Magnitude 7 Metals LLC

STACK SAMPLE RESULTS

POTROOM
LINE 2 DC

Run Number 2 | 7/21/2020 | EPA Method # 5 & 13

METER VOLUME	264.440	CU. FT.
SQUARE ROOT OF DELTA P	0.666	SQ. ROOT IN. WATER
AVERAGE DELTA H	1.586	IN. WATER
METERED GAS TEMPERATURE	96.01	DEG. F
STATIC PRESSURE IN STACK	-0.37	IN. WATER
STACK TEMPERATURE	195.9	DEG. F
BAROMETRIC PRESSURE	29.88	IN. Hg
PROBE TIP DIAMETER	0.2538	INCHES
GAS METER CORRECTION FACTOR	1.000	
TOTAL SAMPLING TIME	360.0	MINUTES
TOTAL WATER COLLECTED	153.9	GRAMS
MOLECULAR WEIGHT	29.2	LB/LB-MOLE
SAMPLING DUCT AREA	196.00	SQ. FT.
TOTAL PARTICULATE COLLECTED	0.0484	GRAMS
GASEOUS FLUORIDE COLLECTED	0.00375	GRAMS
PARTICULATE FLUORIDE COLLECTED	0.00454	GRAMS
TOTAL FLUORIDE COLLECTED	0.00829	GRAMS
AVG ALUMINUM PRODUCTION RATE	458505	LBS./DAY
VOLUME GAS SAMPLED	251.765	SCF
MOISTURE IN STACK GAS	2.797	%
VELOCITY OF STACK GAS (ACTUAL)	2504	FT./MIN.
VOLUMETRIC FLOWRATE IN DUCT	383234	SCFM
PERCENT ISOKINETIC - TRAIN TO DUCT	101.81	%
TOTAL PARTICULATE CONCENTRATION	0.0068	GRAMS/SCM
TOTAL PARTICULATE CONCENTRATION	0.00297	GRAINS/SCF
TOTAL PARTICULATE EMISSION	9.76	LBS./HR.
TOTAL PARTICULATE EMISSION	1.02	LBS./TON
GASEOUS FLUORIDE CONCENTRATION	0.526	MG./SCM
GASEOUS FLUORIDE CONCENTRATION	0.000230	GRAINS/SCF
PARTICULATE FLUORIDE CONCENTRATION	0.637	MG./SCM
PARTICULATE FLUORIDE CONCENTRATION	0.000278	GRAINS/SCF
TOTAL FLUORIDE CONCENTRATION	1.163	MG./SCM
TOTAL FLUORIDE CONCENTRATION	0.000508	GRAINS/SCF
TOTAL FLUORIDE EMISSION	1.669	LBS./HR.
AVG. ALUMINUM PRODUCTION RATE	9.55	TON/HR.
TOTAL FLUORIDE EMITTED	0.175	LBS./TON

