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

N506146741

FACILITY: TI Group Automotive Sys, LLC (Marysville Facility)		**SRN / ID:** N5061
LOCATION: 170 - 184 GRATIOT BLVD, MARYSVILLE		**DISTRICT:** Southeast Michigan
CITY: MARYSVILLE		**COUNTY:** SAINT CLAIR
CONTACT: Mark Eschenburg , Plant Manager		**ACTIVITY DATE:** 10/11/2018
STAFF: Adam Bognar	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** SM OPT OUT
SUBJECT: Scheduled Inspection		
RESOLVED COMPLAINTS:		

On Thursday, October 11, 2018, Michigan Department of Environmental Quality-Air Quality Division (MDEQ-AQD) staff, I, Adam Bognar, conducted an unannounced scheduled inspection of TI-Group Automotive Systems (TI Automotive) located at 170-184 Gratiot Boulevard, Marysville, MI 48040. The purpose of this inspection was to determine the facility's compliance status with the Federal Clean Air Act; Article II, Part 55, Air Pollution Control of Natural Resources and Environmental Protection Act, 1994 Public Act 451; Michigan Department of Environmental Quality, Air Quality Division (MDEQ-AQD) rules; and Opt-Out Permit to Install No. 113-14.

Permit to Install 113-14 was issued on September 12, 2014 as an ROP opt-out permit for VOC and HAP. Four metal tube coating lines are included in the permit. This facility is located in St. Clair county which is in non-attainment for ozone. St. Clair County is in attainment for CO, lead, NOx, and PM. A section of St. Clair county is in non-attainment for Sulfur Dioxide (SOx), but TI Automotive appears to be a few miles north of the SOx non-attainment area.

I arrived at the facility at around 11 am. TI-Group Automotive Systems is located across the street (Gratiot Blvd) from both residential properties and the St. Clair river. Other adjacent properties appear to be industrial. I did not notice any visible emissions while outside of the facility; however, I did notice a slight solvent odor. I entered the facility and met with Mr. Mark Eschenburg, Plant Manager and Dale Diener, Controls Project Leader. I identified myself, provided credentials, and stated the purpose of the inspection. Mr. Diener gave me a tour of the facility and gave me a detailed explanation of all of TI Automotive's processes.

TI Automotive manufactures coated steel tubes used for automotive brake lines, fuel lines, and other fluid carrying systems. The facility operates four metal tube coating lines and four metal tube rolling lines. There are approximately 150 employees that operate these lines continuously during three shifts.

Opt-Out PTI No. 113-14

There are four emission units in this permit. Each emission unit is a metal tube coating line that was previously addressed in another permit before being consolidated in this Opt-Out permit. All four lines are parallel and essentially identical, but there are some differences. Each line consists of a pretreatment section, a primary coating section, and a secondary coating section. Uncoated metal tubing arrives to the coating process wound to a vertical axis revolving cylinder known as a capstan. The capstan unwinds and feeds tubing to the coating line horizontally and continuously through all sections of this coating process at a speed that appeared to be about walking speed (3-4 mph). In this manner, many miles of tubing are produced each day.

EU-COATINGLINE1 and EU-COATINGLINE2 are permitted as "ALGAL" (Aluminum-Galfan coating) lines; however, ALGAL coated tubing is almost never produced anymore. Mr. Diener stated that they only run the ALGAL process on EU-COATINGLINE1 once per quarter and it is only used as replacement lines for existing automobiles. ALGAL is now considered old technology. The automotive industry has moved to "NYGAL" (Nylon-Galfan coating) lines that are more resistant to corrosion from water, salt, and other elements that automobiles are subject to.

EU-COATINGLINE3 and EU-COATINGLINE4 are permitted as "NYGAL" (Nylon-Galfan) lines. All four lines were running NYGAL during my inspection; although line 3 was down temporarily. The air permit allows them to run either ALGAL or NYGAL on any of the four lines because both coatings have nearly equivalent emission rates. The following discussion will describe the NYGAL process.

The coating process starts with large coils of copper coated steel tubing that is partially manufactured in four separate tube rolling machines at this facility. A zinc coated steel tubing that is manufactured at another facility is also used for certain customers. Much of this tubing is "double walled" to make it more capable of handling high pressure fluids. The tubing is generally around 3/8" in diameter.

