MAGNITUDE 7 METALS LLC

Summary Report for ERT

METHOD 14 LINE 2

Run Number 3 POM 3/30/2021 EPA Method # 315

AVG. ALUMINUM PRODUCTION RATE	9.93	TON/HR./LINE
PROCESS DATA CORRECTION FACTOR FOR ROOF EMISSIONS FROM POM (LB/HR)	0.002133	FACTOR
% ISOKINETIC (MANIFOLD to ROOF)	96.2	%
% ISOKINETIC (MANIFOLD to ROOF) CORRECTION FACTOR		

TOTAL POM COLLECTED	10.20	MG
POM CORRECTED FOR %ISOKINETIC > 120		
SECONDARY POM CONCENTRATION	1.66E-04	GRAINS/SCF
SECONDARY POM CONCENTRATION	2.07E-03	LBS./HR.
SECONDARY POM CONCENTRATION	2.09E-04	LBS./TON
SECONDARY POM EMISSION	9.660	LBS./HR.
SECONDARY POM EMISSION	0.973	LBS./TON
SECONDARY POM EMISSION USING CORRECTION FACTOR	0.973	LBS./TON
PRIMARY POM EMITTED	0.191	LBS./TON
TOTAL PRIMARY AND SECONDARY POM EMITTED	1.164	LBS./TON

MAGNITUDE 7 METALS LLC

METHOD 14 SAMPLE RESULTS

LINE 2

Run Number 3 POM 3/30/2021 - 3/31/2021 EPA Method # 315

METER VOLUME	952.400	CU. FT.
SQUARE ROOT OF DELTA P	0.357	SQ. ROOT IN. WATER
AVERAGE DELTA H	1.567	IN. WATER
METERED GAS TEMPERATURE	70.7	DEG. F
STATIC PRESSURE IN STACK	-0.55	IN. WATER
STACK TEMPERATURE	88.3	DEG. F
BAROMETRIC PRESSURE	29.89	IN. Hg
PROBE TIP DIAMETER	0.3266	INCHES
GAS METER CORRECTION FACTOR	0.998	
TOTAL SAMPLING TIME	1395.0	MINUTES
TOTAL WATER COLLECTED	229.9	GRAMS
MOLECULAR WEIGHT	28.9	LB/LB-MOLE
SAMPLING DUCT AREA	1.25	SQ. FT.
TOTAL MCEM COLLECTED	10.20	MG
AVG ALUMINUM PRODUCTION RATE	476685	LBS./DAY/LINE
MANIFOLD ANEMOMETER VELOCITY	116.5	FT./MIN.
MANIFOLD THERMOCOUPLE TEMPERATURE	106.8	DEG. F
AVERAGE ROOF EXIT VELOCITY	116.4	FT./MIN.
AVERAGE ROOF EXIT TEMPERATURE	111.0	DEG. F
VOLUMETRIC FLOWRATE OUT ROOF	7434236	ACFM/LINE
VOLUME GAS SAMPLED	948.940	SCF
MOISTURE IN STACK GAS	1.128	%
VELOCITY OF STACK GAS (ACTUAL)	1228	FT./MIN.
VOLUMETRIC FLOWRATE IN DUCT	1459	SCFM
PERCENT ISOKINETIC - TRAIN TO DUCT	100.18	%
VOLUMETRIC FLOWRATE OUT ROOF	6793969	SCFM/LINE
PERCENT ISOKINETIC - MANIFOLD TO ROOF	96.22	%
SECONDARY POM CONCENTRATION	1.66E-04	GRAINS/SCF
SECONDARY POM EMISSION DUCT RATE	2.07E-03	LBS./HR.
SECONDARY POM EMISSION DUCT RATE	2.09E-04	LBS./TON
ROOF-SECONDARY POM EMISSION	9.660	LBS./HR./LINE
AVG. ALUMINUM PRODUCTION RATE	9.93	TON/HR./LINE
PROCESS DATA CORRECTION FACTOR	0.002133	
ROOF-SECONDARY POM EMISSION	0.973	LBS./TON
PRIMARY POM EMISSION	0.191	LBS./TON
TOTAL PRIMARY AND SECONDARY POM EMITTED	1.164	LBS./TON

