Magnitude 7 Metals LLC

STACK SAMPLE RESULTS

POTROOM
LINE 1

Run Number 3 POM | 4/23/2020 | EPA Method # 5 & 315

METER VOLUME	278.130	CU. FT.
SQUARE ROOT OF DELTA P	0.715	SQ. ROOT IN. WATER
AVERAGE DELTA H	1.835	IN. WATER
METERED GAS TEMPERATURE	70.5	DEG. F
STATIC PRESSURE IN STACK	-0.58	IN. WATER
STACK TEMPERATURE	172.8	DEG. F
BAROMETRIC PRESSURE	29.48	IN. Hg
PROBE TIP DIAMETER	0.2534	INCHES
GAS METER CORRECTION FACTOR	0.989	
TOTAL SAMPLING TIME	360.0	MINUTES
TOTAL WATER COLLECTED	70.8	GRAMS
MOLECULAR WEIGHT	29.0	LB/LB-MOLE
SAMPLING DUCT AREA	196.00	SQ. FT.
TOTAL PARTICULATE COLLECTED	0.0341	GRAMS
MCEM COLLECTED	0.0086	GRAMS
AVG ALUMINUM PRODUCTION RATE	443096	LBS./DAY
VOLUME GAS SAMPLED	270.982	SCF
MOISTURE IN STACK GAS	1.215	%
VELOCITY OF STACK GAS (ACTUAL)	2660	FT./MIN.
VOLUMETRIC FLOWRATE IN DUCT	422806	SCFM
PERCENT ISOKINETIC - TRAIN TO DUCT	99.63	%
TOTAL PARTICULATE CONCENTRATION	0.0044	GRAMS/SCM
TOTAL PARTICULATE CONCENTRATION	0.00194	GRAINS/SCF
TOTAL PARTICULATE EMISSION	7.03	LBS./HR.
TOTAL PARTICULATE EMISSION	0.76	LBS./TON
POM CONCENTRATION	1.121	MG./SCM
POM CONCENTRATION	0.000490	GRAINS/SCF
POM EMISSION	1.775	LBS./HR.
AVG. ALUMINUM PRODUCTION RATE	9.23	TON/HR.
POM EMITTED	0.192	LBS./TON

Magnitude 7 Metals

Stack Sample Results Raw Data Averages

POTROOM LINE 1

Start Date: 4/23/2020 **Stop Date:** 4/23/2020 **Run #:** 3 POM

Traverse Point	Delta P (in. Water)	Delta H (in. Water)	Meter Temperature (in)	Meter Temperature (out)	Static Pressure (in. Water)	Stack Temperature (Deg. F)
A 1-1	0.69	2.40	66	67	-0.54	176
A 1-2	0.65	2.30	66	67	-0.55	176
A 1-3	0.61	2.15	67	68	-0.57	176
A 1-4	0.53	1.85	67	68	-0.53	175
A 2-1	0.59	2.10	68	68	-0.54	172
A 2-2	0.61	2.15	68	68	-0.55	173
A 2-3	0.59	2.10	68	68	-0.48	172
A 2-4	0.49	1.75	68	68	-0.49	171
A 3-1	0.43	1.50	68	67	-0.49	174
A 3-2	0.50	1.75	68	67	-0.47	175
A 3-3	0.54	1.90	68	66	-0.49	176
A 3-4	0.53	1.90	68	66	-0.52	171
A 4-1	0.45	1.60	70	68	-0.51	175
A 4-2	0.41	1.45	70	68	-0.52	174
A 4-3	0.41	1.45	70	69	-0.52	173
A 4-4	0.44	1.55	70	69	-0.51	172
A 5-1	0.47	1.70	70	68	-0.55	177
A 5-2	0.42	1.50	70	68	-0.53	178
A 5-3	0.39	1.40	70	68	-0.53	176
A 5-4	0.33	1.15	70	68	-0.51	174
B 1-1	0.42	1.50	69	69	-0.58	172
B 1-2	0.45	1.60	69	69	-0.60	171
B 1-3	0.44	1.55	71	70	-0.57	171
B 1-4	0.40	1.45	71	69	-0.54	168
B 2-1	0.58	2.10	72	70	-0.64	168
B 2-2	0.55	2.00	72	71	-0.67	167
B 2-3	0.50	1.80	73	72	-0.62	166
B 2-4	0.45	1.60	72	72	-0.58	165
B 3-1	0.55	2.00	73	72	-0.61	165
B 3-2	0.53	1.90	74	73	-0.66	167
B 3-3	0.47	1.70	73	71	-0.64	166
B 3-4	0.48	1.70	73	73	-0.61	168
B 4-1	0.60	2.15	73	73	-0.66	171
B 4-2	0.58	2.10	75	73	-0.66	174
B 4-3	0.60	2.10	74	73	-0.66	176
B 4-4	0.55	2.00	76	75	-0.64	177
B 5-1	0.55	2.00	76	74	-0.64	176
B 5-2	0.63	2.20	76	76	-0.69	180
B 5-3	0.65	2.30	77	75	-0.69	180
B 5-4	0.55	2.00	77	77	-0.65	179
Averages	**Avg. Sq. Rt 0.715**	**1.835**	**70.5**		**-0.58**	**172.8**

