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

N556945568

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| **FACILITY:** Haworth, Inc. - Big Rapids Components-steel & wood | | **SRN / ID:** N5569 |
| **LOCATION:** 300 N Bronson, BIG RAPIDS | | **DISTRICT:** Grand Rapids |
| **CITY:** BIG RAPIDS | | **COUNTY:** MECOSTA |
| **CONTACT:** Brandy Wright , Mfg. Quality Engineer | | **ACTIVITY DATE:** 07/31/2018 |
| **STAFF:** Chris Robinson | **COMPLIANCE STATUS:** Compliance | **SOURCE CLASS:** MAJOR |
| **SUBJECT:** FY '18 on-site inspection to determine the facility's compliance status with ROP No. MI-ROP-N5569-2014. | | |
| **RESOLVED COMPLAINTS:** | | |

On July 31, 2018, AQD staff, Chris Robinson (CR) conducted a scheduled, unannounced on-site inspection of the Haworth, Inc. – Big Rapids Components-Steel & Wood (Haworth) facility located at 300 North Bronson Street in Mecosta County, Michigan to determine compliance with Renewable Operating Permit (ROP) no. MI-ROP-N5569-2014. CR met with Ms. Brandy Wright, Manufacturing Engineering Manager, and Mr. Jeremy Hopkins, Manufacturing Engineer. Credentials were provided and CR announced intent to conduct an inspection of the facility.

Mr. Jim Kozminski, Haworth's Advanced Environmental Engineer works out of Haworth's Holland facility, therefore CR notified Mr. Kozminski on 7/30/2018 that an inspection of the Big rapids facility was scheduled for 7/31/2018 to allow time for him to attend. Unfortunately, Mr. Kozminski could not attend but has been included in all email correspondence.

## I. Facility Description

Haworth manufactures metal and wood office furniture and is composed of two buildings with the wood furniture and coating building to the north and the metal furniture manufacturing building to the south. The two buildings are connected by a vacant parcel of land which is also owned by Haworth, Inc. and used for underground cables. The wood furniture building includes woodworking and manufacturing equipment, and an ultraviolet wood furniture coating line. The metal furniture building includes metal stamping, welding, cleaning, assembly operations, an E-coat dip tank and associated ovens, a powder coat line and associated cure oven, and two rack burn-off ovens with afterburner control.

## II. Regulatory Evaluation

At the time Permit to Install (PTI) No. 301-95 for EUECOAT was evaluated, all toxic pollutants emitted met the applicable toxic screening levels in Rule 224/225.

FGNSPSEE at the stationary source is subject to the Standards of Performance for Surface Coating of Metal Furniture promulgated in Title 40 of the Code of Federal Regulations (CFR), Part 70, Subparts A and EE.

FGEMERGENCYGEN is subject to the National Emissions Standards for Hazardous Air Pollutants (NESHAPS) for Reciprocating Internal Combustion Engines promulgated in 40 CFR, Part 63, Subparts A and ZZZZ (RICE MACT). The ROP contains special conditions for the applicable requirements in 40 CFR, Part 63, Subparts A and ZZZZ that were provided by Haworth.

FGDUSTCOLLECTORS at the stationary source is subject to the federal Compliance Assurance Monitoring (CAM) rule under 40 CFR, Part 64. This emission unit has control devices and potential pre-control emissions of particulate greater than the major source threshold level. The monitoring for the control device is a broken bag detector alarm system, installed on all three dust collectors, to continuously monitor the operation of each baghouse.

FGNESHAPJJ at the stationary source is subject to the Wood Furniture Manufacturing NESHAP promulgated in 40 CFR, Part 63, Subparts A and JJ. The coating limit of 2.75 pounds per gallon (ppg) minus water as applied is below the 3.0 ppg minus water as applied limit from Rule 610 and is considered the Best Available Control Technology under Rule 702(a). The dip tank application method is considered 100% transfer efficiency and therefore BACT. No additional control equipment is required.

No emission units at the stationary source are currently subject to the Prevention of Significant Deterioration (PSD) regulations of Part 18, PSD of Air Quality of Act 451, because at the time of New Source Review permitting the potential to emit of each criterial pollutant was less than 250 tons per year (tpy).

