

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

N188844857

FACILITY: Gentex Corporation		SRN / ID: N1888
LOCATION: 600 N. Centennial Street, ZEELAND		DISTRICT: Grand Rapids
CITY: ZEELAND		COUNTY: OTTAWA
CONTACT: Gary Engerson , Environmental Health and Safety Manager		ACTIVITY DATE: 05/23/2018
STAFF: Tyler Salamasick	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: FY 2018 Major Source Inspection		
RESOLVED COMPLAINTS:		

Background

Gentex Corporation (Gentex) SRN: N1888 is a glass manufacturing facility that specializes in manufacturing automotive mirrors and aerospace glass. The facility also operates support chemical manufacturing, electronic assembly, glass processing and camera imaging. The production facilities consist of a seven-building campus with the headquarters located at 600 N. Centennial Street, Zeeland Michigan. Gentex is located in a primarily industrial area with the nearest residential structure approximately 400 feet west of the facility. The facility was inspected on 5/23/2018 by Tyler Salamasick, Environmental Quality Analyst of the Michigan Department of Environmental Quality, Air Quality Division. 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; and renewable operation permit MI-ROP-N1888-2016a.

Gentex is a major source of volatile organic compounds (VOCs) because the facility has the potential to emit over 100 tons of the pollutant. The facility currently emits approximately 50 tons of VOCs per year. The facility did not take emission limits that would lower their potential to emit below major source thresholds. The facility did take limits to lower their potential to emit individual hazardous air pollutants HAPs as well as aggregate HAPs. Gentex is limited to emit no more than 9 tons per year (tpy) of any individual HAP and no more than 22.5 tpy aggregate HAPs.

Inspection

Site arrival was at 8:45 am on 5/23/2018. I met with the receptionist, I presented my State of Michigan identification card, informed the facility representative of the intent of my inspection and was permitted onto the site. I met with Gary Engerson, Environmental Health and Safety Manager and Justin Olejniczak, Environmental Health and Safety Specialist. Mr. Olejniczak showed me the facility. Gentex is an automotive glass, mirror and circuit board manufacturing facility. The facility consists of six main buildings. During the inspection Mr. Olejniczak showed me the buildings located at 220 Riley, 58 Riley, North Riley Campus, 675 State Street, the Chiller building and 600 N. Centennial (east and west wings).

Building: 220 Riley

Primary function: Subassembly, Synthetic Chemistry and Warehousing

Description

Gentex uses the 220 Riley building for partial assembly of base components. The products are not finished and are eventually sent to different areas of the plant to be finished. I did not observe the use of cleaning solvents, coatings or adhesives. The sub assembly area did not appear to be a significant source of air emissions.

The synthetic chemistry area consisted of multiple reaction vessels. The reactors vary in size between

100 and 200 gallons. The batches react for an extended period of time, which restricts the total amount of material throughput. The reactors can use either atmospheric distillation or vacuum distillation. These processes recollect the solvent through cold traps. The chemical engineer informed me that they produce approximately 10 different products for use on site. The facility uses Rule 290 to exempt the processes from requiring a permit. The facility maintains the records based on batch calculations. This appears to be an appropriate method of maintaining records.

Building: 58 E. Riley

Primary function: Interior mirror final preparation before assembly, Materials Lab/ adhesive and glue blending

Description

The interior mirror final preparation involves glass processing prior to assembly. The facility has multiple glass processing line with various configurations. The process begins with mirrored glass. The mirror is cut and scored. The facility uses water cutting to finish the edge of the glass. Once the pieces are cut the glass is cleaned with acetone. Gentex recently installed two externally vented automated lines which use a new cleaning solution which the facility called "G Solve". The cleaning material consists of approximately 75% volatile organic compound(s) (VOCs). Gentex is currently using Rule 290 to exempt the cleaning processes from requiring a permit. The facility uses a material tracking program to calculate the usage of the cleaning solvents. This includes a point of use record and assumes all cleaning material is used. Mr. Olejniczac indicated that they are in the process of installing additional automated lines and are looking into permitted them instead of using Rule 290.

