

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

N506126958

FACILITY: TI Automotive , LLC (Marysville Facility)		SRN / ID: N5061
LOCATION: 170 - 184 GRATIOT BLVD, MARYSVILLE		DISTRICT: Southeast Michigan
CITY: MARYSVILLE		COUNTY: SAINT CLAIR
CONTACT: James Osborne , Engineering Director		ACTIVITY DATE: 09/04/2014
STAFF: Francis Lim	COMPLIANCE STATUS: Compliance	SOURCE CLASS: SM-208A
SUBJECT: Inspection		SM opt out
RESOLVED COMPLAINTS:		

On September 4, 2014, I conducted an inspection at TI Automotive located at 184 Gratiot Blvd., Marysville, Michigan. The purpose of the inspection was to determine compliance 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) Administrative Rules; and the conditions of Permit-To-Install (PTI) Nos. 871-93B, 164-95A, 260-96B, and 573-96A.

Mr. Jim Osborne, Director, Process & Manufacturing Engineering represented the facility during the inspection. Mr. Mohsen Kambod is the facility's consultant.

Plant Information

TI Automotive Group coats tubing used in the manufacturing of brake and fuel lines for the auto industry. Facility operates four metal tube coating lines. The coating lines operate 2 to 3 shifts per day, up to 7 days a week. All four metal tube coating lines are similar processes, with slight variations. Each line consists of a pretreatment section, a primary coating section, and a secondary coating section.

Facility has the following air permits:

PTI 871-93B Line 1 (Curing and solvent removal/destruction oven)
 PTI 164-95A Line 2 (Curing and solvent removal/destruction oven)
 PTI 260-96B Line 3 (Curing/solvent removal oven with incinerator)
 PTI 573-96A Line 4 (Curing/solvent removal oven with incinerator)

NOTE: Facility submitted an Opt-Out permit to opt-out of the Renewable Operating Permit (ROP) requirements. PTI No. 113-14 was approved September 12, 2014. At the time of inspection, this permit was not yet issued. Facility was registered as a Rule 208a source to opt-out of the ROP. Rule 208a has been rescinded.

Lines 1 and 2 are permitted as ALGAL lines, where the tubing is coated with an aluminum-rich primer coating and Galfan (proprietary zinc/aluminum alloy). In the pretreatment section, small diameter metal tubing (3/8" max diameter) is uncoiled then washed in hot water. After washing, the metal tubing is submerged in a pickling unit containing approximately 20% hydrochloric acid. Emissions from the pickling unit are controlled by a wet scrubber which uses a caustic liquor as scrubbing fluid. When pH goes down to 8.5, caustic liquor is automatically added. After pickling, the metal tubing is then washed again with hot water. Following pretreatment, the tubing is heated to approximately 1,000 °F by an electric heating unit. The tubing is then coated with liquid Galfan. There are no solvents mixed with the liquid

Galfan. The coated tubing is quenched with water to cool, and then dried with hot air. Once the tubing is dry, a second coating, a polymer based aluminum-rich primer coating is applied to the tubing using a flow applicator. A reducer, PM Acetate is added to the coating pot to maintain the required viscosity of the coating. Viscosity of the coating is monitored by the operator on an hourly basis using a Zahn cup. The tube then passes through a mechanical wiper to remove excess coating. Excess coatings are reused. The tubing then goes through a natural gas fired oven consisting of 4 zones of heating. The purpose of the coating oven is twofold: curing of the coating, as well as for solvent removal & destruction. Set point of primary chamber is 1650 °F. Finally, the tubing is quenched in water and the finished tubing is recoiled. If the tubing breaks along the production line, the line is stopped and the tubing is spliced together.

Lines 3 and 4 are permitted as NYGAL lines, where the tubing is coated with nylon and Galfan (proprietary zinc/aluminum alloy). The process basically consists of the same steps as the ALGAL line, except for the following: the tubing is pretreated with Bonderite 1402W after it is treated with Galfan; the second coating consists of a nylon primer (instead of an aluminum-rich primer coating) mixed with PM acetate. Bonderite 1402W is a water based surface activator. Emissions from Lines 3 and 4 are controlled by the curing oven (partial destruction) and incinerator. Intake from the incinerator is upstream of the oven and from the oven.

Facility is now using a new nylon formulation which has 4.4 pounds/gallon VOC content; new aluminum rich primer coating has 4.8 pounds/gallon VOC content. Old formulation coatings have higher VOC content.

The solvent removal oven and incinerator lowers the effective VOC content of the coating below the 3.5 pounds/gal, Rule 621 limit. Calculated effective VOC content of coatings with VOC control is 2.9 pounds/gal.