**III. Compliance Evaluation**

The facility submitted 2017 and 2018 Semi-Annual reports and the 2017 Annual Certification on time, complete and signed by the proper Responsible Official. No odors or visible emissions were observed during this inspection.

**A) ROP Compliance Evaluation**

**1) SOURCE-WIDE**

Haworth is subject to source-wide hazardous air Pollutant (HAP) emission limits of 9 tpy individual HAP and 22 tpy aggregate HAPs. Per discussions with Ms. Wright, records are maintained for a minimum of five (5) years. Records were provided and are included in **Attachment A**. Based on these records, for the time period of June 1, 2017 through July 31, 2018, the total annual aggregate HAPs (MIBK and Methanol) emissions were 7,412 pounds (3.71 tons) which is well below the individual and aggregate limits.

**2) Emission Unit EUECOAT & Flexible Group FGNSPSEE**

EUECOAT consists of a metal furniture e-coat painting process which includes a dip tank, rinse tank, and a 3.0 MMBtu/hr natural gas fired only bake oven. This emission unit is subject to VOC emission limits of 16.8 lb/hr based upon a monthly calendar averaging time period and 52.6 tpy based on a 12-month rolling time period. Haworth provided records as required in SC EUECOAT VI.1.a-g, which are included in **Attachment A**, and consist of the following:

- Monthly hours of operation for the paint process
- Amount of each coating used
- VOC content of each coating used
- VOC emission calculations

Based on these records, the maximum EUECOAT VOC emissions for January 1, 2018 through June 30, 2018 were 0.39 lbs/hr with an average of 0.33 lbs/hr. The maximum annual VOC emissions for July 1, 2017 through June 30, 2018 was observed in October 2017 at 372 pounds (0.186 tons). Haworth appears to be operating well under the required VOC emission limits.

The two materials used in the e-coating process (resin and paste) are restricted to a 2.75 ppg VOC (minus water and as applied) material limit. No thinners other than water are used. Method 24 VOC content testing was conducted, as required in SC EUECOAT V.1, in December 2012. The results (**Attachment B**) are summarized below and demonstrate that both materials are well below the limit.

| Analysis | Resin | Paste |
|---|---|---|
| Density ppg | 8.9 | 7.9 |
| %H2O | 57 | 76 |
| %Solids | 38 | 18 |
| %VOC | 5.0 | 6.1 |

RESIN – 0.05*8.9*(1/1-0.57) = 1.03 pounds VOC/gallon (minus water)
PASTE – 0.061*7.9*(1/1-0.76) = 2.01 pounds VOC/gallon (minus water)

This material limit (with lack of thinning) assures compliance with State RACT requirements of 3.0 ppg VOC (minus water, as applied). The facility does not coat fabric or paper. The federal NSPS for metal furniture coating establishes a limit of 7.5 pounds VOC/gallon of coating solids applied; the aforementioned monthly records and test records demonstrate compliance with this.

RESIN – 0.05*8.9*(1/1-0.38) = 0.72 pounds VOC/gallon of coating
PASTE – 0.06*7.9*(1/1-0.18) = 0.59 pounds VOC/gallon of coating solids

Daily records are kept in the Control Room for the e-coat line. Levels in the resin and paste totes feeding the line are marked daily, and the linear difference between consecutive hash marks is converted to gallons based on the geometry of the tank.

Exhaust gases from EUECOAT equipment appeared to be vented unobstructed vertically to ambient air. Although, the following stack dimensions were not explicitly measured, visual observations appeared to confirm dimensions and heights, as required in SC EUECOAT VIII.1-4, were achieved.

| Stack & Vent ID | Maximum Dimension (inches) | Minimum Height above ground (feet) |
|---|---|---|
| SVBAKEOVEN1 | 19 | 45 |
| SVBAKEOVEN2 | 28 | 45 |
| SVDIPTANK | 18 | 45 |
| SVRINSE | 24 | 45 |

Per SC EUECOAT IX.1, Haworth is required to implement and maintain an acceptable Preventative Maintenance Plan (PMP) and submit any modifications to the AQD. Ms. Wright indicated that all PMP's are maintained in Haworth's computer system and no changes have been made since the last Title V renewal. Examples were provided (**Attachment C**) and CR confirmed that Haworth submitted plans with the 2013 Title V renewal application.

