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

N278559358

FACILITY: Oerlikon Metco		**SRN / ID:** N2785
LOCATION: 1972 MEIJER DR, TROY		**DISTRICT:** Warren
CITY: TROY		**COUNTY:** OAKLAND
CONTACT: Douglas Cox , Manager – Health, Safety, Environment (HSE)		**ACTIVITY DATE:** 08/16/2021
STAFF: Kerry Kelly	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MINOR
SUBJECT: FY 2021 scheduled inspection		
RESOLVED COMPLAINTS:		

On August 16, 2021, I (Kerry Kelly, EGLE-AQD) conducted a targeted, announced inspection at Oerlikon Metco located at 1972 Meijer Dr. in Troy, Michigan. The purpose of the inspection was to determine the facility's compliance with the Federal Clean Air Act; Article II, Part 55, Air Pollution Control of Natural Resources and Environmental Protection Act, 1994 Public Act 451; Michigan Department of Environment Great Lakes and Energy, Air Quality Division (EGLE-AQD) Rules; Permit-to-Install (PTI) Numbers 192-10A and 50-91.

INSPECTION

I arrived at Oerlikon Metco at approximately 12:45 PM, entered the office, introduced myself, and provided my photo credentials to Mr. Douglas Cox, Manager, EHS, Oerlikon Metco. Due to the on-going Covid pandemic, the receptionist asked me to fill out a Covid screening form, which I did, and Mr. Cox took my temperature.

Mr. Cox showed me the processes at the facility and answered questions.

At this facility, Oerlikon Metco manufactures metal alloy powders. The metal powders are used by customers as thermal barrier protection materials in aviation equipment and in military applications. Some metal powders are produced by atomization of molten metal using argon or nitrogen gas (FG-ATOM-SCREEN) and others by heating a metal slurry to drive off moisture (EU-CLADDING). The metal powder is then screened and packaged for distribution (EU-CLADDING and EU-SCREEN-PACK).

The facility operates 24 hours a day, 7 days a week and has 84 employees.

PTI #192-10A
EU-CLADDING
Mr. Cox showed me the cladding process during the inspection. According to Mr. Cox, the cladding process has not been modified since the issuance of PTI 192-10A. Mr. Cox also stated that cladding production has decreased since the issuance of PTI 192-10A.

The cladding operation involves mixing graphite, aluminum powder, glacial acetic acid, and formaldehyde in a mixing bowl. Up to two bowls can be used in this process. Each bowl has a capacity of 200 gallon. The bowl is heated by a steam jacket, generated from a 400,000 Btu/hour natural gas-fired boiler, to evaporate liquids. Particulate emissions from the process are controlled by a 6,000 cfm dust collector. VOC emissions from the process are uncontrolled.

PTI 192-10A contains the following emission limits for EUCLADDING:

Pollutant	**Limit**
VOCs	**14.6 tpy**
PM	**0.007 lb per 1000 lbs of gas**

PM10	**0.19 pph**
Glacial Acetic Acid [CAS # 64-19-7]	**14.1 lbs/ shift**
Formaldehyde [CAS # 50-00-0]	**80 lbs/yr**

Mr. Cox provided material usage data and VOC, formaldehyde, and glacial acetic acid emission calculations as required in EUCLADDING Special Condition (SC) VI.1-3 (Attachment 1). These records indicate the 12-month total VOC emissions ranged from 0.2 tons to 0.79 tons between January 2019 and June 2021. The highest reported 12-month rolling VOC emissions (0.79 tons) occurred during the period ending February 2020.

According to the PTI, compliance with the PM limits is demonstrated by keeping records of the daily baghouse pressure drop range readings. Mr. Cox provided records of the daily pressure drop readings (Attachment 2). These records indicate the baghouse was operated between 0 and 2.8 inches water in 2020 and 0.04 and 1.9 in 2021. The pressure drop established in the malfunction abatement plan (MAP), required in SC III.1, indicates the normal range is 0.1 to 10 inches water column. The AQD inspector observing the stack test for EU-CLADDING noted pressure drops between 0 and 0.1 inches water column during the test. The baghouse maintenance records for EU-CLADDING, provided by Mr. Cox, indicate that maintenance/corrective actions were taken when the baghouse pressure drop approached or exceeded 2 inches water column.

