

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

U6313007438490

FACILITY: FUYAO AUTOMOTIVE NORTH AMERICA, INC.		SRN / ID: U63130074
LOCATION: 315 West Silverbell Road, Suite 100, Lake Orion		DISTRICT: Southeast Michigan
CITY: Lake Orion		COUNTY: OAKLAND
CONTACT:		ACTIVITY DATE: 01/11/2017
STAFF: Tyler Salamasick	COMPLIANCE STATUS: Compliance	SOURCE CLASS:
SUBJECT: Compliance determination		
RESOLVED COMPLAINTS:		

Background

Fuyao Automotive North America, Inc (Fuyao) is an automotive windshield assembly facility located at 315 W. Silverbell Rd., Orion Charter Township, MI 48359. The facility applies weather seals on the edge of automotive glass, applies black surface coating to automotive glass and attaches value added components to automotive glass. Fuyao is located in a primarily industrial area with the nearest residential structure approximately 0.5 miles east and south of the facility. The facility was inspected on 1/11/17 and 1/13/2017 by Tyler Salamasick, Environmental Quality Analyst of the Michigan Department of Environmental Quality, Air Quality Division. The intent of the inspection was to determine the facility's compliance with the Federal Clean Air Act Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act of 1994, PA 451, as amended, and Michigan's Air Pollution Control Rules. Fuyao recently applied for a permit to install for its new facility in Plymouth, Michigan. The site contact is the Environmental Health and Safety Manager, Chuck Stickney.

Primary Inspection

For my first visit, site arrival was at 10:28 am on 1/11/2017. I was greeted by a secretary and requested to meet with Warehouse Manager, Chris Skope. He was listed as the environmental contact in the previous inspection **Activity Report U6313007420765**. After waiting, I was informed that I must speak with the facility's environmental contact Chuck Stickney if I had any regulatory questions. Chuck was not at the facility during my inspection, so I requested to inspect the facility now and return later to meet with the environmental contact. Chris Skope showed me the facility's operations and explained how each process worked. The facility has three primary areas that emit VOCs and HAPs to the atmosphere. The facility has a sunroof area, an encapsulation area, and a value added area. The first area we walked through was the sun roof area. We then inspected the encapsulation area. I finished my inspection after looking at the value added area. I informed Chris that I would return to meet with the environmental contact Chuck Stickney at a later date.

Sunroof Area

Chris informed me that the line would be removed soon and was going to be installed at Fuyao's Dayton Ohio plant. Fuyao plans on having the equipment out by the end of January. The sunroof area consisted of two twin lines. Line P552 front and Line P552 rear. The first step of the process is to load the glass into the robotic area. This glass is then picked up by the robotic arm and sprayed clean with air. A Dow adhesion promotor is applied directly to the glass via a robotic arm. This promotor is not sprayed on, but instead wiped. After the promotor is applied, a worker sprays the mold with mold release. The container associated with the mold release was labeled Diethylene glycol monobutyl ether. Later (after my inspection) Chuck informed me that the facility doesn't regularly use mold release, but instead needs it for special projects. After the mold release is applied, the glass is loaded into the press and reaction liquid is injected into the mold. One of the containers was labeled isophorone diisocyanate and the other was labeled polyetherdiamine (colofast). The molding area was vented to the outside air. This venting included where the mold release was sprayed and where the reaction injection occurred. Once the injection is complete and the plastic has set the glass is moved to a clean-up area. In this final step workers trim off excess plastic that over flowed the mold. This process appears to be permit exempt pursuant to **R 336.1286(e)** for reaction injection molding. The facility uses Methyl Ethyl Ketone (MEK) to purge the applicator equipment. MEK was formerly listed as a HAP by the EPA but has since been delisted.

