

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: On-site Inspection

N558757832

FACILITY: WOODARD-CM		SRN / ID: N5587
LOCATION: 210 S DELANEY RD, OWOSSO		DISTRICT: Lansing
CITY: OWOSSO		COUNTY: SHIAWASSEE
CONTACT: Mike Majerowicz , Industrial Engineer		ACTIVITY DATE: 04/06/2021
STAFF: Julie Brunner	COMPLIANCE STATUS: Compliance	SOURCE CLASS: SM OPT OUT
SUBJECT: On-site inspection of Woodard-CM (N5587) as part of a Full Compliance Evaluation (FCE)		
RESOLVED COMPLAINTS:		

On April 6, 2021, I conducted an on-site inspection of Woodard-CM (N5587) as part of a Full Compliance Evaluation (FCE). The last scheduled inspection was on November 15, 2017.

Arrived: 8:45 AM

Weather: 52°F, wind SSE 4 @ 4 MPH, UV Index 0

Departed: 2:10 PM

Contact:

Mike Majerowicz, Industrial Engineer; 989-725-4462; mmajerowicz@woodard-furniture.com

Facility Description and Regulatory Overview:

This facility manufactures outdoor furniture with steel and aluminum frames. The manufacturing operation includes metal forming, welding, metal surface treatment, coating of metal, and fabric and upholstery manufacturing. The finished furniture is packaged (shrink wrapped and/or boxed) for shipping. The facility also manufactures propane-fueled fire pits. They have also looked at coating of auto parts but so far have only coated prototypes. No projects for coating of miscellaneous metal parts such as auto parts have been completed.

The facility is in an industrial park on the westside outskirts of Owosso. Woodard moved all furniture manufacturing operations to this location in 1995.

There are approximately 175 employees. Operations are one shift per day, 5 to 6 days per week with April to August generally being 6 days per week. Shift hours are currently 6:00 am to 4:30 pm. The plant shuts down in the middle of August after the busy season for a brief break. This year has been very busy and there was no middle of August shutdown.

Woodard-CM (N5587) is a minor source due to the potential to emit of less than 250 tons per year (tpy) and 100 tpy of any regulated air contaminant. The facility is a synthetic minor for emissions of hazardous air pollutants (HAPs) with opt-out limits of less than 9.0 tpy of any single HAP and 22.5 tpy of aggregate HAPs. The facility is not subject to the Title V - Renewable Operating Permit Program.

The facility has one Permit to Install (PTI) 270-95C issued March 16, 2018 which is for a burn-off oven, an E-coat line, and includes the HAPs opt-out limits. The facility also has many exempt processes. The various processes at the plant are listed below.

Emission Unit ID	Description	PTI / Exemption Rule / Federal Reg
Forges	Two small forges, fired by natural gas	Rule 282(2)(a)(i)
Welding stations: steel	Arc welding of steel wire	Rule 285(2)(i)
Welding stations: aluminum	TiG welding of aluminum wire	Rule 285(2)(i)
Production grinders	Metal grinding processes exhausting to in-plant environment	Rule 285(2)(I)(vi)(B)
Cleaning process (two operating modes, one for aluminum parts, one for steel)	Spraying of metal parts with a series of seven clean water, caustic, and acid solutions	Rule 281(2)(e)
EU-Ecoat	The electrodeposition coating line (E-coat) consists of a dip tank, flash-off area, and a natural gas-fired oven used to coat metal lawn furniture and miscellaneous metal parts.	PTI 270-95C / 40 CFR 60, Subpart EE
Four powder coating booths	Powder coating in electrostatic booths, with a two-sectioned oven	Rule 287(2)(d)
Antique coating, booth and area	Spray booth for application antiquing finish to metal parts, with HVLP spray guns, and mat/panel filters	Rule 287(2)(c) / 40 CFR 60, Subpart EE
EU-BurnOffOven	A natural gas-fired burn-off oven with afterburner	PTI 270-95C
Shot blast machine		Rule 285(2)(I)(vi)(C)

