

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Self Initiated Inspection

N558732509

FACILITY: WOODARD-CM		SRN / ID: N5587
LOCATION: 210 S DELANEY RD, OWOSSO		DISTRICT: Lansing
CITY: OWOSSO		COUNTY: SHIAWASSEE
CONTACT: Tony Minarik, Industrial Engineer		ACTIVITY DATE: 11/18/2015
STAFF: Julie Brunner	COMPLIANCE STATUS: Non Compliance	SOURCE CLASS: MINOR
SUBJECT: Self-initiated inspection		
RESOLVED COMPLAINTS:		

On November 18, 2015, AQD staff (Julie Brunner and Dan McGeen) conducted a self-initiated inspection of Woodard-CM (N5587). The inspection was initiated when it was discovered that the electrodeposition coating (E-coat) line has two Permits to Install (PTI).

Environmental contact:

Tony Minarik, Industrial Engineer; 989-725-4410; tminarik@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 is located in an industrial park on the outskirts of Owosso.

Woodard-CM (N5587) is a minor source due to the potential to emit of less than 250 tons per year (tpy) of any regulated air contaminant. The facility is considered minor for emissions of hazardous air pollutants (HAPs) with a potential to emit less than 10 tpy of any single HAP and 25 tpy of aggregate HAPs. The facility is not subject to the Title V - Renewable Operating Permit Program

The coating processes are subject to the federal requirements of 40 CFR Part 60, Subpart EE, New Source Performance Standards (NSPS) for Surface Coating of Metal Furniture. The facility has two PTIs which do not include the requirements of Subpart EE. PTI 270-95 is for a burn-off oven and an E-coat line. The E-coat line is also covered under PTI 146-13 which is a general permit for a coating line emitting up to 10 tpy of volatile organic compounds (VOC). The facility includes a number of exempt processes. The various processes at the plant are listed below.

Emission Unit ID	Description	Permit / Rule / App. Req.
Forges	Two small forges, fired by natural gas	Rule 282 and/or Rule 285(l)(i)
Welding stations: steel	Arc welding of steel wire	Rule 285(i)
Welding stations: aluminum	TiG welding of aluminum wire	Rule 285(i)
Prod grinders	Metal grinding processes exhausting to in-plant environment	Rule 285(l)(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(e)
EUECOAT	E-coat dip tank with water-based paint, and natural gas-fired oven	PTI 270-95, NSPS EE / PTI 146-13
Four powder coating booths	Powder coating in electrostatic booths, with a two sectioned oven	Rule 287(d)
EUANTIQUICOAT and	Spray booth for	Rule 287(c)

area	application antiquing finish to metal parts, with HVLP spray guns, and mat/panel filters	
EUBURNOVEN	Burn-off oven with afterburner	PTI 270-95
Shot blast machine	Shot blast machine, with mechanical collector and baghouse (external vent)	Rule 285(l)(vi)(C)
<u>NEW</u> - Aluminum parts cleaning booth	Aluminum parts cleaner using walnut shells with particulate control (internal vent)	Rule 285(l)(vi)(B)
Machine shop	Various metal working processes	Rule 285(l)(vi)(A) and/or (B)

MAERS for the 2014 Reporting Year:

EUECOAT:

PM10, filterable – 0.003 tpy

SO₂ – 0.0006 tpy

VOC – 0.35 tpy

EUANTIQUICOAT:

VOC – 1.5 tpy

EUBURNOVEN:

PM10, filterable – 0.0086 tpy

SO₂ – 0.0017 tpy

Arrival:

Dan and I arrived at approximately 9:00 AM. No visible emissions were observed from any of the facility exhaust stacks upon arrival.

A pre-inspection meeting was conducted with Mr. Tony Minarik (Industrial Engineer). The facility operations were discussed. 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.

Woodard moved all furniture manufacturing operations to this location in 1995. New owners acquired the facility approximately five years ago. A new furniture line is coming soon and will be manufactured using existing equipment. The facility also manufactures about 50 to 100 propane-fueled fire pits per month.

