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

A403365685

FACILITY: The Dow Chemical Company U.S.A., Midland		**SRN / ID:** A4033
LOCATION: 1790 Building, MIDLAND		**DISTRICT:** Bay City
CITY: MIDLAND		**COUNTY:** MIDLAND
CONTACT: Jim Alger , Midland Area State Air Permitting Specialist		**ACTIVITY DATE:** 11/10/2022
STAFF: Kathy Brewer	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MEGASITE
SUBJECT: EU1353 and FGRULE290 EU1352-02 portion of on site FCE 2022 - 2027		
RESOLVED COMPLAINTS:		

Silicone sealant and adhesives facility at Dow Chemical Midland SRN A4033

On site Inspection Date November 10, 2022

Facility contact: Jim Algers

EU1353 was permitted by PTI #87-17C issued on January 26, 2021 and revised on February 8, 2021 for the silicone sealant and adhesives facility at Dow Chemical Midland SRN A4033.

This emission unit is subject to the requirements of 40 CFR Part 63, Subparts A, UU, EEEE, and FFFF.

EU1353-02 is a Rule 201 permit exempt processing emission unit utilizing the Rule 290 exemption option. EU1353-02 is subject to the requirements of 40 CFR Part 63, Subparts A and FFFF.

MAERS 2021 reported emissions were 2400 lbs VOC and included EU1353 & EU1353-02 emissions. EU1353-02 carbon beds vent to SV1353-001. However, SV1353-001 is not listed in the most recent PTI. It is the main vent for the 1353 building.

The onsite inspection included an overview of the processes, vent locations, control devices and associated metering devices, process operating screens and emission calculations.

At the time of the inspection the facility appeared to be in compliance with the requirements of the EU1353 ROP conditions, EU1353-02 Rule 290 requirements, and the requirements of applicable 40 CFR Part 63 subparts.

Site Records Review

EU1353

- Process status
- E-3213B chilled water condenser discharge Temperature
- DC3211 dust collector dP
- VOC and PM emissions August 2021, January 2022, September 2022
- Example calculations for January 2022 emissions.

EU1353-02

- Carbon beds weight & temperature August 2021, January 2022, September 2022
- R290 tracked emissions August 2021, January 2022, September 2022

AQD File Review

- MAERS emissions reported for 2021
- ROP Semi annual Deviation reports September 2022
- MACT Reports Subpart FFFF, September 2022.
- PTI 87-17 series and associated EVAL forms

Pollution control and monitoring devices viewed on site include:

- 3210 Myers 10 Mixer, solids loading area and vents, operating status screen
- DC3211 Dust Collector, dP meter, dP meter operating status screen
- E3213B chilled water condenser, condenser exhaust temp meter, operating status screen
- 3213 Vessel (knock out pot), operating status screen
- EU1352-02 process vent header, (3) carbon beds

