

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

A017151585

FACILITY: HASTINGS MANUFACTURING COMPANY		SRN / ID: A0171
LOCATION: 325 NORTH HANOVER STREET, HASTINGS		DISTRICT: Grand Rapids
CITY: HASTINGS		COUNTY: BARRY
CONTACT: John Belles, Environmental Engineering Manager		ACTIVITY DATE: 12/04/2019
STAFF: Eric Grinstern	COMPLIANCE STATUS: Non Compliance	
SUBJECT: Unannounced inspection		SOURCE CLASS: MINOR
RESOLVED COMPLAINTS:		

FACILITY DESCRIPTION

The facility is located within the City of Hastings and manufactures piston rings. All processes associated with the making of piston rings are performed onsite, from the casting process through finishing and chrome plating to packaging and shipping. The facility has a dedicated foundry operation housed in a separate building where grey and ductile iron castings are poured and subsequently processed into rings. The facility also manufactures non-cast steel piston rings, which are produced in higher volume than cast iron rings.

REGULATORY OVERVIEW

The facility is subject to NESHAPs Subpart ZZZZZ as a small area source foundry and Subpart N, chrome electroplating.

The facility holds the following active air use permits:

Main Plant

649-90 Abrasive belt sander with Metco wet collector
222-90A Milling and Machining
936-93 Metco Plasma System (Moly)
277-86 Chrome Plating

Foundry

810-79A Ajax furnace, shakeout conveyor, cooling conveyor
267-81 Turntable pouring system
396-91 sand silos, knock-out, shakeout, cooling conveyor

COMPLIANCE EVALUATION

EG was accompanied on an inspection tour of the facility by John Belles, Maintenance and Environmental Manager. Subsequent to the tour a meeting was held to discuss the compliance status of the facility. Representing the facility in the meeting was Ken Holbrook, President and CEO, Danny Pickett, CFO, Dennis Graham, VP of Operations, and John Belles.

During the meeting, outstanding issues regarding the electric induction furnaces and chrome plating lines were discussed. The facility was informed that another Violation Notice (VN) would be issued addressing the electric induction furnaces and chrome plating. The VN will cite a violation of Rule 201 for the furnaces, since they are operating without a permit to install and the facility has failed to demonstrate that they meet an exemption.

The VN will cite a violation of Rule 910 for the chrome plating line due to the observed condition of the mesh pads. Additionally, emission testing will be required for the chrome plating line in accordance with Act 451 Section 324.5503(u), Special Condition 18 of PTI No. 277-86 and Rule 1001 (R336.2001) (c) and (f).

On December 6, 2019, (phone conversation) Dennis Graham proposed that the facility add the nickel alloy in the pour ladle instead of the melting furnace. The facility previously added the nickel in the ladle prior to the start of alloying in the furnace. It is possible that the furnace would be exempt under Rule 290 if they discontinue using nickel in the furnace. Metal is only in the pouring ladle for a maximum of 3 minutes prior to pouring in the mold, therefore potentially reducing nickel emissions compared to alloying in the furnace. Mr. Graham stated that the facility only alloys nickel in two furnace loads of iron a year, which equates to 1.2% of the total metal throughput.

