



REGION 5

CHICAGO, IL 60604

MEMORANDUM

SUBJECT: CLEAN AIR ACT INSPECTION REPORT
Rohm and Haas Chemicals, LLC, Ringwood, IL

FROM: Sasa Dunovic, Inspector/Enforcement Officer
AECAB (IL/IN)

THRU: Nathan Frank, Section Supervisor
AECAB (IL/IN)

TO: File

BASIC INFORMATION

Facility Name: Rohm and Haas Chemicals, LLC (Rohm & Haas)

Facility Location: 5005 Barnard Mill Road, Ringwood, IL 60072

Date of Inspection: February 13, 2024

EPA Inspector(s):

1. Sasa Dunovic, Inspector/Enforcement Officer
2. Dakota Prentice, Environmental Engineer

Other Attendees:

1. Amber Yerkes, EHS Technician
2. Nirav Patel, Operations Leader

Contact Email Address: Amber Yerkes, ayerkes2@dow.com and Nirav Patel, nirav.patel@dow.com

Purpose of Inspection: to investigate compliance with Synthetic Minor limits for hazardous air pollutants (HAPs)

Facility Type: Chemical Manufacturing

Regulations Central to Inspection: HAP emissions and regulatory requirements associated with the Clean Air Act Permit Program (CAAPP) Permit number 96030084 (CAAPP), the state implementation

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plan (SIP), and 40 CFR Part 63 Subpart VVVVVV, National Emission Standards for Hazardous Air Pollutants for Chemical Manufacturing Area Sources. According to the CAAPP permit, the K-2000 polyesters process and intermediate storage tanks, and equipment used for manufacturing small batches of polyester products for Research and Development (R&D) and commercial purposes in Development Building 44 are considered affected facilities under Subpart VVVVVV.

Arrival Time: 10:00 a.m.

Departure Time: 1:30 p.m.

Inspection Type:

- ☒ Unannounced Inspection
- ☐ Announced Inspection

OPENING CONFERENCE

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

The following information was obtained verbally from Rohm & Haas personnel unless otherwise noted.

Process Description:

The facility produces polyurethanes, low-, mid-, and high-molecular-weight polyesters, and water-based adhesives. It also operates small batch and R&D facilities, as well as a washed resin process, storage tanks, and a pilot coater. All operations at the facility are conducted in batches.

The new process, K-2000, for producing high- and mid-molecular-weight polyester resins commenced operation in 2020 in a single 8,000-gallon reactor and supporting equipment. Depending on the final product, the batch reaction can last between 24 and 72 hours. The resulting polyester resins are then processed in the drop tank using solvents such as toluene, methyl ethyl ketone (MEK), or ethyl acetate before being transferred to the polyester intermediate storage tanks. A regenerative thermal oxidizer (RTO) INC 9600 controls all volatile organic material (VOM) air emissions from this process. Additionally, a cooling tower is used to maintain the necessary process temperatures. The low-molecular-weight polyester resins are produced in two batch reactors with supporting equipment (e.g., drop tanks, stripping tanks, condensers). Either RTO INC 8 or RTO INC 9600 controls all VOM air emissions from this process.

The facility also produces solventless and solvent-based polyurethanes. This process uses low-molecular-weight polyester resins, isocyanates, solvents, water, and miscellaneous additives as raw materials. The RTO INC 8 controls all VOM air emissions from this process.

The equipment for producing water-based urethanes and ethylene-vinyl acetate (EVA) R&D is housed in Development Building 28 and Development Formulations. Similarly, Development Building 44 contains the equipment used to manufacture small batches of polyester products for R&D and commercial purposes. The RTO INC 8 controls all VOM air emissions from these two processes.

The facility runs a washed resin process consistent of a washing vessel, dryer, and supporting equipment to wash residuals from maleic anhydride-grafted polypropylene beads. A direct fired thermal oxidizer (TO), INC 5, controls all VOM air emissions from this process.

Additionally, the facility manufactures water-based emulsions, solutions, and dispersions, including EVA polymers, water adhesives, and polymer formulations, using reactors/mixing vessels and support equipment.

The Pilot Coater applies adhesives onto film substrates for research and development trials and demonstrations of products produced at the facility and related facilities. Coatings and adhesives are classified as water-based, solvent-less, or solvent-based. During operation, adhesives are applied to the film and dried in the two curing ovens that are integral components of the coater. When solvent-based applications are run, the resulting VOM emissions are exhausted to TO INC 8. VOM emissions from the coating application station upstream of the curing ovens are drawn to a capture hood and also routed to TO INC 8 for control.