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. The plant shuts down in the middle of August after the busy season for a brief break.

The double permitting of the E-coat process was discussed. The E-coat line is covered under PTI 270-95 and PTI 146-13 which is a general permit. PTI 270-95 limits VOC emissions to 2.2 pounds per hour, 4.2 tpy, and 3.0 pounds per gallon (minus water) based upon a 24-hour averaging period. PTI 146-13 limits VOC emissions to 2000 lb/month and 10 tpy of VOC. PTI 270-95 is more restrictive. This basically means that the general permit cannot be used until the VOC limits in PTI 270-95 for E-coating are removed or modified. Currently, the facility has not coated any parts that are not metal lawn furniture and have not "used" PTI 146-13. It is recommended that the double permitting of the E-coat process be addressed. Potential options include voiding PTI 146-13 or modifying PTI 270-95 to remove the conditions for the E-coat process and adding opt-out limits for hazardous air

pollutants (HAPs) if keeping the general permit.

A facility tour was then taken starting with the incoming metal. For steel furniture, the metal comes in coils and rods. For the aluminum furniture, the aluminum comes in kits from China.

Metal bending and shaping activities:

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

Forges:

The two small natural gas-fired forges are used for forming some steel furniture pieces. The forges were not operating at this time. They usually run just a couple hours per week. The process is vented out the roof.

Welding Department (aluminum and steel):

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, and the rest is done by hand. The robotic welders were not in operation but 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

Prod Grinders:

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:

A new process for surface buffing of aluminum parts has been installed. An enclosed booth which uses walnut shell particulates 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. The process appears to meet exemption Rule 285(l)(vi)(B)

E-coat dip line:

The E-coat process applies a primer to steel parts to protect against rust. 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 water-based primer is applied in a 1750 gallon dip tank. It is a two part mixture consisting of a paste and resin with a solvent to balance the tank. The solvent addition is glycol ether EB (CAS No. 111-76-2) which has been delisted as a HAP. 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. The stacks from the process should be not less than 1.5 times the building height. Stacks were not checked, but there may be one to two stacks on the dip tank and two to three stacks on the curing oven. The information in the files indicates a total of four stacks for the process, but it is a little unclear on how exactly they are distributed.

Parts cleaning process:

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:

They have three powder coating booths which are used to apply topcoats. These are located 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 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 desired, the part is removed from the conveyor, and taken to the antiquing area (see below). The fourth manual powder coating booth applies a clearcoat to the parts. The parts then undergo a final cure.

Antiquing spray booth and area:

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 desired, 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:

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 unit was cooling down at the time of the inspection. The temperature gauge for the oven was at 547°F and the afterburner was at 491°F. The operating temperature of the oven is 750°F and the afterburner temperature should be at least 1400°F when operating. If the temperature in the oven gets too hot, there is an auto-shutdown. This is indicative of a fire in the oven.

Shot blast machine with mechanical collector and baghouse:

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 not running at the time of the inspection and we were able to look inside of it. 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 85 years old.

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(b)) and cleanup as necessary. A small can of toluene which is a HAP was on one work station for cleanup. Cleanup could be quantified under Rule 290.

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(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. They are also exempt because they exhaust into the general, in-plant environment.

Departure:

No violations or concerns were identified at the time of inspection. Records not obtained during the inspection were to be emailed. Dan and I departed the facility at approximately 1:45 PM.

Review of Potential to Emit (PTE):

VOC –

E-coat Line (PTIs 270-95 and 146-13) – 4.2 tpy to 10 tpy (general permit)

EUANTIQUICOAT (Rule 287(b) and (c)) – 6.0 tpy (worse-case est.)

Powder coating – negligible

Miscellaneous clean-up solvent and spray touch-up (Rule 290 and Rule 287(b)) - 6.0 tpy (worse-case)

Total VOC PTE – 16.2 tpy to 22 tpy

Combustion PTE per information in PTI 270-95 –

CO – 4.3 tpy

NOx – 3.64 tpy

PM/PM10/PM2.5 – 26.4 tpy

SO₂ – 0.02 tpy

Records Review:

Mr. Minarik emailed electronic copies of the monthly VOC recordkeeping for the E-coat process, and the Rule 287(c) recordkeeping for the antiquing booth and area.

