

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

A404362904

FACILITY: Dow Silicones Corporation		SRN / ID: A4043
LOCATION: 3901 S Saginaw Rd, MIDLAND		DISTRICT: Bay City
CITY: MIDLAND		COUNTY: MIDLAND
CONTACT: Amanda Karapas , Air Specialist		ACTIVITY DATE: 05/18/2022
STAFF: Gina McCann	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MEGASITE
SUBJECT: EU515-01		
RESOLVED COMPLAINTS:		

Dow Silicones/EGLE-AQD staff present during the inspection:

- Gina McCann (EGLE-AQD, Environmental Specialist)
- Amanda Karapas (Dow MiOps, Air Specialist)
- Christine Mason (Dow Silicones, 515 Production Engineer)
- Matt Weber (Dow Silicones, 515 production Engineer)

This inspection covered one emission unit, EU515-01. This emission unit was recently re-permitted under PTI 812-91D and the ROP modification received May 12, 2022. Dow Silicones Corporation (DSC) entered into a Consent Decree (19-11880) with U.S. EPA on January 24, 2020. The Consent Decree required DSC to update affected air permits at the site to ensure full compliance with the 40 CFR Part 63 Subpart FFFF (MON MACT) requirements including the consideration of trace chemicals discovered in certain raw materials.

EU515-01

This emission unit involves all activities associated with production, storage and transfer of Phenylmethyldichlorosilane (PhMeSiCl₂) and Diphenylmethylchlorosilane (Ph₂MeSiCl). The unit has several different vent paths it can take. While the MgCl₂ slurry is drying, MgCl₂ is being pulled off and enters into the 456 MgCl₂ bin. Emissions can vent to the 456 MgCl₂ bin baghouse (10457) and then out SV515-002. This stack vent has monthly visible emission monitoring required, during routine operation, rather than a continuous monitoring requirement. During the inspection we viewed the area monthly readings will take place. Since the permit was newly issued, monthly monitoring required by special condition (SC) VI.7., has not yet been established.

From the MgCl₂ bin the process proceeds to 515 MgCl₂ quenching and then either to drum off or trailer loading. Emissions via drum off are controlled by carbon drums before exiting via SV515-006. During the inspection we viewed the shed where the carbon drums are housed. There are (2) two banks with (4) four drums per bank. Each bank has a separate scale. The carbon drum banks operate in series. Emissions enter into either the North or South bank depending on which bank is primary and secondary. When the primary bank becomes spent, those drums are replaced. While those drums are being replaced the secondary bank will be switched to be the primary bank and the bank with the new, replaced, drums become the secondary bank.

The MgCl₂ drying process has another vent path. From the MgCl₂ drying process emissions vent to the DV22979 bag filter and DV22981 Bag Filter. These bag filters are mainly in place to keep particulate out of the downstream equipment. Currently SV515-001 is in line from these bag filters, though it was removed from the PTI and is no longer used by EU515-01. During the

inspection we viewed this vent and its associated piping. I was able to see the valve was closed and emissions were venting to the 10453 condenser. The plant will put in a work order at the end of the month, when they apply their management of change process related to the issuance of the new PTI, to remove this vent completely. The valve and piping should be permanently removed in approximately 6 months.

The emissions continue venting through the bag filters to condenser 10453, then condenser 10541, where toluene is recovered. Lastly, the remaining toluene emissions are scrubbed using the toluene scrubber 10530 and then vented out either FGTHROX or FGSITESCUBBERS, whichever is online. If the process diverts from FGTHROX it will be directed to FGSITESCUBBERS and the startup, shutdown, malfunction (SSM) plan followed. SSM shutdown takes approximately (12) twelve to (18) eighteen hours for the process to stop. The reactors will need all material reacted to safely shutdown. This will no longer be an option with the SSM provisions being removed from the MON effective August 2023.

Lastly, emissions have a venting option from distillation and column to condenser 10657. This condenser is only used when the process is not venting to FGTHROX. This condenser will be started up when the process alarms due to diversion from FGTHROX. This is part of the SSM plan and will likely no longer be an option when the SSM provisions are no longer available.

Special condition (SC) I.2. restricts VOC emissions to 20.16 ton per year (tpy) based on a 12-month rolling time period as determined at the end of each calendar month. SC VI.8 is the associated monitoring and recordkeeping requirement that requires the plant to calculate and keep, in a satisfactory manner, records of monthly and 12-month rolling time period VOC emissions for EU515-01 using production records, operating records, and/or other data acceptable to the AQD District Supervisor. For the 12-month rolling time period ending March 2022, VOC emissions were 1.80 tpy.

