

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

B199523581

FACILITY: U S GRAPHITE INC		SRN / ID: B1995
LOCATION: 1621 HOLLAND AVE, SAGINAW		DISTRICT: Saginaw Bay
CITY: SAGINAW		COUNTY: SAGINAW
CONTACT: John Schmitzer , Engineering Manager		ACTIVITY DATE: 10/30/2013
STAFF: Kathy Brewer	COMPLIANCE STATUS: Non Compliance	SOURCE CLASS: MINOR
SUBJECT: Announced inspection to determine compliance with PTI #111-12, 223-70, 230-07, 467-73, 503-92, 504-92, 505-92, 506-92, 507-92, 694-92		
RESOLVED COMPLAINTS:		

I visited US Graphite on October 30, 2013, for a scheduled site inspection. There are currently ten existing permits (PTI 111-12, 223-70, 467-73, 503-92, 504-92, 505-92 506-92, 507-92 and 230-07) for the facility. For the meeting and inspection I met with Mr. John Schmitzer, Engineering Manager and Terry Reinhardt, Process Engineer.

US Graphite (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 seals and bushings for a variety of industries.

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 purchase 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 print out of photos from the inspection is attached and available as a PowerPoint file.

I spoke with Mr. Schmitzer and Mr. Reinhardt about contacting the Clean Air Assistance staff and Office of Environmental Assistance for information on technical and financial help. I also spoke with Mike Young, OEA for the Saginaw Bay District office.

The following table summarizes the inspection findings:

Air PTI Number	Equipment	Compliance status	Comment
PTI # 111-12	Resin treatment & curing operations	Compliant	Not all equipment covered by this PTI moved to new production area
PTI # 223-70	2 baghouses for grinding/machining (30,000 & 20, 000 CFM)	Non compliant Improper handling of collected particulate. No records to demonstrate proper maintenance & operation of baghouses	Equipment still on site & used for machining. Facility would need record keeping established if choose Rule 290 (a)(iii) exemption
PTI # 230-07	Graphite Kiln w/afterburner	PENDING Need afterburner & thermocouple calibration records	
PTI #467-73	Branbury mixer & 3 ovens	Compliant (no monitoring or record keeping requirements)	Equipment still on site. Not certain which ovens so unclear if covered by PTI #111-12 now
PTI #503-92	12MMBtu Johnson boiler Installed 1984	Compliant	May meet Rule 282(b) exemption.
PTI #504-92	Ultrasonic cleaner	Compliant	Equipment no longer used but still on site
PTI #505-92	49.2 MMBtu natural gas fired boiler	Compliant	Installed in 1968 & decommissioned
PTI #506-92	Open top vapor degreaser	Compliant (chiller coil required if using non-aqueous degreaser)	No longer use solvent. Equipment included in PTI #111-12 Or may meet exemption in Rule 281(h)
PTI #507-92	Open top vapor degreaser	Compliant (chiller coil required if using non-aqueous degreaser)	No longer use solvent. Equipment included in PTI #111-12 Or may meet

PTI #694-92	Wheelabrator baghouse serving a one barrel carbon mix blender & screening device	Compliance	exemption in Rule 281(h) Blender & screen still on site & in use. No specific exemption listed in Air rules.
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PTI 223-70: Non Compliance

This was the initial permit for the facility and covered the general manufacturing processes. There are two baghouses that control the emissions from the machining operations. I was unable to determine if the baghouses themselves are adequately monitored and maintained to provide the required control efficiencies. The waste material from the baghouses is collected and shipped off site for disposal. At the time of the inspection the collected material had spilled onto ground at both collection points. A Violation Notice will be sent.

The dust collection system for these operations has collection points for machining stations within the building. The machining is performed on mostly older, manually operated equipment.

This equipment appeared to be unmodified since permitting. It is likely that the operations would be exempt if records were maintained as required by Rule 290 (a)(iii), collected material was handled properly, and the baghouses were maintained and operated properly.

PTI 467-73: Compliance

This permit is for the Banbury mixer. This mixer is associated with the milling operations. Graphite, sulfur, petroleum coke and coal tar are mixed in batches. The mixture is sent to a blender prior to being pressed/stamped in a mold . The equipment is vented through a baghouse to the large stack that previously served a large boiler. There are no monitoring or recordkeeping conditions in the PTI. This equipment appeared to be unmodified since permitting.