Emission Unit ID	Description	PTI / Exemption Rule / Federal Reg
	Shot blast machine, with mechanical collector and baghouse (external vent)	
Aluminum parts cleaning booth	Aluminum parts cleaner using walnut shells with particulate control (internal vent)	Rule 285(2)(l)(vi)(B)
Machine shop	Various metal working processes	Rule 285(2)(l)(vi)(A) and/or (B)
Natural gas-fired emergency generator	Emergency generator for lighting.	Rule 285(2)(g) / 40 CFR 63, Subpart ZZZZ
Natural gas-fired space heaters	10 natural gas-fired space heaters for building heat	Rule 282(2)(b)(i)
Two small natural gas-fired boilers	There is one boiler in maintenance and one for the E-coat process.	Rule 282(2)(b)(i)

The coating processes (when coating metal furniture) are subject to the federal requirements of 40 CFR Part 60, Subpart EE, New Source Performance Standards (NSPS) for Surface Coating of Metal Furniture. For 40 CFR 60, Subpart EE, the following applies:

§60.310 Applicability and designation of affected facility.

(a) The affected facility to which the provisions of this subpart apply is each metal furniture surface coating operation in which organic coatings are applied.

(b) This subpart applies to each affected facility identified in paragraph (a) of this section on which construction, modification, or reconstruction is commenced after November 28, 1980.

There currently is no EPA electronic reporting requirements through the Compliance and Emissions Data Reporting Interface (CEDRI) in 40 CFR 60, Subpart EE.

40 CFR 63, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE) – This subpart establishes emission limitations and operating limitations for HAPs emitted from stationary RICE located at major and area sources of HAP emissions. The natural gas-fired engine on the emergency generator is subject as an existing RICE at an “area source” of HAPs.

Woodard is an "area source" of HAPs with two (2) small natural gas-fired boilers. The gas-fired boilers are not subject to 40 CFR 63 Subpart JJJJJJ, the National Emission Standard for Hazardous Air Pollutants (NESHAP) for Industrial, Commercial, and Institutional Boiler Area Sources.

Michigan Air Emissions Reporting System (MAERS):

The facility reports to MAERS as a Syn Minor, Fee Category D. The 2020 MAERS submission will be audited.

Inspection:

No visible emissions (VEs) were observed from any of the facility exhaust stacks upon arrival. No odors were identified surrounding the facility.

A pre-inspection meeting was conducted with Mike Majerowicz (Industrial Engineer). The facility operations were discussed including potential changes in the coatings and solvents used. Steel and aluminum furniture is manufactured, and the surface treatment is different for each. For steel furniture, a detergent based pre-wash to remove oils is followed by electrodeposition of a primer (E-coat process) to prevent rust. The steel furniture then goes to storage until an order is placed. When ordered, the steel furniture is washed with water and powder coated, and finished to the customer's specifications. For the aluminum furniture, some surface prep such as grinding may be needed then an acid wash followed by powder coating. Depending on the finish type ordered, the antique coating of the furniture is done after the powder coating.

A facility tour was taken. For steel furniture, the metal comes in coils and rods. For the aluminum furniture, the aluminum comes in kits from South East Asia.

Metal bending and shaping activities (Rule 285(2)(l)(vi)(B)):

Some bending and shaping of metal coils and rods is done by hand, and some by machine (CNC bender, etc.). The metal bending and shaping activities exhaust to the general, in-plant environment.

Forges (Rule 282(2)(a)(i)):

The two (2) small natural gas-fired forges (manufactured by the Johnson Gas Appliance Co.) are used for forming some steel furniture pieces. The two forges are greater than 50 years old. There is lower demand for steel furniture than aluminum furniture. They usually run 4 to 8 hours per week depending on orders. The process is vented out the roof.

