

DEPARTMENT OF ENVIRONMENTAL QUALITY  
AIR QUALITY DIVISION  
ACTIVITY REPORT: Scheduled Inspection

N118547073

FACILITY: SHAPE CORP		SRN / ID: N1185
LOCATION: 1900 HAYES ST, GRAND HAVEN		DISTRICT: Grand Rapids
CITY: GRAND HAVEN		COUNTY: OTTAWA
CONTACT: Michael Westbrook , Safety & Environmental Manager		ACTIVITY DATE: 10/26/2018
STAFF: Tyler Salamasick	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MINOR
SUBJECT: FY 2019 unannounced inspection.		
RESOLVED COMPLAINTS:		

*Clean Air Act Inspection report for Shape Corporation, (Shape) Grand Haven, Michigan*

### ***Regulatory authority***

*Under the Authority of Section 5526 of Part 55 of NREPA, The Department of Environmental Quality may upon the presentation of their card, and stating the authority and purpose of the investigation, enter and inspect any property at reasonable times for the purpose of investigating either an actual or suspected source of air pollution or ascertaining compliance or noncompliance with NREPA, Rules promulgated thereunder, and the federal Clean Air Act.*

### ***Facility Background***

Shape Corporation is a manufacturer of automotive parts. The facility specializes in the manufacturing of bumpers and energy management systems (brackets). The main processes involve welding, roll forming, assembly, pultrusion and coating of automotive parts. Shape also produces some metal parts for furniture.

Shape Corporation is not subject to the Title V program, which is discussed below, in the regulatory analysis section of this report.

### ***Compliance History***

The facility has not received any violation notices in the past five years. The facility was last inspected in Fiscal Year 2012 and was found to be in compliance with the applicable air quality rules and regulations at that time.

### ***Location***

Shape Corporation campus is located at 1900 Hayes Street, Grand Haven, Michigan. This area is a light industrial area. The campus consists of buildings at the following locations, 1900 Hayes St, 1820 Hayes St, 1825 Industrial Drive, 1835 Industrial Drive and 1845 Industrial Drive. The nearest residential structure is approximately 0.25 miles to the east of the facility. The campus is also located in close proximity to Shape Corp's 172<sup>nd</sup> Ave and Comstock Street facilities. The facilities were also inspected on the same day as the Hayes Street campus. The inspections are recorded in separate inspection reports. The EPA is currently reviewing the policy on single source determinations and Shape Corporation should reevaluate if the associated buildings are a single source, or if they are separate prior to installation of new emission units.

### ***Recent Changes***

Shape Corp was recently issued a permit to install. The facility installed a pultrusion line at the 1835 Hayes Street building. The pultrusion line is used to make carbon fiber bumpers with light weight

automotive applications. The pultrusion line has two associated natural gas fired curing ovens.

---

### ***Introduction and purpose of inspection***

On October 26, 2018 Tyler Salamasick, Environmental Quality Analyst of the Michigan Department of Environmental Quality, Air Quality Division conducted an unannounced, scheduled inspection of Shape Corporation. The MDEQ inspected the facility campus located at 1900 Hayes Street, Grand Haven, Michigan.

The purpose of the inspection was to determine the facility's compliance with the requirements of the federal Clean Air Act; Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451); the Air Pollution Control Rules; PTI No 97-17 and PTI No 126-00A.

### ***Observations and facility processes***

AQD staff met with Michael Westbrook, Safety and Environmental Manager, presented their identification and informed the representative of the intent of the inspection. The facility representative agreed to show the AQD the facility and its processes. The facility's processes are described in some detail below.

#### **1900 Hayes Street Building**

This building is the main building at Shapes Hayes campus. The building is used for primarily roll forming metal and robotic welding. Metal is brought in as rolls. The metal is then unrolled and passed through a series of dies and welders where it is bent into the shape of a bumper. The different sections of the processes progressively bend the metal with various cutting and welding stations as well. This building also houses multiple robotic welding stations (approximately 10) and value-added stations. Some of the robotic welding stations are externally exhausted to the outside ambient air, while others are exhausted internally through filters.

