#### DEPARTMENT OF ENVIRONMENTAL QUALITY AIR QUALITY DIVISION ACTIVITY REPORT: On-site Inspection

M355472952		
FACILITY: General Formulations, Inc.		SRN / ID: M3554
LOCATION: 320 S. Union St., SPARTA		DISTRICT: Grand Rapids
CITY: SPARTA		COUNTY: KENT
CONTACT: Rob Bachholzky , Chemist		ACTIVITY DATE: 06/18/2024
STAFF: Laura Martin	COMPLIANCE STATUS: Compliance	SOURCE CLASS: SM OPT OUT
SUBJECT: Unannounced, scheduled inspection.		
RESOLVED COMPLAINTS:		

On June 18, 2024, Air Quality Division (AQD) staff Laura Martin (LM) conducted an unannounced, scheduled inspection of General Formulations, Inc, located at 309 South Union Street, Sparta, Michigan. The purpose of this inspection was to determine compliance with applicable air quality rules and regulations.

LM arrived at the facility at approximately 1:30 P.M and prior to entering the facility, odor and visible emission observations were completed. No visible emissions or odors were noted. AQD staff met with Rob Bachholzky (RB), Quality Manager. The purpose of this inspection was briefly discussed with RB, and included a facility walk through, with a final discussion at the end of the inspection. General Formulations is a coating and laminating operations facility that creates products for various advertising and marketing industries. The facility is under an Opt-Out Permit to Install (PTI) No. 192-03H and currently has an application under review for a permit modification to add a new coating line as well as additional control equipment. LM left the facility around 3:00 P.M.

**Compliance Evaluation** 

### EU-CoaterUV

This coater is a 61-inch wide, ultraviolet (UV) coating and curing station on a plastic cling laminator. Emissions are uncontrolled. The coating at this machine is applied via method of reverse gravure with an enclosed doctor blade. All material and waste containers surrounding the coating machine appeared to be properly stored and disposed of at the time of the inspection. One stack was observed venting externally, which was verified during the inspection. The stack was not measured but appeared consistent with the dimensions outlined in the PTI.

The 12-month rolling emission limit for volatile organic compounds (VOCs) is 4.6 tons per year (tpy). Records of VOC emissions from EU-CoaterUV were requested and reviewed. During the 2023 calendar year 0.03 tons of VOC were emitted based on a 12-month rolling time period. VOC content is also limited to 0.16 lb/gal (minus water) as applied. A letter from General Formulations, dated January 27, 2014, was received by AQD requesting the use of manufacturer's formulation data sheets to determine VOC content and was approved. General Formulations only uses one coating material in EU-CoaterUV. The facility keeps records of the VOC content and usage of this coater. After a review of the records, the one coating material utilized by EU-CoaterUV has 0.16 lbs/gal of VOCs. General Formulations appears to be keeping track of its usage rates for all coating materials used, VOC contents and VOC emissions. No reclaim of coating material was identified for this emission unit.

# EU-CoaterE

This coater is a 60-inch wide, roll to roll laminator with gravure and wire rod coating stations and a single zone natural gas-fired oven. This coater only utilizes waterbased coatings and emissions are uncontrolled. All material and waste containers surrounding the coating machine appeared to be properly stored and disposed of at the time of the inspection. One stack was observed venting externally, which was verified during the inspection. The stack dimensions appeared consistent with the PTI.

This emission unit was not in operation at the time of the inspection and as such the oven temperature was not observed. RB stated that the maximum operating temperature for the oven is 220°F.

The 12-month rolling emission limit for VOCs is 22.9 tpy and the VOC coating content is limited to 0.8 lbs/gal (minus water) as applied. Records of VOC emissions were requested and reviewed. During the calendar year of 2023, a total of 7.02 tons of VOCs were emitted based on a 12-month rolling time period. A letter from General Formulations, dated January 28, 2011, was received by AQD requesting the use of manuacturer's formulation data sheets to determine VOC content and was approved. Formulation data sheets and/or Test Method 24 results were requested during the previous inspection and are in the file for review. No new coatings have been added since the previous inspection. The highest VOC containing material was noted to be a water based top coating material called RD 030102-1 that has a VOC content of 0.571 lbs/gal minus water which is below the permitted limit of 0.8 lb/gal minus water. General Formulations appears to be keeping track of usage rates, VOC contents and VOC emissions.

### EU-CoaterF

This coater is a 64-inch wide, roll to roll laminator with gravure and wire rod coating stations, and a natural gas-fired oven. This coater only utilizes water-based coatings and the emissions from this unit are uncontrolled. All material and waste containers surrounding the coating machine appeared to be properly stored and disposed of at the time of the inspection. One stack was observed venting externally, which was verified during the inspection. The stack dimensions appeared consistent with the PTI.

