

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: On-site Inspection

B189157579

FACILITY: HOWMET CORPORATION, PLANT 4		SRN / ID: B1891
LOCATION: 555 BENSTON ROAD, WHITEHALL		DISTRICT: Grand Rapids
CITY: WHITEHALL		COUNTY: MUSKEGON
CONTACT: Michelle Wazny , EHS Engineer		ACTIVITY DATE: 08/04/2021
STAFF: Eric Grinstern	COMPLIANCE STATUS: Compliance	SOURCE CLASS: SM OPT OUT
SUBJECT: Announced on-site compliance inspection		
RESOLVED COMPLAINTS:		

FACILITY DESCRIPTION

Plants 4 consists of Thermatech Coatings and the Ti-Ingot Division. Thermatech provides for sophisticated coatings to aerospace turbine components, while the Ingot Division produces titanium ingots.

REGULATORY ANALYSIS

The stationary source has as an opt-out permit (No. 30-06D).

COMPLIANCE EVALUATION

Due to COVID 19, records were requested and reviewed prior to the onsite inspection.

At the facility, AQD staff, consisting of Eric Grinstern (EG), met with Michelle Wazney, EHS Engineer.

THERMATECH COATINGS DIVISION

Within this division various coatings using different methods are applied to turbine components.

Spray Coating Units**EU-APX**

The Atmospheric Pressure Plasma Spray process (SC-404) applies metallic or ceramic coatings on castings. The process is controlled by a dry cartridge dust collector.

EMISSION LIMITS

Nickel emissions are limited to 0.10 lb/hr and visible emissions are limited to 5% based on a 6-minute average.

Compliance with the emission limits is based on proper operation of the cartridge dust collector. The facility provided spray powder use and emission records for FY 2020. The facility records show no spray powder usage for the second half of 2020. The facility records show 4,547 pounds of powder used in 2020 and particulate matter emissions of 3.05 pounds for the year.

DESIGN/EQUIPMENT PARAMETERS

Requires the operation of a dry cartridge collector.

The dry cartridge collector is installed and operational. The facility has a written operation and maintenance plan for the collector which has previously been provided to AQD. The established normal operating range for the collector is 0.1-6 inches of water column, system alarms at 4.5 inches.

Note: The process was not operating at the time of the inspection.

EU-VPX

The Vacuum Plasma Spray process (SC-403) is a metal deposition operation which applies protective coatings. Process consists of a vacuum chamber where the metal powder is injected into the plasma, melted, and propelled onto the part to form a coating.

EMISSION LIMITS

The permit limits PM and PM10 emissions. PM is limited to 0.015 lbs. per 1000 lbs of exhaust gas and PM10 is limited to 0.1 tpy.

Compliance with the emission limits is based on proper operation of the cartridge dust collector. Compliance with the emission limits is also based upon facility emission calculations which take into account the pounds of powder used, deposition efficiency and collector efficiency. The facility provided emission records as requested. The facility records show that the unit was used during four months in 2020. Facility records document a 12-month total of 0.00015 tons of PM emitted, ending in December 2020.

MATERIAL LIMITS

Limits spray powder usage to 350,400 pounds per 12-month rolling time period. The facility provided material usage records that show a 12-month rolling average usage of 440 pounds.

DESIGN/EQUIPMENT PARAMETERS

Requires the operation of a dry cartridge collector in accordance with an O&M plan. The dry cartridge collector is installed and operational. The facility has a written operation and maintenance plan for the collector which has previously been provided to AQD. Satisfactory operation of the dust collector includes maintaining the pressured drop in accordance with the O&M Plan. The established normal operating range for the collector is 0-6 inches of water column.

Pressure drop records - unit last operated in August 2020 and did not operate during the period of requested records.

MONITORING/RECORDKEEPING

Requires that the facility maintain records of spray usage, collector pressure drop and PM10 emissions. The facility is maintaining the required records and provided copies as requested.

Note: The baghouse is only operated when the unit is being cleaned, which is the only time that the unit vents past the vacuum pump filter.

The unit was not operating at the time of the inspection and is scheduled for removal.

EU-HPA

Hydroxyplatinic acid plating process (HPA-401)
The four plating tanks have filters in the exhaust ducts

EMISSION LIMIT

The permit limits the emission of platinum to 0.028 pounds per month. The platinum emission rate is a fixed value based on an exhaust flow rate of 5000 ft³/minute, assuming a control efficiency of 90%. The facility calculates platinum emissions based on a pound per hour rate of 0.9E-6 multiplied by the hours of operation.

