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

A474126705

FACILITY: MICHIGAN SEAMLESS TUBE, LLC		**SRN / ID:** A4741
LOCATION: 400 MC MUNN ST, SOUTH LYON		**DISTRICT:** Southeast Michigan
CITY: SOUTH LYON		**COUNTY:** OAKLAND
CONTACT: Matthew Bell , Environmental Engineer		**ACTIVITY DATE:** 07/25/2014
STAFF: Francis Lim	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** SM OPT OUT
SUBJECT: Inspection		
RESOLVED COMPLAINTS:		

On July 25, 2014, I conducted an inspection at Michigan Seamless Tube, LLC, located at 400 McMunn Street, South Lyon MI. Mr. Matthew Bell, Environmental Manager represented the facility during the inspection. The purpose of the inspection was to determine 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 Environmental Quality, Air Quality Division (MDEQ-AQD) Administrative Rules; and the conditions of Permit-To-Install (PTI) No. 599-96C.

PROCESS DESCRIPTION

Michigan Seamless manufactures steel tubing from round steel bars. Raw material is in the form of solid round steel billets (in a variety of over 100 grades of steel). Steel billets used to be pre-heated in the walking beam furnace, and then heated to 2300 ^{o}F in the rotary hearth furnace. Walking beam furnace is no longer used – steel billets just pass through it now. In the rotary hearth furnace, the steel billets are placed on a turntable which turns around the stationary hearth surrounding the turntable. Each billet is then indented in the exact center before entering the piercing mill where the billets are fed between heavy rollers that drive it over a piercing point (bullet shaped) to produce a tube shell. While still hot, the pierced tube is reduced (in diameter) in a stretch reducing mill, where the tubes pass through a series of rollers with different speeds. This produces tube shells of superior concentricity. After the steel billets are pierced, the bullet shaped piercing point is automatically dropped in a container.

After being cooled down (to approximately 200 ^{o}F) from the furnaces, the tubes are moved to the acid pickle houses to remove the scale (iron oxide) from the tubes. From here, the tubing goes to an inspection area for random sampling. After inspection, the tubing is moved back to the pickling houses for zinc phosphate and sodium stearate drawing lubricant application. The tubes are then cold worked in the draw bench to further reduce the tubes to the desired size and thickness. In the cold draw bench, the tubes are pulled mechanically over a stationary die and a mandrel (a mandrel is a tool component that grips or clamps materials to be machined), reducing the tubes to the desired size and thickness within very close tolerance.

After cold working, the tubes go to the annealing furnace where variations of temperature, time and the number of cycles produce a wide range of hardness and tensile strength to meet the standards and customer requirements. The annealed tubes are cooled and sent back to the pickling houses for removal of any remaining scale. Typically, tubes are processed in the pickling tanks several times.

The tubes are then sent back to the cold draw bench to be cold drawn to its final size. Finally,

the tubes are straightened, cut to length, inspected, and checked by eddy current and demagnetized.

FURNACES and BOILERS

In 2012, the rotary hearth furnace was derated to 34 MM BTU/hr (from 45.5 MM BTU/hr) as a result of using oxy-fuel combustion where oxygen is used instead of air as the oxidant. Since nitrogen component of air is not present and therefore not heated, fuel consumption is reduced and higher flame temperatures are possible. Increased production, improved quality, reduced fuel consumption (and emissions), and improved temperature control are possible with oxy-fuel.

The rotary hearth furnace was installed in 1945 and modified in 2006 and 2012. The walking beam furnace (not used anymore) was installed in 1979. In 2006, the burners in the rotary hearth furnace were replaced and updated so that the facility can adjust the air/fuel ratio.

Natural gas-fired Boiler 608 (rated at 20.95 MM BTU/hr) was installed in the 1960s; therefore the boilers are grandfathered and also not subject to the NSPS, 40 CFR 60, Subpart Dc. Natural gas fired Boiler 609 (rated at 24.49 MM BTU/hr) was installed in 2012. These boilers supply steam to the pickle houses.

Facility operates three DX atmospheric generators that produce rich exothermic gas used as atmospheric gas in the furnaces. The atmospheric gases are deprived of oxygen therefore preventing oxidation in the furnace. Exothermic generators combust natural gas using a very small amount of air to produce rich exothermic gas. Exothermic generators consist of a premix burner, combustion chamber and atmospheric cooler. Heat provided by the DX generators is recovered and used as auxiliary heat to the pickle houses. DX boilers are exempt under Rule 282(a)(i).

There are six annealing furnaces (temperature range from 900 to 1800 ^{o}F), identified as No. 9, No. 10, No 665, No. 673, no. 980, and No. 981. Annealing Furnace 981 is the new recuperated (combustion air is preheated with recuperated air from exhaust) annealing furnace that was installed in 2014 (rated at 9.47 MM/BTU/hr). The furnaces are exempt under Rule 282(a)(i).

Boilers are inspected yearly by an outside contractor to tune the burners. Although the air/fuel ratio is automatically adjusted, operators can adjust the ratio, as necessary. There are no economizers installed in any of the boilers. Excess air in the boilers is set to 2-3%.

There are several other small boilers and heaters located throughout the facility. All are under 10 MM BTU/hr, and therefore exempt under Rule 282(b)(i).