Printed
3/31/2021 11:04 AM

Stack Sample Results
Raw Data Averages
METHOD 14 LINE 2

Start Date: 3/30/2021 **Stop Date:** 3/31/2021 **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)
1-1a	0.12	1.45	66	66	-0.53	87
1-1b	0.12	1.45	73	71		97
1-2a	0.15	1.80	72	69	-0.55	101
1-2b	0.15	1.80	70	68		100
1-3a	0.15	1.80	70	68	-0.56	99
1-3b	0.15	1.80	70	68		89
2-1a	0.12	1.50	71	71	-0.54	83
2-1b	0.12	1.50	74	70		85
2-2a	0.14	1.70	73	71	-0.55	91
2-2b	0.14	1.70	73	70		91
2-3a	0.13	1.60	73	70	-0.57	91
2-3b	0.13	1.60	71	70		91
3-1a	0.09	1.10	74	69	-0.52	86
3-1b	0.09	1.10	72	69		80
3-2a	0.13	1.60	73	69	-0.54	81
3-2b	0.14	1.70	70	70		80
3-3a	0.12	1.50	74	70	-0.56	78
3-3b	0.12	1.50	75	71		79
Averages	**0.357** (AVG. SQ.RT.)	**1.567**	**70.7**		**-0.55**	**88.3**

MAGNITUDE 7 METALS LLC
METHOD 14 DATA
Line: 1 **2** 3 East 3 West
ROOF MONITOR

Run Start Date 3/30/21
Run End Date 3/31/21
Run # 3PM
Run Start Time ~~09:05~~ 09:10
Run End Time 8:25AM
Probe Tip SN 3248
Avg. Tip Diameter .3266
Delta H **1.91** 2% Moisture
Duct Area = 1.25 sq.ft. (assumed)

Operators
Joe Schneider
Alicia Powell

Digital meter used **2076**
Initial L.C. @ 15.0 = .020
Final L.C. @ 10.0 = .013
Initial Pitot L.C. = Nil
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	HOT BOX TEMP. °F	PUMP VAC. in. Hg	SET PT.
1-1	155	209.000	.12	1.45	66	66	-.53	87	58	253	.1	12.13
			.12	1.45	73	71		97	61	255	.1	12.04
1-2	155	310.420	.15	1.80	72	69	-.55	101	60	255	.3	11.91
			.15	1.80	70	68		100	61	255	.3	11.91
1-3	155	428.640	.15	1.80	70	68	-.56	99	61	255	.3	11.93
			.15	1.80	70	68		89	62	255	.3	12.15
2-1	155	538.750	.12	1.50	71	71	-.54	83	62	255	.2	12.33
			.12	1.50	74	70		85	62	255	.2	12.31
2-2	155	643.065	.14	1.70	73	71	-.55	91	64	255	.3	12.18
			.14	1.70	73	70		91	63	255	.3	12.16
2-3	155	754.800	.13	1.60	73	70	-.57	91	62	255	.2	12.16
			.13	1.60	71	70		91	65	255	.3	12.14
3-1	155	861.175	.09	1.10	74	69	-.52	86	63	255	.3	12.28
			.09	1.10	72	69		80	63	255	.3	12.39
3-2	155	950.665	.13	1.60	73	69	-.54	81	64	255	.3	12.38
			.14	1.70	70	70		80	62	255	.2	12.38
3-3	155	058.480	.12	1.50	74	70	-.56	78	62	255	.2	12.47
			.12	1.50	75	71		79	62	255	.2	12.47
FINAL		161.400										
S/N		36229441					**76**	3-3	**2-A**	**2-H**		

Nomograph factor: 12.61

Form: SS M14 Raw Data L2.xls 12/9/19

AP

MAGNITUDE 7 METALS LLC
METHOD 14 RAW DATA

BT

Line: M14 2 Start Date: 3/30/21 Run: 3PDM Filter: ~~AP~~

PITOT TUBE — Circle to document visual inspection.

SN N9061

Visually inspected? Yes

PROBE TIP

SN 3248

DIAMETER MEASUREMENT (in.)