BackgroundElectric Induction Furnaces

An inspection conducted on October 27, 2016 determined that the facility's use of Rule 290 to exempt two electric induction iron melting furnaces was not appropriate since the facility's metal contains nickel. Rule 290 does not allow an emission unit to emit any air contaminants with an IRSL less than 0.04 micrograms per cubic meter. At the time of the inspection nickel had an IRSL of 0.0042 micrograms per cubic meter. The facility was directed to obtain a permit to install, however, they indicated a preference to use the recently developed Rule 291 exemption. The facility was requested to provide documentation that furnace emissions meet Rule 291. During a meeting held on September 6, 2018, the facility indicated that they will either provide a Rule 291 determination or submit an PTI application. Subsequent to a meeting with the facility on April 30, 2019, the facility was requested via email to provide a Rule 291 demonstration or a permit application by May 17, 2019. The facility provided a Rule 291 demonstration on May 17, 2019. Review of the demonstration showed that it appeared to calculate actual emissions based on 2018 production instead of potential emissions, as required by Rule 2019. Additionally, the demonstration did not account for any nickel emissions from the facility. In a certified letter dated May 30, 2019, the facility was requested to conduct testing to quantify emissions from the two electric induction furnaces. The facility did not respond to the May 30, 2019 letter, resulting in the issuance of a Violation Notice (VN) on September 5, 2019 for failing to provide a test protocol. The facility did not respond to the VN by the deadline, resulting in the issuance of a 2nd VN on September 24, 2019. The facility did not respond to the 2nd VN by the October 8, 2019 deadline. EG visited the plant on November 1, 2019 and met with John Belles to discuss the request to test and VNs. Mr. Belles stated that he was not aware of the certified correspondence sent by AQD.

Chrome Plating

PTI No. 277-86 addresses the operation of a chrome plating operation which is also subject to the Chrome NEHAP, Subpart N. The plating operation consists of five tanks, Tanks No. 1 through 4 and the Udylite Tank (No. 5). Tanks No. 1 through 5 are controlled by Scrubber No. 1. Additionally, the facility has ancillary tanks (deplating, rust inhibitor, rinse, etc.) that are exhausted to Scrubber No. 2.

The last compliance testing was conducted on Scrubber No. 1 in 1998. It appears that prior to conducting testing to demonstrate compliance with the Chrome NESHAP the facility rerouted the exhaust from the chrome tanks to go to Scrubber No. 1. Prior to that time, the tanks were exhausted to Scrubbers No. 1 and No. 2. AQD files contain a staff determination that, based on consultation with Permits, the chrome emission limit for Scrubbers No. 1 and No. 2, contained in PTI No. 277-86, could be combined to apply to Scrubber No. 1. It appears the facility conducted an initial test on February 3, 1998 and a follow-up test on September 17, 1998 to allow for the expansion of the scrubber pressure drop operating range. Results for the September 17, 1998 testing showed a chrome emission rate of 0.007 mg/m³, which is less than the NESHAP limit of 0.015 mg/m³. The average emission rate was 0.000255 pounds per hour. This rate is in excess of the permitted limit, however, it is less than the combined chrome limits for Scrubbers No. 1 and No. 2. The permit should have been modified to reflect the correct emission limits after the system was reconfigured. During an inspection/meeting on September 6, 2018, discussion took place regarding the modification of the permit to accurately represent the current configuration.

Additionally, on September 6, 2018, inspection of chrome scrubber No. 1 No. 1 showed red/yellow staining on each of the three mesh pads, indicating chrome exposure. Stage 3 had a slightly sagging/wavy appearance and had a wood frame constructed around it for support. Stage 2 had a slightly sagging/wavy appearance. Stage 1 and a pronounced sagging/waving appearance with the pad appearing to slightly be pulling away from the frame.

Based upon discussion with the facility, it was the understanding of AQD that the facility would submit an application to modify the permit for the chrome plating operating to accurately represent the current configuration. The modified permit would require testing to demonstrate compliance with the chrome limit due to the length of time since the last test.

The facility did not submit an application to modify the permit and informed AQD in a email dated May 17, 2018 that they wished to stay with the current permit. In a certified letter dated May 30, 2019, the facility was requested to conduct testing to quantify emissions from the two chrome plating scrubbers. The facility did not respond to the May 30, 2019 letter, resulting in the issuance of a VN on September 5, 2019 for failing to provide a test protocol. The facility did not respond to the VN by the deadline, resulting in the issuance of a 2nd VN on September 24, 2019. The facility did not respond to the 2nd VN by the October 8, 2019 deadline. EG visited the plant on November 1, 2019 and met with John Belles to discuss the request to test and VNs. Mr. Belles stated that he was not aware of the certified correspondence sent by AQD.

