

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

B720558870

FACILITY: Knauf Insulation, Inc.		SRN / ID: B7205
LOCATION: 1000 E NORTH ST, ALBION		DISTRICT: Kalamazoo
CITY: ALBION		COUNTY: CALHOUN
CONTACT: Adam Estes , Technical Specialist, Corporate HSE		ACTIVITY DATE: 07/07/2021
STAFF: Amanda Chapel	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT:		
RESOLVED COMPLAINTS:		

On June 22, 2021 Air Quality Division’s (AQD) Amanda Chapel (staff) completed an online review of the Knauf Insulation records. The in-person inspection was completed on July 7, 2021 during stack testing being conducted on Furnaces 1, 2, 3, and 4. Due to continued guidance surrounding COVID-19, digital records reviews are an approved method for completing inspections. Mr. Adam Estes, Technical Specialist, Corporate Health, Safety, and Environmental provided the records via Microsoft Teams for review. The purpose of the inspection was to determine the facility’s compliance with MI-ROP-B7205-2015b, 26-15D, 132-19A, and all other applicable state and federal air quality requirements. The following will summarize both the records review and on-site inspection.

Knauf Insulation LLC is a manufacturer of wool fiberglass insulation. They have approximately 120 employees and operate 24-7. The facility uses four electric melters to make molten glass from raw materials and recycled glass. The molten glass is then spun into glass fibers. Some of the material is sprayed with resin and some is left non-resinated. These lines are controlled with a variety of high efficiency wet scrubbers, venturi scrubbers, and wet electrostatic precipitators.

Since the last ROP was issued, the facility has converted process equipment from Guardian to Knauf technology. This includes changing to a different binder that no longer contains any hazardous air pollutants (HAPs). Because of this 2015 change, the facility is no longer a major source of HAPs and is not subject to 40 CFR Part 63, Subpart NNN, National Emission Standards for Hazardous Air Pollutants for Wool Fiberglass Manufacturing.

**Source Wide Conditions**

All process equipment at the stationary source including equipment covered by other permits, grandfathered equipment, and exempt equipment. (PTI No. 282-02B)

The facility is tracking the pounds of each HAP containing material used on site, monthly. The HAP content in the raw material is also identified in the recordkeeping. Highest HAP emissions are 1,4 dioxane and ethylene oxide at 0.0017 tons in April 21. Highest aggregate HAP emissions are 0.0053 tons in February 2021. Highest 12-month rolling HAP emissions are in April 2021 with 0.1199 tons.

**EU-MATHAND**

This emission unit contains equipment used for raw material receiving, conveying, weighing, mixing, storing, and feeding to FG-FURNACE 1, 3 and 4; and EU-FURNACE#2, that utilizes internally and externally vented baghouse controls. (PTI No. 26-15A)

The facility is tracking all materials which are weighed and identified both monthly and on a 12-month rolling basis. They are also keeping weekly non-certified visible emissions checks. If the person does not have certification, they are trained in Method 22 observation techniques. As a representative sample of the visible emissions, March 2021 with 5 weeks of VE readings all indicated no abnormal visible emissions.

The facility received two deliveries of raw material during the inspection. There were no visible emissions during the deliveries and a Knauf staff member was outside observing during the unloading of the truck. The facility uses borax, cullet, silica sand, and soda ash to make the product. The facility receives truck deliveries multiple times a day. Rail delivery frequency was estimated by Mr. Estes to be once per day. According to Mr. Estes, based on a recent stormwater inspection, they have been sweeping the area more frequently and have installed door sweeps on the exterior doors to prevent anything from blowing underneath.

#### EU-FURNACE#2

This emission unit is one refractory lined electric melt furnace controlled with an externally vented baghouse that discharges molten glass to a refractory lined natural gas fired forehearth and then to EU-ML2ALBFORMING. (PTI No. 26-15A)

The hourly glass pull rate is maintained on the facility's HMI system. This was verified during the on-site inspection. Glass pull rates are taken once per minute and averaged based on the tons produced to come up with a PM10 lbs/ton of glass pulled. The furnace was operating during the inspection as testing was occurring on this emission unit during the inspection.

Bag break alarms are also maintained on HMI system. The staff are also required to fill in manual forms as a backup for the HMI system. Records are updated when HSE personnel are on site. Records include what alarm was triggered, what time and length of the alarm, if there was any opacity, and the explanation of cause of the alarm. In 2021, there have no alarms longer than 2-hours. Monthly and 12-month VOC emissions are being tracked, as required by the permit. Highest VOC emissions are about 3.1 tons per 12-month rolling.

