

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

N341765455

FACILITY: LYMTAL INTERNATIONAL, INC.		SRN / ID: N3417
LOCATION: 4150 S. LAPEER RD., LAKE ORION		DISTRICT: Warren
CITY: LAKE ORION		COUNTY: OAKLAND
CONTACT: Mr. Imad Janineh Janineh ,		ACTIVITY DATE: 10/19/2022
STAFF: Iranna Konanahalli	COMPLIANCE STATUS: Compliance	SOURCE CLASS: SM OPT OUT
SUBJECT: SM CMS FY 2023 schedule inspection of Lymtal International, Inc. ("LymTal") ,4150 South Lapeer Road, Lake Orion, Michigan. Polyurethane Coatings and Sealants Industry		
RESOLVED COMPLAINTS:		

SM CMS FY 2023 schedule inspection

Lymtal International, Inc. (N3417)

4150 S. Lapeer Road

(Formerly known as 4150 Cross @ S Lapeer Road, near exit 81 off I75)

Lake Orion, Michigan 48359-1865

NAIC Code: 325510 Polyurethane Coating Manufacturing. Concrete surface and expansion joint sealants for airports, bridges, parking structures, etc.

SRN reassign (ownership and name change): Harry S. Peterson Company (N3417) until May 1994) → Lymtal International, Inc. (N3417). About 1994, LymTal purchased Harry S. Peterson, which built the plant in 1929.

Phone: 248-373-8100; Fax: 248-373-3480

Synthetic Minor (ROP & MACT) PTI No. 1306-91D dated August 25, 2015. Rule 702 BACT carbon canisters (primary [older canister] and secondary [newer canister] by switching during canister replacement for break-through) control. Limiting HAP is cumene. Two canisters are put aside as spare in storage.

VOIDS: PTI Nos. 1306-91 (6/26/02), 1306-91A (5/20/04), 1306-91B (10/05/10) & 1306-91C (08/25/2015)

PTI No. 1306-91D (add two reactors [TR1 & TR2], LymTal requested to increase hours of operation from 5,000 hrs./yr. to 6,000 hrs./yr., instead AQD removed annual hours of operation limit [PTI No. 1306-91C, FGFACILITY III.1: 5,000 hours per year] but introduced materials usage limit [PTI No. 1306-91D, FG-REACTORS, II.1: 16,000 pounds per year of solvents to reactors]). Solvents (dehydration solvent Aromatic 100 contaminating 100% VOC, 4% HAPS: 3% Cumene and 1% Xylene), assisted by application of vacuum, are used to drive off moisture from reactors materials. 5,000 hours of operation limit is replaced by 16,000 pounds of solvent known as Aromatic 100 (dehydration solvent)

Not Subject to: NESHAP / MACT 5M & 6O for Area Sources (Page38864 / Federal Register / Vol. 72, No. 135 / Monday, July 16, 2007 / Rules and Regulations / Final Rule; residual risk and technology review (RTR) Page 1868, Federal Register / Vol. 86, No. 6 / Monday, January 11, 2021 / Proposed Rules) because LymTal is in Polyurethane Coatings and Sealants Industry and not in Polyurethane Foam Production Industry. Both use Polyols (resins).

National Emission Standards for Hazardous Air Pollutants: Flexible Polyurethane Foam Fabrication Operations Residual Risk and Technology Review (RTR) and Flexible Polyurethane Foam Production and Fabrication Area Source Technology Review.

Dr. Tina Ndoh, Sector Policies and Programs Division (D243-04), Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711; telephone number: (919) 541-1516; fax number: (919) 541-4991; and email address: ndoh.Tina@epa.gov.

Major Source MACT 5M (2003): US EPA promulgated MACT standards for major source Flexible Polyurethane Foam Fabrication Operations facilities in 2003 under 40 CFR part 63, subpart MTTTTT.

Area Source MACT 6O (2007): US EPA promulgated GACT standards for the Flexible Polyurethane Foam Production area source category and the Flexible Polyurethane Foam Fabrication area source category together under 40 CFR part 63, subpart OOOOOO.

Not Subject to: Boiler NSPS Dc, New Source Performance Standards (NSPS), 40 CFR, Part 60, Subpart Dc.

