UNIVERSAL COATING, INC.

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Robert Byrnes
MDEQ – Air Quality Division
Lansing District Office
Constitution Hall, 525 W. Allegan St. 1 South
Lansing, Michigan 48909

April 15, 2016

RE: Response to Violation Notice dated March 16, 2016
Universal Coating, Incorporated, Flint, Michigan (SRN: N7256)

Dear Mr. Byrnes:

Universal Coating, Incorporated ("Universal Coating") recently received a Violation Notice ("VN") (dated March 16, 2016), which alleges several items, listed in Table 1 below. As requested, this letter response includes, where possible: the date the alleged violations occurred; an explanation of the causes and duration of the alleged violations; whether the alleged violations are ongoing; a summary of the actions that have been taken and are proposed to be taken to correct the alleged violations and the dates by which these actions will take place; and what steps are being taken to prevent a reoccurrence. If additional investigation into these items is needed, it is stated.

Table 1. Alleged Violations under VN dated March 16, 2016

Process Description	Alleged Rule/ Permit Condition Violation	MDEQ Comments
Four automatic miscellaneous metal parts spray lines	PTI 96-03C FG-CATOX SC IV.3 (Rules 205, 702, and 910)	The [February 11, 2016] response to this violation did not adequately address the length of time for this violation. Furthermore, the information provided in response to this item claims compliance; however, the data charts provided are still below the required 600 degrees Fahrenheit. The response should include all strip charts where the minimum oxidizer temperature of 600 degrees was not obtained.
	PTI 96-03C FG-CATOX SC I.1 (Rules 205 and 702(a))	Response needs to consider no control credit for periods of operating that the oxidizer was not at the proper temperature.
	PTI 96-03C FG-CATOX SC IV.2 (Rule 702(a))	We have reviewed the previous VN response and the DEQ still feels a PTI modification is needed to use spray equivalent other than HVLP.
Source wide Hazardous Air Pollutant (HAP) restriction	PTI 96-03C FG-FACILITY SC I.1 (Rule 205(1))	Exceeded 9.9 tpy HAP limit.

Catalytic Oxidizer Performance

Universal Coating is in the process of investigating catalytic oxidizer performance to address the alleged violation regarding catalytic oxidizer temperature, and to properly apply control credit to emission calculations.

Satisfactory operation of the catalytic oxidizer is defined under PTI No. 96-03C as a minimum VOC control efficiency of 80.75 percent and a minimum catalyst bed inlet temperature of 600 °F. In December 2005, Universal Coating performed VOC testing under the observation of MDEQ to establish the catalyst bed inlet temperature of 600 °F listed in the current permit. This test resulted in a VOC control efficiency of 82.30 percent (3-run average) at a catalyst bed set point temperature of 600 °F. The results of the December 2005 emissions test (summarized in Table 2 below) indicate that destruction efficiency at a catalyst bed set point temperature of 600 °F exceeds 80.75 percent.

Table 2. Catalytic Oxidizer Performance Testing on December 15, 2005

Parameter	Run No. 1	Run No. 2	Run No. 3	Average
Run Time	08:55-09:55	10:15-11:15	11:30-12:30	
Bed Set Point Temperature (°F)	600	600	600	600
Destruction Efficiency (% by weight)[1]	81.43	82.25	83.21	82.30

[1] Capture efficiency was determined to be 100 percent during the December 2005 test event.

Since the 2005 test, Universal Coating's catalytic oxidizer bed has remained at a set point temperature of 600 °F. The set point temperature is controlled with a thermocouple and is typically established during initial stack testing, then remains at that temperature unless manually adjusted. Universal Coating has assumed a control efficiency equivalent to the permit limit of 80.75 percent in emission calculations, although the emissions test supports an even higher destruction efficiency of 82.30 percent based on this set point.

While operating the catalytic oxidizer, Universal Coating has maintained records of the catalyst bed temperature using a strip chart recorder. In addition to the thermocouple used to maintain set point temperature, the oxidizer is equipped with an adjacent thermocouple that relays catalyst bed inlet information back to the control system for temperature monitoring and recording purposes. This temperature is monitored digitally (instantaneously monitored) and continuously recorded using the strip chart. The temperature is also monitored by operations staff on a daily basis and was consistently recorded on a calendar sheet daily by staff beginning in February 2016. In November 2015, Universal Coating observed a thermocouple failure resulting in erroneous temperature records at the chart recorder. As this thermocouple is not used to maintain the set point of the catalyst bed, it does not appear that this failure coincides with a failure in achieving the set point temperature.