#### **1820 Hayes Street Building**

Associated PTI 126-00A

Shape Corp's 1820 Hayes building is primarily used for electrodeposition coating (e-coat) and welding. The e-coat line is permitted under PTI 126-00A. This process utilizes a non-VOC caustic cleaning wash, a tap water rinse, surface conditioning with a zinc phosphate dip and a sealer dip. The coating is cured on as the parts pass through a curing oven. The permit limits the emissions of nitric acid, phosphoric acid and volatile organic compounds (VOCs) from the process.

#### **1835 Hayes Street Building**

Associated PTI 97-17

This building is primarily used for machining of aluminum. The aluminum machining process utilizes a washing system as well as aging ovens. The recently permitted PTI 97-17 covers a new carbon fiber pultrusion line. The pultrusion process uses carbon fiber and resin resulting in the emission of styrene. The carbon fiber bumpers are cured in ovens EU-Oven006 and EU-Oven007. The pultrusion process is done in a separate segment of the 1835 Hayes Street Building. This designated area is also used in part to store some of the resins. While in this area I detected a strong styrene odor, consistent in strength and profile with odors produced during the use of fiberglass resins. The pultrusion line has an associated laboratory where staff maintain production records. While in the area I reviewed Shape's pultrusion record keeping and calculations.

#### 1825 Industrial Drive Building

Shape utilizes this building for the production of historic part (legacy parts). The building has approximately six welding booths and some associated laser cutting. The laser cutting is internally vented.

#### 1835 Industrial Drive Building

The 1835 building houses Shape's tech center. This area is used for prototype machining. The machine shop cutting is externally exhausted. Most of this building is used for testing materials and does not appear to generate any significant air emissions.

#### 1845 Industrial Drive Building

This building is used as a maintenance shop. They have a single paint booth used for coating maintenance parts. This area was not being used during my inspection. They were dismantling some prototype equipment at the time of my inspection.

---

### ***Regulatory analysis and compliance evaluation***

#### *Facility emission category*

Shape Corporation is a minor source of volatile organic compounds (VOCs), hazardous air pollutants (HAPs) and particulate matter (PM). The facility is not currently subject to the Title V because it is a true minor source of air contaminants.

#### *Source Wide Conditions*

Shape Corp does not currently have a source wide limit. Source wide conditions apply to all process equipment at the stationary source including equipment covered by other permits, grandfathered equipment and exempt equipment. Since the facility does not have a source wide limit they were asked to provide a source wide potential to emit calculation. This calculation is intended to incorporate all potential emissions from both permitted and unpermitted processes. Shape's potentials are listed in the table below.

Source	PM	NOX	CO	Pb	SO2	VOC	Cr
Welding	2.1740						0.0057
Ovens	0.2514	3.3078	2.7786	0.0000	0.0198	0.1819	
Washers	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
HVAC	0.3281	17.9816	0.9630	0.0000	0.0001	0.0006	
1820 E-Coat (PERMITTED)						41.3000	
1835 Pultrusion (PERMITTED)						4.5000	
<b>TOTAL (tons/year)</b>	<b>2.7535</b>	<b>21.2895</b>	<b>3.7416</b>	<b>0.0000</b>	<b>0.0199</b>	<b>45.9826</b>	<b>0.0057</b>

Source	Cr VI	Mn	Ni	Al	HNO3	H3PO4	Styrene
Welding	0.0000	0.9222	0.0029	0.7678			
Ovens							
Washers							
HVAC							
1820 E-Coat (PERMITTED)							
1835 Pultrusion (PERMITTED)					0.5000	0.4000	4.5000
<b>TOTAL (tons/year)</b>	<b>0.0000</b>	<b>0.9222</b>	<b>0.0029</b>	<b>0.7678</b>	<b>0.5000</b>	<b>0.4000</b>	<b>4.5000</b>

The reported potentials from the processes are below 100 ton per year major source thresholds for PM, NOx, CO, Pb, SOx, and VOCs. They are also under the 10 ton per year major source threshold for individual HAP and the 25 ton per year major source threshold for aggregate HAPs.

PTI- 126-00A

Emission units - EU-SURFPREP and EU-ECOATINGLINE

EU-SURFPREP – This is processes includes a non-VOC alkaline cleaner (spray and dip clean), tap water rinse, surface conditioner dip rinse, zinc phosphate dip, tap water rinse, chrome-free sealer dip, and a reverse osmosis water dip.