This furnace is equipped with spinners that spin the molten glass and resin into fiberglass for the resinated line ML2ALBFORMING. This is then sent through an oven and shaped into mats that are cut, folded, and packaged according to the order.

#### EU-FACESIZEPKG

This emission unit contains sizing and packaging operations for the resinated fiberglass production line consisting of one or more of the following processes: trimming, rolling, dicing, and packaging operations. Associated cleanup activities to be included. Operations utilize an

internally vented bag filter followed by internally vented particulate controls or vent to the general in plant environment. (PTI No. 26-15A)

The facility is maintaining a list of the chemical composition of each product, ink, adhesive, and cleaning material including weight percent of VOC, density, and specific gravity. The tracking identifies where the VOC information was obtained which includes manufacturing data, SDS, and EPA fire data. Monthly usage of each VOC containing material is tracked. Blue ink appears to have the highest usage. Highest VOC emission is from January 2021 and is less than 5% of the total VOC limit.

This part of the process was not running during the inspection. It was discussed with the facility that based on the use of asphalt adhesive, used on an estimated 5% of products, the facility has likely been over reporting VOCs for the asphalt adhesive for EU-FACESIZEPKG. The facility believes that the asphalt adhesive contains no VOCs and emissions from adhesive are negligible. They will continue to keep VOC emissions for the ink usage in this emission unit.

#### EU-WBW3ALBFORMING

This emission unit contains a non-resinated fiberglass forming and collection process fed by EU-FURNACE#1 consisting of natural gas-fired dual module forming section with one forming/fan zone and three product fiberizers in each module. The process is equipped with a wet scrubber for each module followed by a shared wet electrostatic precipitator for control. Fluids, including de-dusting agent, are applied at various locations in the process. The product bagging process is controlled by two dust collectors that exhaust inside the building. (PTI No. 132-19A)

This emission unit is currently being installed and is not operational.

#### EU-BINDERMIX

The binder mixing system includes ECOSE ingredient storage tanks, ECOSE binder mix tanks, and process water tanks. (PTI No. 26-15A)

The facility is maintaining a list of the chemical composition of each product, ink, adhesive, and cleaning material including weight percent of VOC, density, and specific gravity. The tracking identifies where the VOC information was obtained which includes manufacturing data and SDS.

This emission unit is part of the EU-ML2ALB line. The facility adds ingredients to two of the tanks manually and the other tanks are filled automatically. The resin is mixed automatically and injected into the spinners which is then baked into the mats. Since the formulation change to a non-HAP containing binder, the facility is now a minor source of HAPs.

#### EU-COOLTOWER

This emission unit is a 1,600 gallon per minute cooling tower equipped with drift eliminators. (PTI No. 26-15D)

The vendor certification is being maintained in the facility's main recordkeeping document. The manufacturer shows that the drift rate is 0.005%. A service report is provided by the contractor to determine the water recirculation and TDS rate. Records are being kept monthly based on an average of the readings which are taken weekly by the contractor. Highest TDS was in March 2021 which was approximately 55% of the allowed material throughput.

Monthly and 12-month PM records are being maintained. PM10 and PM2.5 are assumed to be the same as PM emissions. Highest PM emissions are about 50% of the allowed limit. Monthly records are being maintained which includes pH, recirculation, TDS, and adjustments made to the operating scenario during maintenance.

**FG-ML2ALB**

This flexible group is a resinated fiberglass forming and collection process consisting of natural gas-fired rotary spin fiberizers, one conveyORIZED collection screen, and binder and de-dusting agent/wax spray applicators as well as one conveyor-fed natural gas fired curing oven with cooling section. This equipment is controlled by four high efficiency wet scrubber control systems. (PTI No. 26-15D) This was running during the inspection and EU-FURNACE#2 was undergoing testing during the walk through.

The facility is maintaining a list of the chemical composition of each product, ink, adhesive, and cleaning material including weight percent of VOC, density, and specific gravity. The tracking identifies where the VOC information was obtained which includes manufacturing data and SDS.

Daily weight of glass pulled is being tracked at the facility. There were no exceedances of the 108 ton/day limit in 2021. Annual weight of glass pulled is also being tracked. May 2021 appears to have the highest 12-month rolling emission rate. Dedusting agent is being tracked monthly. The pounds/ton of glass pulled is also being calculated and is less than 20% of the allowed limit. VOC emission rate is being tracked monthly and on a 12-month rolling basis. The VOC emissions from this flexible group are less than 1% of the allowed limit.