Glacial Acetic Acid reported emissions per shift ranged from 0 lb to 14.1 lbs between January 2019 and June 2021. The highest reported Glacial Acetic Acid emissions per shift (14.1 lbs) occurred on several occassions in March and April 2019.

Formaldehyde reported emissions per 12-month rolling time period ranged from 0.89 lbs to 1.74 lbs between January 2019 and June 2021 (Attachment 1). The highest reported formaldehyde emissions per 12-month rolling time period (1.74 lbs) occurred during the 12-month rolling period ending March 2019.

SC I.6 states that there shall be no visible emissions from EU-CLADDING. EU-CLADDING was being operated during the inspection. I did not see any visible emissions from the cladding process stack or indoors where cladding takes place.

SC II.1 limits the formaldehyde content of material processed in EU-CLADDING to not more than 0.086 pound in any batch. Records submitted by Mr. Cox indicate 0.002 lbs of formaldehyde are used per batch.

SC III.1 prohibits Oerlikon Metco from operating EU-CLADDING unless a malfunction abatement plan (MAP) for the 6,000 cfm AAF cartridge filter dust collector system, is implemented and maintained. Mr. Cox provided a copy of the MAP for EU-CLADDING.

SC IV.1 prohibits Oerlikon Metco from operating EU-CLADDING unless the cartridge filter dust collector system is installed, maintained, and operated in a satisfactory manner. Satisfactory operation includes maintaining the dust collector pressure drop in the range specified in the MAP. During the inpsection I observed emissions cladding process are routed to a cartidge filter dust collector. The dust collector is equipped with a gauge which measures the pressure drop across the cartridge filter collector as required in SC IV.2. I noted the pressure drop for the cartridge filter fluctuated between 0.02 and 0.16 inches water column during the inspection. Baghouse pressure drop and maintenance records for EU-CLADDING, provided by Mr. Cox, indicate the baghouse is operated within ranges noted during stack testing or in the MAP and that maintenance/corrective actions were taken when the baghouse pressure drop approached or exceeded 2 inches water column.

FG-ATOM-SCREEN
In the atomization process, raw materials & off-size powder are melted at 2800 - 3150 degrees Fahrenheit in an electric induction furnace. The molten metal is then poured into a basin, or tundish. From the tundish, the molten metal flows through a nozzle and a high-pressure stream of nitrogen or argon gas is injected, turning the liquid stream into metal droplets that solidify into powder. The powder is

then separated by a cyclone and screened to isolate the desirable size product. Super fine particles from the nitrogen atomization process are sent to an internal baghouse then external baghouse. Some super fine particles are sold and others re-used.

The argon gas atomization process is a closed loop system designed to reclaim the argon gas because it more expensive than nitrogen. The difference between the argon gas atomization and the nitrogen gas atomization is that after the process cyclone, the argon gas will go to a baghouse followed by Cryogenic Argon Recycling System for recovery. In the Cryogenic Argon Recycling System, the argon gas will be cooled by nitrogen & condensed into liquid form. The argon liquid is stored in tanks or sent back to the production process.

There are 16 screening lines in the screening area. In the blending process, hoppers are spun to achieve the desired products. In the packaging area, the powder product is packaged into quarter or half gallon plastic jars. During the inspection, I didn't observe any dust in the screening area, packaging area, or near the dust collector.

