

N5358

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

FY 2018 Sched. Insp

N535843178

FACILITY: TROY LABORATORIES INC		SRN / ID: N5358
LOCATION: 440 SOUTH STREET, ROCHESTER		DISTRICT: Southeast Michigan
CITY: ROCHESTER		COUNTY: OAKLAND
CONTACT:		ACTIVITY DATE: 01/25/2018
STAFF: Iranna Konanahalli	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MINOR
SUBJECT: FY 2018 scheduled inspection of Troy Laboratories ("Troy Labs"),		
RESOLVED COMPLAINTS:		

Troy Laboratories (N5358)
440 South St.
Rochester, Michigan 48307-2242

PTI: Permit-to-Install No. 198-94 dated November 04, 1994, for hooded fan for one metal cleaning tank containing a caustic aluminum etching solution of sodium hydroxide (SC 15 limits: 0.07 pound per hour and 0.3 ton per year of sodium hydroxide (NaOH); SC 16 limit: 0% opacity visible emissions).

Ethylene Oxide (EO): Never used.

On January 25, 2018, I conducted a level-2 **FY 2018 scheduled** inspection of Troy Laboratories ("Troy Labs"), located at 440 South St., Rochester, Michigan 48307-2242. The inspection was conducted to determine compliance with the Federal Clean Air Act; Article II, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994, PA 451; and Michigan Department of Environmental Quality, Air Quality Division (MDEQ-AQD) administrative rules.

During the inspection, Mr. Christopher L. Thornber (Phone: 248-652-6000; Fax: 248-652-7812; E-mail: NA), President and Owner, assisted me.

Troy Labs employs four (4) people and has annual sales of 0.4 million dollars. Troy Labs is a job shop that anodizes aluminum parts for mostly non-automotive customers.

Ethylene Oxide (EO)

There is some internet information (e.g., Buzzfile) that Troy Labs is involved in biological laboratory business within Health Services Sector. This information is incorrect. Troy Labs always handled only inorganic chemicals such as sulfuric acid and sodium hydroxide both of which are needed for anodizing aluminum parts. Hence, Troy Labs never used EO.

Anodizing

Anodizing of aluminum parts involves three steps:

1. *Etching*: A proprietary aluminum etching compound containing predominantly sodium hydroxide (NaOH) is used. The etching compound cleans / etches the surface of aluminum parts. One 250-gallon etching tank, with one hood and one fan, is present. Into etching tank, containing water based solution of the compound, the parts are

immersed for etching. PTI No. 198-94 pertains to this etching process. About 5 pounds of the compound is added the tank every two weeks; most of it is dragged by the cleaned parts and not emitted via hood ventilation system. Make-up water is also added. The usage amounts to 125 pounds or 0.063 ton per year (PTI No. 198-94 SC 15 limits: 0.07 pound per hour and 0.3 ton per year of sodium hydroxide (NaOH). Exhaust from the hood is released at the top of 20-foot building (PTI No. 198-94 SC 18 limit: Hs \geq 20 feet). No scrubber.

2. *Anodizing*: Two (2) 385-gallon 15% sulfuric acid tanks are present for anodizing. No exhaust. The etched aluminum parts are charged positively using 15 Volts DC and immersed in 15% sulfuric acid solution to change aluminum surface to aluminum oxide. Anodizing is an electrochemical process that converts the surface to decorative, durable, corrosion resistant, anodic oxide finish or structure that is integrated into the aluminum substrate. Anodizing is controlled oxidation (oxygen from H₂SO₄) where parts themselves act as anode using 15 Volt DC current.
3. *Sealing*: This is a final step. One 385-gallon tank with hot (165-180 °F) water is present. Into the 385-gallon tank, the parts are immersed. Anodized aluminum surface is hydrated with hot water.

Sulfuric acid

Sulfuric acid exists in the anodizing process gas stream (not assisted by exhaust fan) as aerosol droplets because the acid has very low vapor pressure and its partial pressure is very low for 10 percent aqueous solution (0.353×10^{-13} bar at 100 degrees Celsius). See Perry's Chemical Engineers Handbook (pages 3-68 thru 3-69). Hence, sulfuric acid practically does not exist in vapor phase in the gas stream.

Great Lakes Water Authority

Great Lakes Water Authority (GLWA) inspects (twice per year) and samples (six times per year) Troy Labs' effluents.

Conclusion

Troy Laboratories is in compliance with PTI No. 198-94.

NAME B. L. Newhall DATE 01/29/2018 SUPERVISOR Joyce B.