

DEPARTMENT OF ENVIRONMENTAL QUALITY  
AIR QUALITY DIVISION  
**ACTIVITY REPORT: Off-site Inspection**

N046558546

<b>FACILITY:</b> Bix Furniture Service East		<b>SRN / ID:</b> N0465
<b>LOCATION:</b> 27950 Harper, ST CLAIR SHRS		<b>DISTRICT:</b> Warren
<b>CITY:</b> ST CLAIR SHRS		<b>COUNTY:</b> MACOMB
<b>CONTACT:</b> Nancy McInnes,		<b>ACTIVITY DATE:</b> 06/07/2021
<b>STAFF:</b> Iranna Konanahalli	<b>COMPLIANCE STATUS:</b> Non Compliance	<b>SOURCE CLASS:</b> MINOR
<b>SUBJECT:</b> FY2020 scheduled inspection (off-site) of Bix Furniture Services, Inc. ("Bix")		
<b>RESOLVED COMPLAINTS:</b>		

**Bix Furniture Services, Inc. (N0465)**  
**27950 Harper Ave.**  
**Saint Clair Shores, MI 48081-1543**

**VNs: AQD issued Violation Notices (VNs) dated March 26, 2002, for failure to keep lacquer usage records, July 20, 2018, for Rule 336.1201 (Methylene Chloride [MeCl] Stripper) & 336.1910 (the lacquer booth filters not installed properly, gaps and holes were present) and March 19,2021, for Rules 336.1210-1211 & federal §112(g) case-by-case Major MACT 40 CFR, Part 63. As a Major MACT compliance plan, Bix obtained a Major MACT opt-out permit (PTI No. 19-21 with a corresponding Application No. APP-2021-0049 received on March 05, 2021).**

**PTI: PTI No. 19-21, EUWOODSTRIP:**

<b>Emission Unit ID</b>	<b>Emission Unit Description (Including Process Equipment &amp; Control Device(s))</b>	<b>Installation Date / Modification Date</b>	<b>Flexible Group ID</b>
EUWOODSTRIP	Wood stripping operation where furniture is placed on a metal tray and a methylene chloride stripper is hand applied. Excess paint stripper drains from the tray to a holding bucket, where the paint stripper is re-applied until it no longer works.	*	NA

**Synthetic Minor PTI No. 19-21 limits:** EUWOODSTRIP, I.1: 9.1 tpy VOC & methylene chloride (CAS No 75-09-2) combined (predominantly, methylene chloride as a stripping solvent); FGFACILITY, I.1-2: < 8.9 tpy Single HAP & < 22.4 tpy Aggregate HAPs; and FGFACILITY, I.3: 7.3 tpy Methylene chloride (CAS No 75-09-2).

**PTI void: PTI No. 437-82 for lacquer spray booth (approved: 04/13/1983 & voided: 04/18/2002).** Current (FY 2020) lacquer usage is ≈ 20 << 200 gallons per month.

**Subject to (PTI No. 19-21, FGFACILITY, IX.1): Area Source NESHAP / MACT 6H, 40 CFR, Part 63, Subpart HHHHHH, National Emission Standards for Hazardous Air Pollutants: Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources; Final Rule (Page 1738 Federal Register / Vol. 73, No. 6 / Wednesday, January 9, 2008 / Rules and Regulations / Final Rule). The NESHAP is for area sources engaged in paint stripping, and miscellaneous surface coating operations.**

AQD has no delegation of these standards and therefore no attempt has been made evaluate Bix's compliance with NESHAP / MACT 6H. Bix performs methylene chloride paint /varnish stripping from principally wood surface. For the purposes of this NESHAP / MACT 6H rule, paint stripping operations are those that perform paint stripping using MeCl for the removal of dried paint (including, but not limited to, paint, enamel, varnish, shellac, and lacquer) from wood, metal, plastic, and other substrates at area sources.

**Not Subject to: NESHAP/ MACT T, National Emission Standards for Hazardous Air Pollutants: Halogenated Solvent Cleaning (40 CFR, Part 63, Subpart T; NESHAP/ MACT T); Correction; 29484 Federal Register / Vol. 60, No. 107 / Monday, June 5, 1995 / Rules and Regulations; amended National Air Emission Standards for Hazardous Air Pollutants: Halogenated Solvent Cleaning (40 CFR, Part 63, Subpart T); Final Rule; Page 25138 Federal Register / Vol. 72, No. 85 / Thursday, May 3, 2007 / Rules and Regulations.** According to US EPA, the solvent / methylene chloride stripper is not cold-cleaner because wood finish is not soil.

On June 06, 2021, I conducted a level-2 **FY2020 scheduled inspection (off-site)** of Bix Furniture Services, Inc. ("Bix"), located at 27950 Harper Ave., Saint Clair Shores, MI 48081-1543. 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 Environment, Great Lakes & Energy, Air Quality Division (EGLE-AQD) administrative rules.

