

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Scheduled Inspection

A404323809

FACILITY: Dow Corning - Midland Plant		SRN / ID: A4043
LOCATION: 3901 S Saginaw Rd, MIDLAND		DISTRICT: Saginaw Bay
CITY: MIDLAND		COUNTY: MIDLAND
CONTACT: Mike Gruber , Air & Water Team Leader		ACTIVITY DATE: 12/05/2013
STAFF: Jennifer Lang	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MEGASITE
SUBJECT: EU325-01, FG325-01, FG322-01 & FG322SCRUBBERS - Scheduled Inspection		
RESOLVED COMPLAINTS:		

Inspection date: 12/5/13
Inspection started: 9:00 am
Inspection ended: 12:15 pm

Dow Corning and MDEQ-AQD staff present during the inspection.

Jenny Lang (MDEQ-AQD, Environment Engineer Specialist)
Steve Moser (Dow Corning, Assistant General Council)
Mike Gruber (Dow Corning, Air & Water Team Leader)
Sara Bennett (Dow Corning, Air Quality Engineer)

EU325-01

Compliance Status: Compliance

Items noted during the inspection.

1. EU325-01 is the TCS (trichlorosilane) vent recovery system. EU325-01 receives vents from different processes to recover TCS. This emission unit typically vents to the carbon bed and venturi scrubber system described in FG325-01, however, the emission unit may vent to the 337 scrubber in the event the venturi scrubber system is down.
2. According to Dow Corning (DC), EU325-01 is not subject to the MON (40 CFR Part 63, Subpart FFFF) or the HCI MACT (40 CFR Part 63, Subpart NNNNN).
3. Air Permit to Install (PTI) No. 44-06A covers EU325-01 and FG325-01. This permit was issued on 6/1/09. ROP modification application no. 200900104 was received by the MDEQ-AQD on 7/16/09. This application covers the addition of PTI 44-06A to ROP No. MI-ROP-A4043-2008 (hereinafter "ROP"). To date, the PTI has not been rolled into the ROP.
4. Condition no. IX.1 of table EU325-01 of PTI 44-06A states, DC shall not operate the process unless either carbon bed bank no. 1 (carbon bed nos. 20587, 20588 and 20589) or carbon bed bank no. 2 (carbon bed nos. 22200, 22205 and 22210) are installed and operating properly. At the time of my inspection, both carbon bed banks were receiving process vents. For discussion regarding operation of carbon bed bank nos. 1 and 2, see discussion below in FG325-01.
5. Condition no. IX.2 of table EU325-01 of PTI 44-06A states, DC shall not operate the process unless either venturi scrubber bank no. 1 (venturi scrubber nos. 9956, 9957 & 9958), venturi scrubber bank no. 2 (venturi scrubber nos. 22245-1, 22245-2 & 22245-3) or the 337 scrubber are installed and operating properly. At the time of my inspection, venturi scrubber bank no. 2 (i.e., the south venturi scrubber bank) was receiving emissions from carbon bed bank nos. 1 and 2. For discussion regarding operation of venturi scrubber bank no. 2, see discussion below in FG325-01.

FG325-01

Compliance Status: Compliance

1 of 8

Items noted during the inspection.

1. Condition no. VI.1 of table FG325-01 of PTI 44-06A states, while venting to carbon bed bank no. 1, DC shall monitor and record, on a continuous basis (i.e., an instantaneous data point recorded at least once every 15 minutes), the concentration of chlorosilanes from carbon bed bank no. 1. Condition no. III.1 of the same table in the PTI states, if the concentration of chlorosilanes from carbon bed bank no. 1 exceeds 100 ppm by volume (ppmv), except during startup and shutdown periods, the permittee shall implement corrective action and maintain a record of action taken to prevent reoccurrence.

At 11:29 am, at 325 building (i.e., the control room for carbon bed bank nos. 1 and 2), I observed the following chlorosilane concentration on the outlet of carbon bed no. 1. Matt Weber, DC 325 Operations Leader provided the data.

- Carbon bed bank no. 1 (i.e., carbon bed 325) = 6.8 ppmv (instantaneous)

At the time of my inspection, carbon bed no. 20587 was adsorbing, carbon bed no. 20588 was in standby, and carbon bed no. 20589 was regenerating or desorbing. According to Matt, the beds are on a 5-hour regeneration cycle. A FTIR device is used to continuously monitor the chlorosilane concentration from the carbon bed bank.

2. According to Matt Weber of DC, the carbon bed banks run in parallel. Most of the vent emissions are received by carbon bed bank no. 2 (carbon bed 327). Matt stated carbon bed 325 is flow controlled, while carbon bed 327 is pressure controlled. During the inspection, I observed the following flow and pressure readings.

