Magnitude 7 Metals LLC

STACK SAMPLE RESULTS

POTROOM
LINE 1 BA

Run Number 2 POM | 4/22/2020 | EPA Method # 5 & 315

METER VOLUME	276.933	CU. FT.
SQUARE ROOT OF DELTA P	0.721	SQ. ROOT IN. WATER
AVERAGE DELTA H	1.854	IN. WATER
METERED GAS TEMPERATURE	72.5	DEG. F
STATIC PRESSURE IN STACK	-0.55	IN. WATER
STACK TEMPERATURE	175.4	DEG. F
BAROMETRIC PRESSURE	29.64	IN. Hg
PROBE TIP DIAMETER	0.2534	INCHES
GAS METER CORRECTION FACTOR	0.989	
TOTAL SAMPLING TIME	360.0	MINUTES
TOTAL WATER COLLECTED	20.4	GRAMS
MOLECULAR WEIGHT	28.9	LB/LB-MOLE
SAMPLING DUCT AREA	196.00	SQ. FT.
TOTAL PARTICULATE COLLECTED	0.0050	GRAMS
MCEM COLLECTED	0.0076	GRAMS
AVG ALUMINUM PRODUCTION RATE	443096	LBS./DAY
VOLUME GAS SAMPLED	270.267	SCF
MOISTURE IN STACK GAS	0.354	%
VELOCITY OF STACK GAS (ACTUAL)	2679	FT./MIN.
VOLUMETRIC FLOWRATE IN DUCT	430141	SCFM
PERCENT ISOKINETIC - TRAIN TO DUCT	97.68	%
TOTAL PARTICULATE CONCENTRATION	0.0006	GRAMS/SCM
TOTAL PARTICULATE CONCENTRATION	0.00028	GRAINS/SCF
TOTAL PARTICULATE EMISSION	1.04	LBS./HR.
TOTAL PARTICULATE EMISSION	0.11	LBS./TON
POM CONCENTRATION	0.993	MG./SCM
POM CONCENTRATION	0.000434	GRAINS/SCF
POM EMISSION	1.600	LBS./HR.
AVG. ALUMINUM PRODUCTION RATE	9.23	TON/HR.
POM EMITTED	0.173	LBS./TON

Magnitude 7 Metals

Stack Sample Results Raw Data Averages

POTROOM LINE 1 BA

Start Date: 4/22/2020 **Stop Date:** 4/22/2020 **Run #:** 2 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)
B 1-1	0.48	1.70	65	65	-0.50	170
B 1-2	0.46	1.60	65	65	-0.52	170
B 1-3	0.44	1.60	66	66	-0.50	170
B 1-4	0.44	1.60	66	66	-0.48	170
B 2-1	0.52	1.90	67	67	-0.58	169
B 2-2	0.54	1.95	66	65	-0.57	168
B 2-3	0.46	1.65	67	66	-0.53	167
B 2-4	0.46	1.65	67	66	-0.52	167
B 3-1	0.58	2.05	70	68	-0.64	167
B 3-2	0.55	1.95	70	68	-0.59	166
B 3-3	0.50	1.80	70	68	-0.54	166
B 3-4	0.48	1.70	70	68	-0.52	166
B 4-1	0.60	0.02	71	69	-0.58	167
B 4-2	0.50	1.80	71	70	-0.48	170
B 4-3	0.50	1.80	72	70	-0.49	170
B 4-4	0.50	1.80	72	70	-0.50	170
B 5-1	0.50	1.80	72	70	-0.44	166
B 5-2	0.52	1.85	72	70	-0.55	166
B 5-3	0.60	2.15	72	70	-0.58	167
B 5-4	0.60	2.15	72	70	-0.58	167
A 1-1	0.53	1.90	71	71	-0.57	181
A 1-2	0.69	2.40	73	72	-0.58	181
A 1-3	0.69	2.40	73	72	-0.61	181
A 1-4	0.56	2.00	74	73	-0.56	181
A 2-1	0.62	2.20	74	74	-0.59	182
A 2-2	0.66	2.30	75	73	-0.62	182
A 2-3	0.63	2.20	76	75	-0.63	183
A 2-4	0.60	2.10	76	75	-0.60	183
A 3-1	0.45	1.60	77	76	-0.57	183
A 3-2	0.49	1.70	77	76	-0.51	184
A 3-3	0.51	1.80	79	78	-0.51	185
A 3-4	0.52	1.80	80	77	-0.50	185
A 4-1	0.50	1.80	80	78	-0.59	183
A 4-2	0.50	1.80	80	79	-0.56	185
A 4-3	0.49	1.70	79	79	-0.53	183
A 4-4	0.43	1.50	80	79	-0.52	183
A 5-1	0.53	1.90	80	79	-0.55	183
A 5-2	0.45	1.60	79	79	-0.54	183
A 5-3	0.40	1.40	79	79	-0.53	183
A 5-4	0.40	1.40	78	78	-0.55	181
Averages	**Avg. Sq. Rt 0.721**	**1.801**	**72.5**		**-0.55**	**175.4**