AP

Date ~~PRP~~ 4/23/20

Location ~~A~~ PRJ

Room A

Start Time 8:00

Run # 3 POM

Avg. Tip Diameter .2534

Duct Area = 196 sq. ft.

Delta H 1.77

2 % Moisture (assumed)

MAGNITUDE 7 METALS

STACK SAMPLING DATA

COMPLIANCE

Operators Joe Schneider

Chemist

Room Initial L.C. @ 15.0 = .004

Room Final L.C. @ 5.0 = .002

Digital meter used 2077

Initial Pitot L.C. = N.L

POINT #	SAMP TIME Min.	METER VOLUME Cu. Ft.	DELTA P in. H_2O	DELTA H in. H_2O	METER TEMP F IN	METER TEMP F OUT	STATIC PRESS. in. H_2O	STACK TEMP. °F	IMP. TEMP. °F	HEATER BOX TEMP. °F	PUMP VAC. in. Hg	SET PT.
1-1	9	517.600	.69	2.40	66	67	-.54	176	41	250	.1	3.51
1-2	9		.65	2.30	66	67	-.55	176	33	255	.1	3.51
1-3	9		.61	2.15	67	68	-.57	176	35	255	.1	3.51
1-4	9		.53	1.85	67	68	-.53	175	38	255	.1	3.52
2-1	9	547.800	.59	2.10	68	68	-.54	172	40	255	.1	3.54
2-2	9		.61	2.15	68	68	-.55	173	44	255	.1	3.54
2-3	9		.59	2.10	68	68	-.48	172	44	255	.1	3.54
2-4	9		.49	1.75	68	68	-.49	172	46	255	.1	3.55
3-1	9	577.090	.43	1.50	68	67	-.49	174	45	255	.1	3.53
3-2	9		.50	1.75	68	67	-.47	175	47	255	.1	3.52
3-3	9		.54	1.90	68	66	-.49	176	48	255	.1	3.51
3-4	9		.53	1.90	68	66	-.52	171	47	255	.1	3.54
4-1	9	604.150	.45	1.60	70	68	-.51	175	49	255	.1	3.53
4-2	9		.41	1.45	70	68	-.52	174	50	255	.1	3.54
4-3	9		.41	1.45	70	69	-.52	173	42	255	.1	3.55
4-4	9		.44	1.55	70	69	-.51	172	41	255	.1	3.55
5-1	9	629.470	.47	1.70	70	68	-.55	177	43	255	.1	3.58
5-2	9		.42	1.50	70	68	-.53	178	45	255	.1	3.52
5-3	9		.39	1.40	70	68	-.53	176	48	255	.1	3.53
5-4	9		.33	1.15	70	68	-.51	174	51	255	.1	3.54
Before LC		654.310										
S/N		1030720					77	7-1	5A	5H		