Once the glass is cleaned and the materials are prepared, the mirror is assembled. An adhesive is applied to one sheet of glass and the components are adhered together. Once assembled a dimming liquid is injected into the space between the two pieces of glass. The primary emissions from the process are from the initial cleaning of the glass with acetone. The adhesive used in the process is prepared in the Materials Lab, which is located on the second story of the same building.

The Materials Lab is relatively small and consists of a few blending stations with small fume hoods. The lab blends together adhesives/glues/epoxies along with conductive materials, including lead. The facility uses Rule 290 to exempt the process and maintains records to demonstrate compliance.

Building: North Riley Campus

Primary function: Electronic assembly and final interior mirror assembly

Description

The electronic assembly process starts with a blank circuit board. The boards are loaded into machines that add preloaded circuits onto the boards. This equipment uses lead free solder. The boards are loaded into a small curing oven, which is exhausted internally. The lead-free solder has a low VOC content, which is accounted for in the facility record keeping. The facility also tracks miscellaneous solvent usage under a Rule 290 exemption.

The final interior mirror assembly includes multiple lines which combine preassembled components. The lines use isopropyl alcohol (IPA) to clean the glass. They do not use acetone to clean at the final assembly stages because it can damage more sensitive components. The facility tracks the solvent usage and uses it to demonstrate a Rule 290 exemption from permitting.

Building: 675 N. State Street

Primary function: Exterior glass manufacturing, mirror manufacturing, laser ablation, glass coating, final assembly and fluid formulation

Description

The 675 State Street building produces a significant amount of the base components for the mirrors. The process starts with clear glass. The facility has various processes to cut and shape the glass. They also have seven glass coating lines. The glass coating involves a process called sputtering. While the glass is passed through a series of vacuum chambers, it is exposed to ionized chromium and rubidium gas which adhere to the glass and add a reflective coating. This process is done under a vacuum and does not appear to emit to the outside air. The processes is internally vented through what appeared to be a series of filters.

The mirrored glass is then sent for further processing within the building. The processing includes cutting the mirrors into shapes and laser ablation. The laser ablation is used to remove some of the reflective coating in specified patterns.

After observing the glass coating, cutting and laser ablation, we went to the fluid formulation area. This area was a small lab which consisted of primarily the blending of dimming fluid which Gentex uses. There were some fume hoods, thought the mixing vessels were sealed as the product was stirred. The facility tracks the process emissions and uses a Rule 290 exemption to exclude the process from permitting.

The State Street building also does some final assembly. The final assembly is similar to the other assembly lines. The process involves the use of IPA as a cleaning solvent. The emissions from the cleaning process are tracked for Rule 290 purposes.

Building: Central Chiller Plant

Primary function: Provide the various buildings with cooling

Description

The central chiller plant is used to provide the manufacturing buildings with cooling capabilities. The chiller building utilizes multiple compressors and a very small boiler. The process does not utilize anhydrous ammonia as a refrigerant. The chiller process appears to meet permit exemption R 336.1280 for cold storage equipment.

Building: 600 N. Centennial East

Primary function East: Electrical assembly and interior mirror manufacturing including full display assembly

Description

Finished components are assembled on various production lines. The assembly lines are similar to the various other assembly lines at the facility. Workers manually clean the mirrors with IPA and the usage is tracked. The facility uses Rule 290 to exempt the process from requiring a permit.

The electrical assembly is very similar to the electrical assembly at the Riley Campus, except the completed electronics are sealed with a coating at Centennial. The process coating is tracked, and the process appear to meet the 287(c) exemption as claimed by the facility.

Building: 600 N. Centennial West

Primary function West: Automotive glass and aerospace window manufacturing, microelectronic assembly (MEA), aerospace photolithography

Description

Centennial West has a photolithography lab. The processes primary emissions are from the use of cleaning solvents. The facility tracks the usage.