Universal Coating has records indicating the strip chart was calibrated in 2009 and inspected in 2012 and 2013. As part of the inspections (performed by Nestec), the chart recorder was observed to be dysfunctional and recalibration or replacement was recommended, although the catalyst appeared to be operating properly. The strip chart manual does not appear to specify recommended timing for routine strip chart calibration or maintenance, beyond initial setup.

For a properly functioning chart recorder, a degree of error is intrinsic to the strip chart recorder itself based on the accuracy ratings. Based on the strip chart manual for Universal Coating's model, MRC 5000, the *chart recording accuracy* is "0.5% of chart span reference accuracy" and the *input*

accuracy is "0.25% of span". Universal Coating contacted the chart recorder manufacturer to clarify chart recorder performance and accuracy specifications. The *input accuracy* signifies potential error from the actual temperature read at the inlet to the catalyst bed to the instantaneous digital displayed value. The *chart recording accuracy* signifies potential error from the instantaneous digital displayed value to the chart-recorded value. Universal Coating uses a strip chart with a span of 0 to 800 °F and the chart recorder is set to a span of 0 to 799 °F, resulting in a chart recoding accuracy of ±4 °F and an input accuracy of 2 °F, summing to an overall accuracy of ±6 °F from the actual temperature. As such, it would be expected that at any given time, the chart recorder is off as much as 6 °F from the actual set point temperature.

To further illustrate this, Universal Coating performed a simplified accuracy check on the chart recorder on April 14, 2016. The oxidizer is no longer operational as the RTO has now been installed, so the thermocouple was providing a reading equivalent to ambient temperature of 72 °F (indicated on the digital readout). At the digital readout of 72 °F, the chart recorder logged approximately 66 °F. This indicates that the chart recorder accuracy error may be greater than the estimated 4 °F specified in the manual. The difference between the digital readout of 72 °F and the chart recorded value of 66 °F is 6 °F, which is 2 °F greater than the specified chart recording accuracy.

Based on the error of the strip chart explained above, temperature readings displayed on the strip chart that are within the range of 592+ °F would support proper catalytic bed temperature of 600 °F. Regardless, the 2005 performance test establishing proper catalytic oxidizer operation was linked to the set point temperature, rather than the chart-recorded temperature. The performance test indicated that at a set point temperature of 600 °F, the oxidizer is able to achieve 82.30 percent destruction.

Universal Coating is still in the process of gathering documentation to verify the performance of the oxidizer based on the set point being maintained at 600 °F. We are investigating methods to demonstrate alternative compliance with the permit requirement, to demonstrate the set point was maintained even if the chart recorder indicated otherwise. Upon resolution (anticipated by April 25, 2016), we will provide an amendment to specify the duration of the alleged violation.

Updated Emission Calculations

Universal Coating is also in the process of performing a thorough quality control (QC) review of emissions calculations of VOCs from FG-CATOX and HAPs from FG-FACILITY. This includes verification of coating usages, mix ratios, and proper calculation methodology through the extensive recordkeeping system used to track emissions. It appears that the mix ratios have been inputted correctly, but the usage information and calculation methodology for each applicable step is currently under review.

Based on consideration of the catalytic oxidizer performance (specified above) and pending investigation of thermocouple issues, Universal Coating will also be updating VOC and HAP emission calculations as necessary to remove control credit for periods during which proper catalytic inlet bed temperatures were not achieved. For most, if not all, periods of operation, the catalyst bed set point was properly set at 600 °F; however, it appears that the VOC and HAP emissions limitations may still have been exceeded due to high production levels.

HVLP Technology or Equivalent

As previously stated, the use of HVLP or comparable technology (e.g., electrostatic spray, dip, flowcoat, roller, dip-spin) is based on utilizing spray equipment with equal or better transfer efficiency to that of HVLP. Transfer efficiency is typically provided in terms of percent, based on the amount of material that adheres to the target compared to the amount of material that was sprayed through the applicator toward the target. HVLP transfer efficiency is typically estimated to be 65%.

For the specific coating application at FG-CATOX spindle lines EU-T1/T2, EU-T3/T4, EU-T5/T6, and EU-S1, the conventional spray guns that Universal Coating currently uses are expected to provide equivalent or greater transfer efficiency than HVLP guns for the same application. This is due to the relatively small target spray area of the parts on these lines, and the capability to more precisely apply coating with conventional guns than with HVLP (i.e., conventional spray guns are able to be "dialed down" finer than HVLP) for this application. The precise coating from a conventional gun prevents spraying beyond the part, prevents spraying the filter, and uses less total coating that HVLP, resulting in lower potential for VOCs to be emitted. Additionally, Universal Coating has previously submitted a transfer efficiency study indicating that each booth of FG-CATOX is equipped with spray applicators with greater transfer efficiency than that of HVLP.