- Carbon bed 325 (bank no. 1) = 400 CFM (instantaneous)
- Carbon bed 327 (bank no. 2) = 10 psig (instantaneous)

Matt further stated that emissions from the carbon beds are vented to either venturi scrubber bank no. 1, venturi scrubber bank no. 2, or the 337 scrubber (FG337SCRUBBER). At the time of my inspection, venturi scrubber bank no. 2 (i.e., the south venturi scrubber bank) was receiving emissions from the carbon beds.

3. Condition no. VI.2 of table FG325-01 of PTI 44-06A states, while venting to carbon bed bank no. 2, DC shall monitor and record, on a continuous basis (i.e., an instantaneous data point recorded at least once every 15 minutes), the concentration of chlorosilanes from carbon bed bank no. 2. Condition no. III.1 of the same table in the PTI states, if the concentration of chlorosilanes from carbon bed bank no. 2 exceeds 100 ppm by volume (ppmv), except during startup and shutdown periods, the permittee shall implement corrective action and maintain a record of action taken to prevent reoccurrence.

At 11:29 am, at 325 building (i.e., the control room for carbon bed bank nos. 1 and 2), I observed the following chlorosilane concentration on the outlet of carbon bed no. 2. Matt Weber, DC 325 Operations Leader provided the data.

- Carbon bed bank no. 2 (i.e., carbon bed 327) = 7.4 ppmv (instantaneous)

At the time of my inspection, carbon bed no. 22205 was adsorbing. Matt stated that carbon bed no. 22210 was off-line and was expected to be back up and running next week. Therefore, at the time of my inspection, DC only had two carbon beds adsorbing and desorbing on bank no. 2. According to Matt, the beds are on a 5-hour regeneration cycle. A FTIR device is used to continuously monitor the chlorosilane concentration from the carbon bed bank.

4. Condition no. VI.3 of table FG325-01 of PTI 44-06A states, while venting to scrubber bank no. 1 (i.e., north scrubber bank), permittee shall monitor and record, on a continuous basis (i.e., an instantaneous data point recorded at least once every 15 minutes), the following operational parameters with instrumentation acceptable to the AQD.

- The liquid flow rate for venturi scrubber nos. 9956, 9957, and 9958, respectively.

2 of 8

- The concentration of HCl in the outlet water from venturi scrubber no. 9958.

At the time of my inspection, the carbon beds were venting to the south scrubber bank (scrubber bank no. 2). Therefore, I did not observe operational parameters for the north scrubber bank (scrubber bank no. 1).

- Condition no. VI.4 of table FG325-01 of PTI 44-06A states, while venting to scrubber bank no. 2 (i.e., south scrubber bank), permittee shall monitor and record, on a continuous basis (i.e., an instantaneous data point recorded at least once every 15 minutes), the following operational parameters with instrumentation acceptable to the AQD.
 - The liquid flow rate for venturi scrubber nos. 22245-1, 22245-2, and 22245-3, respectively.
 - The concentration of HCl in the outlet water from venturi scrubber no. 22245-3.

At 11:33 am, at 325 building (i.e., the control room for venturi scrubber bank nos. 1 and 2), I observed the following operational parameters for venturi scrubber bank no. 2. Matt Weber, DC 325 Operations Leader provided the data.

Operational Parameter	Observed Value
Liquid flow rate for venturi scrubber no. 22245-1	29.3 gpm (instantaneous)
Liquid flow rate for venturi scrubber no. 22245-2	14.7 gpm (instantaneous)
Liquid flow rate for venturi scrubber no. 22245-3	16.5 gpm (instantaneous)
HCl outlet concentration from venturi scrubber no. 22245-3	0.02 % by weight (instantaneous)

Condition no. III.3 of table FG325-01 of PTI 44-06A states, while venting to scrubber bank no. 2 (i.e., south scrubber bank), if the liquid flow rate of venturi scrubber nos. 22245-1, 22245-2 and 22245-3 is less than 10 gpm, respectively, the permittee shall implement corrective action and maintain a record of action taken to prevent reoccurrence. Condition no. IX.1 of the same table in the PTI states, in part, the concentration of HCl in the outlet water from venturi scrubber no. 22245-3 shall not exceed 10% by weight.

- According to Matt Weber, venturi scrubber bank nos. 1 and 2 are not switched on a routine basis. Matt stated switching of these air pollution control devices is operationally driven. Matt also stated that 3 scrubber nozzles were added to the stack of venturi scrubber bank no. 1 (north scrubber bank). DC considers this addition an emergency scrubber for emergency shutdown events.
- Condition no. VI.5 of table FG325-01 of PTI 44-06A states, DC shall maintain the following records:
 - A record of process streams vented to the 337 scrubber during malfunction of the venturi scrubbers (venturi scrubber nos. 9956, 9957, 9958, 22245-1, 22245-2 and 22245-3).
 - For each calendar month, the number of hours process exhaust gas streams vent to the 337 scrubber.
 - For the 12-month rolling time period, as determined at the end of each calendar month, the total number of hours process exhaust gas streams vent to the 337 scrubber.