*Emission limits* – EU-SURFPREP has the following nitric acid and phosphoric acid limits:

Pollutant	Limit	Time Period / Operating Scenario	Equipment	Testing / Monitoring Method
1. Nitric acid <sup>1</sup> [CAS # 7697-37-2]	0.5 tpy	12-month rolling time period as determined at the	EU-SURFPREP	SC VI.1, SC VI.2

		end of each calendar month		
2. Phosphoric acid <sup>1</sup> [CAS # 7664-38-2]	0.4 tpy	12-month rolling time period as determined at the end of each calendar month	EU-SURFPREP	SC VI.1, SC VI.2
3. Nitric acid <sup>1</sup> [CAS # 7697-37-2]	0.14 lb/hr	Test protocol	EU-SURFPREP	GC 13
4. Phosphoric acid <sup>1</sup> [CAS # 7664-38-2]	0.11 lb/hr	Test protocol	EU-SURFPREP	GC 13

Shape's EU-SURFPREP emissions are limited through process and operational restrictions. EU-SURFPREP does not have material limits. The facility calculates the nitric acid and phosphoric acid emissions based on hours of operation per month multiplied with the respective 0.045 lbs nitric acid per hour and 0.037 lbs phosphoric acid per hour emission factors. I contacted Mike Westbrook and inquired how the emission factors were determined. He provided a correspondence which indicates the emission rate is based on the concentration of free acid in the tank. I informed Mike that so long as if the operational parameters have not changed, the reasoning appears to be appropriate. The facility on average emitted between approximately 1/5<sup>th</sup> and 1/10<sup>th</sup> of the permit limit during the past 5 years.

#### *Process and operational restrictions*

The permit requires that the facility capture and store all waste in closed containers. I did not observe any open waste containers during the inspection. I also did not observe odors in the facility consistent with nitric acid or phosphoric acid.

The permit also limits the surface preparation tank temperatures to a maximum of 160F. The first cleaner alkaline tank was 142F, the second tank was 149F. The phosphate stage was 122F and the surface conditioner was 99F. These are all below the maximum 160F permit limit.

EU-ECOATLINE– This is processes includes an electrocoating dip, rising, a dehydration oven, a final bake and force cooling.

*Emission limits* – EU-ECOATING has a VOC limit of 41.3 tpy per 12 month rolling time period. The facility also has a VOC content of 0.5 lb/gallon \*(minus water) as applied limit. In the past 5 years the highest VOC emission rate occurred in January of 2013 at 30.6732 tpy of VOCs. During the record review it was observed that there was duplicative data for December of 2011 and December of 2012. The excel spreadsheet formula indicated that the data was erroneously quarried from the same 2012 data. It was also observed that the 2013 and 2014 nitric acid and phosphoric acid was reported as zero emissions though the individual yearly tabs report a monthly average emission at approximately 0.005 tons of each acid. The records also report conflicting values for phosphoric acid emissions for the end of 2017. The 12 month rolling records indicate zero emissions from February through December, but the 2017 monthly tab indicates an average monthly emission of approximately 0.003 tons. I indicated this to Mike and he informed me that he would investigate it. Mike resubmitted the corrected excel spreadsheet and the data appears to demonstrate compliance with the permit limits.

*Material limits-* As described above the facility has a 0.5 lbs/gallon VOC limit (minus water as applied). The PPG SDS for Powercron 6000CX indicates that the VOC content (minus water as supplied) is 0.45 lbs/gallon. The coating appears to comply with the VOC limit as set by the permit. The SDS also indicates that the coating is non-HAP based.

*Process and operational restrictions-* The facility is required to capture all waste coatings and store them in closed containers. The permit also requires that all VOC and or HAP containing materials are handled in a manner to minimize the generation of fugitive emissions. I did not observe open containers of waste or product during my inspection. The area was relatively clean and well kept.

PTI 97-17

Emission units (flexible groups) – EU-Pultrusion (FG-Bumpers), EU-Oven006 (FG-Bumpers and FG-DualUseOvens) and EU-Oven007(FG-Bumpers and FG-DualUseOvens)

FG-Bumpers – This processes includes a pultrusion line and two associated ovens used to cure carbon fiber automotive bumpers.

