

**DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Self Initiated Inspection**

N636325347

FACILITY: Machine Tool & Gear Inc.	SRN / ID: N6363
LOCATION: 1021 N SHIAWASSEE, CORUNNA	DISTRICT: Lansing
CITY: CORUNNA	COUNTY: SHIAWASSEE
CONTACT: Marc Irvine, BSME, MSME, Plant Sr. Manufacturing Engineer	ACTIVITY DATE: 06/04/2014
STAFF: Daniel McGeen	COMPLIANCE STATUS: Compliance
SUBJECT: Meeting with company to discuss pending permit application, and self-initiated inspection of facility.	SOURCE CLASS: MINOR
RESOLVED COMPLAINTS:	

On 6/4/2013, staff of the Department of Environmental Quality (DEQ), Air Quality Division (AQD) met with representatives of Machine Tool and Gear Inc., at their Corunna site, to discuss a pending permit application the company wished to submit, and to conduct a self-initiated inspection of the facility. "Self-initiated" refers to an inspection that was not initially planned by the AQD, at the start of the current fiscal year.

Environmental contacts:

Marc A. Irvine, BSME, MSME, Plant Sr. Manufacturing Engineer; 989-743-3936, ext. 235;
MIrvine@newcor.com

Jane Johnson; Operating Systems Coordinator

Facility description:

Machine Tool and Gear's Corunna facility manufactures automotive drive train components, in a number of metal machining processes. They perform heat treating and oil quenching of metal pins, in order to harden the exterior surface.

Emission units:

Emission unit	Emission unit description	Permit number or relevant exemption	Compliance status
EU-Holcroft1	FUR-001; AFC-Holcroft natural gas fired heat treat furnace; 500,000 Btu/hr	PTI No. 439-97A	Compliance
EU-Holcroft2	FUR-002; AFC-Holcroft natural gas fired heat treat furnace; 500,000 Btu/hr	PTI No. 439-97A	Compliance
EU-Holcroft3	FUR-003; AFC-Holcroft natural gas fired heat treat furnace; 500,000 Btu/hr	PTI No. 439-97A	Compliance
EU-Lindberg	FUR-004; Lindberg natural gas fired heat treat furnace, 410,000 Btu/hr	PTI No. 439-97A	Compliance
ENDO-001	Endo gas generator	Rule 285(l)(iv)	Compliance
WASH-002	AFC-Holcroft parts washer using aqueous solution, electrically heated	Rule 285(l)(iii)	Compliance
WASH-003	Lindberg parts washer using aqueous solution; electrically heated	Rule 281(l)(iii)	Compliance
3 natural gas draw furnaces	3 natural gas fired draw furnaces, each rated at 500,000 Btu/hr	Rule 282(b)(l)	Compliance
EU_Evaporator1	Samsco wastewater evaporator, natural gas fired	PTI No. 148-09	Compliance
Machining processes	Numerous metal machining processes, which exhaust into the in-plant environment	Rule 285(l)(vi)(B)	Compliance

Regulatory overview:

This facility is classified as a minor source rather than a major source for particulate emissions, and so is not subject to the Renewable Operating Permit program. It has a Permit to Install (PTI) for four heat treating furnaces, a PTI for a wastewater evaporator, and numerous processes which appear to be exempt from the requirement to obtain an air use permit.

Fee status:

This facility is not considered fee-subject, for the following reasons. Because it is not a major source for criteria pollutants, it is not classified as Category I. Additionally, because it is not a major source for Hazardous Air Pollutants (HAPs), and is not subject to federal New Source Performance Standards, it is not classified as Category II. Finally, because it is not subject to federal Maximum Achievable Control Technology standards, it is not classified as Category III. The facility is not required to submit an annual air emissions report via the Michigan Air Emissions Reporting System (MAERS).

Location:

This facility is located on the eastern edge of a small industrial park. There are industries to the immediate south and west of the plant, with an office building about 200 feet to the north. Further north are other businesses. To the east are farm fields and woods. About 700 feet to the southeast is an apartment complex. These appear to be the closest residences.

Recent history:

The previous environmental contact, Ms. Cassandra Friess, Operating Systems Coordinator, left Machine Tool and Gear earlier this year. Mr. Marc Irvine, Plant Senior Manufacturing Engineer, has since been working on a draft PTI application, or New Source Review application, for a proposed fifth heat treating furnace. He met with Permits Section and district staff in Lansing on 5/22, to discuss their plans, and to make sure they were assembling their application correctly. The purpose of today's meeting was to show AQD where the fifth furnace would be located, to show AQD their existing equipment, and to answer any questions related to the pending application. It was agreed upon that AQD Lansing District staff would conduct an inspection of the plant, while we were at the site.

