

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

N367742705

<b>FACILITY:</b> Magnesium Products of America		<b>SRN / ID:</b> N3677
<b>LOCATION:</b> 2001 Industrial dr., EATON RAPIDS		<b>DISTRICT:</b> Lansing
<b>CITY:</b> EATON RAPIDS		<b>COUNTY:</b> EATON
<b>CONTACT:</b> Colin Chapman , Remelt Superintendent		<b>ACTIVITY DATE:</b> 12/05/2017
<b>STAFF:</b> Michelle Luplow	<b>COMPLIANCE STATUS:</b> Compliance	<b>SOURCE CLASS:</b> MINOR
<b>SUBJECT:</b> Scheduled, unannounced compliance inspection to determine compliance with PTI 219-99 and 99-93		
<b>RESOLVED COMPLAINTS:</b>		

Inspected by: Michelle Luplow (author)

Personnel Present: Colin Chapman, Remelt Superintendent & ISO 14001 Management Rep (cchapman@meridian-mag.com)

**Purpose**

Conduct an unannounced, scheduled compliance inspection of Meridian Magnesium Products of America (Magnesium Products) to determine compliance with PTI 219-99 and 99-93.

Magnesium Products was last inspected March 2013.

**Facility Background**

Colin Chapman, Remelt Superintendent, said Magnesium Products creates magnesium castings for the auto industry, including Ford, GM, Chrysler, Jeep, BMW, Mercedes, and Tesla. They primarily manufacture automotive cross panels, but also produce hatchbacks and radiator grills. MetoKote, located across the street at 3001 Hollow Ridge Dr., has a contract with Magnesium Products to prepare and coat the magnesium components produced at Magnesium Products. Magnesium Products leases the building to MetoKote.

C. Chapman explained that they have 2 types of magnesium alloy: AM-60 (6% Al, 94% Mg) and AZ-91 (9% Al, 1% Zn, 90% Mg). AM-60 is more ductile and is used for internal safety and instrument panels, where AZ-91 is used for external vehicle components and is designed for corrosion resistance.

Magnesium Products is Meridian’s only company that is in the United States. Their other facilities are located in China, Canada and the UK. After discussions with Eric Grinstern, AQD Specialist, he believes this is the only facility in Michigan who melts magnesium.

C. Chapman verified that Magnesium Products does not currently have any boilers installed.

**Inspection**

I arrived at Magnesium Products at approximately 12:45 p.m. December 5, 2017 and met with Colin Chapman, Superintendent of the Remelt Department. I provided C. Chapman with a January 2017 Permit to Install Exemptions handbook. Upon arrival, I detected a metal burning odor outside the facility, that was distinct and definite. Table 1 contains a list of all permitted and exempt equipment which I identified during the inspection.

**Table 1.** Equipment located onsite

Unit	Description	Control	PTI/Exemption
3 Natural gas-fired magnesium melting furnaces	4 MMBtu/hr  Used to melt secondary magnesium from the die casting process to produce magnesium ingots  Each has a 10,000 lb holding capacity and a 2,000 lb/hr melt rate.	Novac 612; cover gas used to prevent oxidation.  Previously used SF6. According to E. Grinstern, AQD foundry Specialist, this gas has the potential to release HF.	PTI 219-99

	Located in the Remelt Department of Magnesium Products		
15 electric resistance magnesium melting furnaces with associated die cast machines	These are continuous flow processes, rather than batch processes.  Located in the Diecast Department of Magnesium Products	Originally a smoke/vapor collector/filtering system vented to the in-plant environment (per permit).  C. Chapman said this has been removed. The original equipment caught fire.	PTI 99-93
Emergency engines	2 emergency generators used for IT backup and for the system that distributes the protective Novec 612 cover gas to prevent magnesium oxidation during power outages	NA	Rule 285(2)(g)
Parts Washer	Crystal Kleen mineral spirits (100% petroleum distillates)  Operating instructions present  Lid was closed  Surface area is less than 10 ft <sup>2</sup>	NA	Rule 281(2)(h)

PTI 219-99

This permit is for 3 natural gas-fired magnesium melting furnaces, each rated at 4 MMBtu/hr. C. Chapman said each has a 10,000 lb holding capacity, and a 2,000 lb/hr melt rate. He said the largest throughput per day that each can do is 40,000 lbs. These units are used for remelting what C. Chapman calls "recycled" magnesium, which is the magnesium that is scrap from their die casting process. They operate these units 24 hours per day, 7 days per week, under 2 12-hour shifts, and are located in the Remelt department.

