Magnitude 7 Metals LLC

STACK SAMPLE RESULTS

POTROOM
LINE 2

Run Number 1 | 7/20/2020 | EPA Method # 5 & 13

METER VOLUME	267.760	CU. FT.
SQUARE ROOT OF DELTA P	0.671	SQ. ROOT IN. WATER
AVERAGE DELTA H	1.611	IN. WATER
METERED GAS TEMPERATURE	100.06	DEG. F
STATIC PRESSURE IN STACK	-0.37	IN. WATER
STACK TEMPERATURE	198.3	DEG. F
BAROMETRIC PRESSURE	29.82	IN. Hg
PROBE TIP DIAMETER	0.2538	INCHES
GAS METER CORRECTION FACTOR	1.000	
TOTAL SAMPLING TIME	360.0	MINUTES
TOTAL WATER COLLECTED	156.7	GRAMS
MOLECULAR WEIGHT	29.1	LB/LB-MOLE
SAMPLING DUCT AREA	196.00	SQ. FT.
TOTAL PARTICULATE COLLECTED	0.0528	GRAMS
GASEOUS FLUORIDE COLLECTED	0.00451	GRAMS
PARTICULATE FLUORIDE COLLECTED	0.00513	GRAMS
TOTAL FLUORIDE COLLECTED	0.00964	GRAMS
AVG ALUMINUM PRODUCTION RATE	458505	LBS./DAY
VOLUME GAS SAMPLED	252.569	SCF
MOISTURE IN STACK GAS	2.837	%
VELOCITY OF STACK GAS (ACTUAL)	2535	FT./MIN.
VOLUMETRIC FLOWRATE IN DUCT	385566	SCFM
PERCENT ISOKINETIC - TRAIN TO DUCT	101.51	%
TOTAL PARTICULATE CONCENTRATION	0.0074	GRAMS/SCM
TOTAL PARTICULATE CONCENTRATION	0.00323	GRAINS/SCF
TOTAL PARTICULATE EMISSION	10.66	LBS./HR.
TOTAL PARTICULATE EMISSION	1.12	LBS./TON
GASEOUS FLUORIDE CONCENTRATION	0.631	MG./SCM
GASEOUS FLUORIDE CONCENTRATION	0.000276	GRAINS/SCF
PARTICULATE FLUORIDE CONCENTRATION	0.717	MG./SCM
PARTICULATE FLUORIDE CONCENTRATION	0.000313	GRAINS/SCF
TOTAL FLUORIDE CONCENTRATION	1.348	MG./SCM
TOTAL FLUORIDE CONCENTRATION	0.000589	GRAINS/SCF
TOTAL FLUORIDE EMISSION	1.947	LBS./HR.
AVG. ALUMINUM PRODUCTION RATE	9.55	TON/HR.
TOTAL FLUORIDE EMITTED	0.204	LBS./TON