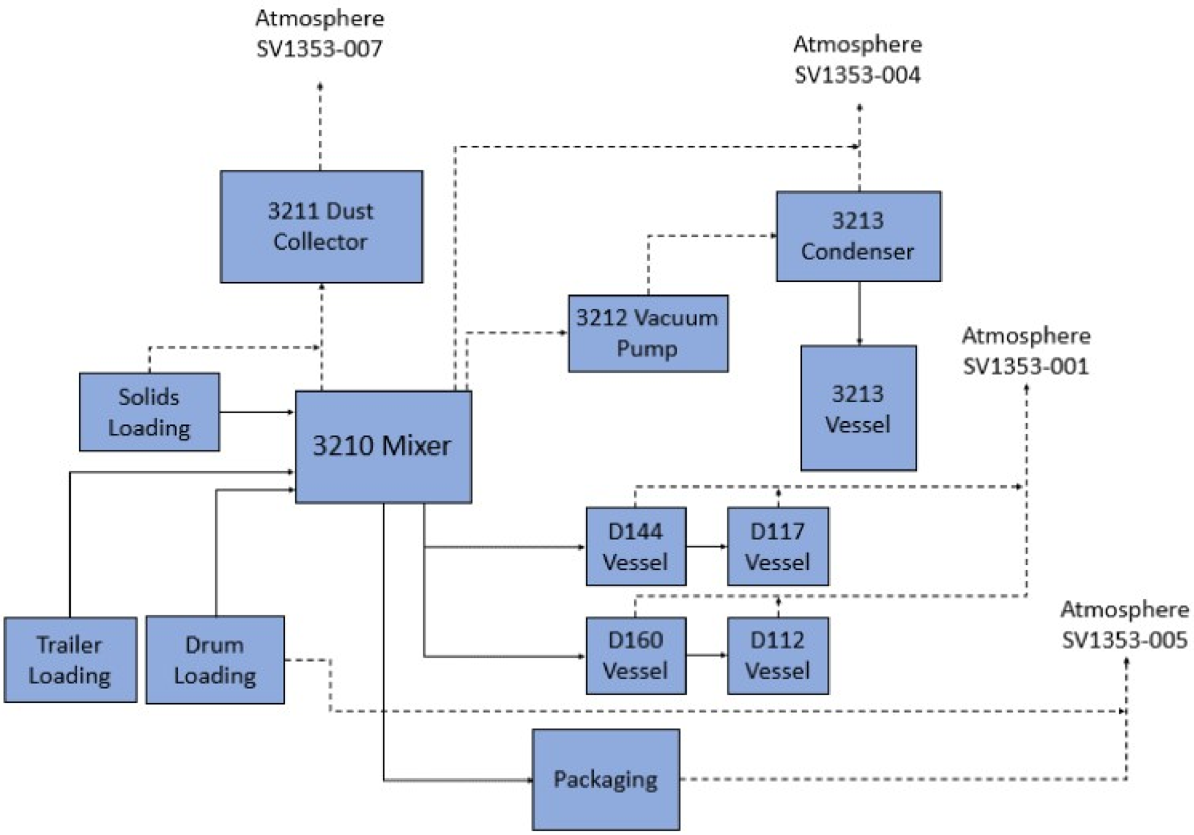
EU1353

Description:

3210 Mixer is in 1353 building, which is a batch process. This batch manufacturing process consists of a mixer, a solids loader, a drum loader, a drum off station, a vacuum pump, a dust collector, and a chilled water condenser. Typical production includes loading the mixer, reacting/heating/mixing the raw materials, removing byproducts, and packaging the finished product. Specific process steps are dependent on the product being made. Batch manufacturing can also include the use of vacuum via vacuum pumps, which emit through the chilled condenser. In addition, solvent cleanouts may be used between specific products, depending on their compatibility. Vessels D112, D117, D144, and D160 vent out SV1353-001, but are exempt from permitting per Rule 284(2)(i).

EU1353 includes a dust collector for solids handling (SV1353-007) and a chilled water condenser (SV1353-004) for emissions of volatiles from charging and process operations.

The following information is from the PTI application.



The following equipment and specified activities operate under exemptions.

Exempt Equipment or Activity	**Description**	**Exemption Rule**
Routine maintenance	**Filter changes, for example**	**285(2)(a)**
Process sampling	**Testing, inspection, etc.**	**283(2)(f)**
Vessels D112, D117, D144, and D160	**Storage/blending vessels**	**284(2)(i)**

I.Emission limits

While on site historical emission records were reviewed. The historical records in the table below were provided on November 17, 2022 and are attached. All particulate is 0.3 micron - PM10 and PM2.5 are the same value.

VOC **(12 Month rolling limit 4.3 TPY)**	**Aug 2021** **793.6 lbs**	**Jan 2022** **233.7 lbs**	**Sept 2022** **195.5 lbs**

PM10 (12 Month rolling limit 1.4 TPY)	**Aug 2021** **491.9 lbs**	**Jan 2022** **507.6 lbs**	**Sept 2022** **344.1 lbs**
PM2.5 (12 Month rolling limit 1.4 TPY)	**Aug 2021** **491.9 lbs**	**Jan 2022** **507.6 lbs**	**Sept 2022** **344.1 lbs**

II.Material Limit(s)

The ROP does not have specific material limits in special conditions for EU1353.

III.Process/Operational Restriction(s)

Operating records reviewed are summarized below. While on site real time and historical operating data records were reviewed. 15 minutes averages for the historical records in the table below were provided on November 17, and 28, 2022 and are attached.

The 1353 permitted process is a batch process with multiple production steps. Raw material loading operations into the 3210 mixer generate emissions vented to the dust collector. The 3210 mixer is closed after raw material loading. The 3212 vacuum pump supplies vacuum on the 3210 mixer and vents to the 3213 condenser. The value ranges below are for periods when 3210 mixer operations vented either to the dust collector or vented to the condenser.

Parameter	Device /ID	Date	Date	Date	Nov 10, 2022 9 -11 AM
Differential pressure (> 0.15 " H2O, < 6 " H2O)	DC3211 dust collector/321104	Aug 2, 2021 3 PM – 5 PM (1.4 to 1.6 dP)	Jan 23, 2022 2PM - 4 PM (1.5 to 1.6 dP)	Sept 11, 2022 1 AM – 3 AM (3.7 dP)	Not Running
Temperature (40 C or less exit gas)	E3213B chilled water condenser/321318	Aug 2, 2021 5PM -7 PM (23.6 to 25.5 C)	Jan 27, 2022 8 AM -10 AM (-0.8 C)	Sept 11, 2022 12 AM – 2 AM (17.4 to 20.3 C)	17.3 C
Vacuum pump	ID: 321307	Aug 2, 2021 5PM -7 PM (running 17:30-18:00)	Jan 27, 2022 8 AM -10 AM (running 8:15 – 9:15)	Sept 11, 2022 12 AM – 2 AM (running)	Not running

SC. 1. The 3212 vacuum pump status and 3213 condenser temperature records indicate the 3213 chilled water condenser maintained an exit gas temperature of 40°C or less when emissions from the 3210 Meyers mixer were vented to the 3213 condenser.