Magnitude 7 Metals

Stack Sample Results — Raw Data Averages

POTROOM — LINE 2 DC

Start Date: 7/21/2020 **Stop Date:** 7/21/2020 **Run #:** 2

Traverse Point	Delta P (in. Water)	Delta H (in. Water)	Meter Temperature (in)	Meter Temperature (out)	Static Pressure (in. Water)	Stack Temperature (Deg. F)
D 1-1	0.44	1.55	85	85	-0.38	184
D 1-2	0.51	1.80	85	85	-0.39	186
D 1-3	0.50	1.75	87	85	-0.40	188
D 1-4	0.52	1.85	87	85	-0.41	187
D 2-1	0.35	1.25	88	86	-0.32	188
D 2-2	0.40	1.40	88	86	-0.36	188
D 2-3	0.47	1.65	89	87	-0.37	189
D 2-4	0.52	1.85	89	87	-0.41	188
D 3-1	0.36	1.30	91	87	-0.37	189
D 3-2	0.37	1.30	91	87	-0.35	190
D 3-3	0.40	1.40	91	87	-0.37	190
D 3-4	0.50	1.80	91	87	-0.39	188
D 4-1	0.38	1.35	93	90	-0.38	193
D 4-2	0.43	1.55	93	90	-0.38	192
D 4-3	0.48	1.70	94	91	-0.38	192
D 4-4	0.39	1.40	94	91	-0.36	190
D 5-1	0.35	1.25	96	93	-0.33	192
D 5-2	0.39	1.40	96	93	-0.37	192
D 5-3	0.39	1.40	97	94	-0.36	191
D 5-4	0.28	1.00	97	94	-0.32	188
C 1-1	0.38	1.35	97	97	-0.32	201
C 1-2	0.38	1.35	99	96	-0.32	202
C 1-3	0.40	1.40	100	98	-0.36	203
C 1-4	0.46	1.60	101	99	-0.38	202
C 2-1	0.52	1.85	102	100	-0.44	202
C 2-2	0.46	1.65	102	100	-0.40	202
C 2-3	0.46	1.65	103	101	-0.40	202
C 2-4	0.48	1.70	103	101	-0.42	202
C 3-1	0.50	1.80	103	101	-0.44	202
C 3-2	0.44	1.60	104	102	-0.38	202
C 3-3	0.42	1.50	104	102	-0.36	204
C 3-4	0.42	1.50	104	102	-0.36	203
C 4-1	0.57	2.00	103	103	-0.32	202
C 4-2	0.52	1.85	104	102	-0.31	202
C 4-3	0.50	1.80	104	102	-0.30	204
C 4-4	0.48	1.70	105	103	-0.30	203
C 5-1	0.52	1.85	105	105	-0.38	202
C 5-2	0.55	1.95	105	105	-0.35	205
C 5-3	0.50	1.80	105	105	-0.30	205
C 5-4	0.45	1.60	106	106	-0.40	202
Averages	**Avg. Sq. Rt 0.666**	**1.586**	**96.0**		**-0.37**	**195.9**

Date 7/21/20

Location Potroom 2

Room D

Start Time 7:40

Run # 2

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 Schmedes

Room Initial L.C. @ 15.0 = 0.02

Room Final L.C. @ _____ = _____

Digital meter used 2078

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	554.000	.44	1.55	85	85	-.38	184	60	155	1.3	3.55
1-2	9		.51	1.80	85	85	-.39	186	50	155	1.4	3.54
1-3	9		.50	1.75	87	85	-.40	188	60	155	1.4	3.54
1-4	9		.52	1.85	87	85	-.41	187	57	155	1.4	3.54
2-1	9	581.200	.35	1.25	88	86	-.32	188	57	155	1.2	3.54
2-2	9		.40	1.40	88	86	-.36	188	60	155	1.3	3.55
2-3	9		.47	1.65	89	87	-.37	189	61	155	1.4	3.55
2-4	9		.52	1.85	89	87	-.41	188	60	155	1.4	3.55
3-1	9	607.400	.36	1.30	91	87	-.37	189	60	155	1.3	3.55
3-2	9		.37	1.30	91	87	-.35	190	58	155	1.3	3.55
3-3	9		.40	1.40	91	87	-.37	190	58	155	1.4	3.55
3-4	9		.50	1.80	91	87	-.39	188	60	155	1.4	3.55
4-1	9	632.755	.38	1.35	93	90	-.38	193	60	155	1.3	3.55
4-2	9		.43	1.55	93	90	-.38	192	61	155	1.4	3.55
4-3	9		.48	1.70	94	91	-.38	192	62	155	1.5	3.56
4-4	9		.39	1.40	94	91	-.36	190	62	155	1.4	3.57
5-1	9	658.580	.35	1.25	96	93	-.33	192	63	155	1.2	3.57
5-2	9		.39	1.40	96	93	-.37	192	65	155	1.4	3.57
5-3	9		.39	1.40	97	94	-.36	191	63	155	1.4	3.58
5-4	9		.28	1.00	97	94	-.32	188	61	155	1.2	3.60
Before LC		682.950										
S/N		14228189					78	77	5A	5H		

