

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

B666060560

FACILITY: Norbrook Plating, Inc.		SRN / ID: B6660
LOCATION: 11400 E Nine Mile Rd, WARREN		DISTRICT: Warren
CITY: WARREN		COUNTY: MACOMB
CONTACT: Abby VanGheluwe , General Manager		ACTIVITY DATE: 10/12/2021
STAFF: Adam Bogнар	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MINOR
SUBJECT: Scheduled Inspection		
RESOLVED COMPLAINTS:		

On October 12, 2021, I, Adam Bogнар, Environmental Engineer with the Michigan Department of Environment, Great Lakes, and Energy– Air Quality Division (EGLE-AQD) conducted a scheduled inspection of Norbrook Plating (the “facility”), located at 11400 Nine Mile Rd, Warren, MI. The purpose of this inspection was to determine the facility’s compliance status 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 (EGLE-AQD) rules; Permit to Install Nos. 584-86A, 238-99, 239-99, 240-99, 266-04; and 40 CFR Part 63 Subpart N – National Emissions Standards for Chromium Emissions From Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks (Chrome NESHAP).

I arrived at Norbrook Plating at around 10 am. I met with Ms. Abby VanGheluwe, General Manager (586-755-4110, abby@norbrookplating.com). I identified myself and stated the purpose for the inspection. Ms. VanGheluwe and I reviewed the records I requested and then inspected the manufacturing plant. Norbrook Plating has three plating lines: A chrome line, a nickel line, and a copper line. In total the lines consist of approximately 60 tanks. Most of these tanks are water rinse tanks between process tanks.

Various plating chemicals are used at the facility including hydrochloric acid, sulfuric acid, phosphoric acid, nitric acid, ammonia, chromic acid, caustic soda, and sodium bisulfide. Only aluminum and steel parts are plated. Plastic parts are not plated at this facility. Parts are plated for various industries including automotive, marine, and motorcycle applications.

Parts are generally plated in layers. Copper plating often goes directly onto the part followed by nickel plating then chrome plating. Sometimes an extra nickel-plating layer is applied before the copper plating. Nitric acid etching (PTI 240-99) is done only for aluminum parts as a pre-plating process. Hydrochloric acid pickling (PTI 238-99) is done only for steel parts as a pre-plating process. Parts are finished and cleaned with detergent solution using two dip tanks.

The copper, nickel, and chrome processes consist of the following series of tanks:

Copper (Cu) process

2 cleaning tanks → 1 rinse water tank → 2 HCl tanks → 2 rinse water tanks → electrolytic Cu strike → 2 rinse tanks → one 5% acid etch tank → 3 electrolytic copper tanks → one copper drag-out rinse tank → 3 copper rinse tanks → copper parts are buffed → copper strike tank → 2 rinse tanks → 1 rack strip

Nickel (Ni) process

2 cleaner tanks → 1 rinse tank → 1 Cu strike tank → 2 rinse tanks → alkaline cleaner → 2 rinse tanks → 1 cyanide activator → 2 rinse tanks → 2 rinse tanks → one of two semi bright nickel tanks → bright Ni tank → Duruni Ni → 3 rinse tanks

Chrome (Cr+6) Process

1 chrome pre-dip → one chromic acid tank (chrome plating activator) → electrolytic chrome tank → chrome drag-out tank → 3 rinse tanks.

Decorative Chrome Plating Tank (PTI No. 584-86A)

Hexavalent chromium is used in the chrome electroplating tank. Norbrook Plating utilizes three different control technologies to reduce emissions that arise from the chromium electroplating. 1 - A wetting agent based fume suppressant is used to comply with 40 CFR 63.342 (d)(3). 2 - An emulsifier is added to develop a foam blanket over the tank during active electrolysis. 3 - A rooftop fiber bed mist eliminator is installed to capture emissions prior to atmospheric release.

The wetting agent is added in 500 ml doses nearly every day. The emulsifier is added as needed to maintain complete foam coverage. The fiber bed mist eliminator is inspected quarterly by a contractor. The baffles are washed down during this inspection. These inspections occurred on 1/5/2021, 3/5/2021, 6/2/2021, and on 9/16/2021. Baffle wash goes to an on-site water treatment system. The fiber bed mist eliminator is not used for compliance with the chrome NESHAP, therefore Norbrook is not required to conduct performance testing.