PTI 192-10A contains the following emission limits for FG-ATOM-SCREEN:

Pollutant	Limit
1. PM	0.007 lb per 1000 lbs of gas
2. PM10	0.85 pph
3. Nickel [CAS # 7440-02-0]	0.0284 pph
4. Nickel [CAS # 7440-02-0]	33.0 lbs/yr
5. Cobalt [CAS # 7440-48-4]	0.0168 pph
6. Cobalt [CAS # 7440-48-4]	0.027 lb/shift
7. Manganese [CAS # 7439-96-5]	0.016 pph
8. Manganese [CAS # 7439-96-5]	140 lbs/yr

Compliance with the pph Nickel (Ni), Cobalt (Co), and Manganese (Mn) limit and lbs/1000 lbs exhaust gas PM limit was demonstrated through stack testing on August 11, 2011. The test report indicates the following:

Pollutant	3 Run Average
PM	0.0036 lb per 1000 lbs of gas
Nickel [CAS # 7440-02-0]	0.0022 pph
Cobalt [CAS # 7440-48-4]	0.0002 pph
Manganese [CAS # 7439-96-5]	0.0017 pph

Oerlikon Metco also tested for PM10 on August 11, 2011, however, the results indicated non-compliance with the permit limit. The company conducted another stack test in Nov. 2011. According to notes posted by the previous AQD inspector for the facility, Joyce Zhu, the Nov. 2011 test data shows that the PM10 emissions from FG-ATOM-SCREEN12 was in compliance with the permit limit.

Mr. Cox provided Nickel (Ni), Cobalt (Co) and Manganese (Mn) emissions records as required in FG-ATOM-SCREEN SC VI.2 and 3 (Attachment 3) . These records indicate the following:

- The 12-month rolling total Ni emissions ranged from 10.86 lbs to 12.85 lbs between January 2019 and June 2021. The highest reported 12-month rolling Ni emissions (12.85 lbs) occurred during the period ending March 2019.
- The pounds of Co emissions per shift ranged from 0 lbs to 0.00058 lbs between January 2019 and June 2021. The highest reported 12-month rolling Ni emissions(0.00058) occurred during the period ending October 2019.
- The 12-month rolling total Mn emissions ranged from 56.82 lbs to 80.58 lbs between January 2019 and June 2021. The highest reported 12-month rolling Ni emissions (80.58 lbs) occurred during the period ending May 2019.

SC I.9 states that there shall be no visible emissions from FG-ATOM-SCREEN . FG-ATOM-SCREEN was being operated during the inspection. I did not see any visible emissions from the FG-ATOM-SCREEN process stack or in the screening area during the inspection.

SC III.2 and IV.1 prohibits Oerlikon Metco from operating FG-ATOM-SCREEN unless a MAP for the 27,000 cfm dust collector system is implemented and maintained and the dust collector pressure drop is kept in the range specified in the MAP. Mr. Cox provided a copy of the MAP for FG-ATOM-SCREEN and records of the daily pressure drop readings (Attachment 4). The MAP indicates the appropriate pressure drop range is 0.1 - 2.0 inches water for the primary filter and 1.0 - 3 inches water for the safety filter and greater than 8 inches water inidicates malfunction. The pressure drop records indicate 4 inches of water is the upper pressure drop limit. The AQD inspector observing the stack test for FG-ATOMSCREEN noted pressure drops of 0.5 for the primary filter and and 1.1 inches water column for the secondary filter during the test. I sent an email to Mr. Cox on September 20, 2021 asking him to provide reasoning/supporting information for the differences in pressure drop ranges noted in the MAP and pressure drop records. In an email response sent September 23, 2021, Mr. Cox stated the "normal range" figures shown in the MAP were established by Oerlikon, as a very cautious monitoring approach. Mr. Cox also wrote that daily checks of the gauges are performed and the communication between the observers (Maintenance staff & EHS staff) begins as the pressure drop passes 2 in wc. However, this is still a "green light" condition for them, but ensures they are regularly talking. Also according to the email, the "red light" condition does not occur until 8 inwc, and even that is well below the advised 14 in wc. Mr. Cox stated that he coordinates preventive maintenance and filter change services with the dust collector OEM, so he wants plenty of time to schedule the near-future downtime requirements (production is completely stopped for these services). In addition, they have warning lamps in the facility and at the dust collector that will alert them when differential pressure reaches 4 in wc (green light changes to yellow). All employees are trained to alert Maintenance, EHS, and Leadership when the lights change to yellow, which is a cautionary level. Likewise, all personnel are trained to stop all production activity if the lights change from yellow to red.

