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

N638869298

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| **FACILITY:** PIONEER METAL FINISHING - STEPHENS ROAD | | **SRN / ID:** N6388 |
| **LOCATION:** 13251 STEPHENS ROAD, WARREN | | **DISTRICT:** Warren |
| **CITY:** WARREN | | **COUNTY:** MACOMB |
| **CONTACT:** Justin Engel , EHS Coordinator | | **ACTIVITY DATE:** 07/06/2023 |
| **STAFF:** Iranna Konanahalli | **COMPLIANCE STATUS:** Compliance | **SOURCE CLASS:** SM OPT OUT |
| **SUBJECT:** FY 2023 scheduled inspection (on-site) of Pioneer Metal Industries ("Pioneer"), located at 13251 Stephens Road Warren, MI 48089-4377. | | |
| **RESOLVED COMPLAINTS:** | | |

**Pioneer Metal Industries (N6388)**

**13251 Stephens Road**

**Warren, MI 48089-4377**

**https://www.PioneerMetal.com**

**Contacts:**

1. **Justin Engel** (Phone: 586-480-1704; Cell:248-602-6841; E-mail: jEngel@pioneermetal.com) EHS Lead

2. **Dave Corey** (Phone: NA; Cell:586-292-2585; E-mail: (dCorey@pioneermetal.com ) Maintenance Manager

**Active permit: ROP NESHAP / MACT, especially, 4M (Surface Coating of Miscellaneous Metal Parts and Products) / 4P (Surface Coating of Plastic Parts and Products) Synthetic Minor Permit-to-Install (PTI) No. 151-05B dated May 25, 2022, for installation of one new chain on edge (COE) coating line and associated purge and cleanup operations (identified as EU-12). COE replaces EU 07, EU-08, and EU-09 of the previous permit. Rule 702 VOC BACT is existing RTO that is a part of FG-RTO. Non-Fugitive Enclosure or NFE is used capture 100% VOC from all process units emitting VOC and deliver to one communal Regenerative Thermal Oxidizer (RTO) that provides minimum VOC destruction efficiency of 95 percent (DE ≥ 95%). RTO shall be operated at minimum 1,500°F or at a temperature that ensures DE ≥ 95% confirmed by testing. Per the July 2023 DE test, the RTO Temperature should be maintained at 1,585 °F. See below for the RTO operating Temperature (T) based upon July 2023**

**RTO Destruction Efficiency (DE) test. I recommended that the permit be revised to make corrections to the errors I pointed out during the FY 2023 inspection. While EU-11 (roll coater automated booth) has been removed from the plant and relocated to the Mexico plant, COE (identified as EU-12) is new installation per PTI # 151-05B. One communal RTO serves all coating processes except small dip drain line (identified as EU-03), which runs sparingly (about three (3) times per month).**

**Not subject to Major NESHSP / MACT 4M (opt-out via Synthetic Minor Permit, PTI No. 151-05B): 40 CFR Part 63, Subpart MMMM, National Emission Standards for Hazardous Air Pollutants: Surface Coating of Miscellaneous Metal Parts and Products / Final & effective January 2, 2004.**

**VN and CE & RTO DE test: AQD issued Violation Notice (VN) dated November 29, 2022. Pioneer failed to show compliance PTI No. 151-05B, FG-RTO (six (6) metal coating units), especially, minimum VOC destruction efficiency of 95 percent (by mass); September 2022 stack testing showed destruction efficiency of 93% < 95 percent, which is required by the permit. Subsequent July 12, 2023, test showed VOC destruction efficiency (DE) 98 > 95 percent at RTO Temperature (T) = 1,585 °F > 1,500 °F. The repeat stack test (Impact Compliance Testing of Farmington Hills, ICT Project No.: 2300144, Test Report dated July 20, 2023) of RTO (Durr Model No. RL50 with a flow capacity of 50,000 standard cubic feet per minute (SCFM)) shows compliance with the requirement of Destruction Efficiency (DE) = 98% > 95% (PTI No. 151-05B, FG-RTO, IV.3: minimum VOC destruction efficiency of 95 percent (by mass)). VOC emissions are controlled via Non-Fugitive Enclosure (NFE) associated with each emission unit and one communal Rotary Design Regenerative Thermal Oxidizer (RTO). The paint overspray particulate emissions are controlled by dry filters. During the RTO DE stack testing of July 12, 2023, differential pressure was measured between each non-fugitive enclosure (NFE) and the adjacent area through each natural draft opening (NDO), using a differential pressure monitoring instrument and smoke tubes to determine capture efficiency (CE) for the FGRTO coating process. Based on my observations during the stack testing Capture Efficiency (CE) was satisfactory (smoke and ΔP) except large dip drain line (EU-02), which had difficulty meeting, constantly, the negative 0.007 inches of water pressure differential. However, EU-02 also passed smoke test.**