Arrival:

AQD Permit Engineers Julie Brunner, Jeff Rathbun, and Daniel Schwanik represented the Permits Section, for the meeting with the company. We arrived at 9:02 AM. There were no odors or visible emissions detected from the plant. Conditions were overcast, humid, and 64 degrees F, with winds 0-5 miles per hour out of the east.

We met with Mr. Irvine, and with Ms. Jane Johnson, who is the new Operating Systems Coordinator. I provided a copy of the DEQ brochure "Environmental Inspections: Rights and Responsibilities," per AQD procedure. We were provided with a copy of the Machine Tool and Gear, Inc. Visitor Safety Guide (attached for reference for future inspections).

Permit discussion:

Mr. Irvine had prepared a draft NSR application for the proposed fifth heat treat furnace. He provided AQD staff with an equipment summary, in table form (attached). This lists the various processes which emit air emissions at the plant. He provided Permits staff with information related to modeling, and with a table identifying the fluids used for heat treating. These documents will also be included in the permit application, which will soon be submitted to the Permits Section.

We also discussed a Rule 202 waiver request, which they would like to submit to the AQD Lansing District. If approved, it would allow them, at their own risk, to begin site preparation activities, like installing utilities and pouring concrete, before the approval of the air use permit. The concrete would need about 30 days to cure, for maximum strength, we were told. If they could obtain waiver request approval, they could pour the concrete while the permit was being reviewed, and it would possibly be cured around the time of permit issuance. This would allow them to install the proposed furnace and endo gas generator relatively soon. Mr. Irvine had drafted a chart, to demonstrate the kinds of difficulties or hardships they would be faced with, if they could not get a waiver request approved. This data will likely be used in the waiver request.

Inspection:

Four natural gas heat treating furnaces, PTI No. 439-97A:

We went to the carburizing area, where there are currently four heat treating furnaces. FUR-004 was manufactured by Lindberg, and the others were made by Holcroft. All three were operating, at this time. We were joined by Mr. Vince Leigh, Heat Treat Supervisor. We were shown where the proposed fifth furnace would be installed, next to the Lindberg unit, and where a new endo gas generator would be installed. There are four existing stacks for the current four furnaces, and a fifth stack would be added, for the proposed furnace.

The heat treating process begins with "green" (unhardened) metal parts entering a furnace, and going through a thermal cycle. The furnace temperature undergoes a specific series of elevations, decreases, and plateaus. Cycle length depends on the needs of the parts being treated, but is usually about 8 hours. The parts are then quenched in oil, which is either at 100 or 350 degrees F. Quenched parts are then transferred into one of two parts washers, which use water-based cleaning solutions. The parts are removed, and then are taken to a draw furnace to be tempered.

The existing four heat treating furnaces each utilize a flame curtain, primarily for safety, to prevent gases inside the furnace from exiting through an open door, but also to prevent air from entering the furnaces. This is because the parts inside need an oxygen-free environment. Natural gas and ammonia are the gases used for this. We were given a demonstration of a flame curtain in operation, from a safe distance, when the doors to one furnace were remotely opened.

We were informed that the only volatile organic compound (VOC) emissions from the heat treating process, other than from the combustion of natural gas as fuel, occur during the quenching process, which lasts for only 3 minutes. This brief period is a small part of the entire heat treat cycle, which lasts for hours.

The existing four stacks come off of an outside wall horizontally, and then exhaust unobstructed, vertically upwards, to a height of 30 feet. There were no visible emissions from the stacks. Weather conditions were overcast, and roughly 65 degrees F.

Near the above stacks were four air to oil coolers, where oil from the heat treating quench baths is cooled. These function like large radiators, using heat exchanger plates. There is no direct contact between the oil and the air. Upon issuance of the air permit, a fifth cooler will be installed for the proposed fifth heat treat furnace, which has an integral quench bath. A concrete pad will need to be poured and cured, before the cooler can be installed.

ENDO-001, endo gas generator; Rule 285(I)(iv):

There is one existing endo gas generator, ENDO-001, manufactured by AFC-Holcroft. Atmosphere generators used in metal heat treating processes are exempt from needing an air use permit under Rule 285(I)(iv). A second endo gas generator, ENDO-002, also an AFC-Holcroft unit, would be installed with the fifth heat treat furnace.