The facility provided emission records as requested. All reviewed months had calculated emissions below the permitted limit. The highest single month was 0.0069 pounds of platinum emitted.

PROCESS/OPERATIONAL RESTRICTIONS

Requires the facility to operate in accordance with the previously submitted O&M plan. The facility has a written operation and maintenance plan for the collector which has previously been provided to AQD.

DESIGN/EQUIPMENT PARAMETERS

Requires the filter media to be maintained and operated in a satisfactory manner and be equipped with a pressure drop device. The pressure drop is required to be maintained in accordance with the O&M Plan. The facility maintains the filter in accordance with the O&M plan and has equipped the unit with a pressure drop device.

MONITORING/RECORDKEEPING

Requires the facility to maintain pressure drop records in accordance with the O&M plan.

The facility follows the O&M plan regarding the pressure drop. Review of the requested records showed all readings to be within the established pressure drop range of 0 to 4 inches. At the time of the inspection, the pressure drop reading was 0.2 inches.

Requires the facility to maintain records of the monthly emission rate for platinum.
The facility is maintaining the required records.

EU-HPA2

Hydroxyplatinic acid plating process (HPA-402).
Includes two plating tanks controlled by a packed bed scrubber (SV-HPA2)
(HPA2 is located where CPA was previously located)

EMISSION LIMIT

The permit limits the emission of platinum to 0.037 pounds per month.
The platinum emission rate is a fixed value based on an exhaust flow rate of 5000 ft³/minute, assuming a control efficiency of 90%. The facility calculates platinum emissions based on a pound per hour rate of 0.9E-6 multiplied by the hours of operation.

The facility provided emission records as requested. The facility records show that EU-HPA2 was not operated in 2020.

PROCESS/OPERATIONAL RESTRICTIONS

Requires the facility to operate in accordance with the previously submitted O&M plan.
The facility has a written operation and maintenance plan for the collector which has previously been provided to AQD.

DESIGN/EQUIPMENT PARAMETERS

Requires the filter media to be maintained and operated in a satisfactory manner and be equipped with a pressure drop device. The pressure drop is required to be maintained in accordance with the O&M Plan. Review of the requested records showed the established pressure drop range is 0 to 2 inches for the top differential and 0 to 3 inches for the bottom differential.

MONITORING/RECORDKEEPING

Requires the facility to maintain pressure drop records in accordance with the O&M plan.
The facility follows the O&M plan regarding the pressure drop. The unit was not operated during the time period of requested records. At the time of the inspection the process was not operating and had not been operating for approximately 18 months.

Requires the facility to maintain records of the monthly emission rate for platinum.
The facility is maintaining the required records.

EU-LPPS

Low pressure plasma spray (SC-402) line equipped with various filters.

EMISSION LIMITS

The permit limits PM and PM10 emissions. PM is limited to 0.00075 lbs. per 1000 lbs of exhaust gas and PM10 is limited to 0.1 tpy.

Compliance with the emission limits is based on proper operation of the cartridge dust collector.
Compliance with the emission limits is also based upon facility emission calculations which take into account the pounds of powder used, deposition efficiency and collector efficiency.

The facility provided requested emission records as requested. The facility records document PM10 emissions of 0.0017 tpy on an 12-month rolling time period.

MATERIAL LIMITS

The permit limits spray powder usage to 96,360 pounds per 12-month rolling time period.

The facility provided material usage records. The 12-month rolling average usage was 5,065 pounds.

PROCESS/OPERATIONAL RESTRICTIONS

Requires the facility to operate in accordance with the previously submitted O&M plan. The facility has a written operation and maintenance plan for the collector which has previously been provided to AQD.

DESIGN/EQUIPMENT PARAMETERS

Requires that each filter is maintained and operated in a satisfactory manner and be equipped with a pressure drop device.

The facility maintains the filter in accordance with the O&M plan and has equipped the unit with a pressure drop device. The established normal operating range for the collector is 0.1-6 inches of water column, system alarms at 4.0 inches. At the time of the inspection, the process was not operating. Review of the facility supplied records showed readings that were below the 0.1 - 6.0 inch pressured drop range. The facility subsequently verified that the Solberg filter was changed out in February and June 2021. The facility stated that they will be verifying the system's control settings.

MONITORING/RECORDKEEPING

Requires that the facility maintain records of powder usage, collector pressure drop and PM10 emissions. The facility is maintaining the required records.