Centennial West assembles dimming aerospace windows. The process starts with sheets of glass. A worker scores and breaks out the shape. The glass is then washed with water and soap. Once washed a VOC based conductive paste is applied and cured in an oven. The oven is exhausted internally. The facility tracks the adhesive usage. Once assembled the glassed is cured a second time in an electric oven which is also internally vented. The glass is next filled with the dimming fluid and cleaned with acetone or IPA.

The other area of the Centennial West building is used for microelectronic assembly and plastic injection molding. The assembly area did not appear to regularly use IPA or acetone like the other assembly areas. This assembly line did not clean glass and the majority of the solvent usage was miscellaneous cleaning and maintenance. Justin informed me that they track the total solvent usage for all of the lines combined under EUCENTwMISCSOL.

Renewable Operating Permit MI-ROP-N1888-2016a
Conditions

FG-FACILITY

This flexible group establishes facility wide hazardous air pollutant (HAP) emission limitations on all process equipment including grand fathered equipment and exempt equipment.

The permit limits the emissions of each individual HAP to less than 9.0 tons per year (tpy). The permit also limits the emissions of the aggregate HAPs to less than 22.5 tpy. The yearly emission rate is based upon a 12 month rolling time period. This means that for any 12 month time period the permittee shall not emit in excess of either permit limit.

The facility tracks the emissions from all of the exempt and grandfathered equipment using a database. The provided information indicated that the highest 12 month rolling emission of any individual HAP was mixed xylene at approximately 2.5 tons. The recent reporting periods indicate that the facility has reduced their xylene emissions to approximately 0.2 tons per 12 month rolling time period.

The information also indicated that the highest monthly emission aggregate HAPs was approximately 3.9 tons. Recent totals indicate that the facility's 12 month rolling total is down to approximately 1.25 tons of aggregate HAPs emitted per 12 month rolling. The records are divided into a monthly report which includes a 12 month rolling total per that reporting period. This is an inefficient method of showing compliance, but it appears to demonstrate the facility is meeting the emission limit. The representatives indicated that they are transitioning to a new reporting program, which should make the data easier to use to determine compliance.

FG-RULE287(c)

This flexible group establishes material usage limitations for any emission unit that emits air

contaminants and is exempt from the requirements of Rule 201 pursuant to Rules 278 and 287(c). Currently the permit lists EUCENTeCONFCOAT as the only emission unit exempted by Rule 287(c).

Each emission unit is limited to no more than 200 gallons of coating per month, as applied, minus water. Justin provided records that indicate the highest monthly coating usage was 169 gallons in January of 2016. Currently the records are included with the unassociated Holland facility. This makes the records difficult to follow. The records also do not include a total usage record, but instead include a total per coating. The records should be clarified to include a monthly total of all coatings used (minus water) per exempt emission unit.

FG-RULE290

This flexible group establishes volatile organic compounds (VOC) and particulate emission limitations for any emission unit that emits air contaminants and is exempt from the requirements of Rule 201 pursuant to Rules 278 and 290. Gentex has a significant amount of Rule 290 exempt processes. The current ROP has 62 listed Rule 290 exempt processes. The majority of the Rule 290 exempt processes are manual cleaning lines which use either acetone or isopropyl alcohol (IPA) or some combination thereof. The cumulative potential to emit from the Rule 290 exempt processes exceeds major source threshold and Gentex did not take federally enforceable limits to keep their potential to emit lower.

Gentex provide documentation that included the following, a description of the emission unit, records of material use and calculations identifying the quality, nature, and quantity of the air contaminant emissions. Some of the calculations claimed to contain confidential business information and those reports will be retained as CBI.

The 290 emission units are each limited to 1,000 lbs of uncontrolled emissions, or 500 lbs of controlled emissions. The facility's records indicated the highest emitting 290 emission unit was the EU220RILEYSYNCEM which emitted on the higher end around 700 lbs per month. This is below the limit as specified in the permit. The majority of the facility's emissions come from the manual cleaning lines. The cleaning lines each emitted approximately 50 to 300 lbs of VOCs per month. This is also below the 1,000lb limit per emission unit as set by the permit.