PFAS stands for “(per or poly) fluorinated alkylated substances” These substances include both:

- PFOS: Perfluorooctanesulfonic acid
- PFSA: Polyfluorosulfonic Acid

In a previous inspection on December 1, 2017, Norbrook plating was using a surfactant that contained PFAS. The substance listed on the MSDS is “Polyfluorosulfonic Acid” (PFSA). I explained to the previous manager, Mr, Ken Otto, that although the use of PFSA in particular is not a violation of AQD rules or the chrome NESHAP, these compounds (PFAS) are the focus of a department wide initiative to identify sources of PFAS in the environment. I discussed my concern with Mr. Otto and he agreed to change his formulation to a “PF-free” surfactant. As of December 5th, 2017, Norbrook Plating is no longer using a PFAS based surfactant.

Special Condition 1: States that the permittee shall not operate the chrome tank unless the chemical fume suppressant is applied in quantities and at a frequency to ensure the surface tension of the chrome tank does not exceed 45 dynes/cm. This permit limit is out of date. According to the updated Chrome NESHAP, surface tension must be kept below 40 dynes/cm. I communicated this information to Ms. VanGheluwe via email on October 22, 2020.

Based on the records I reviewed, surface tension is maintained below 40 dynes/cm. I did not notice any instance of an exceedance of 40 dynes/cm in the records that I reviewed. Beginning in December 2019, Norbrook Plating began sending their chrome bath samples to MacDermid Laboratories for surface tension analysis and other analyses. Previously, Kenco Supply was used for chrome bath analysis. Chrome bath analysis is currently performed monthly. The records I reviewed show that the chrome tank was operated for 105.2 hours during the 12-month period ending in September 2021. The highest reported surface tension was 32.7 dynes/cm² in June 2021.

Special Condition 2: States that Norbrook Plating shall submit an approvable operation and maintenance plan to the AQD within 30 days of the date this permit was issued. Norbrook Plating maintains this plan; however, during my previous inspection I noted that the plan did not adequately address all of the information required by AQD Rule R336.1911 (Rule 911). Specifically, the plan did not include the frequency of inspections/measurements or the proper operating variables for the pH, flow rate, and pressure differential for the nitric acid scrubber. I asked Ms. VanGheluwe to revise the operation and maintenance manual to include all information required by Rule 911.

Ms. VanGheluwe provided me with an updated operation and maintenance plan during this inspection. The new plan includes the frequency of inspections and the proper operating parameters. The new plan specifies that the chrome mist eliminator is inspected quarterly. During the inspection, the inspector notes the condition of the fiber beds, spray nozzles, duct work, drain lines, fan motor, and notes any fan vibration. Quarterly inspections are acceptable for this type of control technology based on the Chrome NESHAP.

Special Condition 3: States that the permittee shall not operate the chrome tank unless the mist eliminator is installed, maintained, and operating properly. A fiber bed mist eliminator is installed. Washdown of the fiber

elements occurs once per week. The unit is inspected quarterly for signs of wear on the fiber beds, spray nozzles, duct work, drain lines, fan motor, and to check for fan vibration. I did not climb to the roof to view the scrubber during this inspection.

Special Condition 4: States that the permittee shall monitor the surface tension of the chrome bath every 4 hours, except as allowed in 40 CFR 63.343(c)(5). Since there have been no bath changes or instances of non-compliance, stalagmometer measurements are taken at least once every 40 hours of operating time. Ms. VanGheluwe showed me calculations indicating that these readings are performed at least every 40 hours of chrome tank operating time. Plating volume has been relatively low in 2020. The chrome tank is only operated 2-3 days per week.

Special Condition 5: Requires the permittee to maintain records of the date, time, and amount of each fume suppressant addition to the chrome tank. These records are maintained. Norbrook Plating adds 500 ml of surfactant and approximately 100 ml of foam agent each day the chrome tank is used. The chemical fume suppressant (foam blanket) is not required since Norbrook Plating complies with the Chrome NESHAP by maintaining surface tension below 40 dynes/cm in the chrome bath. Foam thickness is not measured, additional chemical fume suppressant is added if an operator notices incomplete foam coverage.

Special Condition 6: States that the permittee shall monitor and record both emissions and operating/maintenance information as required by the Chrome NESHAP. Emissions information is not kept since a stack test is not required. Norbrook Plating complies with the Chrome NESHAP by maintaining surface tension below 40 dynes/cm measured by a stalagmometer. MacDermid currently maintains the stalagmometer operating procedure. If Norbrook Plating decides to begin using their own stalagmometer readings, Norbrook will be required to maintain a stalagmometer operating procedure on-site.