During the inspection, I asked for the 12-month rolling time period records through October 2013. On 12/6/13, I received the requested data (see attached). According to the data, the 12-month rolling total from November 2012 through October 2013 was 0 hours. Condition no. IX.2 of the same table in the PTI states, in the event of a malfunction of venturi scrubber nos. 1 and 2, emissions from the process (after the carbon bed system) shall be controlled by the 337 main scrubber. The HCl emission rate from the process before entering the 337 main scrubber shall not exceed 1490 pounds per hour. DC shall not operate the process in this mode for more than 48 hours per calendar month, nor 144 hours per 12-month rolling time period as determined at the end of each calendar month. I did not ask for data pertaining to the 1490 lb/hr HCl emission rate from the carbon bed system before entering the 337 main scrubber as there is no requirement in the PTI to monitor and record this information.

3 of 8

- Condition no. IX.3 of table FG325-01 of PTI 44-06A states, DC shall equip and maintain the carbon bed system (carbon bed bank nos. 1 and 2) with a monitor capable of detecting carbon breakthrough which has been defined as greater than 100 ppm. Compliance with this requirement is discussed in item nos. 1 and 3 above. The condition further goes on to state that if breakthrough is detected, except during startup or shutdown periods, DC shall record the date, time, duration, corrective action taken and actions taken to prevent recurrence. During the inspection, I requested 2013 breakthrough records. On 12/6/13, I received the requested record (see attached). According to the record, to date, in calendar year 2013, there have been no carbon breakthrough events (i.e., concentrations greater than 100 ppmv) on the carbon bed system.

FG322-01

Compliance Status: Compliance

Items noted during the inspection.

- FG322-01 covers all three individual vinyl chlorosilane production processes and associated scrubber to allow for operational flexibility. The VOC emission limits for FG322-01 are for the combination of all three processes as measured coming out of vent no. SV322-04.
- There appeared to be a typo in table FG322-01 of the ROP for scrubber no. 22452. In some conditions within the table, the scrubber was labeled "scrubber no. 22425". DC staff confirmed in the control room for this scrubber that 22452 is the correct number. The control room for the scrubber is located in 322 building.
- DC staff confirmed that FG322-01 is subject to the MON. They further stated that there a no Group 1 control devices associated with this flexible group.
- In the ROP renewal application, DC requested that FG322SCRUBBERS be eliminated and combined with FG322-01.
- Condition no. V.1 of table FG322-01 of the ROP requires DC to verify the VOC and xylene emission rates from FG322-01 by testing on or before six months of the ROP expiration date. The ROP expired on 9/15/13.

DC performed testing for xylene on 3/23/12. EU322-04 in FG322-01 is the only emission unit with a xylene emission limit. According to the results, the average xylene emission rate measured during testing was 0.0020 lbs/hr. Condition no. I.3 of table FG322-01 of the ROP limits xylene emissions from EU322-04 to 2.6 lbs/hr. The average liquid flow rate of scrubber no. 22452 during the test was 13.83 gpm.

DC performed testing for VOC on 5/22/12. According to the results, the average VOC emission rate measured during testing was 23.502 lbs/hr. Condition no. I.1 of table FG322-01 of the ROP limits VOC emission from FG322-01 to 65.1 lbs/hr. The average coolant exit temperature for condenser no. 6379 during the test was -11.73 degrees C. The average liquid flow rate of scrubber no. 22452 during the test was 14.12 gpm.

DC staff and I discussed the possibility of using the operational parameter values recorded during testing for the condenser and the scrubber under CAM (40 CFR Part 64) in the ROP renewal permit for FG322-01.

- Condition no. VI.1 of table FG322-01 of the ROP requires DC to monitor and record, on a continuous basis (i.e., an instantaneous data point recorded at least once every 15 minutes), the exit coolant temperature of condenser no. 6379. This condenser is only associated with EU322-01. Condition no. III.1 of the same table in the ROP states the exit coolant temperature of condenser no. 6379 shall not exceed 5 degrees C.

At 11:49 am, at 322 building (i.e., the control room for condenser no. 6379), I observed the following exit coolant temperature for the condenser. Ryan Shuman, DC Vinyl Manufacturing Engineer provided the data.