1. _____
2. _____
3. ~~A-5~~
4. ~~3266~~
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 30.03 (in. Hg)

CORRECTION FACTOR -.14 (in. Hg)

For Method 13 only:

~~ORIGINAL GASEOUS FLUORIDE SAMPLE VOLUME _____ (liter)~~

M315

		INITIAL WEIGHT	FINAL WEIGHT
IMPINGER #	+ 200 ml water	AP ~~824.6~~ 824.6	742.9
IMPINGER #	+ 100 ml water	606.7	660.1
IMPINGER #	+ EMPTY	506.4	551.4
IMPINGER #	+ SILICA GEL	1558.2	1771.4
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: _____

DGM ~~1774.742~~ 3622944

Form: Impinger Report M14.xlsx 2/19/20

AP

Magnitude 7 Metals LLC

GAS ANALYSIS REPORT

Location M14 L2

Date 3/30/21

Run 3 PDM

Room C

Analyzed by JS

Run	Time	Percent Carbon Dioxide (CO_2)	Percent Oxygen (O_2)
1	16:30	.5	21.0
2	16:35	.5	21.5
3	16:40	.5	21.0

Form: Gas Analysis Form single run.xls 12/9/19

AP

Potline 2 Roof Exit Velocities and Temperatures

Manifold (C-66) Averages		Roof Averages	
WS (ft/min)	Temp (Deg. F)	WS (ft/min)	Temp (Deg. F)
116.5	106.8	116.4	111.0

	C-51			C-66			C-82		
Date/Time	WS (ft/min)	WD (Deg.)	Temp (Deg. F	WS (ft/min)	WD (Deg.)	Temp (Deg. F	WS (ft/min)	WD (Deg.)	Temp (Deg. F)
	_WS_AV	_WD_AV	_TEMP_	_WS_AV	_WD_AV	_TEMP_	_WS_AV	_WD_AV	_TEMP_
Averages:	146.9	171.4	127.1	116.5	148.7	106.8	85.7	140.8	99.0
3/30/21 9:10	112.6	165.1	140.5	91.1	155.8	98.6	88.0	124.8	85.6
3/30/21 9:25	100.0	170.3	141.9	94.8	154.5	102.1	80.3	126.0	88.1
3/30/21 9:40	162.9	1.9	140.2	97.9	149.9	106.4	77.7	140.9	94.5
3/30/21 9:55	218.4	0.9	138.8	101.6	155.8	107.0	69.5	141.2	94.4
3/30/21 10:10	296.4	360.0	137.7	125.6	154.8	108.9	68.6	131.8	94.8
3/30/21 10:25	115.8	20.2	134.8	147.4	154.0	111.4	71.1	133.4	99.8
3/30/21 10:40	158.3	1.7	128.4	137.1	145.5	112.6	79.2	132.6	101.0
3/30/21 10:55	133.6	5.3	122.8	146.2	144.4	111.8	78.2	130.0	100.8
3/30/21 11:10	129.4	14.7	120.2	148.9	147.2	111.7	74.3	126.9	99.9
3/30/21 11:25	139.8	8.5	111.2	142.7	141.6	110.4	74.2	126.1	100.5
3/30/21 11:40	141.0	4.8	110.0	126.5	143.9	111.6	88.0	136.8	102.7
3/30/21 11:55	151.0	7.5	112.5	124.6	148.4	112.9	80.6	133.0	101.2
3/30/21 12:10	116.6	102.9	113.6	126.8	145.1	113.0	103.1	140.3	103.7
