: nitrile, neoprene, natural rubber

EYE PROTECTION:

Chemical safety goggles

OTHER PROTECTIVE EQUIPMENT:

Accessible eye wash and safety shower.
Clean protective clothing

Section X - Special Precautions

HANDLING AND STORAGE PRECAUTIONS:

FOR PROFESSIONAL USE ONLY
DO NOT TAKE INTERNALLY
AVOID CONTACT WITH EYES, SKIN, AND CLOTHING
AVOID BREATHING VAPOR/DUST/MIST
WASH THOROUGHLY AFTER HANDLING
USE ONLY WITH ADEQUATE VENTILATION

DO NOT REUSE EMPTY CONTAINER WITHOUT COMMERCIAL CLEAN OR RECONDITION

OTHER INFORMATION:

*N/A = Information or data Not Available***
**NTP = National Toxicology Program
**IARC = International Agency for Research on Cancer
**NIOSH = National Institute of Occupational Safety and Health
**ACGIH = American Conference of Governmental Industrial Hygienists
**OSHA = Occupational Safety and Health Administration
***PEL = Permissable Exposure Limit (8-hr. TWA) (OSHA)
***TLV = Threshold Limit Value (8-hr. TWA) (ACGIH)
***STEL = Short Term Exposure Limit (15-min TWA) (OSHA)
***C = Ceiling Value

-------- 10032 Backing Material Resin --------

Section XI - Regulatory Data

VOC CONTENT (lbs/gal): 0.0
CALIFORNIA PROP 65: Not known to contain any materials listed by the State of California as known to cause cancer or reproductive harm.

TRANSPORTATION	DOT	UN
HAZARD CLASS :	Not Regulated	Not Regulated
UN/NA NUMBER :	Not Regulated	Not Regulated
SHIPPING NAME:	Not Regulated	Not Regulated
CLASS NUMBER :	Not Applicable	Not Applicable
SUBSID. RISK :	Not Applicable	Not Applicable
PACKING GROUP:	Not Applicable	Not Applicable

REPORTING
CERCLA REPORTABLE QUANTITY: As product: None As Waste: none
SARA SECTION 304 EMERGENCY RESPONSE REPORTABLE QUANTITY: none
SARA SECTION 311/312 INVENTORY REPORTING (Y/N): y
SARA SECTION 311/312 HAZARD CLASS(ES): Acute, delayed health hazard
SARA SECTION 313 RELEASE REPORTING CHEMICALS: none

COMPONENTS ON TSCA INVENTORY (Y/N): y

DISPOSAL
EPA RCRA WASTE CLASS: Not Regulated
EPA RCRA WASTE NUMBER: Not Regulated
CALIFORNIA LIST LAND BAN (Y/N): Not Applicable

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REASON FOR REVISION: Add UK exposure limits REISSUE REQD: n

-------- 10032 Backing Material Resin --------

========== Material Safety
========== For chemicals, coatings and related materials ==========

MSDS #: 1915-92
DATE PREPARED: SUPERSEDES: PREPARED BY:
-12-92 Cathy Griffith, (303)-289-5651

========== Manufacturer ==========

ME : Fel-Pro Chemical Products, L.P.
ADDRESS: P.O. Box 1205
ADDRESS: 7450 North McCormick Blvd.
ADDRESS: Skokie, IL
ZIPCODE: 60076-8205

EMERGENCY PHONE NUMBER
DAY: (708)-674-7700
NIGHT: CHEMTREC
(800) 424-9300
INFORMATION PHONE NUMBER
(303)-289-5651

========== Section I - Product ==========

NUMBER: 51001 51002, 51004, 51005, 51006, 51007, 51008, 51009, 51010, 51011,
NAME : C5-A
CLASS : Lubricant
UN NO : none
CAS NO: none - mix

Health: 1 Slight
Flammability: 1 Slight
Reactivity: 0 Minimal

========== Section II - Hazardous Ingredients ==========

---- Ingredient ---- Material Description	Percent by weight	C. A. S. Registry No.	LEL	Vapor Pressure mm Hg @ 20 C
Petroleum oil	40-60	64742-52-5	N/A	N/A
Copper flake	20-40	7440-50-8	N/A	N/A
Silicon dioxide (encapsulated)	1-3	14808-60-7	N/A	N/A
raphite	10-20	7782-42-5	N/A	N/A

========== Section III - Physical Data ==========

Boiling Range: N/A - N/A deg F
Vapor Pressure: N/A mm @ 20 deg C
Specific Gravity: 1.3
Evaporation Rate: Slower
(relative to n-butyl acetate)
Odor Threshold: no data

Freezing Point: N/A deg F
Vapor Density: Heavier than air
H2O Soluble: Negligible (< 0.1%)
% Volatile by Volume: N/A %
pH: Neutral

Appearance and Odor: Viscous liquid with little odor

========== Section IV - Fire and Explosion Hazard Data ==========

Flash point: >300.0 deg F
(Method Used) Pensky-Martens
Autoignition Temperature: NO DATA

Explosive Limits: LEL N/A UEL (%V in air) N/A

FLAMMABILITY CLASSIFICATION
OSHA: Combustible Liquid - Class IIIB DOT : Not regulated

EXTINGUISHING MEDIA: Foam, CO2, Dry Chemical

SPECIAL FIRE FIGHTING PROCEDURES:
Wear self-contained breathing apparatus and protective clothing. Use water to cool exposed containers. Water stream directed into fire may cause frothing with subsequent spread of fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
Irritating and/or toxic gases or fumes may be generated by thermal

decomposition or combustion. Closed containers may *rupture or explode* (due to pressure build-up) when exposed to extreme heat.

Section V - Toxicological Information

Ingredient Material Description	PEL mg/m3	TLV (twa) mg/m3	TLV (twa) ppm	LD50(mg/kg) (rat) ORAL	LD50(mg/kg) (rbt) DERMAL	LC50(ppm) (rat) INHAL
Petroleum oil	5.	5.0	N/A	N/A	N/A	N/A
Copper flake	1.	1.0	N/A	N/A	N/A	N/A
Silicon dioxide (encapsulated)	0.1	0.1	N/A	N/A	N/A	N/A
Graphite	2.5	2.5	N/A	N/A	N/A	N/A

Section VI - Health Hazard Data

EFFECTS OF OVEREXPOSURE: THRESHOLD LIMIT VALUES: See Section V

ACUTE OVEREXPOSURE INFORMATION
EYES: Mild irritant. No permanent corneal injury likely.
SKIN: Mild irritant. May cause defatting and redness.
INHALATION: Respiratory irritant when heated to high temperatures. Material aspirated into lungs may cause chemical pneumonitis.
INGESTION: May cause nausea and vomiting.
***Preexisting pulmonary and dermatological disorders may be aggravated by exposure to hazardous components.

CHRONIC OVEREXPOSURE INFORMATION:
*This product contains encapsulated silicon dioxide (quartz) which has been listed by NTP and IARC as a suspected human carcinogen via inhalation. No exposure to free respirable quartz is anticipated during normal use of this product. Quartz may be released, however, by grinding or machining of cured compound. Repeated and prolonged overexposure to free respirable quartz may cause silicosis, or other serious delayed lung injury.
**This product contains encapsulated graphite and copper. No exposure to free respirable copper or graphite is anticipated during normal use of this product. Copper or graphite may be released, however, by grinding or machining of cured compound. Repeated or prolonged overexposure to copper or graphite dust or fumes may cause lung injury.

EMERGENCY AND FIRST AID PROCEDURES:
EYES: Flush with plenty of water at least 15 minutes. Obtain immediate medical attention.
SKIN: Remove contaminated clothing. Wash affected area(s) thoroughly with soap and water. Consult a physician.
INHALATION: Remove to fresh air. If breathing is difficult, give oxygen. Administer artificial respiration if not breathing. Obtain medical attention.
INGESTION: DO NOT INDUCE VOMITING.
Give water or milk if victim is conscious and not drowsy. Should vomiting occur, be sure to keep victim's head below hips to avoid aspiration of vomitus into the lungs. Obtain immediate medical attention.

Section VII - Reactivity Data

STABILITY: Stable
STABILITY CONDITIONS TO AVOID: Not Applicable

INCOMPATABILITY (MATERIALS TO AVOID CONTACT WITH): Not Applicable

HAZARDOUS DECOMPOSITION PRODUCTS:
Acrid fumes. Oxides of carbon.

HAZARDOUS POLYMERIZATION: Will not occur
POLYMERIZATION CONDITIONS TO AVOID: Not Applicable

Section VIII - Spill or Leak Procedures

STEPS FOR MATERIAL SPILLAGE:
Ventilate area. Wear appropriate protective equipment during cleanup. Contain spill. Absorb with inert material such as vermiculite. Place into containers with lids. Cover loosely and remove to appropriate waste area. Wash spill area.

WASTE DISPOSAL METHODS:
Review all local, state, and federal regulations concerning health and pollution for appropriate disposal procedures.

Section IX - Special Protection Information

RESPIRATORY PROTECTION:
If the TLV is exceeded, if use is performed in a poorly ventilated space or area with limited ventilation, use a NIOSH-approved organic vapor cartridge respirator in accordance with 29CFR1910.130.

VENTILATION:
Local exhaust as needed to control vapor/dust levels to below recommended limits.

PROTECTIVE GLOVES: Cloth or synthetic

EYE PROTECTION: safety glasses

OTHER PROTECTIVE EQUIPMENT: Clean protective clothing. Eye wash.

Section X - Special Precautions

HANDLING AND STORAGE PRECAUTIONS:
FOR PROFESSIONAL USE ONLY
DO NOT TAKE INTERNALLY
AVOID CONTACT WITH EYES, SKIN, AND CLOTHING
AVOID BREATHING VAPOR/DUST/MIST

KEEP OUT OF REACH OF CHILDREN

OTHER INFORMATION:
*N/A = Information or data Not Available***
**NTP = National Toxicology Program
**IARC = International Agency for Research on Cancer
**NIOSH = National Institute of Occupational Safety and Health
**ACGIH = American Conference of Governmental Industrial Hygienists
**OSHA = Occupational Safety and Health Administration
***PEL = Permissible Exposure Limit (8-hr. TWA) (OSHA)
***TLV = Threshold Limit Value (8-hr. TWA) (ACGIH)
***STEL = Short Term Exposure Limit (15-min TWA) (OSHA)
***C = Ceiling Value

Section XI - Regulatory Data

C Content by weight (lbs/gal): 0.0
LIFORNIA PROP 65: Not known to contain any substances listed as known or spected carcinogens per NTP, IARC, or OSHA.

TRANSPORTATION	DOT	UN	
HAZARD CLASS :	Not Regulated	Not Regulated	
UN/NA NUMBER :	Not Regulated	Not Regulated	
SHIPPING NAME:	Not Regulated	Not Regulated	
CLASS NUMBER :	N/A	AIR: N/A	MARINE: N/A
SUBSID. RISK :	N/A	AIR: N/A	MARINE: N/A
PACKING GROUP:	N/A	AIR: N/A	MARINE: N/A

CERCLA REPORTABLE QUANTITY (lbs): As product: 10000 As Waste: 10000
SARA SECTION 304 EMERGENCY RESPONSE REPORTABLE QUANTITY (lbs): NONE
SARA SECTION 311/312 INVENTORY REPORTING (Y/N): Y
SARA SECTION 311/312 HAZARD CLASS(ES):

ACUTE HEALTH	DELAYED HEALTH	FIRE	REACTIVE	SUDDEN PRESSURE RELEASE
x	x			

SARA SECTION 313 ROUTINE RELEASE REPORTING CHEMICALS: NONE

CHEMICAL	MAXIMUM % BY WT.

COMPONENTS ON TSCA INVENTORY (Y/N): Y

DISPOSAL
A RCRA WASTE CLASS: Not Regulated
A RCRA WASTE NUMBER: Not Regulated
LIFORNIA LIST LAND BAN (Y/N): Not Applicable

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REASON FOR ISSUE: complete review/revision REDISTRIBUTE: Y

MATERIAL SAFETY DATA SHEET

#1922

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : Nickel Anti-Seize Lubricant
IDENTIFICATION NUMBER: 51102,51119,51152,51153,51285,51286
PRODUCT USE/CLASS : Lubricant DATE PRINTED: 08/26/93

SUPPLIER:
Fel-Pro Chemical Products, L.P.
7450 N. McCormick Blvd.
P.O. Box 1205
Skokie, IL 60076-8205

EMERGENCY TELEPHONE: 800-424-9300
24 hrs.

MANUFACTURER:
Fel-Pro Chemical Products, L.P.
7450 N. McCormick Blvd.
P.O. Box 1205
Skokie, IL 60076-8205

EMERGENCY TELEPHONE: 800-424-9300
24 hrs.

PREPARER: Cathy Griffith, PHONE: 303-289-5651, PREPARE DATE: 08/27/93

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

ITEM	CHEMICAL NAME	CAS NUMBER	WT/WT %
01	Graphite	7782-42-5	10-20 %
02	Nickel	7440-02-0	10-20 %
03	Petroleum distillate	64742-18-3	10-20 %
04	Silicon dioxide (quartz)	14808-60-7	1-5 %

EXPOSURE LIMITS

ITEM	ACGIH TLV-TWA	ACGIH TLV-STEL	OSHA PEL-TWA	OSHA PEL-STEL	U. K. TLV-TWA	SKIN
01	2.5 mg/m3	N.E.	2.5 mg/m3	N.E.	N.E.	NO
02	.1mg/m3	N.E.	.1mg/m3	N.E.	N.E.	NO
03	5mg/m3	10mg/m3	5mg/m3	N.E.	N.E.	NO
04	0.1 mg/m3	N.E.	0.1 mg/m3	N.E.	0.1 mg/m3	NO

(See Section 16 for abbreviation legend)

SECTION 3 - HAZARDS IDENTIFICATION

*** EMERGENCY OVERVIEW ***: Harmful if inhaled. Harmful if swallowed. Causes skin and eye irritation. May cause allergic skin reaction. Respiratory irritant.

ACUTE EFFECTS - EYE CONTACT: Contact may cause eye irritation. Mechanical irritant. Contact may cause tearing and redness.

ACUTE EFFECTS - SKIN CONTACT: Substance may cause slight skin irritation. Repeated or prolonged contact may cause sensitization.

ACUTE EFFECTS - INHALATION: Dust may be slightly irritating to eyes and respiratory tracts. Prolonged inhalation may be harmful.

ACUTE EFFECTS - INGESTION: May cause nausea and vomiting.

SECTION 3 - HAZARDS IDENTIFICATION

CHRONIC OVEREXPOSURE EFFECTS -: *Preexisting pulmonary and dermatological disorders may be aggravated be exposure to hazardous conponents. *Repeated and prolonged inhalation of graphite or carbon dusts may cause pulmonary fibrosis, emphysema, and phuemoconiosis. the severity of these effects is greatly influenced by the presence of other harmful mineral dusts, most notably crystalline silica. *This product contains encapsulated silicon dioxide (quartz, silica). No exposure to free respirable silica is anticipated during normal use of this product. It should be noted, however, that free respirable silica has been listed as a supected human carcinogen by NTP and IARC. Inhalation of free respirable silica may cause silicosis or other serious delayed lung injury. Silica may be released by grinding or machining of coated materials. Use NIOSH-approved dust/mist respirator when grinding or machining coating or coated items. *This product contains encapsulated nickel powder. No exposure to free respirable nickel is anticipated during normal use of this product. It should be noted, however, that NTP and IARC have listed nickel as a possible cancer hazard, although IARC could not state with certainty which forms of nickel are human carcinogens. Rodents exposed to high levels of nickel powder via inhalation did not develop increased incidences of malignant tumors.

PRIMARY ROUTE(S) OF ENTRY: EYE CONTACT SKIN CONTACT INGESTION INHALATION

SECTION 4 - FIRST AID MEASURES

FIRST AID - EYE CONTACT: Immediately flush eyes wih plenty of water. Get medical attention, if irritation persists.

FIRST AID - SKIN CONTACT: Wash with soap and water. Get medical attention if irritation develops or persists.

FIRST AID - INHALATION: If symptoms occur, remove to fresh air. Medical personnel may administer oxygen if breathing is difficult. Seek medical attention if symptoms persist.

FIRST AID - INGESTION: If swallowed, do NOT induce vomiting. Give victim a glass of water or milk. Call a physician or poison control center immediately. Never give anything by mouth to an unconscious person.

SECTION 5 - FIRE FIGHTING MEASURES

FLASH POINT: 320 F
(TAGLIABUE CLOSED CUP)

LOWER EXPLOSIVE LIMIT: N.A.
UPPER EXPLOSIVE LIMIT: N.A.

AUTOIGNITION TEMPERATURE: No data

EXTINGUISHING MEDIA: FOAM DRY CHEMICAL WATER FOG CO2

UNUSUAL FIRE AND EXPLOSION HAZARDS: Finely divided dust in air may present explosion hazard. Prevent dust buildup. Closed containers may repture or

explode (due to pressure build-up) when exposed to extreme heat. Irritating and/or toxic gases or fumes may be generated by thermal decomposition or combustion.

SPECIAL FIREFIGHTING PROCEDURES: Halogenated extinguishing agents (such as Halon) should not be used. To control the spread of fire, do not use water; ring small fires with dry sand, using non-sparking shovels; avoid creating dust clouds, eliminate drafts, let fire exinguish itself. Use NIOSH-approved self-contained breathing apparatus and full protective clothing. Use water to cool exposed containers. Water stream directed into fire may cause frothing with subsequent spread of flame.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Reclaim clean material. Contaminated material should be swept or shoveled into appropriate waste container and disposed of in accordance with applicable federal, state and local regulatons.

SECTION 7 - HANDLING AND STORAGE

HANDLING: Wash hands before eating. Avoid prolonged or repeated contact with skin. DO NOT take internally. FOR INDUSTRIAL USE ONLY.

STORAGE: Store away from heat. KEEP OUT OF THE REACH OF CHILDREN.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: General ventilation usually adequate.

RESPIRATORY PROTECTION: Use NIOSH-approved dust/mist respirator when grinding or machining cured compound. If exposure levels are unknown, if levels exceed TLV/PEL, or if effects occur, use NIOSH-approved dust/mist respirator in accordance with applicable health and safety regulations and manufacturer's recommendations.

SKIN PROTECTION: Clean clothing to cover skin. Cloth or synthetic gloves.

EYE PROTECTION: Safety glasses.

OTHER PROTECTIVE EQUIPMENT: Accessible eye wash and safety shower.

HYGIENIC PRACTICES: Follow general industrial safety practices during use. DO NOT reuse empty containers without commercial clean or recondition. Follow all MSDS/label precautions even after container is emptied.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

BOILING RANGE	: 550 - 4946 F	VAPOR DENSITY	: Is heavier than air
ODOR	: Slight grease	ODOR THRESHOLD	: NO data
APPEARANCE	: Gray	EVAPORATION RATE	: Is slower than Butyl Acetate
SOLUBILITY IN H2O	: Negligible		
FREEZE POINT	: N/A	SPECIFIC GRAVITY	: 1.1767
VAPOR PRESSURE	: NO DATA	pH @ 0.0 %	: N/A
PHYSICAL STATE	: Paste	VISCOSITY	: High

COEFFICIENT OF WATER/OIL DISTRIBUTION: No data

(See Section 16 for abbreviation legend)

SECTION 10 - STABILITY AND REACTIVITY

CONDITIONS TO AVOID: Prolonged exposure to heat.

INCOMPATIBILITY: Strong bases or oxidants. F2; NH4NO3; Hydrazine; NH3; (H2 + dioxane); performic acid; P; Se; S; (Ti + KClO3); oxidants, perchlorates. Nickel will react with acids to liberate hydrogen gas which can form explosive mixtures with air. Reaction with acids can liberate hydrogen gas which can form explosive mixtures with air.

PRODUCTS OF DECOMPOSITION OR COMBUSTION -: Oxides of carbon. Various hydrocarbons. Under special conditions, nickel can react with carbon monoxide in reducing atmospheres to form nickel carbonyl, an extremely toxic gas.

HAZARDOUS POLYMERIZATION: Will not occur under normal conditions.
STABILITY: This product is stable under normal storage conditions.

SECTION 11 - TOXICOLOGICAL PROPERTIES

No product or component toxicological information is available.

SECTION 12 - ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION: No Information.

SECTION 13 - DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Review all current federal, state, and local reulations regarding health and disposal for appropriate disposal procedures. Incineration preferred.

SECTION 14 - TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME: Not regulated
DOT TECHNICAL NAME: Not regulated
DOT HAZARD CLASS: NOT REGULATED HAZARD SUBCLASS: N/A
DOT UN/NA NUMBER: N/A PACKING GROUP: N/A RESP. GUIDE PAGE:

IMDG INFORMATION: Not regulated.

AIR/IATA INFORMATION: Not regulated.

SECTION 15 - REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS: AS FOLLOWS -

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200)

CERCLA - SARA HAZARD CATEGORY:
This product has been reviewed according to the EPA 'Hazard Categories' promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

IMMEDIATE HEALTH HAZARD CHRONIC HEALTH HAZARD

SARA 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 of 1986 and 40 CFR Part 372:

CHEMICAL NAME	CAS NUMBER	WT/WT % IS LESS THAN
Nickel	7440-02-0	20.0 %

TOXIC SUBSTANCES CONTROL ACT:
This product contains the following chemical substances subject to the reporting requirements of TSCA 12(B) if exported from the United States:

CHEMICAL NAME	CAS NUMBER
No information is available.	

NEW JERSEY RIGHT-TO-KNOW:
The following materials are non-hazardous, but are among the top five components in this product:

CHEMICAL NAME	CAS NUMBER
Grease	NONE-MIX
Hydrotreated heavy paraffinic dist	64742-54-7

SECTION 15 - REGULATORY INFORMATION

PENNSYLVANIA RIGHT-TO-KNOW:
The following non-hazardous ingredients are present in the product at greater than 3%:

CHEMICAL NAME	CAS NUMBER
Grease	NONE-MIX
Hydrotreated heavy paraffinic dist	64742-54-7
Calcium Stearate	1592-23-0

CALIFORNIA PROPOSITION 65:
WARNING: The chemical(s) noted below and contained in this product, are known to the state of California to cause cancer, birth defects or other reproductive harm:

CHEMICAL NAME	CAS NUMBER
Nickel	7440-02-0

INTERNATIONAL REGULATIONS: AS FOLLOWS -

CANADIAN WHMIS: This MSDS has been prepared in compliance with Controlled Product Regulations except for use of the 16 headings.

CANADIAN WHMIS CLASS: NONE

RCRA HAZARDOUS WASTE CLASS: Not regulated

RCRA HAZARDOUS WASTE CODES: No Information.

CERCLA REPORTABLE QUANTITY (RQ): 100

OTHER INFORMATION

HMIS RATINGS - HEALTH: 1* FLAMMABILITY: 1 REACTIVITY: 0

PREVIOUS MSDS REVISION DATE: 08/26/93

REASON FOR REVISION: new format/complete update

LEGEND: N.A. - Not Applicable, N.E. - Not Established,
N.D. - Not Determined

LEGEND CONT: ACGIH = American Conference of Governmental Industrial Hygienists; OSHA = US Occupational Safety and Health AdministrationUK = United Kingdom; GER = Germany; TLV-TWA = Threshold Limit Value-Time Weighted Average (8 hrs); STEL = Short-Term Exposure Limit (15 min); C = Ceiling Value; PEL = Permissible Exposure Limit

REISSUE: Y

DISCLAIMER

To the best of our knowledge, the information contained in this MSDS is accurate or is obtained from sources believed to be accurate. However, no liability, expressed or implied, is assumed for the accuracy or completeness of the information contained herein. Buyer assumes liability in its use of the Material.

Adhesive

2A271

121

Fel-Pro Incorporated
7450 N McCormick Blvd
Box C1103
Skokie, Illinois 60076
Phone (312) 761-4500 and 674-7700

MATERIAL SAFETY DATA SHEET

=2SF51=

2252-85

Essentially similar to U S Dept. of Labor Form No LSB-00S-4, May 1969

SECTION I

MANUFACTURER'S NAME: Fel-Pro Incorporated	EMERGENCY TELEPHONE NO.: (312) 674-7700
ADDRESS (Number, Street, City, State, and ZIP Code): 7450 N. McCormick Blvd., Skokie, Illinois 60076	
CHEMICAL NAME AND SYNONYMS: Methyl-2-Cyanoacrylate	TRADE NAME AND SYNONYMS: Pro Grip 5500
CHEMICAL FAMILY: Cyanoacrylate Adhesives	FORMULA: $CH_3COOC(CN)=(CH_2)$

SECTION II—HAZARDOUS INGREDIENTS

PAINTS PRESERVATIVES AND SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)
Methyl-2-Cyanoacrylate	>90	2 ppm
Balance of product is considered nonhazardous per U.S. Dept. of Labor		
O.S.H.A. criteria re: 29CFR1910.1200 Hazard Communications Law.		

SECTION III—PHYSICAL DATA

BOILING POINT (°F.)	@ 2mmHg	~ 120°F	SPECIFIC GRAVITY (H_2O=1)	1.1
VAPOR PRESSURE (mmHg.)	@ 77°C	< 2 mmHg	PERCENT VOLATILE BY VOLUME (%)	~ 95%
VAPOR DENSITY AIR=1)		3.8	EVAPORATION RATE (=1)	Not Determined
SOLUBILITY IN WATER		Negligible	Water initiates rapid polymerization	
APPEARANCE AND ODOR	Clear to slightly hazy liquid - pungent, unpleasant odor vapors are mildly lachrymatory			

SECTION IV—FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method Used): 180°F, C.O.C.	FLAMMABLE LIMITS: Not known	Lel	Uel

EXTINGUISHING MEDIA
Dry chemical or CO_2 recommended. Water spray may result in hazardous polymerization.

SPECIAL FIRE FIGHTING PROCEDURES
Wear self-contained breathing apparatus and protective clothing to prevent contact with skin or eyes.

UNUSUAL FIRE AND EXPLOSION HAZARDS
Pyrolysis may result in formation of toxic fumes. Adhesive in absorbent material, such as rags used to wipe up spills, may undergo rapid polymerization and cause an increase in temperature that could conceivably result in autoignition.

DATE ISSUED: OCTOBER 20, 1992
DATE REVISED: NOVEMBER 2, 1994

MATERIAL SAFETY DATA SHEET

PRODUCT IDENTIFICATION:

SURGE RING ROPE is a family of products composed of a resin impregnated fiberglass core encased in spun polyester. The fiberglass is composed of > 99% fibrous glass (CAS# 65997-17-3). The spun polyester is composed of > 99% polyethylene terephthalate polymer (CAS# 25038-59-9).

HAZARDOUS INGREDIENTS:

The product contains the following hazardous materials that are driven off as vapors during the heat curing process at the site of end use:

Toluene	(CAS# 108-88-3)	14.25%
Ethanol	(CAS# 64-17-5)	6.63%
Diallyl Phthalate Monomer	(CAS# 131-17-9)	2.85%
Glycol Ether	(CAS# 111-76-2)	1.03%

PHYSICAL-CHEMICAL DATA:

SURGE RING ROPE is chemically stable and resistant to attack by oil, solvent, acid, and alkali. The autoignition temperature is approximately 1200°F.

PHYSICAL HAZARDS:

SURGE RING ROPE will burn if exposed to flame. Foam, 'alcohol' foam, carbon dioxide, or dry chemical extinguishers should be used. Self-contained breathing apparatus and full protective clothing is recommended in close proximity of the fire.

HEALTH HAZARD AND EXPOSURE DATA:

Inhalation of vapors can cause nasal and respiratory irritation. Repeated excessive exposure to vapors may cause central nervous system, liver, and kidney affects and respiratory or eye irritation. Overexposure to vapors has been suggested to cause liver abnormalities in humans.

FIRST AID:

Remove victim to fresh air immediately if symptoms of overexposure to vapors occurs. Consult a physician if necessary.

SAFE HANDLING PROCEDURES:

Use of an OSHA approved respirator is recommended when working in close proximity of vapors. Personal hygiene measures, such as washing the hands and face immediately after working with this product and before eating, smoking, or using lavatory facilities, are recommended.

DISPOSAL AND SHIPPING INFORMATION:

This material should be disposed of using high temperature incineration and after burner in accordance with local, state, and federal regulations. This material is not regulated by DOT and is not considered a hazardous material when in transit. Material should be stored in a temperature controlled room at approximately 55°F.

INFORMATION CONTACT:

Fibertek, Inc.
P.O. Box 4000
305 Beasley Drive
Franklin, TN 37065
(615)794-1400

To the best of our knowledge, the information contained herein is accurate. However, Fibertek assumes no liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any mateial 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 which exist.

FIBERTEK

P.O. Box 4000
305 Beasley Drive
Franklin, Tennessee 37065

Phone 615•794•1400
Fax 615•790•8289

FACSIMILE TRANSMITTAL

DATE: 10/28/97

TO: Claudia
GE

FROM: Barbara
Fibertek, Inc.

3 **PAGES (Including Cover Sheet)**

FIRST BRANDS

Material Safety Data Sheet
STP(R) Oil Treatment

Any questions, please call:
First Brands Corporation
83 Wooster Heights Road
Building 301
Danbury, CT 06813-1911

Telephone: (203) 731-2300

EMERGENCY TELEPHONE
(24 Hours)

CHEMTREC
(800) 424-9300
483-7616 in District of Columbia

NFPA HAZARD CODE:

4 = Extreme	Fire	0
3 - High	Health	1
2 = Moderate	Reactivity	1
1 = Slight	Specific	
0 = Insignificant		

I. IDENTIFICATION

PRODUCT NAME:	STP Oil Treatment
TYPE:	Oil additive
STOCK:	ST1006, ST1007, ST1007A, ST1010, ST1011, ST1015, ST1015CAN, ST 1020, ST1032, ST1064, ST1075, ST1094, ST1095, ST1505, FBAMIX1, ST1012, ST1014, ST1015C, ST1015P6, ST101526, ST1021, ST1022, ST1024, ST1411, ST1504, 95000, 95001, 95002, 95004, 95006, 95007, 95008, 95009, 95010, 95011, 95123, 95124, 95126, 95127, 95128, 95129, 95130, 95131, 9513X, 9501X, 9502X, ST1014P2T, ST1503
FORMULA:	RM-3579

II. PHYSICAL DATA

BOILING POINT, 760 mm Hg	greater than 400F
FREEZING POINT	below -40F
DENSITY (at 68F)	7.45 lbs/gal
VAPOR DENSITY (Air = 1)	greater than 1
VAPOR PRESSURE (at 68F)	low
VOLATILES BY VOLUME	nil
SOLUBILITY IN WATER, % by Wgt.	nil
EVAPORATION RATE (Butyl Acetate = 1)	less than 1
APPEARANCE AND ODOR	viscous light amber liquid, petroleum odor

III. HAZARDOUS INGREDIENTS

MATERIAL	%	CAS #	EXPOSURE LIMIT	SOURCE
Chemically neutralized heavy naphthenic petroleum distillates	15-40	Not applicable	none established	(3)
Solvent-dewaxed heavy paraffinic petroleum distillates	60-80	64742-65-0	5mg/m3 TWA	(3)
zinc dialkyldithiophosphate	3-11	Not applicable	none established	(3)

NON-HAZARDOUS INGREDIENTS > 1%

Calcium sulfonate	1-4	61789-86-4
Amine grafted ethylene/propylene copolymer	3-11	ACC#11951

None of the ingredients is listed as a carcinogen or potential carcinogen by OSHA, NTP or IARC.

The source for exposure limits listed above are:
(1) OSHA Permissible Exposure Limit (effective 9/89)
(2) ACGIH Threshold Limit Value (1988-89 Edition)
(3) Both the OSHA PEL and ACGIH TLV
(4) Recommended by the Manufacturer

IV. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT
Cleveland Open Cup: 400F

CSMA AEROSOL FLAME EXTENSION
Not applicable

FLAMMABLE LIMITS IN AIR, % BY VOLUME
Not determined

AUTOIGNITION TEMPERATURE
Not determined

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EXTINGUISHING MEDIA
Water fog, foam, alcohol foam, carbon dioxide, and dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES
Water or foam may cause frothing. Use water to cool fire-exposed containers. Avoid contact with strong oxidizing materials.

UNUSUAL FIRE AND EXPLOSION HAZARDS
None expected.

V. HEALTH HAZARD DATA

EFFECTS OF SINGLE OVEREXPOSURE

SWALLOWING Ingestion of petroleum oil, the major ingredient of this product, is unlikely to have any toxic effects. Petroleum oil may act as an intestinal lubricant and result in diarrhea or frequent loose stools.

SKIN ABSORPTION No effects expected from skin absorption

INHALATION Inhalation of this product is unlikely with normal usage, but if mists or vapors form, lipid pneumonitis may occur if exposure is prolonged in poorly ventilated surroundings.

SKIN CONTACT This product may cause moderate irritation, with possible reddening, swelling, and drying of the skin.

EYE CONTACT Splashes into the eye may cause irritation.

EFFECTS OF REPEATED OVEREXPOSURE
No evidence of adverse effects from available information.

OTHER EFFECTS OF OVEREXPOSURE
None currently known.

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MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE

Persons who are prone to acne or seborrhea are susceptible to blockage of hair follicles by insoluble oils. Folliculitis may develop. Comedones and perifollicular papules and pustules (oil boils) may occur. These effects should rapidly clear upon cessation of exposure. Good housekeeping and personal hygiene should prevent these effects.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARDS

None currently known.

EMERGENCY AND FIRST AID PROCEDURES

SWALLOWING	Do not induce vomiting. Treat symptomatically.
SKIN	Remove contaminated clothing. Wash all affected and exposed areas with soap and water.
INHALATION	Remove to fresh air.
EYES	Flush eyes with plenty of water for at least 15 minutes. Seek medical attention.
NOTES TO PHYSICIAN	There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition.

VI. REACTIVITY DATA

STABILITY	Stable.
HAZARDOUS POLYMERIZATION	Will not occur.
CONDITIONS TO AVOID	Heat, sparks and open flames.
INCOMPATIBILITY (Materials to Avoid)	Strong oxidizing agents.
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS	Carbon monoxide, carbon dioxide, aldehydes and ketones, combustion products of nitrogen and sulfur.

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VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED
Wear suitable personal protective equipment. Collect for disposal.
Larger spills may be absorbed on vermiculite or other similar material.

WASTE DISPOSAL METHOD
Incineration or landfill in accordance with federal, state, and local regulations.

VIII. SPECIAL PROTECTION INFORMATION

(for manufacturing and bulk spill cleanup)

RESPIRATORY PROTECTION
None required when handling at minimum feasible temperatures.

VENTILATION
General (mechanical) ventilation is adequate for normal handling.

PROTECTIVE GLOVES Nitrile rubber gloves
EYE PROTECTION Chemical safety goggles
OTHER PROTECTIVE EQUIPMENT
Eye wash

IX. SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
CAUTION: EYE IRRITANT
Avoid contact with eyes.
Wash thoroughly after using.
Empty container retains product residue.
Do not cut or weld on or near empty drums.
Do not reuse empty drums or pails unless properly cleaned.

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OTHER PRECAUTIONS
Observe all requirements of plant, company or government regulations.

KEEP OUT OF REACH OF CHILDREN.

X. DEPARTMENT OF TRANSPORTATION

HAZARDOUS MATERIALS	None
HAZARD CLASSIFICATION	None
IDENTIFICATION NUMBER	None
LABEL(S) REQUIRED)	None

XI. ENVIRONMENTAL DATA

EMERGENCY PLANNING AND COMMUNITY RIGHT TO KNOW INFORMATION
This product contains the following chemicals subject to SARA TITLE III, Section 313 reporting:

Chemical Name	CAS#	Weight %
Zinc dialkyldithiophosphate	N/A	3-11

Hazardous under OSHA/SARA 311	Yes, acute health.
California Proposition 65	This product does not contain chemicals regulated under CA Prop 65.
EPA Toxic Substances Control Act (TSCA)	All of the ingredients are listed on the TSCA inventory.
Canadian Environmental Protection Act	All of the ingredients are listed on the Canadian Domestic Substances list.
European Inventory of Commercial Chemical Substances (EINECS)	All of the ingredients are listed on the EINECS inventory.

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This MSDS is directed to professional users and bulk handlers of the product. Consumer products are labeled in accordance with Federal Hazardous Substances Act regulations.

While First Brands Corporation believes that the data contained herein are factual and the opinions expressed are those of qualified experts regarding the results of the tests conducted, the data are not to be taken as a warranty representation for which First Brands Corporation assumes legal responsibility. They are offered solely for your consideration, investigation and verification. Any use of these data and information must be determined by the user to be in accordance with applicable federal, state and local laws and regulations.

If more information is needed, please contact:

R. L. Lewis
First Brands Corporation
88 Long Hill St.
East Hartford, CT 06108
(203) 728-6194

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transportation regulations for specific requirements.

	D.O.T. SHIPPING INFORMATION	IMO SHIPPING INFORMATION
SHIPPING NAME	: CORROSIVE LIQUID, N.O.S.	CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S.
HAZARD CLASS	: 8	8
PACKING GROUP	: II	II
UN NUMBER	: UN1760	3267
IMDG PAGE	: Not Applicable	8147-1
	(PRODUCT REPORTABLE QUANTITY)	
D.O.T. HAZARDOUS SUBSTANCES	: Not Applicable	Not Applicable
TRANSPORT LABEL REQUIRED	: Corrosive	Corrosive

	ICAO/IATA	TRANSPORT CANADA
SHIPPING NAME	: CORROSIVE LIQUID, BASIC,	CORROSIVE LIQUID N.O.S. ORGANIC.N.O.S.
HAZARD CLASS	: 8	8
SUBSIDIARY CLASS	: --	--
UN/ID NUMBER	: 3267	1760
PACKING GROUP	: II	II
TRANSPORT LABEL REQUIRED	: Corrosive	Corrosive
PACKING INSTRUCTIONS	: PASSENGER 808 CARGO 812	Not Applicable
MAX NET QTY	: PASSENGER 1L CARGO 30L	Not Applicable

ADDITIONAL TRANSPORT INFORMATION

TECHNICAL NAME (N.O.S.) : (Contains diethylenetriamine)

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SECTION XV - REGULATORY INFORMATION

INVENTORY INFORMATION

US TSCA : This product is manufactured in compliance with all provisions of the Toxic Substances Control Act, 15 U.S.C. 2601 et. seq.
This product contains a chemical substance that is subject to export notification under Section 12 (b) of the Toxic Substances Control Act, 15 U.S.C. 2611.2610 et. seq.

CANADA DSL: Components of this product have been reported to Environment Canada in accordance with subsection 25 of the Canadian Environmental Protection Act and are included on the Domestic Substances List.

EEC EINECS: All components of this product are included in the European Inventory of Existing Chemical Substances (EINECS) in compliance with Council Directive 67/548/EEC, Amended 79/831/EEC.

OTHER ENVIRONMENTAL INFORMATION

The following components are defined as toxic chemicals subject to reporting requirements of Section 313 of Title III and of 40 CFR 372 or subject to other EPA regulations.

