

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

N027743274

FACILITY: SHELLCAST INC		SRN / ID: N0277
LOCATION: 5230 INDUSTRIAL PARK DR, MONTAGUE		DISTRICT: Grand Rapids
CITY: MONTAGUE		COUNTY: MUSKEGON
CONTACT: Bob Johnson , Owner		ACTIVITY DATE: 02/08/2018
STAFF: Eric Grinstern	COMPLIANCE STATUS: Non Compliance	SOURCE CLASS: Minor
SUBJECT: Unannounced compliance inspection		
RESOLVED COMPLAINTS:		

**FACILITY DESCRIPTION**

Shellcast is an investment casting facility that primarily produces specialty stainless steel castings along with some nickel and carbon steel castings. The facility is located in an industrial park on the north side White Lake, with the closest residences located approximately a quarter of a mile SE of the facility.

**REGULATORY ANALYSIS**

All processes at the facility were previously evaluated and determined to be exempt from NSR permitting at the time. The facility is subject to the area source Iron and Steel Foundry NESHAP, Subpart ZZZZZ. The facility is classified as an existing, small source under Subpart ZZZZZ.

**COMPLIANCE EVALUATION**

At the facility, AQD staff, consisting of Eric Grinstern (EG), met with Bob Johnson, President, Tom Braun, General Manager, and Jesse Holman, Tooling Supervisor.

Prior to entering the facility, no visible emissions or odors were observed.

During a physical inspection of the facility, EG was accompanied by the above listed facility representatives.

**TOOL ROOM**

The tool room contains four CNC machines used to make molds. The CNC machines exhaust to oil mist/fume collectors that exhaust internally. With the use of the collectors, the room was very clean and contained no smoke. The processes within the tool room are exempt from permitting under Rule 285(2) (l)(vi)(B).

**WAX ROOM**

The wax room contains the wax presses and wax assembly operations. No external ventilation was observed in the room. The facility was in the process of adding exhaust hoods to the wax presses to

reduce worker exposure. The facility uses two waxes, a sprue and a casting wax, to make and assemble wax pattern trees. The facility supplied the SDSs for each of the waxes (attached). The waxes are both paraffin-based waxes manufactured by M. Argueso.

### SHELL ROOM

After the wax pattern trees are assembled, they go to the shell room where they are coated. The molds are coated with a silica slurry followed by a zircon sand via a barrel sander and then a fused silica sand via a fluidized bed unit. Additionally, the facility has a "rainfall" sanding unit that is rarely used. The rainfall unit has an internally exhausted collector. The barrel sander and the fluidized bed unit are exhausted to an internal baghouse that exhausts to the inside atmosphere. The facility has an uninstalled automated fluidized bed unit that will also exhaust to the existing baghouse when it is installed. The primary emissions from the shell room would be particulate, however, all processes are controlled and vented internally. All processes within the shell room appear that they can be exempt under Rule 285(2)(l)(vi)(B), Rule 287 or Rule 290, however the room does not appear to be emitting any particulate to the outside atmosphere.

### DEWAXING AREA

The wax pattern with the shell coating are dewaxed in an autoclave that removes the wax from the molds. The wax melts out of the shell mold into a pan for recycling. Steam for the auto clamp is supplied by a 40 hp/ 1,000,000 btu/hr boiler that was manufactured in 1979. The autoclave exhausts to the outside atmosphere. The boiler is exempt from needing a permit to install under Rule 282(2)(b)(i).

### MOLD CURING OVENS

After dewaxing the molds are cured in one of four ceramic cure ovens. The facility is currently only using three of the four cure ovens. The cure ovens have afterburner chambers; however, they are not equipped with blowers. The facility designs their wax pattern trees to provide for maximum wax removal in the autoclave, thereby reducing wax carryover to the cure ovens. The cure ovens are exempt from needing a permit to install under Rule 282(2)(a)(iii).

### CASTING

The facility has two electric induction furnaces, each with a 300-pound holding capacity. The furnaces are on a single electrical control panel. The facility melts clean bar stock as well as some internal runaround. The furnaces are exempt from permitting under Rule 282(2)(a)(iv). The facility primarily casts stainless steel, but also cast some nickel steel and carbon steel. The facility melted approximately 72 tons of steel in 2017.

### FINISHING

Shell knockoff is conducted in an enclosed booth with a pneumatic vibration unit. The booth is not exhausted to the outside atmosphere. After pneumatic knockoff, the castings are processed through a shotblast unit. The shotblast unit is controlled by an external baghouse that vents to the outside atmosphere. Observation of the baghouse exhaust showed no visible emissions.

The facility has a cut-off saw that is also exhausted to an external baghouse that also vents to the outside atmosphere, with no VE observed from the exhaust. Additionally, the facility has several belts sanders, grinders and sand blast units that vent internally. All of the finishing operations are exempt from permitting under Rule 285(2)(I)(vi)(B) and (C). The facility also has welding operations that are exhausted to an internally exhausted collector. Welding is exempt from permitting under Rule 285(2)(i).

