



REGION 5

CHICAGO, IL 60604

MEMORANDUM

SUBJECT: CLEAN AIR ACT INSPECTION REPORT
Brady Worldwide Inc. - Florist Avenue, Glendale, Wisconsin

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

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

TO: File

BASIC INFORMATION

Facility Name: Brady Worldwide Inc. - Florist Avenue (Brady)

Facility Location: 2230 West Florist Avenue, Glendale, Wisconsin

Date of Inspection: May 28, 2025

EPA Inspector(s):

1. Sasa Dunovic, Inspector/Enforcement Officer
2. Charles Zeman, Physical Scientist

Other Attendees:

1. Alexis Landfried, EHS Engineer
2. Steve Jakubowski, Plant manager
3. Paschal Ozomma, Senior Safety Engineer
4. Jamie Marie Wallner, Director, Global Compliance and Sustainability
5. Blake Miles, Facilities and Maintenance Manager
6. Robert Rinka, Manufacturing Engineer

Contact Email Address: Alexis Landfried, alexis_landfried@bradycorp.com

Purpose of Inspection: Evaluate compliance with the MACT standard for Paper and Other Web coating (40 CFR part 63, subpart JJJJ), the MACT standard for Reinforced Plastic Composites

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Production (40 CFR part 63, subpart WWWW), and the NSPS for Pressure Sensitive Tape and Label Surface Coating Operations 40 CFR 60 subpart RR.

Facility Type: Manufacturer of Pressure Sensitive Labels and Informational Signs.

Regulations Central to Inspection: The facility is an affected source under the MACT standard for Paper and Other Web Coating (40 CFR part 63, subpart JJJJ), the MACT standard for Reinforced Plastic Composites Production (40 CFR part 63, subpart WWWW). Subpart WWWW references the MACT standard for Closed Vent Systems and Control Devices (40 CFR part 63, subpart SS) for demonstrating compliance. The coating lines are subject to the NSPS for Pressure Sensitive Tape and Label Surface Coating Operations (40 CFR part 60, subpart RR).

The facility is a source of volatile organic compounds (VOCs), which are used as a surrogate for Ozone in the Primary and Secondary National Ambient Air Quality Standards (40 CFR part 50) for Ozone.

Arrival Time: 10:45 a.m.

Departure Time: 2:20 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

Was any information collected during the inspection claimed as CBI?

☐ Yes ☒ No.

The following information was obtained verbally from Brady's personnel unless otherwise noted.

Process Description:

The Brady Florist Avenue campus primarily manufactures and prints pressure-sensitive labels, as well as produces raw materials to support other Brady manufacturing facilities or provide toll manufacturing for third parties. Additional operations at this site include sign manufacturing, which involves fiberglass, metal photo, and porcelain, as well as research and development activities. The main production lines at this facility consist of the Web Coating Lines LR-5, LR-6, LR-7, the Pilot Coating Line PC-4, and the Fiberglass Sign Line. These production lines are supported by compounding operations that include four Coating Mixing Tanks (TC-1, AM-7, AM-8, and AM-9) and centralized clean-up operations. To control emissions into the air, all these emission units utilize five regenerative thermal oxidizer (RTO) systems (Systems 7, 8, 9, 10, or 11).

The web coating lines LR-5, LR-6, LR-7 and PC-4 are production coating lines, each consisting of a web coating unit and a drying oven that have the ability to use water-based coatings and solvent-based coatings. The coating lines apply specialized coatings to a continuous roll or sheet of material, known as the web or substrate. Typical substrates used at this facility include polypropylene, PET, polyimide, paper, and various foils.

When running volatile organic solvent-based coatings, emissions are controlled by one of the thermal oxidizer control systems. The coating units are enclosed in separate rooms, which serve as Permanent Total Enclosures (PTEs). The ovens operate under negative pressure and meet the criteria for PTEs. The ovens for LR-5, LR-6, and LR-7 exhaust to one of the RTO control systems (7, 8 or 10). The emissions from the coating heads for LR-5 and LR-7 and the ventilation from the LR-5, LR-6, and LR-7 room enclosures are routed to System 9, which includes a rotary concentrator and RTO.

Coating Line PC-4 is a mid-sized coating line that is used for production and to pilot test new coatings. The emissions from PC-4 are controlled by one dedicated RTO (System 11).