FG-COLDCLEANERS

This flexible group establishes material limits, operational restrictions, design parameters and record keeping requirements for any cold cleaner that is grandfathered or exempt from Rule 201 pursuant to Rule 278 and Rule 281(h) or Rule 285(r)(iv). The permit currently includes four cold cleaners.

Material limit special condition II.1 requires that the cleaning solvents used in FG-COLDCLEANERS not containing more than five percent by weight of the following halogenated compounds: methylene chloride, perchloroethylene, trichloroethylene, 1,1,1-trichloroethane, carbon tetrachloride, chloroform, or any combination thereof. Justin provided me with the SDS sheet for the solvent (Safety Kleen Premium Solvent (Virgin and Recycled)). The SDS indicates that the material is 100% CAS 64742-47-8 (Petroleum distillates). The material does not contain any halogenated compounds. While inspecting the facility, I observed one of the cold cleaners and did not detect odors consistent with the use of halogenated compounds.

The process and operational restrictions section of FG-COLDCLEANERS requires that the cleaned parts are drained for no less than 15 seconds or until dripping ceases. Although the units were not being used at the time of my inspection, I did not observe any evidence that parts had been removed in a

manner that would cause dripping and spills. There were no solvent stains on the ground and I did not detect solvent odors.

The permit also requires that the equipment is maintained as recommended by the manufacturer. Justin informed me that Safety Kleen services the cold cleaners on a scheduled rotation. The regular service appears to meet the requirement of the permit.

The design and equipment parameter section of the permit requires that the cold cleaners meet the one of the following:

1. The cold cleaner must meet one of the following design requirements:
 - a. The air/vapor interface of the cold cleaner is no more than ten square feet.
 - b. The cold cleaner is used for cleaning metal parts and the emissions are released to the general in-plant environment.
2. The cold cleaner shall be equipped with a device for draining cleaned parts.
3. All new and existing cold cleaners shall be equipped with a cover and the cover shall be closed whenever parts are not being handled in the cold cleaner.
4. The cover of a new cold cleaner shall be mechanically assisted if the Reid vapor pressure of the solvent is more than 0.3 psia or if the solvent is agitated or heated.
5. If the Reid vapor pressure of any solvent used in a new cold cleaner is greater than 0.6 psia; or, if any solvent used in a new cold cleaner is heated above 120 degrees Fahrenheit, then the cold cleaner must comply with at least one of the following provisions:
 - a. The cold cleaner must be designed such that the ratio of the freeboard height to the width of the cleaner is equal to or greater than 0.7.
 - b. The solvent bath must be covered with water if the solvent is insoluble and has a specific gravity of more than 1.0.
 - c. The cold cleaner must be controlled by a carbon adsorption system, condensation system, or other method of equivalent control approved by the AQD.

The cold cleaner that I observed had a surface area less than 10 feet and its emissions were only emitted to the in-plant environment. This meets the requirement as set by the permit. The cold cleaner was also covered as required by condition 3.

FG-SIRICEMACT

This flexible group establishes operational restriction as well as design requirements for Gentex's existing emergency spark ignition engines less than 500 HP that commenced construction or reconstruction before June 12, 2006. The permit currently lists 10 generators included in FG-SIRICEMACT.

The process and operational restriction requires that regular maintenance is conducted including the following:

- a. Change oil and filter every 500 hours of operation or annually, whichever comes first, except as allowed in SC III.4;

- b. Inspect the spark plugs every 1,000 hours of operation or annually, whichever comes first, and replace as necessary; and
- c. Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.

Justin provided records that indicated the facility performs regular maintenance on the generators. The records also indicated that the generators have not reached 500 hours yet.

Conclusion

It appears that Gentex 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 MI-ROP-N1888-2016a.

NAME  DATE 6/26/18 SUPERVISOR 