COMPONENT	CAS. NO.	%	TPQ(lbs)	RQ(lbs)	S313	RCRA	TSCA 12B
Bisphenol A	000080-05-7	5 - 10	NONE	NONE	YES	NONE	YES

PRODUCT CLASSIFICATION UNDER SECTION 311 OF SARA
ACUTE - Y CHRONIC - Y FIRE - N REACTIVE - N PRESSURE - N

SECTION XVI - OTHER INFORMATION

NFPA HAZARD RATING (National Fire Protection Association)

Fire - 1; FIRE : Materials that must be preheated before ignition can occur.
Health - 3; HEALTH : Materials which on short exposure could cause serious temporary or residual injury even though prompt medical treatment were given.
Reactivity - 0; REACTIVITY: Materials which in themselves are normally stable, even under fire exposure conditions, and which are not reactive with water.
Special - --

REASON FOR ISSUE: Revised Section XIV

Marvin A. Friedman, Ph.D., Director of Toxicology and Product Stewardship

This information is given without any warranty or representation. We do not assume any legal responsibility for same, nor do we give permission, inducement or recommendation to practice any patented invention without a license. It is offered solely for your consideration, investigation and verification. Before using any product, read its label.

Provided By Electrical Insulation Suppliers Inc.

MAY CAUSE ALLERGIC SKIN OR RESPIRATORY REACTION

CHRONIC HAZARD WARNING:
CHRONIC TOXICITY HAZARD. CONTAINS MATERIAL WHICH MAY CAUSE LUNG DAMAGE. POSSIBLE CANCER HAZARD BASED ON LABORATORY ANIMAL TESTS.
Risk depends on duration and level of exposure.

POTENTIAL HEALTH EFFECTS
EFFECTS OF OVEREXPOSURE:
The estimated acute oral (rat) LD50, acute dermal (rabbit) LD50 values are estimated to be greater than 2,000 mg/kg and 1,846 mg/kg, respectively. The 4-hour LC50 (rat) value is estimated to be greater than 20 mg/L.
Direct contact with this material may cause severe eye and skin irritation.
Inhalation overexposure may cause allergic respiratory reaction.
Refer to Section XI for toxicology information on the OSHA regulated components of this product.

SECTION IV - FIRST AID MEASURES

In case of skin contact, remove contaminated clothing without delay. Wear impervious gloves. Cleanse skin thoroughly with soap and water. Do not omit cleaning hair or under fingernails if contaminated. Do not reuse clothing without laundering. Do not reuse contaminated leatherware.
In case of eye contact, immediately irrigate with plenty of water for 15 minutes. Obtain medical attention without delay.
If vapor of this material is inhaled, remove from exposure. Administer oxygen if there is difficulty in breathing. Give artificial respiration if person is not breathing and continue until normal breathing is established. Obtain medical attention without delay.

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SECTION V - FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT	: > 212 F; 100 C
METHOD	: Tag Closed Cup
FLAMMABLE LIMITS (% BY VOL.)	: Not available
AUTOIGNITION TEMP.	: Not available
DECOMPOSITION TEMP.	: Not available

EXTINGUISHING MEDIA AND FIRE FIGHTING INSTRUCTIONS: Use water spray, carbon dioxide or dry chemical to extinguish fires. Use water to keep containers cool. Wear self-contained, positive pressure breathing apparatus and full fire-fighting protective clothing. See Section VIII (Exposure Controls/Personal Protection) for special protective clothing.

SECTION VI - ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Where exposure level is not known, wear NIOSH approved, positive pressure, self-contained respirator. Where exposure level is known, wear NIOSH approved respirator suitable for level of exposure. In addition to the protective clothing/equipment in Section VIII (Exposure Controls/Personal Protection), wear impervious boots. Cover spills with some inert absorbent material; sweep up and place in a waste disposal container. Flush area with water.

SECTION VII - HANDLING AND STORAGE

Do not get into eyes, on skin, on clothing. Avoid breathing vapor. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

SECTION VIII - EXPOSURE/CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS AND PERSONAL PROTECTIVE EQUIPMENT (PPE)
Utilize a closed system process where feasible. Where this material is not used in a closed system, good enclosure and local exhaust ventilation should be provided to control exposure when spraying or curing at elevated temperatures. Food, beverages and tobacco products should not be carried, stored or consumed where this material is in use. Before eating, drinking or smoking, wash face and hands with soap and water. Prevent eye and skin contact. Wear special protective equipment specified below for operations where eye or skin contact can occur. Prevent contamination of skin or clothing when removing protective equipment. Barrier creams may be used in conjunction with the gloves to provide additional skin protection. Provide eyewash fountain and safety shower in closed proximity to points of potential exposure. Where exposures are below the Permissible Exposure Limit (PEL), no respiratory protection is required. Where exposures exceed PEL, use respirator approved by NIOSH for the material and level of exposure. A full facepiece respirator also provides eye and face protection. Cutting, grinding or sanding of parts fabricated after curing of

SECTION XI - TOXICOLOGICAL INFORMATION

Toxicological information for the product is found under Section III, HAZARDS IDENTIFICATION.
Toxicological information on OSHA regulated components of this product is as follows:

Pulmonary function may be reduced by inhalation of respirable quartz silica. Overexposure to respirable quartz silica can cause delayed (chronic) fibrosis and other lung injury. Chronic inhalation exposure showed that quartz silica can cause lung cancer in rats but not in mice. There is also limited human evidence which shows an association of lung cancer with occupational exposure to quartz silica.

Amorphous silica has an oral (rat) LD50 greater than 7.5 g/kg. The LC50 (rat) following a 4-hour inhalation study is greater than 0.25 mg/L. Overexposure to synthetic amorphous silica dust by inhalation, absorption or ingestion is not expected to cause adverse effects. Amorphous silica does not cause the lung diseases crystalline silica is known to form.

Glycerine has an acute oral LD50 (rat) of 12,600 mg/kg. Eye or skin contact will produce mild irritation. Inhalation of mist could cause respiratory irritation.

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SECTION XII - ECOLOGICAL INFORMATION

No aquatic LC50, BOD or COD data available.
OCTANOL/H2O PARTITION COEF: Not available

SECTION XIII - DISPOSAL CONSIDERATIONS

Disposal must be made in accordance with applicable governmental regulations.

SECTION XIV - TRANSPORT INFORMATION

This section products basic shipping classification information. Refer to appropriate transportation regulations for specific requirements.

	D.O.T. SHIPPING INFORMATION	IMO SHIPPING INFORMATION
SHIPPING NAME	: NOT APPLICABLE/NOT REGULATED	NOT APPLICABLE/NOT REGULATED
HAZARD CLASS/PACKING GROUP	: Not Applicable	Not Applicable
UN NUMBER	: Not Applicable	Not Applicable
IMDG PAGE	: Not Applicable	Not Applicable
	(PRODUCT REPORTABLE QUANTITY)	
D.O.T. HAZARDOUS SUBSTANCES	: Not Applicable	Not Applicable
TRANSPORT LABEL REQUIRED	: None Required	None Required

	ICAO/IATA	TRANSPORT CANADA
SHIPPING NAME	: NOT APPLICABLE/NOT REGULATED	NOT APPLICABLE/NOT REGULATED
HAZARD CLASS	: Not Applicable	Not Applicable
SUBSIDIARY CLASS	: Not Applicable	Not Applicable
UN/ID NUMBER	: Not Applicable	Not Applicable
PACKING GROUP	: Not Applicable	Not Applicable
TRANSPORT LABEL REQUIRED	: None Required	None Required
PACKING INSTRUCTIONS	: PASSENGER Not Applicable	Not Applicable
	CARGO Not Applicable	
MAX NET QTY	: PASSENGER Not Applicable	Not Applicable
	CARGO Not Applicable	

ADDITIONAL TRANSPORT INFORMATION

TECHNICAL NAME (N.O.S.) : Not Applicable

SECTION XV - REGULATORY INFORMATION

INVENTORY INFORMATION

US TSCA : This product is manufactured in compliance with all provisions of the Toxic Substances Control Act, 15 U.S.C.

CANADA DSL: Components of this product have been reported to Environment Canada in accordance with subsection 25 of the Canadian Environmental Protection Act and are included on the Domestic Substances List.

EEC EINECS: Product was not required to be included in the European Inventory of Existing Chemical Substances (EINECS) since the product (or its components) was regarded to be a polymer by the EEC-Commission. This product fulfills the requirements of Council Directive 67/548/EEC, amended 79/831/EEC.

OTHER ENVIRONMENTAL INFORMATION

The following components are defined as toxic chemicals subject to reporting requirements

Provided By Electrical Insulation Suppliers Inc.

of Section 313 of Title III and of 40 CFR 372 or subject to other EPA regulations.

COMPONENT	CAS. NO.	%	TPQ(lbs)	RQ(lbs)	S313	RCRA	TSCA 12B

This product does not contain any components regulated under these sections of the EPA.

PRODUCT CLASSIFICATION UNDER SECTION 311 OF SARA
ACUTE - Y CHRONIC - Y FIRE - N REACTIVE - N PRESSURE - N

SECTION XVI - OTHER INFORMATION

NFPA HAZARD RATING (National Fire Protection Association)
Fire - 1; FIRE : Materials that must be preheated before ignition can occur.
Health - 2; HEALTH : Materials which on intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical treatment is given.
Reactivity - 0; REACTIVITY: Materials which in themselves are normally stable, even under fire exposure conditions, and which are not reactive with water.
Special - --

REASON FOR ISSUE: Revised Component Information

Marvin A. Friedman, Ph.D., Director of Toxicology and Product Stewardship

This information is given without any warranty or representation. We do not assume any legal responsibility for same, nor do we give permission, inducement or recommendation to practice any patented invention without a license. It is offered solely for your consideration, investigation and verification. Before using any product, read its label.

MATERIAL SAFETY DATA SHEET

CONAP(R)

MSDS No : 8123
DATE : 01/10/95
Supersedes: 12/17/93

SECTION I - PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: EASYPOXY(R) K-20 Part B Hardener
SYNONYMS: None
CHEMICAL FAMILY: Mixture
MOLECULAR FORMULA: Mixture
MOLECULAR WEIGHT: Mixture
CONAP, Inc., a wholly owned subsidiary of American Cyanamid Company.
1405 BUFFALO STREET, ORLEAN, NEW YORK 14760
716-372-9650
EMERGENCY PHONE: For product emergency involving spill, leak, fire, exposure or accident call CHEMTREC: 1-800-424-9300. Outside the USA and Canada call 202-483-7616.

SECTION II - COMPOSITION/INFORMATION ON INGREDIENTS

OSHA REGULATED COMPONENTS

COMPONENT	CAS NO.	%	TWA/CEILING	REFERENCE
Diethylenetriamine	000111-40-0	5 - 10	1 ppm	OSHA
			1 ppm (skin)	ACGIH
Glycerine	000056-81-5	< 1.0	10 mg/M3 total	OSHA/ACGIH
			5 mg/M3 respirable	OSHA
Silica, quartz	014808-60-7	40 - 60	0.1 mg/M3 respirable	OSHA/ACGIH
				NTP
				IARC
Silica, amorphous	007631-86-9	< 5.0	6 mg/M3	OSHA
			10 mg/M3	ACGIH

SECTION III - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
APPEARANCE AND ODOR : Light brown, viscous liquid; amine odor
STATEMENTS OF HAZARD:
DANGER! CAUSES BURNS OF THE EYES AND SKIN

MATERIAL SAFETY DATA SHEET

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[redacted]

silwhite
silclear

MANUFACTURED BY:

GENERAL ELECTRIC CO.
SILICONE PRODUCTS DIV.
WATERFORD, NY 12188

EMERGENCY TELEPHONE: (24 HRS)
(518) 237-3330

REVISED: 10/21/85
PREPARER: DA POLSINELLI

***** I PRODUCT IDENTIFICATION *****

PRODUCT IDENTIFICATION: RTV600 CHEMICAL FAMILY: SILICONE SEALANT
CHEMICAL NAME: RTV SILICONE SEALANT FORMULA: MIXTURE

***** II PRODUCT COMPONENTS *****

PRODUCT COMPOSITION	APPROX. %	ACGIH TLV	OSHA PEL	UNITS	CAS REG NO.
A. HAZARDOUS					
METHYLTRIACETOXYSILANE	< 5%	10(R)	10(R)	PPM	4253-34-3 *
B. NON-HAZARDOUS					

***** III PHYSICAL DATA ******

**PRODUCT INFORMATION

BOILING POINT	: NA (F) NA (C)	% VOLATILE BY VOLUME	:<5
VAPOR PRESSURE(20 C)	: NEGL. MM HG	EVAPORATION RATE (BUTYL ACETATE=1	:<1
VAPOR DENSITY(AIR=1)	: NEGL.		
FREEZING POINT	: NA (F) NA (C)	SPECIFIC GRAVITY (WATER=1)	:1.01
MELTING POINT	: NA (F) NA (C)		
PHYSICAL STATE	: PASTE	DENSITY	:UNKN KG/M3
ODOR	: ACETIC ACID	ACIDITY/ALKALINITY	:UNKN MEG/G
COLOR	: RED	PH	:NA

SOLUBILITY IN WATER(20 C): INSOLUBLE
SOLUBILITY IN ORGANIC SOLVENT: PARTIALLY SOLUBLE IN TOLUENE
(STATE SOLVENT)

***** IV FIRE AND EXPLOSION DATA *****

FLASH POINT: 210 (F) 98.9 (C) BY PMCC IGNITION TEMP: NA (F) NA (C)
FLAMMABLE LIMITS IN AIR(%): LOWER NA UPPER NA
EXTINGUISHING MEDIA:
ALL STANDARD FIREFIGHTING MEDIA
SPECIAL FIREFIGHTING PROCEDURES:
NONE KNOWN.

***** V REACTIVITY DATA *****

STABILITY:
X STABLE UNSTABLE

HAZARDOUS:
POLYMERIZATION WILL NOT OCCUR

HAZARDOUS DECOMPOSITION PRODUCTS:
SILICON DIOXIDE.
ACETIC ACID.

INCOMPATIBILITY (MATERIALS TO AVOID):
NONE KNOWN.

CONDITIONS TO AVOID:
NONE KNOWN.

***** VI HEALTH HAZARD DATA *****

ACUTE SIGNS/EFFECTS OF OVEREXPOSURE:

INGESTION:
NONE KNOWN

SKIN CONTACT:
UNCURED PRODUCT CONTACT WILL IRRITATE LIPS,GUMS AND TONGUE.
UNCURED PRODUCT CONTACT MAY IRRITATE THE SKIN.

INHALATION:
APPLIES ONLY IN UNCURED STATE.
MAY CAUSE MILD RESPIRATORY IRRITATION.

EYE CONTACT:
UNCURED PRODUCT CONTACT IRRITATES EYES.

MEDICAL CONDITIONS AGGRAVATED:
NONE KNOWN.

OTHER:

CHRONIC EFFECTS OF OVEREXPOSURE:
NONE KNOWN.

EMERGENCY AND FIRST AID PROCEDURES:

INGESTION:
RINSE MOUTH WITH WATER SEVERAL TIMES.

SKIN:
TO CLEAN FROM SKIN, REMOVE COMPLETELY WITH A DRY CLOTH OR PAPER TOWEL, BEFORE WASHING WITH DETERGENT AND WATER.

INHALATION:
MOVE PERSON TO FRESH AIR.

EYES:
IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES AND GET MEDICAL ATTENTION IF IRRITATION PERSISTS.

NOTE TO PHYSICIAN:
NONE KNOWN.

TOXICITY: METHYLTRIACETOXYSILANE
ACUTE ORAL LD50: 2060 (RAT) MG/KG
ACUTE DERMAL LD50: NONE FOUND MG/KG
ACUTE INHALATION LC50: NONE
OTHER: NONE.

AMES TEST: UNKNOWN
PRINCIPAL ROUTES OF EXPOSURE:
DERMAL - SKIN.
THIS PRODUCT OR ONE OF ITS INGREDIENTS PRESENT 0.1% OR MORE IS NOT LISTED AS A CARCINOGEN OR SUSPECTED CARCINOGEN BY NTP, IARC, OR OSHA:
PRODUCTS/INGREDIENTS:
THIS SPACE RESERVED FOR SPECIAL USE.

***** VII SPECIAL PROTECTIVE EQUIPMENT *****

RESPIRATORY PROTECTION:
USE IN A WELL VENTILATED AREA.
PROTECTIVE GLOVES:
RUBBER GLOVES.
CLOTH GLOVES.
EYE AND FACE PROTECTION:
SAFETY GLASSES.
OTHER PROTECTIVE EQUIPMENT:
NONE KNOWN.
VENTILATION:
USE ONLY IN WELL VENTILATED AREA.
MECHANICAL VENTILATION.

*** VIII SPILL, LEAK AND DISPOSAL PROCEDURES ***

ACTION TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:
WIPE, SCRAPE OR SOAK UP IN AN INERT MATERIAL AND PUT IN A CONTAINER FOR DISPOSAL.
WASH WALKING SURFACES WITH DETERGENT AND WATER TO REDUCE SLIPPING HAZARD.
WEAR PROPER PROTECTIVE EQUIPMENT AS SPECIFIED IN THE PROTECTIVE EQUIPMENT SECTION.
DISPOSAL METHOD:
DISPOSAL SHOULD BE MADE IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.

***** IX SPECIAL PRECAUTIONS *****

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:
AVOID CONTACT WITH SKIN AND EYES.
CAUTION!
REMOVE CONTACT LENSES BEFORE USING SEALANT. DO NOT HANDLE LENSES UNTIL ALL SEALANT HAS BEEN CLEANED FROM THE FINGER-

TIPS, NAILS AND CUTICLES. RESIDUAL SEALANT MAY REMAIN ON FINGERS FOR SEVERAL DAYS AND TRANSFER TO LENSES AND CAUSE SEVERE EYE IRRITATION.
PRODUCT RELEASES ACETIC ACID DURING APPLICATION AND CURING. USE MECHANICAL VENTILATION TO STAY BELOW TLV OF 10 PPM ACETIC ACID.
UNCURED PRODUCT CONTACT IRRITATES EYES.
UNCURED PRODUCT CONTACT MAY IRRITATE SKIN.
USE IN A WELL VENTILATED AREA TO PREVENT IRRITATION BY VAPORS.

ENGINEERING CONTROLS:
EXHAUST VENTILATION
EYEWASH STATIONS.
USE IN A WELL VENTILATED AREA.

** X SHIPPING AND REGULATORY CLASSIFICATION DATA **

DOT SHIPPING NAME: NA
DOT HAZARD CLASS: NA
DOT LABEL(S): NA
UN/NA NUMBER: NA
PLACARDS: NONE

EXPORT: NA

F HAZARD WASTE: NA
OSHA HAZARD CLASS: EYE IRRITANT
CPSC CLASSIFICATION: NA
TRANSPORTATION CLASS: IMO NA
RID (OCTI) NA
ADR (ECE) NA
RAR (IATA) NA

NFPA/HMIS CLASSIFICATION: FLAMMABILITY 0 , REACTIVITY 0 , HEALTH 2

ADDITIONAL INFORMATION:
THESE DATA ARE OFFERED IN GOOD FAITH AS TYPICAL VALUES AND NOT AS A PRODUCT SPECIFICATION. NO WARRANTY, EITHER EXPRESSED OR IMPLIED, IS MADE. THE RECOMMENDED HANDLING PROCEDURES ARE BELIEVED TO BE GENERALLY APPLICABLE. HOWEVER, EACH USER SHOULD REVIEW THESE RECOMMENDATIONS IN THE SPECIFIC CONTENT OF THE INTENDED USE.....
.....
THIS PRODUCT OR ITS COMPONENTS ARE ON THE AUSTRALIAN INVENTORY (ACOIN).....
.....

C =	CEILING LIMIT	NEGL =	NEGLIGIBLE
EST=	ESTIMATED	NF =	NONE FOUND
NA =	NOT APPLICABLE	UNKN =	UNKNOWN
NE =	NONE ESTABLISHED	REC =	RECOMMENDED

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ND = NONE DETERMINED	V	=	RECOMM. BY VENDOR
BY-PRODUCT = REACTION BY-	SKN	=	SKIN
PRODUCT, TSCA INVENTORY	TS	=	TRADE SECRET
STATUS NOT REQUIRED UNDER	R	=	RECOMMENDED
40 CFR PART 720.30(H-2)	MST	=	MIST

AS A SERVICE TO ITS CUSTOMERS, GE SILICONES DISCLOSES IN THE MSDS FOR EACH PRODUCT THE PRESENCE OF EXTREMELY HAZARDOUS SUBSTANCES AND TOXIC CHEMICALS IN THE PRODUCT COMPOSITION. IF THERE IS NO ENTRY FOUND IN THIS SECTION OF THE MSDS, THERE ARE NO EXTREMELY HAZARDOUS SUBSTANCES OR TOXIC CHEMICALS AS DEFINED BY THE LATEST AVAILABLE LIST IN THIS PRODUCT.

EST= estimated NEGL = negligible
NA = not applicable NF - none found
NE = none established REC = recommended UNKN = unknown

Provided By Electrical Insulation Suppliers Inc.

ND = none determined V = recomm. By vendor
By-product = reaction by- SKN = skin
product, TSCA inventory TS = trade secret
status not required under R = recommended
40 CFR part 720.30(h-2) MST = mist
STEL = short term exposure
limit

California Proposition 65...
Warning! This product contains a chemical known to the State of California to cause cancer.

California Proposition 65...
Warning! This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

MATERIAL SAFETY DATA SHEET
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RTV630B

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURED BY:

GE SILICONES
260 HUDSON RIVER ROAD
WATERFORD, NY 12188

EMERGENCY PHONE (24 HRS)

(518) 237-3330 (24 HRS)

SUPPLIED BY:

GE SILICONES
260 HUDSON RIVER ROAD
WATERFORD, NY 12188

EMERGENCY PHONE (24 HRS)

(518) 237-3330 (24 HRS)
REVISED: 01/20/92
PREPARER: DA POLSINELLI

PRODUCT IDENTIFICATION: RTV630B
CHEMICAL FAMILY: FORMULA: MIXTURE
SILICONE POLYMER SOLUTION
CHEMICAL NAME: SILICONE RUBBER COMPOUND

2. COMPOSITION/INFORMATION ON INGREDIENTS

PRODUCT COMPOSITION/ CAS REG NO.	APPROX. WGT. %	ACGIH TLV TWA	ACGIH TLV STEL	OSHA PEL TWA	OSHA PEL STEL	UNITS
A. HAZARDOUS	449	100	150	100	150	100
108-88-3 BENZENE	4PPM	10	NE	1	5	PPM
71-43-2 B. NON-HAZARDOUS						
POLYDIMETHYLHYDROGEN SILOXANE 68988-57-8	30-60	NA	NE	NA	NE	NA
VINYLPOLYDIMETHYLSILOXANE 68083-19-2	30-60	NA	NE	NA	NE	NA
TRADE SECRET COMPONENT	10-30	NE	NE	NE	NE	NA

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:
Blue Liquid
Mild Odor
Product generates flammable gas on contact with acids, bases or oxidizing materials.
Refer to other MSDS sections for detailed information.

POTENTIAL HEALTH EFFECTS
INGESTION:
None known
SKIN CONTACT:
None known.
INHALATION:

MEDICAL CONDITIONS AGGRAVATED:
None known.
SUBCHRONIC (TARGET ORGAN) EFFECTS:

Provided By Electrical Insulation Suppliers Inc.

None known.
CHRONIC EFFECTS/CARCINOGENICITY:
This product or one of its ingredients present 0.1% or more is not listed as a carcinogen or suspected carcinogen by NTP, IARC, OR OSHA
PRODUCTS/INGREDIENTS:
This space reserved for special use.
PRINCIPLE ROUTES OF EXPOSURE:
Dermal - skin.
Eyes.
OTHER:
None known

4 FIRST AID MEASURES

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.
SKIN:
Wash with soap and water.
Get medical attention if irritation persists.
INHALATION:
None known.
EYES:
In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.
NOTE TO PHYSICIAN:
None known.

5. FIRE FIGHTING MEASURES

FLASH POINT: >200 (F) >93.3 (C) BY PMCC. IGNITION TEMP: UNK (F) UNK (C)
FLAMMABLE LIMITS IN AIR(%): LOWER NA UPPER NA
SENSITIVITY TO MECHANICAL IMPACT (Y/N): NO
SENSITIVITY TO STATIC DISCHARGE:
Sensitivity to static discharge is not expected.
EXTINGUISHING MEDIA:
All standard firefighting media
SPECIAL FIREFIGHTING PROCEDURES:
None known.

6. ACCIDENTAL RELEASE MEASURES

ACTION TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:
Wear proper protective equipment as specified in the protective equipment section.
Wipe, scrape, or soak up in an inert material and put in a container intended for flammable materials for disposal.

7. HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:
Store upright in a cool place below 30'c (85'f).
Use only in a well ventilated area.
Do not reuse this container.
Relieve any internal pressure when received and at least weekly thereafter by slowly loosening bung. Retighten bung immediatly
Caution!
Avoid contact with eyes
Good hygienic practices should be observed. Work clothes should be washed seperately at the end of each work day. Disposable clothing should be discarded with material.
Keep container closed when not in use to prevent contact with acidic, basic or oxidizing materials, and metallic catalysts like zin soaps and noble metals(pt, rh, etc.).

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:
Eyewash stations.
Use in a well ventilated area.
RESPIRATORY PROTECTION:
None known.

Safety glasses.
OTHER PROTECTIVE EQUIPMENT:
None known.

Provided By Electrical Insulation Suppliers Inc.

VENTILATION:
Use only in well ventilated area.

9. PHYSICAL AND CHEMICAL PROPERTIES

**PRODUCT INFORMATION

BOILING POINT	NA (F) NA (C)	% VOLATILE BY VOLUME	<3
VAPOR PRESSURE(20 C)	NA MM HG	EVAPORATION RATE	<1
VAPOR DENSITY(AIR=1)	NA	(BUTYL ACETATE=1)	
FREEZING POINT	UNK (F) UNK (C)	SPECIFIC GRAVITY	1.02
MELTING POINT	NA (F) NA (C)	(WATER=1)	
PHYSICAL STATE	LIQUID	DENSITY	1020 KG/M3
ODOR	SLIGHT	ACID/ALKALINITY	0-10PPM MEQ/G
COLOR	BLUE	PH	NA
ODOR THRESHOLD	UNK (PPM)	VOC (EPA METH.24)	NT G/L

SOLUBILITY IN WATER(20C): INSOLUBLE
SOLUBILITY IN ORGANIC SOLVENT: PARTIAL IN TOLUENE
(STATE SOLVENT)

10. STABILITY AND REACTIVITY

STABILITY:
X STABLE UNSTABLE

HAZARDOUS:
POLYMERIZATION WILL NOT OCCUR

HAZARDOUS DECOMPOSITION/COMBUSTION PRODUCTS:
Carbon monoxide.
Carbon dioxide.
Silicon dioxide.
Flammable hydrogen gas.

INCOMPATIBILITY (MATERIALS TO AVOID):
Avoid contact with acidic, basic, or oxidizing agents, and metallic catalysts like tin soaps and noble metals (pt, rh, etc.)

)ITIONS TO AVOID
Product generates flamable gas on contact with acids, bases or oxidizing materials.

11. TOXICOLOGICAL INFORMATION

TOXICITY:

	**PRODUCT INFORMATION	
ACUTE ORAL LD50:	NA	MG/KG
ACUTE DERMAL LD50:	NA	MG/KG
ACUTE INHALATION LC50:	NA	

OTHER: None.

AMES TEST: UNKNOWN

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION:
No data at this time
CHEMICAL FATE INFORMATION:
No data at this time

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD:
Disposal should be made in accordance with federal, state and local regulations.
Incineration recommended in approved incinerator according to federal, state, and local regulations.

EPA HAZARD WASTE: NA

14. TRANSPORT INFORMATION

SHIPPING NAME	NONE
HAZARD CLASS	NONE
DOT LABEL(S)	NONE
UN/NA NUMBER	NONE

PLACARDS
NONE
IATA:
NA
IMO: NONE

PAR (IATA): NONE

15. REGULATORY INFORMATION

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Provided By Electrical Insulation Suppliers Inc.

SARA SECTION 302:
NONE FOUND
SARA (311,312) HAZARD CLASS:
NONE
SARA (313) CHEMICALS:
CPSC CLASSIFICATION: NA
WHMIS HAZARD CLASS:
NON-CONTROLLED
WHMIS TRADE SECRET:
None
EXPORT

SCHDLE B/HTSUS:
3910.00.00003
ECCN:
1C96G
HAZARD RATING SYSTEMS

HMIS	FLAMMABILITY	0 ,	REACTIVITY	1 , HEALTH
NFPA	FLAMMABILITY	0 ,	REACTIVITY	1 , HEALTH

CALIFORNIA PROPOSITION 65:
THIS PRODUCT CONTAINS CALIFORNIA PROPOSITION 65 CHEMICALS WHICH ARE LISTED BELOW.

BENZENE (71-43--2)
TOLUENE 108-88-3

16. OTHER INFORMATION

These data are offered in good faith as typical values and not as a product specification. No warranty, either expressed or implied, is made. The recommended handling procedures are believed to be generally applicable. However, each user should review these recommendations in the specific content of the intended use.....
This product or its components are on the Australian inventory (ACOIN).....

C = ceiling limit
EST= estimated
NA = not applicable
NE = none established
ND = none determined
By-product = reaction by-product, TSCA inventory status not required under 40 CFR part 720.30(h-2)
STEL = short term exposure limit
NEGL = negligible
NF = none found
UNKN = unknown
REC = recommended
V = recomm. By vendor
SKN = skin
TS = trade secret
P = recommended
MST = mist

California Proposition 65...
Warning! This product contains a chemical known to the State of California to cause cancer.

California Proposition 65...
Warning! This product contains a chemical known to the State of California to cause birth defects or other reproductive harm

MATERIAL DATA SAFETY SHEET

GE Silicones
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FORMAT : USA
PRODUCT: RTV1473
ACETOXY CURING SEALANT

SECTION I - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURED BY:
GE SILICONES
260 HUDSON RIVER ROAD
WATERFORD, NY 12188

EMERGENCY PHONE (24 HRS)
(518) 237-3330

SUPPLIED BY:
GE SILICONES
260 HUDSON RIVER ROAD
WATERFORD, NY 12188

EMERGENCY PHONE (24 HRS)
(518) 237-3330

REVISED : 09/25/97
PREPARER : CE HANNIGAN
CHEMICAL FAMILY/USE: SILICONE RUBBER
FORMULA : MIXTURE

SECTION II - COMPOSITION/INFORMATION ON INGREDIENTS

PRODUCT COMPOSITION/ CAS REG NO.	APPROX. WGT. %	ACGIH TLV TWA	ACGIH TLV STEL	OSHA PEL TWA	OSHA PEL STEL	UNITS
1. HAZARDOUS						
METHYLTRIACETOXYSILANE 4253-34-3	1- 5	10 (R)	NE	10 (R)	NE	PPM
OCTAMETHYLCYCLOTETRASILOXANE 556-67-2	1-5	5PPM	NE	GE REC	NE	GUIDE
B. NON-HAZARDOUS						
POLYDIMETHYLSILOXANE SILANOL/STPD 70131-67-8	60-80	-	NE	-	NE	-
SILANOL/STPD SILOXANE W/ME SILSQXNS 68554-67-6	5-10	NF	NE	NF	NE	NA
DIMETHYLPOLYSILOXANE 63148-62-9	1-5	NA	NE	NA	NE	NA
BLACK IRON OXIDE -PIGMENT BLACK 11 CI#77499 12227-89-3	1-5	NE	NE	NE	NE	NA
TREATED FUMED SILICA 68611-44-9	10-30	10	NE	15	NE	MG/M3

See Section 15 for description of any WHMIS Trade Secret(s).

SECTION III - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:
This section not in use.
POTENTIAL HEALTH EFFECTS:
INGESTION:
May be harmful if swallowed.
SKIN CONTACT:
Uncured product contact will irritate lips, gums and tongue.
Uncured product contact may irritate skin.
INHALATION:
Causes irritation of the mouth, nose and throat.
Applies only in uncured state.
EYE CONTACT:
Uncured product contact irritates eyes.
MEDICAL CONDITIONS AGGRAVATED:
None known.
SUBCHRONIC (TARGET ORGAN) EFFECTS:
Reproductive disorders.
May cause liver effects.

CHRONIC EFFECTS/CARCINOGENICITY:
This product or one of its ingredients present 0.1% or more is NOT listed as a carcinogen or suspected carcinogen by NTP, IARC or OSHA.
PRODUCTS/INGREDIENTS

Provided By Electrical Insulation Suppliers Inc.

This space reserved for special use.

PRINCIPLE ROUTES OF EXPOSURE:

Dermal - skin.
Eyes.
Inhalation.

OTHER:

Acetic acid released during curing.

D4

Ingestion: Rodents given large doses via oral gavage of octamethylcyclotetrasiloxane (1600 mg/kg day, 14 days) developed increased liver weights relative to unexposed control animals due to hepatocellar hyperplasia (increased number of liver cells which appeared normal) as well as hypertrophy (increased cell size).

Inhalation: In inhalation studies, laboratory rodents exposed to octamethylycyclotetrasiloxane (300 ppm five days weekm 90 days) developed increased liver weights in female animals relative to unexposed control animals. When the exposure was stopped, liver weights returned to normal. Microscopic examination of the liver cells did not show any evidence of pathology. Inhalation studies utilizing laboratory rabbits and guines pigs showed no effects on liver weights. Inhalation exposures typical of industrial usage (5-10 ppm) showed no toxic effects in rodents.

Range finding reproductive studies were conducted (whole body inhalation, 70 days prior to mating, through mating, gestation and lactation) with octamethycyclotetrasiloxane (D4). Rats were exposed to 70 and 700 ppm. In the 700 ppm group, there was a statistically signifigant reduction in mean litter size and in implantation sites. No D4 related clinical signs were observed in the pups and no exposure related pathological findings were found.

Interim results from a two generation reproductive study in rats exposed to 500 and 700 ppm D4 (whole body inhalation, 70 days prior to mating, through mating, gestation and lactation) resulted in a stastically signifigant decrease in live mean litter size as well as extended periods of off-spring delivery (dystocia). These results were not observed at the 70 and 300 ppm dosing levels.

The relevance of these data to humans is unclear. Further studies are ongoing.

In developmental toxicity studies, rats and rabbits were exposed to octamethycylclotetrasiloxane at concentrations up to 700 ppm and 500 ppm respectively. No teratogenic effects (birth defects) were observed in either study.

This product contains Methylpolysiloxanes which can generate Formaldehyde at approximately 300 degrees Fahrenheit (150 'C) and above, in atmospheres which contain oxygen. Formaldehyde is a skin and respiratory sensitizer, eye and throat irritant, acute toxicant, and potential cancer hazard. An MSDS for Formaldehyde is available from GE Silicones.

SECTION IV - FIRST AID MEASURES

INGESTION:

Rinse mouth with water several times.

SKIN:

To clean from skin, remove completely with a dry cloth or paper towel, before washing with detergent and water. Get medical attention if irritation persists.

INHALATION:

Move person to fresh air.

EYES:

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

NOTE TO PHYSICIAN:

None known.

SECTION V - FIRE FIGHTING MEASURES

FLASH POINT	: NA	(C) NA	(F)
METHOD	: NA		
IGNITION TEMP:	: UNK	(C) UNK	(F)
FLAMMABLE LIMITS IN AIR - LOWER (%)	: UNK		
FLAMMABLE LIMITS IN AIR - UPPER (%)	: UNK		
SENSITIVITY TO MECHANICAL IMPACT (Y/N):	NO		

SENSITIVITY TO STATIC DISCHARGE:

Sensitivity to static discharge is not expected.

EXTINGUISHING MEDIA:

All standard firefighting media

SPECIAL FIREFIGHTING PROCEDURES:
None known

SECTION VI - ACCIDENTAL RELEASE MEASURES

ACTION TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:
Wipe, scrape or soak up in an inert material and put in a container for disposal.
Wash walking surfaces with detergent and water to reduce slipping hazard.
Wear proper protective equipment as specified in the protective equipment section.

SECTION VII - HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:
Avoid breathing vapors, if exposed to high vapor concentration, leave area at once.
Avoid contact with skin and eyes.
Remove contact lenses before using sealant. Do not handle lenses until all sealant has been cleaned up from the finger-tips, nails and cuticles. Residual sealant may remain on fingers for several days and transfer to lenses and cause severe eye irritation.
Product releases acetic acid during application and curing.
Use mechanical ventilation to stay below TLV of 10 ppm acetic acid.
Uncured product contact irritates eyes.
Uncured product contact may irritate skin.

SECTION VIII - EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:
Eyewash stations.
Use in a well ventilated area.
RESPIRATORY PROTECTION:
Use approved NIOSH respiratory protection if TLV exceeded, or overexposure is likely.
PROTECTIVE GLOVES:
Cloth gloves.
EYE AND FACE PROTECTION:
Safety glasses.
OTHER PROTECTIVE EQUIPMENT:
None known.
VENTILATION:
Use only in well ventilated area.
Mechanical ventilation.

SECTION IX - PHYSICAL AND CHEMICAL PROPERTIES

PRODUCT INFORMATION:

BOILING POINT	: NA	(C) NA	(F)
VAPOR PRESSURE (20 C) (MM HG)	: UNK		
VAPOR DENSITY (AIR = 1)	: UNK		
FREEZING POINT	: NA	(C) NA	(F)
MELTING POINT	: NA	(C) NA	(F)
PHYSICAL STATE	: SOLID		
ODOR	: ACETIC ACID		
COLOR	: BLACK		
ODOR THRESHOLD (PPM)	: UNK		
% VOLATILE BY VOLUME	: <3.9		
EVAP. RATE (BUTYL ACETATE = 1)	: <1		
SPECIFIC GRAVITY (WATER = 1)	: 1.06		
DENSITY (KG/M3)	: 1060		
ACID/ALKALINITY (MEQ/G)	: UNK		
PH	: NA		
VOC (EPA METH. 24) (G/L)	: <41		
SOLUBILITY IN WATER (20 C)	: INSOLUBLE		

SOLUBILITY IN ORGANIC SOLVENT (STATE SOLVENT): TOLUENE

SECTION X - STABILITY AND REACTIVITY

STABILITY : STABLE
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
HAZARDOUS THERMAL DECOMPOSITION/COMBUSTION PRODUCTS:
Carbon monoxide
Carbon dioxide
Silicon dioxide
Acetic acid
Formaldehyde

INCOMPATIBILITY (MATERIALS TO AVOID):
None known.
CONDITIONS TO AVOID:
None known

SECTION XI - TOXICOLOGICAL INFORMATION

METHYLTRIACETOXYSILANE
ACUTE ORAL LD50 (MG/KG) : 2,060 (RAT)
ACUTE DERMAL LD50 (MG/KG) : NONE FOUND
ACUTE INHALATION LC50 (MG/L): NONE FOUND
OTHER : None
AMES TEST :

POLYDIMETHYLSILOXANE SILANOL/STPD
ACUTE ORAL LD50 (MG/KG) : > 40,000 (RAT)
ACUTE DERMAL LD50 (MG/KG) : NON-IRRITATING RBT
ACUTE INHALATION LC50 (MG/L): > 535 RAT
OTHER : None.
AMES TEST :

SILANOL/STPD SILOXANE W/ME SILSQXNS
ACUTE ORAL LD50 (MG/KG) : >40,000 RAT, ESTM.
ACUTE DERMAL LD50 (MG/KG) : NONE FOUND
ACUTE INHALATION LC50 (MG/L): > 535 MG/L ESTM.
OTHER : None
AMES TEST : Unknown

TREATED FUMED SILICA
ACUTE ORAL LD50 (MG/KG) : > 10,000 MG/KG (RAT)
ACUTE DERMAL LD50 (MG/KG) : NA
ACUTE INHALATION LC50 (MG/L): NA
OTHER : None.
AMES TEST :

DIMETHYLPOLYSILOXANE
ACUTE ORAL LD50 (MG/KG) : 20,000 RAT
ACUTE DERMAL LD50 (MG/KG) : NONE
ACUTE INHALATION LC50 (MG/L): NONE
OTHER : Tested for acute oral LD50.
AMES TEST :

BLACK IRON OXIDE
ACUTE ORAL LD50 (MG/KG) : NONE FOUND
ACUTE DERMAL LD50 (MG/KG) : NONE FOUND
ACUTE INHALATION LC50 (MG/L): NONE FOUND
OTHER:
NONE

SECTION XII - ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION: No data at this time
CHEMICAL FATE INFORMATION : No data at this time

SECTION XIII - DISPOSAL CONSIDERATIONS

DISPOSAL METHOD:
Disposal should be made in accordance with federal, state and local regulations.

