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

P102768279

FACILITY: DDP Specialty Electronic Materials US, LLC		**SRN / ID:** P1027
LOCATION: 3400 S. Saginaw Rd Unit 96, MIDLAND		**DISTRICT:** Bay City
CITY: MIDLAND		**COUNTY:** MIDLAND
CONTACT: Jennifer Kraut , Environmental Specialist		**ACTIVITY DATE:** 07/12/2023
STAFF: Kathy Brewer	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MEGASITE
SUBJECT: EU04 Primer processes (non polar and polar) . On site inspection and records review. MAP request sent for Carbon emission control		
RESOLVED COMPLAINTS:		

On July 12, 2023, the Department of Environment, Great Lakes, and Energy (EGLE), Air Quality Division (AQD), conducted an inspection of DDP Specialty Electronics Materials US, LLC (DDP) Primers Process (EU04) located within the Dow iPark, Midland, Michigan.

The current ROP MI-ROP-P1027- 2020b states that this emission unit is subject to the NESHAP for Miscellaneous Coating Manufacturing in 40 CFR Part 63, Subpart HHHHH and to the NESHAP for Organic Liquids Distribution in 40 CFR Part 63, Subpart EEEE, and NESHAP for Miscellaneous Organic Chemical Manufacturing in 40 CFR Part 63 Subpart FFFF. In addition, processes subject to HHHHH and FFFF are also subject to the equipment leak provisions of 40 CFR Part 63, Subpart UU (National Emission Standards for Equipment Leaks - Control level 2 Standards)

The most recent PTI for this emission unit is PTI 181-18 issued on January 11, 2019. On September 9, 2019, a Minor Modification of the ROP to include FGMONMACT in table EU04 was incorporated into the ROP.

The EU04 permit conditions include "flexible for toxics" provisions that use TAC Category based emission limits. The emission limits group pollutants by toxicity and period (hourly, 8 hour, 24 hour, annual).

The emissions for EU04 reported to MAERS in 2022 were the following:

Pollutant	Amount
VOC	308 pounds
PM10	8 pounds

We walked through EU04 production and material handling areas, observed air pollution control devices and viewed several operation status screens. On site records of production and associated emission calculations were reviewed.

At the time of the inspection the facility was conducting emission testing of the carbon beds to demonstrate compliance with 40 CFR Part 63 Subpart HHHHH.

The facility appeared to be in compliance with permit and applicable MACT requirements. However, on August 2, AQD sent a request to DDP to submit a MAP for

the EU04 carbon adsorbtion system to clarify operating conditions for compliance with State of Michigan air pollution control requirements.

Description

EU04 Primers process produces primers for use in automotive glass bonding. The Primers process vents use several cartridge filters and three carbon beds for emission control. The solids primer, clear primer, and dissolved solids primer process lines are each operated as a batch process. The three process lines share the same packaging line and some control devices and materials handling. Bulk loading emissions are controlled by vapor return system

The following is from the 40 CFR Part 63 Subpart HHHHH emission test plan:

> **Raw materials are blended/mixed to create intermediate and final products. Primers products are composed mainly of volatile organic solvents. Emissions are produced from filling, depressurization, and packaging operations.**
>
> **The Primers production process can be broken down into three sub process units: Suspended Solids Primer, Clear Primer, and Dissolved Solids Primer. The first unit, Suspended Solids Primer, is used to produce primer that contains pigment. The pigments are airveyed into a pigment handling system where they are dried and then conveyed to a mixing vessel (D-5500). Liquid raw materials are added to the mixing unit and then processed into a final primer. Emissions are generated and vented through control devices (dust collectors and carbon adsorbtion system) during the transfer of pigments, liquid raw materials, and pressurization of the vessels to accommodate for various steps in the mixing process. The final product is transferred to a separate vessel where the primer is packed into various container sizes to meet demand.**
>
> **The second process, Clear Primer, is strictly a liquid mixing operation. Liquid raw materials are added to a mixing vessel (D-5580) according to specific recipes. Emissions are generated and vented through control devices (carbon adsorbtion) during filling and depressurization operations. Once adequately mixed, the product is packaged into various sizes to meet market demand.**
>
> **The third process, Dissolved Solids Primer, utilizes a small solids resin handling system to add resin beads to liquids inside a mixing vessel (D-5590) according to specific recipes. Other raw materials are added to the mixing vessel and then the final product is packaged to meet market demand. Emissions are generated and vented through control devices (carbon adsorbtion) during filling and depressurization operations.**

The Suspended Solids Primer solids handling (dryer system) vents to filter FL-5410 and FL-5420. Raw material loading and transfer vent to FL-2490. The filters are equipped with differential pressure monitors. The in-line cartridge filter FL-5446 is monitored during loading for visible emissions.

