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

N188854475

FACILITY: Gentex Corporation		**SRN / ID:** N1888
LOCATION: 600 N. Centennial Street, ZEELAND		**DISTRICT:** Grand Rapids
CITY: ZEELAND		**COUNTY:** OTTAWA
CONTACT: Justin Olejniczak , Environmental Health and Safety Manager		**ACTIVITY DATE:** 08/04/2020
STAFF: Chris Robinson	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MAJOR
SUBJECT: FY '20 on-site inspection to determine the facility's compliance status with MI-ROP-N1888-2016b.		
RESOLVED COMPLAINTS:		

On August 4, 2020, Chris Robinson (CR) from the Department of Environment, Great Lakes, and Energy (EGLE) Air Quality Division (AQD) conducted an on-site scheduled inspection of Gentex Corporation (SRN N1888). Located in Zeeland, Ottawa County Michigan, to determine compliance with applicable air quality rules and regulations, including the facility's Renewable Operating Permit (ROP) MI-ROP-N1888-2016b. Per recent field work guidance, CR contacted Justin Olejniczak, Environmental Health and Safety Manager on August 3, 2020, to ensure proper staff would be onsite during the August 4, 2020 inspection as well as to prepare for any Covid19 related entry procedures.

Upon arrival, identification was provided to Mr. Olejniczak who was again informed of the purpose of the inspection. Prior to entering the plant CR and Mr. Olejniczak reviewed the facility's permit and any changes or concerns. Per Mr. Olejniczak there have been no changes to the facility since the prior inspection, however the facility is planning to add equipment in the near future. CR and Mr. Olejniczak discussed Rule 201 requirements prohibiting construction prior to permitting as well as the construction window for newly issued permits. Mr. Olejniczak was aware of the requirements. Proper PPE and social distancing were maintained throughout the inspection.

Weather conditions: mostly cloudy approximately 61 degrees F with winds coming out of the north at approximately 10mph (www.weatherunderground.com). CR surveyed the perimeter of the facility upon arrival for odors and visible emissions. None were observed.

A) Facility Description

Gentex is a technology company 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 in Zeeland Michigan.

B) Compliance Evaluation

1) ROP MI-ROP-N1888-2016b

The Semi-annual ROP Report Certifications were received on 9/19/2019 and 2/24/2020 with no deviations noted. The Annual ROP Compliance Certification was also received on 2/24/2020. Stack dimensions noted in the ROP were not explicitly reviewed but were observed. Observations appeared to confirm that the stack dimensions are correct. Also, Mr. Olejniczak Confirmed that there have been no changes to any of the stacks since the last inspection, which was conducted on February 8, 2016. All stacks appeared to be discharging unobstructed vertically upwards to ambient air.

a) Source-wide Conditions

Gentex is subject to source-wide emission limits (Special Conditions (SC) I.1-3) of 9-tpy individual HAPs, 22.5-tpy aggregate HAPs, 224.9-tpy of VOC's and a material limit (SC II.1) of 95,680,000 mirror units produced per year (based on a 12-month rolling time period). The following records are being maintained as required per SC VI.2&3 which have been provided and are attached to this report.

- Gallons or pounds of each HAP containing material used (Monthly)
- Where applicable, gallons or pounds of each HAP containing material reclaimed (Monthly)
- HAP content, in pounds per gallon or pounds per pound, of each HAP containing material used (Monthly).
- Individual and aggregate HAP emission calculations using mass balance (Monthly & 12-month rolling)
- VOC emission rate using an emission factor of 0.0047 pounds VOC per mirror unit assembled (Monthly and 12-month rolling).

- Records of the number of mirror units produced for the Source (Monthly and 12-month rolling).

The following was based on the provided records, which demonstrates that Gentex appears to be operating within the source-wide limits specified in ROP MI-ROP-N1888-2016b.

Pollutant or Material	Limit	Time Period	Total from Aug 2019 – July 2020	Within Limit (Yes/No)
Each Individual HAP	9-tpy	12-month Rolling	0.63 tons (Methyl Iodide)	Yes
Aggregate HAPs	22.5-tpy		1.77 tons	Yes
VOC	224.9-tpy		58.35 tons	Yes
Mirrors produced	95,680,000/year		27,368,890 mirrors	Yes

The facility currently determines HAP content of materials by using either the highest range provided in Safety Data Sheets (SDS) or, if one is not provided in the SDS, by requesting it from the manufacturer. CR discussed this with Mr. Olejniczak and he will begin requesting missing formulation data and updating records as needed.

b) 220 Riley Street (Subassembly, Synthetic Chemistry & Warehousing)
This building is used for partial assembly of base components. The products are not finished and are eventually sent to different areas of the plant to be finished.

The synthetic chemistry area is where the facility makes their adhesive and epoxy. It consists of multiple reaction vessels. 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. This emission unit (EU220RILEYMATLAB) is subject to a VOC emission limit of 2.0-tpy. Records are being maintained based on batch calculations. Maximum 12-month rolling emission were 0.13 pounds (0.00006 tons) which is well below the 2.0tpy limit.

c) 58 E. Riley Street (Interior mirror final preparation before assembly, Materials Lab/ adhesive and glue blending)
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.