**During the July 2023 testing, VOC emissions via RTO stack was 0.83 pound of VOC per hour. The operating conditions noted were: RTO retention time = 15 seconds; coating usage = 19.9 gallons; RTO Temperature (T) = 1,585 °F. Therefore, henceforth until further DE testing, the RTO Temperature should be maintained at > 1,585 °F > 1,500 °F (PTI No. 151-05B, FG-RTO, IV.3: minimum temperature of 1,500°F).**

**July 2003 Test results (VOC 60-minute each run 3-run average) based on AQD calculations: 0.81 pounds of VOC per hour; 0.85 << 9.3 tons of VOC per year; Destruction Efficiency (DE) = 98% > 95%; exhaust flow = 38,980 ACFM = 30,929 SCFM**

**= 30, 371 Dry SCFM. The tests were conducted utilizing the United States Environmental Protection Agency (USEPA) Methods 1, 2, 3A, 4, and 25A.**

**During the testing, July 12, 2023, testing coating was not happening in many processes (e.g., Round Table, Spray Booths (Nos. 1 & 2). However, air flow was present at all processes causing a dilution effect concerning VOC delivered to RTO. The RTO is of rotary design consisting of 12 pies and rotating every 15 seconds for a purpose of heat recovery.**

**On July 07, 2023, I conducted a level-2 FY 2023 scheduled inspection (on-site) of Pioneer Metal Industries ("Pioneer"), located at 13251 Stephens Road Warren, MI 48089-4377. 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 and Energy, Air Quality Division (EGLE-AQD) administrative rules; and PTI No. 151-05B.**

**During the inspection, Justin Engel, EHS Lead and Dave Corey , Maintenance Manager, assisted me.**

**PTI No. 151-05B, Emission Units (EUs).**

**Tables Pioneer Metal Industries (N6388)**

**PTI No. 151-05B, Emission Units (EUs).**

| Emission Unit ID | Emission Unit Description (Including Process Equipment & Control Device(s)) | Installation Date / Modification Date | Flexible Group ID |
|---|---|---|---|
| Phosphate process is not present at Stephens Road facility. The Phosphate Process, if necessary for the parts coated at this facility, is performed at Pioneer Metal Finishing Industrial Hwy. (N5747), 24600 Industrial Highway, Warren, Michigan 48089-4346. | | | |

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| **EU-12 COE** | **The chain on edge (COE) booth consists of a spray coating booth and associated oven. The parts enter a Non-Fugitive Enclosure (NFE) on a chain conveyor and are spray coated with HVLP applicators before entering an oven. Parts (primarily metal automobile parts) are loaded manually onto the chain conveyor. Finished parts are unloaded manually and placed into shipping bins. Particulate matter emissions are controlled by dry filters. The VOC emissions from booth and oven are controlled via Non-Fugitive Enclosure (NFE) and a regenerative thermal oxidizer (RTO). Also, purge and cleanup operations are included.** | **06-01-2021 / 05-25-2022** | **FGRTO** |

**Both COE booth and oven emissions are ducted to an RTO. Back-draft dry filters are present. Three other COEs were removed and replaced by this new COE about May 2021. Differential pressure monitor (ΔP across filters) Magnehelic gauge is present. Log: Portable ΔP monitor is used to log ΔP across filters, once per week.**

**The COE (EU-12) line has three coating booths, one primer, and two topcoat booths. Coating is applied using high volume low pressure (HVLP) spray applicators. The specific primers and topcoats applied vary based on customer specifications. The doors on each booth on the COE line were closed. The doors are opened when access is needed. Following coating, the parts go through an in-line curing oven.**

**COE process: Load parts ➔ Primer ➔ bake oven ➔ First topcoat ➔ Flash off with warm air ➔ Second topcoat ➔ bake oven ➔ Unload parts. Two booths are present in all.**

**New chain-on-edge (COE) coating line (EU-12) was installed about May 2021.**

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| **EU-02**<br><br>**Large dip drain** | **Large dip drain line consist of a coating reservoir installed inside a non-fugitive enclosure. Parts enter the booth on a conveyor and are dipped into the coating reservoir. After coating the parts are removed from the reservoir and excess coating is drained off the parts back into the coating reservoir.** | **05-01-2005 / 06-01-2021 / 05-25-2022** | **FGRTO** |