Each process exhaust that vents to carbon beds are controlled by two independent carbon adsorbtion beds. Clear Primer (Polar) vents to - Polar 9158 carbon bed and

Suspended Solids Primer and Dissolved Solids Primer (Non-Polar) exhaust to Non-polar 9154A carbon bed. The first carbon bed exhaust from each of the carbon beds is directed to a common vent line that goes to a second in series 9154B carbon bed. For emission estimates in the air permit PTI No. 191-18 only the Non-polar process emissions require venting through the second carbon bed 9154B.

During the inspection the Clear Primer mixing vessel (D-5580) was receiving toluene. Process and storage vessels were venting to carbon treatment.

Emissions

Emission records for October 2022, January 2023, and April 2023, were reviewed on site. Review of production and emission records indicate the facility is in compliance with the allowed emission limits.

Pollutant	Limit	October 2022 Emissions LBS	January 2023 Emissions LBS	April 2023 Emissions LBS
1. VOC	8.3 tpy[2] ++	284	351	408
2. Other volatile organics (OVO): organic compounds that are "volatile" but are not "VOC"+	8.3 tpy[1] ++	284	351	408

October 2022 production and emission records were reviewed in detail. Over 60 components were tracked. Some components were not emitted in October 2022. The following components emissions were recorded as being emitted.

October 2022 Amount

Monthly Output Data Record

RM ID	Component	lbs
11086606-1	Gamma-Glycidoxypropyltrimethoxysilane (60-100%)	0.005055967
146662-1	"Not Classified as hazardous under OSHA regulations"	0.002141822
167710-1	UMOH (100%)	0.011330033
210728-1	Carbon Black (>99%)	0.543939937

232299-1	Tetrakis (2-ethylhexane-1,3-diolato) Titanium (60-100%) Isopropyl Alcohol (0.1-1%)	0.000711944
265521-3	Methanol (<1%)	2.82880916
273311-1	Dibutyltin Diacetyldiacetonate	3.22735E-10
275293-1	C7-C8 Alkanes (60-100%) C7-C8 Cycloalkanes (7-13%)	0.018313029
298752-1	Homopolymer of Hexamethylene Diisocyanate (95-100%)	1.6851E-07
31345-1	Residual amounts of TDI and HDI Monomer (<1%)	0.004549309
31345-2	Polyisocyanate based on TDI and HDI	0.236563956
31345-3	n-butyl acetate (35-45%)	0.121450498
31345-4	2,4-Toluene Diisocyanate (0.1-1%)	7.84455E-06
31345-5	Hexamethylene-1,6-Diisocyanate (0.1-1%)	0.000241106
31375-1	Bis(2-(2-isopropyl-3-oxazolidinyl)ethyl)adipate (76 - 84%)* Bis(2-(2-isopropyl-3-oxazolidinyl)ethyl)glutarate (76 - 84%)* Bis(2-(2-isopropyl-3-oxazolidinyl)ethyl)succinate (76 - 84%)* Isopropyl-3-oxazolidineethanol (14 - 20%) Heptane (<= 3%)	0.087609489
31385-1	Tris(4-Isocyanatophenyl) Thiophosphate (20-30%)	0.057047278
31385-2	Monochlorobenzene (1-2%)	0.002601584
31385-3	Ethyl Acetate (65-75%)	0.748194871
31484-1	Aluminum stearate (65-75%)	0.007018911
31516-1	Gamma-Aminopropyltrimethoxysilane (60-100%)	0.000183258
31516-2	Carbmethoxyethyltrimethoxysilane (1-5%)	4.53777E-06