PTI 503-92: Compliance

This PTI is for a 12 MMBTU/hr natural gas fired boiler. This boiler was installed in 1984 and is not subject to the NSPS. There are no special conditions in the PTI for this boiler. Additionally, this boiler appears to meet the exemption in Rule 282(b).

Large portions of the facility are no longer in use and USG is in the process of eliminating steam runs several areas. USG may switch to a newer smaller boiler in the near future.

PTI 504-92: Compliance

This PTI covered an ultrasonic cleaner. This equipment is no longer operated, may be removed, and the PTI could be voided.

PTI 505-92: Compliance

This PTI was for a 49.2 MMBTU/hr natural gas fired boiler. The boiler had been installed in 1968. This boiler is out of commission and the PTI can be voided.

PTI 506-92 and 507-92: Compliance

These PTIs were for two open top vapor degreasers that were permitted to use TCE. In 2005 in response to a LOV the solution in the degreasers was changed to dipropylene glycol methyl ether. These units are both operated as cold cleaners and have an air/vapor interface of less than 10 ft2. Therefore, they both meet the exemption for cold cleaners, R281(h) and the permits may be voided. The most recently issued PTI # 111-12 contains (3) wash tanks as part of the EU-RESINTREAT process.

PTI 694-92: Compliance

This PTI is for a 30 ft3 blender and associated baghouse. This equipment is still operational.. The

blender is used to prepare batches of graphite prior to piece molding, when the batch size is larger than the mixer capacity. The equipment appeared to be in compliance with the PTI.

PTI 230-07: Pending

This PTI was issued for a new 4.3 MMBTU/hr natural gas fired graphite kiln with secondary afterburner. This kiln was permitted to replace existing grandfathered bottle 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.

The new kiln was purchased to process stamped, "green graphite" parts in a more controlled manner with 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.

The kiln is equipped with digital controls that maintain a lockout on the primary chamber based on afterburner temperature. The data controller monitors and continuously records several operating parameters during each batch cycle.

Staff that could provide records for afterburner operation temperatures and thermocouple calibrations were not available. I requested that the facility send me afterburner temperature records for the week of August 20. I also requested copies of any thermocouple calibrations conducted during the past 18 months.

PTI #111-12: Compliance

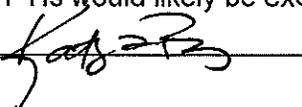
The facility has remodeled buildings and moved the Kiln covered by PTI #230-07, three curing ovens, several pressure resin vessels, and some stamping and machining operations. All equipment listed as part of EU-RESINHEAT in the PTI has not yet been moved, in part, to assure consistency in product as any changes are made.

I reviewed on-site records for resin use and VOC emissions. All required information was available. A copy of the VOC emissions and resin usage for 2012 is attached. Production floor resin consumption records for June through October 2013 are also attached.

Miscellaneous

Much of the equipment at USG is older and covered by several outdated permits. However, based on the site inspection, the equipment appears unchanged since permit issuance or since the grandfathered date. USG is in the process of consolidating operations at the site. During the peak of operation at the site, the facility and buildings covered 14 acres and employed 700 people. The site currently employs about 50 people. Some machining operations have been moved to a US Graphite facility in Mexico. Much of the site is vacant and dilapidated. Many of the operations that are currently covered by older PTIs would likely be exempt.

NAME



DATE

11-7-13

SUPERVISOR



Kelly Building Weekly Resin Consumption

Note! RECORD RESIN LEVELS before refilling or changing resin in storage tanks!

