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

B645533399

FACILITY: CURTIS METAL FINISHING CO		**SRN / ID:** B6455
LOCATION: 6645 SIMS DRIVE, STERLING HTS		**DISTRICT:** Southeast Michigan
CITY: STERLING HTS		**COUNTY:** MACOMB
CONTACT: Ajay Jain , Environmental Manager		**ACTIVITY DATE:** 02/01/2016
STAFF: Francis Lim	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** SM OPT OUT
SUBJECT:		
RESOLVED COMPLAINTS:		

On February 1, 2016, Tyler Salamasick and Francis Lim conducted an inspection at Curtis Metal Finishing Company ("CMF") located at 6645 Sims Dr, Sterling Heights, 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) No. 383-00F.

Dave Yanochko and Ajay Jain represented the company during the inspection.

Permit conditions of PTI No. 383-00F were reviewed with the facility followed by the plant inspection.

FACILITY BACKGROUND

CMF, a Tier II auto supplier is a facility that coats metal fasteners (nuts, bolts, screws) and small metal castings of various sizes primarily for the automotive industry. CMF also supplies fasteners for the military, aerospace, agricultural and energy industry. Facility operates 24 hours/day, up to 7 days per week.

This facility is a synthetic minor source. Previously, the facility was issued several opt-out permits and permits-to-install. All permitted processes and equipment including ROP opt-out conditions are now consolidated into a single permit, PTI No. 383-00F.

Permit No. 383-00F is for nine (9) dip-spin coating lines and one (1) e-coat (electrodeposition) line. This permit sets a facility wide individual and aggregate HAP opt-out emission limits of less than 9 tpy (tons per year) and less than 22.5 tpy, respectively, to opt out of Title V permitting requirements.

A consent order with an effective date of June 12, 1997, CO No. 97-2800-CE agreed to by the DEQ and Curtis Metal is now terminated. The consent order terminated three years from the effective date of the consent order.

During an inspection conducted on March 25, 2010, AQD staff noted that the facility was operating Phosphate Lines 11 and 14 without the scrubber working properly. (NOTE: Phosphate Lines 11 and 14 are now Rule 290 exempt). Curtis Metal was issued a Violation Notice for this permit condition violation, resulting in a case handled by the Macomb County Prosecutor's Office. On October 12, 2013, CMF and the Macomb County Prosecutor's Office entered into a plea agreement. The stipulations of the plea agreement have been terminated.

EQUIPMENT AND PROCESS DESCRIPTION

Upon delivery, metal parts are sent through one of three zinc-phosphate lines (Line 11, 12, and 14). Each line is made up of a series of baths/tanks that includes rinse tanks, sulfuric acid pickling tanks, zinc phosphate tanks, an oil tank, a sealer tank plus a dry off oven. Parts are dipped into a zinc-phosphate solution and then rinsed in consecutive distilled water and city water tanks. Each of the baths is not a required sequential step in the process.

Fumes from Phosphate Line 11 and 14 are vented to one scrubber and the fumes from Phosphate Line 12 are vented to another scrubber. The scrubbers are no longer required and no longer operating. Fumes are still vented through the scrubber exhaust with the scrubber media removed.

The parts are sent through the zinc-phosphate lines to promote adhesion and to prevent corrosion. The parts are then sent to the dip-spin lines or the e-coat line for added protection and for decorative purposes.

The facility has nine dip-spin coating lines (Dip-Spin Line 21 to 29) which operate independently. Various coatings are used in these lines depending upon client specifications. The parts are coated by automatically loading them into a basket and dipping the basket into a coating vat. The basket is then raised, but still inside the vat. Excess coatings are then removed by spinning the basket on its vertical axis (except Line 29). After the excess coating is removed, the parts are dropped to a conveyor and sent to a flash-off zone and then to a curing oven (approximately 45 minutes). The flash off zone is about 2 feet in length and not enclosed. The oven curing operation is enclosed.

Line 29 (manufactured by Reinhardt) spins on its horizontal axis. The vat is contained inside a "clamshell" where the "clamshell" opens up to accommodate the basket and closes during the dip-spin cycle.

The dip-spin baskets are cleaned by blasting them on the table blaster using a metallic grit. The baskets go through a batch oven before blasting. The oven only loosens the excess coating, not to burn off excess coatings.

Emissions from the dip-spin lines, including the dip-spin operation, flash-off zones (a portion of the flash off zone has a small hood) and curing oven are ducted and controlled by two regenerative thermal oxidizers: RTO No. 1 controls Line 21, 22, 23, 24, 25, 26, and 28. This RTO has three chambers: purge, inlet, and outlet, which cycles approximately every 60 seconds. RTO No. 2 (installed December 2012) controls Line 27 and 29. This RTO has only two chambers.