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| | The VOC emissions are controlled via Non-Fugitive Enclosure (NFE) and a regenerative thermal oxidizer (RTO). | | |

**Both booth and oven emissions are controlled by one Rotary RTO. Passes smoke test but no permanent monitor. Log: Portable ΔP monitor is used to log ΔP once per week. No filters as this not spray coating process.**

**Pioneer Metal has been having difficulty meeting the negative 0.007 inches of water pressure differential on the large dip drain coating line (EU-02). Negative pressure is maintained but is not consistently below the required -0.007 inches of water. However, the enclosure shows VOC capture via smoke test. The item needs to be modified during the forthcoming permit revision that will correct errors in the permits.**

**I asked Pioneer (Justin Engel) to enclose a gap (flash-off area) between the dip-drain and the oven (≈ 200 °F). This may help with ΔP problems (-0.007" H2O).**

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| **EU-03**<br><br>**Small dip drain** | Small dip drain line consist of coating reservoir installed inside a non-fugitive enclosure. Parts enter the booth on a conveyor and are dipped into the coating reservoir. After coating the parts are removed from the reservoir and excess coating is drained off the parts back into the coating reservoir. The purge and cleanup solvents are included. The VOC emissions are uncontrolled. | 05-15-1998 /<br><br>06-01-2021 | **FGRule621** |

**Small dip drain line (EU-03) is NOT equipped with Non-Fugitive Enclosure (NFE). The coating is air dried. No oven. No RTO control. VOC are vented directly to outside ambient air. Infrequently used (3-4 times per month). No filter as it is not spray-coating. This is only process that is not controlled by RTO. The small dip drain line operates like the large dip drain line. It was not operating during the FY 2023 inspection as it hardly operates.**

**The drip drain lines (one large & one small) do NOT require dry filters because there is no spray.**

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| **EU-04**<br><br>**Large spray booth** | **One large spray booth followed by an oven. The particulate emissions are controlled by dry filters. The VOC emissions are controlled via NFE and an RTO.** | **05-15-1998 /**<br><br>**06-01-2021 /**<br><br>**05-25-2022** | **FGRTO** |
| **Large manual booth is NOT equipped with oven. VOC emissions from the booth are ducted RTO. Drying (air dried) emissions are released to in-plant environment. No permanent ΔP monitor. Log: Portable ΔP monitor is used to log ΔP once per week.** | | | |
| **EU-05**<br><br>**Batch oven** | **Batch oven. The VOC emissions are controlled via NFE and an RTO.** | **05-15-1998 /**<br><br>**06-01-2021 /**<br><br>**05-25-2022** | **FGRTO** |
| **EU-06**<br><br>**Small spray booth** | **One small spray booth followed by an oven. The particulate emissions are controlled by dry filters. The VOC emissions are controlled via NFE and an RTO.** | **05-15-1998 /**<br><br>**06-01-2021 /**<br><br>**05-25-2022** | **FGRTO** |
| **Air dried. Not equipped with oven. Booth emissions controlled by RTO. Drying emissions are released to in-plant environment. No permanent ΔP monitor. Log: Portable ΔP monitor is used to log ΔP once per week.** | | | |
| **EU-04 & EU-06: Both large spray booth (EU-04) and small spray booth (EU-06), if necessary, use one common batch oven (EU-05). Both oven and the booths (2) VOC emissions are controlled by RTO. Each booth is equipped with an inclined monometer for pressure drop across the filters so that the filters change time can be determined. The booths are equipped with backdraft filters.** | | | |
| **EU-10** | **Round table automated coating booth. The VOC emissions are controlled via NFE and an RTO.** | **05-01-2021 /**<br><br>**05-25-2022** | **FGRTO** |
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**Equipped with dry filters. Both oven and booth emissions go to RTO. No permanent ΔP monitor. Log: Portable ΔP monitor is used to log ΔP once per week. Currently (May 2023) Round Table (EU-10) is not used**

**PTI No. 151-05B, EU-03 (small dip drain line).**

**PTI No. 151-05B, EU-03 (small dip drain line).**

**Small dip drain line consist of coating reservoir installed inside a non-fugitive enclosure. Parts enter on a conveyor and are dipped into the coating reservoir. After coating the parts are removed from the reservoir and excess coating is drained off the parts back into the coating reservoir. The purge and cleanup solvents are included. The VOC emissions are uncontrolled.**