31519-1	Molecular Sieve, Type 3a, 4-8 mesh (100%)	0.039998889
31522-1	Gamma-Mercaptopropyltrimethoxysilane (60-100%)	0.004320863
31522-2	Gamma-Chloropropyltrimethoxysilane (5-10%)	0.000432084
31524-1	2,2'-(1,2-ethenediyl)bis(4,1-phenylene) bisbenzoxazole - (98-100%)	2.16222E-05
31525-1	Bis(trimethoxysilylpropyl)amine (60 - 100%)	5.61546E-06
31525-2	Tris(trimethoxysilylpropyl) amine (1 - 5%)	3.15476E-07
31550-1	Diethyl Malonate (100%)	8.5307E-05
31559-1	Triethylenediamine (TEDA) (< 25%)	0.000319401
31559-2	Dibutyltin diacectate (15-25%)	6.37345E-05
31559-3	Ethylene glycol (19%)	2.62001E-06
31580-1	Stannane, Dibutylbis[(1-oxododecyl)oxy]- (>=95%) Fatty Acids, coco (<=5%)	7.99638E-08
31589-1	Stannane, dibutylbis[(2-ethyl-1-oxohexyl)oxy]- (>=50 - <60%)	1.19254E-06
31589-2	Benzene, dimethyl- (>=40 - <=50%)	0.001078695
31642-1	Talc (60-100%)	0.095452524
31642-2	Calcium Carbonate (10-30%)	0.044743371
31642-3	Chlorite-group minerals (1-5%)	0.007457228
31642-4	Quartz (.1-1%)	0.001491446
31704-1	Toluene (<=100%)	1.747801521

31714-1	**Acetone (98-100%)**	**0.68127917**
31717-1	**Methyl Ethyl Ketone (<=100%)**	**28.04776889**
50158-2	**Individual residual monomers (<0.35%)**	**0.000759061**
50158-3	**Methyl methacrylate (<=1.6%)**	**0.001304558**
50158-4	**Propylene glycol methyl ether acetate (27 - 29%)**	**0.006558243**
50158-5	**Ethylbenzene (13 - 15%)**	**0.009171687**
50158-6	**Naphtha (9 - 11%)**	**0.007079826**
65588-1	**N-(3-(Trimethoxysilyl)propyl)ethylenediamine (70-90%)**	**0.043554312**
65591-1	**3-trimethoxysilylpropane-1-thiol (60-100%) 2,2-DIMETHOXY-1-THIA-2-SILACYCLOPENTAN (>=1 - <=5%)**	**0.002233802**
68698-1	**2,4,4-trimethylhexamethylene-1,6-di-isocyanate (<60%) 2,2,4-trimethylhexamethylene-1,6-di-isocyanate (<40%) isophorone di-isocyanate (<.5%)**	**0.00489217**
70896-1	**3-Methoxy Butyl Acetate (99.5%)**	**0.051208632**
90486-1	**Diphenylmethane Diisocyanate, isomers and homologues (100%)**	**7.16204E-08**
90486-2	**4,4' -Methylenediphenyl diisocyanate (>=18 - <=25%)**	**6.18803E-06**
91856-1	**Vitel 2300B Mixture**	**0.017243636**

ITSL's for Primer Process - Product Summary - October 2022 Attahced

The batch production and air emission for one recipe produced in December 2022 was also reviewed.

Material limits

The ROP does not list any specified material limits.

Process and Operational Restrictions

SC III.1. Cleaning of equipment is required to be done by methods and materials that minimize the emission of VOCs. and OVOs. The facility implements a procedure that includes sampling the spent cleaning solvent to see if additional rinsing is needed.

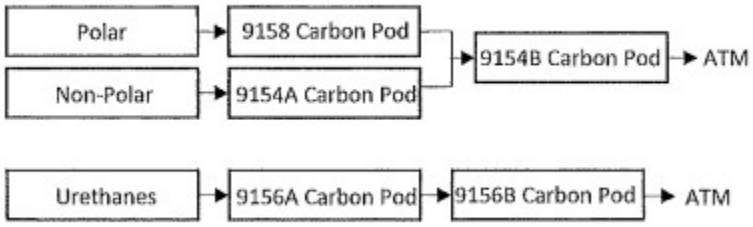
SC III.2 requires all organic was solvent to be stored in closed containers. The rinsing procedure includes instructions for proper handling of used rinse solvents.