Note: The baghouse for this process is only operated when the chamber is being cleaned, since that is the only time that emissions are vented past the vacuum pump filter.

The unit was not operating at the time of the inspection.

EU-HVOF1

High velocity oxy fuel process (SC-405), consisting of one existing spray booth equipped with a filter to control particulate matter emissions.

EMISSION LIMITS

The permit limits PM and PM10 emissions. PM is limited to 0.001 lbs. per 1000 lbs of exhaust gas and PM10 is limited to 0.1 tpy. Compliance with the emission limits is based on proper operation of the cartridge dust collector. Compliance with the emission limits is also based upon facility emission calculations which take into account the pounds of powder used, deposition efficiency and collector efficiency.

The facility provided the requested records, which document a 12-month rolling average of 0.00422 tons of PM10 emissions.

Visible emissions are limited to 5% based on a 6-minute average.

MATERIAL LIMITS

The permit limits spray powder usage to 350,400 pounds per 12-month rolling time period. The facility provided requested material usage records. The 12-month rolling average usage was 12,595 pounds.

PROCESS/OPERATIONAL RESTRICTIONS

Requires the facility to operate in accordance with the previously submitted O&M plan. The facility has a written operation and maintenance plan for the collector which has previously been provided to AQD.

DESIGN/EQUIPMENT PARAMETERS

Requires that the filter is maintained and operated in a satisfactory manner and be equipped with a pressure drop device. The facility maintains the filter in accordance with the O&M plan and has equipped the unit with a pressure drop device. The established normal operating range for the collector

is 0.1-6 inches of water column, system alarms at 4.0 inches. At the time of the inspection, the pressure drop reading was 3.5 inches.

MONITORING/RECORDKEEPING

Requires that the facility maintain records of powder usage, collector pressure drop and PM10 emissions. The facility is maintaining the required records.

EU-APX2

Atmospheric Pressure Plasma Spray Process that applies metallic coatings on castings and is controlled by a dry cartridge dust collector

EMISSION LIMITS

The permit limits PM, PM10, PM2.5 and Nickel emissions. PM is limited to 0.001 lbs. per 1000 lbs of exhaust gas, PM10 and PM 2.5 are each limited to 0.014 pounds per hour, and nickel is limited to 0.0017 pounds per hour.

Compliance with the emission limits is based on proper operation of the cartridge dust collector. Compliance with the emission limits is also based upon facility emission calculations which take into account the pounds of powder used, deposition efficiency and collector efficiency.

The facility provided requested emission records that document PM10, PM2.5 and nickel emissions below the permitted limits. The facility records document PM emissions (assume all PM is PM10/PM2.5) at 2 pounds for the 12-month rolling time period., resulting on hourly emissions less than three significant digits (0.000 lb/hr), as reported by the facility. The facility records show nickel emissions at 2.02E-04 pounds per hour, for the 12-month rolling time period.

Visible emissions are limited to 5% based on a 6-minute average.

MATERIAL LIMITS

The permit limits spray powder usage to 74,000 pounds per 12-month rolling time period.

The facility provided material usage records. The 12-month rolling average usage was 5,997 pounds.

DESIGN/EQUIPMENT PARAMETERS

Requires that the filter is maintained and operated in a satisfactory manner and be equipped with a pressure drop device. The facility maintains the filter in accordance with the O&M plan and has equipped the unit with a pressure drop device. The established normal operating range for the collector is 0.1-6 inches of water column, system alarms at 4.0 inches. At the time of the inspection, the process was not operating.

MONITORING/RECORDKEEPING

Requires that the facility maintain records of powder usage and collector pressure drop. The facility is maintaining the required records.

FG-CVD

Chemical Vapor Deposition (CVD) Units 2 through 8 and EU-VCLEAN25, which is used to clean EU-CVD2 and EU-CVD5.

The emission units are controlled by liquid ring vacuum pumps and caustic scrubbers. (EU-CVD2, EU-CVD3, EU-CVD4, EU-CVD5, EU-CVD6, EU-CVD7, EUCVD8, EU-VCLEAN25)

Note: EU-CVD3 is in the process of being decommissioned.

EMISSION LIMITS

The permit limits the emission of hydrogen chloride to 0.6 tons per year and aluminum chloride to 1.1 tons per year.

Compliance with the emission limits is based on proper operation of the liquid ring vacuum pumps and caustic scrubbers. Compliance with the emission limits is also based upon facility emission calculations which take into account the hours of operation and control efficiency.

