Magna Cosma- Stanton
Facility Id: 38-0177
Calculations: SK

Table 1-1. Facility-Wide Potential Emissions

Emission Source (Source ID)	Pollutants (tpy)							
	PM	**PM_{10}**	**$PM_{2.5}$**	**NO_x**	**VOC**	**CO**	**SO_2**	**Total HAP**
Souuce 01- E coat line with two ovens	1.37	1.37	1.37	7.00	62.92	15.15	0.11	1.08
Source 02- Two Natural gas fired Boilers	0.82	0.82	0.82	9.64	0.59	9.02	0.06	0.02
Source 03: 40 HP Nat. Gas Emergency Generator 02 (Insig)	0.02	0.00	0.00	0.16	0.00	0.67	0.00	0.02
40 HP Nat. Gas Emergency Generator 03 (Insig.)	0.02	0	0	0.16	0.00	0.67	0	0.02
Source 04: 636 HP Nat. Gas Emergency Generator 01 (Insig.)	0.01	0.00	0.00	0.05	0.06	0.29	0	0.25
Source 05: 275 HP Diesel Fire Pup (Insig.)	0.15	0.15	0.15	2.13	0.17	0.46	0.14	0.00
Source 06- Two Cooling Towers : Tower#1 (Insig.)	2.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00
Tower #2 (Insig.)	2.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00
Source 07- Sixteen Roof Top Units- RTU#1-16 (Insig.)	0.65	0.65	0.65	8.59	0.47	7.21	0.05	0.16
Source 08- Welding (Insig.)	0.62	0.62	0.62	0.00	0.00	0.00	0.00	0.02
Facility-Wide Total Emissions	**7.66**	**7.61**	**7.61**	**27.73**	**64.21**	**33.47**	**0.36**	**1.57**
Title V Major Source Threshold (tpy)[1]	100	100	100	100	100	100	100	25
Above Title V Major Source Levels?	*No*	*No*	*No*	*No*	*No*	*No*	*No*	*No*
PSD Major Source Threshold (tpy)[2]	250	250	250	250	250	250	250	N/A
Above PSD Major Stationary Source Levels?	*No*	*No*	*No*	*No*	*No*	*No*	*No*	N/A

1. This is the minimum emissions required from each pollutant to be classified as a major source pursuant to 40 CFR 70.2.

Note: The Magna Cosma and Magna Seating Facilities are under common control, located within a contiguous area, and classified under different SIC codes. Therefore, HAP emissions from the Magna Seating Facility and Magna Cosma Facility must be aggregated when comparing against HAP Major source thresholds. The major source threshold (under Title V permitting program) for HAPs is 25 tpy total HAPs or 10 tpy of any individual HAP. Magna anticipates the aggregated HAP emissions will remain below major source thresholds.

2. Major stationary source, as defined in 40 CFR 52.21(b)(1) for a non-categorical stationary source in an area in attainment for all regulated pollutants.

Magna Structures Tennessee LLC

Permit #981829
Facility ID: 38-0177
Calculations- SK

Source 01 - E-Coat Line

This source consists of an electro coating line to coat automobile frames, battery trays, and battery covers. The parts are cleaned in a series of pretreatment tanks containing: descale solution, cleaner, zinc phosphate and a non-chrome sealer. The first coating applied to the parts is electrocoat primer (E-coat). The parts are dipped into water-borne E-coat made up of mixed pigment and resin components. Following coating application, the parts are rinsed with water to remove and recover any excess or additional paint solids. The parts are then conveyed through one of two 21.0 MMBtu/hr natural gas-fired curing ovens.

Natural Gas-fired Curing Ovens

Heat Input (Oven 1)	21.0	MMBtu/hr
Heat Input (Oven 2)	21.0	MMBtu/hr
	42.0	MMBtu/hr

Maximum Operating Hours:	8,760	hr/yr
Heat value of natural gas:	1,020	Btu/Scf

Potential Emissions from Natural Gas Combustion

Using Emission factors from AP-42 Chapter 1.4, for Natural gas Combustion- Table 1.4-1 and Table1.4-2
Emission factors are based on NG higher heating value of 1000 Btu/scf

Pollutant	Emission factor	Potential Emissions	
	(lb/106 ft3)	(lb/hr)	(tpy)
PM	7.6	0.31	1.37
SO_2	0.6	0.02	0.11
VOC	5.5	0.23	0.99
NOx[1]	38.8	1.60	7.00
CO	84	3.46	15.15
Single HAP	1.8	0.07	0.32
Total HAP	1.89	0.08	0.34

1. NO_X emission factor was provided in lb/MMBtu by manufacturer and converted to lb/MMscf by multiplying by 1,020 MMBtu/MMscf.