Nomograph factor: 4.24

Magnitude 7 Metals LLC

STACK SAMPLE RESULTS

POTROOM
LINE 1

Run Number 3 POM | 4/23/2020 | EPA Method # 5 & 315

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Magnitude 7 Metals

Stack Sample Results Raw Data Averages

POTROOM LINE 1

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B 1-4	0.40	1.45	71	69	-0.54	168
B 2-1	0.58	2.10	72	70	-0.64	168
B 2-2	0.55	2.00	72	71	-0.67	167
B 2-3	0.50	1.80	73	72	-0.62	166
B 2-4	0.45	1.60	72	72	-0.58	165
B 3-1	0.55	2.00	73	72	-0.61	165
B 3-2	0.53	1.90	74	73	-0.66	167
B 3-3	0.47	1.70	73	71	-0.64	166
B 3-4	0.48	1.70	73	73	-0.61	168
B 4-1	0.60	2.15	73	73	-0.66	171
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B 5-3	0.65	2.30	77	75	-0.69	180
B 5-4	0.55	2.00	77	77	-0.65	179
Averages	**Avg. Sq. Rt 0.715**	**1.835**	**70.5**		**-0.58**	**172.8**

AP

Date ~~PRP~~ 4/23/20

Location ~~A~~ PRJ

Room A

Start Time 8:00

Run # 3 POM

Avg. Tip Diameter .2534

Duct Area = 196 sq. ft.

Delta H 1.77

2 % Moisture (assumed)

MAGNITUDE 7 METALS

STACK SAMPLING DATA

COMPLIANCE

Operators

Joe Schneider

Chemist

Room Initial L.C. @ 15.0 = .004

Room Final L.C. @ 5.0 = .002

Digital meter used 277

Initial Pitot L.C. = N.C

POINT #	SAMP TIME Min.	METER VOLUME Cu. Ft.	DELTA P in. H_2O	DELTA H in. H_2O	METER TEMP F IN	METER TEMP F OUT	STATIC PRESS. in. H_2O	STACK TEMP. °F	IMP. TEMP. °F	HEATER BOX TEMP. °F	PUMP VAC. in. Hg	SET PT.
1-1	9	517.600	.69	2.40	66	67	-.54	176	41	250	.1	3.51
1-2	9		.65	2.30	66	67	-.55	176	33	255	.1	3.51
1-3	9		.61	2.15	67	68	-.57	176	35	255	.1	3.51
1-4	9		.53	1.85	67	68	-.53	175	38	255	.1	3.52
2-1	9	547.800	.59	2.10	68	68	-.54	172	40	255	.1	3.54
2-2	9		.61	2.15	68	68	-.55	173	44	255	.1	3.54
2-3	9		.59	2.10	68	68	-.48	172	44	255	.1	3.54
2-4	9		.49	1.75	68	68	-.49	172	46	255	.1	3.55
3-1	9	577.090	.43	1.50	68	67	-.49	174	45	255	.1	3.53
3-2	9		.50	1.75	68	67	-.47	175	47	255	.1	3.52
3-3	9		.54	1.90	68	66	-.49	176	48	255	.1	3.51
3-4	9		.53	1.90	68	66	-.52	171	47	255	.1	3.54
4-1	9	604.150	.45	1.60	70	68	-.51	175	49	255	.1	3.53
4-2	9		.41	1.45	70	68	-.52	174	50	255	.1	3.54
4-3	9		.41	1.45	70	69	-.52	173	42	255	.1	3.55
4-4	9		.44	1.55	70	69	-.51	172	41	255	.1	3.55
5-1	9	629.470	.47	1.70	70	68	-.55	177	43	255	.1	3.58
5-2	9		.42	1.50	70	68	-.53	178	45	255	.1	3.52
5-3	9		.39	1.40	70	68	-.53	176	48	255	.1	3.53
5-4	9		.33	1.15	70	68	-.51	174	51	255	.1	3.54
Before LC		654.310										
S/N		1030720					77	7-1	5A	5H		