The Fiberglass Sign Line includes a wet-end and a curing oven. The wet-end is enclosed in a separate room, which serves as a PTE. The oven operates under negative pressure and meets the criteria for a PTE. Emissions from the room enclosure and oven are exhausted to one of the RTO control systems while in production mode.

Regardless of which incinerator is used, whenever a compliant coating is used (i.e. a coating low in VOCs and high in solids), the coating lines' emissions are not incinerated but are exhausted into the ambient air from a bypass stack. Each closed vent system is equipped with a bypass stack.

Centralized Clean-Up operations are enclosed in a room, which serves as a PTE, and their emissions are sent to the System 9 rotary concentrator and RTO.

The compounding operations utilize coating mixing tanks (TC-1, AM-7, AM-8, and AM-9) to compound or mix any VOC-containing materials. When in operation, the tanks are closed, and their contents are cooled down via the tanks' cooling jackets. Emissions from the mixers are exhausted either directly or through a solvent condensation device to one of the RTO control systems while in production mode.

Corona treaters are used for surface modification, primarily of plastic films, foils, and paper, to improve their surface energy, enabling better adhesion of inks, coatings, and adhesives. Corona treatment uses a high-frequency electrical discharge to ionize the air surrounding the coating material's surface. This ionization of molecular oxygen forms ozone (O₃) as a direct product.

Staff Interview:

The Brady Florist Avenue campus operates 24/7 and employs approximately 310 staff members on campus (about 75 in manufacturing).

The facility is a Tier 1 participant of the Wisconsin Department of Natural Resources (DNR) Green Tier program, which encourages, recognizes, and rewards companies committed to superior environmental performance. The facility also has an ISO 14001 certified environmental management system.

Compounding and mixing operations for the coating lines are conducted during daylight hours within the compounding room. The prepared material is transferred into drums and subsequently transported to the coating line, where it is pumped for application. The facility accounts for emissions losses from the mixers by evaluating the weight of the material lost during the process.

In the production of fiberglass signs, a styrene-based resin is formulated in a designated wet-end enclosed room, which operates as a PTE.

The facility consistently utilizes air emission controls, except during operations involving water-based coatings. The ventilation systems from the LR-5, LR-6, LR-7, and centralized clean-up room enclosures are directed to System 9, which runs continuously regardless of the type of coating used. Notably, all ovens can bypass emissions to the atmosphere when water-based coatings are employed.

The system is designed to interlock and shut down production lines if the RTO temperature drops below a predetermined threshold. Temperature readings are taken continuously and averaged in fifteen-minute increments. If the fifteen-minute average temperature falls more than 50 degrees below the set point, the system triggers a shutdown. These processes are managed by a programmable logic controller (PLC). Additionally, there is an automatic shutdown mechanism if negative pressure is not maintained within the ovens and the PTEs. While the ovens' pressure is not actively tracked, the system is designed to initiate shutdowns if the pressure differential within an oven becomes non-negative.

Regenerative ceramic beds within the RTOs switch every 90 seconds, with a turnover time of less than 1 second. Preventative maintenance on the RTOs is conducted annually, involving the replacement of all thermocouples. The facility replaces its ceramic beds approximately every ten years based on visual inspections and other quantitative assessments.

The company does not provide estimates for ozone emissions from corona treaters, indicating that ozone is not regulated by the Environmental Protection Agency (EPA) or the Wisconsin Department of Natural Resources (WDNR).

TOUR INFORMATION

EPA Toured the Facility: Yes

Data Collected and Observations:

EPA inspectors started a tour of the Brady Florist Avenue facility, beginning at the Web Coating Line LR-6, where observations were made of the line's wet end from outside its enclosure. The tour proceeded to the compounding area, where all mixing tanks (TC-1, AM-7, AM-8, and AM-9) were inspected. During this time, no active mixing was occurring. All mixers were equipped with vapor condensers, closed lids, and double-wall structures for water-jacketed cooling. No odors were detected in the area. The previously observed screen (image #3) showed that emissions from the mixers were directed to control system 10, which was operating at a temperature of 1,518 degrees Fahrenheit. This system was also handling emissions from the Web Coating Line LR-6.