Below is an evaluation of the facility's compliance with applicable air quality rules, regulations and permits. For the purpose of evaluating compliance, the facility will be divided into three parts, foundry, finishing, and miscellaneous.

FOUNDRY

The facility has a dedicated foundry that produces both grey and ductile iron piston ring sleeves that are subsequently cut and finished to make piston rings.

Mold Making

The facility operates two shell mold machines, one large carousel unit and one small unit. The large carousel unit accounts for a majority of mold production. The large unit was installed in 1957 and has never had control. The unit exhausts through a stack directly above the process. The large unit has a sand receiving hopper located at the top of the process that is ducted to the Torit Collector, as required by PTI No. 396-91. The large mold making operation appears to be identified in historical permitting records as the "Semi-automatic mold machine". The unit appears to be grandfathered from PTI requirements. The small mold machine is ducted to the Torit collector.

Observation of the process during the inspection showed that the large unit was in operation. No visible emissions or other compliance concerns were noted. No changes were observed since the last inspection.

Melting

A summary of the compliance status of the melting operation is provided earlier in this report. The foundry alternates melting between two 2-ton Inductotherm electric induction furnaces. The furnaces have rim vent capture systems that duct uncontrolled via a stack (square) through the roof. Ductile inoculation is performed in a tundish ladle without direct capture or control. There are vents above the furnace tapping area that duct uncontrolled through a stack. Charge material consists of pig iron, punchings, stampings and internal runaround.

The east furnace was in operation at the time of the inspection. The furnace was tilted up and either being readied to tap or had recently been tapped. No visible emissions were observed from the furnace or the exhaust stack associated with the rim vent hood.

Pouring/Cooling

Molds are manually poured on an indexing turn table that vents emissions uncontrolled via a 62.5-foot stack. Pouring operations are permitted in PTI No. 810-79A. The mold indexing turn table is a round conveyor where pouring and cooling takes place. The pouring station has a side-draft hood that ducts uncontrolled via a stack. After pouring, the molds travel around the enclosed table which has three exhaust ducts. Two of the ducts vent to the same stack as the pouring station, while the third duct exhausts through a separate stack uncontrolled.

During the inspection, emissions were observed from the pouring stack for a short period of time.

Shakeout

After pouring and cooling on the indexing turn table, molds travel through a knock-out enclosure. The knock-out enclosure is ducted to the Torit

collector, as required by PTI No.396-91. The mold is then conveyed through what the facility appears to identify as a shakeout tunnel that is required to have baghouse control. Shakeout was addressed in PTI No. 810-79A, and then subsequently addressed in PTI No. 396-91. Observation of the shakeout line showed that there are four ducts associated with the tunnel. The first and fourth duct exhaust to the baghouse. The second and third combine into one stack. It was determined during the September 6, 2018 meeting that these two ducts are intakes providing ambient air to the tunnel for cooling.

Observation of the Torit collector showed no visible emissions and good housekeeping practices regarding collected material.

Cooling

After shakeout, the molds are processed through what the facility has identified as a cooling conveyor and then through a George Fischer "feed through" abrasive cleaning unit, both of which are required by PTI 396-91 to have baghouse control. The shakeout conveyor has five ducts that exhaust the cooling line and exhaust to the Torit collector. There are also five other ducts on the conveyor line that combined to a single stack equipped with a rain cap. It was previously determined that these ducts supply ambient air to the tunnel for cooling. After the blast cleaning unit, the sprues are removed on a small breaker machine. The piston sleeves continue to the main plant for cutting and finishing.

Subpart ZZZZ – Area Source Iron and Steel Foundry NESHAP

The facility is subject to Subpart 5Z as a small area source. The facility has submitted all required notifications and continues to submit the required semiannual certification reports, with the exception of the report covering the first semi-annual period for 2019. As a small area source, the facility is required to maintain records of the annual melt rate. The facility tracks annual melt and submits throughput records each year. The facility is also required to maintain a scrap plan and comply with scrap specifications. The scrap plan was previously evaluated. All scrap on site is very clean due to the product they are producing.