Encapsulation

The encapsulation lines consisted of three automated presses and one manual press. Each automated press had an associated surface coating robot. Each robotic arm was capable of two functions. One

setting allowed for the robot to directly apply a black primer or clear surface coat, and one setting allowed the robot to apply an adhesion promotor. The process was as follows. First a clean piece of glass was loaded onto the robot. The robot then applied a black primer. The glass is then conveyed to small electric oven to dry. After the glass was dried and allowed to cool, it is set aside. After coating multiple windows, the line is then switched over to perform the encapsulation process. When converted the robot applies an adhesion promotor on the edge of the glass. The glass is then loaded into a press and polyvinylchloride (PVC) is extruded around the edge of the glass. Staff informed me that the press did not require mold release, and I did not observe mold release being used on the encapsulation lines during my inspection. The manual press was only used for injection molding and did not include a primer or adhesion promotor step, therefore did not appear to generate significant amounts of VOCs or HAPs. These processes could be permit exempt if the facility uses **R 336.1287(c)** for the adhesion promotor, **R 336.1287(c)** for the surface coating, and **R 336.1286(a)** for the PVC extrusion.

Value added

The value added area consisted of multiple lines. The main line consists of one robotic application of clear coat and one application of black primer. These lines allow for the coating to air-dry. This robotic section had one entry point and three exit points. Each exit point fed different lines that applied varying value added components. At some of the value add areas the company uses urethane adhesive. Also one of the components was a dual sided adhesive tape with a lace and weather gasket.

Follow up Inspection

For my second visit, site arrival was at 12:05 pm on 1/13/2016. I was greeted by Environmental Health and Safety Manager Chuck Stickney. Upon meeting I presented my State of Michigan identification card, informed the facility representative of the intent of my inspection and was permitted onto the site. Chuck and I conducted the second walk through to clarify the facility's processes. The clarifications are included in the previous process description.

Potential to emit demonstration (PTE)

Black Primer/Clear Coat potential

Number of application sites- Five (three have an alternate use as adhesive promotors)

Single HAP content of Dow Black Glass Primer coating- 19.0% Toluene

Aggregate HAP content of Dow Black Glass Primer coating- 19.5%

Limit 200 gal per month per booth

$200\text{gal} \times 12\text{month} \times 5\text{ applicators} = 12000\text{gal coating per year}$

$12000 \times 8.36(\text{lbs H}_2\text{O/gal}) \times 0.87(\text{Relative Density H}_2\text{O}) = 87278\text{ lbs of material per year}$

$872278/2000 = 43.6392\text{ tons of material}$

$43.6392\text{ tons of material} \times 0.19\text{ (percent toluene by weight)} = 8.29\text{ tons single HAP (toluene) per year from surface coating}$

$43.6392 \times 0.19 = 8.51\text{ tons aggregate HAP per year from surface coating}$

$5.9\text{ lbs/gal VOC} \times 12000\text{ gal coating per year} = 70800\text{ lbs of VOC}$

$70800\text{ lbs VOC}/2000 = 35.4\text{ tons VOC per year from surface coating}$

Adhesion promotion

Fuyao cannot use the **R 336.1287(a)** exemption for its adhesion promotor because it does not meet in plant environment condition of the exemption, but it appears that they will meet the surface coating exemption **R 336.287(c)**. Even though the process utilizes the same robot from the encapsulation line, the unit is performing a separate function. The black primer surface coating process emissions are considered separate and calculated at an additional 200 gal per month.

$200\text{gal} * 12\text{month} * 3\text{ applicators} = 7200\text{ gal coating per year}$

$7200\text{ gal} * 0.82\text{g/ml} * 6.82731(\text{conversion lbs/gal}) = 40308\text{ lbs per year}$

$40308/2000 = 20.15\text{ tons material}$

$20.15 * 0.453\text{ (aggregate HAPs)} = \mathbf{9.1\text{ tons aggregate HAPs per year from adhesion promotion}}$

$20.15 * 0.35\text{ (single HAPs Xylene)} = \mathbf{7.1\text{ tons xylene (single HAPs) per year from adhesion promotion}}$

$20.15 * 0.05\text{ (single HAPs toluene)} = \mathbf{1\text{ ton toluene (single HAP) per year from adhesion promotion}}$

$20.15\text{ tons} * 97\%\text{ (VOC less H}_2\text{O)} = \mathbf{19.5\text{ tons VOC per year from adhesion promotion}}$

Glass Cleaning with isopropyl alcohol (IPA)

Rule 290 limit 1000 lbs per month uncontrolled

$1000\text{ lbs IPA} * 12\text{ months} = 12000\text{ lbs IPA per year}$

$12000/2000 = 6\text{ tons IPA} = \mathbf{6\text{ tons VOC glass cleaning per year}}$