Special Condition 7: States that the permittee shall maintain records of inspection required to comply with applicable work practice standards of the Chrome NESHAP (40 CFR 63.342(f)). Since a stalagmometer is used to comply with the Chrome NESHAP, the only required operation and maintenance practice is to "follow manufacturers recommendations" while using the stalagmometer. Norbrook Plating appears to comply with this requirement.

Special Condition 8: Specifies stack requirements. The stack appeared to meet permit requirements. Stack was exhausted vertically unobstructed to the ambient air.

I verified that an "Ongoing Compliance Status Report" was completed for the most recent operating year in accordance with the reporting requirements of the Chrome NESHAP.

Nitric Strip Tank with Wet Scrubber (PTI No. 240-99)

Norbrook operates a single 185-gallon nitric strip tank. This is used only for etching aluminum pieces. Steel pieces would quickly corrode if subjected to this tank environment. Emissions from the tank are vented to a packed bed scrubber with a recirculating caustic solution.

Special Condition 1.1: States that the permittee shall operate the nitric strip tank at ambient temperature at all times. Ms. VanGheluwe stated that the tank is not heated. I did not see any evidence that the tank is heated.

Special Condition 1.2: States that the permittee shall not operate the nitric strip tank unless the wet scrubber is installed, maintained, and operated in a satisfactory manner. The wet scrubber was operating during the inspection. The scrubber liquor is maintained at a pH of above 6 by using a pump and process controller to make necessary additions of caustic. The pump is turned on when a pH probe indicates that pH has dropped below 7.

During the inspection, the scrubber liquor flow rate was 10.5 gallons per minute. The operation and maintenance plan provided by Norbrook plating states that the flow should be "greater than 10.5 GPM". The pressure drop gauge for the scrubber showed a pressure of 0.1" of water during the inspection. The operation and maintenance plan states that the pressure should be kept below 1" of water.

The digital pH display showed that the pH was 9.7. The operation and maintenance plan states that the pH must be kept between 6.5 and 10.5. Caustic soda is added automatically by a process controller when the pH falls to 6.5. The record sheet near the caustic drum has a column for an operator to note the daily fluid level in the caustic drum. When the fluid level falls below 25%, the drum is topped off.

Special Condition 1.3: States that the permittee shall install, calibrate, maintain, and operate in a satisfactory manner, devices to monitor the pressure drop and liquid flow rate on a continuous basis for the wet scrubber. A rotameter is present to measure the scrubber liquor flow rate. A pH meter keeps track of the alkalinity. A pressure gauge is present to monitor the pressure drop through the system.

Special Condition 1.4: Requires the permittee to keep records of pressure drop and liquid flow rate for the wet scrubber once per day. These records are maintained. An operator manually records these values daily on a printed record sheet near the tank. Daily readings of pH and the caustic fluid level are also recorded. I reviewed these records on-site. I did not notice any exceedances.

Special Condition 1.5: Requires the permittee to maintain records of production throughput and addition of make-up materials to the tank on a monthly basis. These records are maintained. An operator records each addition of parts to the strip tank on a record sheet near the tank.

Special Condition 1.6: Requires the stack be discharged unobstructed vertically upwards to the ambient air. The stack appeared to comply with permit parameters.

2 Nitric Etch Tanks (PTI No. 240-99)

Special Condition 1: Requires the permittee to keep records of production records, including loads processed per shift and addition of makeup materials for the nitric acid etch tanks. These records are maintained. Nitric etch loads were highest in March 2021 at 89 loads. Total nitric etch loads during the 12-month period ending in September 2021 was 978 loads.

Special Condition 2: Specifies stack requirements. The stack appeared to comply with permit parameters.

Hydrochloric Acid Tank (PTI No. 238-99)

Special Condition 1.1: Requires the permittee to keep records of production records, including loads processed per shift and addition of makeup materials for the hydrochloric acid tank. These records are maintained. Hydrochloric Acid loads were highest in June 2021 at 103 loads. Total Hydrochloric Acid loads during the 12-month period ending in September 2021 was 936 loads.

Special Condition 1.2a: Specifies stack requirements. The stack appeared to comply with permit parameters.

3 Copper Acid Tanks (PTI No. 239-99)

Special Condition 1: Requires the permittee to keep records of production records, including loads processed per shift and addition of makeup materials for the copper acid tanks. These records are maintained. Total copper loads for the 12-month period ending in September 2021 were 2113.

Special Condition 2: Specifies stack requirements. The stack appeared to comply with permit parameters.

Other Metal Treatment Tanks

Norbrook operates several nickel and copper electroplating tanks, cleaning tanks (soapy water), and light acid tanks (5% HCl). These tanks appear to be exempt from Rule 201 requirements pursuant to Rule 285 (2)(r). These tanks are vented to the general in-plant environment. A wetting agent is periodically added to the nickel tanks. The MSDS indicates that the wetting agent does not contain PFAS.