Allowable PM Emissions

Material Input Rate:

12216.1 lb/day
0.2545 ton/hr

E coat Paste (for Frames/trays/Covers) = 101+81+20 gal/day = 202 gal/day = 2080.6 lb/day
E Coat Resin (for Frames/Trays/Covers) = 588+466+111 = 1,165 gallons/day = 10135.5 lb/day
Total material used = 1367 gallons/day

Oven exhaust rate 30000 ft3/min, each (Stack #1 and stack #2)
60000 ft3/min total

TAPCR 1200-03-07-.03(1)

E = 3.59P^0.62
E = 1.54 lb/hr

TAPCR 1200-03-07-.04(1)

E0.02 = 10.29 lb/hr 45.05142857 tpy

TAPCR 1200-03-07-.04(2)

E0.25 = 128.57 lb/hr

Allowable emission rate will be based on 0.02 gr/dscf- TAPCR 1200-03-07-.04(1)

VOC and HAP Emissions from Coating Operation:

Coating Line:

Parameter	Value	Units
Operating Hours	8,760	hr/yr
Frame/Tray/Cover Throughput[1]	369,720	Units/Year
E-Coat Paste VOC[2]	1.10	lb/gal
E-Coat Paste HAP[2]	0.02	lb/gal
E-Coat Resin VOC[2]	0.10	lb/gal
E-Coat Resin HAP[2]	0.00	lb/gal

1. Provided in RFI response dated 06/23/2023.
2. Provided in RFI Response dated 07/07/2023.

E-Coat Emissions:

Chemical (Source ID)	Component	Usage[1] (gal/unit)	VOC Emissions[2] (tpy)	HAP Emissions[3] (tpy)
E-Coat Paste (Source 03)	Frame	0.1	20.33	0.37
	Tray	0.08	16.27	0.30
	Cover	0.02	4.07	0.07
E-Coat Resin (Source 03)	Frame	0.58	10.72	0.00
	Tray	0.46	8.50	0.00
	Cover	0.11	2.03	0.00
		Total from E-Coat:	61.93	0.74
		Emissions from Combustion:	0.99	0.34
		Source Total:	62.92	1.08

1. Provided in RFI response dated 06/23/2023.
2. VOC Emissions (tpy) = Frame/Tray Cover Throughput (Units/Year) * E-Coat Usage (gal/Unit) * E-Coat VOC Content (lb/gal) / 2000 (lbs/ton)
3. HAP Emissions (tpy) = Frame/Tray Cover Throughput (Units/Year) * E-Coat Usage (gal/Unit) * E-Coat HAP Content (lb/gal) / 2000 (lbs/ton)

Magna Structures Tennessee LLC

Permit #981829
Facility ID: 38-0177
Calculations- SK

Source 02: Two (2) 12.5 MMBtu/hr Natural Gas fired Boilers

Operation Hours =	24	hrs./day	
	7	days/wk.	
	52	wks./yr.	
	365	days/yr.	
Actual Operating Hours =	8,760	hrs./yr.	
Potential Operating Hours =	8,760	hrs./yr.	
Total Heat Input Capacity =	12.5	MMBtu/hr.	Boiler 1
Total Heat Input Capacity =	12.5	MMBtu/hr.	Boiler 2

PM Allowable

TAPCR 1200-03-06-.02(2)(a): Non-process particulate, "New" design

E = [0.600] x [(10/Q)^0.5566]
Q = 25.0 MMBtu/hr
E = 0.360 lb/MMBtu

PM (lbs./hr.) = [E (lb/MMBtu)] x [Heat Input Capacity (MMBtu/hr.)] = **9.01 lbs./hr.**

$$\text{PM (tons/yr.)} = \frac{[PM_{allow.}\ (\text{lbs./hr.})] \times [\text{Potential Hours (hrs./yr.)}]}{2000\ \text{lbs./ton}} = \textbf{39.45 ton/yr.}$$

SO2 Allowable

TAPCR 1200-03-14-.02(2)(a)