On October 19, 2022, I conducted a level-2 SM CMS FY 2023 schedule inspection of Lymtal International, Inc. (“LymTal”) located at 4150 South Lapeer Road, Lake Orion, Michigan. 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 Environment, Great Lakes and Energy, Air Quality Division (EGLE-AQD) administrative rules; and ROP & MACT Synthetic Minor PTI No. 1306-91D.

During the inspection, Mr. Imad Janineh (Phone: 248-373-8100- ext. 117; Fax: 248-373-3480; E-mail: imad@LymTal.com), Technical Manager, assisted me. Mr. Francis Lymburner, President, and Owner, was NOT present. Mr. Magdy Talaat (Phone: 248-373-8100; Fax: 248-373-3480; E-mail: magdy@LymTal.com), Vice President and Owner of LymTal, also assisted.

In 1994, Mr. Magdy Talaat and Mr. Francis Lymburner bought Harry S. Peterson Company. They named new company after themselves as LymTal. Harry S. Peterson built the plant in 1929. Sandez and Master Builder purchased the plant in 1988. Using one dozen (12) reactors, LymTal, produces polymer-based concrete surface and gaps (expansion joints) sealing products known as Iso-Flex products. Iso-Flex products are used in the areas of traffic concrete coatings, roof coatings, sealants, penetrating sealers, expansion joints, etc.

PTI No. 1306-91D Emission Units (EUs)

Emission Unit ID	Emission Unit Description (Process Equipment & Control Devices)	Flexible Group ID
EUREACTOR1 1,000 gallons	Reactor for manufacturing polyurethane-based products. Activated carbon control.	FGREACTORS
EUREACTOR2 2,000 gallons	Reactor for manufacturing polyurethane-based products. Activated carbon control.	FGREACTORS
EUREACTOR3 3,000 gallons	Reactor for manufacturing polyurethane-based products. Activated carbon control.	FGREACTORS
EUREACTOR4		FGREACTORS

Emission Unit ID	Emission Unit Description (Process Equipment & Control Devices)	Flexible Group ID
200 gallons	Reactor for manufacturing polyurethane-based products. Activated carbon control.	
EUREACTOR5 300 gallons	Reactor for manufacturing polyurethane-based products. Activated carbon control.	FGREACTORS
EUREACTOR6 900 gallons	Reactor for manufacturing polyurethane-based products. Activated carbon control.	FGREACTORS
EUREACTOR7 500 gallons	Reactor for manufacturing polyurethane-based products. Activated carbon control.	FGREACTORS
EUREACTOR8 300 gallon	Reactor for manufacturing polyurethane-based products. Activated carbon control. (300 gallon Avon)	FGREACTORS
EUREACTOR9 300 gallon	Reactor for manufacturing polyurethane-based products. Activated carbon control. (300 gallon Scholds)	FGREACTORS
EUREACTOR10 175 gallons.	Reactor for manufacturing polyurethane-based products. Activated carbon control. (175 gallon Stainless)	FGREACTORS
100-gallon reactor Reactor10 is not used anymore and has been idle since 2017.		
EUREACTORTR1 2,000 gallons	Reactor for manufacturing polyurethane-based products. Activated carbon control. (2,000 gallon)	FGREACTORS
EUREACTORTR2 2,000 gallons	Reactor for manufacturing polyurethane-based products. Activated carbon control. (2,000 gallon)	FGREACTORS
Reactors TR1 & TR2: Roofing adhesive / coating products are made for Tremco of Cleveland, OH. These reactors are dedicated for Tremco products.		

Emission Unit ID	Emission Unit Description (Process Equipment & Control Devices)	Flexible Group ID
<p>Founded in 1928 by William Treuhaft, who opened his small roofing materials manufacturing plant in Cleveland, Ohio sealants and waterproofing products for multiple structures. Practically, using manufacturing synergy, LymTal performs contract manufacturing.</p> <p>The purpose of this latest integration of the permit (PTI No. 1306-91D) was to add two new reactors (EUREACTORTR1 & EUREACTORTR2) to the existing Flexible Group, FGREACTORS, and to increase the limit on the operating hours.</p>		
EUTDITANK	5,000 gallon TDI storage tank.	NA
EUIPDITANK	3,000 gallon IPDI storage tank.	NA
<p>Changes to the equipment described in this table are subject to the requirements of R 336.1201, except as allowed by R 336.1278 to R 336.1290.</p>		