Magnitude 7 Metals

Stack Sample Results — Raw Data Averages

POTROOM — LINE 2

Start Date: 7/20/2020 **Stop Date:** 7/20/2020 **Run #:** 1

Traverse Point	Delta P (in. Water)	Delta H (in. Water)	Meter Temperature (in)	Meter Temperature (out)	Static Pressure (in. Water)	Stack Temperature (Deg. F)
C 1-1	0.36	1.30	92	92	-0.36	190
C 1-2	0.43	1.55	92	92	-0.37	193
C 1-3	0.44	1.55	93	93	-0.36	193
C 1-4	0.41	1.45	93	93	-0.32	191
C 2-1	0.40	1.45	96	94	-0.33	192
C 2-2	0.44	1.55	96	94	-0.32	192
C 2-3	0.42	1.50	97	95	-0.36	193
C 2-4	0.42	1.50	97	95	-0.37	192
C 3-1	0.55	1.95	99	97	-0.47	194
C 3-2	0.44	1.55	99	97	-0.42	195
C 3-3	0.41	1.45	100	98	-0.38	196
C 3-4	0.46	1.65	100	98	-0.39	195
C 4-1	0.55	1.95	102	99	-0.38	197
C 4-2	0.53	1.90	102	99	-0.35	197
C 4-3	0.47	1.70	104	100	-0.36	198
C 4-4	0.51	1.85	104	100	-0.33	196
C 5-1	0.53	1.90	104	102	-0.35	198
C 5-2	0.54	1.95	104	102	-0.36	199
C 5-3	0.53	1.90	105	103	-0.37	200
C 5-4	0.52	1.90	104	103	-0.39	195
D 1-1	0.49	1.75	99	102	-0.39	199
D 1-2	0.50	1.80	99	100	-0.41	199
D 1-3	0.50	1.80	100	100	-0.42	201
D 1-4	0.51	1.80	100	100	-0.40	201
D 2-1	0.35	1.25	101	100	-0.37	201
D 2-2	0.40	1.40	100	100	-0.38	201
D 2-3	0.45	1.60	100	100	-0.37	201
D 2-4	0.54	1.90	101	101	-0.39	201
D 3-1	0.39	1.40	101	101	-0.37	202
D 3-2	0.42	1.50	102	102	-0.37	203
D 3-3	0.44	1.55	102	102	-0.38	203
D 3-4	0.49	1.75	102	102	-0.40	202
D 4-1	0.41	1.45	103	101	-0.38	202
D 4-2	0.42	1.50	104	102	-0.39	203
D 4-3	0.45	1.60	104	102	-0.41	204
D 4-4	0.42	1.50	105	103	-0.38	204
D 5-1	0.40	1.40	104	104	-0.34	202
D 5-2	0.43	1.50	104	104	-0.36	204
D 5-3	0.40	1.40	104	104	-0.38	203
D 5-4	0.31	1.10	105	105	-0.33	201
Averages	**Avg. Sq. Rt 0.671**	**1.611**	**100.1**		**-0.37**	**198.3**

MAGNITUDE 7 METALS LLC

STACK SAMPLING DATA

COMPLIANCE

Date 7-20-20

Location Potline 2

Room D Room

Operators Alicia Powell

Stop Time 14:45

2 % Moisture (assumed)

Room Initial L.C. @ ____ = ____

Room Final L.C. @ 5.0 = 0.002

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	442.335	.49	1.75	99	102	-.39	199	65	155	2.5	3.57
1-2	9		.50	1.80	99	100	-.41	199	55	155	2.5	3.57
1-3	9		.50	1.80	100	100	-.42	201	65	157	2.5	3.56
1-4	9		.51	1.80	100	100	-.40	201	61	156	2.5	3.56
2-1	9	450.565	.35	1.25	101	100	-.37	201	62	155	2.5	3.56
2-2	9		.40	1.40	100	100	-.38	201	63	156	2.5	3.56
2-3	9		.45	1.60	100	100	-.37	201	63	155	2.5	3.56
2-4	9		.54	1.90	101	101	-.39	201	62	155	2.5	3.56
3-1	9	476.500	.39	1.40	101	101	-.37	202	62	155	2.5	3.56
3-2	9		.42	1.50	102	102	-.37	203	64	155	2.5	3.56
3-3	9		.44	1.55	102	102	-.38	203	62	155	2.5	3.56
3-4	9		.49	1.75	102	102	-.40	202	63	155	2.5	3.57
4-1	9	502.730	.41	1.45	103	101	-.38	202	62	156	2.5	3.57
4-2	9		.42	1.50	104	102	-.39	203	62	155	2.5	3.57
4-3	9		.45	1.60	104	102	-.41	204	63	155	2.5	3.56
4-4	9		.42	1.50	105	103	-.38	204	62	155	2.5	3.57
5-1	9	528.835	.40	1.40	104	104	-.34	202	64	156	2.5	3.58
5-2	9		.43	1.50	104	104	-.36	204	65	155	2.5	3.57
5-3	9		.40	1.40	104	104	-.38	203	64	155	2.5	3.57
5-4	9		.31	1.10	105	105	-.33	201	64	155	2.5	3.59
FINAL		553.560										

Nomograph factor: 4.20

Form: SS Potroom 1 or 2 Raw Data by room.xls 12/9/19

Date 7/20/20

Location PR2

Room C

Start Time 6:30

Run # 1

Avg. Tip Diameter .2538

Duct Area = 196 sq. ft.