SECTION XIV - TRANSPORT INFORMATION

DOT SHIPPING NAME: NONE
DOT HAZARD CLASS : NOT DOT REGULATED
DOT LABEL(S) : NONE
UN/NA NUMBER : NONE
PLACARDS : NONE
IATA : NA
IMO IMDG-code : NA
EUROPEAN CLASS:
RID (OCTI) : NA
ADR (ECE) : NA
RAR (IATA) : NA

SECTION XV - REGULATORY INFORMATION

SARA SECTION 302	: None found
SARA (311,312) HAZARDS CLASS	: ACUTE HEALTH HAZARD CHRONIC HEALTH HAZARD
SARA (313) CHEMICALS	: NONE
CPSC CLASSIFICATION	: NA
WHMIS HAZARD CLASS	: D2B TOXIC MATERIALS
WHMIS TRADE SECRET	: None
EXPORT:	
SCHDLE B/HTSUS	: 3910.00 Silicones in Primary Form
ECCN	: EAR99
HAZARDS RATING SYSTEMS:	
HMIS	: FLAMMABILITY - 0, REACTIVITY - 0, HEALTH - 2
NFPA	: FLAMMABILITY - 0, REACTIVITY - 0, HEALTH - 2
CALIFORNIA PROPOSITION 65	: NONE

SECTION XVI - OTHER INFORMATION

This product or its components are on the European inventory of existing commercial chemicals (EINECS).

These data are offered in good faith as typical values and not as a product specification. No warranty, either expressed or implied, is made. The recommended handling procedures are believed to be generally applicable. However, each user should review these recommendations in the specific content of the intended use.

This product or its components are on the Australian inventory (ACOIN).

C = ceiling limit
EST = estimated
NA = not applicable
NE = none established
ND = none determined
By-product = reaction by-product, TSCA inventory status not required under 40 CFR part 720.30(h-2)
STEL = short term exposure limit

NEGL = negligible
NF = none found
UNKN = unknown
REC = recommended
V = recomm. By vendor
SKN = skin
TS = trade secret
R = recommended
MST = mist
NT = not tested

Date printed: 09/29/97

MATERIAL SAFETY DATA SHEET
DATE OF PRINTING: 07/14/94

SECTION I

NUFACTURER: GLYPTAL,INC.
305 EASTERN AVE
CHELSEA, MA 02150
TELEPHONE: 617-884-6918
PRODUCT CLASS: RED INSULATING ENAMEL
CODE IDENTIFICATION: 1201A
TRADE NAME: GLYPTAL

HMIS 2 4 0

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT BY WEIGHT	ACGIH TLV PPM	ACGIH TLV mg/cu.m.	OSHA PEL PPM	OSHA PEL mg/cu.m.
XYLENE	6.9	100		100	
CAS NUMBER 1330-20-7					
HMIS HEALTH=1 FLAMMABILITY=3 REACTIVITY=0					
XYLOL					
VM&P NAPTHA	2.2	300		300	
CAS NUMBER 8030-30-6					
HMIS HEALTH=2 FLAMMABILITY=3 REACTIVITY=0					
ALIPHATIC HYDROCARBON					
TOLUENE	7.0	100		100	
CAS NUMBER 108-88-3					
HMIS HEALTH=2 FLAMMABILITY=3 REACTIVITY=0					
TOLUENE					
STODDARD SOLVENT	< 0.1	500			
CAS NUMBER 64741-41-9					
HMIS HEALTH=2 FLAMMABILITY=2 REACTIVITY=0					
HYDROCARBON MIXTURE					
IRON OXIDE	3.3				
CAS NUMBER 1309-382					
HMIS HEALTH=0 FLAMMABILITY=1 REACTIVITY=1					
FERRIC OXIDE					
HYDRATED MAGNESIUM SILICATE	6.8	20			
CAS NUMBER 14807-96-6					
HMIS HEALTH=2 FLAMMABILITY=0 REACTIVITY=0					
TALC					
METHL ETHYL KETONE	25.0	200		200	
CAS NUMBER 78-93-3					
HMIS HEALTH=2 FLAMMABILITY=3 REACTIVITY=0					
METHYL ETHYL KETONE					
N-BUTANOL	2.0	50		50	
CAS NUMBER 71-36-3					
HMIS HEALTH=1 FLAMMABILITY=3 REACTIVITY=0					
OXYGENATED HYDROCARBON					

INGREDIENT	PERCENT BY WEIGHT	ACGIH TLV PPM	ACGIH TLV mg/cu.m.	OSHA PEL PPM	OSHA PEL mg/cu.m.
ACETONE	18.0	750		1000	
CAS NUMBER 67-64-1					
HMIS HEALTH=1 FLAMMABILITY=3 REACTIVITY=0					
ACETONE					
PROPANE (PROPELLANT)	15.0			1000	
CAS NUMBER 74-98-6					
HMIS HEALTH=3 FLAMMABILITY=3 REACTIVITY=0					
DIMETHYLMETHANE PROPYL HYDRIDE					

Remaining 14% is non-hazardous alkyd resin.
VM & P (CAS# 8030-30-6). AGENCY OSHA.TYPE STEL. EXPOSURE LIMIT 400 PPM
N/A MEANS NOT AVAILABLE N/EST MEANS NOT ESTABLISHED
NOT EST. means NOT ESTABLISHED
NOT EST. means NOT ESTABLISHED
N/A MEANS NOT AVAILABLE NOT EST MEANS NOT ESTABLISHED

SECTION III - PHYSICAL DATA

BOILING RANGE: 132.1 TO 345.0'F
VAPOR DENSITY: HEAVIER THAN AIR
EVAPORATION RATE: FASTER THAN ETHER
PERCENT VOLATILE BY VOLUME: 87.4
VOC (less water): 5.49 LBS/GAL
WEIGHT PER GALLON: 7.21 POUNDS
VOC.is determined per EPA Reference Method 24 using ASTM procedures D2369 D1475 and D3960.
VAPOR PRESSURE: N/A
MELTING POINT: N/A
SOLUBILITY IN WATER: NEGLIGIBLE
APPEARANCE AND ODOR: RED LIQUID

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

OSHA CATEGORY: FLAMMABLE LIQUID
FLASH POINT : <-20F LEL: .9 UEL: N/A
EXTINGUISHING MEDIA: carbon dioxide, dry chemical or foam
UNUSUAL FIRE AND EXPLOSION HAZARDS: Pressure may build up in closed containers that are exposed to heat. Solvent vapors are heavier than air and may travel a considerable distance along the ground to an ignition source and 'flash back'.
SPECIAL FIRE FIGHTING PROCEDURES: Water may be ineffective, however, water may be used to cool closed containers that are exposed to heat. Firefighting personnel should wear self-contained breathing apparatus.

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: SEE SECTION II
PRIMARY ROUTES OF ENTRY: inhalation and skin contact
EFFECTS OF OVEREXPOSURE: Headache, nausea, dizziness, confusion, irritability.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Respiratory difficulties or preexisting skin sensitization.
CARCINOGENICITY: None of the components of this product are reported carcinogens in A/C with OSHA, NTP, IARC and NIOSH.
EMERGENCY FIRST AID PROCEDURES:
INHALATION: Remove to fresh air. Administer artificial respiration or oxygen if breathing is difficult.
SKIN: Wash affected area with soap and water. Remove and launder contaminated clothing. Consult a physician if irritation persists.
EYES: Flush immediately with large amounts of water for at least 15 minutes. Take to a physician for medical treatment.
INGESTION: Call a physician immediately.

ACUTE: Skin and eye contact: Primary irritation
CHRONIC: Xylene contained in this material has been found to cause the following effects in laboratory animals: amenia, liver abnormalities, liver and eye damage.
Pre-Existing liver and/or kidney disorders may be aggravated by exposure to Xylene. Reports have associated repeated and prolonged occupational overexposure to xylene with permanent brain and nervous system damage. While this material has a low degree of toxicity, breathing high concentrations of vapors or mists may cause irritation of the nose and throat. Respiratory symptoms associated with pre-existing lung disorders may be aggravated by exposure to this material. Persons with pre-existing heart disorders may be more susceptible to irregular heartbeats if exposed to high concentrations of this material. Reports have associated repeated and prolonged occupational over-exposure to solvents with permanent brain and nervous system damage.

SECTION VI - REACTIVITY DATA

STABILITY: NORMALLY STABLE
CONDITIONS TO AVOID: None known
INCOMPATIBILITY (Materials to avoid): Strong acids and bases
HAZARDOUS DECOMPOSITION PRODUCTS: BY FIRE: Normal products of incomplete combustion.
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
CONDITIONS TO AVOID: None known

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Provide adequate ventilation. Remove all possible ignition sources. Absorb and dispose using non-sparking tools. Eliminate all sources of ignition. Evacuate unprotected personnel. Water spray may be used. To contain run-off, cover with an absorbent material and place in containers for proper disposal. Flush area with water to remove residue.
WASTE DISPOSAL METHOD: Dispose in accordance with local applicable regulations. Dispose of using an approved incineration process or in accordance with local, state, and federal regulations regarding health and pollution.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: In outdoor or open areas use Bureau of Mines approved mechanical filter respirator to remove solid airborne particulates of overspray. Indoors, where ventilation is inadequate, use Bureau of Mines approved chemical-mechanical respirators designed to remove both particulate and vapor.
VENTILATION:
PROTECTIVE GLOVES: Recommended if skin contact is likely.
EYE PROTECTION: Chemical splash goggles recommended if potential for splash or eye contact is likely.
OTHER PROTECTIVE EQUIPMENT: Recommended as needed to avoid contact.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING OR STORING: Store in a cool dry place away from heat, sparks and open flame. Keep containers closed and upright to prevent leakage, outside or detached storage is preferred. Inside storage should be in a standard flammable liquid storeroom or cabinet. Metal containers should be grounded when transferring material from one container to another. Do not reuse product container for any purpose.
OTHER PRECAUTIONS:
PREPARED BY: TECHNICAL STAFF
REFERENCE DATE: 5/15/93

MANUFACTURER: GLYPTAL, INC.

PRODUCT: RED INSULATING ENAMEL

THE INFORMATION AND RECOMMENDATIONS CONTAINED HEREIN ARE BASED UPON DATA BELIEVED TO BE CORRECT. HOWEVER, NO GUARANTEE OR WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED, IS MADE WITH RESPECT TO THE INFORMATION ABOVE.

TO WHOM IT MAY CONCERN: EFFECTIVE JAN 1, 1989, WE ARE REQUIRED BY SARA TITLE III SECTION 313 OF THE RIGHT-TO-KNOW LEGISLATION, TO INFORM YOU OF THE PERCENTAGE OF ANY INGREDIENT IN A PRODUCT WHICH IS IN THE 313 LIST OR AS AN LISTING AS A COMPONENT OF A MATERIAL WHICH IS IN A CATEGORY OF CHEMICAL LIST.

PRODUCT: 1201A GLYPTAL

18.0% ACETONE (CAS # 67-64-1)
2.0% N-BUTANOL (CAS # 71-36-3)
25.0% METHYL ETHYL KETONE (CAS # 78-93-3)
7.0% TOLUENE (CAS #108-88-3)
6.9% XYLENE (CAS NUMBER 1330-20-7)

IF YOU WILL MULTIPLY YOUR TOTAL PURCHASES FROM US AS WELL AS FROM OTHER SUPPLIERS BY THE PERCENTAGE OF EACH INGREDIENT FOUND IN EACH PRODUCT AND IF THE TOTAL QUANTITY EXCEEDS THE REPORTABLE QUANTITY FOR THAT INGREDIENT YOU ARE REQUIRED TO FILE FORM R REPORTS.

MATERIAL SAFETY DATA SHEET

DATE OF PRINTING: 03/07/93

SECTION I

MANUFACTURER: GLYPTAL,INC.
305 EASTERN AVE
CHELSEA, MA 02150
TELEPHONE: 617-884-6918
PRODUCT CLASS: ALKYD RESIN SOLUTION
CODE IDENTIFICATION: 1202
TRADE NAME: GLYPTAL

HMIS 2 3 0

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT BY WEIGHT	ACGIH TLV PPM	ACGIH TLV mg/cu.m.	OSHA PEL PPM	OSHA PEL mg/cu.m.
XYLENE		49.9	100		100
CAS NUMBER 1330-20-7					
HMIS HEALTH=1 FLAMMABILITY=3 REACTIVITY-0					
XYLOL					
STODDARD SOLVENT		0.1	500		
CAS NUMBER 64741-41-9					
HMIS HEALTH=2 FLAMMABILITY=2 REACTIVITY-0					
HYDROCARBON MIXTURE					

Remaining 50 X is a non-hazardous alkyd in.
N/A MEANS NOT AVAILABLE M/EST MEANS N$OTSESTABLISHED
NOT EST. means NOT ESTABLISHED
NOT EST. means NOT ESTABLISHED
NIA MEANS NOT AVAILABLE NOT EST MEANS OT ESTABLISHED

SECTION III PHYSICAL DATA

BOILING RANGE: 283.0 TO 285.0 F VAPOR DENSITY: HEAVIER THAN AIR
EVAPORATION RATE: SLOWER THAN ETHER
PERCENT VOLATILE BY VOLUME: 57.5 VOC (leas water): 4.15 LBS/GAL
WEIGHT PER GALLON: 8.31 POUNDS
V.O.C.is determined per EPA Reference Method 24 using ASTM procedure& D2369,D1475 and D3960.
VAPOR PRESSURE: 9.5 MELTING POINT: N/A
SOLUBILITY IN WATER: NEGLIGIBLE
APPEARANCE AND ODOR: CLEAR

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

OSHA CATEGORY: FLAMMABLE LIQUID

FLASH POINT : 79F CC-PM LEL: I UEL: N/A

EXTINGUISHING MEDIA:
Carbon dioxide, dry chemical or foam
UNUSUAL FIRE AND EXPLOSION HAZARDS:
Pressure may build up in closed containers that are exposed to heat. Solvent vapor& are heavier than air and may travel a considerable distance along the ground to an ignition source and flash back.
SPECIAL FIRE FIGHTING PROCEDURES:
Water may be ineffective, however, water may be used to cool closed containers that are exposed to heat. Firefighting personnel should wear self-contained breathing apparatus.

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: SEE SECTION II
PRIMARY ROUTE(S) OF ENTRY:
Inhalation and akin contact
EFFECTS OF OVEREXPOSURE:
Headache, nausea, dizziness, confusion, irritability.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:
Respiratory difficulties or preexisting akin sensitization.
CARCINOGENICITY:
None of the components of this product are reported carcinogens in A/C with OSHA,NTP,IARC and NIOSH.
EMERGENCY FIRST AID PROCEDURES:
INHALATION: Remove to fresh air. Administer artificial respiration or oxygen if breathing is difficult.
SKIN: Wash affected area with soap and water. Remove and launder contaminated clothing. Consult a physician if irritation persists.
EYES: Flush immediately with large amount& of water for at least 15 minutes. Take to a physician for medical treatment.
INGESTION: Call a physician immediately.

ACUTE:Skin and eye contact:Primary irritation
CHRONIC:Xylone contained in this material has been found to cause the following effect in laboratory animala:amenia,livor abnormalitioa,liver and eye damage.
Pre-Exiting liver and/or kidney disorders may be aggravated by exposure to xylene.Reports have associated repeated and prolonged occupational overexposure to xylene with permanent brain and nervous system damage.

SECTION VI - REACTIVITY DATA

STABILITY: NORMALLY STABLE
CONDITIONS TO AVOID:
None known
INCOMPATIBILITY (Materials to avoid)
Strong acid and base
HAZARDOUS DECOMPOSITION PRODUCTS:
BY FIRE: Normal products of incomplete combustion.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
CONDITIONS TO AVOID:
None known

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Provide adequate ventilation. Remove all possible ignition sources.

Absorb and dispose using non-&parking tools.
Eliminate all sources of ignition. Evacuate unprotected personnel. Water spray may be used. To contain run-off, cover with an absorbent material and place in container& for proper disposal. Flush area with water to remove residual.
WASTE DISPOSAL METHOD:
Disposal in accordance with local applicable regulations.
Disposa of using an approved incineration process or in accordance with local, state, and federal regulation& regarding health and pollution.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:
In outdoor or open areas use Bureau of Mina& approved mechanical filter respirator to remove solid airborne particulates of overapray. Indoor&, where ventilation is inadequate. use Bureau of Mines approved chemical-mechanical respirators designed to remove both particulate and vapor.
VENTILATION:
PROTECTIVE GLOVES:
Recommended if skin contact is likely.
EYE PROTECTION:
Chemical splash gogglaa recommended if potential for splash or eye contact is likely.
OTHER PROTECTIVE EQUIPMENT:
Ra&.ommanded as needed to avoid contact.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING OR STORING:
Store in a cool dry place away from haat, sparks and open flama. Keep containers closed and upright to prevent leakage. Outside or detached storage is preferred. Inside storage should be in a standard flammable liquid storeroom or cabinet. Metal containers should be grounded when transferring material from one container to another. Do not reuse product container for any purpose.
OTHER PRECAUTIONS:

PREPARED BY: TECHNICAL STAFF

REFERENCE DATE: 3/7/91

THE INFORMATION AND RECOMMENDATIONS CONTAINED HEREIN ARE BASED UPON DATA BELIEVED TO BE CORRECT. HOWEVER, NO GUARANTEE OR WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED, IS MADE WITH RESPECT TO THE INFORMATION ABOVE.

TO WHOM IT MAY CONCERN: EFFECTIVE JAN 1, 1989, WE ARE REQUIRED BY SARA TIT LE III SECTION 313 OF THE RIGHT TO KNOW LEGISLATION, TO INFORM YOU OF THE PERCENTAGE OF ANY INGREDIENT IN A PRODUCT WHICH IS IN THE 313 LIST OR AS AN LISTING AS A COMPONENT OF A MATERIAL WHICH IS IN A CATEGORY OF CHEMICAL LIST.

PRODUCT: 1202 GLYPTAL

49.9% XYLENE (CAS NUMBER 1330-20-7)

IF YOU WILL MULTIPLY YOUR TOTAL PURCHASES FROM US AS WELL AS FROM OTHER SU PPLIERS BY THE PERCENTAGE OF EACH INGREDIENT FOUND IN EACH PRODUCT AND IF THE TOTAL QUANTITY EXCEEDS THE REPORTABLE QUANTITY FOR THAT INGREDIENT YOU ARE REQUIRED TO FILE FORM R REPORTS.

MATERIAL SAFETY DATA SHEET

SECTION I

MANUFACTURER: GLYPTAL, INC.
305 EASTERN AVE
CHELSEA, MA 02150
TELEPHONE: 617-884-6918
PRODUCT CLASS: GLOSS
CODE IDENTIFICATION: 1209
TRADE NAME: GLYPTAL

HMIS 2 3 0

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT BY WEIGHT	ACGIH TLV PPM	ACGIH TLV mg/cu.m.	OSHA PEL PPM	OSHA PEL mg/cu.m.
XYLENE	27.8	100		100	
CAS NUMBER 1330-20-7					
HMIS HEALTH = 1 FLAMMABILITY = 3 REACTIVITY = 0					
XYLOL					
VM&P NAPTHA	9.8	300		300	
CAS NUMBER 8030-30-6					
HMIS HEALTH = 2 FLAMMABILITY = 3 REACTIVITY = 0					
ALIPHATIC HYDROCARBON					
DIPENTENE	0.5	200			
CAS NUMBER					
HMIS HEALTH = 2 FLAMMABILITY = 2 REACTIVITY = 0					
TERPENE HYDROCARBON SOLVENT					
STODDARD SOLVENT	0.1	500			
CAS NUMBER 64741-41-9					
HMIS HEALTH=2 FLAMMABILITY=2 REACTIVITY=0					
HYDROCARBON MIXTURE					
ZINC COMPOUND	0.2	NE	NE	NE	NE
CAS NUMBER 7440-66-6					
HMIS HEALTH=2 FLAMMABILITY=0 REACTIVITY=0					
ZINC COMPOUND					
BLACK IRON OXIDE	19.0				15
CAS NUMBER 1317-61-9					
HMIS HEALTH=0 FLAMMABILITY=1 REACTIVITY=1					
SYNTHETIC IRON OXIDE					

VM & P (CAS# 8030-30-6). AGENCY OSHA.TYPE STEL. EXPSOURE LIMIT 400 PPM
N/A MEANS NOT AVAILABLE N/EST MEANS NOTESTABLISHED
NOT EST. means NOT ESTABLISHED
NOT EST. means NOT ESTABLISHED
N/A MEANS NOT AVAILABLE NOT EST MEANS NOT ESTABLISHED

SECTION III - PHYSICAL DATA

BOILING RANGE: 250.0 TO 345.0 F VAPOR DENSITY: HEAVIER THAN AIR
EVAPORATION RATE: SLOWER THAN ETHER
PERCENT VOLATILE BY VOLUME: 55.6 VOC (less water): 3.86 LBS/GAL
WEIGHT PER GALLON: 10.09 POUNDS
V.O.C. IS DETERMINED PER EPA REFERENCE METHOD 24 USING ASTM PROCEDURESD2369 D1475, AND D3960.
VAPOR PRESSURE: NA MELTING POINT: NA
SOLUBILITY IN WATER: NEGLIGIBLE
APPEARANCE AND ODOR: BLACK LIQUID

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

OSHA CATEGORY: FLAMMABLE LIQUID

FLASH POINT: 69 F TCC LEL: 1.0 UEL: NA
EXTINGUISHING MEDIA:
Carbon dioxide, dry chemical or foam
UNUSUAL FIRE AND EXPLOSION HAZARDS:
Pressure may build up in closed containers that are exposed to heat. Solvent vapors are heavier than air and may travel a considerable distance along the ground to an ignition source and "flash back".
SPECIAL FIRE FIGHTING PROCEDURES:
Water may be ineffective, however, water may be used to cool closed containers that are exposed to heat. Firefighting personnel should wear self-contained breathing apparatus.

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: SEE SECTION II
PRIMARY ROUTE(S) OF ENTRY:
Inhalation and skin contact
EFFECTS OF OVEREXPOSURE:
Headache, nausea, dizziness, confusion, irritability.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:
Respiratory difficulties or preexisting skin sensitization.
CARCINOGENICITY:
None of the components of this product are reported carcinogens in A/C with OSHA, NTP, IARC and NIOSH.
EMERGENCY FIRST AID PROCEDURES:
INHALATION: Remove to fresh air. Administer artificial respiration or oxygen if breathing is difficult.
SKIN: Wash affected area with soap and water. Remove and launder contaminated clothing. Consult a physician if irritation persists.
EYES: Flush immediately with large amounts of water for at least 15 minutes. Take to a physician for medical treatment.
INGESTION: Call a physician immediately.

Pre-Exiting liver and/or kidney disorders may be aggrevated by exposure to xylene. Reports have associated repeated and prolonged occupational overexpo sure to xylene with permanent brain and nervous system damage.

SECTION VI - REACTIVITY DATA

STABILITY: NORMALLY STABLE
CONDITIONS TO AVOID:
None known
INCOMPATIBILITY (Materials to avoid)
Strong acids and bases
HAZARDOUS DECOMPOSITION PRODUCTS:
BY FIRE: Normal products of incomplete combustion.
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
CONDITIONS TO AVOID:
None known

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Provide adequate ventilation. Remove all possible ignition sources. Absorb and dispose using non-sparking tools.
Eliminate all source of ignition. Evacuate unprotected personnel. Water spray may be used. To contain run-off, cover with an absorbent material and place in containers for proper disposal. Flush area with water to remove residue.
WASTE DISPOSAL METHOD:
Dispose in accordance with local applicable regulations.
Dispose of using an approved incineration process or in accordance with local, state, and federal regulations regarding health and pollution.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:
In outdoor or open areas use Bureau of Mines approved mechanical filter respirator to remove solid airborne particulates of overspray. Indoors, where ventilation is inadequate. use Bureau of Mines approved chemical-mechanical respirators designed to remove both particulate and vapor.
VENTILATION:
PROTECTIVE GLOVES:
Recommended if skin contact is likely.
EYE PROTECTION:
Chemical splash goggles recommended if potential for splash or eye contact is likely.
OTHER PROTECTIVE EQUIPMENT:
Recommended as needed to avoid contact.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING OR STORING:
Store in a cool dry place away from heat, sparks and open flame. Keep containers closed and upright to prevent leakage. Outside or detached storage is preferred. Inside storage should be in a standard

flammable liquid storeroom or cabinet. Metal containers should be grounded when transferring material from one container to another. Do not reuse product container for any purpose.

)THER PRECAUTIONS:

>RE[illegible]) BY: TECHNICAL STAFF .
<EF[illegible]CE DATE: 6/23/97

'HE INFORMATION AND RECOMMENDATIONS CONTAINED HEREIN ARE BASED UPON DATA 3ELIEVED TO BE CORRECT. HOWEVER, NO GUARANTEE OR WARRANTY OF ANY KIND, :XPRESSED OR IMPLIED, IS MADE WITH RESPECT TO THE INFORMATION ABOVE.

) WHOM IT MAY CONCERN: EFFECTIVE JAN 1, 1989, WE ARE REQUIRED BY SARA TIT : III SECTION 313 OF THE RIGHT TO KNOW LEGISLATION, TO INFORM YOU OF THE :RCENTAGE OF ANY INGREDIENT IN A PRODUCT WHICH IS IN THE 313 LIST OR AS) LISTING AS A COMPONENT OF A MATERIAL WHICH IS IN A CATEGORY OF CHEMICAL ST.

PRODUCT: 1209 GLYPTAL

27.8% XYLENE (CAS NUMBER 1330-20-7)

F YOU WILL MULTIPLY YOUR TOTAL PURCHASES FROM US AS WELL AS FROM OTHER SU >PLIERS BY THE PERCENTAGE OF EACH INGREDIENT FOUND IN EACH PRODUCT AND IF 'HE TOTAL QUANTITY EXCEEDS THE REPORTABLE QUANTITY FOR THAT INGREDIENT YOU .RE REQUIRED TO FILE FORM R REPORTS.

Provided By Electrical Insulation Suppliers Inc.

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SEP 08 1997

0300073
GENERAL ELECTRIC SERVICE
1401 EAST VALENCIA ROAD

TUCSON, AZ 85706-0000

ELECTRICAL INSULATION SUPPLIERS
1255 COLLIER RD.
ATLANTA, GA 30318

PHONE # (404)355-1651
FAX # (404)609-6084

MATERIAL SAFETY DATA SHEET INFORMATION:

PLEASE FIND ENCLOSED MATERIAL SAFETY DATA SHEETS (MSDS) COVERING ITEMS PURCHASED FROM ELECTRICAL INSULATION SUPPLIERS (EIS). OSHA REGULATIONS REQUIRE MSDS INFORMATION BE MADE AVAILABLE TO ALL PERSONNEL WHO MAY BE EXPOSED TO HAZARDOUS MATERIALS IN THE WORK PLACE.

UNDER THE "EMERGENCY PLANNING COMMUNITY RIGHT-TO-KNOW ACT OF 1986" INVENTORY AND LOCATION INFORMATION, CONCERNING HAZARDOUS MATERIALS mr30nfgJOB SITE, MAY NEED TO BE REPORTED TO THE LOCAL FIRE DEPARTMENT, THE LOCAL EMERGENCY PLANNING COMMITTEE AND THE STANDARD RESPONSE COMMISSION. YOU MAY WANT TO REFERENCE 40 CFR PART 372 FOR ADDITIONAL INFORMATION. MANUFACTURERS MUST REPORT ANNUAL RELEASES OF LISTED TOXIC CHEMICALS INTO THE ENVIRONMENT, ACCORDING TO SARA TITLE III.

ACCORDING TO 29 CFR PART 1910.1200 PARAGRAPH (g)(6) OF THE HAZARD COMMUNICATION STANDARD, A MSDS IS TO BE PROVIDED THE FIRST TIME THE CUSTOMER BUYS AN ITEM REQUIRING A MSDS. IF AT ANY TIME THE MSDS IS UPDATED OR CHANGED, THE UPDATED MSDS MUST BE SUPPLIED WITH THE FIRST SHIPMENT AFTER THE MSDS UPDATE HAS OCCURRED.

IF YOU NEED FURTHER INFORMATION CONCERNING YOUR SITUATION, YOU MAY CONTACT THE EPA IN WASHINGTON, D.C. THEIR TOLL FREE NO. IS (800)535-0202; THE RCRA/SUPERFUND HOT LINE IS (800)424-9346 OR (703)920-9810; THE TSCA HOT LINE IS (202)554-1404.

BY PROVIDING THIS DOCUMENTATION, EIS IS COMPLYING WITH FEDERAL LAWS GOVERNING MSDS INFORMATION, AS IS KNOWN TO US. THIS IS A SERVICE AIMED AT HELPING YOUR BUSINESS TO ALSO COMPLY WITH GOVERNMENT REGULATIONS.

DAVE SHARPE

"SEE THE REVERSE SIDE FOR DOCUMENT NAME AND P.O. NUMBER"

33983/GENERAL ELECTRIC SERVICE

	MSDS DOCUMENT	SHIP DATE	CUSTOMER PURCHASE ORDER NUMBER
BLR240	GLY1209	08/29/97	GL4096-006381

Provided By Electrical Insulation Suppliers Inc.

MATERIAL SAFETY DATA SHEET

DATE OF PRINTING: 07/14/94

SECTION I

MANUFACTURER: GLYPTAL,INC.
305 EASTERN AVE
CHELSEA, MA 02150
TELEPHONE: 617-884-6918
PRODUCT CLA55: ADHESIVE CEMENT
CODE IDENTIFICATION: 1276
TRADE NAME: GLYPTAL

HMIS 2 3 0

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT BY WEIGHT	ACGIH TLV PPM	ACGIH TLV mu/cu.m.	OSHA PEL PPM	OSHA PEL mg/cu.m.
ETHYL ACETATE	35.7	1000			N.A
CAS NUMBER 141-78-6					
HMIS HEALTH-2 FLAMMABILITY=3 REACTIVITY=O					
ETHYL ACETATE					
NITROCELLULOSE	23.8				
CAS NUMBER 9004-70-0					
HMIS HEALTH=2 FLAMMABILITY=3 REACTIVITY-2					
CELLULOSE NITRATE					
ISOPROPYL ALCOHOL	10.2	400			400
CAS NUMBER 67-63-0					
HMIS HEALTH=2 FLAMMABILITY=3 REACTIVITY=O					
OXYGENATED HYDROCARBON MIXTURE.IPA					
DIBUTYL PHTHALATE	4.8	5 mg/m3			
CAS NUMBER 84-74-2					
HMIS HEALTH-2 FLAMMA81LITY=O REACTIVITY=O					
DIBUTYL PHTHALATE					
TOLUENE	4.1	100			100
CAS NUMBER 108-88-3					
HMIS HEALTH=2 FLAMMABILITY=3 REACTIVITY-0					
TOLUENE					
ETHYL ALCOHOL	4.1	1000			N/A
CA5 NUMBER 64-17-5					
HMLS HEALTH=2 FLAMMABILITY=3 REACTIVITY=O					
ETHYL ALCOHOL					
METHL ETHYL KETONE	1.8	200			200
CAS NUMBER 78-93-3					
HMIS HEALTH-2 FLAMMABILITY-3 REACTIVITY-0					
METHYL ETHYL KETONE					

Remaining 15.6 % is a non-hazardous alkyd resin.
N/A MEANS NOT AVAILABLE N/EST MEANS NOTESTABLISHED
NOT EST. means NOT ESTABLISHED
NOT EST. means NOT ESTABLISHED
N/A MEANS NOT AVAILABLE NOT EST MEANS NOT ESTABLISHED

SECTION III - PHYSICAL DATA

BOILING RANGE: 132.1 TO 232.0 F VAPOR DENSITY: HEAVIER THAN AIR
EVAPORATION RATE: SLOWER THAN ETHER
PERCENT VOLATILE BY VOLUME: 69.7 VOC (loss water): 5.02 LBSIGAL
WEIGHT PER GALLON: 8.97 POUNDS

V.O.C.Is determined per EPA Reference method 24 using ASTM procedures D2369,D1475 and 0 3960.
VAPOR PRESSURE: 45.54 mm/hg MELTING POINT: N/A
SOLUBILITY IN WATER: NEGLIGIBLE
APPEARANCE AND ODOR: CLEAR

SECTION IV - FIRE AND EXPLO51ON HAZARD DATA

OSHA CATEGORY: FLAMMABLE

FLASH POINT : 22F CC-PM LEL: .47 UEL: N/A
EXTINGUISHING MEDIA:
Carbon dioxide, dry chemical or foam
UNUSUAL FIRE AND EXPLOSION HAZARDS:
Pressure may build up in closed containers that are exposed to heat. vapors are heavier than air and may travel a Considerable distance along the ground to an ignition source and flash back.
SPECIAL FIRE FIGHTING PROCEDURES:
Water may be ineffective, however, water may be used to cool closed containers that are exposed to heat. Firefighting personnel should wear self-contained breathing apparatus.

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: SEE SECTION 11
PRIMARY ROUTE(S) OF ENTRY:
inhalation and skin contact
EFFECTS OF OVEREXP05URE:
Headache, nausea, dizziness, confusion, irritability.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:
Respiratory difficulties or preexisting skin sensitization.
CARCINOGENICITY:
None of the components of Limits product are reported carcinogens in A/C with OSHA,NTP,IARC and NIOSH.
EMERGENCY FIRST AID PROCEDURES:

INHALATION: Remove to fresh air. Administer artificial respiration or oxygen if breathing is difficult.
SKIN: Wash affected area with soap and water. Remove and launder contaminated clothing. Consult a physician if irritation persists.
EYES: Flush immediately with large amounts of water for at least 15. minutes. Take to a physician for medical treatment.
INGESTION: Call a physician immediately.

While this material has a low degree of toxicity,breattiin!g high concentrate one of vapors may cause irritation of the nose and throat respiratory symptoms associated with pre-existing lung disorders may be aggravated by exposure Lo this material.Per2sons with preexisting heart disorders may be more susceptible Lo irregular heartbeats if exposed to high concentration of this material.Reports have associated repeated and Prolonged occupational over-exposure to solvents with permanent brain and nervous system.

SECTION VI - REACTIVITY DATA

STABILITY: NORMALLY STABLE
CONDITIONS TO AVOID:
None known
INCOMPATIBILITY (Materials to avoid)
Strong acids and bases
HAZARDOUS DECOMPOSITION PRODUCTS:
BY FIRE: Normal products of incomplete combustion.
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
CONDITIONS TO AVOID:
None known

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Provide adequate ventilation. Remove all possible ignition sources. Absorb and dispose using non-sparking tools.
Elimination all sources of ignition. Evacuate unprotected personnel. Water spray may be used. To contain run-off, cover with an absorbent material and place in containers for proper disposal. Flush area with water to remove residue.
WASTE DISPOSAL METHOD:
Dispose in accordance with local applicable regulations.
Dispose of using an approved incineration process or in accordance with local, state, and federal regulations regarding health and pollution.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:
In outdoor or open areas use Bureau of mines approved mechanical filter respirator to remove solid airborne particulates of overapray. indoors, where ventilation is inadequate use Bureau of Mines approved chemical-mectianical respirators designed to remove both particulate and vapor.

VENTILATION:

PROTECTIVE GLOVES:
Recommended if skin contact is likely.

EYE PROTECTION:
Chemical splash goggles recommended if potential for splash or eye contact is likely.

OTHER PROTECTIVE EQUIPMENT:
Recommended as needed to avoid contact.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING OR STORING:

Store in a cool dry place away from heat, sparks and open flame. Keep containers closed ai-id upright to prevent leakage. outside or detached storage is preferred. Inside storage should be in a standard flamniable liquid storeroom or cabinet. Metal containers should be grounded while transferring material from one container to another. Do not reuse product container for any purpose.

OTHER PRECAUTIONS:

PREPARED BY: TECHNICAL STAFF

REFERENCE DATE: 5/2/93

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MATERIAL SAFETY DATA SHEET

DATE OF PRINTING: 07/15/94

SECTION I

MANUFACTURER: GLYPTAL,INC.
305 EASTERN AVE
CHELSEA, MA 02150
TELEPHONE: 617-884-6918
PRODUCT CLASS: ADHESIVE
CODE IDENTIFICATION: 880
TRADE NAME: GLYPTAL

HMIS 2 3 0

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT BY WEIGHT	ACGIH TLV PPM	ACGIH TLV mg/cu.m.	OSHA PEL PPM	OSHA PEL mg/cu.m.
ETHYL ALCOHOL	40.0	1000			N/A
CAS NUMBER 64-17-5					
HMIS HEALTH=2 FLAMMABILITY=3 REACTIVITY-0					
ETHYL ALCOHOL					
IRON OXIDE	20.0				
CAS NUMBER 1309-382					
HMIS HEALTH-0 FLAMMABILITY-1 REACTIVITY-1					
FERRIC OXIDE					

NIA MEANS NOT AVAILABLE N/EST MEANS NOTESTABLISHED
NOT EST. means NOT ESTABLISHED
NOT EST. means NOT ESTABLISHED
N/A MEANS NOT AVAILABLE NOT EST MEANS NOT ESTABLISHED

SECTION III - PHYSICAL DATA

BOILING RANGE: 170.0 TO 172.0 F VAPOR DENSITY: HEAVIER THAN AIR
EVAPORATION RATE: SLOWER THAN ETHER
PERCENT VOLATILE BY VOLUME: 55.9 VOC (less water): 3.79 LOS/GAL
WEIGHT PER GALLON: 9.47 POUNDS

V.O.C.Is determined per EPA Reference method 24 using ASTM procedures D2369,D1475 and D 3960.
VAPOR PRESSURE: NA MELTING POINT: NA
SOLUBILITY IN WATER: NEGLIGIBLE
APPEARANCE AND ODOR: RED ADHESIVE

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

OSHA CATEGORY: CEMENT LIQUID

FLASH POINT : 60 F TCC LEL: 1.0 UEL: NA

EXTINGUISHING MEDIA:

Carbon dioxide, dry chemical or foam

UNUSUAL FIRE AND EXPLOSION HAZARDS:

Pressure may build up in closed containers that are exposed to heat. Solvent vapors are heavier than air and may travel a considerable distance along the ground to an ignition source and 'flash back'.