The associated one zone oven was not in operation at the time of the inspection. The oven temperature could not be observed. RB stated that the maximum operating temperature for the oven is 231°F. A previous inspection noted that the wire rods were never installed, and instead utilize only gravure rolls.

The 12-month rolling emission limit for VOCs is 40.0 tpy. The VOC content of the coating is limited to 0.8 lb/gal (minus water) as applied. Records of VOC emissions were requested and reviewed. During the 2023 calendar year 5.71 tons of VOC were emitted based on a 12-month rolling time period. A letter from General Formulations, dated January 28, 2011, was received by AQD requesting the use of manufacturer's formulation data sheets to determine VOC content and was approved. Formulation data sheets and/or Test Method 24 results were requested during the previous inspection and are in the file for review. RB stated that no new coatings were being used. The highest VOC containing material was noted to be a water based top coating material called RD 030102-1 that has a VOC content of 0.571 lbs/gal minus water which is below the permitted limit of 0.8 lb/gal minus water.

The Hydrotreated Distillates (CAS No. 64742-46-7) are subject to a 20 lbs/8-hour limit per calendar day. After a review of the records, it appears that no materials were used by EU-CoaterF that contained Hydrotreated Distillates. General Formulations appears to be keeping track of its usage rates, VOC contents, and VOC/Hydrotreated Distillates (CAS No. 64742-46-7) emissions as required. According to records reviewed, it appears that no Hydrotreated Distillates were used during the 2023 calendar year.

# EU-CoaterC

This coater is a 64-inch-wide comma bar coating station with the capability to run in a knife-over-roll configuration, and natural gas fired ovens. VOCs from this emission unit are controlled by a Permanent Total Enclosure (PTE) and an existing Regenerative Thermal Oxidizer (RTO). The emission unit is also equiped with a filtration system to control particulate matter.

Coatings used by EU-CoaterC are solvent based. All material and waste containers surrounding the coating machine appeared to be properly stored and disposed of at the time of the inspection. EU-CoaterC was in operation at the time of the inspection. A device was installed to measure the pressure differential between the PTE and the adjacent area on a continuous basis. A minimum of 0.007 inches of water pressure differential must be maintained. During the inspection water pressure was recorded at 1.2, 1.2, 1.5 and 1.2 throughout each of the coating stages. A temperature monitoring device was also installed and operating properly during the inspection. Oven temperatures were recorded at 130 DegF, 220 DegF, 305, DegF and 475 DegF.

The 12-month rolling emission limit for VOCs is 89.0 tpy. Records of VOC emissions were requested and reviewed. During the 2023 calendar year 1.94 tons of VOC were emitted based on a 12-month rolling time period.

A letter from General Formulations, dated January 28, 2011, was received by AQD requesting the use of manufacturer's formulation data sheets to determine VOC content and was approved. Formulation data sheets and/or Test Method 24 results were requested during the previous inspection and are in the file for review.

Testing of the New RTO destruction efficiency and PTE capture efficiency was required within180-days from the beginning of trial operation of EU-CoaterH. This deadline was extended given the extenuating circumstances of COVID-19 and construction delays due to supply issues. Testing was completed on February 24, 2022, which resulted in a failed test and violation notice (VN) due to only 92.3% destruction efficiency being achieved. Re-testing occurred following maintenance performed on the RTO and a passing destruction efficiency of 98% was achieved in November 2022.

Material Safety Data Sheets (MSDS) were maintained and reviewed onsite. General Formulations appears to be keeping track of usage rates, VOC contents and VOC emissions. The combustion zone temperature was being continuously monitored and recorded every minute through an automated system and rolled into a 3-hour rolling average as required by the permit. The pressure differential was being continuously monitored through the same system and in the same manner.

The notification of completion of construction of the New RTO was received on February 18, 2020, in a timely manner as required by the PTI.

General Formulations is subject to 40 CFR Part 60 Subpart FFF requirements for flexible vinyl and urethane coating and printing. This federal regulation requires performance testing, reporting of VOC exceedances and reporting of drops in incinerator temperatures within 30 days following the end of second and fourth calendar quarters. Based on records reviewed in the file, the requirements of this regulation are being met.

### FG-SolventBased

This flexible group consists of EU-CoaterD, EU-CoaterG, EU-CoaterH, EU-NewMixroom and EU-Washroom. VOC emissions from EU-CoaterD when using solvent-based coatings, EU-CoaterG when using solvent-based coatings, and EU-CoaterH when using solvent-based coatings, and EU-Mixroom are each controlled by a PTE and a new RTO. Each emission unit is equipped with a filtration system to control particulate matter. All material and waste containers surrounding the coating machines appeared to be properly stored and disposed of at the time of the inspection. A device was installed to measure the pressure differential between the Permanent Total Enclosure (PTE) and the adjacent area on a continuous basis. A minimum of 0.007 inches of water pressure differential must be maintained. Pressure differential was being monitored continuously and readings met the minimum required by the permit.