Log of wet scrubber operating parameters are tracked within the HMI system. This is also verified daily on site and submitted to HSE personnel to verify the system is tracking the information. The HMI system tracks the pressure drop and liquid flow rate based on previous stack test parameters. Turnkey is the vendor that does the calibrations on site.

Scrubber	Pressure Drop	Liquid Flow Rate	Date of Last Calibration
1	6.1	253	6/8/2021
2	6.8	259	6/8/2021
3	6.6	263	6/8/2021

Cooling Section	7.3	147	6/8/2021
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**FG-WBWALBFORMING**

This flexible group contains two non-resinated fiberglass forming and collection processes (EU-WBW1ALBFORMING and EU-WBW2ALBFORMING) consisting of natural gas-fired rotary spin fiberizers and conveyORIZED collection screens that utilize four externally vented venturi scrubbers. The lines also include a dicing operation with fugitive emissions from the use of an anti-static additive, silicone and/or de-dusting oil application that utilizes internally vented particulate controls. (PTI No. 26-15D)

This was running during the inspection. We were unable to observe the melting and spinning portion of the emission unit because of the ongoing construction of EU-WBW3ALBFORMING. The loose fiberglass is sent via conveyor to an automated packaging area where bags are stuffed with the white fiberglass, stacked, and ready to ship.

The facility is maintaining a list of the chemical composition of each product, ink, adhesive, and cleaning material including weight percent of VOC, density, and specific gravity. The tracking identifies where the VOC information was obtained which includes manufacturing data and SDS information.

Daily weight of glass pulled is being tracked at the facility. There were no exceedances of the 119 ton/day limit in 2021. Annual weight of glass pulled is also being tracked. The facility is about 90% of the limit in the permit. Weight of de-dusting oil used is being tracked, monthly. VOC tracking includes de-dusting as well as other additives which contain VOCs. VOC emission rate monthly and 12-month rolling emissions are tracked. Highest emissions are approximately 5% of the allowed limit.

Log of wet scrubber operating parameters and control system including pressure drop and liquid flow rate are tracked within the HMI system, continuously. This is also verified daily on site and submitted to HSE personnel to verify the system is tracking the information. The HMI system tracks the pressure drop and liquid flow rate based on previous stack test parameters. As an example, on January 7, 2021, there were alarms recorded multiple times throughout the day. This was attributed to the line being down and preparing for startup. The HMI system was verified that the alarms matched the human backup recording.

Scrubber	Pressure Drop	Liquid Flow Rate	Date of Last Calibration
1	7.4	243	6/8/2021
2	8.7	230	6/8/2021
3	8.2	267	6/8/2021

4	7.7	249	6/8/2021
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#### FG-FURNACE1,3, and 4

This is a flexible group that includes melters associated with EU-WBW3ALBFORMING and FG-WBWALBFORMING, which are all vented to existing baghouses and stack. (PTI No. 26-15A) This was inaccessible during the inspection due to construction.

Bag break alarms are maintained manually on site and verified by Mr. Estes. Records are updated when HSE personnel are on site. Records include what alarm was triggered, what time and length of the alarm, if there was any opacity, and the explanation of cause of the alarm. In 2021, there have no alarms longer than 2-hours.

Mass VOC emission rate monthly and 12-month rolling are being tracked. This flexible group has a continuous monitor for hourly glass pull rate which is monitored by the HMI system.

#### FG-RULE290

This flexible group includes any emission unit that emits air contaminants and is exempt from the requirements of Rule 201 pursuant to Rule 278, Rule 278a, and Rule 290. Emission units installed/modified before December 20, 2016, may show compliance with Rule 290 in effect at the time of installation/modification.

When Rule 290 is used, the facility tracks each material, each component of the material, if the material is carcinogenic or non-carcinogenic, and the associated ITLS or IRSL is applicable. The trial chemical dedusting usages were all tested for approximately 1-hour. During each of the trials, percent of the dedusting agent was monitored as well as emissions in pounds per hour. Recordkeeping from the trials shows that the amount of emissions from both carcinogenic and non-carcinogenic materials were below the allowed 10 lbs/month and 1,000 lbs/month uncontrolled respectively.

#### FG-COLDCLEANERS

This flexible group includes any cold cleaner that is grandfathered or exempt from Rule 201 pursuant to Rule 278, Rule 278a and Rule 281(2)(h) or Rule 285(2)(r)(iv). Existing cold cleaners were placed into operation prior to July 1, 1979. New cold cleaners were placed into operation on or after July 1, 1979.