Delta H 1.74

2 % Moisture (assumed)

MAGNITUDE 7 METALS LLC

STACK SAMPLING DATA

COMPLIANCE

Operators

Joe Schmidt

Room Initial L.C. @ 15.0 = .010

Room Final L.C. @ ____ = ____

Digital meter used 2078

Initial Pitot L.C. = NL

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	285.800	.36	1.30	92	92	-.36	190	60	150	1.2	3.57
1-2	9		.43	1.55	92	92	-.37	193	58	155	1.3	3.55
1-3	9		.44	1.55	93	93	-.36	193	55	155	1.3	3.56
1-4	9		.41	1.45	93	93	-.32	191	60	155	1.3	3.57
2-1	9	311.230	.40	1.45	96	94	-.33	192	65	155	1.3	3.58
2-2	9		.44	1.55	96	94	-.32	192	63	155	1.3	3.58
2-3	9		.42	1.50	97	95	-.36	193	61	155	1.2	3.58
2-4	9		.42	1.50	97	95	-.37	192	62	155	1.3	3.58
3-1	9	337.030	.55	1.95	99	97	-.47	194	62	155	1.8	3.58
3-2	9		.44	1.55	99	97	-.42	195	62	155	1.4	3.58
3-3	9		.41	1.45	100	98	-.38	196	63	155	1.3	3.58
3-4	9		.46	1.65	100	98	-.39	195	65	155	1.6	3.58
4-1	9	364.580	.55	1.95	102	99	-.38	197	64	155	1.8	3.58
4-2	9		.53	1.90	102	99	-.35	197	65	155	1.8	3.58
4-3	9		.47	1.70	104	100	-.36	198	67	155	1.7	3.59
4-4	9		.51	1.85	104	100	-.33	196	68	155	1.7	3.60
5-1	9	393.250	.53	1.90	104	102	-.35	198	67	155	1.8	3.59
5-2	9		.54	1.95	104	102	-.36	199	66	155	1.8	3.59
5-3	9		.53	1.90	105	103	-.37	200	67	155	1.8	3.59
5-4	9		.52	1.90	105	103	-.39	195	65	155	1.8	3.62
Before LC		422.335										
S/N		14228189					78	7-7	5A	5H		

Nomograph factor: 4.20

Form: SS Potroom 1 or 2 Raw Data by room.xls 12/9/19

MAGNITUDE 7 METALS LLC
STACK SAMPLING RAW DATA

Location: Potroom Line: 2 Start Date: 7-20-20 Run: 1 Filter: 15

PITOT TUBE

Circle to document visual inspection.

SN N7052

Visually inspected? Yes

PROBE TIP

SN 7

DIAMETER MEASUREMENT (in.)

1. .2538
2. Avg
3.
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 14
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 29.96 (in. Hg)

CORRECTION FACTOR .14 (in. Hg)

For Method 13 only:

ORIGINAL GASEOUS FLUORIDE SAMPLE VOLUME 1 (liter)

		INITIAL WEIGHT	FINAL WEIGHT
IMPINGER #	+ 100 ml water	720.3	794.9
IMPINGER #	+ 100 ml water	626.8	653.1
IMPINGER #	+ EMPTY	638.9	654.0
IMPINGER #	+ SILICA GEL	1192.7	1233.4
IMPINGER #	+ SILICA GEL		
IMPINGER #	+ SILICA GEL		

BALANCE: METTLER PJ6000 SNR K59603 WEIGHED BY: JS

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

COMMENTS: _____

Form: Impinger Report Stack Samples.xlsx 2/19/20

Magnitude 7 Metals

GAS ANALYSIS REPORT

Location PR 2

Date 7/20/20

Run 1

Room C

Analyzed by JS

Run	Time	Percent Carbon Dioxide (CO_2)	Percent Oxygen (O_2)
1	8:40	1.0	20.5
2	8:50	1.6	21.0
3	9:00	1.4	20.5

Room D

Analyzed by JS

Run	Time	Percent Carbon Dioxide (CO_2)	Percent Oxygen (O_2)
1	9:10	1.4	20.5
2	9:20	1.6	20.0
3	9:30	1.6	19.8