The VOC emission limit for FG-SolventBased is 89 tons per year (tpy) based on a 12month rolling time period. During the 2023 calendar year 24.41 tons of VOCs were emitted based on a 12-month rolling time period.

The FG-SolventBased emission units are connected to and controlled by a regenerative thermal oxidizer (New RTO). A control panel for the New RTO was observed adjacent to the EU-CoaterC which had monitors for each emission unit's status. An observation/office area is also used to monitor the New RTO. The new RTO is required to maintain a minimum destruction efficiency of 95% (by weight), maintain a minimum combustion zone temperature of 1,400 DegF or the minimum combustion zone temperature from the most recent acceptable stack test, and a minimum retention time of 0.5 seconds. The PTE is required to operate with a minimum capture efficiency of 100% (by weight). The setpoint stated by General Formulations staff is 1,450 DegF and the observed operating temperature at the time of the inspection ranged from 1,599 – 1,605 DegF. RB explained that if the New RTO temperature falls below the set point it will not automatically shut down. An audio alarm will sound off and staff must manually shut down the New RTO if it is necessary. Each event the New RTO goes below 1,450 DegF is recorded. Records of these events were reviewed on-site, and all details recorded were acceptable reasons such as power outages.

New RTO bypass times are to be recorded for EU-CoaterD, EU-CoaterG, and EU-CoaterH; however, EU-CoaterG currently uses only water-based coating materials and is not connected to the RTO, and EU-CoaterH does not have a bypass stack and is constantly routed to the New RTO. Records of bypass times and emissions during bypass for EU-CoaterD were reviewed. General Formulations appear to be

adequately keeping track of the bypass times and emissions during bypass for EU-CoaterD as required.

The VOC limit for EU-CoaterD and EU-CoaterG combined during periods of New RTO bypass is 63.2 tpy based on a 12-month rolling time period. Total VOC emissions for EU-CoaterD and EU-CoaterG for the 2023 calendar year were 0.011 tpy and 5.047 tpy respectively, based on a 12-month rolling time period.

The VOC limit for EU-CoaterH during periods of New RTO bypass is 42.0 tpy based on a 12-month rolling time period. It was discovered during the previous inspection that EU-CoaterH does not have an RTO bypass installed and all emissions from the emission unit are always routed through the RTO.

The VOC content of each waterborne coating is limited to 0.54 lb/gal minus water. The highest VOC content of waterborne coating used during the 2023 calendar year was 0.101 lb/gal minus water.

All mixing tanks and dispersion mills in EU-NewMixroom are required to have covers on at all times except when necessary to add, remove or mix. Covers were observed in place on all equipment and containers as required by the permit.

The notification of completion of construction of EU-CoaterH, EU-NewMixroom and EU-Washroom was received on February 18, 2020, in a timely manner as required by the PTI.

FG-SolventBased is subject to having in place a Malfunction Abatement Plan (MAP), after 180 days from commencement of trial operation of EU-CoaterH. A MAP was submitted by General Formulations on October 30, 2020, within the required timeframe. Following a malfunction of the RTO in March 2023, another update to the MAP was submitted in June 2023 to address the issues experienced and is in the file for review.

General Formulations appears to be keeping track of coating usage rates, VOC contents, daily, monthly and 12-month rolling VOC emissions for FG-SolventBased and specifically the sums of EU-CoaterD and EU-CoaterG.

# FG-TACs

This flexible group covers emission units EU-CoaterC, EU-NewMixroom, EU-CoaterD, EU-CoaterG and EU-CoaterH. This flexible group is limited to 1,115.5 lbs/yr of 1,4-Dioxane emissions, 5,574.3 lbs/yr acrylic acid emissions and 446.2 lbs/yr formaldehyde emissions per 12-month rolling time periods. This flexible group is also limited to 15.9 lbs/8-hr of petroleum distillates, solvent-dewaxed and light paraffinic and 19.3 pounds per hour (pph) of ammonium hydroxide. Records of the above referenced toxic air contaminants (TACs) emissions were requested and reviewed. During the 2023 calendar year 1,4-Dioxane emissions were 18 lbs/yr based on a 12-month rolling time period. Acrylic acid emissions were recorded as 0 lbs, and ethyl acrylate emissions were 60 lbs/yr. Formaldehyde emissions were 6 lbs/yr. The highest 8-hour petroleum distillate, solvent-dewaxed, and light paraffinic emissions were 7.146 lbs/8-hr. The highest pounds per hour emission of ammonium hydroxide were 12.778 pounds per hour (pph). Based on the review of the records General Formulations is keeping track of the TACs as required.