SC. 2. Dust collector differential pressure records indicate the dust collector maintained a pressure drop greater than 0.15 inches of water and less than 6 inches of water when emissions from solids loading into the 3210 Meyers mixer were vented to the 32111 dust collector.

IV. Design/Equipment parameters

SC.1 The chilled water condenser and exhaust gas temperature monitoring equipment and operating screen were viewed while on site and appeared to be installed, maintained, and operated in a satisfactory manner.

SC.2. The DC3211 dust collector and differential pressure monitoring equipment and operating screen were viewed while on site and appeared to be installed, maintained, and operated in a satisfactory manner.

V. Testing

The ROP contains a requirement to verify emissions of VOC and Particulate matter upon request of the AQD District Supervisor. No testing has been requested.

VI Monitoring/Recordkeeping

SC.1 Records review indicate the permittee completed required calculations by the last day of the calendar month, for the previous calendar month and maintained records in a format acceptable to the AQD District Supervisor. Records of emission generating production and emission estimate calculations were reviewed on site. Emission estimates are based on the number of batches made of each product. Emissions from activities performed during production of each product are used in Emission Master to establish a batch emission rate for each pollutant tracked. Most recent update of Emission Master was October 17, 2022.

PM is also determined by modeled emissions based on the number of batches based on the assumption that 1% of the total amount of filler used reaches the dust collector where a 90% capture efficiency is applied.

FROM MAERS :

The Emission Master® software generates a lb/batch emission factor for each chemical out of the inal control device for each vent. This value is based on the required data inputs of volume, ressure, temperature, etc. into the various emission models used in the program (filling loss, vent lown, purge, etc.). The Emission Master® calculations also incorporate emission reductions due to ontrol device efficiency (control devices include the 1353 Carbon Bed System, the 3213 Chilled Vater Condenser, and the 3211 Dust Collector). To calculate the total emissions for the time period such as every month), the number of batches made during the month for each product is nultiplied by the emission factor to arrive at the total emissions for each chemical.

SC. 2 Records reviewed indicate the permittee performed the required monitoring and recorded the exit gas temperature of the E-3213B chilled water condenser on a continuous basis while the 3210 Myers 10 Mixer was operating.

SC.3 Records reviewed indicate the permittee performed the required monitoring and recorded the pressure drop across the DC3211 dust collector on a continuous basis while the 3210 Myers 10 Mixer was operating.

SC.4 Records reviewed indicate the permittee completed calculations for the VOC, PM, PM10, and PM2.5 emission rates from EU1353-01 monthly, for the preceding 12-month rolling time period, using a method acceptable to the AQD District Supervisor. The required records were available and reviewed.

VII. Reporting

The facility submitted required reports. There were no ROP Deviations reported for EU1353 for the Jan - Jun 2022 period. There were no 40 CFR Part 63 Subpart FFFF MON MACT deviations reported for EU1353 for the Jan - Jun 2022 period.

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FGRULE290 - EU1353-02

Description:

EU1353-02 is a Rule 201 permit exempt processing emission unit utilizing the Rule 290 exemption option last updated April 2021.

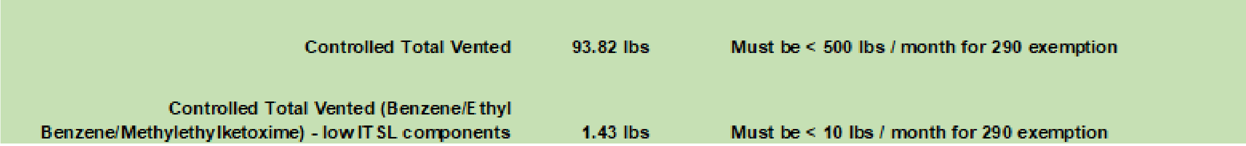
EU1353-02 consists of a twin screw extruder that produces multiple specialty adhesives for the construction, electronics, and automotive industries. Emissions from this process are controlled by three carbon beds in series (called V-180A, V-180B, and V-180C) before being emitted to the atmosphere through SV1353-001. These carbon beds utilize the following continuous monitors: weight and discharge temperature.