Welding Department for aluminum and steel (Rule 285(2)(i)):

Aluminum and steel are welded in separate welding stations. The aluminum is welded by hand using the wire and torch method. For steel, there are two robotic welding stations (1980s vintage), and the rest is done by hand. The robotic welders were in operation and some hand welding was being done at the time of inspection. After welding, the furniture pieces are hung on a chain-on-edge conveyor line to travel to the next processing area in the plant

Production Grinders (Rule 285(2)(l)(vi)(B)):

Because aluminum is soft, and can easily get nicked or scraped, the aluminum parts are buffed, prior to being washed and painted. The furniture is removed from the conveyor when passing the hand grinding areas as needed. The production grinders exhaust to the general, in-plant environment.

Aluminum parts cleaning booth (Rule 285(2)(l)(vi)(B)):

A process for surface buffing of aluminum parts was installed around 2015. It consists of an enclosed booth which uses walnut shell particulates and has a cartridge dust collector and collection system for disposal of the walnut particulates. The booth is manually operated. The operator stands inside the booth and “sprays” the walnut shells at the part. No particulate or dust was outside of the booth and the process is vented into the plant atmosphere.

E-coat dip line (EU-Ecoat, PTI 270-95C):

The E-coat process applies a primer to steel parts to protect against rust. Typical operation is 3 days per week. Aluminum parts do not need to be primed. The entire process line is enclosed. The steel parts are first spray washed in a seven-stage washer to remove dirt and dust. The washer chemicals consist of various nitric acids, phosphoric acids, inorganic salts, nitrates, fluorides, silicates, and sodium hydroxide. The water-based primer is applied in a 1750-gallon dip tank. It is a two-part water-based mixture consisting of a paste and resin. A solvent is added to balance the tank. The solvent addition is glycol ether EB (CAS No. 111-76-2) which has been delisted as a HAP. Lactic acid is no longer used as an additive. A new additive/solvent is being reviewed for use. It is ethylene glycol monoethyl ether (2-hydroxyethanol), CAS No. 112-25-4. It appears to be a listed HAP. I recommend the chemical be reviewed for meaningful change per the Policy and Procedure: [AQD-025: Permit Exemption for Changes in a Process or Process Equipment that are not a Meaningful Change or a Meaningful Increase in Toxic Air Contaminants](#).

After coating, the furniture pieces enter a flash-off area, and then a natural gas-fired curing oven. The oven temperature is approximately 350°F to 375°F. There is one stack on the dip tank and two stacks on the curing oven which appear to be at the permitted heights in Special Condition (SC) VIII.1 - 3.

The use of manufacturer’s formulation data to determine volatile organic compound (VOC) coating content per Special Condition (SC) V.1 was approved on June 28, 2016 by the Lansing District Supervisor. Technical specification sheets for the E-coating system are maintained and scans of the chemical composition/information of the ingredients are in the electronic file. The facility is in compliance with SC V.1 and SC VI.2.

The records required by SC VI.3 for calculation of VOC emissions from EU-Ecoat are in the electronic file and are discussed below.

A small hot water boiler that is part of the emission unit is used to provide heat to the tanks in the process. The E-coat process tanks are cleaned out once a year and there are various holding tanks sitting close to the E-coat process for this purpose.

Parts cleaning process (Rule 281(2)(e)):

There is a large parts washing process at the plant. It can wash either steel or aluminum parts, but not both at the same time. It has one operating mode for washing steel parts, and a more intensive, 7 stage washing process for aluminum with caustic and acidic solutions being sprayed, followed by clean water rinses. All of the metal parts go through a natural gas-fired dryer following the wash process. Then, the parts are ready for powder coating application.

Powder coating booths (Rule 287(2)(d)):

They have three powder coating booths which are used to apply topcoats. These are in a separate room, and slide on rails to be moved on and off the process chain-on-edge conveyor line. A fourth powder coating booth for clearcoats sits outside of the room housing the topcoat booths. Of the three topcoat booths, two automated lines apply high volume colors to the metal furniture. Overspray of the high-volume colors is collected for reuse. The smaller orders in different colors are applied using a manually operated powder coating booth. The automatic booths require two (2) operators each, and the manual booth requires four (4) operators. The booths have particulate filters, and exhaust into the in-plant environment. The manual booth was operating, and operators wear particulate masks when powder coating. The powder is collected in the lower sides and bottom of the booth.