The air flow to RTO No. 1 is rated at 44,000 scfm. The minimum operating temperature of both RTOs is 1400°F. There is an interlock system that shutdown the dip-spin lines when RTO temperature drops below 1400°F. During a shutdown, the automatic loading of the dip-spin basket stops; however, the loaded basket continues and finishes the spinning cycle. The conveyor and oven continue operating until manually shutdown. The RTO program logic that includes the damper opening/closing sequence was included in the previous report.

If an RTO is shut down due to an extended plant shutdown, it is restarted 5 hours before the scheduled start of production. Production will not start until the RTO is up to proper operating temperature.

The facility previously operated two e-coat lines, Line 41 and 42. E-coat Line 41 has been shutdown since July 1, 2008 and subsequently removed. Coatings are applied by immersing parts into a dip tank. The e-coat line is anodic and a rectifier current is applied to the e-coat process (300 to 500 amps current). Anodic e-coat deposits negatively charged coating into a positively charged metallic surface. The coating is first mixed in a premix tank before it is added to the bath. E-coat material is added based on an analysis by lab personnel. The paint solids average 17%, the concentration of DMEA is approximately 0.7% and the butyl cellosolve (ethylene glycol) is approximately 3%, and the balance is water.

E-coat Line 42 operates according to the following sequence: parts are dipped into an electrodeposition tank; the parts are then rinsed in a five-stage permeate rinse tanks/city water rinsing tanks (three permeate rinse tanks and two city water rinse tanks); and finally the parts are dried in a curing oven. Rinsing removes residual organics and pigments from the parts. The resulting coating will not drip or transfer to other materials when parts are removed from the rinse tanks. The permeate from the paint bath goes through the ultrafiltration system. The solids are returned to the paint bath and the liquid comes back to the permeate rinse tank.

Although the coating is water based, DMEA and butyl cellosolve are added to compensate for losses during the rinse process. VOC content of e-coat, as applied is 0.13 lbs/gal.

The permeate rinse is treated in the wastewater treatment facility. The city water rinse tanks are continuously overflowing and go to the wastewater treatment. The wastewater consists predominantly of water and the reducer DMEA, and butyl cellosolve. The wastewater treatment facility operates a clarifier to separate and remove the solids. Polymer is added to precipitate suspended solids. Sludge is processed through a filter press. Treated water is discharged to the Detroit Water and Sewerage System.

The company claims that only 3.3% of the VOCs that are used in the E-coat lines are emitted on-site (from flash off area, dip tank and oven). 96.7% of the solvent dissolves in the rinse water and is carried off to the sewer. Therefore, the facility only report as emissions 3.3% of VOCs used. This is specified in the permit. A mass balance study was done and results submitted to the DEQ. According to Bill Presson, permit supervisor, the company's claims are acceptable.

Material usage is logged per line. Material usage is logged at the individual production lines. A physical inventory of coatings used is done weekly and totaled every four weeks. The material inventory is used to "true-up" production records.

PERMIT-TO-INSTALL CONDITIONS

Curtis Metal Finishing was issued PTI No. 383-00F on September 17, 2014.

In determining compliance with VOC and HAP permit limits, I reviewed emissions records for the thirteen four-week period ending in December, 2016.

Since the facility uses noncompliant solvent-based coatings in the dip-spin lines, compliance with Rule 621 is achieved by controlling emissions with a regenerative thermal oxidizer. Facility has demonstrated that with RTO control, equivalent emission rate is below 3.5 pounds/gallon (as applied, less water).

Facility conducts due diligence in monitoring RTO parameters and implements preventive maintenance for the RTOs.

Facility keeps a record of RTO parameters that are monitored 3 times per shift. Among the parameters monitored are RTO afterburner temperature (NOTE: this is just an additional monitoring since the facility already has a continuous temperature chart recorder), inlet and outlet temperature, and fan speed. A change in pressure drop adjusts the variable speed fan (fan speed is measured in hertz) to maintain flow rate. See attached RTO logs for September and October 2016.

EUDIPSPIN SPECIAL CONDITIONS:

EUDIPSPIN consists of Dip-Spin Line 21, 22, 23, 24, 25, 26, and 28, including associated cure ovens controlled by RTO No. 1.

I.1. For the 13 four-week time period ending in December 2016, 23.92 tons of VOCs (after RTO control) were emitted. This is below the permit limit of 51.5 tons per 13 four-week period. See attached.

