

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

B286440905

FACILITY: Shiloh Industries, LLC		SRN / ID: B2864
LOCATION: 250 Adams Avenue, ALMA		DISTRICT: Lansing
CITY: ALMA		COUNTY: GRATIOT
CONTACT: Dan Rinke , Human Resources Manager		ACTIVITY DATE: 07/25/2017
STAFF: Michelle Luplow	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MINOR
SUBJECT: Scheduled, unannounced inspection to determine compliance with PTI No's 183-95A, 272-96, and 5-00A.		
RESOLVED COMPLAINTS:		

Inspected by: Michelle Luplow

Personnel Present: Dan Rinke, Human Resources & EHS Manager (Daniel.rinke@shiloh.com)

**Purpose:** Conduct an unannounced, scheduled compliance inspection. During the August 2016 inspection Dan Rinke noted that production would likely increase with the addition of various pieces of equipment to process 2 new types of parts for GM. This inspection was conducted to learn what, if any, processes were added or changed since the 2016 inspection, in addition to checking for compliance with the flux usage limits, which limits HF emissions.

**Facility Background/Regulatory Overview:** Shiloh Industries is a fabricator of various aluminum automotive parts which are die cast molded onsite from aluminum ingots.

The facility currently has 3 active air quality permits for 3 natural gas-fired aluminum jet melter furnaces: 183-95A, 272-96, and 5-00A. PTI 272-96 has a supplemental revision of the original October 1996 permit, issued in December 1996. The supplemental permit changed the opacity limit from 5% to 20% and changed the flux usage rate limit from 131.4 tons/year to 6.6 tons/year.

D. Rinke said only the 1053 jet melter furnace (PTI 183-95A) has been consistently used since 2013. The other two (1100 and 1106) have been used sparingly since 2013, after Shiloh bought the plant. Although there were plans to increase production of parts, and thus bring all 3 furnaces online for production, D. Rinke explained that the production has not increased as rapidly as planned. He said Shiloh operates 24 hr/day, runs 3 shifts, and most often operates 5 days per week, although they do occasionally schedule a 6<sup>th</sup> day to meet production demands.

Hydrofluoric Acid (HF) is the HAP of concern at this facility. Shiloh is currently working on a potential to emit demonstration for HAPs, which will include HF emissions.

**Inspection:** This was an unannounced, scheduled compliance inspection. The inspection was conducted 12:20 – 1:30 p.m. on July 25, 2017. At approximately 9:00 a.m. I had attempted to conduct the inspection, but due to scheduling conflicts, D. Rinke and I rescheduled for later in the day. I gave D. Rinke a January 2017 Permit to Install Exemption handbook.

During the inspection we discussed the importance of being aware of the fluorine content of the flux and how compliance with the permit ensures that HF emissions from the facility, at the property line, are at a safe level for public health. I explained that Shiloh should pay attention to the flux's content: a change in the fluorine content of the flux will result in a change in HF emissions.

The current SDS for Shiloh's flux states that less than 40% is potassium fluorosilicate ( $K_2SiF_6$ ), the fluorine-containing compound. Based on my own calculations, assuming 100% of the flux contains fluorine and using the permitted limit of 6.6 tons flux per year, Shiloh would exceed the 10 ton per year HAP threshold for HF. Shiloh has submitted a potential to emit for HAPs, but is still working on adding the potential to emit of HF from the fluxing operations to their potential to emit demonstration. Determination of whether Shiloh is a true minor source of HAP will be made once Shiloh submits the potential to emit for HF. After speaking with D. Rinke during the inspection, it is likely Shiloh will restrict their potential to emit using the 6.6 tons of flux per year per furnace unit and assuming 40% of the flux is  $K_2SiF_6$  (based on the SDS).

D. Rinke explained that they only use raw ingots (bars) of aluminum, also known as "clean charge", in their processes, in addition to reusing the scrap aluminum from the die casting process or parts from the die cast processes that did not meet QA/QC.

D. Rinke explained that the amount of flux charged into the furnace is not dependent on the quantity of aluminum in the furnace, but is charged on a shift basis (generally once at the end of each shift), 2.5 lbs of flux per charge. At maximum production in the 1053 furnace, for example, (operating the entire 3 shifts at maximum aluminum holding capacity equating to 21,000 lbs of aluminum per operating day), the maximum flux usage rate would equate to 0.71 lbs flux/ton of aluminum, at 7.5 lbs flux/day maximum (2.5 lbs x 3 charge times). He explained that there are times when the molten aluminum is tested and determined that it does not need to be fluxed. Situations like these would result in less flux per ton of aluminum, which is one of the reasons why their reported flux/ton of aluminum data are less than the maximum 0.71 lbs flux/ton aluminum, and one reason why the flux/ton of aluminum numbers are not consistent from month to month. The other reason is that some shifts they might not run aluminum through the furnace and therefore no flux is added.

Each furnace has a 20% limit on opacity being emitted from the stack. Prior to entering and leaving the facility I saw no signs of opacity from any of the stacks.