Nomograph factor: 4.20

MAGNITUDE 7 METALS LLC

STACK SAMPLING DATA

COMPLIANCE

Date 7-21-20

Location Potroom 2

Room C

Operators Alicia Powell

Stop Time 2:00pm

Room Initial L.C. @ _____ = _____

Room Final L.C. @ 5.0 = .003

Final Pitot L.C. = NIL

2 % Moisture (assumed)

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	682.950	.38	1.35	97	97	-.32	201	68	155	2.0	3.54
1-2	9		.38	1.35	99	96	-.32	202	59	155	2.0	3.54
1-3	9		.40	1.40	100	98	-.36	203	63	156	2.0	3.54
1-4	9		.46	1.60	101	99	-.38	202	66	156	2.0	3.55
2-1	9	708.010	.52	1.85	102	100	-.44	202	69	156	2.0	3.56
2-2	9		.46	1.65	102	100	-.40	202	63	155	2.0	3.56
2-3	9		.46	1.65	103	101	-.40	202	63	155	2.0	3.57
2-4	9		.48	1.70	103	101	-.42	202	63	155	2.0	3.57
3-1	9	735.430	.50	1.80	103	101	-.44	202	63	155	2.0	3.57
3-2	9		.44	1.60	104	102	-.38	202	61	155	2.0	3.57
3-3	9		.42	1.50	104	102	-.36	204	61	155	2.0	3.56
3-4	9		.42	1.50	104	102	-.36	203	61	155	2.0	3.57
4-1	9	761.980	.57	2.00	103	103	-.32	202	62	155	2.0	3.57
4-2	9		.52	1.85	104	102	-.31	202	64	155	2.0	3.57
4-3	9		.50	1.80	104	102	-.30	204	65	155	2.0	3.56
4-4	9		.48	1.70	105	103	-.30	203	66	156	2.0	3.57
5-1	9	790.360	.52	1.85	105	105	-.38	202	68	155	2.0	3.58
5-2	9		.55	1.95	105	105	-.35	205	64	155	2.0	3.57
5-3	9		.50	1.80	105	105	-.30	205	63	155	2.0	3.57
5-4	9		.45	1.60	106	106	-.40	202	63	155	2.0	3.59
FINAL		818.440										

Nomograph factor: 4.20

MAGNITUDE 7 METALS LLC
STACK SAMPLING RAW DATA

Location: Potroom Line: 2 Start Date: 7-21-20 Run: 2 Filter: 16

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

248 deg. F. +/- 25 deg. F.

Range: 223 - 273 deg. F.

HEATER BOX SETTING

For Method 14

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 ~~[illegible]~~ AP 30.02 (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	750.1	834.1
IMPINGER #	+ 100 ml water	757.6	780.0
IMPINGER #	+ EMPTY	636.0	646.7
IMPINGER #	+ SILICA GEL	1180.7	1217.5
IMPINGER #	+ SILICA GEL		
IMPINGER #	+ SILICA GEL		

BALANCE: METTLER PJ6000 SNR K59603

2 Kg Class S-1 Calibration Wt. 2000.0

WEIGHED BY: AP

Balance check must be +/- 0.5 grams.

COMMENTS: _____

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

Magnitude 7 Metals LLC

GAS ANALYSIS REPORT

Location Potroom 2

Date 7/21/20

Run 2

Room D

Analyzed by CAJS

Run	Time	Percent Carbon Dioxide (CO_2)	Percent Oxygen (O_2)
1	7:50	1.8	20.8
2	8:00	1.8	21.5
3	8:10	1.8	21.5

Room C

Analyzed by JS

Run	Time	Percent Carbon Dioxide (CO_2)	Percent Oxygen (O_2)
1	8:15	1.8	21.0
2	8:25	2.0	21.5
3	8:35	2.0	21.0