Although Lines 1 and 2 are permitted for an ALGAL line, the facility modified these lines so that either an ALGAL line or NYGAL line could be run on these 2 lines. A permit is not necessary for the modification since the nylon coating has an equivalent emission rate as the aluminum-rich primer coating. During the inspection, all four lines were running the NYGAL line.

The coating lines are operated and controlled using a state of the art PC based system manufactured by Factory Automation Control and Technical Services, Inc. (FACTS). The system controls and monitors electrical devices connected to it. The system has the ability to monitor, record, and generate a report of process variables and parameters.

Compliance

In calculating the VOC emissions from the coating lines, facility is using an overall destruction efficiency of 76.5% (90% incinerator destruction and 85% overall capture efficiency). This was the number assigned by the permit engineer during the permit evaluation. Residence time at the incinerator is approximately 2.1 secs.

Coating and PM Acetate usages per line are determined through monthly inventories. Usage is determined by counting the number of drums processed. The usage is reported in multiples of 50 gallons (one drum) minus the amount recycled. Operating hours are logged per day and used to prorate hourly and daily usage rate. VOC emissions from the coating and from PM Acetate are then calculated on an hourly, daily, and monthly basis. Total VOC emissions

are calculated per line, based on a rolling 12 month period.

PM Acetate is used as cleanup solvent. Cleanup solvent is taken from the same container used for reducing the coating, It is included in the usage records for PM Acetate. Acetate waste resulting from cleanup is hauled away as hazardous waste.

All compliance records are maintained. Staff randomly reviewed usage and emissions records for all 4 tubing coating lines for 2013 and 2014. Staff did not notice any exceedance of the usage and emissions limits during the random review. During the random review, staff noticed that usage entries were mostly for the NYGAL lines. While it may be possible that the lines were running mostly NYGAL, it could also mean that inadvertent entries were done when recording ALGAL instead of NYGAL.

Special Conditions for Permit No. 871-93B (Line 1) and 164-95A (Line 2).

14) Limit of 1.8 pounds VOC per hour and limit of 7.9 tons VOC per rolling 12-month time period. Pounds/hour emissions are calculated from VOC emissions per day and from hours of production. For Line 1, VOC emissions are 2.08 tons/year for the 12-month period ending in July 2014. For Line 2, VOC emissions are 1.82 tons/year for the 12-month period ending July 2014. See attached records.

15) Primary chamber oven temperatures for both lines were above the limit of 1600 °F.

16) A temperature monitoring device is installed on each chamber of each oven. Chamber 1 has 4 zones, chamber 2 has 3 zones. During the inspection, Line 1 oven temperatures for the different zones ranged from 1635 °F to 1656 °F. Line 2 oven temperature for the different zones ranged from 1643 °F to 1655 °F.

17) The exhaust flow from coating line to oven is limited to not more than 50 scfm. Each blower to the oven is rated at 50 scfm.

18) An encoder (measures RPM of fan motor) is installed on each line. The encoder is interlocked with the control system. The line will be stopped if the blower stops rotating. Fan speed is recorded by FACTS.

19) The stacks appeared to be constructed in accordance with the dimensions specified in permit (25" max diameter and 45' min height above ground).

20) Scrubbers are installed on both lines. The scrubbers appeared to be working properly. There is a viewing window to observe scrubber liquid flow to scrubbers. Facility implements a malfunction abatement plan for the scrubbers. Pressure drop across scrubbers is monitored.

21) The pH of the scrubbing solution for the scrubbers is kept above 7. There is a control switch that automatically stops the line if the pH analyzer detects a pH below 7.

22) A pH control system will stop Line 1 and Line 2 if the pH analyzer detects a pH below 7. pH is recorded by the pH control system.

23) A copy of the preventative maintenance program for the scrubbers is in the plant file.

Facility follows a weekly and monthly preventative maintenance on the scrubbers.

24) Usage limit for Dorrflex G (aluminum-rich primer) is 1 gallon/hour, and 8,568 gallons/year based on a 12-month rolling time period as determined at the end of each month. Based on the records provided, Dorrflex G has not been used in 2013 and 2014. See attached records.

25) Permit limit is 0.40 gallons of PM Acetate per hour and 1700 gallons/year based on a 12-month rolling time period as determined at the end of each month. Based on facility records, PM Acetate usage is less than 0.40 gallons/hour for Lines 1 and 2. Line 1 usage is 1397 gallons/year for the 12-month period ending July 2014. Line 2 usage is 1191 gallons/year for the 12-month period ending in July 2014. See attached records.

26) This condition specifies monthly information that has to be kept by the facility. Required records are kept by the facility.

27) This is a stack test condition. At this time, based on excellent VOC controls, high coating transfer efficiency, and good monitoring of emissions controls, a stack test is not necessary.