PTI No. 1306-91D Flexible Groups

Flexible Group ID	Flexible Group Description	Associated Emission Unit IDs
FGREACTORS	Reactors for manufacturing polyurethane-based products. Emissions are controlled by a dual-stage carbon adsorption system consisting of two (2) activated carbon canisters operating in series.	EUREACTOR1, EUREACTOR2, EUREACTOR3, EUREACTOR4, EUREACTOR5, EUREACTOR6, EUREACTOR7, EUREACTOR8, EUREACTOR9, EUREACTOR10, EUREACTORTR1, EUREACTORTR2
FGFACILITY	All process equipment source-wide including equipment covered by other	

Flexible Group ID	Flexible Group Description	Associated Emission Unit IDs
	permits, grand-fathered equipment and exempt equipment.	
<p>VOC emissions control system consists of a 55-gallon knock-out drum (which is not required by the permit) that knocks out moisture and significant amount of high molecular weight VOC (knock-out drum materials consist of 60 percent liquid high molecular weight VOC and 40 percent water) and saves carbon, a primary 55-gallon carbon canister (dirty) and secondary 55-gallon carbon canister (polishing). The carbon canisters are made by Carbtrol Corporation of Bridgeport, CT; Phone: 800-242-1150. The canisters contain activated carbon (CAS # 7440-44-0, 100% carbon). Previously, on July 23, 2014, LymTal changed the secondary canister and previous secondary canister is now primary.</p> <p>Most recently, LymTal, about September 2022, replaced both canisters due to aging. The canisters were never saturated or had breakthrough occurred. I confirmed that both canisters were brand new. Furthermore, two stand-by canisters were purchased.</p>		

Twelve (12) reactors (Reactor Nos. 1 thru 10 and TR1 & TR2) 5,000-gallon TDI and 3,000-gallon IPDI storage tanks are part of the permit. The emissions from all reactors are controlled by a knock-out drum (55-gallon drum) and a couple of 55-gallon carbon canisters (activated carbon adsorption units) arranged in series. The knock-out drum take out easily condensable high molecular weight compounds such as mineral spirits so that longevity of carbon canisters can be increased by reducing hydrocarbons load on them.

LymTal International, Inc. (“LymTal”) manufactures polyurethane-based products, concrete coatings and sealants; and as well as some adhesives and sealers. A major part of manufacturing at this time is coatings and sealants for water proofing concrete floors. In general, the company uses a base polymer (variety of Polyols, about 11), either Toluene Diisocyanate (TDI) or Isoprophorone isocyanate (IPDI) to react with a trade secret proprietary mixture in a batch reactor vessel with other components to produce the finished product. TDI (aromatic) and IPDI (aliphatic) are stored at 100-120 degrees Fahrenheit to prevent crystallization. TDI and IPDI are stored in a separate and isolated room with safety alarm system to protect worker’s health and safety. There is a closed / sealed pipe system to pump from bulk tanks to the reactors. The plant, in addition, is equipped with low oxygen alarm (audible and visible) system for worker safety. Before chemical reaction, Polyols are dehydrated.

The dehydration (moisture removal) is accomplished by adding mineral spirits (Aromatic 100 or Hi Sol also known as Light Aromatic Solvent which is a clear, colorless, liquid with a sweet aromatic smell.) to Polyols, heating and drawing vacuum (26 inches Hg) on Polyol tank / reactor. LymTal uses Polyols as raw materials. Other raw materials used are solvents, fillers, catalysts, surfactants, and plasticizers, additives. During the last several years MEK consumption has been gradually reduced to nil; LymTal has accomplished its goal of eliminating MEK altogether in the products so as to minimize fire, safety and environmental hazard. In addition, MEK is hygroscopic and, as a result, there were product problems. Mineral spirits completely replaced MEK. Dehydration solvents include Hi-Sol 10, TS-100 and 100 Solvent. Insurance company advised to eliminate MEK to reduce fire hazard and employee health and safety including odor. Insurance company inspects LymTal every year. As a matter of fact, insurance premium was reduced based on eliminating MEK at the site.

Elimination of methyl ethyl ketone (CAS# 78-93-3, MEK, Butanone C₄H₈O, density ρ = 0.805 g/mL, Flash Point FP = 16 °F, Boiling Point BP = 175 °F, Vapor Pressure = 78 mm Hg at 20 °C, Flammability Range FR = 1.4%v [LEL] – 11.4%v [UEL], Viscosity μ = 0.43 centipoise), an explosive material due to low flash point (FP = 16 °F) and wide flammability range, reduced the plant insurance rates. About December 13, 2005, US EPA removed (de-list) MEK from CAA Sec. 112 HAP list although it is VOC.