Facility Wide

$20.2\text{ tons VOC adhesion promotor} + 35.4\text{ tons VOC surface coating} + 6\text{ tons VOC glass cleaning} = \mathbf{61.6\text{tpy VOC facility}}$

$8.51\text{ tons agg HAP surface coating} + 9.1\text{ ton agg HAP adhesion promotion} = \mathbf{17.61\text{ aggregate HAPs facility}}$

$1\text{ ton toluene adhesion promotor} + 8.29\text{ tons toluene surface coating} = \mathbf{9.29\text{ tons toluene (single HAP) facility}}$

$\mathbf{7.1\text{ tons xylene (single HAPs) per year from adhesion promotion}}$

Actual Emissions Calculations

Dow PVC Primer (Encapsulation)

$2016\text{ L} * 0.264\text{ gal/L} = 532.6\text{ gal}$

$532.6\text{ gal} * 5.9\text{ lb VOC /gal} = 3142.3\text{ lbs VOC}$

$3142.4\text{ lbs}/2000\text{ lbs/ton} = \mathbf{1.57\text{ tons VOC per year from Dow PVC Primer}}$

Dow Clear Glass Primer (VA)

$3447\text{ L} * 0.264\text{ gal/L} = 910\text{ gal}$

$910\text{ gal} * 0.82\text{g/ml} * 6.82731(\text{conversion}) * 0.97\text{ (VOC percent weight)} = 4941.7\text{ lbs VOC per year}$

4941.7 lbs/ 2000 lbs/ton= **2.47 tons** VOC per year from Dow Clear Primer

Dow Black Glass Primer(VA)

12264 L *0.264 gal/L= 323.8 gal

323.8 gal *6.53 lbs VOC/ gal= 2114.4 lbs VOC per year

2114.4/ 2000 lbs/ton=**1.06** tons VOC per year from Dow Black Primer

Urethane

671.6 gal * 0.09 lbs/gal = 60 lbs

Tons per year- **Not significant**

MR-4A (primer)

67 gal* 8.344 lbs/gal (density of H₂O) * 0.96 (specific gravity of MR-4A)= 536.7 lbs

536.7 lbs /2000 lbs/ton= **0.27** tons per year VOC from MR-4A(primer)

IPA

6.57 lbs per gallon * 1000 gal of IPA = 6570 lbs VOC

6570 lbs VOC/2000 lbs/ton = **3.285** tons VOC per year from IPA

MEK (100% conc.)

770 gal *0.805 (specific gravity relative to water) *8.344 lbs/gal (density of H₂O)=5172 lbs per year VOC

5172 lbs/ 2000 lbs/ton = **2.59** tons per year VOC from MEK

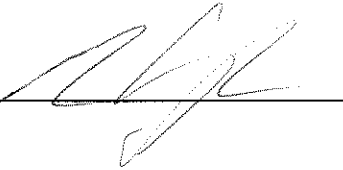
Total actual VOC emissions

1.57 + 2.47 + 1.06 + 0.27 + 3.285 + 2.59 = 11.245 tons VOC from the facility per year

Conclusion

It appears that Fuyao is in compliance with the Federal Clean Air Act Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act of 1994, PA 451, as amended, and Michigan's Air Pollution Control Rules. I used the worst case calculations for plant emissions, counting the application of adhesion promotor separate from surface coating of black or clear paint. This effectively counted three out of the five applicators twice. I did this because the application of the promotor was a different process than the application of the pigment. With this conservative estimate Fuyao was close to the major source threshold for aggregate HAPs (17.61 tons of 25 tons) and single HAP (toluene 9.29 tons of 12 tons). The facility does not appear to be excluded from using exemptions per the requirements of R 336.1278. Based on the information provided, Fuyao's actual emissions were 11.245 tons of VOC per year. This is below the significance levels of Rule 119 (40 tons of VOC per year). If Fuyao were to install any additional lines they would need to calculate their potential to emit and determine if a permit would be required for their operations. This does not seem likely

though; the facility informed me that they plan on moving most of their equipment to Plymouth Michigan by the end of September 2017, and that they are currently in the process of applying for a permit for that location. The Detroit district office has been informed of the facility and its background.

NAME 

DATE 2/15/17

SUPERVISOR SK