Emissions and records:

EU1353-02 is a controlled emission unit with pollutants in two Health Based Screening levels. R290 Chemicals Non-carcinogen VOCs and Materials in 122(f) required are to be less than 500 lbs. per month. R290 Chemicals with IRSLs > or equal to 0.4 ug/m^3 and/or ITSLs > or equal to 0.4 ug/m^3 and < 2.0 ug/m^3 are required to be less than 10 lbs. per month. Emissions tracked include benzene, ethylbenzene, methanol, methylene chloride, m-xylene, p-xylene, toluene, and n-hexane.

Emission records and calculations were reviewed on site. The emissions are based Emission Master values from each product batch and the number of batches by product each month. The facility completed all required calculations as required by the ROP (FGRULE290).

For January 2022 the facility provided the following summary in response to AQD records request:



Controlled Total Vented	93.82 lbs	Must be < 500 lbs / month for 290 exemption
Controlled Total Vented (Benzene/Ethyl Benzene/Methylethylketoxime) - low ITSL components	1.43 lbs	Must be < 10 lbs / month for 290 exemption

The following monthly and 12 month emissions were provided in response to AQD records request:

	Must be < 500 lbs / month for 290 exemption	Must be < 10 lbs / month for 290 exemption		
MONTH	Actual lbs. of emissions for <500 lbs./Mth Chemicals	Actual lbs. of emissions for <10 lbs./Mth Chemicals	12 M Rolling Average of <500 lbs./Mth Chemicals (lbs)	12 M Rolling Average of <10 lbs./Mth Chemicals (lbs)
Aug-21	173.9	1.36	99.79	2.27
Jan-22	93.8	1.43	105.90	2.57
Sep-22	102.7	1.08	87.64	2.31

Additional example records are attached.

Operations & Monitoring:

Carbon beds operate in series (two) with third carbon bed as back up. The carbon beds are located on scales. There is carbon bed weight alarm at 78 kg. The maximum weight for adequate control is 81.6 kg.

A carbon bed temperature alarm occurs at 60 C, at 75 C the system is shutdown. A 80 C limit was used for establishing adequate control.

Parameter	Device /ID	Date/Time/Range	Date/Time/Range	Date/Time/Range	
1353-02 operating status		Aug 1, 2021 1 PM -3 PM Running	Jan 26, 2022 6 -8 AM Running	Sept 1, 2022 8 – 10 PM Running	Nov 10, 2022 9-11 AM Not Running
Carbon bed A Weight (kg) (varied within range stated)	V-180A	Aug 1, 2021 1 PM -3 PM 3.28 - 4.73	Jan 26, 2022 6 -8 AM 3.8 – 4.2	Sept 1, 2022 8 – 10 PM 4.3 – 4.5	12.4
Carbon bed A exhaust temperature (C) (varied within range stated)		Aug 1, 2021 1 PM -3 PM 18.48 – 23.88	Jan 26, 2022 6 -8 AM -1.5	Sept 1, 2022 8 – 10 PM 24.3 – 28.0	14.7
Carbon bed B Weight (kg)	V-180B	Aug 1, 2021 1 PM - 3 PM	Jan 26, 2022 6 -8 AM	Sept 1, 2022 8 – 10 PM	0

(varied within range stated)		**1.55 - 3.39**	**3.5 – 3.9**	**0.2 – 0.6**	
Carbon bed B **exhaust temperature (C)** **(varied within range stated)**		**Aug 1, 2021** **1 PM -3 PM** **18.5 – 22.61**	**Jan 26, 2022** **6 -8 AM** **-1.3**	**Sept 1, 2022** **8 – 10 PM** **24.7 – 27.9**	**14.8**
Carbon bed C **Weight (kg)** **(varied within range stated)**	**V-180C**	**Aug 1, 2021** **1 PM - 3 PM** **45.6 – 46.78**	**Jan 26, 2022** **6 -8 AM** **43.4 – 43.8**	**Sept 1, 2022** **8 – 10 PM** **60.9 – 62.1**	**0.1**
Carbon bed C **exhaust temperature (C)** **(varied within range stated)**		**Aug 1, 2021** **1 PM - 3 PM** **18.8 – 23.16**	**Jan 26, 2022** **6 -8 AM** **-1.5**	**Sept 1, 2022** **8 – 10 PM** **24.5 – 28.0**	**14.2**

Reporting:

The facility submitted required reports. There were no ROP Deviations reported for EU1353-2 for the Jan - Jun 2022 period. There were no 40 CFR Part 63 Subpart FFFF MON MACT deviations reported for EU1353-02 for the Jan - Jun 2022 period.

NAME Kathy Brewer DATE 12/8/2022 SUPERVISOR Chris Hare