The facility provided requested records which document HCL emissions to be 0.0928 tons/year and AICL3 emissions to be 0.1102 tons per year, based on a 12-month rolling time period.

PROCESS/OPERATIONAL RESTRICTIONS

Requires that the facility maintain each liquid ring vacuum pump and caustic scrubber according to be maintained and operated according to the previously submitted O&M plan. The facility maintains the vacuum pump and caustic scrubber in accordance with the O&M plan.

DESIGN/EQUIPMENT PARAMETERS

The facility is not allowed to operate any CVD unit under vacuum or EU-VCLEAN25 unless the associated liquid ring vacuum pump is installed, maintained and operated in a satisfactory manner, including maintaining the pH of the caustic solution in accordance with the O&M Plan.

Requires installation and operation of each associated caustic scrubber in a satisfactory manner, including maintaining the pH of the caustic solution in accordance with the O&M Plan. During the inspection, the process operator stated that the established pH operating range is 7-10. During the inspection, none of the units were operating.

Requires the facility to equip and maintain each liquid ring vacuum pump and caustic scrubber with a device to measure the pH of each caustic solution. During the inspection, the operator showed staff the electronic recording of the pH.

MONITORING/RECORDKEEPING

Requires that the facility maintain records of pH, and emissions of HCL and AICL3. The facility is maintaining the required records. Review of the supplied records showed a few readings over a pH of 10.

FG-STRIPLINES

The plasma strip line (T-404) consisting of four hydrochloric acid tanks and four water rinse tanks and the strip etch line (T-404) consisting of one nitric acid tank, one 701 strip tank, one ferric chloride tank, one alkaline cleaner tank, two hydrochloric acid tanks, and three water rinse tanks. Emissions are controlled by scrubbers.

EU-PLASMA (Plasma West Strip Acid Line) is controlled by scrubber (SC-0017)
EU-ETCH (East Etch/Strip Acid Line) is controlled by scrubber (SC-0018)

EMISSION LIMITS

The permit limits the emission of hydrogen chloride to 300 pounds per month. Compliance with the emission limits is based on proper operation of the scrubber. Compliance with the emission limits is also based upon facility emission calculations which take into account the hours of operation and control efficiency.

The facility provided requested records, documenting HCL emissions at a monthly high of 8.9 pounds per month over the last 12 months.

PROCESS/OPERATIONAL RESTRICTIONS

Requires that the acid tank and associated scrubber be maintained and operated according to the previously submitted O&M plan. The facility maintains the vacuum pump and caustic scrubber in accordance with the O&M plan.

DESIGN/EQUIPMENT PARAMETERS

Requires that the acid tank and associated scrubber be maintained and operated in a satisfactory manner and be equipped with a device to measure the pressure drop, pH and liquid flow rate.

The facility has installed a device to monitor pressure drop, pH and flow rate.

MONITORING/RECORDKEEPING

Requires that the facility maintain records of scrubbing liquid pH, liquid flow rate and pressure drop across the scrubber. The facility is also required to maintain HCL emission records. The facility provided copies of the requested records required by the permit.

EU-PLASMA (Plasma West Strip Acid Line) - The facility provided requested daily records for the scrubber. The established differential pressure is 0-4 inches, the pH is 7.0 or above, and the water flow rate is 0.5 to 1.0 gpm. Review of the records showed all readings to be within the established ranges. At the time of the inspection, the process was operating and had a differential pressure of 1.4 inches, a pH of 10.86, and a flow of 0.5 gph.

EU-ETCH (East Etch/Strip Acid Line) - The facility provided requested daily records for the scrubber. The established differential pressure is 0-4 inches, the pH is 7.0 or above, and water flow rate is 0.5 to 1.0 gpm. Review of the records showed all readings to be within the established ranges. At the time of the inspection, the process recently had an alarm and was shut down. They were waiting for maintenance to address the cause of the problem.

MISCELLANEOUS

In addition to the emission units listed in the permit, the facility has numerous emission units that they have designated as exempt from permitting or are not expected to have air emissions. Processes designed as exempt from permitting include the following: Heat Treat Furnaces (Rule 282(2)(i)), Blasting/Cleaning (Rule 285(2)(l)(vi)), EBPVD (287(2)(d)), FPI (Preparation Inspection)(Rule 283(2)(d)), Powder Preparation (Rule 287(2)(k)), Atmospheric Furnaces (Rule 290, emission records included in facility monthly air recordkeeping information.)