The two cold cleaners on site are located in the WBW area and in the parts room. During the inspection, the lids were closed and there were cleaning brushes in the area where parts are cleaned. Crystal Clean services the cleaners quarterly.

**FG-EXTRICEMACT<500 bhp**

This flexible group includes requirements of 40 CFR Part 63, Subpart ZZZZ - National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE), located at an area source of HAP emissions, existing emergency, compression ignition (CI) RICE equal to or less than 500 brake hp. A RICE is existing if the date of installation is before June 12, 2006.

Weekly maintenance records are sent to the HSE personnel including date of maintenance, hours meter reading, reason for running, hours spent for an emergency, hours spent for maintenance and testing, hours spent for non-emergency, fuel level, annual service, and notes. Engines run for approximately 30 minutes per week for readiness testing. Temperature, fuel level, oil pressure, RMP during running, leaking fuel or coolant, battery, and many other parameters are checked during weekly maintenance by employees on site.

Total hours of operation are tracked using both the weekly hours meter and a 12-month rolling formula to show the yearly hours operated. The facility is running the engines less than the allowed 100 hours per calendar year for maintenance checks. The fuel usage is also tracked based on hours run and worst-case scenario load based on the manufacturer specifications. Bill of lading identified the fuel as 15 ppm of less of sulfur.

Fuel supplier certification was supplied during the inspection. The fuel is certified ultra-low sulfur less than 15 ppm by Buckeye Terminals in Marshall. The non-resettable hours meter read EU-DETROITDSL1 604.9 hours and EU-DETROITDSL2 581.7 hours. The fuel filters were labeled they were changed on 12-18-2020. This is the date the engines were last serviced. Neither were running during the inspection.

**FG-EXTRICEMACT>500bhp**

This flexible group contains requirements contained in 40 CFR Part 63, Subpart ZZZZ - National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE), located at an area source of HAP emissions, existing emergency, compression ignition (CI) RICE greater than 500 brake hp. A RICE is existing if the date of installation is before June 12, 2006.

See the above discussion of records maintained for this flexible group. The hours meter reading during the inspection was 685 hours and the fuel filter was last changed on 1-5-2021. This was not running during the inspection.

**FG-NSPSIII**

This flexible group contains a 900 HP (671 kilowatts (kW)) new emergency compression ignition (diesel fuel fired) RICE engine located at an area source of HAP emissions, subject to MACT ZZZZ.

The permittee is required to demonstrate compliance with the MACT by complying with the NSPS III. Engine manufactured after April 1, 2006.

Manufacturer certification documentation was provided for EU-ALLEYGEN during the ROP renewal process. The engine is an EPA certified Tier 2 engine built in August 2006. The facility is following the manufacturer's emission-related written instructions for required maintenance and maintaining records of maintenance performed.

The engines hours of operation, emergency versus non-emergency operating hours, and hours meter are being tracked. See above discussion related to fuel certification and more in-depth discussion of tracking. The hours meter read 301.9 hours during the inspection. The label on the engine states the horsepower for the engine is 900hp and engine model C18. The fuel filter was last changed on 1-5-2021. This was not running during the inspection.

#### FG-CAMUNITS

The equipment in this flexible group is subject to Compliance Assurance Monitoring, 40 CFR 64.6. Equipment in this flexible group includes EU-ML2ALBFORMING, EU-WBW1ALBFORMING, EU-WBW2ALBFORMING, and EU-WBW3ALBFORMING.

The facility tracks the scrubber pressure drop and liquid flow rate continuously using their HMI system. The averaging period is every four hours. The indicator range was established during the last performance test. EU-WBW3ALBFORMING is not yet operational. The facility tracks all alarms on site and maintains records of maintenance performed, both preventative and as required by alarms on site.

#### FG-FIBERIZATION

This emission unit contains all process equipment associated with the conversion of the existing fiberization process to the Knauf fiberization process. (PTI No. 26-15A) The emission units contained in this flexible group are EU-ML2ALBFORMING, EU-ML2ALBCURING, EU-WBW1ALBFORMING, and EU-WBW2ALBFORMING.

Annual emissions of PM2.5 and PM10 in tons/calendar year per Appendix 9 are being tracked. PM10 and PM2.5 emission factors from stack testing are used to determine emission rates of PM10/2.5 monthly. Highest emission rates are in January 2021 for PM10/2.5.

The facility appears to be in compliance with all requirements contained in MI-ROP-B7205-2015b, 26-15D, 132-19A, and all other applicable state and federal air quality requirements.

NAME *Quinn Cuyler* DATE 7/13/21 SUPERVISOR *RIL T/23/21*