

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

B872331082

FACILITY: HOWMET CORPORATION, HRC and PLANTS 5 & 10		SRN / ID: B8723
LOCATION: 1500 & 1600 S. Warner St. (HRC, Plt. 5), WHITEHALL		DISTRICT: Grand Rapids
CITY: WHITEHALL		COUNTY: MUSKEGON
CONTACT: Christopher Rohrer, Manager of Environmental Engineering		ACTIVITY DATE: 09/09/2015
STAFF: Eric Grinstern	COMPLIANCE STATUS: Compliance	SOURCE CLASS: SM OPT OUT
SUBJECT: Unannounced inspection		
RESOLVED COMPLAINTS:		

FACILITY DESCRIPTION

Howmet is a subsidiary of ALCOA. The stationary source (SRN: B8723) comprises Howmet Plants 5, 10 and the Research Center, which are all located on the South Campus of Howmet.

REGULATORY ANALYSIS

The stationary source has one opt-out permit, PTI No. 63-06. Many of the processes have minimal emissions and do not have specific emission limits or monitoring requirements within the opt-out permit.

COMPLIANCE EVALUATION

At the facility staff consisting of Eric Grinstern met with Chris Rohrer and Dan Gezon.

PLANT 5

Plant 5 is divided into four business units, Ti Cast, Ceramic Manufacturing, Hot Isostatic Pressing and Wax Manufacturing.

TITANIUM CASTNG (Ti Cast)

Ti Cast consists of the investment casting of titanium which encompasses the following processes:

Wax Pattern

Wax patterns are formed via the injection of molten wax into dies. The patterns are then assembled into a tree of patterns.

Monoshell

The wax molds are coated through a ceramic slurry / stucco process. All particulate emitting processes (stucco towers) are baghouse controlled, which vent internally.

Autoclave/burn-off oven

After drying, the ceramic molds are processed through an autoclave to remove the wax. From the autoclave the molds are fired in a burn-off oven to condition the shell.

The molds are then processed through the de-plating room which is controlled by an internally vented baghouse.

Melting/Pouring

After being pre-heated molds are poured from metal melted in the induction melting furnaces.

After pouring the molds are allowed to cool under a hood that ducts uncontrolled to the outside.

Finishing

After pouring molds are cooled prior to shell knocked-off. The casting then goes through various cut-off, grinding, sanding and other finishing processes. A portion of the castings are processed through salt baths that are vented uncontrolled. The facility also has a cut-off saw that is controlled by a wet collector.

Titanium Chemical Milling

Milling of the titanium castings is performed in either the Primary Hydrogen Fluoride(HF) Tank or the Alternate HF Tank. The castings then undergo further finishing operations, i.e. grinding, sanding etc. After these processes the castings return to this department to be cleaned in the Weak Acid Rinse Tank (nitric acid). All operations are controlled by the large HF scrubber, except the Alternative HF Tank, which is controlled by the small HF scrubber.

EUALTACIDBATHTNK

Alternate acid bath
Small scrubber

- 1.a HF limit (0.03 TPY)
- 1.1b HNO3 (0.005 TYP)
- 1.2 O&M Plan
- 1.3 HF (small scrubber) water flow indicator
- 1.4 Records – compliance with acid emission limits

The facility provided records demonstrating compliance with the requirements and emission limits.

FGLRGHFSCRUBBER

Primary chemical milling tank
Weak acid rinse tank
Large scrubber

- 2.1a HF limit (0.03 TPY)
- 2.1b HNO3 (0.005 TYP)
- 2.2 O&M Plan
- 2.3 HF (large scrubber) water flow indicator
- 2.4 Records – compliance with acid emission limits

The facility provided records demonstrating compliance with the requirements and emission limits.

CERAMIC MANUFACTURING

Within the ceramics division the primary operation is the manufacturing of crucibles. Particulate ceramic is combined with gum arabic and then formed. The formed product is then cured within a kiln.

WAX MANUFACTURING

Within the wax manufacturing division, wax “chips” are made for the use in making wax patterns for investment casting. The chips are used by Howmet as well as being sold to other users. All processes associated with wax manufacturing have previously been determined exempt from NSR permitting.

Wax is manufactured in five wax kettles (one soluble wax kettle and four “standard” wax kettles). The soluble wax mixing is controlled by a Torit collector that is vented externally.

From the kettles the wax is extruded in to chips, which are packaged for usage/shipping.

HOT ISOSTATIC PRESSING (HIP)

HIP involves the simultaneous application of elevated temperature and isostatic pressure for an extended period of time. This process is used to eliminate voids within a cast part or to consolidate a material, such as powdered metals or ceramic composites.

PLANT 10

Plant 10 is an investment wax casting operation that utilizes Nickel/Chromium/Cobalt alloys. All castings are either single crystal or directionally solidified.

Below is a summary of the primary processes within Plant 10.

Wax Pattern

Wax patterns are formed and assembled both by hand and robotic.

Monoshell

The wax molds are coated through a ceramic slurry/stucco process. All particulate emitting processes (stucco towers) are baghouse controlled, which vent internally.

De-Waxing – Burn-off Oven

After the monoshell coating is dried the wax is removed in a steam autoclave. From the autoclave the molds are fired in a burn-off oven to condition the shell.

Casting

After burn-off the molds are poured. All melting and pouring is performed in vacuum furnaces.

Finishing

The facility has numerous finishing (knock-off, cut-off, sanding, blasting) that are all controlled by collectors that vent internally.

Salt Baths

Castings are processed through KOH salt baths to remove core and shell material.

Acid Tanks

Following the salt baths is a hydrochloric acid rinse line that neutralizes the casting after being processed through the caustic baths.

Autoclaves

Castings are processed through one of two sodium hydroxide autoclaves to remove core material.

After being processed through the autoclaves, the castings are cleaned with pressurized water; heat treated and then undergoes further finishing processes.

As part of the final inspection processes, the castings are acid etched for grain inspection. The facility two scrubber towers associated with this process.

Zygo Inspection

The facility uses a fluorescent penetrant for the inspection of castings.

N-Ray Testing

The facility uses gadolinium nitrate and methanol as part of the N-Ray testing preparation.

The stationary source has opt-out limits for particulate and HAPs. The facility provided records demonstrating compliance with the limits.

FGFACILITY

- 3.1a PM (13 tpy)
- 3.1b Indiv. HAP (3.0 tpy)
- 3.1c Comb. HAP (6.0 tpy)

The facility provided records demonstrating compliance with the PM and HAP limits.

Subpart ZZZZZZ

The stationary source is subject to Subpart ZZZZZZ

The facility has submitted all required notifications and is complying with the requirements of Subpart ZZZZZZ.

Based on the information obtained and observations made during this inspection, the stationary source appears to be in compliance with all applicable air quality rules and regulations.

NAME 

DATE 9/17/15

SUPERVISOR 