AP

Date 4-22-20

Location Potroom 1

Room A

Stop Time 2:15 pm

MAGNITUDE 7 METALS

STACK SAMPLING DATA

COMPLIANCE

Operators

Alicia Powell

Chemist

Room Initial L.C. @ 5.0 = .003

Room Final L.C. @ 5.6 = .004

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	378.140	.53	1.9	71	71	.57	181	37	255	.01	3.51
1-2	9		.69	2.4	73	72	.58	181	38	255	.01	3.52
1-3	9		.69	2.4	73	72	.61	181	38	255	.01	3.52
1-4	9		.56	2.0	74	73	.56	181	41	255	.01	3.53
2-1	9	407.460	.62	2.2	74	74	.59	182	44	255	.01	3.53
2-2	9		.66	2.3	75	73	.62	182	45	255	.01	3.53
2-3	9		.63	2.2	76	75	.63	183	45	255	.01	3.53
2-4	9		.60	2.1	76	75	.60	183	46	255	.01	3.53
3-1	9	437.680	.45	1.6	77	76	.57	183	47	255	.01	3.54
3-2	9		.49	1.7	77	76	.51	184	46	255	.01	3.53
3-3	9		.51	1.8	79	78	.51	185	46	255	.01	3.54
3-4	9		.52	1.8	80	77	.50	185	44	255	.01	3.54
4-1	9	464.800	.50	1.8	80	78	.59	183	46	255	.01	3.55
4-2	9		.50	1.8	80	79	.56	185	39	255	.01	3.55
4-3	9		.49	1.7	79	79	.53	183	39	255	.01	3.55
4-4	9		.43	1.5	80	79	.52	183	40	255	.01	3.56
5-1	9	491.760	.53	1.9	80	79	.55	183	42	255	.01	3.56
5-2	9		.45	1.6	79	79	.54	183	40	255	.01	3.55
5-3	9		.40	1.4	79	79	.53	183	42	255	.01	3.55
5-4	9		.40	1.4	78	78	.55	181	44	255	.01	3.56
FINAL		517.450										

Nomograph factor: 4.24

Date 4/22/20

Location PotRoom 1

Room B

Start Time 0745

Run # 2P0M

Avg. Tip Diameter .2534

Duct Area = 196 sq. ft.

Delta H 1.77

2 % Moisture (assumed)

MAGNITUDE 7 METALS

STACK SAMPLING DATA

COMPLIANCE

Operators

Chi A. [illegible]