Date (Friday's)	Process time (hrs/wk)	<u>CRC (Type 1)</u>		<u>Durez (Type 1)</u>		<u>CRC LOW PRESSURE (Type 1)</u>		<u>P-fill (Type 2)</u>	
		Resin Tank level (in)	Zahn 3 Viscosity time (sec @ °F)	Resin consumed (gal/wk)	Zahn 3 Viscosity time (sec @ °F)	Resin consumed (gal/wk)	Zahn 3 Viscosity time (sec @ °F)	Resin Tank Level (in)	Zahn 3 Viscosity time (sec @ °F)
6/21/2013	63	12/28	20/66	10	57/66			9	61/53
6/28/2013	58	24	19/66	10	56/66			9	61/53
7/5/2013	32	16	19/66	10	57/66			9	61/53
7/12/2013	68	11/+31	20/66	15	57/66			9	61/53
7/19/2013	50	20	20/66	5	57/66			9	61/53
7/26/2013	57	16	19/66	15	57/66			9	60/53
8/2/2013	58	23/16	19/66	5	58/66			9	60/53
8/9/2013	51	15/24	20/66	0	58/66			9	61/53
8/16/2013	43	18	19/66	0	58/66			9	61/53
8/23/2013	40	12	13/79	0	58/66	Low press. Started		9	61/53
8/30/2013	46	29	18/66	∅	57/66	∅	19/66	9	60/53
9/6/2013	54	22	12/72	∅	57/66	5	18/66	9	61/53
9/13/2013	56	17	13/70	∅	58/66	5	19/66	9	60/53
9/20/2013	54	12	14/70	5	75/77	5	19/66	9	61/53
9/27/2013	66	10/32	15/70	5	90/76	5	17/66	9	60/53
10/4/2013	51	28	15/70	20	85/76	5	16/66	9	60/53
10/11/2013	51	24	17/69	∅	120/75	∅	17/66	9	60/53
10/18/2013	48	21	17/70	∅ 10	150/75	∅	17/66	7	60/53
10/25/2013	47	18	16/70	5	190/74	∅	18/66	7	60/53
11/1/2013									
11/8/2013									
11/15/2013									
11/22/2013									
11/29/2013									

2 cans CRC
not used 9/27

10/30/2013
KR

2012 - US Graphite Annual VOC emissions

Limits

VOCs - 1.5 tons/yr

Formaldehyde - 270 lbs/yr

Diallyl pthalate - 195 lbs/yr

Air contaminant	MSDS	Sp. Grav.	%VOC Content	Gal/yr	VOC Lb/yr	VOC Ton/yr
Phenol formaldehyde (Type 1)	Capital Resin CRC-720	1.2	13.5	1456.00	1965.60	0.98
Formaldehyde (Type 1)	(CAS 50-00-0)		1.8		262.08	
Thermoset polyester resin (Type 2)	Von Roll 3255	1.19	60.0	85.20	507.11	0.25
Diallyl Phtalate (Type 2 catalyst)	Diallyl Pthalate	1.119	100.0	2.90	27.03	0.01
T-Butyl Peroxybenzoate (Type 2 catalyst)	Luperox P	1.042	98.4	6.82	58.28	0.03
Furfural Acetone (Type 4)	CRC NC-1012	1.15	10.0	71.10	68.18	0.03
Diethyl Sulfate (Type 4 catalyst)	Diethyl Sulfate	1.177	98.0	2.42	23.26	0.01
Epoxy resin (Type 5)	Epon Resin 815C	1.13	30.0	0.00	0.00	0.00
Boron Triflouride Monoethyamine (type 5 catalyst)	Leecure B-550	1.3	100.0	0.00	0.00	
Total air contaminant					2911.55	1.52

10/30/2013
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Phenol-Formaldehyde resin (Type 1)					
Month	Resin use (gal)	Process time (hrs)	VOC emission rate (lbs/hr)	VOC emission rate (tons/mo)	Formaldehyde (lbs/mo)
Jan	126	212	0.80	0.085	22.68
Feb	180	216	1.13	0.122	32.4
Mar	115	287	0.54	0.078	20.7
April	170	237	0.97	0.115	30.6
May	200	248	1.09	0.135	36
June	140	249	0.76	0.095	25.2
July	185	207	1.21	0.125	33.3
Aug	105	238	0.60	0.071	18.9
Sept	125	230	0.73	0.084	22.5
October	110	197	0.75	0.074	19.8
Nov	0	0	#DIV/0!	0.000	0
Dec	0	0	#DIV/0!	0.000	0
2012 total	1456	2321		0.983	262.08

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Thermoset polyester resin (Type 2)				
Resin use (gal)	Process time (hrs)	VOC emission rate (lbs/hr)	VOC emission rate (tons/mo)	Diallyl Pthalate (lbs/mo)
0	212	0.00	0.000	0.0
7.1	216	0.20	0.021	2.4
21.3	287	0.45	0.064	7.2
21.3	237	0.54	0.064	7.2
7.1	248	0.17	0.021	2.4
14.2	249	0.34	0.043	4.8
0	207	0.00	0.000	0.0
0	238	0.00	0.000	0.0
0	230	0.00	0.000	0.0
14.2	197	0.43	0.043	4.8
0	0	#DIV/0!	0.000	0.0
0	0	#DIV/0!	0.000	0.0
85.2	2321		0.256	29.0

10/30/2013

* Measured by inch
in large diameter
storage tank