I.2. For the 13 four-week time period ending in December 2016, 0.61 tons of dibasic ester, dimethyl glutarate, and dimethyl succinate were emitted. This is below the permitted limit of 3.7 tons per 13 four-week period. See attached.

Section II NA

III.1. CMF collects and disposes hazardous waste properly. US Ecology processes their hazardous waste.

III.2. CMF implements a malfunction abatement plan (MAP) for EUDIPSPIN. An updated MAP was submitted to the DEQ on February 13, 2013. Facility conducts preventive maintenance every 10 weeks, every four months, once a year, once every two years, once every three years, depending on activity. Inspections include vibration testing/analysis, duct inspection, flow rate verification, inspect motor and gear drives and other activities.

IV.1. A stack test was conducted on RTO No. 1 on March 14-15, 2002. The stack test verified that the RTO control efficiency is at least 83.6% (permit limt). Test results (as calculated by AQD) are: capture, 95.7%; destruction 98.8%; overall control, 94.9%. I conducted random checks of the RTO temperature recorder (September and October 2015) and verified RTO operating temperature is at least 1400 °F. There is an interlock system that shutdown the dip-spin lines when RTO temperature drops below 1400 °F. There is also an alarm when the RTO temperature goes down below 1400 °F to alert facility personnel that all connected dip-spin lines are shutdown automatically.

V.1. VOC content of the coatings is determined from information supplied by the coating suppliers. VOC content determination is based on Method 24. Magni Industries supplies the majority of the coatings to the company.

VI.1. Facility completes all required calculations in a format acceptable to the AQD District Supervisor by the end of the 4-week period.

VI.2. The temperature of the RTO is being monitored and recorded on a continuous basis (temperature chart recorder) as required. In addition, an operator verifies RTO temperature by recording temperature in a logsheet three times per shift.

VI.3. A current list of the chemical composition of each coating, reducer, additive, and cleanup solvent is maintained. MSD sheets were provided during the previous inspection.

VI.4a. During the inspection, the record of hours of operation for each dip-spin line was reviewed.

VI.4b. During the inspection, the information necessary to calculate VOC emissions, including dibasic ester, dimethyl glutarate, and dimethyl succinate emissions was reviewed.

VI.4c. The facility provided records for Dibasic Esters emissions for the 13 four-week time period. Dibasic ester, dimethyl glutarate, and dimethyl succinate emissions were 0.61 tons for the 13 four-week period ending in December 2915.

VI.4d. I reviewed records of VOC emissions per four-week period and for a 13 four-week time period.

Section VII NA

VIII.1. Actual stack dimensions were not verified. Stack dimensions appear to meet permit requirements.

EUECOAT SPECIAL CONDITIONS

EUCOAT is for E-coat Line 42 consisting of an electrodeposition tank, a five-stage water rinse process, and a cure oven.

I.1. The highest VOC emission for any one 4-week period for the 13 four-week time period ending in December 2015 was 374.50 pounds (Period 13), below the permitted limit of 800 pounds per four-week period. See attached.

I.2. For the 13 four-week period ending in December 2016, 2.12 tons of VOCs were emitted from E-coat Line 42, below the permit limit of 4.7 tons per 13 four-week period. See attached.

Section II NA Section III NA Section IV NA Section V NA

VI.1. Facility completes all required calculations in a format acceptable to the AQD District Supervisor by the end of the 4-week period.

VI.2. The company provided a current list of the chemical composition of each coating, reducer, and additive. MSDS sheets were provided during the previous inspection.

VI.3a. CMF keeps a weekly record, for each coating, reducer, or additive used, of the following: coating ID, amount used, and VOC content.

VI.3b. CMF completes and keeps a record of all required calculations in a format acceptable to the AQD District Supervisor by the end of the 4-week period.

Section VII NA

VIII.1. Actual stack dimensions were not verified. Stack dimensions appear to meet permit requirements.

FGDIPSPINS SPECIAL CONDITIONS

FGDIPSPINS consists of Dip-Spin Line 27 and 29, including associated cure ovens controlled by RTO No. 2.

I.1. For the 13 four-week time period ending in December 2016, 6.93 tons of VOCs (after RTO control) were emitted. This is below the permit limit of 12.5 tons per 13 four-week period. See attached.

I.2. For the 13 four-week time period ending in December 2016, 0.03 ton of dibasic ester, dimethyl glutarate,

and dimethyl succinate were emitted. This is below the permitted limit of 7.8 tons per 13 four-week period. See attached.