The tubing is uncoiled from the capstan and fed to the coating lines where it first enters a hot water bath to wash the tubing. After washing, the tube is submerged in a pickling tank containing approximately 20% hydrochloric acid. The pickling unit prepares the surface of the tubing for the primer coating by removing any scale/oxidation. Before the tubing exits the pickling unit, high pressure inert gas (N_2) is used to air-wipe the hydrochloric acid off the tubing. This air-wiping generates a hydrochloric acid mist that is controlled by a caustic wet scrubber. Each coating line has its own dedicated caustic wet scrubber. Each scrubber is equipped with a process control system that automatically adds caustic liquor to the scrubber when the pH falls below 8.5.

After pickling, the tubing is again rinsed in hot water and heated to approximately 1000°F using an electric induction unit. The heated tubing is then coated with liquid Galfan (proprietary zinc/aluminum alloy). The Galfan exists as a molten metal inside an insulated tank that the tubing is fed through. There are no solvents mixed with the liquid Galfan.

The Galfan coated tubing is quenched with water to cool, and then dried with hot air. Once the tubing is dry, it is pretreated with the water-based surface activator Bonderite 1402W. After the Bonderite treatment, the tubing is coated with a nylon primer that is mixed with PM Acetate (VOC). PM Acetate is added to the primer as needed based on the viscosity of the solution. Viscosity is monitored by operators on an hourly basis using a Zahn cup. Excess nylon primer is removed by passing the tube through a mechanical wiper. Excess primer is reused.

After receiving the solvent based nylon primer coating, the tubing is fed through a four-zone natural gas fired oven to cure the coatings. Each coating line has a dedicated oven. In coating lines 1 and 2, this oven is run at 1650°F and doubles as an oxidizer for VOC emission control. In coating lines 3 and 4 the oven is run at approximately 1200°F. Coating lines 3 and 4 are equipped with a shared incinerator downstream of the oven exhaust that runs at 1650°F to achieve VOC destruction.

The tubing receives the nylon coating after the curing oven. There are several layers of nylon with slightly differing compositions. The differing nylon compositions are applied so that if one nylon layer is penetrated by some corrosive agent, then another layer may be more resistant to that agent. A small amount of oily byproduct is emitted from the nylon coating process. A capture system is in place to suck up any oil emissions and catch them in a mist eliminator/oil catch system.

The nylon coated tubing is heated/cured using an induction coil and quenched in water to set the coating. The finished product is re-coiled and shipped to various automotive manufacturers.

When the occasional ALGAL coating is applied the only difference is that instead of the nylon primer, an aluminum-rich primer is used. The aluminum rich primer is also mixed with PM Acetate. No nylon or Bonderite 1402W is used in ALGAL.

There have not been any major changes to the coating lines since the last AQD inspection in 2014. The most recent changes include a circular shaping die that the tubing passes through before the coating that ensures that the tubing is the correct shape. A brush has also been installed before the coating process to create micro scorings on the surface of the metal, aiding in coating adhesion. Dryers have been installed to dry the nylon pellets before they are melted and used as coating.

Since the special conditions of each of the four coating lines are essentially the same, I am going to address them simultaneously in the following paragraphs.

III. Process/Operational Restrictions

A minimum operating temperature is required for the ovens and incinerators. Ovens must be above 1600°F and incinerators must be above 1450°F. The table below outlines the temperature values I noted during my inspection.

The pH of the caustic scrubbers is required to be maintained at a level no less than 7.0 at all times of operation. Table 1 below outlines the pH values I noted during my inspection.

Table 1: Inspection Data - Pickling Tank pH and Oven Temperatures

Coating Line #	Caustic Liquor pH	Oven/Incinerator Temp
1	9.5	1650°F
2	8.8	1650°F
3	11.7	1650°F
4	9.6	1619°F

In coating lines 1 and 2 the exhaust flow of the coating line to the coating oven is limited to 50 SCFM. During my inspection, the exhaust flow to oven 1 was 31 SCFM and the exhaust flow to oven 2 was 17.5 SCFM.

An approved preventative maintenance plan is required for caustic scrubber operation. A preventative maintenance plan was submitted and approved by the AQD on September 27, 1999 (located in AQD facility file).