Emissions are controlled by the devices listed in the table below. Process and operational restrictions for each of the equipment ensures emissions are collected efficiently. SC III.1. restricts operation of EU515-01 unless the control devices operate as listed below.

	Required control device	Operating Parameter
a.	DV22979 Bag Filter	Pressure drop is between 0.5 and 75 inches of water
b.	DV22981 Bag Filter	Pressure drop is between 0.5 and 75 inches of water
c.	HX-10453 Condenser	Coolant supply temperature is -5°C or less
d.	HX-10541 Condenser	Coolant supply temperature is -5°C or less

	Required control device		Operating Parameter
e.	HX-10657 Condenser		Liquid flow rate is 100 gpm or more ^A
f.	DV10530 Scrubber	Toluene	Exhaust air temperature is -5°C or less
g.	FGTHROX		As specified in FGTHROX
h.	MgCl ₂ Carbon Drum		Carbon bed weight gain is not more than 80 kg per carbon drum bank

^A Compliance with this parameter is not required while EU515-01 is venting to FGTHROX.

Each of the monitoring parameters has associated monitoring and recordkeeping requirements. SC VI.2. requires the plant to monitor and record, on a continuous basis, the pressure drop across DV22979 and DV22981 Bag Filters with instrumentation acceptable to the AQD District Supervisor. For the purposes of this condition, “on a continuous basis” is defined as an instantaneous data point recorded at least once every 15 minutes. The plant may record block average values for 15 minute or shorter periods calculated from all measured data values during each period. I reviewed pressure drop across each bag filter for the time period January 1, 2021 through May 16, 2022. This review covered two permits, 812-91C and 912-91D. SC III.3. and III.4. of the previous permit (812-91C) restricted venting to atmosphere unless within the appropriate operating ranges. This vent restriction was on SV515-001. As described above, this vent is no longer used and was removed from the current permit, 812-91D. The current restriction requires the pressure differential regardless of vent path. Monitoring and recordkeeping were reviewed for both permits and the plant operated within the required parameters.

SC VI.3. requires the plan to monitor and record, on a continuous basis, the coolant supply temperature of Condensers HX-10453 and HX-10541 with instrumentation acceptable to the AQD District Supervisor. For the purposes of this condition, “on a continuous basis” is defined as an instantaneous data point recorded at least once every 15 minutes. The plant may record block average values for 15 minute or shorter periods calculated from all measured data values during each period. These condensers are in line with the same coolant supply line. Therefore, the coolant supply temperature is the same for each and is monitored as such. I reviewed the coolant supply temperature for the timeframe January 1, 2021 through May 16, 2022. The only timeframe of potential deviations was in September, which was during annual FGTHROX turnaround time. The process was not in operation during this time. Therefore, the plant was in compliance with this requirement.

SC III.1.e. restricts operation of EU515-01, while not venting to FGTHROX or FGSITESCRUBBERS, unless the liquid flow rate of condenser HX-10657 is 100 gpm or greater. SC VI.4 is the associated monitoring and recordkeeping requirement that requires the liquid flow rate of condenser HX-

10657 to be monitored and recorded when EU515-01 is not venting to FGTHROX. This is the condenser that is used as part of the SSM plan while shutdown occurs and it does not operate often. I reviewed liquid flow rates for the time period starting January 1, 2021 through May 16, 2022. There were a few times when the condenser was below the required 100 gpm. However, further investigation into the status of the process showed the process was not in operation during these time periods. Therefore, the plant is in compliance with this requirement.

During routine operations, the preferred vent path is through the 22979/22981 bag filters, condenser 10453, condenser, 10541, and then the toluene scrubber 10530. The toluene scrubber serves as a final control to remove emissions prior to venting to FGTHROX or FGSITESCRUBBERS. The toluene scrubber is required to operate with an exhaust air temperature at -5°C or less. SC VI.5. is the associated monitoring and record keeping requirement that requires the plan to monitor and record, on a continuous basis, the exhaust air temperature of Toluene Scrubber DV10530 with instrumentation acceptable to the AQD District Supervisor. For the purposes of this condition, “on a continuous basis” is defined as an instantaneous data point recorded at least once every 15 minutes. The plant may record block average values for 15 minute or shorter periods calculated from all measured data values during each period. The plant tracks multiple parameters to ensure compliance with this requirement. In addition to the exhaust air temperature, the plant monitors additional parameters that determine if the process was in operation and if the process was venting to FGTHROX. I reviewed records for the time period January 1, 2021 through May 16, 2022. The toluene scrubber operated outside of the required exhaust air temperature during the timeframe of September 10, 2021 through October 3, 2021. DSC has a site-wide turnaround during this timeframe for maintenance on FGTHROX. The plants will typically utilize this timeframe to perform maintenance at the plant level as well. Looking at the timeframe September 10, 2021 through October 3, 2021, the process was down for FGTHROX maintenance and maintenance on the Phenylmethyldichlorosilane process.