Operational Parameter	Observed Value	Alarm Set Point
Condenser no. 6379	-14.5 degrees C (instantaneous)	High = 3 degrees C High - High = 5 degrees C

4 of 8

- Condition no. VI.2 of table FG322-01 of the ROP requires DC, within 30 days following 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 specified in table FG322-01. Condition no. I.4 of same table in the ROP limits VOC emissions to 86.6 tpy, based on a 12-month rolling time period as determined at the end of each calendar month. During the inspection, I requested the calculated 12-month rolling VOC emission estimate through October 2013. On 12/6/13, I received the requested data (see attached). According to the data, the 12-month rolling total VOC emissions from November 2012 through October 2013 was 47.44 tons.

FG322SCRUBBERS

Compliance Status: Compliance

Items noted during the inspection.

- Condition no. VI.1 of table FG322SCRUBBERS of the ROP requires DC to monitor and record, on a continuous basis (i.e., an instantaneous data point recorded at least once every 15 minutes), the liquid flow rate of scrubber no. 22452. Condition no. III.1 of the same table in the ROP states the liquid flow rate of scrubber no. 22452 shall not be less than 10.0 gpm.

At 11:54 am, at 322 building (i.e., the control room for scrubber no. 22452), I observed the following operational parameters for the scrubber. Ryan Shuman, DC Vinyl Manufacturing Engineer provided the data.

Operational Parameter	Observed Value	Alarm Set Point
Scrubber no. 22452 – 1 st stage - venturi	11.84 gpm (instantaneous)	Did not ask for this alarm set point.
Scrubber no. 22452 – 2 nd stage – tray/spray tower	8.99 gpm (instantaneous)	Did not ask for this alarm set point.
Scrubber no. 22452 – combined liquid flow rate	20.83 gpm (instantaneous)	Low – Low = 12 gpm

NAME *J. J. J.*

DATE 12/9/13

SUPERVISOR *C. Aare*

5 of 8

Lang, Jennifer (DEQ)

From: steve.moser@dowcorning.com
Sent: Friday, December 06, 2013 11:21 AM
To: Lang, Jennifer (DEQ)
Cc: mike.gruber@dowcorning.com; sara.bennett@dowcorning.com
Attachments: Permit and Exemption References for Certain EUs in FG322-01 and FG325-01 Conditions Information.pdf

Jennifer,

Attached is the information you requested during your inspection yesterday. Please note that we have included the "data" responses for FG325-01 in the same document as the data for FG322-01 since those responses are essentially "none" or "zero."

Per your original schedule, we will expect to see you again next Wednesday, December 11. Be safe.

Stephen V. Moser
Assistant General Counsel
Dow Corning Corporation
2200 W. Salzburg Rd. - CO1282
PO Box 994
Midland, MI 48686-0994
Phone: 989-496-5843
Fax: 989-496-6663
Email: steve.moser@dowcorning.com

Response to email request dated 11/25/2013 from Jennifer Lang, MDEQ, to Michael Gruber, Dow Corning Midland Plant

These EUs were listed in FGHAP2012A2A for PTI 91-07D. Are these EUs permitted or exempt?

Emission Units	Permit No.	Exemption Rule
EU2404-01		284d
EU2409-01		284d
EU2409-02		284g
EU2701-01	209-73A	
EU303-04		282b
EU3104-14		283 and 290
EU322-01 now part of FG322-01	242-07	
EU322-02 now part of FG322-01	242-07	
EU324-05		284i
EU325-04		282b
EU501-15		284i
EU501-17		284i
EU501-40		282b
EU508-03		282b
EU604-10		282b
EUSITE-05		287 j, 285i, 285lvi
EUSITE-08		287 j, 285i, 285lvi

DC 006043

Data Requested During 12/6/2013 Inspection

- A. **FG322-01 (ROP Mark-up Condition VI.3.)**
12-Month Rolling VOC Emissions for FG322-01:
Permit Limit = 86.6 TPY

Mo-Yr	12-Month Rolling Totals	
	VOC Emissions (lbs)	VOC Emissions (tons)
Nov-12	97,891.30	48.95
Dec-12	99,834.50	49.92
Jan-13	95,649.40	47.82
Feb-13	98,115.10	49.06
Mar-13	105,537.90	52.77
Apr-13	102,178.60	51.09
May-13	98,723.30	49.36
Jun-13	101,695.40	50.85
Jul-13	97,361.60	48.68
Aug-13	89,468.40	44.73
Sep-13	93,042.50	46.52
Oct-13	94,875.60	47.44

- B. **FG325-01 (ROP Mark-up Condition VI.5.)**
Process Streams Vented to the 337 Scrubber During Malfunction of the Venturi Scrubbers:

For each calendar month and 12-month rolling total from November 2012 - October 2013, the number of hours (and process streams) venting to 337 scrubber (backup to venturi scrubber system) = 0.

- C. **FG325-01 (ROP Mark-up Condition IX.3.)**
Record of Carbon Breakthrough:

To date, in calendar year 2013, there has been no carbon breakthrough (greater than 100 ppm) on the carbon bed system.