Chemist

Room Initial L.C. @ 15.0 = 012

Room Final L.C. @ 5.0 = .004

Digital meter used 207

Initial 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	240.400	.48	1.70	65	65	-.50	170	40	231	.1	3.53
1-2	9		.46	1.60	65	65	-.52	170	42	233	.1	3.53
1-3	9		.44	1.60	66	66	-.50	170	42	243	.1	3.61
1-4	9		.44	1.60	66	66	-.48	170	43	243	.1	3.61
2-1	9	266.055	.52	1.90	67	67	-.58	169	40	250	.1	3.61
2-2	9		.54	1.95	66	65	-.57	168	42	248	.1	3.62
2-3	9		.46	1.65	67	66	-.53	167	43	250	.1	3.56
2-4	9		.46	1.65	67	66	-.52	167	45	250	.1	3.56
3-1	9	293.020	.58	2.05	70	68	-.64	167	49	251	.1	3.58
3-2	9		.55	1.95	70	68	-.59	166	52	248	.1	3.58
3-3	9		.50	1.80	70	68	-.54	166	53	250	.1	3.58
3-4	9		.48	1.70	70	68	-.52	166	53	250	.1	3.58
4-1	9	321.051	.60	2.15	71	69	-.58	167	54	250	.1	3.58
4-2	9		.50	1.80	71	70	-.48	170	53	254	.1	3.57
4-3	9		.50	1.80	72	70	-.49	170	54	246	.1	3.57
4-4	9		.50	1.80	72	70	-.50	170	55	248	.1	3.57
5-1	9	349.200	.50	1.80	72	70	-.44	166	51	245	.1	3.60
5-2	9		.52	1.85	72	70	-.55	166	50	246	.1	3.60
5-3	9		.60	2.15	72	70	-.58	167	50	248	.1	3.60
5-4	9		.60	2.15	72	70	-.58	167	51	249	.1	3.60
Before LC		378.073										
S/N		1036720					77	7-1	54	54		

Nomograph factor: 4.24

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

Location: B+R Room Line: 1 Date sampled: 4-22-20 Run: 2PM Filter: FP

PITOT TUBE — Circle to document visual inspection.

SN N7052

Visually inspected? Yes

PROBE TIP

SN 7

DIAMETER MEASUREMENT (in.)

1. _____
2. AJ6
3. 2534
4. _____
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 29.78 (in. Hg)

CORRECTION FACTOR .14 (in. Hg)

For Method 13 only:

ORIGINAL GASEOUS FLUORIDE SAMPLE VOLUME _____ (liter)

M315

		INITIAL WEIGHT	FINAL WEIGHT
IMPINGER # 1	+ 100 ml water	735.9	677.2
IMPINGER # 2	+ 100 ml water	756.7	783.9
IMPINGER # 3	+ EMPTY	644.6	659.2
IMPINGER # 4	+ SILICA GEL	1091.3	1128.6
IMPINGER #	+ SILICA GEL		
IMPINGER #	+ SILICA GEL		

BALANCE: METTLER PJ6000 SNR K59603 WEIGHED BY: AP

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

Magnitude 7 Metals LLC

GAS ANALYSIS REPORT

Location Potroom 1 Date 4-22-20

Run 2POM

Room B Analyzed by CZ

Run	Time	Percent Carbon Dioxide (CO_2)	Percent Oxygen (O_2)
1	0800	0.5	20.5
2	0810	0.5	20.6
3	0825	0.4	20.6

Room A Analyzed by AP

Run	Time	Percent Carbon Dioxide (CO_2)	Percent Oxygen (O_2)
1	12:00	0.5	20.5
2	12:15	0.6	20.5
3	12:25	0.5	20.4

MCEM analysis

Location: POTROOM 1 RUN Scrubber: Date: 4/22/2020 Filter #: FP

	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	2.5036	2.5034	0.0002	0.2		160
2 (Part. Beaker)+2M	2	2.5111	2.5082	0.0029	2.9	100	200
3W	3W	2.5163	2.5155	0.0008	0.8		125
3S	3S	2.5593	2.5544	0.0049	4.9	136.4	115.3
3S converted to ml						173.8	87.5
Totals					8.8	273.8	572.5
					$\sum m_{total}$	$\sum v_{aw}$	$\sum v_{tw}$

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	0.27	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	0.86	0.00	0.00
Less filter blank (mg) (not to exceed … (mg/filter) F_b		1.2	mg
MCEM weight (mg) No blank corr. $\sum m_{total}$		8.8	mg
MCEM weight (g)		0.0088	g
MCEM wt (mg) minus acetone & MeCl2 blk $\sum m_{total} - w_a - w_t$		8.8	mg
MCEM weight (mg) blk corr. $m_{MCEM} = \Sigma m_{total} - w_a - w_t - f_b$		7.6	mg
MCEM weight (g)		0.0076	g

Notes:

Filename: M315-2020 Data