



REGION 5

CHICAGO, IL 60604

MEMORANDUM

SUBJECT: CLEAN AIR ACT INSPECTION REPORT
Hexion Inc., Sheboygan, Wisconsin

FROM: Natalie Schulz, Environmental Engineer
AECAB (MN/OH)

THRU: Brian Dickens, Section Supervisor
AECAB (MN/OH)

TO: File

BASIC INFORMATION

Facility Name: Hexion Inc.

Facility Location: 2522 S 24th Street, Sheboygan, Wisconsin 53081

Date of Inspection: March 11, 2024

EPA Inspector(s):

1. Natalie Schulz, Environmental Engineer
2. Dakota Prentice, Environmental Engineer
3. Justin Smith, Environmental Engineer

Other Attendees:

1. Jeff Tomchak, Interim Site Lead, Hexion Inc.
2. Jake Remo, Project Engineer, Hexion Inc.
3. Matt Jalbert, Maintenance Lead, Hexion Inc.
4. Cheryl Ann Tomchak, Regional Quality Manager
5. Jenna Kouba, Wisconsin DNR

Contact Email Address: Rebecca.Truka@hexion.com

Purpose of Inspection: Evaluate compliance with VOC and HAP emission requirements in permit

Facility Type: Formaldehyde and resin manufacturing

Facility Name: Hexion Inc.
Facility Location: 2522 S 24th Street, Sheboygan, WI
Date of Inspection: March 11, 2024

Regulations Central to Inspection: Synthetic Minor Operation Permit No. 460041670-F10, expired in 2014. Permit application submitted to Wisconsin DNR.

Permit requirements include:

Process Gas Boiler, B20

A.1.a.(1) 98% destruction by weight, or 20 parts per million by volume of exhaust gas on a dry basis, corrected to 3% O₂, whichever is less stringent.

A.1.a.(2) The permittee shall operate one or more boilers at all times that formaldehyde plant #1 or #2 or resin process is in operation except during bypass. Bypass shall not exceed 6,000 minutes per plant in any 12 consecutive calendar months (s. 285.65(7), Wis. Stats.) and permit number 94-POY-008.

A.2.a.(1)(a) Meet the formaldehyde emission limit exiting the boilers of 0.08 pound per hour. This is an aggregated limit, not a per boiler limit. This limit does not apply during the allowable 6,000 minutes of bypass.

Process Gas Boiler, B21

B.1.a.(1) 98% destruction by weight, or 20 parts per million by volume of exhaust gas on a dry basis, corrected to 3% O₂, whichever is less stringent.

B.2.a.(1)(a) Meet the formaldehyde emission limit exiting the boiler of 0.08 pound per hour. This is an aggregated limit, not a per boiler limit. This limit does not apply during the allowable 6,000 minutes of bypass.

B.2.a.(2) The permittee shall operate one or more boilers at all times that formaldehyde plant #1 or #2 or resin process is in operation except during bypass. Bypass shall not exceed 6,000 minutes per plant in any 12 consecutive calendar months (s. 285.65(7), Wis. Stats.), permit number 94-POY-008 and 8/17/2005 exemption letter.

Component Fugitive Emissions

H.1.a.(1) For components in light liquid or gas/vapor service, the permittee shall visually inspect and/or monitor fugitive VOC equipment leaks at a level of 10,000 ppm (s. NR 440.62, Wis. Adm. Code).

H.1.a.(2) For components in heavy liquid service, evidence of potential leaks will be found by visual, audible, olfactory, or any other detection method (s. NR 440.62, Wis. Adm. Code).

H.1.b.(1) The permittee shall detect and repair fugitive VOC equipment leaks according to NR 440.62(3) and (4) which is reproduced below. Definitions of terms found in NR 440.62(3) and (4) are in Appendix A of this permit (s. NR 407.09(4)(a)3.b., Wis. Adm. Code).

The facility has elected to comply with the alternate compliance option of 40 CFR Part 65 in lieu of NSPS III.

Arrival Time: 1:00 p.m. central

Departure Time: 3:30 p.m. central

Inspection Type:

- ☒ Unannounced Inspection
- ☐ Announced Inspection

OPENING CONFERENCE

- ☒ Presented Credentials
- ☒ Stated authority and purpose of inspection
- ☒ Provided Small Business Resource Information Sheet
- ☐ Small Business Resource Information Sheet not provided.
- ☒ Provided CBI warning to facility

The following information was obtained verbally from the Hexion staff members listed above unless otherwise noted.