**PTI No. 151-05B, EU-03, I.1-2.**

**PTI No. 151-05B, EU-03, I.1-2.**

| Pollutant | Limit | Time Period / Operating Scenario | Equipment | CY 2022 |
|---|---|---|---|---|
| 1. VOC | 2,000 pounds per month | Each calendar month | EU-03 | < 505 lb/mo<br>Highest = 505 lb/mo for Oct-2022 |
| 2. VOC | 3.9 tpy | 12-month rolling time period as determined at the end of each calendar month | EU-03 | 372 gal per yr<br>2,389 lb/yr (1.12 tpy) |

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| **No RTO. No booth. Air dried on-line. Runs about 4 times per month. Updraft exhaust filters.** |

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**PTI No. 151-05B, EU-03, III.1-3.**

**During the FY 2023 inspection, I noted that all solvents, paints, and waste materials were stored in bins with closed lids.**

**PTI No. 151-05B, EU-03, VI.1-4.**

**The usage records kept VOC emissions calculations are performed using MS Excel spreadsheets.**

**PTI No. 151-05B, Flexible Groups (FGs).**

**PTI No. 151-05B, Flexible Groups (FGs).**

| Flexible Group ID | Flexible Group Description | Associated Emission Unit IDs |
|---|---|---|
| FGRule621 | All metal parts coating lines source-wide, including metal parts coating lines covered by other permits, which are exempt by R 336.1621(10)(b). | EU-03 (As of April 2021) |
| FGRTO | Six (6) emissions units for coating of metal parts. The purge and cleanup solvents are included. The particulate | EU-02, |

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|---|---|---|
| | emissions are controlled by dry filters. The VOC emissions are controlled via Non-Fugitive Enclosure (NFE) associated with each emission unit and a common regenerative thermal oxidizer (RTO). | EU-04, EU-05, EU-06, EU-10, EU-12 |

**EU10 = ROUND TABLE. EU-04 = No oven. EU-06 = No oven.**

**All 6 coating units are ducted to RTO.**

**PTI No. 151-05B, FG-Rule621.**

**PTI No. 151-05B, FG-Rule621.**

| Pollutant | Limit | Time Period / Operating Scenario | Equipment | Monitoring / Testing Method | Underlying Applicable Requirements |
|---|---|---|---|---|---|
| 1. VOC | 30.0 tpy | 12-month rolling time period as determined at the end of each calendar month | All metal parts coating lines source-wide, including metal parts coating lines covered by other permits, which are exempt by R 336.1621(10)(b). | SC VI.2, SC VI.3 | R 336.1702(d) |

**No oven. No. RTO.**

**Currently (July 2023), only EU-03 is subject to FG-Rule621. Therefore, see EU-03 which emitted 1.12 tons of VOC per year.**

**PTI No. 151-05B, FG-Rule621.**

**All metal parts coating lines source-wide, including metal parts coating lines covered by other permits, which are exempt by R 336.1621(10)(b).**

**PTI No. 151-05B, FG-RTO.**

**FG-RTO (EU-02, EU-04, EU-05, EU-06, EU-10, EU-12): Six (6) emissions units for coating of metal parts. The purge and cleanup solvents are included. The particulate emissions are controlled by dry filters. The VOC emissions are controlled via Non-Fugitive Enclosure (NFE) associated with each emission unit and a common regenerative thermal oxidizer (RTO).**

**PTI No. 151-05B, FG-RTO, I.**

**PTI No. 151-05B, FG-RTO, I.**

| Pollutant | Limit | Time Period / Operating Scenario | Equipment | CY2022 |
|---|---|---|---|---|
| 1. VOC | 9.3 tpy | 12-month rolling time period as determined at the end of each calendar month | FGRTO | 15,636 gal/yr coatings 4,362 lb/yr =2.18 tpy VOC |
| 2. Methyl isobutyl ketone (CAS No. 108-10-1) | 24.1 pounds per 8-hour | Per 8-hour | FGRTO | 63 pounds per month in April 2023 |
| | | | | |

**Rotary RTO used 32 MM SCF natural gas. July 12, 2023, showed Rotary RTO VOC destruction efficiency (DE) of 98 > 95 percent at RTO Temperature (T) = 1,585 °F.**

**PTI No. 151-05B, FG-RTO, II.**

**CY 2022: Pioneer used 15,636 << 51,300 gallons of coatings per year (PTI No. 151-05B, FG-RTO, II.2 limit: 51,300 gallons of total coatings per year).**