Parts washers, WASH-002 and WASH-003; Rule 285(I)(iii):

Their two parts washers at the plant use a water-based solution, whose Material Safety Data Sheet (MSDS) states that some ingredients are trade secret compounds. As part of reviewing the pending permit application, Permits staff will contact the supplier of the solution, with Mr. Irvine's permission, if Mr. Irvine calls the supplier to discuss. These parts washers may qualify for exemption Rule 285 (I)(iii), or Rule 281(e).

Rule 285(I)(iii) exempts the following equipment and any exhaust system or collector exclusively serving the equipment: "Equipment for surface preparation of metals by use of aqueous solutions, except for acid solutions." The parts washer exhaust passively through the roof, according to the Equipment Summary table provided by Mr. Irvine, and the washers utilize an aqueous solution.

Rule 281(e) exempts "Equipment used for washing or drying materials if no volatile organic compounds

that have a vapor pressure greater than 0.1 millimeter of mercury at standard conditions are used in the process and no oil or solid fuel is burned." These parts washers are electrically heated, and do not utilize natural gas or oil as fuel, from their Equipment Summary table. The solution appears to consist of solids and surfactants, Permits staff learned the following week, on 6/11. The permit application is expected to have more information on the solution. The washers will actually become part of the emission unit with the heat treating processes, in the permit for the proposed fifth furnace.

Draw furnaces; Rule 282(b)(l):

There are two electrically heated draw furnaces, which do not utilize quenching. They do not appear to be subject to Rule 201, being electrically heated. There are also three natural gas-fired draw furnaces, which are each rated at 500,000 Btu/hr heat input capacity, and therefore appear to be exempt from needing an air use permit under Rule 282(b)(l).

Samsco wastewater evaporator, natural gas-fired; PTI No. 148-09:

The wastewater evaporator heats oil-containing wastewater to remove the water. I could not see the exhaust stack from outside the facility offices, but there were no visible emissions from the general roofline of the building. They periodically have an employee, Mr. Leigh, go up on the roof, and photograph the roof area around the exhaust stack for the evaporator, to check for signs of oily fallout. So far, they have never observed oil on the roof.

District staff will follow up with the company to determine if the company is keeping VOC emission calculations for the process, based upon the assumption (from the permit application) that the VOC content of the wastewater is 1% (this conservative assumption assumes that all of the oil in the wastewater is volatile). Also, the District will ask if the wastewater is tested twice per year, to determine VOC content, water content, and metals content, as required by the air use permit.

Machining operations; Rule 285(l)(vi)(B):

Mr. Terry Baker, Supervisor, showed us the metal machining processes in the plant. They perform cutting, grinding, drilling, turning of metal parts takes place. These processes exhaust into the general, in-plant environment, and appear to satisfy the exemption criteria of Rule 285(l)(vi)(B). A number of their processes are CNC machines. Some minor assembly of parts also takes place.

Miscellaneous:

Cold rolling of metal parts to form splines appears to be exempt under Rule 285(l)(l), which exempts "Equipment used exclusively for bending, forming, expanding, rolling, forging, pressing, drawing, stamping, spinning, or extruding either hot or cold metals."

There are a number of induction hardening machines in the plant, which use a magnetic field to harden metal parts.

Facility recordkeeping:

Ms. Johnson provided copies of their Monthly Quench Oil Addition and Usage Log, for the past 12 months, which are attached for reference. We were shown the updated version of this form they are now using, for the month of May, 2014. This expanded form allows for more precise tracking of their oil usage, reclaiming, and emissions. They had previously been overestimating monthly oil usage, because they did not subtract the amount of oil which ended up in oil filters, or as spills/cleanups. Also, they will now be able to track VOC emissions on a 12 month rolling basis, which will be a requirement of the air permit for the proposed fifth furnace.

PTI No. 439-97A limits quench oil usage in the flexible group, FG-HeatTreat, which consists of the four current heat treating furnaces, to no more than 350 gallons per month. The monthly forms for April 2013 through May 2014 indicate they used less than 350 gallons each month. The highest usage was 250

gallons, for April 2014.

Conclusion:

I could not find any instances of noncompliance during the inspection, nor any areas of concern. Facility staff were very helpful, and professional.

Mr. Irvine will prepare to finalize the draft permit application, and submit it to the AQD Permits Section. Once it has been assigned an application number by Permits, Mr. Irvine will be informed of that number, and will submit a construction waiver request to the AQD Lansing District Supervisor, Michael McClellan. AQD Lansing District staff will review the waiver request in accordance with DEQ policy, to determine if they agree that waiting for the permit to be issued before beginning construction would constitute undue hardship.

NAME 
AC,

DATE 6/16/2014

SUPERVISOR 