Class VI county 5.0 lbs. / MMBtu

SO_2 (lbs./hr.) = [Emission Standard (lbs./MMBtu)] x [Heat Input Capacity (MMBtu/hr.)] **125 lb/hr**

$$SO_2 \text{ (ton/yr.)} = \frac{[PM_{allow.} \text{ (lbs./hr.)}] \times [\text{Potental Hours (hrs./yr.)}]}{2000 \text{ lbs. /ton}} = \textbf{547.50 ton/yr.}$$

NATURAL GAS

Potential Emissions **For Boiler 1**

Pollutant	MMBtu/hr.			lb./MMBtu		lbs./hr.		hr./yr.		lbs./ton		ton/yr.
PM	=	12.5	x	0.007451	=	**0.09**	x	8,760	/	2,000	=	**0.41**
SO_2	=	12.5	x	0.000588	=	**0.01**	x	8,760	/	2,000	=	**0.03**
CO	=	12.5	x	0.082353	=	**1.03**	x	8,760	/	2,000	=	**4.51**
VOC	=	12.5	x	0.005392	=	**0.07**	x	8,760	/	2,000	=	**0.30**
NO_X	=	12.5	x	0.088039	=	**1.10**	x	8,760	/	2,000	=	**4.82**
Total												**10.06**

Actual Emissions **For Boiler 1**

Pollutant	MMBtu/hr.			lb./MMBtu		lbs./hr.		hr./yr.		lbs./ton		ton/yr.
PM	=	12.5	x	0.007451	=	**0.09**	x	8,760	/	2,000	=	**0.41**
SO_2	=	12.5	x	0.000588	=	**0.01**	x	8,760	/	2,000	=	**0.03**
CO	=	12.5	x	0.082353	=	**1.03**	x	8,760	/	2,000	=	**4.51**
VOC	=	12.5	x	0.005392	=	**0.07**	x	8,760	/	2,000	=	**0.30**
NO_X	=	12.5	x	0.088039	=	**1.10**	x	8,760	/	2,000	=	**4.82**
Total												**10.06**

Potential Emissions **For Boiler 2**

Pollutant	MMBtu/hr.			lb./MMBtu		lbs./hr.		hr./yr.		lbs./ton		ton/yr.
PM	=	12.5	x	0.007451	=	**0.09**	x	8,760	/	2,000	=	**0.41**
SO_2	=	12.5	x	0.000588	=	**0.01**	x	8,760	/	2,000	=	**0.03**
CO	=	12.5	x	0.082353	=	**1.03**	x	8,760	/	2,000	=	**4.51**
VOC	=	12.5	x	0.005392	=	**0.07**	x	8,760	/	2,000	=	**0.30**
NO_X	=	12.5	x	0.088039	=	**1.10**	x	8,760	/	2,000	=	**4.82**
Total												**10.06**

Actual Emissions **For Boiler 2**

Pollutant	MMBtu/hr.			lb./MMBtu		lbs./hr.		hr./yr.		lbs./ton		ton/yr.
PM	=	12.5	x	0.007451	=	**0.09**	x	8,760	/	2,000	=	**0.41**
SO_2	=	12.5	x	0.000588	=	**0.01**	x	8,760	/	2,000	=	**0.03**
CO	=	12.5	x	0.082353	=	**1.03**	x	8,760	/	2,000	=	**4.51**
VOC	=	12.5	x	0.005392	=	**0.07**	x	8,760	/	2,000	=	**0.30**
NO_X	=	12.5	x	0.088039	=	**1.10**	x	8,760	/	2,000	=	**4.82**
Total												**10.06**

The Boiler is subject to 40 CFR 60 Subpart Dc

Potential Emissions (Both Boilers 1 and 2)

Pollutant	lbs./hr.	ton/yr.
PM	**0.19**	**0.82**
SO_2	**0.01**	**0.06**
CO	**2.06**	**9.02**
VOC	**0.13**	**0.59**
NO_X	**2.20**	**9.64**

Emission Factors

AP 42, Chapter 1.4: Natural Gas Combustion, Tables 1.4-1 and 1-4-2

Vendor provided data

Pollutant	Emission Factor (lbs./ 10^6 scf)		Conversion Factor (Btu/ft^3)	Factor (lbs./MMBtu)
PM	7.6	/	1020	0.0075
SO_2	0.6	/	1020	0.0006
CO	84	/	1020	0.0824
VOC	5.5	/	1020	0.0054
NO_X[1]	89.8	/	1020	0.0880

1. NOx emission factor for the Boilers given by the manufacturer in company calculations was 89.8 lbs/MMscf