

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

A4903
FY2018 Insp-

A490344610

FACILITY: PHOENIX WIRE CLOTH INC		SRN / ID: A4903
LOCATION: 585 STEPHENSON HWY, TROY		DISTRICT: Southeast Michigan
CITY: TROY		COUNTY: OAKLAND
CONTACT:		ACTIVITY DATE: 05/29/2018
STAFF: Iranna Konanahalli	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MINOR
SUBJECT: FY 2018 inspection of Phoenix Wire and Cloth, Inc. ("Phoenix")		
RESOLVED COMPLAINTS:		

Phoenix Wire and Cloth, Inc. (A4903)
585 Stephenson Highway
Troy, Michigan 48083-1134
Phone: 248-585-6350 or 800-458-3286
Fax: 248-585-4121

VN: AQD issued Violation Notice (VN) dated August 15, 1995, for paint spray booth (in 1995, solvent-based coating usage >> 200 gallons per month) installed in 1966 (before August 1967) for exceeding Rule 336.1621 VOC limit of 4.7 pounds of VOC per gallon of air-dried coatings. Electro-static applicators were used for wrap-around effect. As a result of this VN, about 1996, Phoenix installed Wagner Powder Systems' powder coating equipment and completely phased out liquid coatings.

On May 02 (plant personnel were busy and hence no walk-through inspection occurred) & 29, 2018, I conducted a level-2 annual **FY 2018 inspection** of Phoenix Wire and Cloth, Inc. ("Phoenix"), located 585 Stephenson Highway, Troy, Michigan 48083-1134. 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; Michigan Department of Environmental Quality, Air Quality Division (MDEQ-AQD) administrative rules.

During the inspection, Mr. Sean Fitzsimmons (Phone: 248-585-6350; Fax: 248-585-4121), Quality Assurance Manager, assisted me.

Mr. Dennis Reblin retired in 2003. Mr. Bill Holmes (Phone: 248-585-6350; Fax: 248-585-4121; E-mail: billholmes@flash.net), Accounts Manager, did not participate.

The company makes wire mesh products for security / safety fences (perimeter fencing, machine guards, robotic enclosures, etc.), cages, enclosures, partitions, theft and loss prevention systems, etc. The wire mesh products need corrosion protection. Since 1996, these wires have been coated using powder-coating equipment manufactured by Wagner Powder Systems, Inc. Prior to 1997, Phoenix used to coat wired systems such as fences, enclosures, etc. using electrostatic paint spray applicators (electrostatic gun where paint particles were electrically charged, and the parts were grounded resulting in higher transfer efficiency and wrap-around of the paint on the part). As stated above, the solvent-based liquid coatings resulted in violation of Rule 336.1621 (limit: 4.7 pounds of VOC per gallon of air-dried coatings).

For fencing, most commonly used materials are: steel, galvanized steel, tinned steel, stainless steel, brass, bronze, copper, etc. Wires and frames are purchased preferably pre-cut at desired sizes.

Replacement of non-compliant solvent-based liquid coatings with powder coatings (since 1996) has resulted in elimination of VOC emissions. Powder coatings attain 100 percent transfer efficiency resulting coating materials savings.

Wagner Powder Systems' powder coating equipment is a completely enclosed system. The system is equipped with ten (10) automatic guns (stationary and not reciprocating) and two (2) manual guns. The powder booth is 4 feet wide and 25 feet long. A cloud of powder coating coats the wired parts. Overspray powder is ducted through a capture system consisting of a gravity settling chamber and two cyclones all of which capture the particles. The captured powder paint particles are returned to the spray guns. It is totally enclosed system with no air flowing out; and, therefore, no pollution. Predominantly, three colors are used: black, yellow and orange. Occasionally, custom colors are used if requested by the customer.

A gravity settling chamber is present. The chamber collects relatively larger particles. Remaining particles are collected in two cyclones (Wagner Powder Systems). Cyclone particles are returned to the settling chamber. From the chamber, the powder coating particles are recycled to the guns for repeat spray. Exhaust air from the cyclones returns to the booth and hence the system is totally enclosed.

As always with powder coatings, an oven is present to cure the coatings for polymer cross linking.

The powder coating booth is exempt from Rule 336.1201 (Permit-to-Install) pursuant to Rule 336.1287(2)(d).

The powder coating produces very high coating transfer efficiency (TE > 90%) as result of reusing over-spray powder that is captured. Powder coatings are low in VOCs; typically, less than 1% VOC. Predominantly, VOC emissions are from curing oven due to monomer crosslinking. The filters that capture the powder for recycling / reusing insure low particulate emissions. While powder coatings contain \approx 1% VOC, solvent-based coatings contain 40-70% VOC. While powder coatings result in over 90% transfer efficiency, liquid spray coatings (with no electrostatic) can attain \approx 40% transfer efficiency.

The powder (particle size: 2-10 μ m) may be thermoplastic or thermo-set polymer. Powder coating results in tougher finished surface than conventional liquid coatings. Usually coating thickness is greater than 50 μ m. Higher thickness with tougher finish is possible by using powder coating in place of liquid coatings. Powder coating curing time (10-15 minutes) is usually shorter than that liquid coatings (no latent heat or enthalpy of evaporation is needed) resulting in energy savings.

Powder coating process is environment-friendly due to practically nil waste. Unfortunately, the process does not facilitate easy color change. It is excellent for one color such as black. Usually, it is electrostatic application, where paint particles (powder) are electrically charged and the part to be coated is grounded.

14 welding machines

Fourteen (14) welding machines are present. One (1) of Fourteen (14) machines has its own portable capture device for particulate matter emissions. The emissions are filtered using Nederman cartridge filter system (1 cartridge) and discharged to in-plant environment.

The welding fumes, without particulate filtration (except from one machine located in another part of the plant), are discharged to in-plant environment. General plant ventilation fan is present in the welding room. Six (6) welders weld on full-time basis.

The machines are exempt from Rule 336.1201 (Permit-to-Install) pursuant to Rule 336.1285 (2)(i) (welding). The exemption does not require any particulate control system.

Conclusion:

The violation of Rule 621 is permanently resolved with replacement of liquid coatings with powder coating. Currently (May 2018), all process equipment are exempt from Rule 201. Phoenix is compliance with conditions of the exemptions.

NAME J. Skenanahall:

DATE 6/5/2018

SUPERVISOR Joyce B.

