

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

P102770584

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: 11/14/2023
STAFF: Kathy Brewer	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MEGASITE
SUBJECT: EU94 on site inspection, records review		
RESOLVED COMPLAINTS:		

EU94 DDP Inspection November 14, 2023

DDP Contact Jennifer Kraut

EU94 is the divinylbenzene (DVB) process in the specialty monomers manufacturing block with process cracker furnaces G and H, reactors, distillation/fractionation columns, separators, storage tanks/silos and related equipment. Cracker furnaces G and H burn both natural gas and process vent gas and have a heat input capacity of 6.76 MMBTU/hr each.

EU94 was most recently permitted by PTI 1311-90C issued in 2004 and has been incorporated into ROP MI-ROP-P1027-2020b Section 1 EU94 conditions. Distillation residues from the specialty monomers (process tars) are sent to EU95 tar incinerator.

The EU94 DVB process is subject to 40 CFR Part 63 Subparts FFFF, EEEE, and H. The DVB storage tank V-401 is subject to 40 CFR Part 60 Subpart Kb.

The facility reported throughput and emissions in MAERS were the following:

Reporting Year 2021	Reporting Year 2022
3283 tons throughput	2667 tons throughput
1817 lbs VOC	1894 lbs VOC
3982 lbs NOx	3643 lbs NOx
956 lbs CO	874 lbs CO
119 lbs PM10	109 lbs PM10
24 lbs SO2	22 lbs SO2

During the November 14, 2023 on site visit inspection, emission control devices and the associated metering devices, vents, and real time process screens were viewed. Process overviews, emission locations, and emission calculations including example

monthly production for monthly and 12 month rolling materials and emission limit compliance records were reviewed. Process and control device status and operating parameters records were also provided.

At the time of the inspection the facility appeared to be in compliance with the requirements of the EU94 ROP conditions.

On Site Records Review

Process schematics and operation screens including valving and emission points

Process and control device monitor “hourly” data readings

VOC Emission records and supporting calculations

AQD File Review

ROP Semiannual Deviation report Sept 2022, March 2023, Sept 2023.

MACT Reports Subpart MON Sept 2022, March 2023, Sept 2023.

MAERS 2021, 2022

Description

Production of DVB generates vapors from cracking and distillation, storage, transfer, and loading of raw, intermediate, and final materials. The emission unit includes a railcar vapor return balance system. The process normally operates 24 hours, 7 days/week.

The process incorporates vent recovery throughout the process. Process vents, including those from the 728 building, G & H cracker tanks, and the north tank farm, vent to a pressure swing adsorber carbon bed. The pressure swing adsorber (PSA) normally vents emissions to H cracker. When H cracker is down, the PSA vents to the atmosphere. Vapors from the cracker process vent from H cracker to a process furnace.

Emissions

The emission limits record review indicate compliance with the ROP emission limits.

Parameter	Permit Limit	Jan 2023		Aug 2023
1. VOC	1.9 tpy 12 month rolling		12 month rolling ton 0.05	12 month rolling ton 0.043
2. Benzene	579 ppy			

	12 month rolling	Monthly total LBS 0.00314	12 month rolling LBS 6.4	12 month rolling LBS 7.2
3. Ethylvinylbenzene	429 ppy 12 month rolling	Monthly total LBS 0.00071 (m & p)	12 month rolling 15.9	12 month rolling LBS 0.02

Per the September 2022 MACT FFFF semi annual report, MACT FFFF subject HAPS handled are Benzene, Ethylbenzene, Styrene, Toluene, Xylene, Naphthalene, and Methanol .

January 2023 emission sources and calculation for benzene were reviewed in detail.

Material limits

The ROP does not list any specified material limits.

Process/Operational limits

The facility is required to comply with the requirements of 40 CFR Part 60, Subpart Kb for raw material storage tank V 401. Per 40 CFR Part 60.113b and 115b, the facility will document how the required control efficiency is achieved, parameters to monitor. On site discussion indicates the facility is in compliance with Kb requirements but no records were reviewed.

Design and Equipment Parameters

The facility is limited to operating the portions of EU94 that vent to the PSA unless the PSA is installed, maintained, and operated in a satisfactory manner. Satisfactory operation includes, but is not limited to, maintaining a PSA carbon bed operating temperature (top section) of less than 50°C in either PSA carbon bed adsorber V-281A or V-281B (whichever is receiving process exhaust).