The ROP flexible Group FGRILEYMANCLN includes all of the element cleaning lines located within the 58 East Riley Street building. This flex group is subject to an Acetone emission limit of 66-tpy and a material limit of 132,000 lbs/yr, both based on a rolling 12-mont time period. Records of Acetone usage are being maintained. Based on these records, which cover a time period of August 2019 through July 2020 the facility’s maximum rolling 12-month usage was 72,130.26 pounds for August 2019. The facility assumes 100% used is emitted. Therefore, Acetone emissions for August 2019 were also the highest during that time period with a 12-month rolling total of 36.07 tons (72,130.26lbs/2000lb per ton).

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. Emission unit EURILEYMATLAB is subject to a VOC emission limit of 6.0tpy based on a rolling 12-month period. VOC records are being maintained. Based on these records, which covers a time period of August 2019 through July 2020 the facility's maximum 12-month VOC emissions were 0.62 lbs. (0.003 tons) for April 2020.

d) North Riley Campus: Electronic assembly and final interior mirror assembly

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 solvent usage under a Rule 290 exemption.

Both the acetone and IPA emissions are uncontrolled and therefore, appear to be subject to the 1,000 lb./month emission limit specified in Rule 290. Based on the facility's Rule 290 records for August 2019 through July 2020, the highest monthly emissions of all Rule 290 emission units, source wide, was 765.5 pounds during the month of October 2019 for EU-RILEYMANCLNIECAPL6, which is below the limit specified in Rule 290.

e) 675 North State Street: Exterior glass manufacturing, mirror manufacturing, laser ablation, glass coating, final assembly and fluid formulation

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 are 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.

The fluid formulation area (EUSTATEFLUIDFORM) is a small lab use for blending of the dimming fluid. This emission unit is subject to a VOC emission limit of 6.0tpy based on a rolling 12-month period. VOC records are being maintained. Based on these records, which covers a time period of August 2019 through July 2020 the facility's maximum 12-month VOC emissions were 3.99 lbs. (0.0018 tons) for February 2020.

The State Street building also does some final assembly. The final assembly is similar to the other assembly lines. This ROP flexible Group (FGSTATEMANCLN) includes all of the element cleaning lines located within the 675 North State Street building. This flex group is subject to a VOC emission limit of 70-tpy and a cleaning solvent usage of 140,000 lbs/yr, both based on a rolling 12-month time period. Records for VOC emission and cleaning solvent usage are being maintained. Based on these records, which cover a time period of August 2019 through July 2020 the facility's maximum 12-month cleaning solvent usage was 67,006.5 pounds for February 2020. The facility assumes 100% used is emitted. Therefore, VOC emissions for February 2020 were also the highest during that time period with a 12-month rolling total of 33.50 tons (67,006.5lbs/2000lb per ton).

f) 600 North Centennial East: Electrical assembly and interior mirror manufacturing including full display assembly
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. This ROP flexible Group (FGCENTeMANCLN) includes all of the element cleaning lines located within the 600 North Centennial East Street building. This flex group is subject to a VOC emission limit of 19-tpy and a cleaning solvent usage of 38,000 lbs/yr, both based on a rolling 12-month time period. Records for VOC emissions and cleaning solvent usage are being maintained. Based on these records, which cover a time period of August 2019 through July 2020 the facility's maximum rolling 12-month cleaning solvent usage was 6,844.75 pounds for August 2019, December 2019, and January 2020. The facility assumes 100% used is emitted. Therefore, VOC emissions for those months were also the highest during that time period with a 12-month rolling total of 3.42

tons (6,844.75lbs/2000lb per ton).

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 appears to meet the 287(c) exemption as claimed by the facility. Based on data provided for August 2019 through July 2020 the months with the highest emissions were February, June, and July of 2020 at 31.7 gallons. Well under the 200 gallon/month limit.

g) 600 North Centennial West: Automotive glass and aerospace window manufacturing, microelectronic assembly (MEA), aerospace photolithography

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 a sheet of glass that is scored so that the shape of window can be broke out. The glass is then washed with water and soap then 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 then filled with the dimming fluid and cleaned with acetone or IPA.

Centennial West is also 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. All solvent usage is being tracked.

The facility has claimed that the application of the auto dimming fluid (EUCENTeCONFCOAT) is exempt under Rule 287(2)(c). This process is limited to 200 gallons per month of dimming fluid, as applied, minus water and per emission unit. Records were provided for August 2019 through July 2020. The maximum monthly usage was 31.70 gallons in February, June & July of 2020.