Once the product is ready for packaging, it will be either loaded via trailer or drummed off. The carbon drums described above capture emissions during this phase of the process. The carbon drum banks operate in series. Emissions enter into either the North or South bank depending on which bank is primary and secondary. When the primary bank becomes spent, those drums are replaced. While those drums are being replaced the secondary bank will be switched to be the primary bank and the bank with the new, replaced, drums become the secondary bank.

SC III.1.h. restricts operation of EU515-01 unless the carbon bed weight gain is not more than 80 kg per carbon drum bank. SC VI.6. is the associated monitoring and recordkeeping requirement that requires the plant to monitor and record, on a continuous basis, the weight of each MgCl₂ Carbon Drum carbon drum bank with instrumentation acceptable to the AQD District Supervisor. For the purposes of this condition, “on a continuous basis” is defined as an instantaneous data point recorded at least once every 15 minutes. The plant may record block average values for 15 minute or shorter periods calculated from all measured data values during each period. This is a new requirement in the PTI series. PTI 812-91D was issued April 7, 2022 and the ROP modification received May 12, 2022. Since the inspection occurred on May 18, 2022, the plant did not have a full month of records to review. However, monitoring and recordkeeping was in place and being implemented.

The Table 1 shows the operating parameters observed during the inspection.

Table 1			
Pollution Control Device	Operational Restriction	Instantaneous Reading Observed During Inspection	Secure Process Alarm (SPA)
DV22979 Bag Filter	Pressure drop is between 0.5 and 75 inches of water ("W.C.)	0 "W.C.	2.00-65.00
DV22981 Bag Filter	Pressure drop is between 0.5 and 75 "W.C.	0 "W.C.	2.00-65.00
HX-10455 Condenser	Coolant supply temperature is -5°C or less	-23°C	-10°C
HX-10541 Condenser	Coolant supply temperature is -5°C or less	-23°C	-10°C
HX-10657 Condenser	Liquid flow rate is 100 gpm or more	0 gpm	115 gpm
DV10530 Toluene Scrubber	Exhaust air temperature is 5°C or less	18°C	-10°C
MgCl ₂ Carbon Drums	Carbon bed weight gain is not more than 80 kg per carbon bank	North (primary) 19.6 kgs South (secondary) 0.4 kgs	75.00 kg

*Process was not in operation during the inspection.

Additionally, the plant is required to equip and maintain each of the control devices with an appropriate instrument to monitor the required parameters. During the inspection we viewed each of the control devices and the associated monitoring devices.

Along with confirming the equipment is installed and operating in a satisfactory manner, emission control efficiency is determined by properly maintaining the equipment. Table 2

identifies the dates associated with calibrations on the transmitters. Routine calibrations are being performed. Table 2 identifies the dates associated with calibrations on the transmitters. Routine calibrations are being performed.

Table 2

Unit	Equipment	Date
		6/11/2020
DV22979 Bag Filter	14547	6/09/2021
		6/11/2020
		3/12/2020
DV22981 Bag Filter	14572	10/14/2020
		6/9/2021
		8/8/2020
HX-10455 Condenser	561	7/30/2021
		8/8/2020
HX-10541 Condenser	561	7/30/2021
HX-10657 Condenser		Did not request
DV10530		8/8/2020
	1263	
Toluene Scrubber		7/30/2021
MgCl2 Carbon Drums		New Requirement

		as of 5/12/2022
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Compliance Reporting

I reviewed the annual ROP deviation report and a few deviations were identified for EU515-01. Two deviations were identified during an EGLE inspection and with the issuance of PTI 812-91D, the deviations were resolved. Another deviation was due to vents diverting from FGTHROX. When the plant diverts from FGTHROX they implement the SSM plan. This requires time to fully implement and during this time, the process vents will not achieve Group 1 MON MACT level of control. The site is currently working on installing a back-up air pollution control device that will meet Group 1 control requirements.

NAME



DATE

5/26/2022

SUPERVISOR