Nomograph factor: 4.24

MAGNITUDE 7 METALS LLC

STACK SAMPLING DATA

COMPLIANCE

Date 4-23-20

Location Potline 1

Room B

Operators Alicia Powell

Stop Time 2:20

Room Initial L.C. @ 5 = .004

Room Final L.C. @ 5 = .002

2 % Moisture (assumed)

Final Pitot L.C. = nil

POINT #	SAMP TIME Min.	METER VOLUME Cu. Ft.	DELTA P in. H_2O	DELTA H in. H_2O	METER TEMP F IN	METER TEMP F OUT	STATIC PRESS. in. H_2O	STACK TEMP. °F	IMP. TEMP. °F	HEATER BOX TEMP. °F	PUMP VAC. in. Hg	SET PT.
1-1	9	654.415	.42	1.50	69	69	.58	172	42	245	.01	3.55
1-2	9		.45	1.60	69	69	.60	171	39	248	.01	3.55
1-3	9		.44	1.55	71	70	.57	171	37	255	.01	3.56
1-4	9		.40	1.45	71	69	.54	168	40	255	.01	3.58
2-1	9	679.850	.58	2.10	72	70	.64	168	40	255	.01	3.59
2-2	9		.55	2.00	72	71	.67	167	42	254	.01	3.59
2-3	9		.50	1.80	73	72	.62	166	43	255	.01	3.61
2-4	9		.45	1.60	72	72	.58	165	44	255	.01	3.61
3-1	9	707.900	.55	2.00	73	72	.61	165	46	255	.01	3.61
3-2	9		.53	1.90	74	73	.66	167	46	255	.01	3.61
3-3	9		.47	1.70	73	71	.64	166	49	255	.01	3.60
3-4	9		.48	1.70	73	73	.61	168	47	255	.01	3.60
4-1	9	736.030	.60	2.15	73	73	.66	171	40	255	.01	3.58
4-2	9		.58	2.10	75	73	.66	174	40	255	.01	3.57
4-3	9		.60	2.10	74	73	.66	176	40	255	.01	3.56
4-4	9		.55	2.00	76	75	.64	177	39	255	.01	3.56
5-1	9	765.750	.55	2.00	76	74	.64	176	42	255	.01	3.57
5-2	9		.63	2.20	76	76	.69	180	41	255	.01	3.55
5-3	9		.65	2.30	77	75	.69	180	44	255	.01	3.55
5-4	9		.55	2.00	77	77	.65	179	46	255	.01	3.56
FINAL		795.835										

Nomograph factor: 4.24

Magnitude 7 Metals LLC

GAS ANALYSIS REPORT

Location PRI

Date 4/23/20

Run 3

Room A

Analyzed by JS

Run	Time	Percent Carbon Dioxide (CO_2)	Percent Oxygen (O_2)
1	8:15	1.2	20.5
2	8:20	1.2	21.0
3	8:35	1.2	20.5

Room B

Analyzed by AP

Run	Time	Percent Carbon Dioxide (CO_2)	Percent Oxygen (O_2)
1	1:56	0.5	20.0
2	2:00	0.8	20.2
3	2:05	0.6	20.0

MAGNITUDE 7 METALS, LLC
STACK SAMPLING RAW DATA
METHODS 5 & 13 or METHODS 5 & 315

Location: Potroom Line: 1 Date sampled: 4-23-20 Run: 3RDM Filter: GP

PITOT TUBE — Circle to document visual inspection.

SN N 7052

Visually inspected? Yes

PROBE TIP

SN 7

DIAMETER MEASUREMENT (in.)

1. _____
2. _____
3. AVG.
4. .2534
5. _____
6. _____
7. _____
8. _____

If previous calibration referenced, circle Yes to document visual inspection.

Out of round max. 0.004 in.