The RTO INC 9600 is equipped with a bypass. This device, which is also referred to as a "cold stack", is designed to temporarily open in the event of a power outage or emergency shutdown of the oxidizer to protect personnel from injury and equipment from damage when operation of the oxidizer is resumed.

Staff Interview:

The facility operates 24 hours a day, seven days a week, with two 12-hour shifts and employs around 90 people.

The facility conducts AVO (audible, visual, and olfactory) inspections to ensure that the process vessels and equipment are in good condition and free of leaks. Along with these inspections, the facility also monitors the lower explosive limit (LEL) throughout the facility as a surrogate process to detect potential leaks. However, they do not monitor visible floating hydrocarbon in the cooling water. The facility representatives are not aware of any emissions controls from solvent storage tanks. They also mentioned that, like RTO INC 9600, RTO INC 8 can vent through a "cold stack".

The facility uses glycols to clean reactors and drop tanks used in solventless production, while solvents like ethyl acetate and M-Pyrol, are used to clean equipment in solvent-based and polyurethane production.

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The coater at the facility is used infrequently, mainly for research and development, and for testing purposes of coatings and adhesives manufactured with client-provided materials. It is not used for commercial production.

The wastewater treatment facility was previously used to treat remediation water, but it has not been used in the last two years. Covanta, a third-party contractor, handles all process water treatment.

Raw materials and products are transported by tracks and tanker trailers. The facility has one loading bay where solventless products are loaded into tanker trucks and four separate bays where raw materials are offloaded from tanker trucks. The offloading process is carried out using vapor balancing.

TOUR INFORMATION

EPA Toured the Facility: Yes

Data Collected and Observations:

During the site tour, EPA visited the water-based polymers production area, followed by the new high- and mid-molecular-weight polyester production building, solvents storage tank area, small batches of polyester products Building 44, the washed resin process, the pilot coater, the low-molecular-weight polyester, and polyurethane production process.

During the site tour, we observed that all three thermal oxidizers were in service. The temperatures recorded in RTO INC 9600, RTO INC 8, and TO 5 were 880°C, 1674°F, and 1528°F, respectively. During the inspection, we also noticed that one tanker truck was being loaded with solventless polyester, while no offloading of solvents was observed.

During our tour of the small batches of polyester products in Building 44, we noticed some odors that Amber identified as coming from heating oil.

Photos and/or Videos: were not taken during the inspection.

Field Measurements: were not taken during this inspection.

CLOSING CONFERENCE

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

Requested documents:

- Air Emission calculation spreadsheets with all supporting information for all emission units including insignificant activities for the period January 1, 2020, to December 31, 2022.
- TRI Emission calculation spreadsheets with all supporting information for Toulene, Ethylene glycol, and Diisocyanates for the period January 1, 2020, to December 31, 2022.

- Hourly VOM emission rate (in lbs/hr) and the overall reduction efficiency (%) of both the VOM emission capture system and control devices for the period January 1, 2020, to December 31, 2022.
- Number of batches for K-2000 and Polyurethane processes for the period January 1, 2020, to December 31, 2022.
- 2020-2023 Leak Detection and Repair Records with the identification of the leaking component; the date and time the leak is detected; the action taken to repair the leak; and the date and time the leak is repaired.
- For TO INC 5, RTO INC 8, and RTO INC 9600 the following for the period January 1, 2020, to December 31, 2023:
 - Monitoring data.
 - A log of operating time for the capture system, control device, monitoring equipment, and the associated emission source.
 - A maintenance log for the capture system, control device and monitoring equipment detailing all routine and non-routine maintenance performed including dates and duration of any outages.
- Copies of the last two performance tests performed on TO INC 5, RTO INC 8, and RTO INC 9600.
- Records for the occurrence of emissions through the "cold stacks", including the date and time, a description of the event, and, if not the result of a power outage, the actual or likely reason(s) for the emergency safety shutdown of the control device.
- Copies of Notification of Compliance Status (NOCS).
- Copies of all semiannual reports for the period January 1, 2020, to December 31, 2023.
- Heat exchange system inspection plan.
- Operating plan for storage tanks and measured parameter values.
- Records identifying wastewater streams and the type of treatment they receive (the disposition of the organic phase).
- Total concentration of partially soluble HAP in each wastewater stream.
- Plant layout.
- Process flow diagrams.

Concerns:

The review of the 2021 and 2022 reported toxic release inventory (TRI) indicated that the facility had emitted toluene in quantities over their Synthetic Minor permitted limits.

DIGITAL SIGNATURES

Report Author: Dunovic, Sasa
Digitally signed by Dunovic, Sasa
Date: 2024.03.22 09:56:43 -05'00'

Section Supervisor: NATHAN FRANK
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Date: 2024.03.22 13:06:09 -05'00'