3/30/21 12:25	153.9	30.3	113.6	127.5	146.0	113.2	96.5	139.2	103.8
3/30/21 12:40	135.8	2.8	110.8	123.1	144.5	113.3	100.0	135.2	104.3
3/30/21 12:55	164.4	1.5	111.8	113.9	143.2	114.3	107.9	137.8	106.3
3/30/21 13:10	101.7	191.8	115.1	110.9	150.9	113.3	78.6	126.5	101.4
3/30/21 13:25	112.3	97.7	113.0	95.2	145.0	116.9	106.0	143.6	104.0
3/30/21 13:40	232.6	166.6	117.9	100.1	143.7	115.6	95.9	136.7	103.5
3/30/21 13:55	121.9	172.6	129.7	96.8	143.8	117.2	78.9	131.5	103.0
3/30/21 14:10	120.3	128.8	127.5	107.4	136.9	112.7	87.8	128.6	99.9
3/30/21 14:25	113.6	126.9	121.9	103.1	143.2	114.9	84.4	132.8	103.2
3/30/21 14:40	180.9	172.7	114.7	114.5	134.1	107.9	96.2	121.6	94.6
3/30/21 14:55	153.4	28.4	113.8	135.4	144.5	111.4	62.2	120.3	96.2
3/30/21 15:10	236.9	39.6	113.8	127.4	146.7	112.0	73.9	130.1	98.4
3/30/21 15:25	150.2	21.1	108.1	126.2	138.2	106.8	74.9	130.3	95.4
3/30/21 15:40	140.7	87.7	112.9	103.4	136.6	102.6	79.8	131.8	91.2
3/30/21 15:55	117.3	101.8	130.4	96.3	150.5	101.5	86.6	123.5	87.4
3/30/21 16:10	123.7	16.6	117.7	100.8	158.1	101.9	85.5	126.6	88.8
3/30/21 16:25	294.6	359.9	107.8	119.8	152.1	107.3	76.9	133.7	93.9
3/30/21 16:40	297.1	359.9	108.8	158.8	155.4	110.1	66.2	133.7	99.7
3/30/21 16:55	107.1	31.5	121.5	127.3	144.2	107.6	64.9	124.3	97.9
3/30/21 17:10	94.7	154.5	129.9	113.9	143.2	106.0	64.9	138.2	96.4
3/30/21 17:25	96.3	162.3	129.4	104.0	155.0	104.6	64.0	137.1	95.9
3/30/21 17:40	96.1	167.8	129.5	95.6	165.6	103.3	74.4	132.1	92.6
3/30/21 17:55	90.5	166.0	130.5	110.7	169.3	105.0	59.1	130.7	94.2
3/30/21 18:10	86.8	169.0	130.6	119.2	154.9	106.7	56.5	137.6	96.5
3/30/21 18:25	89.2	152.6	130.8	128.5	157.1	106.5	69.3	133.7	97.0
3/30/21 18:40	97.3	142.4	130.4	132.8	144.6	106.4	60.9	136.7	98.0
3/30/21 18:55	93.9	154.4	129.8	123.5	152.1	106.3	57.1	144.4	97.1
3/30/21 19:10	94.9	161.3	129.6	125.6	160.7	106.2	59.0	139.3	95.7
3/30/21 19:25	94.9	159.8	130.7	102.4	175.8	105.2	57.7	123.8	94.5
3/30/21 19:40	89.2	168.7	131.5	149.3	174.1	106.6	63.9	122.4	95.5
3/30/21 19:55	89.2	173.1	130.9	124.2	171.4	106.7	62.9	124.1	97.3
3/30/21 20:10	89.2	154.5	132.8	120.2	169.4	106.7	64.7	139.4	97.4
3/30/21 20:25	88.2	154.4	133.2	130.8	154.6	107.5	80.3	142.4	99.0