PICKLE HOUSES

There are 5 pickle houses – No. 1, No. 2, No. 3, No. 4, and No 5 utilizing sulfuric acid and phosphoric acid to remove iron oxide scale from the tubes. Pickle House No. 5, recently installed in 2012 has a scrubber control. A scrubber was installed because the location of the pickling tanks could not provide for adequate ventilation. Scrubber fluid goes through the scrubber once-through. From the scrubber, fluid goes to the rinse tanks in the pickling operation. Scrubber fluid is not recirculated in the scrubber. Scrubber fluid is injected before the forced draft fan to scrubber. Water flow to scrubber is monitored. The scrubber is assumed to have 99% efficiency. The rest of the pickle houses are uncontrolled. Pickle House

No. 2 used to have a scrubber control, but was removed.

Tubes from the rotary furnace go to Pickle House No. 5. Tubes from the furnace typically will have more scale. Pickle House Nos. 2 and 3 are used for applying zinc phosphate and sodium stearate drawing lubricant (intermediate treatment). Pickle House Nos. 1and 4 is used for finish pickling. As mentioned above, tubes typically go through several pickling tanks during the manufacturing process.

Sulfuric acid concentration in the pickling tanks is kept at 12%. Only the amount of time is varied - more scale, longer immersion time.

AUXILLIARY PROCESS EQUIPMENT

Facility installed a SCANACON system to remove the iron from the pickling solution. Now facility can do a continuous on-line cleanup of the pickling solution without emptying the tanks. The SCANACON system uses resin pellets where the metals adhere to it. The metals are washed from the resin and goes to the waste water treatment plant. The SCANACON is used to recover sulfuric acid in Pickle House Nos. 2, 3, and 5. The SCANACON captures the negatively charged sulfides.

Previously, cooling water from furnace goes to a cooling pond. The cooling pond has been replaced by a water tower.

Plant discharge goes to the wastewater treatment plant. Lime slurry is added to the wastewater influent to neutralize the acid. The neutralized wastewater is bottom-fed to 2 clarifiers. Liquid overflow goes to the sewer, bottoms goes to thickener tanks. Sludge from thickener tanks goes to a filter press. Cake is disposed of as nonhazardous waste. Facility recently upgraded the water treatment plant.

Facility applies a blue UV coating (UV Curable Blue DTM Coating RAL 5017) to the tubes, using a flow coater. This coating has neither VOC nor carcinogens.

Facility uses solvent based ink to stamp the tubes. Usage of solvent based ink is very minimal. This is Rule 290 exempt.

COMPLIANCE ISSUES

On July 14, 2005, AQD staff issued a letter of violation for the following: Rule 210, inadequate opt out permit; and Rule 201, no permit for three of the four pickle houses (Pickle House 2 was then covered by PTI no. 42-72).

AQD requested a stack test for the 4 pickle houses before a permit could be issued. The test results for the pickle houses showed that emissions for all four pickle houses combined were 0.65 pounds of sulfuric acid/hour.

Permit No. 599-96C was issued on October 15, 2012 for the addition of a new boiler (No. 609), addition of Pickle House No. 5 (with scrubber control), modifications to the existing rotary hearth furnace, modifications to the existing walking beam furnace, and modifications to Pickle House No. 2. Permit No. 599-96C also include facility wide opt out limits.

Permit No. 599-96C, FG-PICKLING

Special Cond I.1 and I.2. Sulfuric acid emissions from all pickle houses are 1.4 tons per year

based on a rolling 12-month time period (limit is 6.1 tons per year, based on a rolling 12-month period). Hourly sulfuric acid emission from Pickle House No. 5 is less than the limit of 0.01 lb/hr. Emissions calculations are done in accordance with Appendix A of the permit.

Special Cond II. NA

Special Cond III.1. The scrubber for Pickle House No. 5 is installed and operating properly. Flow rate of scrubber fluid is monitored. Periodic maintenance is conducted on the scrubber.

Special Cond IV. NA

Special Cond V. There is no testing requirement for FGPICKLING. However, a stack test was conducted on July 26-27, 2006 for Pickle house Nos. 1, 2, 3, and 4.

Special Cond VI.1. Required emissions calculations are done

Special Cond VI.2. Emissions calculations for the pickle houses are done.

Special Cond VII. NA

Special Cond VIII. Stack dimensions appear to be as specified in permit.

Special Cond IX. NA

Permit No. 599-96C, FGFACILITY

Special Cond I.1. Facility wide NOx limit of 89 tons per year based on a rolling 12-month period. Facility submitted gas usage and used an emission factor of 140 pounds NOx/MM cubic ft. At the end of June, 2014, twelve month rolling emissions were 19.86 tons, below permit limit. Emissions calculations are done in accordance with Appendix A of the permit.

Special Cond II.1. Facility burns only sweet natural gas in all equipment included in FGFACILITY.

Special Cond III. NA

Special Cond IV. EUBOILER 608 and EUBOILER 609 are maintained according to manufacturer's recommendations.

Special Cond V. NA

Special Cond VI.1. Facility completes all required calculations in a format acceptable to the AQD.

Special Cond VI.2. Facility completes required monthly and 12-month rolling NOx emissions calculations. 12-month rolling NOx emissions are calculated monthly.

Special Cond 7. NA

Special Cond VIII. Stack dimensions appear to be as specified in permit.

Special Cond IX. NA

Attached is the natural gas fuel usage, NOx emissions and sulfuric acid emissions. NOx emissions are calculated based on total natural gas usage billed to the facility. EF used is 100 lbs/MMCF (plus 10% for older heaters). NOTE: Facility tracks individual natural gas usage for each boiler and furnace for MAERS. Every major fuel burning equipment has gas meters.

NAME [signature] DATE 09-22-14 SUPERVISOR CTE