CAL. BY: _____

CALIPER: MITUTOYO S/N 7002015

NORANDA 0.5"

THICKNESS STD # 1 _____

SAMPLER OPERATION

PROBE HEAT SETTING	HEATER BOX SETTING
248 deg. F. +/- 25 deg. F.	For Method 13
Range: 223 - 273 deg. F.	165 deg. F. +/- 15 deg. F.
	Range: 150 - 180 deg. F.
	For Method 315
	248 deg. F. +/- 25 deg. F.
	Range: 223 - 273 deg. F.

BAROMETER READING 29.62 (in. Hg)

CORRECTION FACTOR .14 (in. Hg)

For Method 13 only:

~~ORIGINAL GASEOUS~~ M315

~~FLUORIDE SAMPLE VOLUME~~ _____ (liter)

	INITIAL WEIGHT	FINAL WEIGHT
IMPINGER # 1 + 100 ml water	732.2	766.7
IMPINGER # 2 + 100 ml water	746.4	717.5
IMPINGER # 3 + EMPTY	627.0	647.8
IMPINGER # 4 + SILICA GEL	1108.3	1152.7
IMPINGER # + SILICA GEL		
IMPINGER # + SILICA GEL		

BALANCE: METTLER PJ6000 SNR K59603 WEIGHED BY: CA

2 Kg Class S-1 Calibration Wt. 2000.0 Balance check must be +/- 0.5 grams.

COMMENTS: _____

Form: Impinger Report M5&13 or 5&315.xls 9/17/18

MCEM analysis

Location: POTROOM 1 RUN Scrubber: Date: 4/23/2020 Filter #: GP

	Aluminum Dish						
Container No.	ID	Final Weight (g)	Tare Weight (g)	Weight gain (g)	Weight gain (mg)	Acetone wash volume (ml)	Methylene chloride wash volume (ml)
1 - Petri	1	2.5622	2.5617	0.0005	0.5		175
2 (Part. Beaker)+2M	2	2.5391	2.5347	0.0044	4.4	120	200
3W	3W	2.5115	2.5098	0.0017	1.7		125
3S	3S	2.5044	2.5012	0.0032	3.2	137.1	205.6
3S converted to ml						174.6	156.0
Totals					9.8	294.6	656.0
					$\sum m_{total}$	$\sum v_{aw}$	$\sum v_{tw}$

Acetone Lot # 231086 Density of Acetone (mg/ml)		785.0	
Acetone blank Weight (g) and Volume (ml)	0		200
Acetone blank Concentration $c_a = m_a \div (v_a \rho_a)$	0.00E+00		
Less acetone wash blank (mg) (not to exceed 1 mg/l of acetone used) $w_a = c_a \rho_a \sum v_{aw}$		0.00	
Concentration of acetone (mg/l) allowed compared to actual concentration	0.29	0.00	0.00
$MeCl_2$ Lot # 174189 Density of Methylene Chloride (mg/ml)		1318	
Methylene blank Weight (g) and Volume (ml)	0		200
Methylene Chloride blank Concentration $c_a = m_a \div (v_a \rho_a)$		0.00E+00	
Less methylene chloride wash blank (mg) (not to exceed 1.5 mg/l of methylene chloride used) $w_t = c_t \rho_t \sum v_{tw}$		0.00	
Concentration of methylene chloride (mg/l) allowed compared to actual concentration	0.98	0.00	0.00
Less filter blank (mg) (not to exceed … (mg/filter) F_b		1.2	mg
MCEM weight (mg) No blank corr. $\sum m_{total}$		9.8	mg
MCEM weight (g)		0.0098	g
MCEM wt (mg) minus acetone & MeCl2 blk $\sum m_{total} - w_a - w_t$		9.8	mg
MCEM weight (mg) blk corr. $m_{MCEM} = \sum m_{total} - w_a - w_t - f_b$		8.6	mg
MCEM weight (g)		0.0086	g

Notes:

Filename: M315-2020 Data