TI-INGOT DIVISION

The Ti-Ingot Division is part of Plant 4. The Ti-Ingot Division manufactures titanium ingot from titanium sponge and titanium scrap. The permit contains the following emission units for the Ti-Ingot Division: EU-TORCHBOOTH and EU-ACIDROOM. The permit does not contain any emission unit specific conditions for those emission units. Emissions from Ti-Ingot are accounted for under the FG-FACILITY4 source-wide emission limits.

Titanium is received and processed to prepare the metal for ingot production. Scrap is processed to achieved the desired size via torching and cutting. Torch cutting is conducted in two booths, each of which have baghouse control. Additionally, scrap is sized via sawing and shearing. The facility has previously designated torching as exempt from permitting under Rule 285(2)(l)(vi)(C). The shearing and and cutting operations would also be exempt from permitting under Rule 285(2)(l)(vi)(C).

The titanium scrap is cleaned in four blast units, (1) Wheelabrator unit that is controlled by a wet collector, (2) tumblasters that are controlled by one large wet collector, and (1) small tumblast unit that is controlled by a wet collector (Geoff). The facility perviously exempted the units from permitting under Rule 285(2)(l)(vi)(C). However, since the units are controlled by wet collectors, it was determined that exemption under Rule 290 is likely more appropriate. The facility maintains emission record, which demonstrate compliance with Rule 290 emission limits.

The facility also has an acid room (EU-ACIDROOM). Titanium is processed through the acid line that includes a hydrogen fluoride tank, a nitric acid tank, and three rinse tanks. Emissions from the acid tanks are controlled by a scrubber. At the time of the inspection, the scrubber recirculation tank had a pH reading of 7.4 (listed operating range: 6.0-9.5). The scrubber pressure drop had a reading of 0.1" (bottom) and 3.8" (top). The facility has designated the acid room as exempt form permitting under Rule 290. The facility maintains emission records as part of the monthly air recordkeeping information, which documents compliance with Rule 290.

Titanium sponge/powder is processed in a press that provides the desired shape for construction of the ingot electrode. The press does not exhaust to the outside atmosphere. The press would appear to be exempt from permitting under Rule 285(2)(l)(i).

The ingot electrode is constructed by welding scrap titanium around the titanium sponge. The facility has an argon atmosphere plasma welder as well as numerous welding stations used to construct the ingot electrodes. Welding Booth No. 1 is located across from Vacuum Arc Remelt furnace No. 7 (VAR 7) and is equipped with baghouse control. Additional welding stations, without capture, vent to the in-plant atmosphere. The facility has previously designated the welding operations as exempt from permitting under Rule 285(2)(i).

The facility has four VAR furnaces. Furnaces No. 2 and No. 4 are primary melt furnaces, Furnace No. 7 is a primary and remelt furnace. Furnace No. 5 is a remelt furnace. The vacuum pump exhaust from each of the VAR furnaces has previously been designated by the facility as exempt under Rule 290. The facility maintains records for the VAR furnaces (total) in the monthly air recordkeeping information. Review of the records show emissions below the Rule 290 threshold. There is a crucible cleaner that services VAR No. 2,4 and 7, as well as another crucible cleaner that services VAR No. 5. The crucible cleaners are controlled with wet scrubbers. The units were previously exempted under Rule 285(2)(l)(vi)(C), however, Rule 290 appears to be more appropriate, due to the limited emissions and wet collector control.

The facility has two bevel booths that grind a bevel on the ends of the ingots. Each of the booths are controlled by separate baghouses, DC-40 and DC-41. The booths were not in operation at the time of the inspection, however, observation of the area around the baghouses showed collected particulate leaking on the ground around DC-40. The facility agreed to clean up the particulate and repair the leak ASAP. The grinding operations are exempt from permitting under Rule 285(2)(l)(vi)(C).

FG-FACILITY4

Source-wide opt out limits for PM10, Individual HAP and Total HAPs.

EMISSION LIMITS

Restricts PM10 emissions to 15 tpy, individual HAP to 6.5 tpy and total HAPs to 10 tpy.

The facility provided requested records, documenting PM emissions at 3.57 tons per 12 month rolling time period, the highest individual HAP amount was 0.269 tons (HCL) based on a 12 month rolling time period. The total HAP emission rate was 0.33 tons based on a 12 month rolling average.

MONITORING/RECORDKEEPING

Requires the facility to calculate and maintain emission records for PM10, and HAPs. The facility is maintaining the required records.

CONCLUSION

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.

NAME Eric Grinstern

DATE 08/25/2021

SUPERVISOR AH