For Line 2, there is an additional requirement for disposal of waste materials. Waste materials are stored in closed containers and hazardous wastes are disposed appropriately.

Special conditions for Permit No. 260-96B (Line 3) and 573-96A (Line 4).

Line 3 is slightly different from Line 4 since the former has capability for both aluminum-rich primer coating and nylon coating. However, aluminum-rich primer coating has been seldom used in Line 3. Line 4 can only be used for nylon application. Both Lines 3 and 4 have ovens and emissions are ducted to an incinerator.

14) Limit of 3.0 pounds VOC/hour and VOC limit of 13.4 tons per rolling 12-month time period. Pounds/hour emissions are calculated from VOC emissions per day and from hours of production. For Line 3, VOC emissions are 2.27 tons/year and for Line 4, 1.78 tons VOC/year, based on the rolling 12-month period ending July 2014. See attached records.

15) The incinerator control appears to be working properly. Incinerator has 3 chambers. Temperature limit is 1450 °F. Temperature is set at 1700 +/- 150 °F. During the inspection, temperature was at 1685 °F. When the high or low temperature setpoint is triggered, the lines will shutdown. According to the facility, retention time is at 2.1 seconds, more than the limit of 0.5 seconds. The destruction efficiency of the incinerator is expected to be more than 95%. Facility uses an overall destruction efficiency of 76.5% for the purpose of calculating VOC emissions. Facility implements a weekly and monthly preventative maintenance on the incinerator.

16) An encoder (measures RPM of fan motor) is installed on each line. The encoder is interlocked with the control system. The line will be stopped if the blower stops operating. Fan speed is recorded by FACTS.

17) The stacks appeared to be constructed in accordance with the dimensions specified in permit (total of 3 stacks: stack #1, 25" max diameter and 45' min height above ground; stack #2, 8" max diameter and 40' min height above ground; and stack #3, 24" max diameter and 45' min height above ground).

18) Scrubbers are installed on both lines. The scrubbers appeared to be working properly. Scrubber is equipped with a view window to observe scrubber liquid flow. Facility implements a malfunction abatement plan for the scrubbers. Scrubber contact surface (rings and spheres) are serviced regularly. Pressure drop across scrubbers is monitored.

19) The pH of the scrubbing solution for the scrubbers is maintained above 7. There is a control switch that automatically stops the line if the pH analyzer detects a pH below 7.

20) A pH control system will stop Line 3 and Line 4 if the pH analyzer detects a pH below 7. pH is recorded by the pH control system.

21) A copy of the preventative maintenance program for the scrubbers is in the plant file. Facility follows a weekly and monthly preventative maintenance on the scrubbers.

22) Permit limit is 0.40 gallons of PM Acetate per hour and 2,315 gallons per year based on a 12-month rolling time period as determined at the end of each month. Based on facility records, acetate usage is less than 0.40 gallons/hour. For Line 3, usage is 1487 gallons/year based on a rolling 12-month time period ending July 2014. For Line 4, usage is 1142 gallons/year based on a rolling 12-month time period ending July 2014. See attached records.

23) This condition specifies monthly information that has to be kept. Required records are kept by the facility.

24) This is a stack test condition. At this time, based on excellent VOC controls, high coating transfer efficiency, and good monitoring of emissions controls, a stack test is not necessary.

Miscellaneous Operations

Other manufacturing operations at the site are the continuous induction brazing line (Rule 285 (i) exempt), nylon extrusion for nylon jacket application (Rule 286 exempt), and propylene extrusion for propylene jacket application (Rule 286 exempt). The continuous induction brazing line is a strip roll-forming, brazing/heat treating process used for manufacturing small diameter steel tubing. Process starts with mechanical roll-forming of a copper plated steel strip. A small amount of lube oil is applied in the tube forming mill. The rolled tube then passes through an electro-magnetic induction brazing process consisting of three induction power supply networks to progressively heat the tubing to its brazing temperature. In this process, flux is not needed since nitrogen and hydrogen is introduced to prevent oxidation. The tube is then cooled/quenched with water, reheated, and dipped in a Galfan bath. A thin coat of nylon is applied to the tube. The brazing line was transferred from their Warren facility in 2006. Facility also operates an exempt cold cleaner (Rule 281(h)) used in the maintenance department. The cold cleaner uses mineral spirits. Solvent is topped off or replaced as needed. Solvent usage is small.

These miscellaneous processes have low emissions. The facility is ISO 14001 certified. Plastic thermoforming is no longer done at the site.

In general, emissions control are well maintained and adequately interlocked to stop production during a malfunction of the control system.

J. A. J. 05-29-14

NAME _____ DATE _____ SUPERVISOR CTE