Products, both one-component (ambient moisture cure) and two-component (chemical cure: A. reacted iso-cyanate & B. blend of amines), are a result of chemical reactions and blending between polymers, fillers (pigments, calcium carbonate, etc.), solvents (NMP, DPMA, DPM, TS100 or aromatic solvents, NPA, N-Butanol, etc.) and additives (UV protectors, antioxidants, wetting agents, dispersion agents, etc.)

There are twelve (12) reactors and three (3) mixers. During the inspection, I noticed that the reactors and mixers did not have permanent exhaust stacks attached to each one. There is a flexible detachable duct that is connected to an exhaust stack that the company utilizes as standby duct for any emergency cases when the company may need to exhaust any emissions directly to the outside air. There were no visible emissions observed during the plant tour. Mr. Janineh and Mr. Talat confirmed that reactions occur in a closed vessel so that the only possible source of emissions is fugitive emissions. Since there were no stacks attached directly to the vessels, Janineh indicated that any potential emissions are discharged in the general in-plant environment. All reactors have vacuum applied to them through a vacuum pump for use during dehydration (using Aromatic 100) stage. Between the batches, reactors are cleaned using mineral spirits (TS100, aka Aromatic 100, aromatic solvents. The vacuum (dehydration) process emissions are controlled by carbon canisters (in series 55-gallon drums: knock-out drum for moisture & high molecular weight compounds, dirty primary canister and polishing secondary canister). Isocyanates are used in the manufacturing process. However, being hygroscopic, Isocyanates react readily with water and it assumed that all isocyanates have reacted and that no

emissions to ambient air occur. Hence, dehydration step is used to remove water. Several solvents (TS-100, Hi-Sol10, 100 Solvent, Aromatic 100 all are Cumene, Xylene, Mineral Spiral Spirits based, name depending upon supplier) together with an application of vacuum and heat to the reactors are used to assist dehydration.

Reactants (Polyols, TDI, IPDI) are mixed to homogeneous mixture in twelve (12) stirred tank reactors at 180 degrees Fahrenheit for 4-5 hours when the reaction is complete. Then the products are allowed to cool to 100 degrees Fahrenheit and the additives such as UV-protectors, bubble releasers, viscosity adjusters, etc. are added. The products are packaged at 80-90 degrees Fahrenheit.

Pilot Plant

LymTal also has one 55-gallon pilot reactor to test new products developed on a test-tube scale before going to production scale. The pilot reactor operates 2-3 times per month. One 2-gallon reactor is added. This is pilot plant scale up reactor.

One more 175-gallon (working capacity 100 gallon and maximum capacity 175 gallons) pilot reactor is bought but idled and never used since 2015.

Storage tanks (21)

See the attached storage tank list and locations to the FY2014 inspection report.

The LymTal has one 5,000-gallon storage tank for TDI, one 3,000-gallon storage tank for IPDI upstairs in a locked room. TDI and IPDI are extremely hazardous and are continuously monitored using an ambient air leak detection alarm system. These TDI and IPDI tanks are part of the permit.

There are four storage tanks for Polyols in the production area (one 2,000-gallon, two 3,000-gallon and one 5,000-gallon tanks). Two 2,500-gallon tanks for castor oil are installed in the production area.

At the backyard, one 2000-gallon and one 1100-gallon tanks store mineral spirits. One 2000-gallon MEK storage tank is currently empty. One 5000-gallon tank stores castor oil. In all, there are three castor oil tanks including two in production area. Castor oil is imported from India.

After 12-reactor and 4-mixer processes, 25-gallon carbon canister, vacuum pump, two knockout drums (to remove liquids, if any) and 55-gallon carbon canisters (two activated carbon canisters first 55-gallon canister and second 55-gallon canister) are connected in series to control emission of volatile organic compounds (VOC) (PTI No. 1306-91D, FG-REACTORS, SC IV.1 & 2 SC V.2). 55-gallon canister is brought down from the roof for easy of maintenance. A portable instrument (single point monitor made by MDA Scientific with various keys for each chemical such as MDI, IPDI, TDI, etc) is used to monitor breakthrough for both canisters (PTI No. 1306-91D, FG-REACTORS SC V.2). A hose is connected to a sample tap on the 55-gallon canister. Few years ago (Feb 2010), 55-gallon canister moved from the roof to a location near small 25-gallon canister, which is located near the vacuum pump. The portable instrument is directly connected. Breakthrough is determined separately for MDI, TDI and IPDI. The records of breakthrough monitoring are maintained (PTI No. 1306-91D, FG-REACTORS, SC VI.2). MDI, IPDI, TDI breakthrough is monitored once a week.