The following information was reviewed. The records review and on site observations indicate compliance with the ROP emission requirements.

Device	IP 21 identifier	Condition limit	Jan 24, 2023 10:30 – 12:30	Aug 24, 2023 19:00 - 21:00	Nov 14, 2023 On site reading
	DI_223	PSA vents to H	closed	closed	closed

SV94001 open/closed to atmosphere		Cracker normally			
PSA carbon bed operating temperature (top section) in carbon bed adsorber V- 281A	AI_260 AI_270	Limit < less than 50°C	<15 C	<30 C	<11 C
PSA carbon bed operating temperature (top section) in carbon bed adsorber V- 281B	AI_268 AI_278	Limit < less than 50°C	<15 C	<30 C	<12 C
G Cracker surge tank vent valve to PSA	G024_DI_0240	Vents to PSA normally	open	open	
SV94003 (H Cracker) status	DI_229				closed
H Cracker surge tank to PSA	H071_DI_0240	Vents to PSA normally	open	open	open

Operating data was also provided for Aug 10, 2023 PSA carbon bed temperatures during an approximately 12 hour period when a data outage occurred. The columns were not operating during the period w/o data. PSA carbon bed temperatures were below 30 C prior to the data outage period and below 35 C once the data outage period was over.

The PSA carbon beds alternate operation. The carbon in the PSA is changed approximately once every ten years.

An alarm is activated if the PSA carbon bed temperature deviates from an established departure range or if voltage to the temperature monitor drops.

Based on records provided as of the end of January 2023 the PSA had vented to the H cracker 100% of the past 12 months.

Testing/Sampling

The ROP does not specify any testing requirements.

Monitoring/Recordkeeping

The facility is required to install, calibrate, maintain and operate in a satisfactory manner a device to monitor and record the temperature of the top section of either carbon bed adsorber V-281A or V-281B (whichever is receiving process exhaust) on a continuous basis. During the inspection we viewed temperature monitoring devices, instantaneous readings, and historical operating records.

The facility is required, by the end of each calendar month, to calculate and record emissions from the process for the previous calendar month to demonstrate compliance with the 12-month rolling time period emission totals for VOC, benzene, and ethylvinylbenzene.

Information reviewed and on site observations indicate compliance with the ROP emission requirements.

Reporting

ROP Deviation reports

Sept 2022 No Deviations reported for EU94

March 2023 No Deviations reported for EU94 but an ethylene glycol spill from above ground material transfer pipe due to disconnected coupling. Spill cleaned up & line repaired

Sept 2023 No Deviations reported for EU94

MACT FFFF Semi Annual reports

September 2022 No MACT FFFF Deviations reported for EU94

March 2023 No MACT FFFF Deviations reported for EU94

September 2023 No MACT FFFF Deviations reported for EU94

Stack/Vent Restrictions

Vent locations for the PSA carbon beds, H cracker and G cracker vents to atmosphere, and the north tank farm were viewed. Tank V-401, 1099 tank for solvent truck loading. Stack heights were not verified.

The following table contains additional description information for some of the emission unit vents.

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Comments
1. V94001 (PSA)	6	50	Backup to Cracker H

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Comments
2. SV94002 (G Cracker)	37	60	
3. SV94003 (H Cracker)	30	103	
4. SV94004 (North Tank farm)	6	28	Intermediate and Crude storage, process feed, product
5. SV94005 (West tank farm)	4	1	Finished storage only
6. SV94006 ^b (V-422 tank)	2	20	Intermediate diethylbenzene tank
7. SV94007 (Process day tanks)	4	1	In distillation block as intermediate product for quality assurance then transfer to final storage
8. SV94008 (582 drum loading)	18	18	Warehouse, final drum packaging from west tank
9. SV94009 (1099 Tank Truck Loading)	24	9.8	Bulk tank truck loading station, isotherms from west tank
10. SV94010 (Product storage tanks)	3	21	Series of intermediate tanks in distillation area. 4 tanks (flux, blowdown tank recycled to Crude)

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Comments
11. SV94011 (755storage tanks)	2	0.03	Inhibitor building (polymerization prevention one has HAP

Other Requirements

The ROP does not specify any other requirements.

NAME 

DATE 2/9/2024

SUPERVISOR 