

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

B199561582

FACILITY: U S GRAPHITE INC		SRN / ID: B1995
LOCATION: 1621 HOLLAND AVE, SAGINAW		DISTRICT: Bay City
CITY: SAGINAW		COUNTY: SAGINAW
CONTACT: Bill Burns , Quality Manager		ACTIVITY DATE: 11/04/2021
STAFF: Gina McCann	COMPLIANCE STATUS: Non Compliance	SOURCE CLASS: MINOR
SUBJECT: Inspection to determine compliance with the following PTIs: 467-73, 503-92, 694-92, 507-92, 223-70, 506-92, 230-07 and 111-12A.		
RESOLVED COMPLAINTS:		

Mr. Chris Hare and I performed a scheduled inspection at US Graphite (USG). Ms. Sarah Witgen, Director of Human Resources, Mr. Bill Burns, Quality Manager and Mr. Bill Griffus, Plant Manager accompanied us. I determined compliance for the following permits: 467-73, 503-92, 694-92, 507-92, 223-70, 506-92, 230-07 and 111-12A. The facility was in non-compliance with the conditions of PTI 111-12A and had installed an oven without obtaining a Rule 201 permit. A violation notice dated January 21, 2022 followed the inspection.

Here is an overview of the active permits, equipment associated with them as wells as the equipment location.

PTI #	Equipment	Location of Equipment
111-12A	EURESINTREAT Resin storage tanks, pressure vessels, wash tanks and electric curing ovens.	Kelly Building
230-07	Graphite Kiln	Kelly Building
694-92	E245 blenders w/baghouse collector	Building 1 Room south of boiler
507-92	Detrex Degreaser Model 2D500	Building 2
506-92	Detrex Degreaser Model 20500S	Building 2
503-92	12 MMBtu/Hr Boiler	Far north room in Building 1

223-70	Grinding operations	Building 2
467-73	Oven	Branbury Room/Building 1

USG was initially established at this site in 1910 and developed a process to manufacture “brush carbon.” This was used primarily for electric motor brushes. The current operations at the site are for the manufacture of “mechanical graphite.” Mechanical graphite is used for various parts including seal and bushings for a variety of industries. During the peak of operations at the site, the facility and buildings covered 14 acres and employed 700 people. At the last inspection the site employed about 50 people, it appeared to be roughly the same. Some machining operations have been moved to a US Graphite facility in Mexico and much of the site was vacant when we visited. Several buildings on-site have received facelifts since the last inspection and there was active shrub removal and general site cleanup happening while we were on-site.

The manufacturing process consists of the following main steps. The raw materials are brought on site in various containers and forms. The raw materials are primarily natural graphite, petroleum coke, coal tar pitch, sulfur, and resins. The natural graphite looks like coal and is milled to certain specifications on site. The other solid components are purchased pre-milled. The materials are blended and compressed into billets. These billets are then fired in the kilns to create specific qualities in the part. These parts are then machined to final dimensions or further treated with resins or additional carbon impregnation. A general process flow diagram (pfd) along with two more specific pfd's are attached to this report.

Ms. Witgen provided an aerial view of the property, see attached. The process begins in building 1. This building consists of the boiler (PTI 503-92), blending and pressing processes. A base material consisting of pitch, sulfur, carbon, and graphite is blended in the banbury room. Each barrel is then cooked (PTI 467-73) and set to cool for 24 hours in the cooling room located between the banbury and boiler rooms. The boiler provides steam to heat the paddles and rollers used during the mixing process. Once the material is cooled it is milled in one of the Raymond Mills (PTI 694-92). PTI 694-92 requires a fabric filter baghouse to be installed on the process equipment. In approximately 2019 the baghouse was replaced with the following equipment: Donaldson Torit model # DFT2-12, Holds (12) cartridge filters, Total Filter Media Area: 3,048 ft², Air-To-Media Ratio @ 6,000 cfm: 2:1 and Automatic Pulse Clean System with differential pressure gauge and sequencing timer board in enclosure.