An excerpt from the procedures that include rinse instructions and spent rinse material is attached.

Design and Equipment Parameters

SC IV.1 requires the facility to only operate portions of EU04 venting to the carbon beds if the carbon beds are installed, maintained and operated in a satisfactory manner and in compliance with FGCOATINGS MACT. FGCOATINGSMACT requires DDP to comply with the requirements of MACT HHHHH. DDP's compliance method for the MACT HHHHH is determined at the exhaust of the first carbon pod in the carbon adsorbtion system for the Non-polar processes (Carbon 9154A Pod) and Polar processes (Carbon 9158 Pod).

The two carbon beds, Non-polar Carbon 9154A Pod and the Polar Carbon 9158 Pod, are followed by a shared carbon bed Carbon 9154B Pod. EU04 contains limits and requirements based upon the exhaust from the Non-polar process to be vented through two carbon beds in series.



The facility tracks the process activity emissions that are sent to the carbon beds and the associated carbon adsorbtion capacity consumed and remaining. The site removes the Carbon 9154A Pod when the estimated consumed carbon is near 1,700 pounds consumed. At the time of the inspection the site had exchanged the former "guard" carbon (9154B) with the first carbon in the Non-polar carbon adsorbtion system (9154A) on June 28, 2023.

For the months of October 2022, January 2023, and April 2023 the following carbon change records for carbon 9154A pod were provided.

Date	9154A Carbon Available (lb)	9154A Carbon Consumed (lb)
10/1/2022	368.5	1331.5

10/10/2022	202.1	1497.9	Change
10/31/2022	1290.8	409.2	
1/1/2023	1569.9	130.1	
1/31/2023	944.4	755.6	
4/1/2023	1144.7	555.3	
4/12/2023	919.1	780.9	Change
4/30/2023	1307.4	392.6	

The last change for carbon 9158 pod occurred on April 13, 2023. For the months of October 2022, January 2023, and April 2023 the following carbon change records for carbon 9158 pod were provided.

Date	Carbon Available (lb)	Carbon Consumed (lb)	
10/1/2022	1458.6	241.4	
10/31/2022	1355.7	344.3	
1/1/2023	1197.3	502.7	
1/31/2023	1119	581	
4/1/2023	942.3	757.6	See change record
4/30/2023	1653.3	46.7	

The facility also tracks the carbon pods exhaust temperature per the MACT HHHHH Notice of Compliance. The carbon pods exhaust temperature is to be ≤ 120 F to meet adsorbtion rate estimates. The following temperature transmitters (TTs) are checked for functionality once per year. The last date each TT was checked is listed below.

- TT9154-03 (EU04 – Polar): 11/8/22
- TT9154-02 (EU04 – Non-Polar): 11/8/22

Operations monitoring information graphing carbon pod exhaust temperatures, consumed carbon, and available carbon are attached for October 2022, January 2023, and April 2023.

The production control logic for process vents sent to Carbon 9154A and 9158 were reviewed. A screenshot of the logic with setpoints for alarms is attached.

Between July 11 and July 13, 2023, DDP conducted performance testing required by MACT HHHHH on the non-regenerative carbon adsorbtion system associated with Primers Process (EU04) and Urethanes/Prepolymer process Unit (EUR290) located at 100 building in Midland, Michigan.

During testing elevated THC levels measured in the carbon adsorbtion 9154A Pod exhaust were not demonstrating 95% removal required by MACT HHHHH. Initial review of the potential cause for the elevated THC levels measured in the carbon adsorbtion 9154A Pod exhaust found that the practice of installing the "guard" carbon pod as the first carbon pod may result in reduced available carbon adsorbtion capacity compared to the assumed available carbon adsorbtion capacity used to calculate removal efficiency.

DDP also monitored the THC levels at the exhaust vent of the of the carbon adsorbtion system second in series Carbon 9154B Pod, that receives the exhaust from the Non-polar Carbon 9154A Pod and the Polar Carbon 9158 Pod. The THC levels at the Carbon 9154B Pod exhaust vent to atmosphere indicated a ≥ 95% organic HAPs removal efficiency.

To comply with MACT HHHHH, DDP has proposed installing a newly supplied carbon pod as the first carbon pod in the Non-polar process vent carbon adsorbtion system and no longer replacing the first Non-Polar Carbon Pod with the "guard" second carbon pod.