During the FY 2020 inspection, Mr. Terry Iwig (Phone: 586-775-0430; Fax: 586-775-7468; Cell: 586-419-2317; E-mail: BixFurnitureService@Yahoo.com), via phone, assisted me. Ms. Nancy McInnes (Phone: 586-775-0430; Fax: 586-775-7468; Cell: NA; E-mail: BFSMI@Yahoo.com ), Owner, was not contacted.

The purpose of inspection was to follow up on the most recent violation notices as stated above and recently (June 2021) issued permit (PTI No. 19-21).

Founded in 1974, Bix Furniture Services, Inc. ("Bix") is in the business of repairing and restoring antique / old furniture. Services include stripping, repairing, refinishing, upholstery, etc. The furniture restoration involves old paint and varnish (wood finish) stripping using methylene chloride (MeCl) and spray application of lacquer for finishing restored product.

In the past (since 1980s), Bix had been alleged source of odors. The neighbors lodged numerous odor complaints. Permit review (PTI No. 19-21) process determined that the maximum concentration of MeCl (Dichloromethane or Methylene chloride) is at 27% of SRSL with no other sources of methylene chloride anticipated at the facility or the neighborhood. As MeCl, a confirmed carcinogen, vapor density (Air =1) = 2.9, i.e. nearly 3 times heavier than air, MeCl stays at ground level. Maximum concentration of 27% of SRSL will provide adequate margin of safety.

### **Touch-up booth**

One touch-up booth with back-draft system is present. Only hand-held spray cans are used for touch-up. The booth is exempt from Rule 336.1201 (Permit-to-Install) pursuant to Rule 336.1287(2)(b).

### **8 ft \* 8 ft Spray Booth / Room.**

One paint spray both / room (8 ft. Width x 8 ft. Depth x 10 ft. Height) equipped with a back-draft dry filter system is present. The filter system, for lacquer overspray particulate control, consists of 24 filter panels. During the May 2018 and August 2019, inspection, I observed that the dry filters were not installed properly. There were lots of holes and gaps in the filter system. In addition, on August 30, 2019, two (2) of twenty-four (24) filter panels were removed when the booth was not operating. During FY 2020 inspection, however, the filters were installed properly.

I asked Mr. Iwig to install the filters such that they fit, at all times, snugly without gaps and holes. Duct / painter's tape may be used to cover the gaps. I also asked him to keep records of paint / varnish and solvent usage. The paint, varnish, stain and solvent usage records are not available. However, the usage is about 20 gallons per month (<< 200 gallons per month) based upon estimates from the purchase records. HVLP (High Volume Low Pressure) guns are not used. But, LVHP (Low Volume High Pressure) guns are used.

The booth is exempt from Rule 336.1201 (Permit-to-Install) pursuant to Rule 336.1287(2)(c) provided filter system is operated properly and lacquer usage records are kept. AQD issued Rule 910 violation notice (July 20, 2018) for failure to install the filters properly. During FY 2020 inspection the filters were installed properly.

### **Mohawk Finishing Products (Phone: 800-522-8266) of Hickory, NC 28602 Lacquer M545-4087**

40-55% aromatic hydrocarbons (CAS # 64742-95-6); 10-25% 1,2,4- trimethyl benzene (CAS # 95-63-6); 2-10% aromatic hydrocarbons (CAS # 64742-94-5); and other minor components.

100% VOC solvent. Flash Point (FP) = 108 °F TCC (Tag Closed Cup). Auto Ignition = NA °F. Boiling Point (BP) = 100 °F @ 760 mm Hg. Vapor Pressure (VP) = NA mm Hg at 68 °F. Specific Gravity (SG, Water = 1.0) = 0.952. Density ( $\rho$ ) @ 68 °F = 7.9 pounds / gallon (0.952 kg /L). Flammability range = NA %v (LEL) – NA%v (UEL).

### **5 ft \* 10 ft Paint / Varnish Stripper**

Methylene chloride paint stripper consists of 5 ft. Wide \* 10 ft. Length \* < 1 ft. Height open top tank. From the stripping tank, spent solvent is collected at one (right-front) corner by gravity flow in a 5-gallon pale. A strainer is used to remove solids from the solvent. The collected solvent is reused / recycled until the stripper solvent becomes ineffective. As Bix installed, about April 2017, at one corner of the stripper tank, ventilation system with fan ( $\approx$ \$20,000.00), evaporation of methylene chloride is mechanically assisted. The capture system is attached to the stripper tank because MeCl stays close to the floor. Bix should have installed refrigerated condenser to recover solvent as well such that recovered solvent could be reused. Because MeCl is expensive, payback period for solvent recovery

condenser should have been evaluated. The opt-out permit is approved without requiring a condenser suggesting that it may have not been justified based upon cost considerations. In addition, the stripper room is equipped with one floor ventilation system as methylene chloride is nearly three times heavier than air (MeCl vapor density = 2.93, air = 1).