Magnesium Products is limited to melting magnesium that is not contaminated with paint, grease, oil, rubber, plastic or other ignitable material at the furnace temperature. C. Chapman said all magnesium melted in these permitted units are from virgin alloy and are not contaminated with paint, grease, oil, rubber, plastic or other ignitable materials.

PTI 99-93

This permit is for 16 2700-lb holding capacity (12,000 lb/hr melt rate) electric resistance melt furnaces with associated die casting machines and smoke and vapor collector/filter systems mounted to each die cast machine to collect emissions; the filtered emissions are discharged back into the plant environment. These units are located within the diecast department. C. Chapman said these units are generally operated 24 hours per day, 5 days per week under 3 shifts. The melt furnaces are a continuous flow system: the units are constantly being reloaded/charged, and are used to re-alloy the magnesium.

C. Chapman said the smoke and vapor collector/filter systems were removed. They caught on fire because the units were not maintained properly (the internal system became gummed up), thus all emissions from the die casting machines are vented to the in-plant environment. The OSHA indoor air studies and personal monitoring devices for employees were instituted to ensure that the air quality for the employees met OSHA standards with the implementation of the practice to exhaust unfiltered exhaust gas back into the plant environment. C. Chapman has documentation that the in-plant pollutant levels meet OSHA standards. He said testing is conducted every other year.

In the previous inspection report it was mentioned that the equipment permitted under PTI 99-93 (the 16 electric-resistance melt furnaces and associated die casting machines) could be exempt per Rules Rule 290 and 285(2)(l)(ii), respectively. C. Chapman also had a letter to the AQD in 1999 that stated PTI 99-93 could be voided because the die cast machines are exempt under the aforementioned rules and that the associated electric resistance melting furnaces are exempt under Rule 290. Rule 282(2)(a)(vi) would not be applicable, as the electric resistance melting furnaces exceed the capacity of 16,000 lbs/day. This permit has not been voided.

During the inspection and after, C. Chapman and I discussed the applicability of these exemptions. There are 16 die cast stations and 15 electric resistance melt furnaces. It appears that the die casting machines can be exempt from a PTI per Rule 285(2)(l)(ii), but it has yet to be determined whether the electric resistance melt furnaces can be exempt per Rule 290:

upon file review, I've found no documentation of Rule 290 demonstrations for the furnaces, and it is my professional judgment that the permit cannot be void until we can ensure that Rule 290 or Rule 291 can be met for the furnaces.

Ten of the 15 furnaces have undergone modifications without applying for and obtaining a PTI modification. All 15 furnaces were originally permitted to melt 1,200 lbs/hr (28,800 lbs/day). C. Chapman informed me that 5 of the furnaces have been modified to melt a maximum of 31,500 lbs/day and another 5 have been modified to melt a maximum of 48,000 lbs/day. Technically, modifying these capacities without a permit to modify is a violation of Rule 201; however, I have requested that Magnesium Products conduct a Rule 278/278(a) demonstration in conjunction with a Rule 290 or Rule 291 demonstration. If these modified units can be shown to meet Rule 290, then a violation notice will not be issued and AQD can proceed with voiding PTI 99-93.

There are challenges with calculating a Rule 290 or Rule 291 exemption demonstration because there are currently no known AQD emission factors for magnesium melting furnaces. Possible TACs that can be emitted from these processes can be found in Magnesium Products' "Standard Specification for Magnesium-Alloy Die Castings," attached.

In addition to looking at TACs and PM from the furnaces, I will request that Magnesium Products also consider in their exemption demonstration the emissions from their magnesium cover gas, Novec 612 (SDS attached), a fluorinated compound which Eric Grinstern, Foundry Specialist, said has the potential to create HF emissions. Cover gases are used to prevent oxidation of the metal.

The one requirement within this PTI is that there be no visible emissions from the diecast machines. There is a haze present in the in-plant environment that C. Chapman attributes to the die cast release agent. He said that the release agent evaporates water and that the haze in the plant is steam and vapor from the process, not smoke. He said that when the plant has shut down production, the haze immediately dissipates.

**Compliance Statement:** Magnesium Products is currently in compliance with PTI 99-93 and 219-99, pending the exemption demonstration for the equipment under PTI 99-93.

NAME *M. M. Laer*

DATE 1/22/18

SUPERVISOR *B. M.*