Finishing

After the sleeves are cast in the foundry, they are processed through equipment that splits, polishes, grinds and machines the piston rings. A number of these processes are unvented and or are exempt from permitting requirements under Rule 285(2)(l)(vi)(B) &(C).

Of these processes, the following are covered under permits to install.

Milling and Machining

PTI No. 222-90A addresses the collection of metal chips from cast iron machining. These processes are controlled by a collection system installed in 2012, which is called the "Invincible Collector". The Invincible Collector consists of a cyclone, baghouse, and HEPA filtration unit. PTI No. 222-90A restricts PM emissions to 0.05 pounds per 1,000 pounds of exhaust gases and 1.13 pound per hour. The process is also required to have baghouse control with an opacity limit of 5%. No emissions were observed from the outlet of the collection system during the inspection. The facility records the pressure drop across the baghouse on a daily basis. During the inspection the pressure drop on the primary filter was 3.8" (posted range 0.10-10), while the secondary filter had a pressure drop of 19.0" (posted range 1-25).

Abrasive belt sander with Metco wet collector

PTI No. 649-90 addresses the operation of an abrasive belt sanding process consisting of two units which are each controlled by a Metco wet collector. PTI No. 649-90 restricts PM emissions to 0.1 pounds per 1,000 pounds of exhaust gases. The emission unit also has an opacity limit of 10%. The process is also required to be controlled by a wet collector with a stack not less than 39 feet and maximum diameter of 12 inches. The facility has established preventative maintenance procedures to assure proper operation.

Metco Plasma Spray System (Moly)

PTI No. 936-93 addresses the operation of a Metco plasma spray unit. The unit coats the outside edge of the rings, via a plasma spray system, with molybdenum powder. The unit is controlled by the "Moly Collector". The Moly Collector consists of a cartridge filter unit followed by a HEPA filter. The permit limits PM emissions to 0.003 pounds per hour and 0.02 tons per year. Visible emissions are limited to 0% opacity. PTI No. 936-93 addresses only one plasma spray unit, while there are three cells installed. The second and third units appear to meet Rule 285(2)(l), which exempts plasma coating equipment from the requirement to obtain a permit to install. The three cells are controlled by Collectors 2157 and 1003. Collector 2157 controls cell #1, while Collector 1003 controls cells #2 and #3. During the inspection, Mr. Belles stated that cell #2 is no longer in operation. During the inspection, Collector 2157 had a pressure drop of 2.6". The facility has a posted maximum pressure drop of 3.0". Collector 1003 had a pressure drop of 3.8" for the collector and a pressure drop of 0.0" for the HEPA. The facility has a posted collector operating range of 0-2" and a HEPA operating range of 0-6". The facility will be requested to investigate the cause of the low HEPA pressure drop. No emissions were observed from either of the collectors during the inspection.

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Tanks No.1 through No. 5 and Scrubber No. 1 are regulated by the Chrome NESHAP.

Scrubber No. 2 is located adjacent to Scrubber No. 1 and is a packed bed scrubber system. The only monitoring system associated with Scrubber No. 2 is a low water flow alarm.

The scrubbers are located in an enclosure above the chrome plating room. Observation of Scrubber No. 1 showed a similar condition to that which was observed during the last inspection: red/yellow staining on each of the three mesh pads, indicating chrome exposure. Stage 1 has a pronounced sagging/wavy appearance, Stage 2 had a slightly sagging/wavy appearance and had a wood frame constructed around it for support. Stage 3 had a slightly sagging/wavy appearance.

Conclusion

A VN will be issued regarding the violation of Rule 910 for the chrome plating line due to the observed condition of the mesh pads. Additionally, emission testing will be required for the chrome plating line in accordance with Act 451 Section 324.5503(u), Special Condition 18 of PTI No. 277-86 and Rule 1001(R336.2001) (c) and (f). The VN will also cite a violation of Rule 201 for the furnaces, since they are operating without a permit to install and the facility has failed to demonstrate that they meet an exemption.

NAME 

DATE 12/9/19

SUPERVISOR 