Based upon the purchase records of the most recent 3.5 years, an average MeCl usage is 125 gallons (1,386 pounds) per month or 1,493 gallons (16,557 pounds or 8.3 tons) per year (Density ( $\rho$ ) @ 68 °F = 11.09 pounds per gallon (1.33 kg /L)). All usage is emitted to ambient air predominantly via stack.

Hence, Bix was considered a Major MACT source based upon Potential-to-Emit (PTE) until it obtained an opt-out permit (June 2021). AQD issued Rule 201 violation notice (July 20, 2018). Based upon the above usage data (1,493 gallons per year) and cost of MeCl (\$400 per 55-gallon drum = \$7.27 per gallon), Bix spends \$10,858 per year for the stripping solvent (MeCl). If solvent can be recovered and recycled, Bix can save up to ten thousand dollars in solvent costs; of course, there is a capital and operating costs for the refrigerated condenser. PTI No. 19-21 does NOT require a control device such as a condenser for solvent recovery based upon either Rule 702 BACT or Rule 225 T-BACT.

Based upon purchase records, CY 2019 usage of the stripper is 1,750 gallons per year (average of 146 gallons per month) as purchased; each purchase order consists of four (4) 55-gallon drums of the stripper solvent or MeCl.

Bix has started keeping usage records since June 2021. Ms. Jen Dixon is expected to help Bix with a design of MS Spreadsheet. Further evaluation of records may be performed next year as insufficient materials and solvents, especially MeCl, usage records are available at this time.

According to US EPA, the solvent / methylene chloride stripper is not a cold-cleaner because wood finish is not soil.

### **Chemisphere Corporation of St. Louis, MO 63139, MeCl Stripper**

50-100% Methylene chloride (CAS # 75-09-2)

10-40% Methanol (CAS # 67-56-1)

During the permit review, it was determined that the stripper predominantly (>85%) contains MeCl.

100% VOC solvent (principally halogenated, MeCl). Flash Point (FP) = NA °F TCC (Tag Closed Cup). Auto Ignition = 556 °C = 1,033 °F. Boiling Point (BP) = 40 °C = 104 °F @ 760 mm Hg. Vapor Pressure (VP) = 353 mm Hg at 20 °C = 68 °F. Specific Gravity (SG, Water = 1.0) = 1.32. Density ( $\rho$ ) @ 68 °F = 11 pounds per gallon (1.32 kg /L). Flammability range = 12 %v (LEL) – NA%v (UEL). Vapor density (Air =1) = 2.93, i.e. nearly 3 times heavier than air.

**Methylene chloride (MeCl, CAS # 75-09-2, CH<sub>2</sub>Cl<sub>2</sub> Molecular weight: 84.9.) aka DCM or dichloromethane, methylene dichloride**

Flash Point (FP) = NA (does not burn easily due to Cl) °F TCC (Tag Closed Cup). Auto Ignition = 556 °C = 1,033 °F. Boiling Point (BP) = 39.6 °C = 103.3 °F @ 760 mm Hg. Vapor Pressure (VP) = 57.3 kilopascal (kPa) at 25 °C = 77 °F. Specific Gravity (SG, Water = 1.0) = 1.33. Density ( $\rho$ ) @ 68 °F = 11.09 pounds per gallon (1.33 kg /L). Flammability range = 13 %v (LEL) – 23%v (UEL). Viscosity = 0.413 cP at 25 °C = 77 °F. Vapor density (Air =1) = 2.9, i.e. nearly 3 times heavier than air. PEL (Permissible) = 25 ppm 8-hour average and 125 ppm 15-minute average. IDLH (immediate danger) = 2,300 ppm CA. 1 ppm = 3.47 milligrams per cubic meter.

EGL-EMM, EGL-RRD, MIOSHA may conduct further investigation.

Ms. Jennifer Dixon (Phone: 517-284-6892 or 800-662-9278; E-mail: DIXONJ2@michigan.gov), Air Quality Liaison, Environmental Support Division, ESD-EGL helped Bix with a permit application for the stripping process.

### Conclusion

AQD issued July 20, 2018, & March 19, 2021 Violation Notices (VNs). In the interim, Bix is deemed to be in a partial compliance, concerning the VNs and the permit, as Bix obtained a MACT Synthetic Minor permit and started keeping records in June 2021. Ms. Dixon of ESD-EGL helped Bix with its application for the permit and will, also, assist with a MS Spreadsheet for the required calculations.

NAME J. S. Marshall

DATE June 18, 2021

SUPERVISOR Joyce