Act 451; the Air Pollution Control Rules, Michigan Rule R 336.1910 requires an air-cleaning device to be installed, maintained, and operated in satisfactory manner. On August 2, AQD sent a request to DDP to submit a MAP for the EU04 carbon adsorbtion system within 30 days of submitting the MACT HHHHH test result report to clarify carbon adsorbtion system requirements for satisfactory operations.

SC IV.2. requires the facility to only operate portions of EU04 venting to the specified filters if the filters are installed, maintained and operated in a satisfactory manner.

The operations flow schematics with venting to filters and valve status were reviewed on site Example schematics are attached. Operations screens for October 4, 2022, January 5, 2023, and April 6,2023 showing operating status and filter operations were reviewed and are attached.

The operations records indicate the facility is maintaining and operating the filters in a satisfactory manner.

Monitoring and Recordkeeping

SC VI. 2. and VI.3 requires the facility to calculate 12 month rolling VOCs and OVOs.

Emission calculations including monthly production information, calculated estimates of generated of air contaminants generated from production, and air pollution control device efficiencies were reviewed.

Records for October 2022, January 2023, and April 2023 were reviewed on site.

The calculations are based on the emissions of each pollutants emission rate during a process activity for manufacturing of a specific product, times the number of batches performed of each product or cleaning, and the applicable emission control efficiency. Emissions are tracked post control device by TAC Category and if VOC.

Carbon consumption calculations are based on engineering calculations for process steps of each product. The carbon control manufacturer provided carbon availability and consumption estimates. Details can be found in the March 15, 2021 MACT HHHHH Supplemental Notification of Compliance.

The ROP Table EU04 permit limits and requirements are based upon the exhaust from the Non-polar processes vented through two carbon beds in series. For the Non-polar process, The facility assumes a 90% control efficiency for acetone and a 95% control efficiency for the remaining volatiles post exhausting through both carbon pods. For the Polar process, the facility assumes a 90% control efficiency for acetone and a 95% control efficiency for the remaining volatiles.

During testing, the outlet on the Polar Carbon 9158 Pod indicated >95% removal for THC.

The facility applies a 95% removal efficiency factor at the exhaust of Carbon 9154A Pod for emissions from the Non-Polar process exhausted to the carbon adsorbtion system for demonstrating compliance with MACT HHHHH. Preliminary test monitoring data indicated there may have been occasions when the Carbon 9154A Pod has not achieved 95% removal efficiency. After the facility changed the operating practice of using the send carbon as the lead carbon and began using a fresh carbon pod as the lead, emissions form the Carbon 9154A Pod measured a removal efficiency >95%.

SC VI.4. requires the facility to keep current description of activities that emit air contaminants with all information needed to demonstrate compliance with emission limits, Review of production information and emission calculations indicate the facility is in compliance with this requirement.

SC VI.5 requires the facility to keep monthly records of activities that emit air contaminants with all information needed to demonstrate compliance with emission limits. Review of production information and emission calculations indicate the facility is in compliance with this requirement.

SC VI.6 and VI.7 require the facility to calculate emissions and determine screening levels for a TAC, which has no AQD established screening level nor is listed in the emission limits for EU04, prior to emitting the TAC except for PTI exempt changes resulting in the emission of a TAC that does not involve determining a screening level. Records review indicate the facility is in compliance with this requirement.

SC VI.8. requires the facility to conduct monthly VE checks of FL-5410, FL5420, FL2490, and FL-5446 during routine operations. VE records were reviewed for

October 2022, January 2023, and April 2023. A copy of the VE inspection procedure for FL-5446 is attached. FL-5446, FL-5410 and FL-5420 October 2022, January 2023, and April 2023 VE readings are attached.

Records indicate the facility is conducting and recording required VE inspections of the filters as required.

Reporting

Semi-annual deviation reports and certifications were submitted as required by SC VII.1., 2., and 3. No deviations were reported for EU04.

SC VII.4 requires the facility to annually submit information on each TAC emitted for the first time. Submittals for the period of July 1, 2021 through June 30, 2023 state there were no new TACs emitted.

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NAME Kathy Brewer DATE 8/24/2023 SUPERVISOR Chris Hare