SPECIAL FIRE FIGHTING PROCEDURES:

water may be ineffective, however, water may be used to cool closed containers that are exposed to heal. Firefighting personnel should wear self-contained breathing apparatus.

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: SEE SECTION II

PRIMARY ROUTE(S) OF ENTRY:

inhalation and skin contact

EFFECTS OF OVEREXP05URE:

Headache, nausea, dizziness, confusion, irritability.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:

Respiratory difficulties or preexisting skin sensitization.

CARCINOGENICITY:

None of the components of this product are reported carcinogens in A/C with OSHA,NTP,IARC and NIOSH.

EMERGENCY FIRST AID PROCEDURES:

INHALATION: Remove Lo fresh air. Administer artificial respiration or oxygen if breathing is difficult.

SKIN: Wash affected area with soap and water. Remove and launder contaminated clothing. Consult a physician if irritation Persists.

EYES: Flush immediately with large amounts of water for at least 15 minutes. Take to a physician for medical treatment.

INGESTION: Call a physician immediately.

SECTION VI - REACTIVITY DATA

STABILITY: NORMALLY STABLE

CONDITIONS TO AVOID:

None known

INCOMPATIBILITY (Materials to avoid)

Strong acids and bases

HAZARDOUS DECOMPOSITION PRODUCTS:

BY FIRE: Normal products of incomplete combustion.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
CONDITIONS TO AVOID:
None known

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Provide adequate ventilation. Remove all possible ignition sources. Absorb and dispose using rioii-sparkiiig tools.
Eliminate all sources of ignition. Evacuate unprotected personnel. Water spray may be used. To contain run-off, cover with an absorbent material and place in containers for proper disposal. Flush area with water Lo remove residue.
WASTE DISP05AL METHOD:
Dispose in accordance with local applicable regulations.
Dispose of using an approved incineration process or in accordance with local, state, and federal regulations regarding health and pollution.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:
In outdoor or open areas use Bureau of Mines approved mechanical filter respirator to remove solid airborne particulates of overepray. Indoors, where ventilation is inadequate. use Bureau of Mines approved chemical-mectianical respirators designed Lo remove both particulate and vapor.
VENTILATION:
PROTECTIVE GLOVES:
Recommended if skin contact is likely.
EYE PROTECTION:
Chemical splash goggles recommended if potential for splash or eye contact is likely.
OTHER PROTECTIVE EQUIPMENT:
Recommended as needed to avoid contact.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING OR STORING:
Store in a cool dry place away from heat, sparks and open flame. Keep containers closed and upright Lo prevent leakage. outside or detached storage is preferred. inside storage should be in a standard flammable liquid storeroom or cabinet. Metal containers should be grounded when transferring material from one container to another. Do not reuse product container for any purpose.
OTHER PRECAUTIONS:

PREPARED BY: TECHNICAL STAFF

REFERENCE DATE: 8/01/93

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PRODUCT: 880 GLYPTAL

IF YOU WILL MULTIPLY YOUR TOTAL PURCHASES FROM US AS WELL AS FROM OTHER SU PPLIERS BY THE PERCENTAGE OF EACH INGREDIENT FOUND IN EACH PRODUCT AND IF THE TOTAL QUANTITY EXCEEDS THE REPORTABLE QUANTITY FOR THAT INGREDIENT YOU ARE REQUIRED TO FILE FORM R REPORTS.

PRODUCT: 1276 GLYPI'AL

10.2% OXYGENATED HYDROCARBON MIXTURE (CAS 67-63-0)
1.8% METHYL ETHYL KETONE (CAS 78-93-3
4.8% 01 BUTYL PHTHALATE (CAS 84-74-2
4.1% TOLUENE (CAS #108-88-3)

IF YOU WILL MULTIPLY YOUR TOTAL PURCHASES FROM US AS WELL AS FROM OTHER SU PPLIERS BY THE PERCENTAGE OF EACH INGREDIENT FOUND IN EACH PRODUCT AND IF THE TOTAL QUANTITY EXCEEDS THE REPORTABLE QUANTITY FOR THAT INGREDIENT YOU ARE REQUIRED TO FILE FORM R REPORTS.

MATERIAL SAFETY DATA SHEET

SECTION I

MANUFACTURER: GLYPTAL, INC.
305 EASTERN AVE
CHELSEA, MA 02150
TELEPHONE: 617-884-6918
PRODUCT CLASS: ALKYD
CODE IDENTIFICATION: 9921
TRADE NAME: GLYPTAL

HMIS 2 3 0

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT BY WEIGHT	ACGIH TLV PPM	ACGIH TLV mg/cu.m.	OSHA PEL PPM	OSHA PEL mg/cu.m.
XYLENE	42.8	100		100	
CAS NUMBER 1330-20-7					
HMIS HEALTH=1 FLAMMABILITY=3 REACTIVITY=0					
XYLOL					
VM&P NAPTHA	14.0	300		300	
CAS NUMBER 8030-30-6					
HMIS HEALTH=2 FLAMMABILITY=3 REACTIVITY=0					
ALIPHATIC HYDROCARBON					
BUTYL CELLOSOLVE	1.7	25		25	
CAS NUMBER 111-76-2					
HMIS HEALTH=2 FLAMMABILITY=1 REACTIVITY=0					
ETHYLENE GLYCOL N-BUTYL ETHER					
AROMATIC 100	3.0	100		100	
CAS NUMBER 64742-95-6					
HMIS HEALTH=2 FLAMMABILITY=2 REACTIVITY=0					
AROMATIC HYDROCARBON MIXTURE					
STODDARD SOLVENT	< 0.1	500			
CAS NUMBER 64741-41-9					
HMIS HEALTH=2 FLAMMABILITY=2 REACTIVITY=0					
HYDROCARBON MIXTURE					
GRAPHITE	8.8		10		
CAS NUMBER 64743-05-1					
HMIS HEALTH=1 FLAMMABILITY=0 REACTIVITY=0					
CARBON					
GRAPHITE	8.8		2.5	15	
CAS NUMBER 7782-42-5					
HMIS HEALTH=1 FLAMMABILITY=0 REACTIVITY=0					
NATURAL GRAPHITE					

VM & P (CAS# 8030-30-6). AGENCY OSHA.TYPE STEL. EXPOSURE LIMIT 400 PPM
N/A MEANS NOT AVAILABLE N/EST MEANS NOTESTABLISHED
NOT EST. means NOT ESTABLISHED
NOT EST. means NOT ESTABLISHED
N/A MEANS NOT AVAILABLE NOT EST MEANS NOT ESTABLISHED

SECTION III - PHYSICAL DATA

BOILING RANGE: 250.0 TO 345.0 F VAPOR DENSITY: HEAVIER THAN AIR
EVAPORATION RATE: SLOWER THAN ETHER
PERCENT VOLATILE BY VOLUME: 74.6 VOC (less water): 5.22 LBS/GAL
WEIGHT PER GALLON: 8.48 POUNDS
V.O.C. IS DETERMINED PER EPA REFERENCE METHOD 24 USING ASTM PROCEDURES D2369 D1475 AND D3960.
VAPOR PRESSURE: NA
MELTING POINT: NA
SOLUBILITY IN WATER: NEGLIGIBLE
APPEARANCE AND ODOR: GREEN PAINT

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

OSHA CATEGORY: FLAMMABLE LIQUID

FLASH POINT : 71 F TCC LEL: 1.0 UEL: NA
EXTINGUISHING MEDIA:
Carbon dioxide, dry chemical or foam

UNUSUAL FIRE AND EXPLOSION HAZARDS:
Pressure may build up in closed containers that are exposed to heat. Solvent vapors are heavier than air and may travel a considerable distance along the ground to an ignition source and "flash back".
SPECIAL FIRE FIGHTING PROCEDURES:
Water may be ineffective, however, water may be used to cool closed containers that are exposed to heat. Firefighting personnel should wear self-contained breathing apparatus.

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: SEE SECTION II
PRIMARY ROUTE(S) OF ENTRY:
Inhalation and skin contact
EFFECTS OF OVEREXPOSURE:
Headache, nausea, dizziness, confusion, irritability.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:
Respiratory difficulties or preexisting skin sensitization.
CARCINOGENICITY:
None of the components of this product are reported carcinogens in A/C with OSHA, NTP, IARC and NIOSH.
EMERGENCY FIRST AID PROCEDURES:
INHALATION: Remove to fresh air. Administer artificial respiration or oxygen if breathing is difficult.
SKIN: Wash affected area with soap and water. Remove and launder contaminated clothing. Consult a physician if irritation persists.
EYES: Flush immediately with large amounts of water for at least 15 minutes. Take to a physician for medical treatment.
INGESTION: Call a physician immediately.

Pre-Exiting liver and/or kidney disorders may be aggravated by exposure to xylene. Reports have associated repeated and prolonged occupational overexpo sure to xylene with permanent brain and nervous system damage.
Prolonged or repeated exposure to vapors or mists of glycol ethers may caus e blood disorders. Liver damage, kidney damage. Respiratory symptoms associate d with pre-existing lung disorders (E.G.ASTHMA-LIKE CONDITIONS) may be aggr avated by overexposure to glycol ethers.

SECTION VI - REACTIVITY DATA

STABILITY: NORMALLY STABLE
CONDITIONS TO AVOID:
None known
INCOMPATIBILITY (Materials to avoid)
Strong acids and bases
HAZARDOUS DECOMPOSITION PRODUCTS:
BY FIRE: Normal products of incomplete combustion.
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
CONDITIONS TO AVOID:
None known

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Provide adequate ventilation. Remove all possible ignition sources. Absorb and dispose using non-sparking tools.
Eliminate all sources of ignition. Evacuate unprotected personnel. Water spray may be used. To contain run-off, cover with an absorbent material and place in containers for proper disposal. Flush area with water to remove residue.
WASTE DISPOSAL METHOD:
Dispose in accordance with local applicable regulations.
Dispose of using an approved incineration process or in accordance with local, state, and federal regulations regarding health and pollution.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:
In outdoor or open areas use Bureau of Mines approved mechanical filter respirator to remove solid airborne particulates of overspray. Indoors, where ventilation is inadequate, use Bureau of Mines approved chemical-mechanical respirators designed to remove both particulate and vapor.
VENTILATION:
PROTECTIVE GLOVES:

Recommended if skin contact is likely.
EYE PROTECTION:
Chemical splash goggles recommended if potential for splash or eye contact is likely.
OTHER PROTECTIVE EQUIPMENT:
Recommended as needed to avoid contact.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING OR STORING:
Store in a cool dry place away from heat, sparks and open flame. Keep containers closed and upright to prevent leakage. Outside or detached storage is preferred. Inside storage should be in a standard flammable liquid storeroom or cabinet. Metal containers should be grounded when transferring material from one container to another. Do not reuse product container for any purpose.
OTHER PRECAUTIONS:

PREPARED BY : TECHNICAL STAFF
REFERENCE DATE: 7/29/97

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PRODUCT: 9921 GLYPTAL

42.8% XYLENE (CAS NUMBER 1330-20-7)

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RECEIVED
AUG 20 1997

0300087
GENERAL ELECTRIC SERVICE
1401 EAST VALENCIA ROAD

TUCSON, AZ 85706-0000

ELECTRICAL INSULATION SUPPLIERS
1255 COLLIER RD.
ATLANTA, GA 30318

PHONE # (404)355-1651
FAX # (404)609-6084

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UNDER THE "EMERGENCY PLANNING COMMUNITY RIGHT-TO-KNOW ACT OF 1986" INVENTORY AND LOCATION INFORMATION, CONCERNING HAZARDOUS MATERIALS mr30nfgJOB SITE, MAY NEED TO BE REPORTED TO THE LOCAL FIRE DEPARTMENT, THE LOCAL EMERGENCY PLANNING COMMITTEE AND THE STANDARD RESPONSE COMMISSION. YOU MAY WANT TO REFERENCE 40 CFR PART 372 FOR ADDITIONAL INFORMATION. MANUFACTURERS MUST REPORT ANNUAL RELEASES OF LISTED TOXIC CHEMICALS INTO THE ENVIRONMENT, ACCORDING TO SARA TITLE III.

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IF YOU NEED FURTHER INFORMATION CONCERNING YOUR SITUATION, YOU MAY CONTACT THE EPA IN WASHINGTON, D.C. THEIR TOLL FREE NO. IS (800)535-0202; THE RCRA/SUPERFUND HOT LINE IS (800)424-9346 OR (703)920-9810; THE TSCA HOT LINE IS (202)554-1404.

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DAVE SHARPE

"SEE THE REVERSE SIDE FOR DOCUMENT NAME AND P.O. NUMBER"

33983/GENERAL ELECTRIC SERVICE

	MSDS DOCUMENT	SHIP DATE	CUSTOMER PURCHASE ORDER NUMBER
BLR240	GLY9921	08/14/97	GL4096-006244

Provided By Electrical Insulation Suppliers Inc.

MATERIAL SAFETY DATA SHEET

GREAT WESTERN CHEMICAL CO.

NFPA 704 DESIGNATION
HAZARD RATING

4 = Extreme
3 = High
2 = Moderate
1 = Slight
0 = Insignificant

Fire: 3
Health: 1
Reactivity: 0
Special: -

Issue Date: 04/16/90 Supersedes: New

PRODUCT NAME: ACETONE

CHEMICAL NAME: 2-Propanone CHEMICAL FAMILY: Ketone

FORMULA: CH_3COCH_3 MOLECULAR WEIGHT: 58.08

D.O.T. SHIPPING CLASSIFICATION: Acetone Flammable Liquid UN1090

I. PHYSICAL DATA

BOILING POINT 760mm, Hg	133.32° F. (56.29° C.)	FREEZING POINT	-141.77° F.(-96.54° C.)
SPECIFIC GRAVITY (WATER = 1)	0.7915 @ 20° C.	pH of 1% (w/v) SOLUTION	NDA
PERCENT VOLATILE ORGANICS BY VOLUME	100	SOLUBILITY IN WATER	Complete
APPEARANCE AND ODOR	Clear, colorless liquid with a sharp penetrating odor.		

II. HAZARDOUS INGREDIENTS

MATERIAL	HAZARD	%(wt.)	ACGIH TLV (Units)	OSHA PEL
*Acetone CAS# 67-64-1	Flammable/Irritant	100	Air: 750 ppm STEL: 1000 ppm	Air: TWA 750 ppm STEL: 1000 ppm

* Chemicals subject to SARA Title III, Section 313 reporting. This notification must not be detached from this MSDS, and any copies of this MSDS must include this notification.

All chemicals contained in this product are listed on the Toxic Substance Control Act (TSCA) Inventory.

N/A = Not Applicable
NDA = No Data Available

EMERGENCY PHONE NUMBERS

Great Western Chemical Company
808 S.W. 15th Avenue
Portland, Oregon 97205
Phone: (503) 228-2600

800/424-9300
CHEMTREC

III. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT [test method(s)]	0° F.; Tag. Closed Cup	AUTOIGNITION TEMPERATURE	869° F.
FLAMMABLE LIMITS IN AIR, % by volume		LOWER	2.6
		UPPER	12.8
EXTINGUISHING MEDIA	Foam, carbon dioxide and dry chemicals. A water "fog" may be used for fire fighting. A water spray should be used to cool container only.		
UNUSUAL FIRE AND EXPLOSION HAZARDS	May produce hazardous fumes or hazardous decomposition products. Vapors from this product may concentrate in confined spaces and form an explosive mixture.		
SPECIAL FIRE FIGHTING PROCEDURES	When fire fighting, wear full protective equipment, including self-contained breathing apparatus.		

IV. HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE	Air: 750 ppm		
ROUTE OF EXPOSURE	EYE CONTACT "Warning" Irritant	SKIN CONTACT "Warning" Irritant	SKIN ABSORPTION No data published
	INHALATION Harmful if inhaled	INGESTION Harmful if swallowed	
EFFECTS OF OVEREXPOSURE	Causes eye and skin irritation. Harmful if swallowed or inhaled.		
EMERGENCY AND FIRST AID PROCEDURES	EYES: Immediately flush eyes with plenty of clean running water for at least 15 minutes, lifting the upper and lower lids occasionally. Call a physician immediately. EXTERNAL: In case of contact, immediately flush skin with plenty of clean running water for at least 15 minutes, while removing contaminated clothing and shoes. If irritation occurs, get medical attention. INTERNAL: If swallowed, DO NOT induce vomiting. Immediately drink a large quantity of milk or water and call a physician. Never give anything by mouth to an unconscious person. INHALATION: If inhaled, immediately move to fresh air. If not breathing, give artificial respiration, preferably mouth to mouth. If breathing is difficult, give oxygen. Call a physician.		

CHRONIC EXPOSURE EFFECTS	Prolonged or repeated exposure can cause defatting of skin, irritation and possibly dermatitis.

V. REACTIVITY DATA

STABILITY				CONDITIONS TO AVOID	
UNSTABLE		STABLE	X		Hot Storage

INCOMPATIBILITY (materials to avoid)	Oxidizers and strong mineral acids
HAZARDOUS DECOMPOSITION PRODUCTS	Carbon monoxide and carbon dioxide

HAZARDOUS POLYMERIZATION				CONDITIONS TO AVOID	
MAY OCCUR		WILL NOT OCCUR	X		None

VI. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED	Remove all ignition sources and contain spilled liquid. (For small spills, add dry material to contain.) Wearing recommended protective equipment, and using explosion-proof equipment, remove bulk of liquid; add dry material to absorb remaining liquid; pick up and containerize for product recovery or disposal. Flush area with water; collect rinsates for disposal or sewer, as appropriate.
WASTE DISPOSAL METHOD	This product, if disposed as shipped, meets EPA criteria of a hazardous waste as specified in 40 CFR 261 on the basis of its ignitability. Dispose of product in a licensed hazardous waste disposal facility in accordance with all applicable laws. When empty, thoroughly rinse container with water before disposal. Return to manufacturer or any other industrial use.

VII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type)		If an OSHA-PEL is exceeded, then a NIOSH-approved respirator with an organic vapor cartridge or supplied air is required.		
VENTILATION	LOCAL EXHAUST	Required	SPECIAL	None
	MECHANICAL (general)	As a supplement to the local exhaust system.	OTHER	N/A
PROTECTIVE GLOVES		Rubber or synthetic rubber		
EYE PROTECTION		Chemical goggles (recommended by ANSI Z87.1-1979)		
OTHER PROTECTIVE EQUIPMENT		Rubber apron, rubber boots, eyewash, safety shower		

VIII. SPECIAL PRECAUTIONS

PRECAUTIONARY LABELING

FOR INDUSTRIAL USE ONLY.

Keep out of reach of children.

Protect eyes, skin, and clothing from contact with product.

Use only with adequate ventilation.

Keep container tightly closed when not in use.

Wash thoroughly after handling.

WARNING: ACETONE is flammable.

This product is not manufactured to contain a known carcinogen or reproductive toxin.

WARNING: Hot organic chemical vapors or mists are susceptible to sudden spontaneous combustion when mixed with air. Ignition may occur at temperatures below those published in the literature as "autoignition" or "ignition" temperatures. Ignition temperatures decrease with increasing vapor volume and vapor/air contact time are influenced by pressure changes.

Ignition may occur at typical elevated-temperature process conditions, especially in process operating under vacuum if subjected to sudden ingress of air, or outside process equipment operating under elevated pressure if sudden escape of vapors or mists to the atmosphere occurs. Any proposed use of this product in elevated-temperature processes should be thoroughly evaluated to assure that safe operating conditions are established and maintained.

OTHER HANDLING AND STORAGE CONDITIONS

Store in a cool, dry, well-ventilated area away from heat, sparks, and open flame.

Empty container is hazardous. It can contain flammable residues and flammable/explosive vapors. Do not cut, puncture, or weld on or near this container.

Always ground and bond container before transferring.

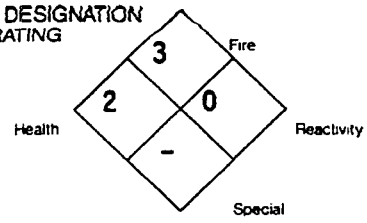
PREPARED BY	Ed Doheny	DATE	April 16, 1990

This Material Safety Data Sheet is provided as an information resource only. It should not be taken as a warranty or representation for which Great Western Chemical Company assumes legal responsibility. While Great Western Chemical Company believes the information contained herein is accurate and compiled from sources believed to be reliable, it is the responsibility of the user to investigate and verify its validity. The buyer assumes all responsibility of using and handling the product in accordance with applicable federal, state, and local regulations.

MATERIAL SAFETY DATA SHEET

Thinner

NFPA 704 DESIGNATION
HAZARD RATING



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0 = Insignificant

GREAT WESTERN CHEMICAL CO.

Issue Date: 08/15/91 Supersedes: 08/04/91

PRODUCT NAME: XYLENE

CHEMICAL NAME: Dimethylbenzene CHEMICAL FAMILY: Aromatic Hydrocarbons

FORMULA: $C_6H_4\ (CH_3)_2$ MOLECULAR WEIGHT: 106.18

D.O.T. SHIPPING CLASSIFICATION: Xylene Flammable Liquid UN1307

I. PHYSICAL DATA

BOILING POINT 760mm, Hg	281-286° F.	FREEZING POINT	NDA
SPECIFIC GRAVITY (WATER = 1)	0.864 @ 20° C.	pH of 1% (w/v) SOLUTION	NDA
PERCENT VOLATILE ORGANICS BY VOLUME	100	SOLUBILITY IN WATER	Negligible
APPEARANCE AND ODOR	Clear, colorless liquid with a characteristic odor.		

II. HAZARDOUS INGREDIENTS

MATERIAL	HAZARD	% (wt.)	ACGIH TLV (Units)	OSHA PEL
* Xylene CAS# 1330-20-7 (all isomers)	Flammable/Irritant	80 ± 5	Air: 100 ppm STEL: 150 ppm	Air: TWA 100 ppm STEL: 150 ppm
* Ethyl Benzene CAS# 100-41-4	Flammable/Irritant	20 ± 5	Air: 100 ppm STEL: 125 ppm	Air: TWA 100 ppm STEL: 125 ppm

* Chemicals subject to SARA Title III, Section 313 reporting. This notification must not be detached from this MSDS, and any copies of this MSDS must include this notification. This notification applies only to material while it is within the boundaries of the United States of America or its territories.

All chemicals contained in this product are listed on the Toxic Substance Control Act (TSCA) Inventory.

N/A = Not Applicable
NDA = No Data Available

EMERGENCY PHONE NUMBERS

Great Western Chemical Company
808 S.W. 15th Avenue
Portland, Oregon 97205
Phone: (503) 228-2600

800/424-9300
CHEMTREC

III. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT [test method(s)]	80° F.; Tag. Closed Cup	AUTOIGNITION TEMPERATURE	930° F.
FLAMMABLE LIMITS IN AIR, % by volume		LOWER	1.0
		UPPER	7.0
EXTINGUISHING MEDIA	Foam, carbon dioxide, and dry chemicals. A water "fog" or spray should be used to cool containers only.		
UNUSUAL FIRE AND EXPLOSION HAZARDS	May produce hazardous fumes or hazardous decomposition products. Vapors from this product may concentrate in confined spaces and form an explosive mixture.		
SPECIAL FIRE FIGHTING PROCEDURES	When fire fighting, wear full protective equipment, including self-contained breathing apparatus.		

IV. HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE	Not established on this product.		
ROUTE OF EXPOSURE	EYE CONTACT	SKIN CONTACT	SKIN ABSORPTION
	"Warning" Irritant	"Warning" Irritant	No data published
	INHALATION	INGESTION	
	Harmful if inhaled	Harmful if swallowed	
EFFECTS OF OVEREXPOSURE	Causes eye and skin irritation. Harmful if swallowed or inhaled.		
EMERGENCY AND FIRST AID PROCEDURES	EYES: Immediately flush eyes with plenty of clean, running water for at least 15 minutes, lifting the upper and lower lids occasionally. Call a physician immediately. EXTERNAL: In case of contact, immediately flush skin with plenty of clean running water for at least 15 minutes, while removing contaminated clothing and shoes. Then wash with soap and water. If irritation occurs, get medical attention. INTERNAL: If swallowed, DO NOT induce vomiting. Immediately drink a large quantity of milk or water and call a physician. Never give anything by mouth to an unconscious person. INHALATION: If inhaled, immediately move to fresh air. If not breathing, give artificial respiration, preferably mouth to mouth. If breathing is difficult, give oxygen. Call a physician.		

CHRONIC EXPOSURE EFFECTS	Repeated exposure can lead to dermatitis with possible liver and/or kidney damage; otherwise, same as for overexposure.

V. REACTIVITY DATA

STABILITY				CONDITIONS TO AVOID	
UNSTABLE		STABLE	X		Hot storage

INCOMPATIBILITY (materials to avoid)	Oxidizers
HAZARDOUS DECOMPOSITION PRODUCTS	Carbon monoxide and carbon dioxide

HAZARDOUS POLYMERIZATION				CONDITIONS TO AVOID	
MAY OCCUR		WILL NOT OCCUR	X		None

VI. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED	Remove all ignition sources and contain spilled liquid. (For small spills, add dry material to contain.) Wearing recommended protective equipment, and using explosion-proof equipment, remove bulk of liquid; add dry material to absorb remaining liquid; pick up and containerize for product recovery or disposal. Flush area with water; collect rinsates for disposal or sewer, as appropriate.
WASTE DISPOSAL METHOD	This product, if disposed as shipped, meets EPA criteria of a hazardous waste as specified in 40 CFR 261 on the basis of its ignitability. Dispose of product in a licensed hazardous waste disposal facility in accordance with all applicable laws. When empty, container should be thoroughly cleaned before disposal, return to manufacturer, or any other industrial use.

VII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type)		If the OSHA-PEL is exceeded, then a NIOSH-approved respirator with an organic vapor cartridge or supplied air is required.		
VENTILATION	LOCAL EXHAUST	Required	SPECIAL	None
	MECHANICAL (general)	As a supplement to the local exhaust system	OTHER	N/A
PROTECTIVE GLOVES		Rubber or synthetic rubber		
EYE PROTECTION		Chemical goggles (recommended by ANSI Z87.1-1979)		
OTHER PROTECTIVE EQUIPMENT		Rubber apron, rubber boots, eyewash, and safety shower		

VIII. SPECIAL PRECAUTIONS

PRECAUTIONARY LABELING

FOR INDUSTRIAL USE ONLY.
Keep out of reach of children.
Protect eyes, skin, and clothing from contact with product.
Use only with adequate ventilation.
Keep container tightly closed when not in use.
Wash thoroughly with soap and water after handling.

WARNING: XYLENE is flammable.

Many petroleum and petrochemical products may contain trace, but detectable, amounts of some chemicals known to cause cancer, birth defects, or other reproductive harm. These chemicals are usually not intentionally added to the product, but trace amounts may be present in the raw materials, may be formed during processing, or unintentionally may contaminate the product during transportation.

WARNING: Hot organic chemical vapors or mists are susceptible to sudden spontaneous combustion when mixed with air. Ignition may occur at temperatures below those published in the literature as "autoignition" or "ignition" temperatures. Ignition temperatures decrease with increasing vapor volume and vapor/air contact time are influenced by pressure changes.

Ignition may occur at typical elevated-temperature process conditions, especially in process operating under vacuum if subjected to sudden ingress of air, or outside process equipment operating under elevated pressure if sudden escape of vapors or mists to the atmosphere occurs. Any proposed use of this product in elevated-temperature processes should be thoroughly evaluated to assure that safe operating conditions are established and maintained.

OTHER HANDLING AND STORAGE CONDITIONS

Store in a cool, dry, well-ventilated area away from heat, sparks, and open flame.

Empty container is hazardous. It can contain flammable residues and highly flammable/explosive vapors. Do not cut, puncture, or weld on or near this container.

Always ground and bond container before transferring.

PREPARED BY	Mike Hoefler	DATE	August 15, 1991

This Material Safety Data Sheet is provided as an information resource only. It should not be taken as a warranty or representation for which Great Western Chemical Company assumes legal responsibility. While Great Western Chemical Company believes the information contained herein is accurate and compiled from sources believed to be reliable, it is the responsibility of the user to investigate and verify its validity. The buyer assumes all responsibility of using and handling the product in accordance with applicable federal, state, and local regulations.

ISRAEL: THIS INFORMATION APPLIES TO ISOPROPANOL ONLY:
OCCUPATIONAL EXPOSURE LIMITS FOR CHEMICAL SUBSTANCES - 1990
TIME WEIGHTED AVERAGE: 400 PPM TWA; 983 MG/M3 TWA
SHORT TERM EXPOSURE LIMIT: 500 PPM STEL; 1,230 MG/M3 STEL
ACTION LEVEL: 200 PPM AL; 491.5 MG/M3 AL

MEXICO: THIS INFORMATION APPLIES TO ISOPROPANOL ONLY:
SECRETARIAT OF LABOR AND SOCIAL WELFARE INSTRUCTION NO. 10 PERMISSIBLE
EXPOSURE LIMITS - 1992
TIME WEIGHTED AVERAGE: 400 PPM TWA; 980 MG/M3 TWA (NEW)
SHORT TERM EXPOSURE LIMIT: 500 PPM STEL; 1225 MG/M3 (NEW)
SKIN DESIGNATION: SKIN - POTENTIAL FOR CUTANEOUS ABSORPTION (NEW)

OTHER INTERNATIONAL REGULATIONS: NOT AVAILABLE

16. OTHER INFORMATION

REVISIONS (GIVE DATE AND SPECIFY CHANGES): NOT APPLICABLE - FIRST RELEASE

HAZARD RATINGS: HMIS CLASSIFICATION: FIRE=1 (SLIGHTLY FLAMMABLE), HEALTH=1 (SLIGHTLY HAZARDOUS), REACTIVITY=0 (STABLE), PERSONAL PROTECTION=B
0=LEAST, 1=SLIGHT, 2=MODERATE, 3=HIGH, 4=EXTREME
THIS INFORMATION IS INTENDED SOLELY FOR THE USE OF INDIVIDUALS TRAINED IN THE PARTICULAR SYSTEM.

TRAINING REQUIREMENTS: WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM TRAINING IS REQUIRED FOR HANDLING AND USING THIS PRODUCT IN CANADIAN WORKPLACES. U.S. OSHA REQUIREMENTS FOR HANDLING CHEMICAL SUBSTANCES MUST BE IN PLACE FOR HANDLING AND USING THIS PRODUCT IN THE UNITED STATES.

RECOMMENDED USES AND RESTRICTIONS: CLEANING OF CLEAR SURFACES. CHECK FOR COMPATIBILITY WITH MATERIAL TO BE CLEANED PRIOR TO USE.

ADDITIONAL INFORMATION: KEEP OUT OF REACH OF CHILDREN.

DISCLAIMER: THIS INFORMATION IS FURNISHED WITHOUT WARRANTY, REPRESENTATION, OR LICENSE OF ANY KIND, EXCEPT THAT IT IS ACCURATE TO THE BEST OF H.L. BOUTON CO., INC.'S KNOWLEDGE, OR OBTAINED FROM SOURCES BELIEVED TO BE ACCURATE. H.L. BOUTON CO., INC. DOES NOT ASSUME ANY LEGAL RESPONSIBILITY FOR USE OR RELIANCE UPON THE SAME. CUSTOMERS ARE ENCOURAGED TO CONDUCT THEIR OWN TESTS AND INVESTIGATIONS. BEFORE USING THE PRODUCT, PLEASE READ AND UNDERSTAND THE LABEL AND THE MATERIAL SAFETY DATA SHEET.

REFERENCES:

1. THE REGULATION RESPECTING THE CONTROL OF BIOLOGICAL AND CHEMICAL AGENTS MADE UNDER OCCUPATIONAL HEALTH AND SAFETY ACT, ONT. REG. 654/86.
2. INTERNATIONAL AGENCY FOR RESEARCH ON CANCER, MONOGRAPHS EVALUATION FOR CARCINOGENIC RISK IN HUMANS.
3. TEXT ENTITLED "DANGEROUS PROPERTIES OF INDUSTRIAL CHEMICALS" BY SAX, N.I.
4. THE "DOCUMENTATION OF THE THRESHOLD LIMIT VALUES AND BIOLOGICAL EXPOSURE INDICES" BY THE AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS.

5. THE MERCK INDEX, AN ENCYCLOPEDIA OF CHEMICALS.
6. THE CCINFO SYSTEM, CANADIAN CENTRE OF OCCUPATIONAL HEALTH AND SAFETY.
7. RTECS DATABASE BY THE U.S. NATIONAL INSTITUTE OF OCCUPATIONAL SAFETY AND HEALTH.
8. NEW JERSEY DEPARTMENT OF HEALTH HAZARDOUS SUBSTANCES FACT SHEET.
9. CANADIAN ENVIRONMENTAL PROTECTION ACT, NEW SUBSTANCES NOTIFICATION REGULATIONS - DOMESTIC SUBSTANCES LIST.
10. ORIGINAL SUPPLIER MSDS.

OTHER RELATED MANUFACTURER'S BROCHURES: NOT AVAILABLE

KEY/LEGEND: NOT AVAILABLE - MEANS THAT THE INFORMATION FOR THAT FIELD COULD NOT BE OBTAINED. NOT APPLICABLE - MEANS THAT THE FIELD IN QUESTION DOES NOT PERTAIN TO THIS PARTICULAR PRODUCT DUE TO THE INHERENT NATURE OF THE PRODUCT.

LABEL INFORMATION:
VISIONAID RAINBOW II
87.5% WATER CAS #7732-18-5
10% ISOPROPYL ALCOHOL CAS #67-63-0
2.5% SODIUM DODECYL SULFATE CAS #151-21-3
TRACE COPPER CAS #7440-50-8
TRACE DIRECT BLUE 86 (COPPER PHTHALOCYANINE COMPOUND) CAS #1330-38-7
TRACE ACID GREEN 25 CAS #4403-90-1
TRACE SODIUM SULFATE CAS #7757-82-6
TRACE SODIUM CHLORIDE CAS #7647-14-5
TRACE SODIUM CARBONATE CAS #497-19-8

CAUTION-COMBUSTIBLE LIQUID.
CAUTION-CAUSES EYE AND SKIN IRRITATION.
HARMFUL IF SWALLOWED.
CONTAINS ISOPROPANOL.
KEEP AWAY FROM OPEN FLAME AND HEAT.
AVOID CONTACT WITH EYES.
DO NOT DRINK.
USE WITH ADEQUATE VENTILATION.

SEE MATERIAL SAFETY DATA SHEET FOR ADDITIONAL INFORMATION.

H.L. BOUTON COMPANY, INC.
11 KENDRICK RD., WAREHAM,
MASSACHUSETTS,
U.S.A., 02571

VISION-AID RAINBOW II

VISION AID RAINBOW EYE GLASS CLEANER

CHP OF YES NO

SIGNIFICANCE OF CHANGE IN PHYSICAL APPEARANCE: UNDER SEVERELY COLD TEMPERATURES PRODUCT MAY BEGIN TO TURN CLOUDY WHICH MAY DEGRADE ITS FUNCTIONALITY.
CONDITIONS OF REACTIVITY: DO NOT HEAT ABOVE 80C (176F).

11. TOXICOLOGICAL INFORMATION

LD50 OF PRODUCT: 17423 MG/KG ORAL-RAT (CALCULATED)
LC50 OF PRODUCT: NOT AVAILABLE
INHALATION ACUTE - ROUTE OF ENTRY AND EFFECTS OF EXPOSURE: Y Y=YES, N=NO, U=UNKNOWN HIGH LEVELS MAY CAUSE HEADACHE, NAUSEA, DIZZINESS.
INHALATION CHRONIC - ROUTE OF ENTRY AND EFFECTS OF EXPOSURE: Y Y=YES, N=NO, U=UNKNOWN NO LONG TERM EFFECTS EXPECTED.
INGESTION - ROUTE OF ENTRY AND EFFECTS OF EXPOSURE: Y Y=YES, N=NO, U=UNKNOWN MILDLY TOXIC BY INGESTION. MAY CAUSE NAUSEA, HEADACHE AND VOMITING.
SKIN CONTACT - ROUTE OF ENTRY AND EFFECTS OF EXPOSURE: Y Y=YES, N=NO, U=UNKNOWN MAY CAUSE MILD IRRITATIONS, DRYING OUT OF SKIN. PROLONGED OR REPEATED SKIN CONTACT MAY CAUSE DRYING OUT OF SKIN, IRRITATIONS AND OR DERMATITIS.
SKIN ABSORPTION - ROUTE OF ENTRY AND EFFECTS OF EXPOSURE: N Y=YES, N=NO, U=UNKNOWN
EYE CONTACT - ROUTE OF ENTRY AND EFFECTS OF EXPOSURE: Y Y=YES, N=NO, U=UNKNOWN MAY IRRITATE EYES, CAUSE REDNESS AND TEMPORARY CORNEAL DAMAGE.
SUBCHRONIC EFFECTS: CNS (CENTRAL NERVOUS SYSTEM) DEPRESSION.
IS PRODUCT AN IRRITANT? Y Y=YES, N=NO, U=UNKNOWN EYE AND SKIN IRRITANT.
IS PRODUCT A SENSITIZER? N Y=YES, N=NO, U=UNKNOWN
EVIDENCE OF EPIDEMIOLOGY: N Y=YES, N=NO, U=UNKNOWN
EVIDENCE OF CARCINOGENICITY: N Y=YES, N=NO, U=UNKNOWN IARC GROUP 3, INSUFFICIENT EVIDENCE.
EVIDENCE OF REPRODUCTIVE TOXICITY: N Y=YES, N=NO, U=UNKNOWN INSUFFICIENT EVIDENCE.
EVIDENCE OF TERATOGENICITY: N Y=YES, N=NO, U=UNKNOWN
EVIDENCE OF MUTAGENICITY: N Y=YES, N=NO, U=UNKNOWN
EVIDENCE OF NEUROTOXICITY: Y Y=YES, N=NO, U=UNKNOWN MAY OCCUR FROM INGESTION OF ISOPROPANOL.
EVIDENCE OF NARCOSIS: Y Y=YES, N=NO, U=UNKNOWN MAY CAUSE SEVERE NARCOSIS IF LARGE AMOUNTS ARE INGESTED.
OTHER STUDIES RELEVANT TO MATERIAL: NONE KNOWN.
SYNERGISTIC PRODUCTS: NONE KNOWN.

12. ECOLOGICAL INFORMATION

ECOTOXICITY:
ACUTE AND LONG-TERM TOXICITY TO FISH AND INVERTEBRATES: SOLUTIONS OF ALCOHOLS ARE TOXIC TO AQUATIC LIFE AT MODERATE TO LOW CONCENTRATIONS. NO LONG TERM ECOLOGICAL EFFECTS ARE LIKELY.

TOXICITY TO AQUATIC AND TERRESTRIAL PLANTS: CONCENTRATED SOLUTIONS OF ALCOHOLS AND SURFACTANTS MAY CAUSE DAMAGE TO AQUATIC AND TERRESTRIAL PLANTS.

ACUTE AND DIETARY TOXICITY TO BIRDS: NOT EXPECTED TO BE TOXIC.

TOXICITY TO BENEFICIAL MICROORGANISMS: CONCENTRATED SOLUTIONS OF ALCOHOLS AND SURFACTANTS HAVE ANTIMICROBIAL ACTIVITY.

ENVIRONMENTAL FATE:
PERSISTENCE AND DEGRADATION: MODERATELY PERSISTENT BUT IS BIODEGRADABLE OVER TIME.