# FG-Facility

This flexible group covers all emissions units on site and applies source-wide to all process equipment including equipment covered by other permits, grand-fathered equipment, and exempt equipment. FG-Facility has an emission limit of less than 9.0 tpy and less than 22.5 tpy per a 12-month rolling time period for individual and total aggregate Hazardous Air Pollutants (HAPs) respectively. HAP emission records were requested and reviewed. During the 2023 calendar year, the greatest individual HAP emissions were 0.074 tpy of vinyl acetate. Aggregate HAP emission during the 2023 calendar year were 1.787 tpy.

Additionally, FG-Facility has an emission limit for VOCs of 493 lbs/day and less than 90 tpy per a 12-month rolling time period. General Formulations does appear to be keeping track of usage rates for each VOC containing material used. The highest daily VOC emission was noted to have occurred on February 21, 2023, when 333.55 lbs of VOCs were emitted. During the 2023 calendar year, 30.09 tons of VOC were emitted.

FG-Facility has an emission limit of 0.5 tpy per 12-month rolling time period of Benzophenone (CAS No. 119-61-9) per a 12-month rolling time period. Emissions are based off a 2% weight percent of Benzophenone (CAS No. 119-61-9) due to reactivity. EU-CoaterUV is the only process that utilizes Benzophenone (CAS No. 119-61-9) containing coating materials. The highest 12-consecutive month Benzophenone (CAS No. 119-61-9) emissions occurred during the 12-month period ending in November 2023 when 0.0010 ton of Benzophenone (CAS No. 119-61-9) was emitted. General Formulations appears to be keeping adequate track of their Benzophenone (CAS No. 119-61-9) containing material usage rates, content, monthly and 12-month rolling total emissions. No reclaim was identified for this emission unit.

### EU-CoaterD

This coater is a 62-inch wide, 140-feet per minute roll to roll laminator with a knifeover-roll and two gravure coating stations and a three-zone natural gas-fired oven. This coating utilizes water and solvent based coatings. All material and waste containers surrounding the coating machine appeared to be properly stored and disposed of at the time of the inspection. This coater uses a three-stage oven. During the inspection, EU-CoaterD was not operating, and oven temperatures could not be recorded.

### EU-CoaterG

A 64-inch wide, roll to roll laminator with comma coating stations, a reverse gravure of wire rod coating stations, a natural gas-fired oven, and a reverse gravure topcoat station with a natural gas-fired oven. At the time of the inspection EU-CoaterG was in operation utilizing only water-based coating materials and was stated by RB that EU-CoaterG was never switched to run solvent-based materials. All material and waste containers surrounding the coating machine appeared to be properly stored and disposed of at the time of the inspection. This coater uses a three-stage oven. The observed temperatures at the time of the inspection were 225°F, 235°F, and 245°F, with the maximum temperature settings of 250°F on all oven stages.

### EU-CoaterH

A 64-inch-wide comma bar coating station with natural gas fired, three stage oven. This coater is capable of using both water-based and solvent-based coatings. All emissions from EU-CoaterH are captured by the PTE and controlled by the RTO. Coater H was operating during the inspection with oven temps recorded at 150 DegF, 180 DegF and 210 DegF.

## EU-NewMixroom

This mix room is a batch process where coatings and adhesives are produced for internal use and external sales. This unit consists of four mixers, two dispersing mills equipped with an enclosed recirculated solvent spray tub wash operation, and a three-roll mill machine that takes powdered pigment and blends them into coatings. Emissions from the mix room are captured by a PTE and controlled by the existing RTO. During the inspection RB and LM walked through EU-NewMixroom. Containers observed in the mix room were properly stored and sealed.

Dirty cleaning solvents are reclaimed at a solvent recycler, with the waste remaining sent off site as hazardous waste. This unit appears to be exempt from permitting per Rule 285(2)(u).

### EU-Washroom

Two parts washers were observed in the washroom, and both were closed at the time of the inspection. Based on the size of the parts washers they both appear to be exempt from permitting per Rule 281(2)(h).

Solvent based and water based chemical storage areas were observed and all containers we covered and stored in a manner that reduces the generation of fugitive emissions. Spent filters were being properly containerized and are sent to Waste Management for disposal.

### **Compliance Determination**

Based on the review of the records provided and the facility walk through, General Formulations appears to be in compliance with Opt-Out PTI No. 192-03H.

NAME Laura Martin

DATE 8/5/2024 SUPERVISOR