After the topcoat powder coating has been applied, the parts are cured in either of two curing ovens. After curing, a chain-on-edge conveyor takes the parts by an antiquing area. If the antique finish is not desired, the part stays on the conveyor. If antiquing is ordered, the part is removed from the conveyor, and taken to the antiquing area.

Antiquing area with spray booth (Rule 287(2)(c)):

Operators spray on a water-based antiquing finish using HVLP spray guns. The booth is equipped with a wall of mat/panel filters. Various dabbing or streaking techniques using newspapers or rags to achieve an aged look is done outside of the booth.

After metal furniture has an antiquing finish applied, it is placed back on the chain-on-edge conveyor, and goes through the powder coating booth for the clearcoat finish. The furniture then enters the second of two curing ovens. (If antiquing is ordered, the units are not fully baked in the first oven.) This allows the powder coat to be reheated in the second oven which provides a harder finish.

Burn-off oven (PTI 270-95C):

The natural gas-fired Blu-surf burn-off oven is used to remove the layers of paint which can build up over time on metal part hooks used to convey the parts through the production process. Additionally, when the coating on a piece of painted steel furniture does not meet the standards for quality that piece of furniture is cleaned in the burn-off oven. The operating temperature of the oven is 750°F and the afterburner temperature is set to 1400°F when operating, in compliance with SC IV.1. The oven is equipped with a temperature gauge to continually monitor the afterburner temperature as required by SC IV.2. If the temperature in the oven gets too hot, there is an auto-shutdown. This is indicative of a fire in the oven. The burn-off oven runs about 4 hours per day depending on rejects or customer refurbishments.

Shot blast machine with mechanical collector and baghouse (Rule 285(2)(l)(vi)(C)):

The shot blast machine is used for removing ash deposits from hooks and metal parts that have gone through the burn-off oven. It can also be used to remove rust from steel. It was operated at the time of the inspection. Parts are placed on a holding rack and moved into and out of the shot blast machine using a fork lift. The baghouse for it sits across from it and vents externally. The shot blast machine system was in the old Woodard plant and is approximately 100 years old. The shot blast machine runs not more than 4 hours per day.

Textile, finishing and packaging area:

Fabric, cushions, and/or a lattice of plastic straps are applied to the furniture here. There are over 300 different fabric choices for customers. The fabric can be heat sealed and/or machine sewn to create pillows and cushions for the furniture.

In the finishing area, there is some touchup of paint using spray cans (Rule 287(2)(b)) and cleanup as necessary. Small cans of toluene which is a HAP were used for cleanup but that practice has been discontinued. The annual usage of toluene in painting processes in 2020 was 142 gallons which is a decrease since the last inspection. Rule 290(2)(a)(ii)(A) allows up to 1,000 lb/month of toluene.

After finishing, the furniture is carefully packaged to avoid damage in shipping. They glue and assemble cardboard boxes using water-based glue. They have a large mechanical box cutter. They also have a process which shrink wraps products with clear plastic using a propane hot gun. A reaction injection molding machine to create packing pillows uses a 2-component liquid isocyanate material. Two drums of isocyanate materials were connected and when mixed, polymerize to create foam pillows in a plastic bag. This process appears exempt under Rule 286(2)(e).

Machine shop:

Their machine shop has a vertical milling machine and other metal machining processes, which are exempt because they are used on a non-production basis (Rule 285(2)(l)(vi)(A)). They exhaust into the general, in-plant environment.

Natural gas-fired space heaters (Rule 282(2)(b)(i)):

There are 10 natural gas-fired space heaters used for building heat.

Natural gas-fired emergency generator (Rule 285(2)(g)):

There is one (1) emergency generator for lighting that was installed when the building was built. It is in the Maintenance Department. It runs about once every 5 years.