BIOACCUMULATION/BIOCONCENTRATION: WILL NOT BIOACCUMULATE.

SOIL MOBILITY: SIMILAR TO WATER.

PHYSICAL/CHEMICAL:
FOR ADDITIONAL PHYSICAL/CHEMICAL CHARACTERISTICS SEE SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES.

HYDROLYTIC AND PHOTOLYTIC STABILITY: STABLE.

13. DISPOSAL CONSIDERATIONS

PLEASE NOTE: THE ADVICE IN THIS SECTION IS GIVEN IN ACCORDANCE WITH THE LAWS THAT WERE IN EFFECT AT THE TIME. LAWS ARE TRANSIENT AND MAY CHANGE OR BE REINTERPRETED. STATE/PROVINCIAL OR LOCAL REGULATIONS ARE COMPLEX AND MAY DIFFER FROM FEDERAL REGULATIONS. THIS INFORMATION APPLIES TO THE MATERIAL AS MANUFACTURED; PROCESSING, USE OR CONTAMINATION MAY MAKE THE INFORMATION INAPPROPRIATE, INACCURATE OR INCOMPLETE. THESE REGULATIONS MAY ALSO APPLY TO EMPTY CONTAINERS, LINERS AND RINSATE. REMEMBER THAT THE RESPONSIBILITY FOR PROPER WASTE DISPOSAL LIES WITH THE OWNER OF THE WASTE. SEE SECTION 15 REGULATORY INFORMATION FOR ADDITIONAL REGULATIONS.

CLASSIFICATION UNDER APPLICABLE LAWS (RCRA (RESOURCE CONSERVATION AND RECOVERY ACT), 40CFR 261): RCRA: NOT LISTED.

IDENTIFICATION (US EPA WASTE NUMBER & DESCRIPTIONS): NOT LISTED.

WASTE DISPOSAL METHOD: INCINERATE IN AN APPROVED INCINERATOR, OR LANDFILL. CONSULT FEDERAL, STATE/PROVINCIAL AND LOCAL REGULATIONS.

DISPOSAL OF PACKAGING: NO RESTRICTIONS.

SAFE HANDLING OF RESIDUES: NOT REQUIRED.

CAN PACKAGING BE INCINERATED? Y Y=YES, N=NO, U=UNKNOWN IN AN APPROVED INCINERATOR.

CAN PACKAGING BE RECYCLED? Y Y=YES, N=NO, U=UNKNOWN TRIPLE RINSED CONTAINERS MAY BE RECYCLED.

CAN PACKAGING BE RECLAIMED? N Y=YES, N=NO, U=UNKNOWN

CAN PACKAGING BE LANDFILLED? Y Y=YES, N=NO, U=UNKNOWN

PHYSICAL/CHEMICAL PROPERTIES RELATED TO DISPOSAL OPTIONS: NOT AVAILABLE.

FOR ADDITIONAL PHYSICAL/CHEMICAL CHARACTERISTICS SEE SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES.

14. TRANSPORT INFORMATION

SPECIAL SHIPPING INSTRUCTIONS AND PRECAUTIONS - WITHIN PREMISES: NOT REGULATED.

SPECIAL SHIPPING INSTRUCTIONS AND PRECAUTIONS - OFF PREMISES: NOT REGULATED.

DOT CLASSIFICATION/DESCRIPTION: NOT REGULATED.

TDG CLASSIFICATION/DESCRIPTION: NOT REGULATED.

CLASSIFICATION/DESCRIPTION UNDER OTHER INTERNATIONAL TRANSPORTATION REGULATIONS: NOT REGULATED.

15. REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS:
OSHA: THIS PRODUCT IS CLASSIFIED AS AN EYE AND SKIN IRRITANT UNDER THE OSHA STANDARD CLASSIFICATION SYSTEM.

TSCA (TOXIC SUBSTANCES CONTROL ACT): INGREDIENTS OF THIS PRODUCT ARE ON THE U.S. TSCA. EXPORT NOTIFICATION: ISOPROPANOL EXPORT NOTIFICATION REQUIRED - SECTION 4.

FIFRA (FEDERAL INSECTICIDE, FUNGICIDE AND RODENTICIDE ACT): NOT APPLICABLE.

CERCLA (COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT) NOT LISTED.

EPCRA (SARA TITLE III [SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT]): NOT LISTED.

CAA (CLEAN AIR ACT): NOT LISTED.

CWA (CLEAN WATER ACT): NOT LISTED.

FDA/USDA (FOOD AND DRUG ACT): NOT APPLICABLE.

NFPA (NATIONAL FIRE PROTECTION ASSOCIATION): NFPA CLASSIFICATION FIRE=1 (SLIGHTLY FLAMMABLE), HEALTH=1 (SLIGHTLY HAZARDOUS), REACTIVITY=0 (STABLE) 0=LEAST, 1=SLIGHT, 2=MODERATE, 3=HIGH, 4=EXTREME
THIS INFORMATION IS INTENDED SOLELY FOR THE USE OF INDIVIDUALS TRAINED IN THE PARTICULAR SYSTEM.

EYE GLASS CLEANER

U.S. STATE REGULATIONS:
RIGHT TO KNOW REQUIREMENTS (STATE AND SUBSTANCE):
FLORIDA HAZARDOUS SUBSTANCES LIST: ISOPROPANOL
MASSACHUSETTS RIGHT-TO-KNOW LIST: ISOPROPANOL
MINNESOTA HAZARDOUS SUBSTANCES LIST: ISOPROPANOL
NEW JERSEY RIGHT-TO-KNOW LIST: ISOPROPANOL SN 1076
NEW JERSEY RIGHT-TO-KNOW SPECIAL HAZARDOUS SUBSTANCE: ISOPROPANOL (FLAMMABLE - THIRD DEGREE) (NEW)
PENNSYLVANIA RIGHT-TO-KNOW LIST: ISOPROPANOL ENVIRONMENTAL HAZARD, LISTED AS: [2-PROPANOL]
CALIFORNIA DIRECTOR'S LIST OF HAZARDOUS SUBSTANCES: ISOPROPANOL

CANADIAN REGULATIONS:
WHMIS (WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM):
WHMIS CLASS: B3 - COMBUSTIBLE LIQUID
WHMIS CLASS: D2B - TOXIC: EYE/SKIN IRRITANT.

CEPA (CANADIAN ENVIRONMENTAL PROTECTION ACT)/DSL (DOMESTIC SUBSTANCES LIST): ALL THE INGREDIENTS OF THIS PRODUCT ARE ON THE CANADIAN DSL AS REQUIRED BY CEPA.

INTERNATIONAL REGULATIONS:
EUROPE: EUROPEAN INVENTORY OF EXISTING COMMERCIAL CHEMICAL SUBSTANCES (EINECS) COUNCIL DIRECTIVE 67/548/EEC OF JUNE 1967 AS AMENDED BY DIRECTIVE 79/831/EEC

UNITED KINGDOM: HEALTH AND SAFETY EXECUTIVE (HSE) OCCUPATIONAL EXPOSURE STANDARDS (OESS) - 1992
TIME WEIGHTED AVERAGE: 400 PPM TWA; 980 MG/M3 TWA
SHORT TERM EXPOSURE LIMIT: 500 PPM STEL; 1225 MG/M3 STEL
SKIN ABSORPTION/SENSITIZATION: CAN BE ABSORBED THROUGH THE SKIN.
LISTED IN UNITED KINGDOM OESS: [PROPAN-2-OL]

JAPAN: CHEMICAL SUBSTANCE CONTROL LAW (MITI)

AUSTRALIA: THIS INFORMATION APPLIES TO ISOPROPANOL ONLY:
NATIONAL OCCUPATIONAL HEALTH AND SAFETY COMMISSION (NOHSC) EXPOSURE STANDARDS FOR ATMOSPHERIC CONTAMINANTS IN THE OCCUPATIONAL ENVIRONMENT - 1991
TIME WEIGHTED AVERAGE/PEAK LIMITATION: 400 PPM TWA; 983 MG/M3 TWA
SHORT TERM EXPOSURE LIMIT: 500 PPM STEL; 1230 MG/M3 STEL
EXPOSURE STANDARD UNDER REVIEW: EXPOSURE LIMITS UNDER REVIEW

GERMANY: THIS INFORMATION APPLIES TO ISOPROPANOL ONLY:
DEUTSCHE FORSCHUNGSGEMEINSCHAFT (DFG) MAXIMUM CONCENTRATIONS AT THE WORKPLACE (MAK) AND BIOLOGICAL TOLERANCE VALUES FOR WORKING MATERIALS (BAT) - 1993
MAK VALUE: 400 PPM MAK; 980 MG/M3 MAK
PEAK LIMITATION: 2X NORMAL MAK (30 MIN. AVERAGE VALUE); DON'T EXCEED 4 TIMES DURING SHIFT
EMBRYOTOXICITY/FETOTOXICITY: CLASSIFICATION NOT YET POSSIBLE.
EMBRYOTOXICITY/FETOTOXICITY: CLASSIFICATION NOT YET POSSIBLE.

FIRST AID EQUIPMENT AND SKILLS REQUIRED ON-SITE: NO SPECIAL EQUIPMENT REQUIRED.

ANTIDOTE: NONE.

NOTE TO PHYSICIAN:
DELAYED EFFECTS AND SYMPTOMS DETECTABLE ONLY BY CLINICAL TESTING: INGESTION OF LARGE QUANTITIES MAY CAUSE INTOXICATION FOLLOWED BY SEVERE GASTROINTESTINAL [illegible]D UPSET.

[illegible]NT AND DIAGNOSTIC PROCEDURES: TREAT SYMPTOMATICALLY.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: ALLERGIES.

SEE SECTION 3 HAZARDS IDENTIFICATION, SUBSECTION POTENTIAL HEALTH EFFECTS FOR MORE INFORMATION.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES:
FLAMMABILITY CLASSIFICATION (29 CFR 1910.1200): COMBUSTIBLE LIQUID.
FLASH POINT AND METHOD: 82C (180F)
FLAMMABLE LIMITS IN AIR - LOWER: 2.5% (ISOPROPANOL)
FLAMMABLE LIMITS IN AIR - UPPER: 12.0% (ISOPROPANOL)
AUTOFLAMMABILITY AND AUTOIGNITION TEMPERATURE: Y Y=YES, N=NO, U=UNKNOWN
456C (852F) (ISOPROPANOL)
SENSITIVITY TO STATIC DISCHARGE: Y Y=YES, N=NO, U=UNKNOWN
MAY BE SENSITIVE UNDER SOME CONDITIONS.
SENSITIVITY TO IMPACT: N Y=YES, N=NO, U=UNKNOWN
NOT SENSITIVE.
EXPLOSIVE PROPERTIES: NONE
OXIDIZING PROPERTIES: NONE
FLAME PROPAGATION OR BURNING RATE: NOT AVAILABLE
HAZARDOUS COMBUSTION PRODUCTS: OXIDES OF CARBON (COX)
PROPERTIES THAT MAY INITIATE OR CONTRIBUTE TO FIRE INTENSITY: AEROSOL OR FINE SPRAYS.
POTENTIAL FOR DUST EXPLOSION: NONE.
REACTIONS THAT RELEASE FLAMMABLE GASES, VAPORS OR INVISIBLE VAPORS: NONE KNOWN.
EXPOSURE HAZARDS FROM RESULTING GASES: NO SPECIAL HAZARDS.
FAST OR INTENSELY BURNING CHARACTERISTICS: NONE EXPECTED.
NONFLAMMABLE FIRE AND EXPLOSION HAZARDS: CLOSED CONTAINERS EXPOSED TO HEAT MAY RUPTURE.
UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE KNOWN.

EXTINGUISHING MEDIA:
SUITABLE EXTINGUISHING MEDIA: ALCOHOL FOAM, DRY CHEMICAL, CARBON DIOXIDE, WATER FOG.

UNSUITABLE EXTINGUISHING MEDIA: NON-ALCOHOL RESISTANT FOAMS.

FIREFIGHTING INSTRUCTIONS:
INSTRUCTIONS TO FIRE FIGHTERS: FIRE-FIGHTERS SHOULD WEAR SELF-CONTAINED BREATHING APPARATUS WHEN FIGHTING FIRES.

FIRE FIGHTING PROTECTIVE EQUIPMENT: SELF-CONTAINED BREATHING APPARATUS.

PLEASE NOTE: THE MINIMUM PROTECTION FOR ALL FIREFIGHTERS INCLUDES SELF-CONTAINED BREATHING APPARATUS (SCBA) AND FULL FIREFIGHTING TURN OUT GEAR [illegible]" GEAR). SEE SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION, [illegible]ION PERSONAL PROTECTIVE EQUIPMENT (PPE) FOR MORE INFORMATION.

6. ACCIDENTAL RELEASE MEASURES

CONTAINMENT TECHNIQUE: PREVENT FROM ENTERING WATERWAYS AND STORM SEWERS.

CLEAN-UP TECHNIQUE: CONTAIN SPILL. COVER SPILL WITH INERT ABSORBENT (ABSORBALL, VERMICULITE). USING NON-SPARKING TOOLS, SHOVEL OR SWEEP UP INTO A CLEAN CONTAINER. REMOVE FROM AREA. FLUSH SPILL AREA WITH WATER.

EVACUATION PROCEDURES: FOLLOW NORMAL EMERGENCY RESPONSE PLAN (ERP).

SPECIAL INSTRUCTIONS, EQUIPMENT AND OTHER EMERGENCY ADVICE: RISK OF SPREADING AN ALREADY EXISTING FIRE.

SEE SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION SUBSECTION PERSONAL PROTECTION EQUIPMENT (PPE) FOR ADDITIONAL INFORMATION.

REPORTING REQUIREMENTS ASSOCIATED WITH SPILLS, LEAKS AND RELEASES: NOT AVAILABLE.

SEE SECTION 15 REGULATORY INFORMATION FOR ADDITIONAL INFORMATION.

7. HANDLING AND STORAGE

HANDLING:
HANDLING PRACTICES: USE GROUNDING WIRES IF TRANSFERRING LARGE QUANTITIES. KEEP AWAY FROM OXIDIZERS, HEAT AND OTHER IGNITION SOURCES. DO NOT ALLOW TO FREEZE.

HYGIENE RECOMMENDATIONS TO PREVENT CONTINUED EXPOSURE: USE NORMAL GOOD INDUSTRIAL HYGIENE PRACTICES.

REGULATORY REQUIREMENTS ASSOCIATED WITH SAFE HANDLING: NOT AVAILABLE

SEE SECTION 15 REGULATORY INFORMATION FOR ADDITIONAL INFORMATION.

VENTILATION REQUIREMENTS FOR HANDLING: NONE REQUIRED.

MEASURES TO PREVENT AEROSOL AND DUST GENERATION AND FIRE: NOT REQUIRED.

STORAGE:
CONDITIONS FOR SAFE STORAGE: KEEP AWAY FROM OXIDIZERS, HEAT AND OTHER IGNITION SOURCES. DO NOT STORE IN DIRECT SUNLIGHT. STORE IN COOL, DRY WELL-VENTILATED AREA. DO NOT ALLOW TO FREEZE.

VENTILATION REQUIREMENTS FOR STORAGE: NONE REQUIRED.

STORAGE TEMPERATURE RANGE: BELOW 40C (104F)

STORAGE HUMIDITY RANGE: NOT APPLICABLE

QUANTITY LIMITS FOR SAFE STORAGE: NOT APPLICABLE

SPECIAL MATERIALS TO BE USED FOR PACKAGING OR CONTAINERS: NOT APPLICABLE

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:
RECOMMENDED ENGINEERING MEASURES AND SPECIAL PROCESS CONDITIONS: NO SPECIAL MEASURES REQUIRED.

VENTILATION REQUIREMENTS: GENERAL EXHAUST VENTILATION IS RECOMMENDED.

SEE SECTION 7 HANDLING AND STORAGE FOR ADDITIONAL INFORMATION.

ANTICIPATED HAZARDS OF NORMAL USE: COMBUSTIBILITY IF EXPOSED TO IGNITION SOURCES AND SKIN IRRITATION.

SPECIFIC BIOLOGICAL CONTROL PARAMETERS: NOT APPLICABLE

RECOMMENDED MONITORING PROCEDURES: KEEP ISOPROPANOL AIR CONCENTRATION BELOW THE TLV/TWA.

PERSONAL PROTECTIVE EQUIPMENT (PPE):
PLEASE NOTE: SINCE THE PREPARER DOES NOT KNOW THE LOCAL CONDITIONS OF USE AND EXPOSURE, PPE INFORMATION IS GENERALIZED, AND IS INTENDED ONLY AS A GUIDELINE. LOCAL CONDITIONS MAY WARRANT A GREATER DEGREE OF PROTECTION.

PERSONAL PROTECTIVE EQUIPMENT - RESPIRATORY: N Y=YES, N=NO, U=UNKNOWN
NONE REQUIRED.

PERSONAL PROTECTIVE EQUIPMENT - GLOVES: Y Y=YES, N=NO, U=UNKNOWN
RUBBER OR PLASTIC GLOVES.

PERSONAL PROTECTIVE EQUIPMENT - EYES: Y Y=YES, N=NO, U=UNKNOWN
SAFETY GLASSES.

PERSONAL PROTECTIVE EQUIPMENT - FOOTWEAR: N Y=YES, N=NO, U=UNKNOWN
NORMAL WORK APPAREL SHOULD BE SUFFICIENT.

ADDITIONAL PROTECTIVE CLOTHING OR EQUIPMENT: N Y=YES, N=NO, U=UNKNOWN
NORMAL WORK APPAREL SHOULD BE SUFFICIENT.

EXPOSURE GUIDELINES:
EXPOSURE LIMIT FOR PRODUCT: NONE SPECIFICALLY FOR THIS PRODUCT "SEE SECTION 2".

EYE GLASS CLEANER

PLEASE NOTE: CALCULATING EXPOSURE LIMITS ON MIXTURES REQUIRES PROFESSIONAL JUDGMENT TO DETERMINE IF THE RESULTS ARE APPROPRIATE TO THE SPECIFIC COMBINATION OF INGREDIENTS. OCCASIONALLY CERTAIN CHEMICAL MIXTURES CONTAIN COMPONENTS THAT MAY ACT UPON THE SAME ORGAN SYSTEM. THE COMBINED HEALTH EFFECTS MAY BE ADDITIVE. SEE SECTION 2 COMPOSITION/INFORMATION ON INGREDIENTS FOR EXPOSURE LIMITS OF EACH INGREDIENT IF PRODUCT IS A MIXTURE.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: CLEAR BLUE SOLUTION.
ODOUR: SLIGHT ALCOHOLIC ODOUR.
ODOUR THRESHOLD: NOT AVAILABLE
PHYSICAL STATE: LIQUID
PH FACTOR: NOT APPLICABLE
VAPOUR PRESSURE: 20 MMHG AT 20C (68F)
VAPOUR DENSITY: 1
BOILING POINT: 93C (200F)
MELTING POINT: -6C (21F)
FREEZING POINT: -6C (21F)
SOLUBILITY IN WATER: 100%
SOLUBILITY IN OTHER SOLVENTS (SPECIFY SOLVENT): NOT AVAILABLE
SPECIFIC GRAVITY (RELATIVE DENSITY): 0.98
HEAT VALUE: NOT AVAILABLE
PARTICLE SIZE: NOT APPLICABLE
VOLATILE ORGANIC COMPOUNDS (VOC) CONTENT: 10%
SOFTENING POINT: NOT APPLICABLE
EVAPORATION RATE: 0.99
MISCIBILITY: 100%
VISCOSITY: AS FOR WATER
CONDUCTIVITY: SLIGHTLY HIGHER THAN WATER
BULK DENSITY: NOT APPLICABLE
PERCENT VOLATILE BY VOLUME: 10%
PARTITION CO-EFFICIENT (N OCTANOL/WATER): NOT AVAILABLE
SATURATED VAPOR CONCENTRATION AND REFERENCE TEMPERATURE: NOT AVAILABLE
MOLECULAR WEIGHT: NOT APPLICABLE - MIXTURE
MOLECULAR FORMULA: NOT APPLICABLE - MIXTURE
ADDITIONAL CHARACTERISTICS NOT LISTED: SURFACE ACTIVE FOAMING.

10. STABILITY AND REACTIVITY

STABILITY OF PRODUCT: Y Y=YES, N=NO, U=UNKNOWN
STABLE.
CONDITIONS TO AVOID: HIGH TEMPERATURES, FLAME AND OTHER IGNITION SOURCES.
INCOMPATIBILITY (MATERIALS TO AVOID): STRONG OXIDIZERS.
HAZARDOUS DECOMPOSITION PRODUCTS: OXIDES OF CARBON (COX).
HAZARDOUS DECOMPOSITION PRODUCTS FORMED UPON CONTACT WITH WATER: NONE
DEGRADATION TO UNSTABLE PRODUCTS: WILL NOT OCCUR.
PRESENCE OF STABILIZERS: N Y=YES, N=NO, U=UNKNOWN
NONE REQUIRED.
EXOTHERMIC REACTION (POLYMERIZATION): N Y=YES, N=NO, U=UNKNOWN
WILL NOT OCCUR.

MATERIAL SAFETY DATA SHEET (MSDS)

This MSDS should be attached or kept with the respective product with which it is associated.

5AJ09, 5AX19, 6AT62

MATERIAL SAFETY DATA SHEET

VISIONAID RAINBOW II

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL NAME: VISIONAID RAINBOW II
COMPANY PRODUCT CODE: LCL211B, LCL211BR, LCL211E, LCL2112, LCL2110, ILC1760D, LC5000D, LC3870, LCT100
PREPARED BY: ASR CONSULTANTS LTD. APPROVED BY H.L. BOUTON CO., INC.
PHONE NUMBER: (416) 925-3407
DATE PREPARED: JUNE 1, 1995
LAST REVISION DATE: NOT APPLICABLE - FIRST RELEASE

MANUFACTURER:	SUPPLIER:
H.L. BOUTON CO., INC. 11 KENDRICK RD., WAREHAM, MASSACHUSETTS, U.S.A. 02571 (800) 426-1881	H.L. BOUTON CO., INC. 11 KENDRICK RD., WAREHAM, MASSACHUSETTS, U.S.A. 02571 (800) 426-1881

INFORMATION PHONE NUMBERS: U.S.A.: (800) 426-1881 (BUSINESS HOURS)
EMERGENCY PHONE NUMBERS: U.S.A.: CHEMIREC (800) 424-9300 (24 HOURS)
CANADA: CANUTEC (613) 996-6666 (24 HOURS)
SIZE: 3.8L (128 FL. OZ.), 473 ML (16 FL. OZ.), 103 ML (3.5 FL.OZ.), 59 ML (2 FL. OZ.)
PRODUCT USE: LENS CLEANER
CHEMICAL NAME: MIXTURE
CHEMICAL FAMILY: NOT APPLICABLE
SYNONYMS: NOT APPLICABLE
FORMULA: NOT APPLICABLE
CLASSIFICATION: WHMIS CLASS: B3 - COMBUSTIBLE LIQUID
WHMIS CLASS: D2B - TOXIC: EYE/SKIN IRRITANT.
SYMBOLS:
RISK PHRASES: CAUTION - COMBUSTIBLE LIQUID.
CAUSES EYE AND SKIN IRRITATION.

2. COMPOSITION/INFORMATION ON INGREDIENTS

HAZARDOUS INGREDIENTS:
CHEMICAL NAME: ISOPROPANOL
COMMON NAME: RUBBING ALCOHOL
CAS NO.: 67-63-0
PERCENT: 10%
FORMULA: C3H8O
EXPOSURE LIMITS OF INGREDIENT: TLV: 400 PPM (983 MG/M3)
STEL: 500 PPM (1230 MG/M3)
OSHA PEL: 400 PPM (983 MG/M3)
LD50: 4420 MG/KG (RAT-ORAL)
12800 MG/KG (RABBIT-SKIN)
LC50: LCLO: 12000 PPM/8 HOUR (RAT-INHALATION)

LISTS WHICH INCLUDE CHEMICAL:
NIOSH RTECS #NI8050000
NEW JERSEY DEPARTMENT OF HEALTH HAZARDOUS SUBSTANCES FACT SHEET - ISOPROPYL ALCOHOL
SUBSTANCE NO. 1076 REV.
OTHER: ISOPROPANOL IS ALSO KNOWN AS ISOPROPYL ALCOHOL, IPA, SEC-PROPYL ALCOHOL, PROPAN-2-OL, 2-PROPANOL, 2-PROPANOL (ISOPROPANOL)
ISOPROPANOL HAS A FLASH POINT OF 12C (53F). SEE SECTION 5 FOR FLASH POINT OF PRODUCT.

CHEMICAL NAME: SODIUM DODECYL SULPHATE
COMMON NAME: SDS
CAS NO.: 151-21-3
PERCENT: 2.5%
FORMULA: C12H25O4S,NA
EXPOSURE LIMITS OF INGREDIENT: NOT ESTABLISHED
LD50: 1288 MG/KG (RAT-ORAL)
LC50: NOT AVAILABLE
LISTS WHICH INCLUDE CHEMICAL: NIOSH RTECS #WT1050000
OTHER: NOT AVAILABLE

NON-HAZARDOUS INGREDIENTS:
CHEMICAL NAME: HYDROGEN HYDROXIDE
COMMON NAME: WATER
CAS NO.: 7732-18-5
PERCENT: 87.5%
FORMULA: H2O
EXPOSURE LIMITS OF INGREDIENT: NOT ESTABLISHED
LD50: 55000 MG/KG (RAT-ORAL)
LC50: NOT APPLICABLE
LISTS WHICH INCLUDE CHEMICAL: NOT APPLICABLE
OTHER: NON-HAZARDOUS

CHEMICAL NAME: PYLAKLOR TURQUOISE BLUE S-400
COMMON NAME:
CAS NO.: NOT APPLICABLE - MIXTURE
PERCENT: APPROXIMATELY 0.0036% (CALCULATED TO 3626 PPM)
FORMULA: NOT APPLICABLE - MIXTURE
EXPOSURE LIMITS OF INGREDIENT: UNKNOWN FOR MIXTURE, HOWEVER DIRECT BLUE 86 HAS AN EXPOSURE LIMIT OF 1 MG/M3 (AS, CU, DUST AND MISTS) OSHA-PEL TWA/ACGIH
LD50: GREATER THAN 5000 MG/KG ORAL
LC50: NOT AVAILABLE
LISTS WHICH INCLUDE CHEMICAL: NOT APPLICABLE - MIXTURE
OTHER: THIS IS A MIXTURE WHICH CONTAINS:
2% COPPER CAS NO. 7440-50-8
0.39% DIRECT BLUE 86 (COPPER PHTHALOCYANINE COMPOUND) CAS NO. 1330-38-7
ACID GREEN 25 CAS NO. 4403-90-1
SODIUM SULFATE CAS NO. 7757-82-6
SODIUM CHLORIDE CAS NO. 7647-14-5
SODIUM CARBONATE CAS NO. 497-19-8
THIS IS A CONTROLLED PRODUCT AS DEFINED BY THE CANADIAN WHMIS, CATEGORY D-2-B. THIS CONTAINS COPPER COMPOUND AND SODIUM CARBONATE WHICH ARE LISTED ON THE IDL, BUT EXIST AT CONCENTRATIONS WELL BELOW REPORTABLE CONCENTRATIONS.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: COMBUSTIBLE LIQUID, MAY CAUSE EYE OR SKIN IRRITATION.

POTENTIAL HEALTH EFFECTS: SEE SECTION 11 TOXICOLOGICAL INFORMATION FOR BACKGROUND DATA ON THE HEALTH HAZARDS PRESENTED IN THIS SUBSECTION.

INHALATION:
ROUTE OF ENTRY: Y Y=YES, N=NO, U=UNKNOWN

SINGLE EXPOSURE SEVERITY, TARGET ORGANS AND TYPE OF EFFECT: HIGH LEVELS MAY CAUSE HEADACHE, NAUSEA, DIZZINESS.

REPEATED EXPOSURE SEVERITY, TARGET ORGANS AND TYPE OF EFFECT: NO LONG TERM EFFECTS EXPECTED.

LIFETIME EXPOSURE SEVERITY, TARGET ORGANS AND TYPE OF EFFECT: NO LONG TERM EFFECTS EXPECTED.

SIGNS AND SYMPTOMS OF EXPOSURE: HEADACHE, NAUSEA, DIZZINESS.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: NONE EXPECTED.

INGESTION:
ROUTE OF ENTRY: Y Y=YES, N=NO, U=UNKNOWN

SINGLE EXPOSURE SEVERITY, TARGET ORGANS AND TYPE OF EFFECT: MILDLY TOXIC BY INGESTION. MAY CAUSE NAUSEA, HEADACHE AND VOMITING.

REPEATED EXPOSURE SEVERITY, TARGET ORGANS AND TYPE OF EFFECT: CNS (CENTRAL NERVOUS SYSTEM) DEPRESSION.

LIFETIME EXPOSURE SEVERITY, TARGET ORGANS AND TYPE OF EFFECT: CNS (CENTRAL NERVOUS SYSTEM) DAMAGE.

SIGNS AND SYMPTOMS OF EXPOSURE: NAUSEA, HEADACHE, VOMITING.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: NONE EXPECTED.

SKIN CONTACT:
ROUTE OF ENTRY: Y Y=YES, N=NO, U=UNKNOWN

SINGLE EXPOSURE SEVERITY, TARGET ORGANS AND TYPE OF EFFECT: MAY CAUSE MILD IRRITATIONS, DRYING OUT OF SKIN.

REPEATED EXPOSURE SEVERITY, TARGET ORGANS AND TYPE OF EFFECT: PROLONGED OR REPEATED SKIN CONTACT MAY CAUSE DRYING OUT OF SKIN, IRRITATIONS AND/OR DERMATITIS.

LIFETIME EXPOSURE SEVERITY, TARGET ORGANS AND TYPE OF EFFECT: PROLONGED OR REPEATED SKIN CONTACT MAY CAUSE DRYING OUT OF SKIN, IRRITATIONS AND/OR DERMATITIS.

SIGNS AND SYMPTOMS OF EXPOSURE: DRY SKIN, IRRITATION.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: SKIN CONDITIONS AND ALLERGIES.

SKIN ABSORPTION:
ROUTE OF ENTRY: N Y=YES, N=NO, U=UNKNOWN

SINGLE EXPOSURE SEVERITY, TARGET ORGANS AND TYPE OF EFFECT: NO EFFECTS EXPECTED.

REPEATED EXPOSURE SEVERITY, TARGET ORGANS AND TYPE OF EFFECT: NO EFFECTS EXPECTED.

LIFETIME EXPOSURE SEVERITY, TARGET ORGANS AND TYPE OF EFFECT: NO EFFECTS EXPECTED.

SIGNS AND SYMPTOMS OF EXPOSURE: NONE EXPECTED.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: NONE EXPECTED.

EYE CONTACT:
ROUTE OF ENTRY: Y Y=YES, N=NO, U=UNKNOWN

SINGLE EXPOSURE SEVERITY, TARGET ORGANS AND TYPE OF EFFECT: MAY IRRITATE EYES, CAUSE REDNESS AND TEMPORARY CORNEAL DAMAGE.

REPEATED EXPOSURE SEVERITY, TARGET ORGANS AND TYPE OF EFFECT: CORNEAL THICKENING LEADING TO SCARRING FROM REPEATED EYE CONTACT.

LIFETIME EXPOSURE SEVERITY, TARGET ORGANS AND TYPE OF EFFECT: PERMANENT CORNEAL DAMAGE FROM REPEATED EYE CONTACT.

SIGNS AND SYMPTOMS OF EXPOSURE: IRRITATION, REDNESS.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: NONE EXPECTED.

HAZARDS TO THE ENVIRONMENT:
ENVIRONMENTAL HAZARDS OVERVIEW: SOLUTIONS OF ALCOHOLS ARE TOXIC TO AQUATIC LIFE AT MODERATE TO LOW CONCENTRATIONS. DETERGENTS SUCH AS SDS (SODIUM DODECYL SULPHATE) ARE AESTHETIC NUISANCES AND MAY ENHANCE TOXICITY OF OTHER COMPONENTS.

4. FIRST AID MEASURES

FIRST AID FOR INHALATION: MOVE TO FRESH AIR. IF DIZZINESS PERSISTS, CONSULT PHYSICIAN.

FIRST AID FOR INGESTION: IF CONSCIOUS, INDUCE VOMITING AND DRINK TWO GLASSES OF WATER. SEEK MEDICAL ADVICE.

FIRST AID FOR SKIN CONTACT: WASH THOROUGHLY WITH SOAP AND WATER.

FIRST AID FOR EYE CONTACT: FLUSH WITH PLENTY OF WATER FOR AT LEAST FIFTEEN MINUTES. IF IRRITATION PERSISTS, CONSULT PHYSICIAN.

FIRST AID EQUIPMENT AND SKILLS REQUIRED ON-SITE: NO SPECIAL EQUIPMENT REQUIRED.

ANTIDOTE: NONE.

NOTE TO PHYSICIAN:
[illegible]ED EFFECTS AND SYMPTOMS DETECTABLE ONLY BY CLINICAL TESTING: INGESTION [illegible]GE QUANTITIES MAY CAUSE INTOXICATION FOLLOWED BY SEVERE GASTROINTESTINAL AND UPSET.

[illegible]MENT AND DIAGNOSTIC PROCEDURES: TREAT SYMPTOMATICALLY.

[illegible]DICAL CONDITIONS AGGRAVATED BY EXPOSURE: ALLERGIES.

SEE SECTION 3 HAZARDS IDENTIFICATION, SUBSECTION POTENTIAL HEALTH EFFECTS FOR MORE INFORMATION.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES:
FLAMMABILITY CLASSIFICATION (29 CFR 1910.1200): COMBUSTIBLE LIQUID.
FLASH POINT AND METHOD: 82C (180F)
FLAMMABLE LIMITS IN AIR - LOWER: 2.5% (ISOPROPANOL)
FLAMMABLE LIMITS IN AIR - UPPER: 12.0% (ISOPROPANOL)
AUTOFLAMMABILITY AND AUTOIGNITION TEMPERATURE: Y Y=YES, N=NO, U=UNKNOWN
456C (852F) (ISOPROPANOL)
SENSITIVITY TO STATIC DISCHARGE: Y Y=YES, N=NO, U=UNKNOWN
MAY BE SENSITIVE UNDER SOME CONDITIONS.
SENSITIVITY TO IMPACT: N Y=YES, N=NO, U=UNKNOWN
NOT SENSITIVE.
EXPLOSIVE PROPERTIES: NONE
OXIDIZING PROPERTIES: NONE
FLAME PROPAGATION OR BURNING RATE: NOT AVAILABLE
HAZARDOUS COMBUSTION PRODUCTS: OXIDES OF CARBON (COX)
PROPERTIES THAT MAY INITIATE OR CONTRIBUTE TO FIRE INTENSITY: AEROSOL OR FINE SPRAYS.
POTENTIAL FOR DUST EXPLOSION: NONE.
REACTIONS THAT RELEASE FLAMMABLE GASES, VAPORS OR INVISIBLE VAPORS: NONE KNOWN.
EXPOSURE HAZARDS FROM RESULTING GASES: NO SPECIAL HAZARDS.
FAST OR INTENSELY BURNING CHARACTERISTICS: NONE EXPECTED.
NONFLAMMABLE FIRE AND EXPLOSION HAZARDS: CLOSED CONTAINERS EXPOSED TO HEAT MAY RUPTURE.
UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE KNOWN.

EXTINGUISHING MEDIA:
SUITABLE EXTINGUISHING MEDIA: ALCOHOL FOAM, DRY CHEMICAL, CARBON DIOXIDE, WATER FOG.

UNSUITABLE EXTINGUISHING MEDIA: NON-ALCOHOL RESISTANT FOAMS.

FIREFIGHTING INSTRUCTIONS:
INSTRUCTIONS TO FIRE FIGHTERS: FIRE-FIGHTERS SHOULD WEAR SELF-CONTAINED BREATHING APPARATUS WHEN FIGHTING FIRES.

FIRE FIGHTING PROTECTIVE EQUIPMENT: SELF-CONTAINED BREATHING APPARATUS.

PLEASE NOTE: THE MINIMUM PROTECTION FOR ALL FIREFIGHTERS INCLUDES SELF-C[illegible]NED BREATHING APPARATUS (SCBA) AND FULL FIREFIGHTING TURN OUT GEAR ([illegible] GEAR). SEE SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION, S[illegible]TION PERSONAL PROTECTIVE EQUIPMENT (PPE) FOR MORE INFORMATION.

[illegible]CCIDENTAL RELEASE MEASURES

CONTAINMENT TECHNIQUE: PREVENT FROM ENTERING WATERWAYS AND STORM SEWERS.

CLEAN-UP TECHNIQUE: CONTAIN SPILL. COVER SPILL WITH INERT ABSORBENT (ABSORBALL, VERMICULITE). USING NON-SPARKING TOOLS, SHOVEL OR SWEEP UP INTO A CLEAN CONTAINER. REMOVE FROM AREA. FLUSH SPILL AREA WITH WATER.

EVACUATION PROCEDURES: FOLLOW NORMAL EMERGENCY RESPONSE PLAN (ERP).

SPECIAL INSTRUCTIONS, EQUIPMENT AND OTHER EMERGENCY ADVICE: RISK OF SPREADING AN ALREADY EXISTING FIRE.

SEE SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION SUBSECTION PERSONAL PROTECTION EQUIPMENT (PPE) FOR ADDITIONAL INFORMATION.

REPORTING REQUIREMENTS ASSOCIATED WITH SPILLS, LEAKS AND RELEASES: NOT AVAILABLE.

SEE SECTION 15 REGULATORY INFORMATION FOR ADDITIONAL INFORMATION.

7. HANDLING AND STORAGE

HANDLING:
HANDLING PRACTICES: USE GROUNDING WIRES IF TRANSFERRING LARGE QUANTITIES. KEEP AWAY FROM OXIDIZERS, HEAT AND OTHER IGNITION SOURCES. DO NOT ALLOW TO FREEZE.

HYGIENE RECOMMENDATIONS TO PREVENT CONTINUED EXPOSURE: USE NORMAL GOOD INDUSTRIAL HYGIENE PRACTICES.

REGULATORY REQUIREMENTS ASSOCIATED WITH SAFE HANDLING: NOT AVAILABLE

SEE SECTION 15 REGULATORY INFORMATION FOR ADDITIONAL INFORMATION.

VENTILATION REQUIREMENTS FOR HANDLING: NONE REQUIRED.

MEASURES TO PREVENT AEROSOL AND DUST GENERATION AND FIRE: NOT REQUIRED.

STORAGE:
CONDITIONS FOR SAFE STORAGE: KEEP AWAY FROM OXIDIZERS, HEAT AND OTHER IGNITION SOURCES. DO NOT STORE IN DIRECT SUNLIGHT. STORE IN COOL, DRY WELL-VENTILATED AREA. DO NOT ALLOW TO FREEZE.

VENTILATION REQUIREMENTS FOR STORAGE: NONE REQUIRED.

STORAGE TEMPERATURE RANGE: BELOW 40C (104F)

STORAGE HUMIDITY RANGE: NOT APPLICABLE

QUANTITY LIMITS FOR SAFE STORAGE: NOT APPLICABLE

SPECIAL MATERIALS TO BE USED FOR PACKAGING OR CONTAINERS: NOT APPLICABLE

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:
RECOMMENDED ENGINEERING MEASURES AND SPECIAL PROCESS CONDITIONS: NO SPECIAL MEASURES REQUIRED.