	C-51			C-66			C-82		
Date/Time	WS (ft/min)	WD (Deg.)	Temp (Deg. F	WS (ft/min)	WD (Deg.)	Temp (Deg. F	WS (ft/min)	WD (Deg.)	Temp (Deg. F)
3/30/21 20:40	90.8	83.3	133.2	123.3	146.6	106.3	87.4	152.1	100.2
3/30/21 20:55	85.6	123.5	132.3	142.9	155.0	108.0	91.5	135.3	101.7
3/30/21 21:10	90.9	126.3	131.8	119.3	146.1	107.0	89.1	135.0	100.3
3/30/21 21:25	84.9	141.7	131.9	149.4	146.0	108.2	97.6	136.1	103.2
3/30/21 21:40	90.0	146.4	131.9	130.0	144.6	107.5	101.2	136.2	103.1
3/30/21 21:55	99.1	48.9	133.2	121.9	146.8	107.6	104.8	140.4	103.0
3/30/21 22:10	301.1	359.9	136.8	136.7	155.3	108.5	84.5	129.0	100.1
3/30/21 22:25	289.3	359.9	136.6	131.5	148.0	111.0	92.3	148.2	102.9
3/30/21 22:40	299.9	359.9	133.5	133.4	144.4	110.8	109.6	152.3	103.7
3/30/21 22:55	256.6	359.9	134.0	138.5	160.0	110.2	117.0	162.1	103.7
3/30/21 23:10	290.1	359.9	135.4	142.5	152.5	111.1	103.3	142.2	103.7
3/30/21 23:25	277.8	359.9	133.8	150.2	150.0	112.1	112.4	149.5	104.4
3/30/21 23:40	285.8	359.9	134.5	133.0	151.3	112.2	107.3	145.4	104.3
3/30/21 23:55	283.1	359.9	134.6	149.2	149.4	111.8	104.3	145.2	103.7
3/31/21 0:10	286.9	359.9	136.3	135.4	147.1	111.7	105.7	144.2	104.5
3/31/21 0:25	283.5	359.9	137.5	130.6	144.2	113.4	118.2	143.3	106.8
3/31/21 0:40	298.3	359.9	137.5	116.6	140.7	113.2	112.5	144.7	105.3
3/31/21 0:55	279.6	359.9	137.5	107.2	140.4	113.9	104.4	142.8	106.4
3/31/21 1:10	286.8	359.9	136.1	117.5	142.5	113.0	112.8	145.2	106.0
3/31/21 1:25	290.3	359.9	136.5	109.5	140.6	114.0	112.8	146.3	107.5
3/31/21 1:40	98.1	6.8	134.9	115.7	147.0	113.3	113.6	155.8	106.2
3/31/21 1:55	75.1	186.1	130.7	103.7	151.0	105.2	93.5	154.9	102.3
3/31/21 2:10	79.8	181.8	130.9	96.0	144.0	105.3	80.9	150.7	101.7
3/31/21 2:25	90.0	190.1	128.4	99.1	144.2	102.2	85.7	156.3	102.2
3/31/21 2:40	94.1	187.9	129.8	100.2	142.8	103.9	75.6	148.8	101.0
3/31/21 2:55	100.3	195.2	129.0	88.3	146.8	103.2	83.8	152.6	101.7
3/31/21 3:10	100.7	193.8	130.2	91.1	144.9	103.9	81.6	148.0	101.5
3/31/21 3:25	103.4	195.7	128.8	98.3	146.9	103.1	77.3	149.7	101.3
3/31/21 3:40	107.5	192.5	129.8	98.1	142.8	103.8	75.0	152.9	101.1
3/31/21 3:55	104.6	190.1	131.3	95.2	137.5	103.6	73.7	145.6	101.5
3/31/21 4:10	99.6	190.9	130.7	95.0	139.6	103.0	71.9	145.6	100.9
3/31/21 4:25	99.4	191.0	129.7	99.3	136.0	102.4	73.2	147.7	100.7
3/31/21 4:40	116.4	185.7	129.6	105.0	140.8	99.9	62.8	142.6	99.2
3/31/21 4:55	114.1	191.6	129.6	99.9	147.6	100.1	71.8	159.6	97.6
3/31/21 5:10	107.5	187.9	129.6	98.5	149.5	101.2	63.0	147.6	98.9
3/31/21 5:25	113.7	188.1	129.6	101.8	139.0	100.4	70.9	148.8	97.9
3/31/21 5:40	120.5	192.0	128.8	105.0	146.1	98.3	87.8	155.3	96.2
3/31/21 5:55	109.7	193.6	129.4	97.4	142.4	101.6	79.9	148.9	96.8
3/31/21 6:10	112.8	194.7	127.1	105.2	142.5	101.0	77.4	154.1	95.2
3/31/21 6:25	105.7	196.2	121.1	101.2	150.6	98.3	89.2	157.6	95.2
3/31/21 6:40	118.9	189.9	112.9	107.4	154.1	98.3	112.0	159.9	93.1
3/31/21 6:55	116.8	188.0	108.5	106.6	150.7	98.3	101.0	152.6	94.0
3/31/21 7:10	121.9	193.3	106.9	115.3	150.5	96.5	106.0	161.7	92.5
3/31/21 7:25	118.2	189.8	119.0	111.1	150.4	96.5	110.5	156.9	92.6
3/31/21 7:40	101.5	195.8	129.5	108.9	150.2	96.5	103.1	154.7	91.7
3/31/21 7:55	107.3	190.3	131.3	104.2	150.1	97.6	113.0	152.8	92.4
3/31/21 8:10	99.8	192.0	129.6	108.2	144.9	97.5	108.4	150.9	93.3
3/31/21 8:25	97.8	190.4	129.4	100.9	148.9	93.4	112.3	150.1	92.7