While 55-gallon secondary carbon canister was always located near the vacuum pump, 55-gallon primary carbon canister was relocated from the roof to near the other canister. The secondary 55-gallon canister was replaced as follows: February 2010, March 22, 2012, and July 23, 2014. Both 55-gallon carbon canisters were replaced in September 2022. Also, two 55-gallon carbon canisters are set aside as backup / spare. Prior secondary canister always becomes primary canister upon replacement: canister swap, i.e. most recent secondary canister is swapped as a primary and primary canister that is saturated (attained break-through) is sent out for regeneration.

VOC control equipment, two 55-gallon carbon canisters, are arranged series:

55-gallon knock-out drum → 55-gallon primary carbon canister (new carbon placed in service September 2022) → 55-gallon knock-out drum → Vacuum pump → 55-gallon secondary carbon canister for polishing operation.

PTI No. 1306-91D

Monthly hours of operation, VOC and HAP, the required calculations, carbon canister break-through monitoring records are kept. (PTI No. 1306-91D, FG-REACTORS, SC VI.1 [solvent usage] & 2 [carbon canister break-through]). AQD (Permit Engineer Michelle Rogers) removed hours of operation limit (PTI No. 1306-91C, FGFACILITY, SC III.1: 5,000 hours / year) instead added solvent usage limit (PTI No. 1306-91D, FG-REACTORS SC II.1: 16,000 pounds of solvents per year). LymTal used 2,333.5 pounds (1.167 tons) of VOC / solvents per year for CY 2015 (PTI No. 1306-91D, FG-REACTORS SC II.1 limit: 16,000 pounds of solvents per year). Not taking into

account 96% control efficiency of combined two 55-gallon carbon canister system (dirty primary 80% and polishing secondary 80%, in addition knock-out drum), LymTal emitted 1.167 tons of VOC per year and 0.0467 HAPs per year (PTI No. 1306-91D, FG-FACILITY SC I.1 [VOC] & I.2 [HAP] limits: 5 tpy VOC and 3 tpy Aggregate HAPs); i.e. all solvents used are considered emitted in spite of two 55-gallon carbon canister control plus knock-out drum prior to carbon canisters, for the purpose of calculations and compliance. LymTal keeps VOC and HAP records (PTI No. 1306-91D, FG-FACILITY SC VI.1 [VOC and HAP info] and 2 [VOC and HAP emissions])

CY2020: LymTal used 5,687 pounds (2.844 tons) of VOC / solvents per year. HAPs (cumenes and xylenes) = 217 pounds per year

CY2021: LymTal used 5,343 pounds (2.672 tons) of VOC / solvents per year. HAPs (cumenes and xylenes) = 161 pounds per year.

The used solvent may be deemed to be VOC emissions before carbon canister control. All VOC and HAP emissions are before control.

Usage limit 16,000 pounds of solvents per year(PTI No. 1306-91D, FG-REACTORS SC II.1: 16,000 pounds of solvents per year)

Boilers

One steam boiler of capacity 0.5 million BTU per hour and one hot water boiler of capacity 1 million BTU per hour are present. These boilers are not subject to federal NSPS for Small Industrial-Commercial-Institutional Steam Generating Units (40 CFR, Part 60, Subpart Dc) because boiler design capacity is less than 10 million BTU per hour. In addition, pursuant to Rule 336.1282(b), the boilers burning sweet natural gas (up to 50 million BTU per hour) are exempt from Rule 336.1201 (Permit-to-Install).

Dow Automotive Contract Manufacturing Business

Dow Project got cancelled due to economic crisis and General Motors bankruptcy.

Conclusion

LymTal is in compliance with the permit (ROP opt-out PTI No. 1306-91D). 55-gallon carbon canisters (primary and secondary) in series are operating properly. The carbon adsorption system controls VOC emissions from solvents-assisted reactors dehydration process emissions.

NAME *J. S. Marshall*

DATE November 17, 2022 SUPERVISOR *Joyce*