VENTILATION REQUIREMENTS: GENERAL EXHAUST VENTILATION IS RECOMMENDED.

SEE SECTION 7 HANDLING AND STORAGE FOR ADDITIONAL INFORMATION.

ANTICIPATED HAZARDS OF NORMAL USE: COMBUSTIBILITY IF EXPOSED TO IGNITION SOURCES AND SKIN IRRITATION.

SPECIFIC BIOLOGICAL CONTROL PARAMETERS: NOT APPLICABLE

RECOMMENDED MONITORING PROCEDURES: KEEP ISOPROPANOL AIR CONCENTRATION BELOW THE TLV/TWA.

PERSONAL PROTECTIVE EQUIPMENT (PPE):
PLEASE NOTE: SINCE THE PREPARER DOES NOT KNOW THE LOCAL CONDITIONS OF USE AND EXPOSURE, PPE INFORMATION IS GENERALIZED, AND IS INTENDED ONLY AS A GUIDELINE. LOCAL CONDITIONS MAY WARRANT A GREATER DEGREE OF PROTECTION.

PERSONAL PROTECTIVE EQUIPMENT - RESPIRATORY: N Y=YES, N=NO, U=UNKNOWN
NONE REQUIRED.

PERSONAL PROTECTIVE EQUIPMENT - GLOVES: Y Y=YES, N=NO, U=UNKNOWN
RUBBER OR PLASTIC GLOVES.

PERSONAL PROTECTIVE EQUIPMENT - EYES: Y Y=YES, N=NO, U=UNKNOWN
SAFETY GLASSES.

PERSONAL PROTECTIVE EQUIPMENT - FOOTWEAR: N Y=YES, N=NO, U=UNKNOWN
NORMAL WORK APPAREL SHOULD BE SUFFICIENT.

ADDITIONAL PROTECTIVE CLOTHING OR EQUIPMENT: N Y=YES, N=NO, U=UNKNOWN
NORMAL WORK APPAREL SHOULD BE SUFFICIENT.

EXPOSURE GUIDELINES:
EXPOSURE LIMIT FOR PRODUCT: NONE SPECIFICALLY FOR THIS PRODUCT "SEE SECTION 2".

PLEASE NOTE: CALCULATING EXPOSURE LIMITS ON MIXTURES REQUIRES PROFESSIONAL JUDGMENT TO DETERMINE IF THE RESULTS ARE APPROPRIATE TO THE SPECIFIC COMBINATION OF INGREDIENTS. OCCASIONALLY CERTAIN CHEMICAL MIXTURES CONTAIN COMPONENTS THAT MAY ACT UPON THE SAME ORGAN SYSTEM. THE COMBINED HEALTH EFFECTS MAY BE ADDITIVE. SEE SECTION 2 COMPOSITION/INFORMATION ON INGREDIENTS FOR EXPOSURE LIMITS OF EACH INGREDIENT IF PRODUCT IS A MIXTURE.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: CLEAR BLUE SOLUTION.
ODOUR: SLIGHT ALCOHOLIC ODOUR.
ODOUR THRESHOLD: NOT AVAILABLE
PHYSICAL STATE: LIQUID
PH FACTOR: NOT APPLICABLE
VAPOUR PRESSURE: 20 MMHG AT 20C (68F)
VAPOUR DENSITY: 1
BOILING POINT: 93C (200F)
MELTING POINT: -6C (21F)
FREEZING POINT: -6C (21F)
SOLUBILITY IN WATER: 100%
SOLUBILITY IN OTHER SOLVENTS (SPECIFY SOLVENT): NOT AVAILABLE
SPECIFIC GRAVITY (RELATIVE DENSITY): 0.98
HEAT VALUE: NOT AVAILABLE
PARTICLE SIZE: NOT APPLICABLE
VOLATILE ORGANIC COMPOUNDS (VOC) CONTENT: 10%
SOFTENING POINT: NOT APPLICABLE
EVAPORATION RATE: 0.99
MISCIBILITY: 100%
VISCOSITY: AS FOR WATER
CONDUCTIVITY: SLIGHTLY HIGHER THAN WATER
BULK DENSITY: NOT APPLICABLE
PERCENT VOLATILE BY VOLUME: 10%
PARTITION CO-EFFICIENT (N OCTANOL/WATER): NOT AVAILABLE
SATURATED VAPOR CONCENTRATION AND REFERENCE TEMPERATURE: NOT AVAILABLE
MOLECULAR WEIGHT: NOT APPLICABLE - MIXTURE
MOLECULAR FORMULA: NOT APPLICABLE - MIXTURE
ADDITIONAL CHARACTERISTICS NOT LISTED: SURFACE ACTIVE FOAMING.

10. STABILITY AND REACTIVITY

STABILITY OF PRODUCT: Y Y=YES, N=NO, U=UNKNOWN
STABLE.
CONDITIONS TO AVOID: HIGH TEMPERATURES, FLAME AND OTHER IGNITION SOURCES.
INCOMPATIBILITY (MATERIALS TO AVOID): STRONG OXIDIZERS.
HAZARDOUS DECOMPOSITION PRODUCTS: OXIDES OF CARBON (COX).
HAZARDOUS DECOMPOSITION PRODUCTS FORMED UPON CONTACT WITH WATER: NONE
DEGRADATION TO UNSTABLE PRODUCTS: WILL NOT OCCUR.
PRESENCE OF STABILIZERS: N Y=YES, N=NO, U=UNKNOWN
NONE REQUIRED.
EXOTHERMIC REACTION (POLYMERIZATION): N Y=YES, N=NO, U=UNKNOWN
WILL NOT OCCUR.

SIGNIFICANCE OF CHANGE IN PHYSICAL APPEARANCE: UNDER SEVERELY COLD TEMPERATURES PRODUCT MAY BEGIN TO TURN CLOUDY WHICH MAY DEGRADE ITS FUNCTIONALITY.
CONDITIONS OF REACTIVITY: DO NOT HEAT ABOVE 80C (176F).

11. TOXICOLOGICAL INFORMATION

OF PRODUCT: 17423 MG/KG ORAL-RAT (CALCULATED)
OF PRODUCT: NOT AVAILABLE
ATION ACUTE - ROUTE OF ENTRY AND EFFECTS OF EXPOSURE: Y Y=YES, N=NO, U=UNKNOWN HIGH LEVELS MAY CAUSE HEADACHE, NAUSEA, DIZZINESS.
ATION CHRONIC - ROUTE OF ENTRY AND EFFECTS OF EXPOSURE: Y Y=YES, N=NO, U=UNKNOWN NO LONG TERM EFFECTS EXPECTED.
INGESTION - ROUTE OF ENTRY AND EFFECTS OF EXPOSURE: Y Y=YES, N=NO, U=UNKNOWN MILDLY TOXIC BY INGESTION. MAY CAUSE NAUSEA, HEADACHE AND VOMITING.
SKIN CONTACT - ROUTE OF ENTRY AND EFFECTS OF EXPOSURE: Y Y=YES, N=NO, U=UNKNOWN MAY CAUSE MILD IRRITATIONS, DRYING OUT OF SKIN. PROLONGED OR REPEATED SKIN CONTACT MAY CAUSE DRYING OUT OF SKIN, IRRITATIONS AND OR DERMATITIS.
SKIN ABSORPTION - ROUTE OF ENTRY AND EFFECTS OF EXPOSURE: N Y=YES, N=NO, U=UNKNOWN
EYE CONTACT - ROUTE OF ENTRY AND EFFECTS OF EXPOSURE: Y Y=YES, N=NO, U=UNKNOWN MAY IRRITATE EYES, CAUSE REDNESS AND TEMPORARY CORNEAL DAMAGE.
SUBCHRONIC EFFECTS: CNS (CENTRAL NERVOUS SYSTEM) DEPRESSION.
IS PRODUCT AN IRRITANT? Y Y=YES, N=NO, U=UNKNOWN EYE AND SKIN IRRITANT.
IS PRODUCT A SENSITIZER? N Y=YES, N=NO, U=UNKNOWN
EVIDENCE OF EPIDEMIOLOGY: N Y=YES, N=NO, U=UNKNOWN
EVIDENCE OF CARCINOGENICITY: N Y=YES, N=NO, U=UNKNOWN IARC GROUP 3, INSUFFICIENT EVIDENCE.
EVIDENCE OF REPRODUCTIVE TOXICITY: N Y=YES, N=NO, U=UNKNOWN INSUFFICIENT EVIDENCE.
EVIDENCE OF TERATOGENICITY: N Y=YES, N=NO, U=UNKNOWN
EVIDENCE OF MUTAGENICITY: N Y=YES, N=NO, U=UNKNOWN
EVIDENCE OF NEUROTOXICITY: Y Y=YES, N=NO, U=UNKNOWN MAY OCCUR FROM INGESTION OF ISOPROPANOL.
EVIDENCE OF NARCOSIS: Y Y=YES, N=NO, U=UNKNOWN MAY CAUSE SEVERE NARCOSIS IF LARGE AMOUNTS ARE INGESTED.
OTHER STUDIES RELEVANT TO MATERIAL: NONE KNOWN.
SYNERGISTIC PRODUCTS: NONE KNOWN.

12. ECOLOGICAL INFORMATION

ECOTOXICITY:
ACUTE AND LONG-TERM TOXICITY TO FISH AND INVERTEBRATES: SOLUTIONS OF ALCOHOLS ARE TOXIC TO AQUATIC LIFE AT MODERATE TO LOW CONCENTRATIONS. NO LONG TERM ECOLOGICAL EFFECTS ARE LIKELY.

TOXICITY TO AQUATIC AND TERRESTRIAL PLANTS: CONCENTRATED SOLUTIONS OF ALCOHOLS AND SURFACTANTS MAY CAUSE DAMAGE TO AQUATIC AND TERRESTRIAL PLANTS.

ACUTE AND DIETARY TOXICITY TO BIRDS: NOT EXPECTED TO BE TOXIC.

TOXICITY TO BENEFICIAL MICROORGANISMS: CONCENTRATED SOLUTIONS OF ALCOHOLS AND SURFACTANTS HAVE ANTIMICROBIAL ACTIVITY.

ENVIRONMENTAL FATE:
PERSISTENCE AND DEGRADATION: MODERATELY PERSISTENT BUT IS BIODEGRADABLE OVER TIME.

BIOACCUMULATION/BIOCONCENTRATION: WILL NOT BIOACCUMULATE.

SOIL MOBILITY: SIMILAR TO WATER.

PHYSICAL/CHEMICAL:
FOR ADDITIONAL PHYSICAL/CHEMICAL CHARACTERISTICS SEE SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES.

HYDROLYTIC AND PHOTOLYTIC STABILITY: STABLE.

13. DISPOSAL CONSIDERATIONS

PLEASE NOTE: THE ADVICE IN THIS SECTION IS GIVEN IN ACCORDANCE WITH THE LAWS THAT WERE IN EFFECT AT THE TIME. LAWS ARE TRANSIENT AND MAY CHANGE OR BE REINTERPRETED. STATE/PROVINCIAL OR LOCAL REGULATIONS ARE COMPLEX AND MAY DIFFER FROM FEDERAL REGULATIONS. THIS INFORMATION APPLIES TO THE MATERIAL AS MANUFACTURED; PROCESSING, USE OR CONTAMINATION MAY MAKE THE INFORMATION INAPPROPRIATE, INACCURATE OR INCOMPLETE. THESE REGULATIONS MAY ALSO APPLY TO EMPTY CONTAINERS, LINERS AND RINSATE. REMEMBER THAT THE RESPONSIBILITY FOR PROPER WASTE DISPOSAL LIES WITH THE OWNER OF THE WASTE. SEE SECTION 15 REGULATORY INFORMATION FOR ADDITIONAL REGULATIONS.

CLASSIFICATION UNDER APPLICABLE LAWS (RCRA (RESOURCE CONSERVATION AND RECOVERY ACT), 40CFR 261): RCRA: NOT LISTED.

IDENTIFICATION (US EPA WASTE NUMBER & DESCRIPTIONS): NOT LISTED.

WASTE DISPOSAL METHOD: INCINERATE IN AN APPROVED INCINERATOR, OR LANDFILL. CONSULT FEDERAL, STATE/PROVINCIAL AND LOCAL REGULATIONS.

DISPOSAL OF PACKAGING: NO RESTRICTIONS.

SAFE HANDLING OF RESIDUES: NOT REQUIRED.

CAN PACKAGING BE INCINERATED? Y Y=YES, N=NO, U=UNKNOWN IN AN APPROVED INCINERATOR.

CAN PACKAGING BE RECYCLED? Y Y=YES, N=NO, U=UNKNOWN TRIPLE RINSED CONTAINERS MAY BE RECYCLED.

CAN PACKAGING BE RECLAIMED? N Y=YES, N=NO, U=UNKNOWN

CAN PACKAGING BE LANDFILLED? Y Y=YES, N=NO, U=UNKNOWN

PHYSICAL/CHEMICAL PROPERTIES RELATED TO DISPOSAL OPTIONS: NOT AVAILABLE.

FOR ADDITIONAL PHYSICAL/CHEMICAL CHARACTERISTICS SEE SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES.

14. TRANSPORT INFORMATION

SPECIAL SHIPPING INSTRUCTIONS AND PRECAUTIONS - WITHIN PREMISES: NOT REGULATED.

SPECIAL SHIPPING INSTRUCTIONS AND PRECAUTIONS - OFF PREMISES: NOT REGULATED.

DOT CLASSIFICATION/DESCRIPTION: NOT REGULATED.

TDG CLASSIFICATION/DESCRIPTION: NOT REGULATED.

CLASSIFICATION/DESCRIPTION UNDER OTHER INTERNATIONAL TRANSPORTATION REGULATIONS: NOT REGULATED.

15. REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS:
OSHA: THIS PRODUCT IS CLASSIFIED AS AN EYE AND SKIN IRRITANT UNDER THE OSHA STANDARD CLASSIFICATION SYSTEM.

TSCA (TOXIC SUBSTANCES CONTROL ACT): INGREDIENTS OF THIS PRODUCT ARE ON THE U.S. TSCA. EXPORT NOTIFICATION: ISOPROPANOL EXPORT NOTIFICATION REQUIRED - SECTION 4.

FIFRA (FEDERAL INSECTICIDE, FUNGICIDE AND RODENTICIDE ACT): NOT APPLICABLE.

CERCLA (COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT): NOT LISTED.

EPCRA (SARA TITLE III [SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT]): NOT LISTED.

CAA (CLEAN AIR ACT): NOT LISTED.

CWA (CLEAN WATER ACT): NOT LISTED.

FDA/USDA (FOOD AND DRUG ACT): NOT APPLICABLE.

NFPA (NATIONAL FIRE PROTECTION ASSOCIATION): NFPA CLASSIFICATION FIRE=1 (SLIGHTLY FLAMMABLE), HEALTH=1 (SLIGHTLY HAZARDOUS), REACTIVITY=0 (STABLE)
0=LEAST, 1=SLIGHT, 2=MODERATE, 3=HIGH, 4=EXTREME
THIS INFORMATION IS INTENDED SOLELY FOR THE USE OF INDIVIDUALS TRAINED IN THE PARTICULAR SYSTEM.

U.S. STATE REGULATIONS:
RIGHT TO KNOW REQUIREMENTS (STATE AND SUBSTANCE):
FLORIDA HAZARDOUS SUBSTANCES LIST: ISOPROPANOL
MASSACHUSETTS RIGHT-TO-KNOW LIST: ISOPROPANOL
MINNESOTA HAZARDOUS SUBSTANCES LIST: ISOPROPANOL
NEW JERSEY RIGHT-TO-KNOW LIST: ISOPROPANOL SN 1076
NEW JERSEY RIGHT-TO-KNOW SPECIAL HAZARDOUS SUBSTANCE: ISOPROPANOL (FLAMMABLE - THIRD DEGREE) (NEW)
PENNSYLVANIA RIGHT-TO-KNOW LIST: ISOPROPANOL ENVIRONMENTAL HAZARD, LISTED AS: [2-PROPANOL]
CALIFORNIA DIRECTOR'S LIST OF HAZARDOUS SUBSTANCES: ISOPROPANOL

CANADIAN REGULATIONS:
WHMIS (WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM):
WHMIS CLASS: B3 - COMBUSTIBLE LIQUID
WHMIS CLASS: D2B - TOXIC: EYE/SKIN IRRITANT.

CEPA (CANADIAN ENVIRONMENTAL PROTECTION ACT)/DSL (DOMESTIC SUBSTANCES LIST): ALL THE INGREDIENTS OF THIS PRODUCT ARE ON THE CANADIAN DSL AS REQUIRED BY CEPA.

INTERNATIONAL REGULATIONS:
EUROPE: EUROPEAN INVENTORY OF EXISTING COMMERCIAL CHEMICAL SUBSTANCES (EINECS) COUNCIL DIRECTIVE 67/548/EEC OF JUNE 1967 AS AMENDED BY DIRECTIVE 79/831/EEC

UNITED KINGDOM: HEALTH AND SAFETY EXECUTIVE (HSE) OCCUPATIONAL EXPOSURE STANDARDS (OESS) - 1992
TIME WEIGHTED AVERAGE: 400 PPM TWA; 980 MG/M3 TWA
SHORT TERM EXPOSURE LIMIT: 500 PPM STEL; 1225 MG/M3 STEL
SKIN ABSORPTION/SENSITIZATION: CAN BE ABSORBED THROUGH THE SKIN.
LISTED IN UNITED KINGDOM OESS: [PROPAN-2-OL]

JAPAN: CHEMICAL SUBSTANCE CONTROL LAW (MITI)

AUSTRALIA: THIS INFORMATION APPLIES TO ISOPROPANOL ONLY:
NATIONAL OCCUPATIONAL HEALTH AND SAFETY COMMISSION (NOHSC) EXPOSURE STANDARDS FOR ATMOSPHERIC CONTAMINANTS IN THE OCCUPATIONAL ENVIRONMENT - 1991
TIME WEIGHTED AVERAGE/PEAK LIMITATION: 400 PPM TWA; 983 MG/M3 TWA
SHORT TERM EXPOSURE LIMIT: 500 PPM STEL; 1230 MG/M3 STEL
EXPOSURE STANDARD UNDER REVIEW: EXPOSURE LIMITS UNDER REVIEW

GERMANY: THIS INFORMATION APPLIES TO ISOPROPANOL ONLY:
DEUTSCHE FORSCHUNGSGEMEINSCHAFT (DFG) MAXIMUM CONCENTRATIONS AT THE WORKPLACE (MAK) AND BIOLOGICAL TOLERANCE VALUES FOR WORKING MATERIALS (BAT) - 1993
MAK VALUE: 400 PPM MAK; 980 MG/M3 MAK
PEAK LIMITATION: 2X NORMAL MAK (30 MIN. AVERAGE VALUE); DON'T EXCEED 4 TIMES DURING SHIFT
EMBRYOTOXICITY/FETOTOXICITY: CLASSIFICATION NOT YET POSSIBLE.
EMBRYOTOXICITY/FETOTOXICITY: CLASSIFICATION NOT YET POSSIBLE.

ISRAEL: THIS INFORMATION APPLIES TO ISOPROPANOL ONLY:
OCCUPATIONAL EXPOSURE LIMITS FOR CHEMICAL SUBSTANCES - 1990
TIME WEIGHTED AVERAGE: 400 PPM TWA; 983 MG/M3 TWA
SHORT TERM EXPOSURE LIMIT: 500 PPM STEL; 1,230 MG/M3 STEL
ACTION LEVEL: 200 PPM AL; 491.5 MG/M3 AL

" "CO: THIS INFORMATION APPLIES TO ISOPROPANOL ONLY:
TARIAT OF LABOR AND SOCIAL WELFARE INSTRUCTION NO. 10 PERMISSIBLE
NIRATIONS - 1992
WEIGHTED AVERAGE: 400 PPM TWA; 980 MG/M3 TWA (NEW)
TERM EXPOSURE LIMIT: 500 PPM STEL; 1225 MG/M3 (NEW)
DESIGNATION: SKIN - POTENTIAL FOR CUTANEOUS ABSORPTION (NEW)

OTHER INTERNATIONAL REGULATIONS: NOT AVAILABLE

16. OTHER INFORMATION

REVISIONS (GIVE DATE AND SPECIFY CHANGES): NOT APPLICABLE - FIRST RELEASE

HAZARD RATINGS: HMIS CLASSIFICATION: FIRE=1 (SLIGHTLY FLAMMABLE), HEALTH=1 (SLIGHTLY HAZARDOUS), REACTIVITY=0 (STABLE), PERSONAL PROTECTION=B
0=LEAST, 1=SLIGHT, 2=MODERATE, 3=HIGH, 4=EXTREME
THIS INFORMATION IS INTENDED SOLELY FOR THE USE OF INDIVIDUALS TRAINED IN THE PARTICULAR SYSTEM.

TRAINING REQUIREMENTS: WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM TRAINING IS REQUIRED FOR HANDLING AND USING THIS PRODUCT IN CANADIAN WORKPLACES. U.S. OSHA REQUIREMENTS FOR HANDLING CHEMICAL SUBSTANCES MUST BE IN PLACE FOR HANDLING AND USING THIS PRODUCT IN THE UNITED STATES.

RECOMMENDED USES AND RESTRICTIONS: CLEANING OF CLEAR SURFACES. CHECK FOR COMPATIBILITY WITH MATERIAL TO BE CLEANED PRIOR TO USE.

ADDITIONAL INFORMATION: KEEP OUT OF REACH OF CHILDREN.

DISCLAIMER: THIS INFORMATION IS FURNISHED WITHOUT WARRANTY, REPRESENTATION, OR LICENSE OF ANY KIND, EXCEPT THAT IT IS ACCURATE TO THE BEST OF H.L. BOUTON CO., INC.'S KNOWLEDGE, OR OBTAINED FROM SOURCES BELIEVED TO BE ACCURATE. H.L. BOUTON CO., INC. DOES NOT ASSUME ANY LEGAL RESPONSIBILITY FOR USE OR RELIANCE UPON THE SAME. CUSTOMERS ARE ENCOURAGED TO CONDUCT THEIR OWN TESTS AND INVESTIGATIONS. BEFORE USING THE PRODUCT, PLEASE READ AND UNDERSTAND THE LABEL AND THE MATERIAL SAFETY DATA SHEET.

REFERENCES:
1. THE REGULATION RESPECTING THE CONTROL OF BIOLOGICAL AND CHEMICAL AGENTS MADE UNDER OCCUPATIONAL HEALTH AND SAFETY ACT, ONT. REG. 654/86.
2. INTERNATIONAL AGENCY FOR RESEARCH ON CANCER, MONOGRAPHS EVALUATION FOR CARCINOGENIC RISK IN HUMANS.
3. TEXT ENTITLED "DANGEROUS PROPERTIES OF INDUSTRIAL CHEMICALS" BY SAX, N.I.
4. THE "DOCUMENTATION OF THE THRESHOLD LIMIT VALUES AND BIOLOGICAL EXPOSURE INDICES" BY THE AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS.

5. THE MERCK INDEX, AN ENCYCLOPEDIA OF CHEMICALS.
6. THE CCINFO SYSTEM, CANADIAN CENTRE OF OCCUPATIONAL HEALTH AND SAFETY.
7. RTECS DATABASE BY THE U.S. NATIONAL INSTITUTE OF OCCUPATIONAL SAFETY AND HE
8 JERSEY DEPARTMENT OF HEALTH HAZARDOUS SUBSTANCES FACT SHEET.
9 ADIAN ENVIRONMENTAL PROTECTION ACT, NEW SUBSTANCES NOTIFICATION ATIONS - DOMESTIC SUBSTANCES LIST.
ORIGINAL SUPPLIER MSDS.

OTHER RELATED MANUFACTURER'S BROCHURES: NOT AVAILABLE

KEY/LEGEND: NOT AVAILABLE - MEANS THAT THE INFORMATION FOR THAT FIELD COULD NOT BE OBTAINED. NOT APPLICABLE - MEANS THAT THE FIELD IN QUESTION DOES NOT PERTAIN TO THIS PARTICULAR PRODUCT DUE TO THE INHERENT NATURE OF THE PRODUCT.

LABEL INFORMATION:
VISIONAID RAINBOW II
87.5% WATER CAS #7732-18-5
10% ISOPROPYL ALCOHOL CAS #67-63-0
2.5% SODIUM DODECYL SULFATE CAS #151-21-3
TRACE COPPER CAS #7440-50-8
TRACE DIRECT BLUE 86 (COPPER PHTHALOCYANINE COMPOUND) CAS #1330-38-7
TRACE ACID GREEN 25 CAS #4403-90-1
TRACE SODIUM SULFATE CAS #7757-82-6
TRACE SODIUM CHLORIDE CAS #7647-14-5
TRACE SODIUM CARBONATE CAS #497-19-8

CAUTION-COMBUSTIBLE LIQUID.
CAUTION-CAUSES EYE AND SKIN IRRITATION.
HARMFUL IF SWALLOWED.
CONTAINS ISOPROPANOL.
KEEP AWAY FROM OPEN FLAME AND HEAT.
AVOID CONTACT WITH EYES.
DO NOT DRINK.
USE WITH ADEQUATE VENTILATION.

SEE MATERIAL SAFETY DATA SHEET FOR ADDITIONAL INFORMATION.

H.L. BOUTON COMPANY, INC.
11 KENDRICK RD., WAREHAM,
MASSACHUSETTS,
U.S.A., C2571

VISION-AID RAINBOW II

Issue Date: March 1, 1993

MATERIAL SAFETY DATA SHEET

Section I - Component Data

Product: Woven Fiberglass Tapes - All Styles

Fibrous glass continuous filament	CAS No.: 65997-17-3	%: 98
Starch based sizing		%: 2

As part of this MSDS we certify the following two items:

1) This product has not come in contact with mercury during the manufacturing process.
2) This product was not manufactured with, nor does it contain any Ozone Depleting Chemicals (ODC)IDENTIFIED AS CLASS I OR CLASS II.

Section II - Physical Data

Fiberglass is chemically stable and incompatibility occurs with strong acids and alkalis (oxidizing mineral, oxalic, hydrofluoric). Fiberglass softens at approximately 1300 degrees F.

Section III - Physical Hazards

Flash Point: None
Extinguishing Media: None required for fiberglass tape.
Fiberglass will not burn and possesses no unusual fire and explosion hazards.

Section IV - Health Hazard Data and First-Aid Procedures

Workplace exposure: 5 mg/m3 OSHA PEL 10 mg/m3 ACGIH TVL
Ventilation is recommended to minimize exposure nuisance dusts and to finish mists.

Signs and Symptoms of Overexposure: Rash, itching, conjunctivitis, coughing, sneezing.

Inhalation: Move individual to fresh air. Seek medical attention if irritation persists.
Acute: Inhalation of fibers can cause mechanical irritation of the mouth, nose and throat.
Chronic: A number of epidemiology studies, done over many years, of workers employed for up to 40 years in the manufacture of fiber glass have shown no evidence of increases in either malignant or non-malignant respiratory disease attributable to exposure to fiber glass. However, recent studies have shown slight increases in lung cancer among workers employed in the manufacture of glass wool and mineral wool insulation products. THOSE SAME STUDIES SHOWED NO EVIDENCE OF A SIMILAR EFFECT AMONG CONTINUOUS FILAMENT FIBER GLASS WORKERS, THIS PRODUCT IS PRODUCED WITH A CONTINUOUS FILAMENT FIBER GLASS. The International Agency for Research on Cancer (IRAC) has categorized fiberglass continuous filament as not classifiable with respect to human carcinogenicity.

Skin Contact: Wash with mild soap and running water. Rubbing irritated area may force fibers into the skin. Seek medical attention if irritation persists.
Acute: May produce itching and temporary mechanical irritation.
Chronic: None known.
Eye Contact: Flush eyes with running water for at least 15 minutes. Seek medical attention if irritation persists.
Acute: May produce temporary mechanical irritation.
Chronic: None known.

Ingestion: Not Applicable
Acute: Unlikely to occur. Observe individual. If symptoms develop consult a physician.
Chronic: None known.

Section V - Spill and Disposal Procedures

These products are not classified as hazardous wastes under the Resource Conservation and Recovery Act and, unless prohibited by state or local regulations, can be disposed of in a municipal landfill. Any finish oils contained in plant waste water should be biodegradable in conventional biological wastewater treatment systems.

Section VI - Personnel Protection Information

Cleanliness: Keep work area clean. Dispose of waste in a receptacle close to

work area to avoid unnecessary handling of waste materials.

Eye Protection: Safety glasses, goggles, or face shields should be worn whenever there is a possibility that dust or fibers may get into eyes.

Avoid Irritation: Do not rub or scratch irritated areas as this may force fiberglass fibers into the skin. Wash hands with soap and water after handling.

Work Clothes: Wear loose fitting, long sleeved clothing. Gloves may be useful in some applications. Use vacuum equipment, not compressed air, to remove fiberglass fibers from clothes. Wash work clothes separately from other clothing.

3525 INTERNATIONAL BOULEVARD, BROWNSVILLE,TX. 78521
(210)542-1957 (210)542-5491 FAX:(210)542-6538

OCT 20 1997

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GENERAL ELECTRIC SERVICE
1401 EAST VALENCIA ROAD

TUCSON, AZ 85706-0000

ELECTRICAL INSULATION SUPPLIERS
1255 COLLIER RD.
ATLANTA, GA 30318

PHONE # (404)355-1651
FAX # (404)609-6084

MATERIAL SAFETY DATA SHEET INFORMATION:

PLEASE FIND ENCLOSED MATERIAL SAFETY DATA SHEETS (MSDS) COVERING ITEMS PURCHASED FROM ELECTRICAL INSULATION SUPPLIERS (EIS). OSHA REGULATIONS REQUIRE MSDS INFORMATION BE MADE AVAILABLE TO ALL PERSONNEL WHO MAY BE EXPOSED TO HAZARDOUS MATERIALS IN THE WORK PLACE.

UNDER THE "EMERGENCY PLANNING COMMUNITY RIGHT-TO-KNOW ACT OF 1986" INVENTORY AND LOCATION INFORMATION, CONCERNING HAZARDOUS MATERIALS MFG JOB SITE, MAY NEED TO BE REPORTED TO THE LOCAL FIRE DEPARTMENT, THE LOCAL EMERGENCY PLANNING COMMITTEE AND THE STANDARD RESPONSE COMMISSION. YOU MAY WANT TO REFERENCE 40 CFR PART 372 FOR ADDITIONAL INFORMATION. MANUFACTURERS MUST REPORT ANNUAL RELEASES OF LISTED TOXIC CHEMICALS INTO THE ENVIRONMENT, ACCORDING TO SARA TITLE III.

ACCORDING TO 29 CFR PART 1910.1200 PARAGRAPH (g)(6) OF THE HAZARD COMMUNICATION STANDARD, A MSDS IS TO BE PROVIDED THE FIRST TIME THE CUSTOMER BUYS AN ITEM REQUIRING A MSDS. IF AT ANY TIME THE MSDS IS UPDATED OR CHANGED, THE UPDATED MSDS MUST BE SUPPLIED WITH THE FIRST SHIPMENT AFTER THE MSDS UPDATE HAS OCCURRED.

IF YOU NEED FURTHER INFORMATION CONCERNING YOUR SITUATION, YOU MAY CONTACT THE EPA IN WASHINGTON, D.C. THEIR TOLL FREE NO. IS (800)535-0202; THE RCRA/SUPERFUND HOT LINE IS (800)424-9346 OR (703)920-9810; THE TSCA HOT LINE IS (202)554-1404.

BY PROVIDING THIS DOCUMENTATION, EIS IS COMPLYING WITH FEDERAL LAWS GOVERNING MSDS INFORMATION, AS IS KNOWN TO US. THIS IS A SERVICE AIMED AT HELPING YOUR BUSINESS TO ALSO COMPLY WITH GOVERNMENT REGULATIONS.

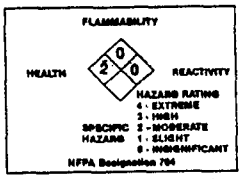
DAVE SHARPE

"SEE THE REVERSE SIDE FOR DOCUMENT NAME AND P.O. NUMBER"

Provided By Electrical Insulation Suppliers Inc.

	MSDS DOCUMENT	SHIP DATE	CUSTOMER PURCHASE ORDER NUMBER
BLR240	HESGON	10/07/97	GL4096-006625
BLR240	SPRMF30MG	10/07/97	GL4096-006625

217



HOBART

MATERIAL SAFETY DATA SHEET

MSDS NO: HB-TW
REVISED: AUGUST 1990
CH-3620

For U.S. Manufactured Welding Consumables and Related products
May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910. 1200 and Superfund Amendments and Reauthorization Act (SARA) of 1986 Public Law 99-499. Standard must be consulted for specific requirements.

SECTION 1 - IDENTIFICATION

Manufacturer/Supplier Name:		HOBART BROTHERS COMPANY	Telephone No: (513) 332-4000
Address:		600 WEST MAIN STREET, TROY, OHIO 45373	Emergency No: (513) 332-4000
Trade Name For:	"GROUP A":	FABCO 81, 82HD, 85,87, 90, 802, 825, RXR & GC5	Classification: AWS A5.20
		FABCOR 86; LM-25, FORMULA XL-525 & XL-550	
Trade Name For:	"GROUP B":	FABSHIELD 3, 4, 11, 21B, 23, 31, 32, 55, HSR, 3NI1, 120C & 2125	Classification: AWS A5.20
Trade Name For:	"GROUP C":	FABCO 83, 115, 803, 805, 805TC, 806, 2N, 1CM, 2CM;	Classification: A5.29
		FABCO HICOR 110, 1W	
Trade Name For:	"GROUP D":	FABLOY 5CM, 9CM, 4130, 4150, 409, 410, 439	Classification AWS A5.22
		FABLOY 1CM, 2CM, 2N, 3N & T	Classification AWS A5.28
		FABTUF 250, 960; PS 588	NONE
Product Type For:	"GROUP A"	FLUX CORED ARC WELDING (FCAW) MILD STEEL	
Product Type For:	"GROUP B"	FLUX CORED ARC WELDING (FCAW) & SELF SHIELDED TUBULAR WIRE	
Product Type For:	"GROUP C"	FLUX CORED ARC WELDING (FCAW) LOW ALLOY	
Product Type For:	"GROUP D"	FLUX CORED ARC WELDING (FCAW)	

SECTION 2 - HAZARDOUS MATERIALS

IMPORTANT

This section covers the materials from which this product is manufactured. The fumes and gases produced during welding with normal use of this product are covered by Section 5. The term "hazardous" in "Hazardous Materials" should be interpreted as a term required and defined in OSHA Hazard Communication Standard (29 CFR Part 1910.1200). The chemicals or compounds which are reportable by Section 313 of SARA are marked by the symbol #.

GROUP A

INGREDIENT	%WEIGHT	CAS NO.	EXPOSURE LIMIT (mg/m³) OSHA PEL	ACGIH TLV
IRON	80-95	7439-89-6	Not Reported	Not Reported
#MANGANESE	<4	7439-96-5	5CL*	5
TITANIUM OXIDE	4-9	13463-67-7	5	10
SILICON	<2	7440-21-3	5	10
FLUORSPAR	<5	7789-75-5	2.5 (As F)	2.5 (As F)

GROUP B

INGREDIENT	%WEIGHT	CAS NO.	EXPOSURE LIMIT (mg/m³) OSHA PEL	ACGIH TLV
IRON	80-95	7439-89-6	Not Reported	Not Reported
#MANGANESE	<2	7439-96-5	5CL*	5
TITANIUM OXIDE	<4	13463-67-7	5	10
MAGNESIUM OXIDE	<3	1309-48-4	5	10
SILICON	<1	7440-21-3	5	10
FLUORSPAR	5-10	7789-75-5	2.5 (As F)	2.5 (As F)
#BARIUM FLUORIDE	<3	7787-32-8	0.5 (As Ba)	0.5 (As Ba)
#ALUMINUM	<3	7429-90-5	5	10
#**NICKEL	<1	7440-02-0	1	1

*CL-Ceiling Limit

**Present in FABSHIELD 3NI1 & 2125

GROUP C

INGREDIENT	%WEIGHT	CAS NO.	EXPOSURE LIMIT (mg/m³) OSHA PEL	ACGIH TLV
IRON	80-90	7439-89-6	Not Reported	Not Reported
#MANGANESE	<3	7439-96-5	5CL*	5
NICKEL	<3	7440-02-0	1	1
CHROMIUM	<2	7440-47-3	1	0.5
TITANIUM OXIDE	<5	13463-67-7	5	10
SILICON	<4	7440-21-3	5	10
FLUORSPAR	<2	7789-75-5	2.5 (As F)	2.5 (As F)
#**COPPER	<1	7440-50-8	1	1

*CL-Ceiling Limit

**Present in FabCo 83

GROUP D

EXPOSURE LIMIT (mg/m³)

Trade Name For:	"GROUP D":	FABLOY 5CM, 9CM, 4130, 4150, 409, 410, 439	Classification AWS A5.22
		FABLOY 1CM, 2CM, 2CM1, [illegible]	Classification AWS A5.28
		FABTUF 250, 560, PS 588, [illegible]	NONE
Product Type For:	"GROUP A"	FLUX CORED ARC WELDING (FCAW) MILD STEEL	
Product Type For:	"GROUP B"	FLUX CORED ARC WELDING (FCAW) & NON SHIELDED TUBULAR WIRE	
Product Type For:	"GROUP C"	FLUX CORED ARC WELDING (FCAW) LOW ALLOY	
Product Type For:	"GROUP D"	FLUX CORED ARC WELDING (FCAW) [illegible]	

SECTION 2 - HAZARDOUS MATERIALS

IMPORTANT

This section covers the materials from which this product is manufactured. The fumes and gases produced during welding with normal use of this product are covered by Section 5. The term "hazardous" in "Hazardous Materials" should be interpreted as a term required and defined in OSHA Hazard Communication Standard (29 CFR Part 1910.1200). The chemicals or compounds which are reportable by Section 313 of SARA are marked by the symbol #.