*Emission limits* – FG-Bumpers has the following emission limits:

<b>Pollutant</b>	<b>Limit</b>	<b>Time Period/ Operating Scenario</b>	<b>Equipment</b>	<b>Testing / Monitoring Method</b>
<b>1. VOC</b>	<b>4.5 tpy</b>	<b>12-month rolling time period as determined at the end of each calendar month</b>	<b>FG-Bumpers</b>	<b>SC VI.2</b>
<b>2. PM</b>	<b>0.01 lb/1,000 lbs exhaust, on a dry gas basis</b>	<b>Hourly</b>	<b>EU-Pultrusion</b>	<b>SC VI.6</b>

Shape’s emissions are limited by material usage limits. The facility recently completed the installation of the pultrusion process and is still troubleshooting the operation. The facility’s emissions are currently at a high of approximately 0.1 tpy. This is expected to increase as the facility’s production becomes more consistent.

*Material limits*

At the time of permit issuance, the facility had a stack height of 35 ft. Due to modeling the facility was limited to 270 parts per week and 32 parts per oven cycle. The permit was written to allow the weekly limit to be removed once the stack height was raised to at least 52.5 feet. The facility raised the stack on 4/8/2018. The facility has one record of 42 bumpers baked on 1/19/2018 indicated in one cycle. This might be 2 cycles recorded in one slot, as the rest of the data indicates normal cycle sizes at 24 or 32 bumpers. The facility complied with the 270 parts per week limit during the entire period with the 35 ft stack.

After raising the stack to at least 52.5 ft the facility is limited to 45,000 parts per year, per 12 month rolling time period and 96 parts per oven cycle. The facility has currently produced a total of 4811 parts (AQD calculated) since the installation of the equipment. The records are not currently set up to

automatically display a 12 month rolling total. The records should be modified to include a rolling total to ensure compliance with the permit limits. Each oven batch does not exceed the 96 parts per oven cycle with most batches containing either 96 parts or approximately 40.

#### *Process and operational restrictions*

The permit requires that the ovens not be operated in exceedance of 200F while processing parts from EU-Pultrusion. Pultrusion staff indicated that the temperature is monitored, and they do not exceed 200F because it would ruin their parts.

#### *Design and equipment parameters*

The permit requires that EU-Pultrusion is equipped with a properly operated dust collector. The facility has a baghouse with a pressure drop and associated alarm. The equipment is also designed to prevent the process from operating if the baghouse is not running.

FG-DualUseOvens- This process involves both aluminum aging activities as well as the curing of EU-Pultrusion parts. The flexible group sets process and operational restrictions for the ovens. The facility is not permitted to cure with ammonia, molten materials, oil coated parts or use the ovens for oil quenching. During the inspection Mike indicated that the ovens are not used for such activities and I did not observe evidence to indicate otherwise.

#### *Exempt processes*

Shape Corporations primary activities of metal processing, rolling cutting and bending appear to meet various permit exemptions. These processes, though they emit air contaminants are not subject to Rule 201 which would require a permit so long as they meet the requirements of R 336.1285(1)(2)(1)(i).

The same Rule 201 exemptions apply to the maintenance shop coating booth so long as it meets the requirements of R 336.1287.

The aluminum curing ovens, with the exception of the permitted EU-Pultrusion curing ovens, may also be exempt from Rule 201 so long as they meet the exemption R 336.1282. This exemption in part states ... Rule 282. (2) The requirement of R 336.1201(1) to obtain a permit to install does not apply to any of the following: (a) Any of the following processes or process equipment which are electrically heated or which fire sweet gas fuel or no. 1 or no. 2 fuel oil at a maximum total heat input rate of not more than 10,000,000 Btu per hour: (i) Furnaces for heat treating or forging glass or metals, the use of that does not involve ammonia, molten materials, oil-coated parts, or oil quenching.

The two permitted curing ovens do not meet this exemption because they are used to cure/heat treat carbon fiber bumpers (not metal).

---

#### *Discussion*

**Compliance Assistance:** The facility should take some actions to ensure accurate data management. The facility should also maintain a current potential to emit calculation as they make plans to install new processes that emit air contaminants. If the facility is going to install equipment that would increase their potential to emit in exceedance of major source thresholds, they should either acquire an opt-out permit with source wide limits or apply for a Title V permit.

**Compliance statement:** It appears that Shape Corporation is in compliance with the requirements of

the federal Clean Air Act; Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451); the Air Pollution Control Rules; and PTIs No. 126-00A and 91-17.

NAME 

DATE 12/26/18 , SUPERVISOR 