The copper and nickel electroplating tanks appear to be subject to 40 CFR Part 63 - National Emissions Standards for Hazardous Air Pollutants: Area Source Standards for Plating and Polishing Operations (NESHAP WWWWWW).

The AQD has not taken delegation of 40 CFR Part 63 Subpart WWWW (6W) standards therefore compliance was not evaluated. I informed Ms. VanGheluwe that Norbrook Plating is subject to NESHAP WWWW.

Buffing

There are five buffing stations used to buff parts before and after plating. These buffing stations are in a separate room from the plating processes in accordance with housekeeping practices of the Chrome NESHAP. One of the stations is only used to buff chrome from already plated parts and is located in a different room than the other four buffing stations. All of these buffing stations are exhausted through a cyclone dust collector and out through a stack on top of the building.

According to Ms. VanGheluwe, all of these buffing stations and blowers have been in place and operational since approximately 1950. There is no existing documentation showing when these machines were purchased. The buffing machines and cyclone dust collector appear to be that old. Buffing equipment at Norbrook Plating appears to be grandfathered. The exemption rule that would require non-permitted buffing operations to be controlled with a fabric filter was not promulgated until 1993. This equipment appears to be installed before the promulgation of the federal Clean Air Act. I informed Ms. VanGheluwe that any new buffing processes or replacements to these buffing units would result in Norbrook Plating becoming subject to the latest buffing/polishing regulations – which would require installation of a fabric filter style dust collector for any emissions ventilated outdoors.

Boilers

Norbrook operates one natural gas fired boiler for process heating. It is a Burnham Boiler Model 4FL-345-50-0-OP with a maximum heat input of 2.8 million BTU/hr. There is a backup natural gas fired boiler present that is even smaller. Both these boilers appear to be exempt from Rule 201 requirements pursuant to Rule 282 (2)(b) because they have a heat input less than 50MM BTU. The boilers are not subject to 40 CFR 60, Subpart Dc for Small Industrial-Commercial-Institutional Steam Generating Units because they have a maximum heat input less than 10 million BTU/hr.

Stacks

In August 2020, AQD received a complaint stating that some of the stacks on top of Norbrook Plating appeared to be in disrepair. I investigated this complaint and noticed that there is one stack that is laying flat on the roof which appears to be exhausting towards the neighborhood behind Norbrook Plating. During an inspection in October 2020, Ms. VanGheluwe stated that this stack is an inlet for a blower. On that date, Ms. VanGheluwe also stated that this stack is on schedule to be repaired and put back in place before winter 2020. These stacks have been repaired. The stack that appeared to be exhausting towards the nearby neighborhood has been re-attached to its appropriate scaffolding.

Two of the stacks have rain caps which belong to both the process boiler and backup boiler. AQD regulations do not appear to restrict rain-cap usage on these types of boilers. The remainder of the stacks appeared to be exhausted vertically unobstructed.

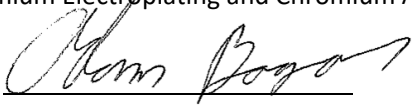
Mist

AQD received a complaint in August 2020 and again in August 2021 alleging that a mist is entering the surrounding community originating from the open bay doors at Norbrook Plating. I investigated this complaint and I did notice a mist coming from the bay doors Norbrook Plating. It appears the mist is primarily coming from the heated tanks which contain an aqueous based alkaline cleaner. A lesser amount of mist is also released from the Nickel plating tanks. These tanks are not ventilated outdoors, and the mist is released into the general in plant environment. This is likely the same mist which can be observed coming out of the bay door behind Norbrook Plating. All of the plating tanks at Norbrook Plating have the potential to emit visible vapor depending on ambient temperature/humidity. The majority of this vapor is water, but it also may contain some amount of plating chemicals. The mist does not have a strong odor associated with it and does not appear to have an opacity over 20%. Ms. VanGheluwe stated that the bay doors are kept open in the summer months to keep the plant from getting too hot.

I left the facility at around 11 am.

Compliance Determination

Norbrook Plating Inc. appears to comply 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 (EGLE-AQD) rules; Permit to Install Nos. 584-86A, 238-99, 239-99, 240-99, 266-04; and 40 CFR Part 63 Subpart N – National Emissions Standards for Chromium Emissions From Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks (Chrome NESHAP).

NAME 

DATE 10/22/21

SUPERVISOR 