**Subpart ZZZZZ – Area Source Iron and Steel Foundry NESHAP**

Shellcast is subject to Subpart 5Z. The facility is considered a “small” area source under the standard because the annual metal throughput is less than 20,000 tons on an annual basis. Compliance requirements are summarized in the checklist below.

**IRON AND STEEL FOUNDRIES AREA SOURCES  
40 CFR PART 63 SUBPART ZZZZZ**

**Notification and Reporting Requirements**

Requirement	Citation 40 CFR	Notification Submitted		Comments
		Yes	No	
Initial Notification (Existing - May 1, 2008) (New – May 1, 2008 or no later than 120 days after startup)	63.10890(b)(small) or 63.10900(b)(large) and Subpart A 63.9	X		
Notification of Size Classification (Existing-January 2, 2009) (New - No later than 120 days after startup)	63.10890(g) (small) or 63.10899(d)(large)	X		Facility is a small area source
Notification of Compliance – Metallic Scrap Management / Binder Formulation (Existing-February 1, 2009) (New – February 1, 2008 or no later than 30 days after startup)	63.10890(c)(1)and(3) (small) or 63.10900(b)(large) and Subpart A 63.9	X		
Notification of Compliance – Mercury Requirements (Existing - February 3, 2010) (New – February 1, 2008 or no later than 30 days after startup)	63.10890(c)(2)(small) or 63.10900(b)(large) and Subpart A 63.9	X		
	63.10890(f)(small)			

Semiannual Certification Reports (July 30/January 30)	or 63.10899(c)(large)		X	No Semiannual certifications received after 2010
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**Size Classification Requirements – Small and Large Foundries**

Requirement	Citation	Facility Compliance		Comments
		Yes	No	
<b>Existing and New Sources</b>				
Maintain records of metal melt production Small – annual records Large – monthly records	63.10890(e)(7) (small) or 63.10899(6)(large)	X		Existing small foundry → Melts ≤ 20,000 ton/yr Existing large foundry → Melts ≥ 20,000 tons/yr New small foundry → Melting capacity ≤ 10,000 ton/yr New large foundry → Melting capacity ≥ 10,000 ton/yr

**Binder Management Requirements – Small and Large Foundries**

Requirement	Citation	Facility Compliance		Comments
		Yes	No	
<b>Existing and New Sources</b>				
No methanol in catalyst for a furfuryl alcohol warm box mold/core line (Existing - January 2, 2009) (New – January 2, 2008, or upon startup)	63.10886	X		The facility does not have a warm box mold or core line.
Copies of MSDS or product data sheets for binders and coatings	63.10890(e)(5) (small) or 63.10899(4)(large)	X		
Records of annual quantity and composition of binders and coatings used that contain HAPs	63.10890(e)(6) (small) or 63.10899(5)(large)	X		

**Metallic Management Practice Requirements – Large and Small Foundries**

Requirement	Citation	Facility Compliance		Comments
		Yes	No	
Comply with one of the following options for incoming scrap:  1. Prepare and operate according to written material specifications	63.10885(a)			X Option 1 ? Option 2

<p>that scrap does not contain post-consumer auto body scrap, engine blocks, oil filters, oily turnings, lead components, chlorinated plastics, or free organics.</p> <p>2. Prepare and operate according to written material specifications that scrap has been depleted to the extent practicable.</p> <p>Certain scrap can be subject to one option and other scrap subject to the other option if scrap remains segregated until charge make-up. (Existing-January 2, 2009) (New – January 2, 2008, or upon startup)</p>				
<p>Records of material specifications and records demonstrating compliance with material specifications.</p>	<p>63.10890(e)(small) or 63.10899(a)(1) (large)</p>	<p>X</p>		

**Mercury Management Practice Requirements – Large and Small Foundries**

Requirement	Citation	Facility Compliance		Comments
		Yes	No	
<p>Comply with one of the following options for each scrap provider, contract or shipment:</p> <ol style="list-style-type: none"> <li>1. Site-Specific Plan</li> <li>2. EPA Approved Program</li> <li>3. Specialty Alloy</li> <li>4. Non-motor Vehicle Scrap</li> </ol> <p>(Existing- January 4, 2010) (New – January 2, 2008, or upon startup)</p>	<p>63.10885(b)</p>			<p>? Option 1 ? Option 2 ? Option 3 X Option 4</p>

**CONCLUSION**

Overall, excellent housekeeping was observed during the inspection. The facility's actions to minimize and prevent emissions goes beyond that which is normally observed at a steel foundry.

Based on the information and observations made as part of this inspection, the facility appears to be in compliance with applicable air quality rules and regulations, except for the following:

Failure to submit Subpart ZZZZZ semiannual certification reports from 2011 until current. The facility was informed that a violation notice will be issued for not submitting the reports. Based on this inspection, the facility is complying with all of the work practice/recordkeeping requirements of Subpart ZZZZZ but failed to submit the certifications.

NAME 

DATE 2/23/18

SUPERVISOR 