There have been no changes to the facility's equipment since the previous inspection. Therefore, notification required under SC FGNSPEE VII.5 is not required at this time.

**3) Flexible Group FGDUSTCOLLS & FGDUSTCOLLSCAMPLAN**

Haworth operates three (3) 50,000 CFM pulse-jet pneumatic baghouses for collecting particulate from the woodworking operations at the wood furniture building. The baghouses are externally vented for only part of the year. They are subject to a particulate matter emission limit of 0.01 pound per 1,000 pounds of exhaust gases. This limit assumes proper operation of the baghouses. The facility conducts weekly non-certified visible emissions observations as required in SC FGDUSTCOLLS VI.1 and has installed and maintained a broken bag detector to continuously monitor operations as required in SC FGDUSTCOLLSCAMPLAN VI.1. Daily readings are recorded, which were provided and are included in **Attachment D**. Based on the readings there has not been any recent alarms. Therefore, non-certified visible emission checks have not been required per SC FGDUSTCOLLSCAMPLAN VI.2.

During the inspection the following readings were collected from the broken bag detector:

| Baghouse ID | Delta P | Motor Amps | Broken Bag Detector (%) |
|---|---|---|---|
| DC-1 | 3 | 180 | -- |
| DC-2 | 0.2 | 110 | 1 |
| DC-3 | 2 | 200 | 1 |

The broken Bag detector for DC-1 was not working at the time of this inspection and the records (**Attachment D**) indicated that a reading had not been collected for the week of July 23rd, which CR discussed with Ms. Wright. Ms. Wright followed up via email on August 1, 2018 (**Attachment E**) indicating that the reading had been collected but not transferred to the provided inspection sheet. A PM Work order was generated prior to this inspection and Haworth is in the process of repairing the detector. The missing weekly reading is included on the attached PM work order (**Attachment D**).

Records of malfunctions/repairs are maintained as required by SC FGDUSTCOLLS VI.2 and the woodworking equipment is never operated unless the appropriate baghouse is operating, per SC FGDUSTCOLLS III.1.

As required by SC FGDUSTCOLLS IX.1, Haworth is required to implement and maintain an acceptable PMP and submit any modifications to the AQD. As previously discussed, all PMP's are maintained in Haworth's computer systems.

**5) Flexible Group FGNESHAPJJ**

The Wood coating operations (EUWOODCTG) includes the UV wood coating line which is comprised of one UV-topcoat application unit, one UV-light cure zone, one pre-heat chamber, five manual spray booths and two cure

ovens. This emission unit is subject to the NESHAP 40 CFR, Part 63, Subpart JJ for *Wood Furniture Manufacturing Operations.*

These requirements pertain to surface coating of wood furniture. Other than overspray filters, no control equipment is necessary for these coating operations. Volatile HAP (VHAP) limits are placed on each type of coating utilized. Per discussions, no HAPs are emitted from Wood coating operations. Product Data Sheets for the coatings were requested and provided (**Attachment F**) which indicate 0% VHAP. Requested records were readily available. Haworth provided a revised Work Practice Plan, which is required by SC FGNESHAPJJ VI.3. The plan is now available in the site file.

**6) Flexible Group FGRULE290**
Haworth utilizes two (2) rack burn-off ovens (EURACKBURN1 & 2) that appear, at this time, to be exempt from Rule 201 permitting requirements under Rule 290. The burn-off ovens are used for incinerating excess coating off metal part racks used on the powder coat line process. They are rated at 780,000 Btu/hr and emissions are controlled by an afterburner.

Based on the digital displays, oven BO1 was operating with a primary chamber temperature of 726oF and an afterburner temperature of 1,405oF. Oven BO2 was operating with a primary chamber temperature of 769oF and an afterburner temperature of 1,584oF. Based on a January 2003 Rule 290 demonstration provided by Haworth, the ovens can meet the monthly emission limit specified in Rule 290 of 500 lbs of VOC's per oven as long as the facility does not exceed 115 batches per month and maintains a destruction efficiency of 95% which requires an afterburner temperature of at least 1,400oF. Per Ms. Wright, based on operations, the plant cannot process more than 80 batches per month. Thermocouples are calibrated annually and were last calibrated in July 2018. Calibration records and circle charts are included in **Attachment G**.