The following is the information on the engine and generator:

Brand – Olympian

Model – A4350 Natural Gas

Serial # 2037184

Engine Manufacture Date: Dec. 1994

Gen Set Model No. 95A 02376 S, Date: 6/30/95

No Tier Rating

Engine: 1800 RPM

Generator: 100 kW

Engine clock: 685 hours

The emergency engine at the stationary source is subject to the National Emission Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE) promulgated in 40 CFR Part 63, Subparts A and ZZZZ as an existing RICE. Michigan does not have delegation to implement and enforce this standard at area sources, but sources are still required to comply with this standard. They are implementing 40 CFR 60 Subpart ZZZZ requirements for the emergency engine.

Records Review:

Electronic copies of the monthly VOC recordkeeping for the E-coat process, facility-wide coating usage which also included the Rule 287(2)(c) recordkeeping for the antiquing booth and area were obtained for the years 2018, 2019, and 2020.

For the antiquing booth, the coating usage was far below the 200 gallons per month allowed by Rule 287(2)(c). The highest usage in 2020 was in December and 30.1 gallons of coatings was used for the month.

For the E-coat process (EU-Ecoat), the throughput of resin, paste, and solvent added to the dip tank for a given month counts as the VOC emitted in that month. The VOC emission limits in PTI 270-95C are 2,000 lb/month and 10.0 tpy. The following are the VOC emissions for 2020.

Month	VOC (lbs / month)	VOC (tons / month)	VOC (12-month rolling)
Jan-2020	24.8	0.012	
Feb-2020	21.5	0.011	
Mar-2020	11.1	0.006	
Apr-2020	0	0	
May-2020	19.5	0.010	
Jun-2020	33.6	0.017	

Jul-2020	37.1	0.019	
Aug-2020	26.0	0.013	
Sep-2020	26.0	0.013	
Oct-2020	27.3	0.014	
Nov-2020	22.1	0.011	
Dec-2020	27.2	0.014	0.14 tpy
Permit Limit	2000		10.0 tpy

Total VOC emissions from EU-Ecoat for 2018 was 0.16 tpy and for 2019 was 0.14 tpy.

Metal furniture surface coating operations are limited per 40 CFR 60, Subpart EE to 7.5 lb VOC per gallon of coating solids applied on a monthly volume-weighted average. The following are the monthly VOC averages for 2020:

Month	NSPS Subpart EE - lb/gallon of coating solids applied for
	EU- Ecoat/Antique
Jan-20	1.4
Feb-20	3.1
Mar-20	5.0
Apr-20	0!
May-20	3.4
Jun-20	2.9
Jul-20	2.8

Aug-20	5.7
Sep-20	3.0
Oct-20	3.4
Nov-20	3.5
Dec-20	3.5

Compliance with the VOC limits for metal furniture surface coating operations per 40 CFR 60, Subpart EE is being demonstrated.

For the HAPs opt-out, the single and aggregate HAP emission records may need some updates. The coatings used in EU-Ecoating do not contain any HAPs. The antiquing paints have some HAPs according to the SDS and one of the thinners contains HAPs. The HAPs content of the coatings needs to be updated in the records. The highest used single HAP is toluene which is used as a clean-up solvent. Annual emissions of toluene for 2020 was estimated at 0.52 tons. The conservative estimate of aggregate HAP emissions is less than 1 ton for the 2018, 2019, and 2020 years.

All records obtained as part of the inspection are located here: S:\@District Facilities\N5587 \Records\N5587 Inspection 4-6-2021.

All site pictures taken during the inspection are located here: S:\@District Facilities\N5587\Site Pictures\N5587 Inspection 4-6-2021.

Summary:

The facility appears to be in compliance with PTI 270-95C, and the applicable air quality rules and regulations. The HAPs recordkeeping needs some updates, but facility estimates indicate that they are well below the HAPs opt-out limits.



Image 1(019) : Loading of shot blast machine



Image 2(IMG 0120) : Powder coating



Image 3(IMG_0121) : Spray booth for application antiquing finish



Image 4(IMG_0130) : Aluminum parts cleaning booth

NAME Julie L. Brunner

DATE 4/28/2021

SUPERVISOR B. M.