IV. Design/Equipment Parameters

All four coating ovens must be equipped with a temperature monitoring device. Each oven is equipped with four temperature monitoring devices – one at each zone. This information is sent to the integrated control system that will automatically shut down the process if the temperature falls below a set value.

It is required that each of the ovens have an encoder that measures the rpm of the inlet blowers to the coating ovens (lines 1 and 2) and incinerator (lines 3 and 4). An encoder is present on each of the four blowers that relays the information back to the process control system for each line. If the blowers fail or the rpm's fall below their set value, the coating line will automatically shut down.

TI Automotive shall not operate a pickling tank unless the caustic scrubber is installed and operating correctly. The caustic scrubbers appeared to be operating correctly on all four lines. The process control computer indicated that the pH was above the 7.0 limit and that caustic liquor was flowing through the unit. I did not notice any acidic smells while walking next to the pickling tanks. Per permit requirements, each of the scrubbers is equipped with a pH control system that will automatically shut down the coating lines if the pH falls below 7.0.

VI. Monitoring/Recordkeeping

Special Condition 1: Requires TI Automotive to record coating oven inlet blower RPM information using the process control system. This information is recorded in the computer system. Mr. Eschenburg provided me with recent blower RPM records (Attachment 4) for each coating line. I reviewed these records and did not notice any instance where the blower speed was below the permit minimums.

Special Condition 2: Requires TI Automotive to record the pH of the caustic scrubbing solution using the process control system. These records are maintained for all four pickling tanks. Mr. Eschenburg provided me with recent pH records for each tank (Attachment 5). I reviewed these records and did not notice any instance where the pH was below the permit minimum of 7.

Special Condition 3: Requires TI Automotive to submit all required calculations in an acceptable format for the previous calendar month. Calculations and records appear to be kept in an acceptable manner.

Special Condition 4: Requires TI Automotive to keep a monthly record of the hours of operation, amount of Dorriflex G used, PM Acetate used, amount of each coating used, total VOC emissions (lb/day, tons/month, 12-month rolling), and the amount and VOC content of all purge/cleanup solvents used.

The hours of operation data for each individual coating line is recorded monthly and included alongside the facility-wide VOC information (Attachment 1). The facility 24 hours a day in three shifts. There is no permit condition limiting the hours of operation.

Dorriflex G (Aluminum/teflon based primer) is only used on the rare occasions that the ALGAL process is run. Mr. Eschenburg reviewed his records and stated that 170 gallons were used in 2017, and 80 gallons were used in 2018 (YTD). Dorriflex G has a VOC content of 4.8 lbs/gallon. There is also 2% Phenol (HAP).

PM Acetate usage is recorded for each individual coating line (Attachment 2). Total usage for the 12-month rolling period ending in September, 2018 is detailed in the table below. PM Acetate usage appears to be under

the 1,700 gallon/year usage limit on coating lines 1 & 2, and the 2315 gallons/year limit on coating lines 3 and 4. The VOC content of PM Acetate is 8.08 lbs/gallon.

PM Acetate, also known as propylene glycol methyl ether acetate (PGMEA), is not considered a HAP by the EPA because it is based on propylene glycol rather than ethylene glycol. Only glycol ethers based on ethyl analogues such as ethylene glycol, diethylene glycol, and triethylene glycol are considered HAPS.

Nylon primer usage is recorded alongside PM acetate usage. Total usage for the 12-month rolling period ending in September, 2018 is outlined in Table 2 below. The VOC content of Nylon Primer is 5.89 lbs/gallon. The HAP content of the Nylon Primer is around 1.04 lbs/gallon. HAPS in the Nylon Primer include, by weight, 5% Phenol, 5% Creslyic Acid, and 0.38% Formaldehyde.

Table 2: Coating Lines 1-4 - Annual Solvent/VOC usage for the 12-month rolling period ending in September, 2018

Coating Line #	PM Acetate Use (Gallons) (8.08 lbs VOC/gallon)	Nylon Primer Use (Gallons) (5.89 lbs VOC/gallon) (1.04 lbs HAPs/gallon)	Total VOC Used (Tons)	Total HAP Used (Tons)
1	1194	420	6.06	0.22
2	1219	455	6.27	0.24
3	1237	1237	8.64	0.64
4	1081	442	5.67	0.23
Totals (1,2,3,4)	4731	2554	26.64	1.33

*usage does not necessarily reflect actual emissions since the ovens/incinerator will oxidize a portion of the VOC/HAP used.