The following table was used to determine which permitted equipment was still present onsite. D. Rinke reviewed the list to ensure its accuracy. Included in this table are the CNC and other machines that have been installed since August 2016 for the new GM parts production lines

Table 1. Current permitted equipment

Emission Unit	PTI/Exemption	Compliance Notes
No. 1106 Aluminum jet melter furnace, natural gas-fired, metal fabric filter screen, east side of building	5-00A	Compliance
No. 1053 Aluminum jet melter furnace, natural gas-fired, metal fabric filter screen, southeast side of building	183-95A	Compliance
No. 1100 Aluminum jet melter furnace, natural gas-fired, metal fabric filter screen, southwest side of building	272-96	Compliance
One electric hold furnace and die cast machine, "holding pot"	Rule 282(2)(a)(vi)	D. Rinke said this unit is only operated for "surface jobs": those jobs that are sporadically picked up to produce parts for old cars, or for experimental parts from prototype dies. Fluxing does not occur in this unit. Molten aluminum, which has already been cleaned via fluxing, is held at temperature in this pot
Aluminum die cast machine with launder system which maintains aluminum's heat as it is conveyed	Rule 285(2)(l)(ii)	Compliance. Die cast machines are exempt
T-4; 2 MMBtu/hr natural gas-fired heat treating oven	Rule 282(2)(a)(i)	Compliance. Unit heats and cools the Al ingots – ingots remain solid; furnace must be less than 10 MMBtu/hr to be exempt. Will follow up on Btu/hr in a supplemental report.
T-5; natural gas-fired heat treating oven	Rule 282(2)(a)(i)	Compliance. Unit heats and cools the Al ingots – ingots remain solid; furnace must be less than 10

		MMBtu/hr to be exempt. Will follow up on Btu/hr in a supplemental report.
CNC machines, mills, lathes	Rule 285(2)(l)(vi)(B)	Compliance. Multiple units for the manufacturing of 2 new types of parts in addition to their traditional parts manufacturing. All emissions are vented to the in-plant environment
Shot blasting	Rule 285(2)(l)(vi)(B)	Compliance. Steel media used on the manufactured parts. Control is self-contained within the plant.
Parts Washing	Rule 281(2)(e)	Compliance. Surfactant and water washer (likened to an industrial-sized dish water) to wash the finished parts
Onan Emergency Generator for backup lighting; Model # 12.5IC-18R10259AB Serial # 300539077	TBD	Follow-up provided under separate activity once additional information on unit is received

PTI 183-95A: No. 1053 Al jet melter furnace

Almost all aluminum processing has been done using this furnace during 2016 and 2017. The other two furnaces (1100 & 1106) have not been used on a regular basis. In this process aluminum flux and nitrogen are injected into the furnace to separate out the impurities. This is the same process that occurs for the 1106 and 1100 furnaces.

Shiloh is limited to one pound of flux per ton of aluminum melted, and 6.6 tons of flux per year for furnace 1053. Shiloh is required to keep monthly records of the amount of flux used and the flux composition is to be kept on file.

I was provided with calendar year 2016 and calendar year 2017 records. Total flux used for 2016 was 0.82 tons and 0.47 tons of flux for January – June 2017. All months were shown to be under 1 lb flux/ton aluminum for 2016 and 2017. Highest flux usage rate in 2016 was 0.76 lb flux/ton aluminum in October, and for 2017, 0.28 lb flux/ton aluminum in February.

All “waste” scrap aluminum from the die cast machines are re-melted to be used in Shiloh’s processes.

The stack is required to be not less than 35’ above ground level. D. Rinke said the height of the building from the floor to the ceiling is 24’. Last year they measured the stack heights for all 3 furnaces (from roofline to top of the stack), and furnace melter 1053 had an additional height of 12’10”. This would make the total stack height almost 37’ above ground level and therefore meets the permitted stack height requirement.

272-96: No. 1100 Al jet melter furnace

Shiloh is limited to one pound of flux per ton of aluminum melted, and 6.6 tons of flux per year for furnace 1100. Shiloh is required to keep monthly records of the flux usage rate, and the flux composition is to be kept on file. Furnace 1100 was not used at any time during calendar year 2016 up through June 2017, and therefore Shiloh meets the flux usage rate limits.

The stack for furnace melter 1100 is required to be no less than 36.5’ above ground level. The stack height from the roofline to the exit point of the stack was measured at 12’, equating to a total stack height from ground level of 36’. I will inform D. Rinke of this finding and allow Shiloh a chance to determine how to come into compliance with the stack height. I will not cite a violation at this time, but will include their compliance plan under a separate activity in MACES.

PTI 5-00A: No 1106 Al jet melter furnace

Shiloh is limited to 2 pounds of flux per hour on a monthly average and is required to keep record of the flux usage rate and hours of operation on a monthly basis.

Furnace 1106 was operated in June and July of 2016 and has not yet operated in 2017 (up through June). For each calendar year, Shiloh has an excel spreadsheet that keeps track of furnace operating hours per furnace per

month. Based on the hours operated in June and July 2016 (144 hours and 24 hours, respectively), the lb flux/hour, averaged over these monthly operating hours is 0.1 lb/hr for both June and July.

**Compliance Statement:** Shiloh Industries is currently in compliance with PTI's 183-95A, 272-96, and 5-00A. A potential to emit for HAPs is still being conducted. Compliance checks on the emergency generator will be conducted when more information has been received.

NAME Mickie Fyfe DATE 8/1/17 SUPERVISOR B.M.