**PTI No. 151-05B, FG-RTO, III, 1-5.**

**Throughout the facility, waste paints and solvents stored in closed containers (bins with lids) to minimize fugitive VOC / HAP emissions.**

**Pioneer implemented Malfunction Abatement Plan (MAP) for Rotary RTO (Durr model RL50 RTO with 50,000 standard cubic feet per minute (SCFM) exhaust flow rate). RTO Temperature (T) must be maintained at T > 1,585 °F based upon July 2023 RTO DE test. VFD (variable frequency drive) controller output maintained at > 55 Hz (normally 60-66 Hz or hertz). VFD adjusts the motor speed.**

**All coating units showed during the July 2023 tests negative pressure (either negative 0.007 inches of water between each Non-Fugitive Enclosure (NFE) or acceptable smoke flow). Pioneer has a hard time to maintain negative 0.007 inches of water pressure differential on their large dip drain coating line (EU-02), consistently; however, it passes smoke test. The permit revision is required for this unit.**

**PTI No. 151-05B, FG-RTO, IV, 1-5.**

**The filters are installed and operating properly where required. HVLP guns are used. RTO operates at destruction efficiency of 98 percent (DE = 98% > 95%) based upon July 2023 stack at 1,585 °F > 1,500 °F (PTI No. 151-05B, FG-RTO, IV.3: > 1,500°F, DE > 95 % with retention time of > 0.5 seconds). Hence, until next test, the required minimum RTO temperature is 1,585 °F (≈ 1,600 °F). The temperature is continuously monitored (data logger saves T every minute). Pressure differential (ΔP) at NDO (natural draft opening) is logged once per week. As stated before, maintaining ΔP < -**

**(negative) 0.007 inches of water has been problematic for large dip drain coating process (EU-02), consistently. However, smoke test shows negative pressure in the enclosure (EU-02). This ΔP issue will be addressed in next permit revision.**

**PTI No. 151-05B, FG-RTO, V, 1-3.**

**See above for July 2023 DE test. DE = 98% > 95%. ΔP (except large dip drain coating process (EU-02)) and smoke test were acceptable at ΔP < - (negative) 0.007 inches of water. Pioneer conducts weekly ΔP and smoke tests as well.**

**PTI No. 151-05B, FG-RTO, VI, 1-8.**

**Pioneer keeps coating VOC & HAP content, usage, etc. records. Using MS Excel, performs the required calculations (e.g., April-2023, monthly: 1,563 & 1,543 gallons total & RTO Lines usage; 431 pounds of VOC from RTO lines & 129 pounds of VOC from Small Drip Drain line (no control), respectively; 347 pounds of HAPs).**

**Temperature (T) and ΔP & smoke test information is kept on files.**

**RTO operating hours records are kept (usually 10 hours per day).**

| CY 2023 (Jan thru Jul 2023) Monthly Statistical Temperature Summary | | | | | |
|---|---|---|---|---|---|
| CY2023 Jan-Jul | Average | Median | Minimum | Maximum | Standard Deviation |
| JAN | 1583.1 | 1583.4 | 1537.4 | 1618.9 | 4.8 |
| FEB | 1583.2 | 1583.7 | 1566.4 | 1599.2 | 4.1 |
| MAR | 1583.1 | 1583.6 | 1564.3 | 1596.8 | 3.7 |
| APR | 1583.2 | 1583.4 | 1571.3 | 1629.8 | 3.1 |

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|---|---|---|---|---|---|
| **MAY** | **1583.2** | **1583.4** | **1571.0** | **1596.5** | **3.3** |
| **JUN** | **1583.2** | **1583.3** | **1553.8** | **1653.6** | **3.4** |
| **JUL** | **1583.2** | **1583.3** | **1568.4** | **1629.5** | **3.4** |
| **PTI No. 151-05B, FG-RTO, IV.3: > 1,500°F, DE > 95 % with retention time of > 0.5 seconds. However, July 2023 tested DE = 98% at 1,585 ° F.** | | | | | |

**PTI No. 151-05B, FG-FACILITY, I, 1-3.**

**PTI No. 151-05B, FG-FACILITY, VI, 1-3.**

**Coating usage and HAP content information is kept on file. The required calculations are performed.**

**Conclusion**

**Pioneer is in compliance with its permit. July 2023 stack test (RTO DE = 98 > 95 %) resolved the Violation Notice (VN) dated November 29, 2022.**

NAME J Shanahan DATE October 1, 2023 SUPERVISOR Joyce