Circle Charts are maintained and readily available. The chart for oven BO1 indicates possible issues with the afterburner pen which shows that the main oven operated for approximately two (2) hours without afterburner control. CR discussed these issues with Ms. Wright and Mr. Kozminski. During a phone conversation with Mr. Kozminski on August 28, 2018, Mr. Kozminski indicated that an outside vendor is looking into the issues, but so far, the oven appears to be operating correctly. A recent circle chart was provided for oven BO1 showing that the afterburner pen is out of alignment by approximately two (2) hours.

The circle chart for oven B02 shows that the main oven starts when the afterburner temperature reaches approximately 1,300F and the pen seems to start below the zero mark on the graph. This suggests that the operating temperature may actually be higher than 1,300F. In addition, the afterburner temperature displayed on the digital readout during the inspection was 1,584F. The pen for the main oven seems to match observations during the inspection. Based on the charts, the main oven operates at approximately 800F and the observed temperature during the inspection, based on the digital readout, was 769F. This suggests that the afterburner pen is most likely incorrectly aligned.

At this time, based on observation made during the inspection, CR feels that the ovens are operating properly. CR followed-up with Mr. Kozminski on August 31, 2018 and informed him, based on their Rule 290 determination discussed above, that an afterburner temperature of 1,400F MUST be maintained while combustion is occurring in the main oven. A violation Notice will not be issued at this time. However, chart recorder issues will need to be addressed if Haworth continues to use them as a way of demonstrating compliance. Email correspondence is included in **Attachment E**.

**7) Flexible Group FGCOLDCLEANERS**
Haworth has three (3) Renegade brand cold cleaners that use a non-VOC citrus-based cleaner. Upon inspection of one of the units, the lid was closed, and instructions posted. Per Ms. Wright, these units are maintained by Crystal Clean and there have been no changes to the solvent since the previous inspection conducted on 7/13/2016. An MSDS for the solvent is on file. The air/vapor interface of these units is less than ten square feet, which exempts them from Rule 201 permitting requirements under Rule 281(2)(h).

**8) Flexible Group FGEMERGENCYGEN**
Haworth operates one (1) existing Stationary Engine <500 HP installed in 1996 and subject to NESHAP 40 CFR, Part 63, Subpart ZZZZ for *Stationary Reciprocating Internal Combustion Engines.* An hour meter is installed as required in SC FGEMERGENCYGEN IV.1 and the facility records hours of operation for both maintenance/testing and emergency use. Based on records reviewed on-site, the emergency generator operated for approximately 9.5 hours from June 9, 2017 through July 5, 2018. This is well under the maximum allowable hours required in SC FGEMERGENCYGEN III.1.a-c. A maintenance plan has been developed and is

maintained in Haworth's computer systems. Inspections and oil changes are conducted annually by an outside vendor.

**B) MAERS**
Emissions data for 2017 was submitted to MAERS on time and complete with no issues noted. CR reviewed and passed the submittal on April 6, 2018. A copy of the 2017 MAERS submittal is included in **Attachment H.** The following emissions were noted in the submittal:

| Emission Unit | Particulate Matter (lb.) | VOC (lb.) |
|---|---|---|
| EU WOODWORK | 2,500 | -- |
| EU-ECOAT | -- | 3,456 |
| EU-WOODCTG | -- | 3,194 |

**IV. Compliance Determination**
Based on the observations made at the time of this inspection and a subsequent records review, Haworth appears to be in compliance with ROP MI-ROP-N5569-2014 at this time.

Attachments
A - Emission Records
B - Method 24 VOC Content Analysis
C - PMP Examples
D - Baghouse Records
E – Correspondence
F – Product Data Sheets
G - Burn-off Oven Circle Charts and Calibration Records
H - 2017 MAERS Report

NAME  DATE 9/17/2018 SUPERVISOR