Process Description:

The facility receives 68 raw materials; the primary raw materials are methanol, urea, and phenol, which it receives via rail car. The materials are pumped into storage tanks, which have vapor balance systems connected to the process gas boilers. The phenol, formaldehyde, steric acid, wax, and caustic storage tanks are heated.

Methanol is pumped through a silver catalyst bed to be converted to formaldehyde. First the methanol goes through a purifier to vaporize the methanol. The vaporized methanol is mixed with outside air to raise it out of the explosive range before it goes to the reactor. After the reactor, the vapor goes through a heat exchanger prior to being routed through a wet scrubber. The process/waste gas, which is reportedly made up of mostly hydrogen, goes to one of two process gas boilers, while the raw feed goes to a distillation column to bring it to approximately 52% formaldehyde. The finished formaldehyde product is then sent to storage tanks.

Approximately 60% of the formaldehyde is used on-site to make resin; the rest is shipped off-site to customers. There are three reactors onsite used to make urea or phenol resins. The reaction happens in one vessel; the vessel is kept under vacuum.

The facility also has a PVA plant and a wax plant on site. The PVA plant mixes polyvinyl acetate with resin. The wax plant creates wax for particle boards. Purchased wax is heated, mixed with TEA and water, and then run through a homogenizer.

Staff Interview:

The silver catalyst in the reactors is replaced about every three months. Methanol does not completely react at the catalyst bed. Gas exiting the catalyst bed is approximately 12% methanol. The gas exiting the catalyst bed is routed to a distillation column where methanol is separated from the formaldehyde and sent back to the start of the process for reuse.

Formic acid is typically an undesired impurity that can form when formaldehyde is exposed to outside air, but the resin process is usually not impacted by the presence of smaller amounts of formic acid. Batches with high levels of formic acid would be mixed with other batches before going to the resin plant.

The packing material in the wet scrubber has never been replaced. It is cleaned with a caustic wash and the flow through the scrubber is monitored.

Process gas bypasses the boilers at start-up of the formaldehyde plant. The boilers may also be bypassed in the event of a malfunction or to avoid sending process gas in the explosive range to the boilers. Bypass gas is sent straight to the atmosphere. The bypass records were requested for later review.

LDAR is conducted by a third-party that comes on-site monthly. The LDAR records were requested for later review.

TOUR INFORMATION

EPA Toured the Facility: Yes

Data Collected and Observations:

Boiler #1 was running during the tour. Boiler #2 was not running during the tour. Inspectors utilized a FLIR optical gas imaging camera during the tour. The inspectors observed trailing from the Boiler #1 stack through the FLIR camera. Results of performance testing completed at the boilers were requested for later review.

Photos and/or Videos: were taken during the inspection and are listed in Appendix A.

Field Measurements: were not taken during this inspection.

CLOSING CONFERENCE

☒ Provided U.S. EPA point of contact to the facility

Requested documents:

- Performance testing completed at boilers
- Emission calculations spreadsheets for previous three years
- Cooling tower water breakthrough testing for previous twelve months
- Bypass records for the previous three years
- 2023 LDAR records

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Concerns: Inspectors expressed concern over the trailing plume from boiler stack #1 observed with the FLIR camera (see Appendix A) which suggested incomplete combustion of hydrocarbons.

DIGITAL SIGNATURES

Report Author: NATALIE SCHULZ  Digitally signed by NATALIE SCHULZ
Date: 2024.04.02 16:20:41 -05'00'

Section Supervisor: BRIAN DICKENS  Digitally signed by BRIAN DICKENS
Date: 2024.04.03 08:48:50 -05'00'

Facility Name: Hexion Inc.

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Date of Inspection: March 11, 2024

APPENDICES

1. Appendix A: Digital Image Log and Digital Video Log

Facility Name: Hexion Inc.
Facility Location: 2522 S 24th Street, Sheboygan, WI
Date of Inspection: March 11, 2024

APPENDIX A: DIGITAL IMAGE LOG AND DIGITAL VIDEO LOG

Inspector Name: Natalie Schulz **Archival Record Location:** Enf_Hexion_WI_24_Inspection

Image Number	File Name	Date and Time (incl. Time zone and DST)	Description of Image
1	FLIR0126.mp4	March 11, 2024 3:17 p.m. central	Boiler 1 stack