GROUP A

INGREDIENT	%WEIGHT	CAS NO.	EXPOSURE LIMIT (mg/m³) OSHA PEL	ACGIH TLV
IRON	80-95	7439-89-6	Not Reported	Not Reported
#MANGANESE	<4	7439-96-5	5CL*	5
TITANIUM OXIDE	4-9	13463-67-7	5	10
SILICON	<2	7440-21-3	5	10
FLUORSPAR	<5	7789-75-5	2.5 (As F)	2.5 (As F)

GROUP B

INGREDIENT	%WEIGHT	CAS NO.	EXPOSURE LIMIT (mg/m³) OSHA PEL	ACGIH TLV
IRON	80-95	7439-89-6	Not Reported	Not Reported
#MANGANESE	<2	7439-96-5	5CL*	5
TITANIUM OXIDE	<4	13463-67-7	5	10
MAGNESIUM OXIDE	<3	1309-48-4	5	10
SILICON	<1	7440-21-3	5	10
FLUORSPAR	5-10	7789-75-5	2.5 (As F)	2.5 (As F)
#BARIUM FLUORIDE	<3	7787-32-8	0.5 (As Ba)	0.5 (As Ba)
#ALUMINUM	<3	7429-90-5	5	10
#**NICKEL	<1	7440-02-0	1	1

*CL-Ceiling Limit **Present in FABSHIELD 3Ni1 & 2125

GROUP C

INGREDIENT	%WEIGHT	CAS NO.	EXPOSURE LIMIT (mg/m³) OSHA PEL	ACGIH TLV
IRON	80-90	7439-89-6	Not Reported	Not Reported
#MANGANESE	<3	7439-96-5	5CL*	5
#NICKEL	<3	7440-02-0	1	1
#CHROMIUM	<2	7440-47-3	1	0.5
TITANIUM OXIDE	<5	13463-67-7	5	10
SILICON	<4	7440-21-3	5	10
FLUORSPAR	<2	7789-75-5	2.5 (As F)	2.5 (As F)
#**COPPER	<1	7440-50-8	1	1

*CL-Ceiling Limit **Present in FabCo 83

GROUP D

INGREDIENT	%WEIGHT	CAS NO.	EXPOSURE LIMIT (mg/m³) OSHA PEL	ACGIH TLV
IRON	80-95	7439-89-6	Not Reported	Not Reported
#MANGANESE	<2	7439-96-5	5CL*	5
#NICKEL	<1	7440-02-0	1	1
#CHROMIUM	10-20	7440-47-3	1	0.5
TITANIUM OXIDE	<2	13463-67-7	5	10
SILICON	<2	7440-21-3	5	10
#MOLYBDENUM	<2	7439-98-7	5	10
#**COPPER	<1	7440-50-8	1	1

*CL-Ceiling Limit **Present in PS 588

SECTION 3 - PHYSICAL/CHEMICAL CHARACTERISTICS

Not Applicable

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

Non Flammable: Welding arc and sparks can ignite combustibles. See Z49.1 referenced in Section 7.

SECTION 5 - REACTIVITY DATA

Hazardous Decomposition Products

Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedures, and electrodes used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating, or galvanizing), the number of welders and the volume of the work area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities).

When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 2. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section 2, plus those from the base metal and coating, etc., as noted above.

It is understood, however, that the elements and or oxides to be mentioned are virtually always present as complex oxides and not as metals. [Characterization of Arc Welding Fume: American Welding Society]. The elements or oxides listed below correspond to the ACGIH categories located in [TLV Threshold Limit Values for Chemical Substances and Physical Agents in the Workroom Environment].

Reasonably expected constituents of the fume would include: complex oxides of iron, manganese, silicon, and titanium. Groups A, B and C may have fluorides present. Groups C & D may also contain chromium and nickel.

GROUP A

SUBSTANCE	CAS NO.	EXPOSURE LIMIT (mg/m³) OSHA PEL	ACGIH TLV
IRON OXIDE	1309-37-1	10 (As Fe)	5 (As Fe)
MANGANESE	7439-96-5	1, 3 STEL** (Fume)	1, 3 STEL** (Fume)
SILICA	7631-86-9	6	10
TITANIUM OXIDE	13463-67-7	5	10
FLUORIDES		2.5 (As F)	2.5 (As F)

*CL-Ceiling Limit **STEL-Short Term Exposure Limit

GROUP B

SUBSTANCE	CAS NO.	EXPOSURE LIMIT (mg/m³) OSHA PEL	ACGIH TLV
IRON OXIDE	1309-37-1	10 (As Fe)	5 (As Fe)
MANGANESE	7439-96-5	1, 3 STEL** (Fume)	1, 3 STEL** (Fume)
SILICA	7631-86-9	6	10
TITANIUM OXIDE	13463-67-7	5	10
MAGNESIUM OXIDE	1309-48-4	5 (Fume)	10 (Fume)
FLUORIDES		2.5 (As F)	2.5 (As F)
ALUMINUM OXIDE	1344-28-1	5	10 (As Al)
***NICKEL (Soluble)	7440-02-0	0.1 (As Ni)	0.1 (As Ni)
***NICKEL OXIDE	1313-99-1	1 (As Ni)	1 (As Ni)
BARIUM	7440-39-3	0.5 (Sol)	0.5

*CL-Ceiling Limit **STEL-Short Term Exposure Limit ***Present in FABSHIELD 3Ni1 & 2125

GROUP C

SUBSTANCE	CAS NO.	EXPOSURE LIMIT (mg/m³) OSHA PEL	ACGIH TLV
IRON OXIDE	1309-37-1	10 (As Fe)	5 (As Fe)
MANGANESE	7439-96-5	1, 3 STEL** (Fume)	1, 3 STEL** (Fume)
CHROMIUM OXIDE	1308-38-9	0.5 (As Cr)	0.5 (As Cr)
CHROMIC ACID	1333-82-0	0.1 CL*(As CrO_3)	0.05 (As Cr)
NICKEL (SOLUBLE)	7440-02-0	0.1 (As Ni)	0.1 (As Ni)
NICKEL OXIDE	1313-99-1	1 (As Ni)	1 (As Ni)
SILICA	7631-86-9	6	10
TITANIUM OXIDE	13463-67-7	5	10
FLUORIDES		2.5 (As F)	2.5 (As F)
***COPPER	7440-50-8	0.1 (Fume)	0.2 (Fume)

*CL-Ceiling Limit **STEL-Short Term Exposure Limit ***Present in FabCo 83

GROUP D

SUBSTANCE	CAS NO.	EXPOSURE LIMIT (mg/m³) OSHA PEL	ACGIH TLV
IRON OXIDE	1309-37-1	10 (As Fe)	5 (As Fe_2O_3)
MANGANESE	7439-96-5	1, 3 STEL** (Fume)	1, 3 STEL** (Fume)
CHROMIUM OXIDE	1308-38-9	0.5 (As Cr)	0.5 (As Cr)
CHROMIC ACID	1333-82-0	0.1 CL*(As CrO_3)	0.05 (As Cr)
NICKEL (SOLUBLE)	7440-02-0	0.1 (As Ni)	0.1 (As Ni)
NICKEL OXIDE	1313-99-1	1 (As Ni)	1 (As Ni)
SILICA	7631-86-9	6	10
TITANIUM OXIDE	13463-67-7	5	10
MOLYBDENUM	7439-98-7	5	10
***COPPER	7440-50-8	0.1 (Fume)	0.2 (Fume)

*CL-Ceiling Limit **STEL-Short Term Exposure Limit ***Present in PS 588

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.
One recommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample inside the welder's helmet if worn or in the worker's breathing zone. [See ANSI/AWS F1.1, available from the "American Welding Society," P.O. Box 351040, Miami, FL 33135. Also, from AWS is F1.3 "Evaluating Contaminants in the Welding Environment - A Sampling Strategy Guide," which gives additional advice on sampling.]. At a minimum, materials listed in this section should be analyzed.

SECTION 6 - HEALTH HAZARD DATA

Threshold Limit Value:

The exposure level for welding fume has been established at 5mg/m³ with OSHA's PEL and ACGIH's TLV. See Section 5 for specific fume constituents which may modify this TLV.

Effects of Overexposure

Electric arc welding may create one or more of the following health hazards:
FUMES AND GASES can be dangerous to your health.
SHORT - TERM (ACUTE) OVEREXPOSURE to welding fumes may result in discomfort such as dizziness, nausea, or dryness or irritation of nose, throat or eyes.
PRIMARY ROUTES OF ENTRY are the respiratory system, eyes and/or skin.
IRON, IRON OXIDE, MANGANESE - Remove from overexposure and apply artificial respiration if needed. Wash eyes or skin with water to remove dusts.
FLUORSPAR - Fluoride compounds evolved may cause skin and eye burns, pulmonary edema bronchitis.
NICKEL, NICKEL OXIDE - Metallic taste, nausea, tightness in chest, fever, allergic reactions. Remove from overexposure, apply artificial respiration. Wash skin or eyes with soap and water. Allergic reactions likely in approximately 10% of workers.
CHROMIUM - Inhalation of fume with chromium (VI) compounds can cause irritation of the respiratory system, damage to the lungs and asthma like symptoms. Swallowing chromium (VI) salts can cause severe injury or death. Dusts on the skin can form ulcers. Eyes may be burned by chromium (VI) compounds. Allergic reactions likely in some people from chromium compounds.
LONG - TERM (CHRONIC) OVEREXPOSURE may lead to siderosis (iron deposits in lungs) and is believed by some investigators to affect pulmonary functions.
PRIMARY ROUTE OF ENTRY is the respiratory system.
IRON, IRON OXIDE - Long Term overexposure to iron fumes can cause deposits of iron in the lung. This condition is called "siderosis". Lungs will clear in time when exposure to iron and its compounds ceases. Iron and Magnetite (Fe_3O_4) are not regarded as fibrogenic materials.
FLUORIDE - Repeated overexposure to fluoride can cause serious bone erosion.
MANGANESE - Long term overexposure to manganese compounds may affect the central nervous system. Symptoms include muscular weakness, tremors similar to Parkinson's disease. Behavioral changes and changes in handwriting may also appear. Employees overexposed to manganese compounds should get quarterly medical examinations for early detection of manganism.
NICKEL, NICKEL OXIDE - Long term overexposure to nickel compounds may cause lung fibrosis or pneumoconiosis. Studies of nickel refinery workers indicated a higher incidence of lung and nasal

GROUP C

SUBSTANCE	CAS NO.	EXPOSURE LIMIT (mg/m³) OSHA PEL	ACGIH TLV
IRON OXIDE	1309-37-1	10 (As Fe)	5 (As Fe)
MANGANESE	7439-96-5	1, 3 STEL** (Fume)	1, 3 STEL** (Fume)
CHROMIUM OXIDE	1308-38-9	0.5 (As Cr)	0.5 (As Cr)
CHROMIC ACID	1333-82-0	0.1 CL*(As CrO_3)	0.05 (As Cr)
NICKEL (SOLUBLE)	7440-02-0	0.1 (As Ni)	0.1 (As Ni)
NICKEL OXIDE	1313-99-1	1 (As Ni)	1 (As Ni)
SILICA	7631-86-9	6	10
TITANIUM OXIDE	13463-67-7	5	10
FLUORIDES		2.5 (As F)	2.5 (As F)
***COPPER	7440-50-8	0.1 (Fume)	0.2 (Fume)

*CL-Ceiling Limit **STEL-Short Term Exposure Limit ***Present in FabCo 83

GROUP D

SUBSTANCE	CAS NO.	EXPOSURE LIMIT (mg/m³) OSHA PEL	ACGIH TLV
IRON OXIDE	1309-37-1	10 (As Fe)	5 (As Fe_2O_3)
MANGANESE	7439-96-5	1, 3 STEL** (Fume)	1, 3 STEL** (Fume)
CHROMIUM OXIDE	1308-38-9	0.5 (As Cr)	0.5 (As Cr)
CHROMIC ACID	1333-82-0	0.1 CL*(As CrO_3)	0.05 (As Cr)
NICKEL (SOLUBLE)	7440-02-0	0.1 (As Ni)	0.1 (As Ni)
NICKEL OXIDE	1313-99-1	1 (As Ni)	1 (As Ni)
SILICA	7631-86-9	6	10
TITANIUM OXIDE	13463-67-7	5	10
MOLYBDENUM	7439-98-7	5	10
***COPPER	7440-50-8	0.1 (Fume)	0.2 (Fume)

*CL-Ceiling Limit **STEL-Short Term Exposure Limit ***Present in PS 588

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.
One recommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample inside the welder's helmet if worn or in the worker's breathing zone. [See ANSI/AWS F1.1, available from the "American Welding Society," P.O. Box 351040, Miami, FL 33135. Also, from AWS is F1.3 "Evaluating Contaminants in the Welding Environment - A Sampling Strategy Guide," which gives additional advice on sampling.]. At a minimum, materials listed in this section should be analyzed.

SECTION 6 - HEALTH HAZARD DATA

Threshold Limit Value:

The exposure level for welding fume has been established at 5mg/m³ with OSHA's PEL and ACGIH's TLV. See Section 5 for specific fume constituents which may modify this TLV.

Effects of Overexposure

Electric arc welding may create one or more of the following health hazards:
FUMES AND GASES can be dangerous to your health.
SHORT - TERM (ACUTE) OVEREXPOSURE to welding fumes may result in discomfort such as dizziness, nausea, or dryness or irritation of nose, throat or eyes.
PRIMARY ROUTES OF ENTRY are the respiratory system, eyes and/or skin.
IRON, IRON OXIDE, MANGANESE - Remove from overexposure and apply artificial respiration if needed. Wash eyes or skin with water to remove dusts.
FLUORSPAR - Fluoride compounds evolved may cause skin and eye burns, pulmonary edema bronchitis.
NICKEL, NICKEL OXIDE - Metallic taste, nausea, tightness in chest, fever, allergic reactions. Remove from overexposure, apply artificial respiration. Wash skin or eyes with soap and water. Allergic reactions likely in approximately 10% of workers.
CHROMIUM - Inhalation of fume with chromium (VI) compounds can cause irritation of the respiratory system, damage to the lungs and asthma like symptoms. Swallowing chromium (VI) salts can cause severe injury or death. Dusts on the skin can form ulcers. Eyes may be burned by chromium (VI) compounds. Allergic reactions likely in some people from chromium compounds.
LONG - TERM (CHRONIC) OVEREXPOSURE may lead to siderosis (iron deposits in lungs) and is believed by some investigators to affect pulmonary functions.
PRIMARY ROUTE OF ENTRY is the respiratory system.
IRON, IRON OXIDE - Long Term overexposure to iron fumes can cause deposits of iron in the lung. This condition is called "siderosis". Lungs will clear in time when exposure to iron and its compounds ceases. Iron and Magnetite (Fe_3O_4) are not regarded as fibrogenic materials.
FLUORIDE - Repeated overexposure to fluoride can cause serious bone erosion.
MANGANESE - Long term overexposure to manganese compounds may affect the central nervous system. Symptoms include muscular weakness, tremors similar to Parkinson's disease. Behavioral changes and changes in handwriting may also appear. Employees overexposed to manganese compounds should get quarterly medical examinations for early detection of manganism.
NICKEL, NICKEL OXIDE - Long term overexposure to nickel compounds may cause lung fibrosis or pneumoconiosis. Studies of nickel refinery workers indicated a higher incidence of lung and nasal cancers. Nickel and its compounds are required to be considered as carcinogenic by OSHA although the International Agency for Research on Cancer states that specific nickel compounds that may be carcinogenic to humans cannot be identified.
CHROMIUM - Studies have shown that chromate production workers exposed to hexavalent chromium compounds have an excess of lung cancers. Chromium (VI) compounds are required by OSHA to be considered carcinogenic. Chromium (VI) compounds are more readily absorbed through the skin than chromium (III) compounds. Good practice requires the reduction of employee exposure to chromium (III) and (VI) materials.
ARC RAYS can injure eyes and burn skin.
ELECTRIC SHOCK can kill.
See Section 7

EMERGENCY AND FIRST AID PROCEDURES

Call for medical aid, Employ first aid techniques recommended by the American Red Cross.
Eyes & Skin: If irritation or flash burns develop after exposure, consult a physician.

CARCINOGENICITY

Nickel and chromium must be considered as possible carcinogens under OSHA (29CFR 1910.1200) and are present in "Group C & D" electrodes and Fabshield 3Ni1 & 2125 of "Group B".

SECTION 7 - PRECAUTIONS FOR SAFE HANDLING & USE/APPLICABLE CONTROL MEASURES

Read and understand the manufacturer's instructions and the precautionary label on the product. See American National Standard Z49.1. Safety in Welding and Cutting published by the American Welding Society, P.O. Box 351040, Miami, FL 33135 and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, Washington, D.C. 20402 for more detail on any of the following.
VENTILATION: Use enough ventilation, local exhaust at the arc, or both, to keep the fumes and gases below TLV's in the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes.
RESPIRATORY PROTECTION: Use NIOSH approved or equivalent fume respirator or air supplied respirator when welding in confined space or where local exhaust or ventilation does not keep exposure below TLV.
EYE PROTECTION: Wear helmet or use face shield with filter lens. As a rule of thumb begin with Shade Number 14. Adjust if needed by selecting the next lighter and/or darker shade number. Provide protective screens and flash goggles, if necessary, to shield others.
PROTECTIVE CLOTHING: Wear hand, head and body protection which help to prevent injury from radiation, sparks and electrical shock. See ANSI Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection; as well as dark nonsynthetic clothing. Train the welder not to touch live electrical parts and to insulate himself from work and ground.

PROCEDURE FOR CLEANUP OF SPILLS OR LEAKS: Not applicable
WASTE DISPOSAL: Prevent waste from contaminating surrounding environment. Discard any product, residue, disposable container or liner in an environmentally acceptable manner, in full compliance with federal, state and local regulations.
SPECIAL PRECAUTIONS: IMPORTANT: Maintain exposure below the PEL/TLV. Use industrial hygiene monitoring to ensure that your use of this material does not create exposures which exceed PEL/TLV. Always use exhaust ventilation. Refer to the following sources for important additional information.
ANSI Z49.1 The American Welding Society, P.O. Box 351040, Miami FL 33135 OSHA (29CFR1910) U.S. Dept. of Labor, Washington, D.C.20210.

HOBART BROTHERS COMPANY believes this data to be accurate and to reflect qualified expert opinion regarding current research. However, HOBART BROTHERS COMPANY cannot make any express or implied warranty as to this information.

MSDS NO: SW
REVISED: 8/85

HOBART

MATERIAL SAFETY DATA SHEET

FOR U.S. MANUFACTURED WELDING CONSUMABLES AND RELATED PRODUCTS MAY BE USED TO COMPLY WITH OSHA'S HAZARD COMMUNICATION STANDARD, 29 CFR 1910. 1200. STANDARD MUST BE CONSULTED FOR SPECIFIC REQUIREMENTS.

SECTION 1 - IDENTIFICATION

MFG./SUPPLIER: HOBART BROTHERS CO.

TELE# 1-513-339-6000

ADDRESS: 600 W. MAIN ST., TROY, OH. 45373

EMER.# 1-513-339-6000

TRADE NAME: HB-25, 28, 33, S-3, S-6, HB-18, 25P

CLASSIFICATION: AWS A5.18 MILD STEEL, AWS A5.28 LOW ALLOY, AWS A5.25 EM 13K-EW, ELECTROSLAG

PRODUCT TYPE: GAS METAL ARC WELDING (GMAW) SOLID WIRE

SECTION 2 - HAZARDOUS MATERIALS

This sections covers the materials from which this product is manufactured. The fumes and gases produced during welding with normal use of the product are covered by section 5.
The term "Hazardous Materials" should be interpreted as a term required and defined in OSHA Hazard Communication Standard (29 CFR Part 1910.1200).

		Exposure Limit (mg/m3)	
Ingredient	CAS No.	OSHA PEL	ACGIH TLV
IRON	7439-89-6	5	NOT REPORTED
MANGANESE	7439-96-5	5 CL*	1 CL* (FUME)
SILICON	7440-21-3	NOTHING FOUND	10,20 STEL**
COPPER	7440-50-8	1 (DUST)	2 STEL**
***MOLYBDENUM	7439-98-7	15 (MO)	10(Mo),20 STEL**

*CL-CEILING LIMIT **STEL-SHORT TERM EXPOSURE LIMIT ***PRESENT IN HB-18

SECTION 3 - PHYSICAL/CHEMICAL CHARACTERISTICS

NOT APPLICABLE

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

NONFLAMMABLE: Welding arc and sparks can ignite combustibles. See Z49.1 referenced in Section 7.

SECTION 5 - REACTIVITY DATA

HAZARDOUS DECOMPOSITION PRODUCTS

Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, and electrodes used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating or galvanizing), the number of welders and the volume of the work area, the quality and amount of ventilation, the position of the welders head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities.

When the electrode is consumed, the fume and gas decomposition products generated in percent and form from the ingredients listed in Section 2. Decompositions products of normal operation include those origination from the volatilization, reaction, or oxidation of the materials shown in Section 2, plus those from the base metal and coating, etc., as noted above.

It is understood, however, that the elements and or oxides to be mentioned are virtually always present as complex oxides and not as metals. [Characterization of Arc Welding Fume: American Welding Society]. The elements or oxides listed below correspond to the ACGIH categories located in [TLV Threshold Limit Values for Chemical Substances and Physical Agents in the Workroom Environment].

Reasonably expected constituents of the fume would include: complex oxides of iron, manganese, silicon, copper and molybdenum.

		Exposure Limit (mg/m3)	
Substance	CAS NO.	OSHA PEL	ACGIH TLV
IRON OXIDE	1309-38-2	5	10 (AS Fe 203)
MANGANESE	7439-96-5	5 CL*	1 CL* (FUME)
SILICON OXIDE	7631-86-9	5	3
COPPER	7440-50-8	0.1 (FUME)	0.2 (FUME)
***MOLYBDENUM	7439-98-7	15 (Mo)	10 (Mo), 20 STEL**

*CL - Ceiling Limit **STEL - Short Term Exposure Limit ***Present in HB-18

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.

One recommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample inside the welder's helmet if worn or in the worker's breathing zone. [See ANSI/AWS F1.1, available from the "American Welding Society". P.O. 33135, Box 351040, Miami, Fl.

Also, from AWS is F1.3 "Evaluating contaminants in the Welding Environment-a Sampling Strategy Guide," which gives additional advice on sampling]. At a minimum, materials listed in the section should be analyzed.

SECTION 6 - HEALTH HAZARD DATA
THRESHOLD LIMIT VALUE:

The ACGIH recommended general limit for Welding Fume NOC (Not Otherwise Classified) is 5mg/m3. ACGIH-1985 or latest date) preface states "The TLV-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations." See Section 5 for specific fume constituents which may modify this TLV.

EFFECTS OF OVEREXPOSURE

Electric arc welding may create one or more of the following health hazards:

FUMES AND GASES can be dangerous to your health.

SHORT-TERM (ACUTE) OVEREXPOSURE to welding fumes may result in discomfort such as dizziness, nausea, or dryness or irritation of nose, throat or eyes.

LONG-TERM (CHRONIC) OVEREXPOSURE may lead to siderosis (iron deposits in the lungs) and is believed by some investigators to affect pulmonary functions.

ARC RAYS can injure eyes and burn skin.

ELECTRIC SHOCK can kill.

See Section 7.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed the radiation from the arc.

One recommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample inside the welder's helmet if worn or in the worker's breathing zone. [See ANSI/AWS F1.1, available from the "American Welding Society," P.O. Box 351040, Miami, Fl. 33135. Also, from AWS is F1.3 "Evaluating Contaminants in the Welding Environment - A Sampling Strategy Guide," which gives additional advice on sampling]. At a minimum, materials listed in this section should be analyzed.

SECTION 6 - HEALTH HAZARD DATA

Threshold Limit Value:

The ACGIH recommended general limit for Welding Fume NOC (Not Otherwise Classified) is 5 mg/m3. ACGIH - 1985 or latest date) preface state "The TLV-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations." See Section 5 for specific fume constituents which may modify the TLV.

Effects of Overexposure

Electric arc welding may create one or more of the following health hazards:

FUMES AND GASES can be dangerous to your health

SHORT - TERM (ACUTE) OVEREXPOSURE to welding fumes may result in discomfort such as dizziness, nausea, or dryness or irritation of nose, throat or eyes.

LONG - TERM (CHRONIC) OVEREXPOSURE may lead to siderosis (iron deposits in lungs) and is believed by some investigators to affect pulmonary functions.

ARC RAYS can injure eyes and burn skin.

ELECTRIC SHOCK can kill.

See Section 7.

Emergency and First Aid Procedures

Call for medical aid. Employ first aid techniques recommended by the American Red Cross.
Eyes & Skin: If irritation or flash burns develop after exposure, consult a physician.

Carcinogenicity

These products do not contain ingredients that are defined as carcinogenic per 29CFR 1910.1200-Hazard Communication Standard.

SECTION 7 - PRECAUTIONS FOR SAFE HANDLING & USE/APPLICABLE CONTROL MEASURES

Read and understand the manufacturer's instructions and the precautionary label on the product. (See American National Standard Z49.1. Safety in Welding and Cutting published by the American Welding Society, P.O. Box 351040, Miami, Fl. 33135 and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, Washington, D.C. 20402. For more detail on many of the following:)

VENTILATION: Use enough ventilation, local exhaust at the arc, or both, to keep the fumes and gases below TLV's in the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes.

RESPIRATORY PROTECTION: Use NIOSH approved or equivalent fume respirator or air supplied respirator when welding in confined space or where local exhaust or ventilation does not keep exposure below TLV.

EYE PROTECTION: Wear helmet or use face shield with filter lens. AS a rule of thumb begin with Shade Number 14. Adjust if needed by selecting the lighter and/or darker shade number. Provide protective screens and flash goggles, if necessary, to shield others.

PROTECTIVE CLOTHING: Wear hand, head, and body protection which help prevent injury from radiation, sparks, and electrical shock. See ANSI Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing. Train the welder not to touch live electrical parts and to insulate himself from work and ground.

PROCEDURE FOR CLEANUP OF SPILLS OR LEAKS: Not applicable

WASTE DISPOSAL: Prevent waste from contaminating surrounding environment. Discard any product, residue, disposable container or liner in an environmentally acceptable manner, in full compliance with federal, state, and local regulations.

SPECIAL PRECAUTIONS:IMPORTANT: Maintain exposure below the PEL/TLV. Use industrial hygiene monitoring to ensure that your use of this material does not create exposures which exceed PEL/TLV. Always use exhaust ventilation. Refer to the following sources for important additional information.

ANSI Z49.1 The American Welding Society, P.O. Box 351040, Miami, Fl. 33135 - OSHA (29CFR1910) U.S. Dept. of Labor, Washington, D.C. 20210.

Hobart Brothers believes this data to be accurate and to reflect qualified expert opinion regarding current research. However, Hobart Brothers cannot make any express or implied warranty as to this information.

MSDS#:CE-LHMS

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MATERIAL SAFETY DATA SHEET

FOR U.S. Manufactured Welding Consumables and Related Products
May be used to comply with OSHA'S Hazard Communication Standard 29 CFR 1910. 1200.
Standard must be consulted for specific requirements.

SECTION 1 - IDENTIFICATION

Manufacturer/Supplier Name: HOBART BROTHERS COMPANY — Telephone #: 1-513-339-6000

Address: 600 W. MAIN ST., TROY, OH. 45373 — Emergency #:SAME AS ABOVE

Trade Name:18,418,718,718LMP,718MC,18AC,418SR; S-718,S-8AC — Classification:AWS A5.1 E7018

Product Type: SHIELDED METAL ARC WELDING (SMAW) LOW HYDROGEN MILD STEEL

SECTION 2 - HAZARDOUS MATERIALS

IMPORTANT

This section covers the materials [illegible] which this prod[illegible] is manufactured. The fumes and gases produced during welding with normal use of the product are [illegible]ed by Section [illegible]

The term "hazardous" in "Hazardou[illegible]ials" should b[illegible]terpreted as a term required and defined in OSHA Hazard Communication Standard (29 CFR Part 1910.[illegible]

Ingredient	CAS NO.	OSHA PEL	Exposure Limit (mg/m3) ACGIH TLV
IRON	7439-89-6	5	NOT REPORTED
MANGANESE	7439-96-5	5 CL*	1 CL*
TITANIUM OXIDE	13463-67-7	15	10,20 STEL**
FLUORSPAR	7789-75-5	2.5 (as F)	2.5 (as F)
POTASSIUM SILICATE	1312-76-1	NOTHING FOUND	NOTHING FOUND
SODIUM SILICATE	1344-09-8	NOTHING FOUND	NOTHING FOUND

[illegible]L-Ceiling Limit **STEL- Short Term Exposure Limit

SECTION 3 - PHYSICAL/CHEMICAL CHARACTERISTICS

NOT APPLICABLE

SECTION 4 - [illegible]IRE AND EXPLOSION HAZARD DATA

Non Flammable: Welding arc an[illegible]rks can ignite combustibles. See Z49.1 referenced in Section 7.

SECTION 5 - REACTIVITY DATA

Hazardous Decomposition Products

Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedures, and electrodes used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating, or galvanizing), the number of welders and the volume of the work area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities).

When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 2. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section 2, plus those from the base metal and coating, etc., as noted above.

It is understood, however, that the elements and or oxides to be mentioned are virtually always present as complex oxides and not as metals. [Characterization of Arc Welding Fume: American Welding Society]. The elements or oxides listed below correspond to the ACGIH categories located in [TLV Threshold Limit Values for Chemical Substances and Physical Agents in the Workroom Environment].

Reasonably expected constituents of the fume would include: complex oxides of iron, manganese, silicon, titanium. Fluorides would also be present.

Substance	CAS NO.	OSHA PE[illegible]	Exposure Limit (mg/m3) ACGIH TLV
IRON OXIDE	1309-38-2	5	10 (as Fe2O3)
[illegible]NGANESE	7439-96-5	5 CL*	1 CL* (Fume)
[illegible]ILICON OXIDE	7631-86-9	5	3
TITANIUM OXIDE	13463-67-7	15	10,20 STEL**
FLUORIDES		2.5 (as F)	2.5 (as F)

*CL - Ceiling Limit **STEL - Short Term Exposure Limit

EMERGENCY FIRST AID PROCEDURES

Call for medical aid. Employ first aid techniques recommended by the American Red Cross.
Eyes and Skin: If irritation or flash burns develop after exposure, consult a physician.

Carcinogenicity

These products do not contain ingredients that are defined as carcinogenic per 29CFR 1910.1200 - Hazard Communication Standard.

SECTION 7-PRECAUTIONS FOR SAFE HANDLING AND USE/ APPLICABLE CONTROL MEASURES

Read and understand the manufacturer's instructions and the precautionary label on the product. (See American National Standard Z49.1. Safety in Welding and Cutting published by the American Welding Society, P.O. Box 351040, Miami, Fl. 33135 and OSHA Publication 2206 (29CFR 1910), U.S. Government Printing Office, Washington, D.C. 20402. For more detail on many of the following:)

VENTILATION: Use enough ventilation, local exhaust at the arc, or both, to keep the fumes and gases below TLV's in the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes.

RESPIRATORY PROTECTION: Use NIOSH approved or equivalent fume respirator or air supplied respirator when welding in confined space or where local exhaust does not keep exposure below TLV.

EYE PROTECTION: Wear helmet or use face shield with filter lens. As a rule of thumb begin with Shade #14. Adjust if needed by selecting the next lighter and/or darker shade number. Provide protective screens and flash goggles, if necessary, to shield others.

PROTECTIVE CLOTHING: Wear hand, head, and body protection which help to prevent injury from radiation, sparks, and electrical shock. See ANSI Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats shoulder protection, as well as dark substantial clothing. Train the welder not to touch live electrical parts and to insulate himself from work and ground.

PROCEDURE FOR CLEANUP OF SPILLS OR LEAKS: Not applicable

WASTE DISPOSAL: Prevent waste from contaminating surrounding environment. Discard any product, residue, disposable container or liner in an environmentally acceptable manner, in full compliance with federal, state, and local regulations.

SPECIAL PRECAUTIONS: IMPORTANT: Maintain exposure below the PEL/TLV. Use industrial hygiene monitoring to ensure that your use of this material does not create exposures which exceed PEL/TLV. Always use exhaust ventilation. Refer to the following sources for important additional information.

ANSI Z49.1 The American Welding Society, P.O. Box 351040, Miami, Fl. 33135 -- OSHA (29CFR1910) U.S. Dept. of Labor, Washington D.C. 20210.

Hobart Brothers believes this data to be accurate and to reflect qualified expert opinion regarding current research. However, Hobart Brothers cannot make any express or implied warranty as to this information.

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HOBART

MSDS NO: TW-FABSHIELD

REVISED: 8-85

MATERIAL SAFETY DATA SHEET

For U.S. Manufactured Welding Consumables and Related Products
May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910. 1200.
Standard must be consulted for specific requirements.

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SECTION 1 — IDENTIFICATION

Manufacturer/Supplier Name: HOBART BROTHERS COMPANY	Telephone No: 1-513-339-6000
Address: 600 W. MAIN STREET, TROY, OHIO 45373	Emergency No: 1-513-339-6000
Trade Name: FABSHIELD 3, 4, 11, 13, 21, 21B, 23, 31, 55, HSR, SHIELDCOR 4, 8, 11, GS FABSHIELD 3Ni1	Classification: AWS A5.20 AWS A5.29

Product Type: FLUX CORE ARC WELDING (FCAW) - SELF SHIELDED TUBULAR WIRE

SECTION 2 — HAZARDOUS MATERIALS

IMPORTANT

This section covers the materials from which this product is manufactured. The fumes and gases produced during welding with normal use of this product are covered by Section 5.

The term "hazardous" in "Hazardous Materials" should be interpreted as a term required and defined in OSHA Hazard Communication Standard (29 CFR Part 1910.1200).

Ingredient	CAS No.	Exposure Limit (mg/m³)	
		OSHA PEL	ACGIH TLV
IRON	7439-89-6	5	Not Reported
MANGANESE	7439-96-5	5 CL*	1 CL* (Fume)
TITANIUM OXIDE	13463-67-7	15	10, 20 STEL**
MAGNESIUM OXIDE	1309-48-4	15	10
SILICON	7440-21-3	Nothing Found	10, 20 STEL**
FLUORSPAR	7789-75-5	2.5 (as F)	2.5 (as F)
BARIUM FLUORIDE	7787-32-8	0.5 (as Ba)	0.5 (as Ba)
ALUMINUM	7429-90-5	Nothing Found	10
***NICKEL	7440-02-0	1	1

*CL — Ceiling Limit **STEL — Short Term Exposure Limit ***Present in FABSHIELD 3Ni1

SECTION 3 — PHYSICAL/CHEMICAL CHARACTERISTICS

Not Applicable

SECTION 4 — FIRE AND EXPLOSION HAZARD DATA

Non Flammable: Welding arc and sparks can ignite combustibles. See Z49.1 referenced in Section 7.

SECTION 5 — REACTIVITY DATA

Hazardous Decomposition Products

Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedures, and electrodes used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating, or galvanizing), the number of welders and the volume of the work area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities).

When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 2. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section 2, plus those from the base metal and coating, etc., as noted above.

It is understood, however, that the elements and or oxides to be mentioned are virtually always present as complex oxides and not as metals. [Characterization of Arc Welding Fume: American Welding Society]. The elements or oxides listed below correspond to the ACGIH categories located in [TLV Threshold Limit Values for Chemical Substances and Physical Agents in the Workroom Environment].

Reasonably expected constituents of the fume would include: complex oxides of iron, manganese, silicon, titanium, magnesium, barium and aluminum. Fluorides would also be present. Nickel present in FABSHIELD 3Ni1.

Substance	CAS No.	Exposure Limit (mg/m³)	
		OSHA PEL	ACGIH TLV
IRON OXIDE	1309-38-2	5	10 (as Fe_2O_3)
MANGANESE	7439-96-5	5 CL*	1 CL* (Fume)
SILICON OXIDE	7631-86-9	5	3
TITANIUM OXIDE	13463-67-7	15	10, 20 STEL**
MAGNESIUM OXIDE	1309-48-4	15	10
FLUORIDES		2.5 (as F)	2.5 (as F)
ALUMINUM OXIDE	1344-28-1	Nothing Found	10
***NICKEL (Soluble)		1 (as Ni)	0.1 (as Ni)
***NICKEL OXIDE	1313-99-1	Nothing Found	1 (as Ni)
BARIUM	7440-39-3	0.5 (sol.)	0.5

*CL — Ceiling Limit **STEL -- Short Term Exposure Limit ***Present in FABSHIELD 3Ni1

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.

One recommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample inside the welder's helmet if worn or in the worker's breathing zone. [See ANSI/AWS F1.1, available from the "American Welding Society," P. O. Box 351040, Miami, FL 33135. Also, from AWS is F1.3 "Evaluating Contaminants in the Welding Environment — A Sampling Strategy Guide," which gives additional advice on sampling]. At a minimum, materials listed in this section should be analyzed.

SECTION 6 — HEALTH HAZARD DATA

Threshold Limit Value:

The ACGIH recommended general limit for Welding Fume NOC (Not Otherwise Classified) is 5 mg/m³. ACGIH-1985 or latest date) preface states "The TLV-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations." See Section 5 for specific fume constituents which may modify this TLV.

Effects of Overexposure

Electric arc welding may create one or more of the following health hazards:

FUMES AND GASES can be dangerous to your health.

SHORT - TERM (ACUTE) OVEREXPOSURE to welding fumes may result in discomfort such as dizziness, nausea, or dryness or irritation of nose, throat or eyes.

NICKEL — NICKEL OXIDE (NiO) Metallic taste, nausea, tightness in chest, fever, allergic reactions. Remove from over exposure. Apply artificial respiration. Wash skin or eyes with soap and water. Allergic reactions likely in about 10% of workers.

LONG-TERM (CHRONIC) OVEREXPOSURE may lead to siderosis (iron deposits in lungs) and is believed by some investigators to affect pulmonary functions.

NICKEL — NICKEL OXIDE (NiO) long term overexposure to nickel compounds may cause lung fibrosis or pneumoconiosis. Studies of nickel refinery workers indicated a higher incidence of lung and nasal cancers. Nickel and its compounds are required to be considered as carcinogenic by OSHA although the International Agency for Research on Cancer states that specific nickel compounds that may be carcinogenic to humans cannot be identified.

ARC RAYS can injure eyes and burn skin.

ELECTRIC SHOCK can kill.

See Section 7.

Emergency and First Aid Procedures

Call for medical aid. Employ first aid techniques recommended by the American Red Cross.

Eyes & Skin: If irritation or flash burns develop after exposure, consult a physician.

Carcinogenicity

Nickel must be considered as a possible carcinogen under OSHA (29CFR 1910.1200).

SECTION 7 — PRECAUTIONS FOR SAFE HANDLING AND USE/APPLICABLE CONTROL MEASURES

Read and understand the manufacturer's instructions and the precautionary label on the product. (See American National Standard Z49.1. Safety in Welding and Cutting published by the American Welding Society, P. O. Box 351040, Miami, FL 33135 and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, Washington, D.C. 20402. For more detail on many of the following:)

VENTILATION: Use enough ventilation, local exhaust at the arc, or both, to keep the fumes and gases below TLV's in the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes.

RESPIRATORY PROTECTION: Use NIOSH approved or equivalent fume respirator or air supplied respirator when welding in confined space or where local exhaust or ventilation does not keep exposure below TLV.

EYE PROTECTION: Wear helmet or use face shield with filter lens. As a rule of thumb begin with Shade Number 14. Adjust if needed by selecting the next lighter and/or darker shade number. Provide protective screens and flash goggles, if necessary, to shield others.

PROTECTIVE CLOTHING: Wear hand, head, and body protection which help to prevent injury from radiation, sparks, and electrical shock. See ANSI Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing. Train the welder not to touch live electrical parts and to insulate himself from work and ground.

PROCEDURE FOR CLEANUP OF SPILLS OR LEAKS: Not applicable

WASTE DISPOSAL: Prevent waste from contaminating surrounding environment. Discard any product, residue, disposable container or liner in an environmentally acceptable manner, in full compliance with federal, state and local regulations.

SPECIAL PRECAUTIONS: IMPORTANT: Maintain exposure below the PEL/TLV. Use industrial hygiene monitoring to ensure that your use of this material does not create exposures which exceed PEL/TLV. Always use exhaust ventilation. Refer to the following sources for important additional information.