I.3 For the 13 four-week time period ending in December 2016, 0.01 tons of naphthalene were emitted. This is below the permitted limit of 0.6 tons per 13 four-week period. See attached.

Section II NA

III.1. CMF collects and disposes hazardous waste properly. US Ecology processes their hazardous waste.

III.2. CMF handles all VOC and/or HAP containing materials in a manner minimizing fugitive emissions.

IV.1 and IV.2. RTO No. 2 is installed, maintained and operated properly. A stack test was conducted on RTO No. 2 on January 29 and 30, 2013. The stack test results showed an overall destruction efficiency of 61% (62 x 0.99) which appears to be noncompliant with the permit condition of 84% (88 x 0.95). After discussions with the facility that "water-based coatings could not be detected by the Flame Ionization Detector accurately", AQD concluded that the stack test was invalid. A retest was conducted on May 20, 2014 using solvent-based coatings.

I conducted random checks of the RTO temperature recorder (September and October 2015 temperature charts) and verified RTO operating temperature is at least 1400 °F. There is an interlock system that shutdown the dip-spin lines when RTO temperature drops below 1400 °F. There is also an alarm when the RTO temperature goes down below 1400 °F to alert facility personnel that all connected dip-spin lines are shutdown automatically.

V.1. VOC content of the coatings is determined from information supplied by the coating suppliers. VOC content determination is based on Method 24.

V.2. A stack test was conducted on RTO No. 2 on January 29 and 30, 2013. A retest was conducted on May 2014. For the purpose of calculating emissions, 98.1% destruction efficiency and 84.2% capture efficiency is used for RTO No. 2.

VI.1. Facility completes all required calculations in a format acceptable to the AQD District Supervisor by the end of the 4-week period.

VI.2. The temperature of the RTO is monitored and recorded on a continuous basis (temperature recorder) as required. In addition, an operator records RTO temperature in a logsheet, three times per shift, to verify that RTO temperature is above the limit.

VI.3. The company provided a current list of the chemical composition of each coating, reducer, and additive. MSD sheets were provided during the previous inspection.

VI.4a. CMF keeps a record of material usage.

VI.4b. CMF keeps a record of VOC content of the materials used.

VI.4c and VI.4d. I reviewed records of VOC emissions per four-week period and per 13 four-week time period.

VI.5. Facility keeps records necessary to calculate dibasic ester, dimethyl glutarate, dimethyl succinate and naphthalene emissions.

VI.6 I verified that RTO No. 2 operating temperature is kept above 1400 °F

VII.1. EUDIPSPINS installation has been completed. .

VIII.1, VIII.2, VIII.3, VIII.4, VIII.5, VIII.6, and VIII.7. Actual stack dimensions were not verified. Stack dimensions appear to meet permit requirements.

Section IX NA

FGFACILITY SPECIAL CONDITIONS

FGFACILITY is for all source wide equipment and processes.

I.1 and 1.2 Facility-wide aggregate HAPs for the 13 4-week period ending in December 2016 is 0.91 tpy. Highest individual HAP emissions is less than 0.91 tpy. Limit is 22.5 tpy aggregate HAP and 8.9 tpy any single HAP. See attached records.

1.1b. Facility-wide VOC emissions for the 13 4-week period ending December 2016 are 33.03 tpy. Limit is 89.9 tpy. See attached records.

Section II NA Section III NA Section IV NA

V.1. CMF determines HAP content of materials from manufacturer's formulation data.

VI.1. Facility completes all required calculations in a format acceptable to the AQD District Supervisor by the end of the 4-week period.

VI.2a. Usage of each HAP containing material used is kept.

VI.2b. I did not verify if facility takes credit for reclaimed HAP containing material.

VI.2c. HAP content of each HAP containing material is kept.

VI.2d and e. Individual and aggregate HAP emissions calculations for each four-week period is kept.

Section VII NA Section VIII NA Section IX NA

Phosphate Line Nos. 11, 12 and 14

Phosphate Line Nos. 11 and 12 were previously included in the permit. Phosphate Line No. 14 was previously exempt under Rule 285(r). These three emission units are now exempt under Rule 290. There are negligible emissions from the alkaline cleaning, sulfuric acid pickling, zinc phosphating operations and drying of sealers in the natural gas-fired dryers. Facility does not keep monthly emissions calculations, but keeps a calculation showing maximum emissions based on assumed parameters are negligible. If parameters change, facility will recalculate emissions based on new parameters. See attached calculations.

NAME _____ DATE 02-18-16 SUPERVISOR CTE