For the antiquing booth, the coating usage was far below the 200 gallons per month allowed by Rule 287(c) from February 2014 to November 2015.

For the E-coat process, 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 on PTI 270-95 are 2.2 lb/hr and 4.2 tpy. On PTI 146-13, the VOC emission limits are 2000 lb/hr and 10 tpy. A review of the records for the last two months of 2014, and 2015 shows reported exceedances of the average hourly emission limits on PTI 270-95 in Nov-14, Feb-15, Apr-15, Aug-15, and Sep-15.

Month	Op Hours (month)	VOC (lbs / month)	VOC (lbs / hr)	VOC (tons / month)	VOC (12-month rolling)
Nov-14	72	193.6	2.7	0.097	
Dec-14	104	112.4	1.1	0.056	
Jan-15	96	112.4	1.2	0.056	
Feb-15	80	193.6	2.4	0.097	
Mar-15	96	149.8	1.6	0.075	
Apr-15	88	231.0	2.6	0.116	
May-15	104	193.6	1.8	0.097	
Jun-15	88	193.6	2.2	0.097	
Jul-15	88	74.9	0.8	0.037	
Aug-15	64	156.1	2.4	0.078	
Sep-15	80	193.6	2.4	0.097	
Oct-15	88	112.4	1.3	0.056	0.96
Permit Limit		2000	2.2		4.2 / 10.0

Above the limit on PTI 270-95

There is confusion that the maximum hourly VOC emission limit is 3.0, and it is 2.2. The VOC emission limit of 3.0 lb/gallon (minus water) as applied is a daily content limit, not an hourly emission limit. The calculation to show compliance with the VOC emission limit of 3.0 lb/gallon (minus water) based on a 24-hr averaging period was missing and/or miscalculated in the records.

Based on the information in the records, compliance with this emission limit is not being demonstrated on a 24-hr basis. The worse-case VOC content in the E-coat tank could be ~2.25 lb/gallon (minus water) based on the VOC content (minus water) of the CP524 POWERCRON black paste. This VOC content in the tank is also dependent on the amount of glycol ether EB (CAS No. 111-76-2) added to the E-coat tank to balance it. Glycol ether EB (CAS No. 111-76-2) has a VOC content of 7.49 lb/gallon. For the month of September, the VOC content of the E-coat was calculated by AQD staff as 1.5 lb/gallon (minus water) which is below the VOC permit limit of 3.0 lb/gallon (minus water) at least on a monthly basis.

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.
- (c) Any owner or operator of a metal furniture surface coating operation that uses less than 3,842 liters of coating (as applied) per year and keeps purchase or inventory records or other data necessary to substantiate annual coating usage shall be exempt from all other provisions of this subpart. These records shall be maintained at the source for a period of at least 2 years.

VOC emissions from any metal furniture surface coating operation shall not exceed 0.90 kilogram of VOC per liter (7.5 lb of VOC per gallon) of coating solids applied on a monthly volume-weighted basis. Records to show compliance with the VOC emission limits in 40 CFR 60 Subpart EE were missing and/or miscalculated in the information submitted. For the month of September, the VOC content of the metal furniture surface coating operation in the E-coat was calculated by AQD staff as 1.9 lb/gallon of coating solids applied which is below the Subpart EE limit of 7.5 lb of VOC/gallon of coating solids applied on a monthly volume-weighted basis.

Summary:

Noncompliance with VOC limits on PTI 270-95 for the E-coat process were identified with this inspection. The recordkeeping for the facility does need some corrections as not all calculations to demonstrate compliance with permit limits and NSPS limits are being completed properly.

It is recommended that the double permitting of the E-coat process and the lack of enforceable restrictions for HAPs be addressed by the facility in the near future and will help resolve the noncompliance.

NAME Julie L. Brown DATE 1/8/16 SUPERVISOR B.M.