Coating lines 1 and 2 both have an annual VOC emission rate of 7.9 TPY. Coating lines 3 and 4 both have an annual VOC emission rate of 13.4 TPY. Based on the reported usages, coating lines 1 through 4 appear to meet the emission and material limits outlined in Permit to Install 113-14.

VOC/HAP waste disposed of is recorded monthly. Mr. Eschenburg provided me with 12-month rolling totals of VOC and HAP waste (Attachment 3). Most of this waste is Nylon Primer. Other sources of this waste include PM Acetate and contaminated rags. The amount of waste in these records is only an estimate since no testing is performed on the waste shipped out. This VOC/HAP waste is not used as a credit to subtract from facility-wide emissions.

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Facility-wide potential emissions are limited by ROP Opt-Out limits of 50 tpy VOC, 8 tpy of an individual HAP, and 18 tpy total HAPs. Based on my record review these limits have not been exceeded. Total facility-wide VOC use for the 12-month rolling period ending in September 2018 is approximately 29.76 Tons. Facility-wide emissions are detailed in Attachment 1.

Facility-wide HAP usage for the 12-month rolling period ending in September 2018 is approximately 1.74 Tons. The HAP profile is approximately 47% phenol and 47% creslyic acid. The balance consists of HCl from the pickling tanks and formaldehyde.

Recordkeeping issues:
During my inspection, I was not able to review records because the Environmental Contact, Mr. Jim Osborne, was out of the office. Mr. Osborne is responsible for maintaining VOC/HAP usage records. Per my request, Mr. Eschenburg provided me these records on Friday, October 19. There were some minor issues with the records I received. All the information needed to comply with Permit to Install 113-14 was included, but it was not in the correct format. For example, VOC/HAP usage data was recorded for each month but was not totaled in 12-month rolling intervals. TI Automotive worked quickly to remedy the recordkeeping issues I had and provided me with revised records. Recordkeeping now appears to be satisfactory.

Cold Cleaners
I observed seven parts washers/cold cleaners located throughout the facility. These are used for maintenance purposes. All cleaning tanks had operating procedures posted near the unit. Additionally, safety data sheets for the cleaning agent used are located next to the units. The lids were closed during my inspection. One of the

parts washers is heated but uses an aqueous based cleaner. The solvent based cold cleaners utilize either mineral spirits or PM Acetate as the wash solvent. Combined VOC emissions from these cold cleaners are estimated annually for the MAERS report at approximately 1 ton per year. All air/vapor interfaces were less than 10 square feet. All cleaning solvents appear to have a Reid vapor pressure less than 0.3 psia. I informed Mr. Diener that lids need to be kept closed when not in use and washed parts need to be held above the tank until dripping ceases. These parts washers/cold cleaners appear to be exempt from Rule 201 requirements pursuant to Rule 281 (2)(k) and Rule 281 (2)(h).

Metal Tube Rolling Operation

TI Automotive operates four metal tube rolling/brazing lines parallel to the four coating lines. These lines are used to create the tubing that is fed to the coating lines. The raw material is received as a coil of approximately 1.5-inch-wide copper coated steel sheet. This steel sheet is fed continuously through the rolling/brazing line at a similar rate to the coating machines. The sheet is rolled into a tube by a series of dies. The tube can be either single or double rolled. The freshly rolled tube is then heated to a high temperature through induction and sealed by brazing. The tube is cooled by running it through a water jacketed tube containing inert gas (to prevent oxidation). The finished product is coiled and sent to the coating line. All brazing is performed in a completely enclosed environment. Metal tube rolling operations appear to be exempt from Rule 201 requirements pursuant to Rule 285 (2)(i).

Boilers

There are two natural gas fired boilers used for process water heating. Each boiler has a heat input capacity of 750,000 Btu/hr. These boilers appear to be exempt from Rule 201 requirements pursuant to Rule 282 (2)(b)(i).

Compliance Determination

This facility appears to be 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); Michigan Department of Environmental Quality-Air Quality Division (MDEQ-AQD) Administrative Rules; and Permit to Install No. 113-14.

NAME Adam Bogart DATE 11/8/2018 SUPERVISOR SB