Rule 336.1278(b) excludes any activity that results in an increase in actual emissions greater than the significance levels defined in Rule 119. Activity means the concurrent and related installation, construction, reconstruction, relocation, or modification of any process of process equipment. According to the permit application, the emissions at the time of permitting were 7.884 tpy (ton per year). This is below all species of PM (particulate matter) significance values, therefore I did not redo a calculation. The reason is production has decreased since original installation and since emissions were below significance levels at the time of permitting then they should be below now. The collection area of the replacement collector is smaller, however cartridge collectors are typically better at collecting fine particulate as compared to fabric filters

and with the flow on the replacement collector being higher this is likely a replacement of an air pollution control equipment with an equivalent or more efficient piece of equipment Rule 336.1285(2)(d).

Continuing through the pfd, once the material is milled it is then pressed into forms and these parts will then leave building 1 to be cured in a furnace. The parts can go to one of three buildings. Building 3 houses tube furnaces and three bottle/beehive furnaces, building 6 has 2 additional beehive furnaces. In the bottle furnaces the pressed parts are loaded into the kiln and gradually heated up to >2000 °F. The heating and cooling cycle typically lasts for up to 14 days. These furnaces all appear to be grandfathered, though the exact installation date is unknown. The installation pre-dates USG ownership which was obtained in the late 1970's.

Depending on the need per grade the parts may go to pitch treat or pitch burnoff located in building 5. These ovens were also installed prior to USG ownership and an exact installation date is unknown.

Instead of using the furnaces in building 1 or building 6, USG installed a 4.3 MMBTU/hr natural gas fired graphite kiln with secondary afterburner. This kiln was permitted (230-07) to replace existing grandfathered bottle furnaces. The new kiln was purchased to process stamp, "green graphite" parts in a more controlled manner with a shorter cycle time. The kiln did not provide parts with consistent characteristics and is now being used as a curing oven.

The permit requires that the kiln not be operated unless the secondary afterburner is operating at a minimum temperature of 1,400 °F. The permit requires recordkeeping for the afterburner temperature, malfunctions and chemical composition of material processed in kiln.

Staff was able to provide records for afterburner operation temperatures and thermocouple calibrations required by the permit.

Parts may also go to graphitization (if required per grade) in building 4. This building houses electric graphitization furnaces. The facility dates the installation in the 1960's. I researched for similar process across the state and there isn't anything permitted that is like this process. Conversations with permit section suggested NOx and SOx would not be emissions and if anything is emitted it may be PM. However, due to the age of installation it appears that this equipment may be considered grandfathered.

Once the parts are cured, they are impregnated with resin in the Kelly building or in an oven in the finishing building. Resin is hardened into the parts in one of three electric curing ovens. Oven #2 was recently installed and can likely be considered an in-kind replacement for a previous oven under exempt from permitting under R 336.1285(2)(c). The resin impregnation process is covered under PTI 111-12A. At the time of the inspection the facility was not able to produce the records necessary to determine compliance with the PTI. A violation notice was sent for not having records.

The oven in the finishing building or building 2 also impregnates parts with resin, like those in the Kelly building. It was installed in 1996 and a permit was not obtained prior to installation. I could not identify an exemption for this process and a R201 permit violation was cited for this installation.

Lastly, machine finishing of parts occurs either in the Saginaw plant or is shipped to a sister plant in Mexico. Finishing occurs in building 2 where there are local controls on the roof (PTI 223-70) as well as a newly installed baghouse. This baghouse is likely exempt under R336.1285(2)(l)(vi)(C). Finishing can also occur in the Kelly building and has a cartridge collector located on the south side of the property near Boxwood Street.

Building 2 also houses two older vapor degreasers (PTIs 506-92 and 507-92) that no longer operate as vapor degreasers. Instead, they operate as cold cleaners with an air/vapor interface of less than 10 ft². EPP 40 is the solution used and Safety Kleen picks up any spent material.

At the time of the inspection the facility was in non-compliance with PTI 111-12A and R201. A violation notice was sent January 21, 2022.

NAME 

DATE 1/21/2022

SUPERVISOR 