The next stop was the wet end enclosure of web coating line LR-5, which was operational during the inspection. This line's wet end was enclosed in a room serving as a PTE. The room featured self-closing doors and a ventilation system designed to collect solvent vapors. All observed points of ventilation using an optical gas imaging camera demonstrated effective suction. The collected vapors were directed to control system 7, which was noted as operating at 1,649 degrees Fahrenheit. As the web coating lines LR-5 and LR-7 do not operate concurrently, web coating line LR-7 was inactive during the inspection.

The tour continued through the central clean-up operations, which were also situated in a room with self-closing doors serving as a PTE. While no active cleaning was taking place during the inspection, the ventilation/ emission collection system was operational. Brady personnel indicated that the ventilation system runs in a lower mode when room sensors do not detect activity, increasing collection rates during periods of activity. The presence of the inspection team led to an increase in air exchange while in the room.

During the tour, Pilot Coating Line PC-4 was observed operating from outside its wet-end enclosure. The Fiberglass Sign Fabrication line was not operational at the time of the inspection. Observations were made of the line within its wet-end room, including its ventilation collection points, as well as the compounding operation area adjacent to it where styrene resin is prepared.

Following the inspection of the production lines, we proceeded to observe the operation of thermal oxidizer systems 7, 8, 9, and 10.

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:

1. For the period between January 2024 and April 2025, please provide the following for the Web Coating Lines LR-5, LR-6, LR-7, Centralized Clean-Up, Pilot Coating Line PC-4, Fiberglass Sign Fabrication Line, and the Coating Mixing Tanks:
 - Emission calculations along with the supporting data, indicating the weight of VOCs and HAPs emitted for each compliance period.
 - For each coating type, provide the temperature that is maintained during the mixing period.
2. For the period between January 2024 and April 2025, please provide the following for the control systems 7, 8, 9, 10, and 11 the following records:
 - Temperature recordings averaged into 15-minute increments, with 3- hour averages.
 - A log of operating times for each capture system, thermal control unit, monitoring equipment and the associated coating line.
 - Records of pressure differential from room enclosures and blower motor operation.
 - Each 3-hour period where the oxidizer combustion temperature was 50 Degree F below the average combustion chamber temperature maintained during the most recent performance test.
 - The total operating hours for each corona treater.
3. For the period between January 2024 and April 2025, please provide the following for the control systems 7, 8, 9, 10, and 11:
 - A maintenance log for the capture system, thermal control unit, monitoring equipment detailing all routine and non-routine maintenance performed including dates and durations of any outages.
 - A log of all equipment calibrations or replacements including dates of the equipment calibrations or replacements.
4. Copies of all notifications submitted under 40 CFR Part 63 Subparts JJJJ and WWWW, with supporting documentation [40 CFR 63.3400(e) and 40 CFR 63.5905(a)].
5. Copies of the reports for the stack testing of control systems 7, 8, 9, 10, and 11 performed in the last five years.
6. Copies of the semiannual reports submitted under 40 CFR Part 63 Subparts JJJJ [40 CFR 63.3400(c)].
7. The manufacturer and model for each corona treater used by the facility.

DIGITAL SIGNATURES

Report Author: Dunovic, Sasa Digitally signed by Dunovic, Sasa
Date: 2025.06.24 12:15:09 -05'00'

Section Supervisor: Frank, Nathan Digitally signed by Frank, Nathan
Date: 2025.06.27 13:10:27
-05'00'

Facility Name: Brady Worldwide Inc. - Florist Avenue
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APPENDICES

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

Facility Name: Brady Worldwide Inc. - Florist Avenue
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APPENDIX A: DIGITAL IMAGE LOG AND DIGITAL VIDEO LOG

Inspector Name: Sasa Dunovic

Archival Record Location: [Images](#)

Image Number	File Name	Date and Time (MDT)	Description of Image
1	IMG_0924.JPG	5/28/2025 10:36	Presentation slide titled "Key Processes - FLO, features a detailed flow chart outlining various stages of production process.
2	IMG_0925.JPG	5/28/2025 11:01	Hand-drawn diagram on a whiteboard illustrating the emission units and associated air pollution control devices within the facility.
3	IMG_0926.JPG	5/28/2025 11:02	Screen showing the emission units and associated air pollution control devices with monitored values at the time of the inspection.
4	IMG_0927.JPG	5/28/2025 11:06	Screen showing the control systems notifications alarms and setpoints.