h) Other Exempt Equipment

Rule 290 (FGRULE290)
Gentex is currently using Rule 201 permitting exemption Rule 290 for several equipment which includes the following emission units:
220RILEYSYNCHEM, EU-9001RILEYBRDWASHER, EU-9001RILEYLASER, EU-9001RILEYMANCLNGR1, EU-9001RILEYMANCLNGR2, EU-9001RILEYMANCLNGR3, EU-9001RILEYMANCLNGR4, EU-9001RILEYPASTE, EU-CENTeBRDWASHER, EU-CENTeLASER, EU-CENTeMANCLNFDM105, EU-CENTeMANCLNFDM106, EU-CENTeMANCLNFDM107, EU-CENTeMANCLNFDM108, EU-CENTeMANCLNFDM110, EU-CENTePASTE, EU-CENTwDEFLASH, EU-CENTwMISCSOL, EU-CENTwPHOTOLITH, EU-CENTwVACUUM, EU-RILEYELMWSH110, EU-RILEYELMWSH203, EU-RILEYINKJET2, EU-RILEYINKJET2, EU-RILEYINKJET2, EU-RILEYINKJET3, EU-RILEYMANCLN208, EU-RILEYMANCLNCGP101, EU-RILEYMANCLNCGP102, EU-RILEYMANCLNCGP103, EU-RILEYMANCLNIECAPL2, EU-RILEYMANCLNIECAPL3, EU-RILEYMANCLNIECAPL4, EU-RILEYMANCLNIECAPL5, EU-RILEYMANCLNIECAPL6, EU-RILEYMISCSOL, EU-RILEYVACUUM, EU-STATECHEMCUT, EU-STATELASER, EU-STATEMANCLN514, EU-STATEMANCLN515, EU-STATEMANCLN516, EU-STATEPOTTING, EU-STATEVACUUM.

Rule 290 records were provided for August 219 through June 2020 and are attached. Emissions from only EU-RILEYVACUUM, EU-STATEVACUUM, and EU-CENTwVACUUM are controlled and would be subject to the 500 lb./month emission limit. Between these three emission units only, the month with the highest emissions was December 2019 at 13.96 pounds for EU-CENwVACUUM, which is under the 500 lb./month limit. The remaining 290 emission units appear to be subject to the 1,000 lb./month limit. As noted above the highest monthly emissions of all Rule 290 emission units, source wide, was 765.5 pounds during the month of October 2019 for EU-RILEYMANCLNIECAPL6, which is below the limit specified in Rule 290.

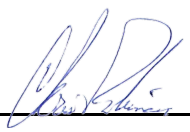
Rule 285 (FGCOLDCLEANERS)
Gentex has five (5) cold cleaners (EUCENTeCOLDCLEAN, EUSTATECOLDCLEAN, EURILEYCOLDCLEAN, EU220RILEYCOLDCLEAN, EU9001RILEYCOLDCLEAN) containing Safety Kleen Premium Solvent. These units are maintained by Safety Kleen and do not contain any halogenated compounds. Lids are kept closed when not in use. Each has a surface area of less than 10 square feet.

Emergency Engines (FGRICEMACT)
Gentex has 10 existing (<500hp) emergency generators (EUCENTNGGEN1, EUCENTNGGEN2, EUSTATENGGEN1, EUSTATENGGEN2, EUSTATENGGEN3, EU58RILEYNGGEN, EU220RILEYNGGEN, EU380RILEYNGGEN, EUCHILLERNGGEN, EU9001RILEYNGGEN) and two new (<500hp) generators (EU310RILEYNGGEN and EU9001RILEYNGGEN2), both installed in 2019. The facility is required to conduct and document regular maintenance every 500, 1000 hours of operation or annually. Mr. Olejniczak provided records demonstrating that Gentex is conducting regular maintenance. Since the generators have not reached 500 hours of operation, annual requirements are being met as required per NESHAPs 40 CFR Part 63, Subpart A and Subpart ZZZZ, for Stationary Reciprocating Internal Combustion Engines. All of the emergency generators are being operated under Rule 201 permitting exemption Rule 285(2)(g) for Internal combustion engines that have less than 10,000,000 Btu/hour maximum heat input.

2) MAERS Review
Emissions data for 2019 was received on time on February 18, 2020 and reviewed by the AQD on May 21, 2020. Other than having to upload documentation no changes were made to the submittal. The 2019 submittal is attached and summarized below.

Pollutant	LB	Tons
CO	0.00	0.00
LEAD	499.52	0.25
NOX	142.39	0.07
PM10,PRIMARY	7810.22	3.91
PM2.5,PRIMRY	0.00	0.00
SO2	0.85	0.0004
VOC	104455.88	52.23
ACETONE	70680.48	35.34
ACETONITRILE	573.46	0.29
CRESOL MX IS	0.31	0.0002
DIETHANOLAMI	0.01	0.00001
DIMETHFORMAM	208.00	0.10
ETHYLBENZENE	113.81	0.06
ETHYLENE GLY	10.88	0.01
HCL	3.74	0.002
HEXANE	174.31	0.09
METH ETH KET	4.27	0.002
METH IODIDE	1607.65	0.80
METH ISOCYAN	7.09	0.004
METH TERT BU	14.34	0.01
METHANOL	180.49	0.09
TOLUENE	993.87	0.50
TRIETHAMINE	15.64	0.01
XYLENE,O	569.03	0.28

C) Conclusion
Based on the observations and records review Gentex appears to be in compliance with the requirements specified in MI-ROP-N1888-2016b.

NAME  DATE 9/25/2020 SUPERVISOR HH