ANSI Z49.1 The American Welding Society, P. O. Box 351040, Miami, FL 33135 — OSHA (29CFR1910) U.S. Dept. of Labor, Washington, D.C. 20210.

Hobart Brothers believes this data to be accurate and to reflect qualified expert opinion regarding current research. However, Hobart Brothers cannot make any express or implied warranty as to this information.

H-1236-B
Revision Date 5/85

INCO ALLOYS INTERNATIONAL, INC.
Material Safety Data Sheet
Welding Products
Filler Metals

MSDS No. _____

Inco Alloys International, Inc.
Welding Products Company
1401 Burris Road
Newton, N. C. 28658

FOR ADDITIONAL INFORMATION
Industrial Hygiene (304) 526-5436
Emergency Number (304) 526-5780

SECTION 1 - Product Identification

This MSDS covers all Inco Alloys International, Inc., welding products identified as:
FILLER METAL
Trade name and nominal composition are listed in Section 2-A

SECTION 2 - Hazardous Ingredients*

IMPORTANT

This section covers the materials contained in the product as shipped. The fumes and gases produced during welding are covered in Section 6.

Ingredient	CAS No.	PEL(1)	TLV(2)	Ingredient	CAS No.	PEL(1)	TLV(2)
Aluminum (Al)	7429-90-5	NONE	10	Molybdenum (Mo)	7439-98-7	15	10
Chromium (Cr)	7440-47-3	1	0.5	Nickel (Ni)	7440-02-0	1	1
Cobalt (Co)	7440-48-4	0.1	0.05	Niobium (Nb)	7440-03-1	NONE	NONE
Copper (Cu)	7440-50-8	1	1				
Iron (Fe)	1309-37-1	NONE	NONE	Titanium (Ti)	7440-32-6	15	10
Manganese (Mn)	7439-96-5	C5	C5	Tungsten (W)	7440-33-7	NONE	5

SECTION 2-A - Tradename and Nominal Composition

Wt.% - 1% or greater
Ni & Cr 0.1% or greater

PRODUCT NAME	Al	Cr	Co	Cu	Fe	Mn	Mo	Ni	Nb	Ti	W
Nickel Filler Metal 61		0.1						96		3	
MONEL® Filler Metal 40		0.1		32	2	1		66			
MONEL Filler Metal 60		0.1		27		4		65	1	3	
MONEL Filler Metal 64	3	0.1		30		1		65			
MONEL Filler Metal 67		0.1		68		1		31			
INCONEL® Filler Metal 62		0.1		16	8			74	3		
INCONEL Filler Metal 69	1	16			7	1		73	1	3	
INCONEL Filler Metal 72		44						55		1	
INCONEL Filler Metal 82		20			1	3		72	3		
INCONEL Filler Metal 92		17			7	3		71		4	
INCONEL Filler Metal 601	2	23		1	15	1		61			
INCONEL Filler Metal 617	2	22	13		2		9	52			
INCONEL Filler Metal 625		22			3		9	61	4		
INCONEL Filler Metal 718		19			19		4	53	5	1	
INCOLOY® Filler Metal 65		21		2	30	1	3	42		1	
NI-ROD® Filler Metal 44		0.1			47	11		41			
NI-ROD® Filler Metal 99		0.1						99			
INCO® Filler Metal HX		22	2		19		9	47			1
INCO Filler Metal G-3		22	5		20		7	44			2
INCO Filler Metal 904L		20		2	46	2	5	25			
INCO Filler Metal C-276		16	2		6		16	57			3

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SECTION 3 - Physical Data

Filler metals are solid alloy wire

SECTION 4 - Fire and Explosion Data

Nonflammable; however, welding arcs and sparks can ignite flammable liquids and vapors and combustible solids.

Notes: *As defined by OSHA (29CFR1910.1200) or certain state regulations.
1 Permissible Exposure Limit - (mg/m^3) -OSHA (29CFR1910.)
2 Threshold Limit Value - (mg/m^3) -American Conference of Governmental Industrial Hygienists (current as of MSDS revision date)

SECTION 5 - Health Hazard Information

Exposure Limits: Section 2 lists specific hazardous ingredients and exposure limits. Section 6 lists exposure limits for hazardous reaction products that might be formed by welding and high temperature cutting. **IMPORTANT** - Determine actual exposure by industrial hygiene monitoring.

POSSIBLE SIGNS AND SYMPTOMS OF EXPOSURE TO DUST, WELDING FUME AND GASES

SHORT TERM EXPOSURE:

Metallic taste; nausea; tightness of chest; fever; irritation of eyes, nose, throat and skin; loss of consciousness/death due to welding gases or lack of oxygen.

LONG TERM EXPOSURE

Adverse effects may result from long time exposure to welding fume, gases, or dusts. These effects may include skin sensitization, neurological damage, and respiratory disease such as bronchial asthma, lung fibrosis or pneumoconiosis. Nickel and chromium must be considered possible carcinogens under OSHA (29CFR1910.1200). The International Agency for Research on Cancer has indicated that nickel and certain nickel compounds are probably carcinogenic for humans, but that the specific compounds which may be carcinogenic cannot be specified precisely. This conclusion was based on experience in certain nickel refining operations. Chromium has also been listed by IARC because of "sufficient evidence for the carcinogenicity of chromium and certain chromium compounds". The studies forming the basis for the conclusion were from operations different from the production or welding of nickel and chromium alloys. Recent epidemiological studies of workers melting and working alloys containing nickel/chromium have found no increased risk of cancer. Nevertheless, exposures MUST be maintained below the levels specified in section 2 and section 6.

AGGRAVATION of preexisting respiratory or allergic conditions may occur in some workers.

EMERGENCY AND FIRST AID

Remove from exposure and obtain prompt medical attention. If victim is unconscious, administer oxygen. If not breathing, resusitate immediately.

SECTION 6 - Reactivity Information

Hazardous Reaction Products:

Fumes and gases from welding and high temperature cutting cannot be classified simply. The composition and quantity of both depend on the metal being welded, the process, procedures, and electrodes used. The constituents of the fume are generally different from the ingredients listed in Section 2 and may include oxides of the metals, chromates, fluorides, and complex metallics. The gases may include carbon monoxide, ozone, and oxides of nitrogen. Chlorinated solvents may be decomposed by the arc into toxic gases such as phosgene. The following exposure limits apply to those fumes and gases which may be found in the welding or high temperature cutting environment.

Substance	PEL	TLV	Substance	PEL	TLV
Aluminum fume (Al)	NONE	5.0	Manganese fume (Mn)	C5.0	1.0
Carbon monoxide (CO)	50ppm	50ppm	Molybdenum (soluble) (Mo)	5.0	5.0
Chromium (Chromates)	0.1	0.05	Nickel (soluble) (Ni)	1.0	0.1
Cobalt fume (Co)	0.1	0.05	Nitrogen dioxides (NO_2)	C5.0ppm	3ppm
Copper fume (Cu)	0.1	0.2	Ozone (O_3)	0.1ppm	0.1ppm
Fluorides (as F)	2.5	2.5	Phosgene ($COCl_2$)	0.1ppm	0.1ppm
Iron oxide fume (as Fe)	10.0	5.0			

(PEL/TLV values are mg/m^3 except where indicated as ppm)

SECTION 7 - Spill or Leak Procedures

Vacuum residue from cutting, grinding, or welding operations into suitable container. Dispose of in accordance with EPA or local regulations

SECTION 8 - Special Protection Information

Respiratory Protection:

Necessary when permissable exposure limits may be exceeded during cutting, grinding, or welding. Use air-supplied respirator in confined spaces. — Use only NIOSH approved respirator in accordance with 29CFR1910.134

Ventilation:

Use local exhaust when cutting, grinding, or welding. **IMPORTANT** -maintain exposures below the limits in Section 2 and 6. Confined spaces require special attention to provision of adequate ventilation.

Eye Protection and Protective Clothing: Required when cutting, grinding, or welding. Wear gloves, face protection, and flame retardant clothing. Do not expose skin. Select welding lense shade from AWS publication F2.2.

SECTION 9 - Special Precautions

IMPORTANT - Maintain exposures below the PEL/TLV. Use industrial hygiene air monitoring to ensure that your use of this material does not create exposures which exceed PEL/TLV. Always use exhaust ventilation. Refer to the following sources for important additional information:

ANSI Z49.1 The American Welding Society
P. O. Box 351040, Miami, FL 33135

OSHA(29CFR1910), U.S. Dept. of Labor
Washington D.C. 20210

*** MANUFACTURER'S INFORMATION ***

MANUFACTURED BY:
INSULATING MATERIALS INCORPORATED
1 CAMPBELL ROAD
SCHENECTADY, NEW YORK 12306

EMERGENCY TELEPHONE:
24 HRS (518) 395-3310
REVISED: 09/30/93
PREPARER: A.L.DRAKE

*** I PRODUCT IDENTIFICATION ***

PRODUCT IDENTIFICATION: 271
CHEMICAL FAMILY: INSULATING VARNISH
CHEMICAL NAME: ROSIN BASED RESIN SOLUTION
FORMULA: MIXTURE

*** II PRODUCT COMPONENTS ***

HAZARDOUS PRODUCT COMPOSITION	APPROX. WT %	ACGIH TVL	OSHA PEL	UNITS	CAS REG. NO.
ETHYL ALCOHOL	30-60	1000	1000	PPM	64-17-5
ROSIN POLYMER	30-60	10	15	MG/M3	68152-50-1
TOLUENE	1-5	100	100	PPM	108-88-3
METHYL ALCOHOL	1-5	200	200	PPM	67-56-1
DIACETONE ALCOHOL	1-5	50	50	PPM	123-42-2
METHYL ISOBUTYL KETONE	1-5	50	50	PPM	108-10-1
BENZENE	<0.001	10	10	PPM	71-43-2

* COMPANY RECOMMENDED VALUE

FORMULATION INFORMATION:
SARA 313 REPORTABLES: 108-88-3
TOLUENE 3.2%; 67-56-1 METHYL ALCOHOL 2.1%; 108-10-1 METHYL ISOBUTYL KETONE 1.1%

*** III PHYSICAL DATA ***

**PRODUCT INFORMATION
BOILING POINT : NA (F) NA (C) % VOLATILE BY WEIGHT: 57.0
VAPOR PRESSURE(20C): NA MM HG EVAPORATION RATE : >1

VAPOR DENSITY(AIR=1:	NA	(BUTYL ACETATE = 1)	
FREEZING POINT :	NA (F) NA (C)	SPECIFIC GRAVITY :	0.957
MELTING POINT :	NA (F) NA (C)	(WATER=1 @ 25C)	
PHYSICAL STATE :	LIQUID	DENSITY :	NA
ODOR :	ALCOHOL ODOR	ACIDITY/ALKALINITY :	NA
ODOR THRESHOLD :	UNK (PPM)		
COLOR :	BLACK	PH :	NA

SOLUBILITY IN WATER (20C): APPRECIABLE
SOLUBILITY IN ORGANIC SOLVENT: NA
(STATE SOLVENT)

ETHYL ALCOHOL
BOILING POINT: 176 (F) 80 (C)
VAPOR PRESSURE: (20 C) 46 MM HG
VAPOR DENSITY: (AIR=1) 1.6

ROSIN POLYMER
BOILING POINT: NA (F) NA (C)
VAPOR PRESSURE: (20 C) <.001 MM HG
VAPOR DENSITY: (AIR=1) NA

TOLUENE
BOILING POINT: 231 (F) 111 (C)
VAPOR PRESSURE: (20 C) 22 MM HG
VAPOR DENSITY: (AIR=1) 3.2

METHYL ALCOHOL
BOILING POINT: 149 (F) 65 (C)
VAPOR PRESSURE: (20 C) 97.25 MM HG
VAPOR DENSITY: (AIR=1) 1.11

DIACETONE ALCOHOL
BOILING POINT: 337 (F) 169 (C)
VAPOR PRESSURE: (20 C) <1.0 MM HG
VAPOR DENSITY: (AIR=1) 4.0

METHYL ISOBUTYL KETONE
BOILING POINT: 241 (F) 116 (C)
VAPOR PRESSURE: (20 C) 15 MM HG
VAPOR DENSITY: (AIR=1) 3.5

BENZENE
BOILING POINT: 176 (F) 80 (C)
VAPOR PRESSURE: (20 C) 75 MM HG
VAPOR DENSITY: (AIR=1) 2.77

*** IV FIRE AND EXPLOSION DATA ***

FLASH POINT: 28 (F) -2 (C) BY PMCC.
IGNITION TEMPERATURE: NF (F) NF (C)
FLAMMABLE LIMITS IN AIR (%): LOWER 1.2 UPPER 12.0

SENSITIVITY TO MECHANICAL IMPACT (Y/N): N
SENSITIVITY TO STATIC DISCHARGE:
SENSITIVITY TO STATIC DISCHARGE IS EXPECTED; MATERIAL HAS A FLASH POINT BELOW 200 F.
EXTINGUISHING MEDIA
ALCOHOL FOAM
CARBON DIOXIDE
DRY CHEMICAL
SPECIAL FIREFIGHTING PROCEDURES
VAPORS MAY FORM EXPLOSIVE MIXTURE WITH AIR.
EXTREMELY FLAMMABLE.
WEAR RESPIRATORY PROTECTION IF IN A CONFINED AREA.
COOL EXPOSED CONTAINERS WITH WATER SPRAY AFTER EXTINGUSHING FIRE
POSITIVE PRESSURE, SELF-CONTAINED BREATHING APPARATUS

*** V REACTIVITY DATA ***

STABILITY:
X STABLE _ UNSTABLE
HAZARDOUS
POLYMERIZATION WILL NOT OCCUR
HAZARDOUS DECOMPOSITION/COMBUSTION PRODUCTS
CARBON MONOXIDE.
CARBON DIOXIDE.
TOXIC FUMES.
ALCOHOLS.
INCOMPATIBILITY (MATERIALS TO AVOID)
AVOID CONTACT WITH ACIDIC,BASIC OR OXIDIZING AGENTS.
CONDITIONS TO AVOID
KEEP AWAY FROM HEAT,SPARKS AND FLAME.

*** VI HEALTH HAZARD DATA ***

ACUTE SIGNS/EFFECTS OF EXPOSURE
INGESTION
HARMFUL IF SWALLOWED.
CAUSES VOMITING,NAUSEA,AND DIARRHEA
LARGE INTAKE CAN RESULT IN NARCOSIS.
SKIN CONTACT
CAUSES MODERATE SKIN IRRITATION.
WILL CAUSE SKIN DEFATTING.
INHALATION
EXCESSIVE INHALATION CAUSES HEADACHE,DIZZINESS,NAUSEA AND INCOORDINATION.
CAUSES IRRITATION OF THE MOUTH,NOSE,AND THROAT.
MAY IRRITATE THE LUNGS.
EYE CONTACT
CAUSES SEVERE EYE IRRITATION WILL DAMAGE TISSUE

MEDICAL CONDITIONS AGGRAVATED
DERMAL AILMENTS.
CENTRAL NERVOUS SYSTEM DISORDERS.
OTHER
NONE KNOWN.
CHRONIC EFFECTS OF EXPOSURE
DERMATITIS.
RESPIRATORY AILMENTS.
CENTRAL NERVOUS SYSTEM DAMAGE.
LIVER AND KIDNEY DAMAGE.
REPRODUCTIVE DISORDERS.
EYE DAMAGE.
REPORTED TO CAUSE EMBRYOTOXICITY WHEN TESTED ON SOME LABORATORY ANIMALS.
EMERGENCY AND FIRST AID PROCEDURES
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.
SKIN
REMOVE CONTAMINATED CLOTHING AND LAUNDER BEFORE REUSE.
WASH WITH SOAP AND WATER.
GET MEDICAL ATTENTION IF IRRITATION PERSISTS.
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.
EYES
IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES AND GET MEDICAL ATTENTION.
NOTE TO PHYSICIAN
ASPIRATION MAY CAUSE SEVERE LUNG DAMAGE. EVACUATE STOMACH IN A WAY WHICH AVOIDS ASPIRATION.

TOXICITY: ETHYL ALCOHOL
ACUTE ORAL LD50: 7,060 (RAT) MG/KG
ACUTE DERMAL LD50: LDLo 20,000 (RBT) MG/KG
ACUTE INHALATION: LC50 20,000 PPM/10H (RAT)
OTHER: EYE AND SKIN IRRITANT.
AMES TEST: UNKNOWN

TOXICITY: ROSIN POLYMER
ACUTE ORAL LD50: >5000 (RAT) MG/KG
ACUTE DERMAL LD50: NA MG/KG
ACUTE INHALATION: NA
OTHER: NON-IRRITATING TO SKIN (RBT),MINIMALLY IRRITATING TO EYE (RBT).
AMES TEST: UNKNOWN

TOXICITY: TOLUENE
ACUTE ORAL LD50: 5000 (RAT) MG/KG
ACUTE DERMAL LD50: 12,124 (RBT) MG/KG
ACUTE INHALATION: LCLo 4000 PPM/4H (RAT)
OTHER: EYE AND SKIN IRRITANT.
AMES TEST: UNKNOWN

TOXICITY: METHYL ALCOHOL
ACUTE ORAL LD50: 5,628 (RAT) MG/KG
ACUTE DERMAL LD50: 15,800 (RBT) MG/KG
ACUTE INHALATION: LC50 64,000 PPM/4H (RAT)
OTHER: EYE AND SKIN IRRITANT.
AMES TEST: UNKNOWN

TOXICITY: DIACETONE ALCOHOL
ACUTE ORAL LD50: 4000 (RAT) MG/KG
ACUTE DERMAL LD50: 13500 (RBT) MG/KG
ACUTE INHALATION: TCLO 400 PPM (HMN) PUL
OTHER: EYE AND SKIN IRRITANT.
AMES TEST: UNKNOWN

TOXICITY: METHYL ISOBUTYL KETONE
ACUTE ORAL LD50: 2080 (RAT) MG/KG
ACUTE DERMAL LD50: NA MG/KG
ACUTE INHALATION: LC 8,000 PPM/4H (RAT)
OTHER: EYE AND SKIN IRRITANT.
AMES TEST: UNKNOWN

TOXICITY: BENZENE
ACUTE ORAL LD50: 3,400 (RAT) MG/KG
ACUTE DERMAL LD50: NA MG/KG
ACUTE INHALATION: LC50 10,000 PPM/7H (RAT)
OTHER: EYE AND SKIN IRRITANT.
AMES TEST: UNKNOWN
PRINCIPALS ROUTES OF EXPOSURE
ORAL.
DERMAL - SKIN.
EYES.
INHALATION.
ABSORPTION THROUGH SKIN.
THIS PRODUCT OR ONE OF ITS INGREDIENTS PRESENT 0.1% OR MORE IS NOT LISTED AS A CARCINOGEN OR SUSPECTED CARCINOGEN BY NTP, IARC, OR OSHA
PRODUCTS/INGREDIENTS
THIS SPACE RESERVED FOR SPECIAL USE.

*** VII SPECIAL PROTECTIVE EQUIPMENT ***

RESPIRATORY PROTECTION
USE IN A WELL VENTILATED AREA.
PROTECTIVE GLOVES
RUBBER GLOVES.
EYE AND FACE PROTECTION
MONOGOGGLES.
OTHER PROTECTIVE EQUIPMENT
RUBBER APRON.
VENTILATION

USE ONLY IN WELL VENTILATED AREA.

*** VIII SPILL, LEAK AND DISPOSAL PROCEDURE ***

ACTION TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED

WIPE, SCRAPE OR SOAK UP IN AN INERT MATERIAL AND PUT IN A CONTAINER FOR DISPOSAL.
WASH WALKING SURFACES WITH DETERGENT AND WATER TO REDUCE SLIPPING HAZARD.
WEAR PROPER PROTECTIVE EQUIPMENT AS SPECIFIED IN THE PROTECTIVE EQUIPMENT SECTION.
REMOVE SOURCES OF IGNITION.
WARN OTHER WORKERS OF SPILL.
INCREASE AREA VENTILATION.

DISPOSAL METHOD

DISPOSAL SHOULD BE MADE IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.
INCINERATION RECOMMENDED IN APPROVED INCINERATOR ACCORDING TO FEDERAL, STATE, AND LOCAL REGULATIONS.

*** IX SPECIAL PRECAUTIONS ***

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

USE GROUND STRAP.
STORE UPRIGHT IN A COOL PLACE BELOW 30'C (85'F).
AVOID BREATHING VAPORS, IF EXPOSED TO HIGH VAPOR CONCENTRATION, LEAVE AREA AT ONCE.
AVOID CONTACT WITH SKIN AND EYES.
OPEN CONTAINER CAUTIOUSLY.
USE ONLY IN A WELL VENTILATED AREA.
DANGER! EXTREMELY FLAMMABLE.
KEEP CONTAINER CLOSED WHEN NOT IN USE TO PREVENT CONTACT WITH ACIDIC, BASIC OR OXIDIZING MATERIALS.
CURE ONLY WHERE APPROPRIATE VENTILATION SYSTEMS EXIST.
KEEP AWAY FROM FOOD AND SMOKING MATERIALS.
UNCURED PRODUCT CONTACT IRRITATES EYES.
AVOID CONTACT WITH EYES.

ENGINEERING CONTROLS

EXHAUST VENTILATION
EYEWASH STATIONS.
USE IN A WELL VENTILATED AREA.

*** X SHIPPING AND REGULATORY CLASSIFICATION DATA ***

DOT SHIPPING NAME: RESIN SOLUTION

DOT HAZARD CLASS: 3, II
DOT LABEL(S): FLAMMABLE LIQUID
UN/NA NUMBER: UN1866
PLACARDS: FLAMMABLE LIQUID
EPA HAZARD WASTE: D001, D018 RQ=100/45.4
OSHA HAZARD CLASS: IRRITANT
WHMIS HAZARD CLASS:
B2 FLAMMABLE LIQUIDS
D2A VERY TOXIC MATERIALS
D2B TOXIC MATERIALS
NMFC CLASSIFICATION: CLASS 55
TRANSPORTATION CLASS: IMDG: 3.2 PG 3278
IATA: 3, II
NFPA/HMIS CLASSIFICATION: FLAMMABILITY 3 , REACTIVITY 0 , HEALTH 2
ADDITIONAL INFORMATION

THIS PRODUCT OR ITS COMPONENTS ARE ON THE EUROPEAN INVENTORY OF EXISTING COMMERCIAL CHEMICALS (EINECS).....

THESE DATA ARE OFFERED IN GOOD FAITH AS TYPICAL VALUES AND NOT AS A PRODUCT SPECIFICATION. NO WARRANTY, EITHER EXPRESSED OR IMPLIED, IS MADE. THE RECOMMENDED HANDLING PROCEDURES ARE BELIEVED TO BE GENERALLY APPLICABLE. HOWEVER, EACH USER SHOULD REVIEW THESE RECOMMENDATIONS IN THE SPECIFIC CONTEXT OF THE INTENDED USE.....

C =	CEILING LIMIT	NEGL =	NEGLIGIBLE
EST=	ESTIMATED	NF =	NONE FOUND
NA =	NOT APPLICABLE	UNKN =	UNKNOWN
NE =	NONE ESTABLISHED	REC =	RECOMMENDED
ND =	NONE DETERMINED	V =	RECOMM. BY VENDOR
BY-PRODUCT = REACTION BY-		SKN =	SKIN
PRODUCT, TSCA INVENTORY		TS =	TRADE SECRET
STATUS NOT REQUIRED UNDER		R =	RECOMMENDED
40 CFR PART 720.30(H-2)		MST =	MIST

THIS PRODUCT CONTAINS A MATERIAL THAT IS ON THE CALIFORNIA PROPOSITION 65 LIST OF CHEMICALS.
WARNING! THIS PRODUCT CONTAINS A CHEMICAL KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.....

THIS PRODUCT CONTAINS A MATERIAL THAT IS ON THE CALIFORNIA PROPOSITION 65 LIST.
WARNING! THIS PRODUCT CONTAINS A CHEMICAL KNOWN TO THE STATE OF CALIFORNIA TO CAUSE BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM.
.....

*** MANUFACTURER'S INFORMATION ***

MANUFACTURED BY:
INSULATING MATERIALS INCORPORATED
1 CAMPBELL ROAD
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EMERGENCY TELEPHONE:
24 HRS (518) 395-3310
REVISED: 09/05/96
PREPARER: A.L. DRAKE

*** I PRODUCT IDENTIFICATION ***

PRODUCT IDENTIFICATION: 277
CHEMICAL FAMILY: INSULATING VARNISH
CHEMICAL NAME: FLUOROTELOMER DISPERSION
FORMULA: MIXTURE

*** II PRODUCT COMPONENTS ***

HAZARDOUS PRODUCT COMPOSITION	APPROX. WT %	ACGIH TVL	OSHA PEL	UNITS	CAS REG. NO.
ISOPROPYL ALCOHOL	60-100	400	400	PPM	67-63-0
MODIFIED POLYDIFLUOROMETHYLENE	7-13	NA	NA	NA	65530-85-0
MODIFIED POLYDIFLUOROMETHYLENE	1-5	NA	NA	NA	163440-89-9
MODIFIED POLYDIFLUOROMETHYLENE	0.1-1	NA	NA	NA	131324-06-6

* COMPANY RECOMMENDED VALUE

FORMULATION INFORMATION:
NONE

*** III PHYSICAL DATA ***

**PRODUCT INFORMATION

BOILING POINT	: 180	(F)	82	(C)	% VOLATILE BY WEIGHT: 85
VAPOR PRESSURE(20C)	: 33.0	MM HG			EVAPORATION RATE : >1
VAPOR DENSITY(AIR=1	: 2.07				(BUTYL ACETATE = 1)
FREEZING POINT	: -128	(F)	-89	(C)	SPECIFIC GRAVITY : .89
MELTING POINT	: NA	(F)	NA	(C)	(WATER=1 @ 25C)

PHYSICAL STATE	: DISPERSION	DENSITY	: NA
ODOR	: ALCOHOL	ACIDITY/ALKALINITY	: NA
ODOR THRESHOLD	: UNKNOWN (PPM)		
COLOR	: WHITE	PH	: 4-6

SOLUBILITY IN WATER (20C): APPRECIABLE
SOLUBILITY IN ORGANIC SOLVENT: NA
(STATE SOLVENT)

ISOPROPYL ALCOHOL
BOILING POINT: 180 (F) 82 (C)
VAPOR PRESSURE: (20 C) 32 MM HG
VAPOR DENSITY: (AIR=1) 2.1

MODIFIED POLYDIFLUOROMETHYLENE
BOILING POINT: NA (F) NA (C)
VAPOR PRESSURE: (20 C) NA MM HG
VAPOR DENSITY: (AIR=1) NA

MODIFIED POLYDIFLUOROMETHYLENE
BOILING POINT: NA (F) NA (C)
VAPOR PRESSURE: (20 C) NA MM HG
VAPOR DENSITY: (AIR=1) NA

MODIFIED POLYDIFLUOROMETHYLENE
BOILING POINT: NA (F) NA (C)
VAPOR PRESSURE: (20 C) NA MM HG
VAPOR DENSITY: (AIR=1) NA

*** IV FIRE AND EXPLOSION DATA ***

FLASH POINT: 55 (F) 13 (C) BY TCC
IGNITION TEMPERATURE: 748 (F) 398 (C)
FLAMMABLE LIMITS IN AIR (%): LOWER 2.0 UPPER 12.7
SENSITIVITY TO MECHANICAL IMPACT (Y/N): N
SENSITIVITY TO STATIC DISCHARGE:
SENSITIVITY TO STATIC DISCHARGE IS EXPECTED; MATERIAL HAS A FLASH POINT BELOW 200 F.
EXTINGUISHING MEDIA
CARBON DIOXIDE
DRY CHEMICAL
FOAM
WATER MIST
SPECIAL FIREFIGHTING PROCEDURES
EXTREMELY FLAMMABLE.
COOL EXPOSED CONTAINERS WITH WATER SPRAY AFTER EXTINGUSHING FIRE
POSITIVE PRESSURE, SELF-CONTAINED BREATHING APPARATUS
EVACUATE AREA AND FIGHT FIRE FROM A SAFE DISTANCE.
WEAR FULL PROTECTIVE CLOTHING.

*** V REACTIVITY DATA ***

STABILITY:
X STABLE _ UNSTABLE
HAZARDOUS
POLYMERIZATION WILL NOT OCCUR
HAZARDOUS DECOMPOSITION/COMBUSTION PRODUCTS
CARBON MONOXIDE.
CARBON DIOXIDE.
HYDROGEN CHLORIDE.
HYDROGEN FLOURIDE.
INCOMPATIBILITY (MATERIALS TO AVOID)
AVOID CONTACT WITH ACIDIC,BASIC OR OXIDIZING AGENTS.
PROLONGED CONTACT WITH ALUMINUM
DO NOT EXPOSE TO AMINES.
AVOID HALOGENS
ALDEHYDES.
CONDITIONS TO AVOID
KEEP AWAY FROM HEAT,SPARKS AND FLAME.

*** VI HEALTH HAZARD DATA ***

ACUTE SIGNS/EFFECTS OF EXPOSURE
INGESTION
CAUSES VOMITING,NAUSEA,AND DIARRHEA
MAY PRODUCE NERVOUS SYSTEM EFFECTS SUCH AS FEELING OF WEAKNESS, UNSTEADY WALK, AND DILATION OF BLOOD VESSELS.
SKIN CONTACT
CAUSES DRYING OF THE SKIN.
MAY CAUSE A RASH AND ITCHING OF THE SKIN.
MAY CAUSE SKIN DEFATTING WITH PROLONGED EXPOSURE.
INHALATION
EXCESSIVE INHALATION CAUSES HEADACHE,DIZZINESS,NAUSEA AND INCOORDINATION.
MAY IRRITATE MOUTH, NOSE, AND THROAT.
CAUSES TEMPORARY DISCOMFORT.
EYE CONTACT
MAY IRRITATE EYES.
CAUSES REDNESS AND TEARING.
CAUSES BLURRED VISION.
MEDICAL CONDITIONS AGGRAVATED
PULMONARY DISORDERS.
OTHER
NONE KNOWN.
CHRONIC EFFECTS OF EXPOSURE
PULMONARY EDEMA.
EMERGENCY AND FIRST AID PROCEDURES
INGESTION
DO NOT INDUCE VOMITING. SLOWLY DILUTE WITH 1-2 GLASSES OF WATER OR MILK AND SEEK MEDICAL ATTENTION. NEVER GIVE ANY-

THING BY MOUTH TO AN UNCONSCIOUS PERSON.

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. WASH WITH SOAP AND WATER.

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.

EYES

IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES AND GET MEDICAL ATTENTION.

NOTE TO PHYSICIAN

ASPIRATION MAY CAUSE SEVERE LUNG DAMAGE. EVACUATE STOMACH IN A WAY WHICH AVOIDS ASPIRATION.

TOXICITY: ISOPROPYL ALCOHOL
ACUTE ORAL LD50: 5,045 (RAT) MG/KG
ACUTE DERMAL LD50: 12,800 (RBT) MG/KG
ACUTE INHALATION: LCLo 12,000 PPM/8H (RAT)
OTHER: EYE AND SKIN IRRITANT.
AMES TEST: UNKNOWN

TOXICITY: MODIFIED POLYDIFLUOROMETHYLENE
ACUTE ORAL LD50: ALD >17,000 (RAT) MG/KG
ACUTE DERMAL LD50: NA MG/KG
ACUTE INHALATION: NA
OTHER: NONE.
AMES TEST: UNKNOWN

TOXICITY: MODIFIED POLYDIFLUOROMETHYLENE
ACUTE ORAL LD50: ALD >11,000 (RAT) MG/KG
ACUTE DERMAL LD50: NA MG/KG
ACUTE INHALATION: NA
OTHER: NONE.
AMES TEST: UNKNOWN

TOXICITY: MODIFIED POLYDIFLUOROMETHYLENE
ACUTE ORAL LD50: ALD >11,000 (RAT) MG/KG
ACUTE DERMAL LD50: NA MG/KG
ACUTE INHALATION: NA
OTHER: NONE.
AMES TEST: UNKNOWN

PRINCIPALS ROUTES OF EXPOSURE

DERMAL - SKIN.
EYES.
INHALATION.
ABSORPTION THROUGH SKIN.

THIS PRODUCT OR ONE OF ITS INGREDIENTS PRESENT 0.1% OR MORE IS NOT LISTED AS A CARCINOGEN OR SUSPECTED CARCINOGEN BY NTP, IARC, OR OSHA

PRODUCTS/INGREDIENTS

THIS SPACE RESERVED FOR SPECIAL USE.

*** VII SPECIAL PROTECTIVE EQUIPMENT ***

RESPIRATORY PROTECTION
USE IN A WELL VENTILATED AREA.
USE APPROVED NIOSH RESPIRATORY PROTECTION IF TLV EXCEEDED OR OVER EXPOSURE IS LIKELY.
PROTECTIVE GLOVES
NEOPRENE.
EYE AND FACE PROTECTION
SAFETY GLASSES.
MONOGOGGLES.
OTHER PROTECTIVE EQUIPMENT
RUBBER APRON.
VENTILATION
USE ONLY IN WELL VENTILATED AREA.
MECHANICAL VENTILATION.

*** VIII SPILL, LEAK AND DISPOSAL PROCEDURE ***

ACTION TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED
WIPE, SCRAPE OR SOAK UP IN AN INERT MATERIAL AND PUT IN A CONTAINER FOR DISPOSAL.
WEAR PROPER PROTECTIVE EQUIPMENT AS SPECIFIED IN THE PROTECTIVE EQUIPMENT SECTION.
REMOVE SOURCES OF IGNITION.
WARN OTHER WORKERS OF SPILL.
INCREASE AREA VENTILATION.
PERSON NOT TRAINED SHOULD EVACUATE AREA.
DISPOSAL METHOD
DISPOSAL SHOULD BE MADE IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.
INCINERATION RECOMMENDED IN APPROVED INCINERATOR ACCORDING TO FEDERAL, STATE, AND LOCAL REGULATIONS.

*** IX SPECIAL PRECAUTIONS ***

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
USE GROUND STRAP.
STORE UPRIGHT IN A COOL PLACE BELOW 30'C (85'F).
AVOID CONTACT WITH SKIN AND EYES.
USE ONLY IN A WELL VENTILATED AREA.
DANGER! EXTREMELY FLAMMABLE.
KEEP CONTAINER CLOSED WHEN NOT IN USE TO PREVENT CONTACT WITH ACIDIC, BASIC OR OXIDIZING MATERIALS.

KEEP AWAY FROM FOOD AND SMOKING MATERIALS.
WASH HANDS BEFORE EATING AND SMOKING.
USE ONLY SPARK-PROOF AND EXPLOSION-PROOF TOOLS AND EQUIPMENT.

ENGINEERING CONTROLS
EXHAUST VENTILATION
SHOWERS.
EYEWASH STATIONS.
USE IN A WELL VENTILATED AREA.

*** X SHIPPING AND REGULATORY CLASSIFICATION DATA ***

DOT SHIPPING NAME: FLAMMABLE LIQUID, NOS ISOPROPYL ALCOHOL, FLUOROTELOMER RESINS
DOT HAZARD CLASS: 3, II
DOT LABEL(S): FLAMMABLE LIQUID
UN/NA NUMBER: UN1993
PLACARDS: FLAMMABLE LIQUID
EPA HAZARD WASTE: D001 RQ=100/45.4
OSHA HAZARD CLASS: IRRITANT
WHMIS HAZARD CLASS:
B2 FLAMMABLE LIQUIDS
D2B TOXIC MATERIALS
NMFC CLASSIFICATION: CLASS 55
TRANSPORTATION CLASS: IMDG: 3.2, PG 3230
IATA: 3, II
NFPA/HMIS CLASSIFICATION: FLAMMABILITY 3 , REACTIVITY 0 , HEALTH 1
ADDITIONAL INFORMATION

THESE DATA ARE OFFERED IN GOOD FAITH AS TYPICAL VALUES AND NOT AS A PRODUCT SPECIFICATION. NO WARRANTY, EITHER EXPRESSED OR IMPLIED, IS MADE. THE RECOMMENDED HANDLING PROCEDURES ARE BELIEVED TO BE GENERALLY APPLICABLE. HOWEVER, EACH USER SHOULD REVIEW THESE RECOMMENDATIONS IN THE SPECIFIC CONTEXT OF THE INTENDED USE.....

C =	CEILING LIMIT	NEGL =	NEGLIGIBLE
EST=	ESTIMATED	NF =	NONE FOUND
NA =	NOT APPLICABLE	UNKN =	UNKNOWN
NE =	NONE ESTABLISHED	REC =	RECOMMENDED
ND =	NONE DETERMINED	V =	RECOMM. BY VENDOR
BY-PRODUCT = REACTION BY-PRODUCT, TSCA INVENTORY STATUS NOT REQUIRED UNDER 40 CFR PART 720.30(H-2)		SKN =	SKIN
		TS =	TRADE SECRET
		R =	RECOMMENDED
		MST =	MIST

277 Thixotropic Masking Agent

Product Description

277 is a unique thixotropic masking agent formulated with Dupont Krytox®. It is used by the electrical and electronics industry as a surface treatment for easy removal of a wide variety of cured insulating resins including solventless epoxies and solventless polyesters.

Applications

277 is suggested for use on surfaces where adhesion of a cured resin is not desired. It may be applied to lamination surfaces, end shields, machined surfaces, armature shafts*, transformer feet, lug connections, etc.

* 277 also acts as a lubricant resulting in a slip plane for press fit bearings, gears, etc. 277 may be thoroughly removed with fluorinated solvents or by mechanical means such as abrasion[steel wool] and machining.

Product Information

Data

Percent Solids, by weight; avg.	14-16
Weight per Gallon @25°C; lbs(kg), ave.	7.4
Viscosity @25°C[Brookfield], cps, ave.	2.5 rpm: 2560
	20 rpm: 400
Thixotropic Index	6-7
Flash Point [TCC], °F (°C)	55 (11)

Methods of Application

277 may be applied by brushing or dipping. A thin film of 277 is applied on the area to be masked and allowed to dry prior to resin treatment. After the bake cycle, the resin can be easily removed with a scraper or wire brush. Best results are achieved while the unit is still warm. Thin films of 277 will dry in 30 minutes or less. Adequate ventilation improves drying, as does allowing adequate spacing of coated pieces to avoid crowding.

Shelf Life

277 can be expected to remain stable and perform acceptably when stored for periods of up to one year @ 77° F in the original sealed container. There will be slight settling of the material in storage. The material should be mixed thoroughly before use for best results.

Specifications

The properties shown above are typical values only and should not be used as a basis for preparing specifications. Please contact vonRoll Isola USA, Inc. for assistance in the preparation of specifications.

One West Campbell Road
Schenectady, NY 12306
(518) 344-7100 Fax: (518) 344-7384

Safety Precautions

Material Safety Data Sheets defining the known hazards and describing safety precautions appropriate for this product are available upon request from vonRoll Isola USA, Inc. Similar information sheets for solvents and other chemicals used with this product may be obtained from the appropriate supplier and used accordingly.

Availability

277 resin is available from vonRoll Isola USA, Inc. or from authorized VRI distributors. For the name of your nearest distributor or for more information on this product, contact our Customer Service department @ [518] -344- 7100.

KRYTOX® is a registered trademark of DuPont.

FAX
384 6557
APCO

LIMITATIONS OF WARRANTY

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