The primary filter pressure drop readings ranged from 1 to 3.6 inches water column in in 2020 and 0.9 to 4 inches water in 2021 in the records provided by Mr. Cox. The secondary filter pressure drop readings ranged from 1.5 to 4.4 inches water column in in 2020 and 1.7 to 5.5 inches water in 2021 in the records provided by Mr. Cox. During the inspection, I noted the pressure drop for the primary filter was 2.6 inches water.

SC IV.2 and 4 prohibits Oerlikon Metco from operating FG-ATOM-SCREEN unless sensors which measure the pressure drop across the primary and safety filters are installed, maintained and operated in a satisfactory manner. The sensors must have audio and visual alarms triggered by pressure drop levels outside of normal operating ranges. During the inspection I observed that the baghouse for FG-ATOM-SCREEN is equipped with a digital pressure drop recorder.
SC IV.5 prohibits Oerlikon Metco from operating the hopper blender in EU-SCREEN-PACK unless a gasketed cover is installed, maintained, and operated in a satisfactory manner. During the inspection I observed the hopper blenders had a properly installed gasketed cover.

PTI #50-91
This permit covers tape making process. The tape making process was operating during the inspection. In the tape making area I observed the operator pouring a mixture of metal powder and solvent from a jug into a trough approximately 12 in x 3 in x 3 in. A vinyl film is rolled over the trough and the metal solvent mixture is spread onto the vinyl. The coated vinyl is then cured at room temperature. Emissions from the tape making process are vented, uncontrolled, through a hood over the film applicator.

A paste product is also packaged in the tape making area. The paste is made at another facility and just packaged in the tape making area.

SC 14 requires limits the VOC emission rate from the tape making process to 10.8 lb/hour and 1.0 tons/year. Mr. Cox provided records of the hourly and 12-month rolling VOC emissions from the tape-making process (Attachment 5). Recorded hourly VOC emissions ranged from 0.016 lbs to 0.168 lbs between January 2019 through July 2021. 12-month rolling VOC emissions ranged from 134.6 lbs (0.07 tons) to 593.1 lbs (0.36 tons). The highest reported hourly and 12-month rolling VOC emissions were reported in February 2019.

SC 15 and 18 require there to be no visible emissions from the tape making process and emissions to be discharged vertically upwards from two stacks each at an exit point not less than 26.5 feet above ground level. While on the roof of the facilty, I did not observe any visible emissions from he tape making stack and the stack appeared to meet the height requirements. I did also just barely detected an intermittent solvent odor upwind of the tape making stack while I was on the roof.

CLADDING BOILER

The boiler used in EU-CLADDING does not appear to be subject to the National Emissions Standands for Hazardous Air Pollutants (NESHAP) for Industrial, Commercial, and Institutional Boilers Area Sources (40 CFR Part 63, Subpart JJJJJJ nor the New Source Performance Standards (NSPS) for Small Industrial-Commercial-Institutional Steam Generating Units (40 CFR Part 60, Subpart Dc) because it is a gas-fired boiler with a heat input capacity less than 10 MMBtu/hour.

CONCLUSION

Oerlikon Metco appears to be operating in compliance with the Federal Clean Air Act; Article II, Part 55, Air Pollution Control of Natural Resources and Environmental Protection Act, 1994 Public Act 451; Michigan Department of Environment Great Lakes and Energy, Air Quality Division (EGLE-AQD) Rules; Permit-to-Install (PTI) Numbers 192-10A and 50-91.

NAME K. Kelly DATE 9/29/21 SUPERVISOR Joyce