Regardless, Universal Coating is proposing to update their permit to remove this requirement, at the request of MDEQ. The permit application for this change is anticipated to be submitted by April 25, 2016.

Date Violations Occurred, Duration (whether violation is ongoing), and Cause

The following table summarizes the date, duration, cause, and resolution of the alleged violations, if this information is known. If additional investigation is necessary, an anticipated date of resolution is provided.

Table 3. Cause and Duration of Alleged Violations

Process Description	Alleged Rule/ Permit Condition Violation	Date Alleged Violation Occurred & Duration	Cause of Violation	Resolution
Four automatic miscellaneous metal parts spray lines	PTI 96-03C FG-CATOX SC IV.3 (Rules 205, 702, and 910)	The dates and duration of the alleged violation will be provided pending catalytic oxidizer performance investigation, anticipated by April 25, 2016.	Under review	The alleged violation was resolved upon RTO installation, completed on March 21, 2016. The RTO tracks chamber temperature continuously, and has been set up to log this information digitally on an SD card. Universal Coating has contracted a company to install a data acquisition system for the chamber temperature records for operating data backup to Universal Coating environmental staff files.
	PTI 96-03C FG-CATOX SC I.1 (Rules 205 and 702(a))	The dates and duration of the alleged violation will be provided pending catalytic oxidizer performance investigation and final calculation review, anticipated by April 25, 2016.	Increase in production	The alleged violation was resolved upon RTO installation, completed on March 21, 2016. Anticipated reduction in VOC emissions will likely be reflected in May or June 2016 emission calculations (12-month rolling calculations). Updated VOC emission records are anticipated to be submitted by July 1, 2016.
	PTI 96-03C FG-CATOX SC IV.2 (Rule 702(a))	Not applicable	Not applicable	The alleged violation will be resolved through a permit application submitted by April 25, 2016.
Source wide Hazardous Air Pollutant (HAP) restriction	PTI 96-03C FG-FACILITY SC I.1 (Rule 205(1))	The dates and duration of the alleged violation will be provided pending catalytic oxidizer performance investigation and final calculation review, anticipated by April 25, 2016.	Increase in production	The alleged violation was resolved upon RTO installation, completed on March 21, 2016. Anticipated reduction in HAP emissions will likely be reflected in May or June 2016 emission calculations (12-month rolling calculations). Updated VOC emission records are anticipated to be submitted by July 1, 2016.

Corrective Actions and Actions Taken to Prevent Reoccurrence

As outlined in our February 11, 2016 response, Universal Coating has been in the process of obtaining and installing a regenerative thermal oxidizer (RTO) to replace the catalytic oxidizer control and increase destruction efficiency at the stack of FG-CATOX since September 2014, when the need for additional VOC reduction at FG-CATOX was recognized due to increases in demand and production. The control technology investigation has been an ongoing effort since 2014, consisting of coating line exhaust flow measurements, destruction efficiency guarantee discussions, balance of exhaust flow, construction information review, and planning for operational parameter monitoring and recording.

In July 2015, a contract was signed with an oxidizer vendor for replacement of the facility's oxidizer control with a system of higher destruction efficiency. On August 19, 2015, the oxidizer vendor provided an estimated timeline for delivery and startup. Although originally scheduled for October 2015, the RTO was delivered during the second week of December, 2015. FG-CATOX lines were routed to the RTO and the RTO commenced operation after shakedown on March 21, 2016. The RTO is anticipated to achieve a significantly higher destruction efficiency than the current unit (98% anticipated, compared to current 82.3%). Destruction efficiency testing on the RTO is scheduled to be performed during the second quarter of 2016.

Universal Coating is in the process of updating their Malfunction Abatement Plan (MAP) to account for the new RTO operation and maintenance. The RTO tracks chamber temperature continuously, and has been set up to log this information digitally on an SD card. Universal Coating is also currently recording RTO chamber temperature daily on a log sheet in addition to the digital record. Further, Universal Coating has contracted a company to install a data acquisition system for the chamber temperature records for operating data backup to Universal Coating environmental staff files.

Universal Coating will also be submitting a permit application by April 25, 2016 to increase the VOC limit listed under SC I.1 of FG-CATOX, to account for the inclusion and growing demand of the four automatic miscellaneous metal parts spray lines, including EU-T5/T6.

Through these combined efforts, Universal Coating will achieve compliance with the VOC and HAP limits and does not anticipate a reoccurrence.

If you have any questions regarding this response, please contact me at 810-785-7555 or Ms. Rhiana Dornbos of NTH Consultants, Ltd. at 517-702-2953.

Sincerely,

Tim Johnson
General Manager
Universal Coating, Incorporated

cc: Ms. Julie Taylor – Universal Coating