UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, ILLINOIS 60604

SUBJECT:	CLEAN AIR ACT INSPECTION REPORT Masonite Corporation, Marshfield, Wisconsin
FROM:	Laura Neudorf, Environmental Engineer AECAB (MI/WI)
THRU:	Sarah Marshall, Section Supervisor AECAB (MI/WI)
TO:	File

BASIC INFORMATION

Facility Name: Masonite Corporation

Facility Location: 1401 East 4th Street, Marshfield, Wisconsin 54449

Date of Inspection: March 14, 2023

EPA Inspector(s):
1. Laura Neudorf, Environmental Engineer
2. Erin DuMontelle, Environmental Engineer

Other Attendees:
1. Mark Lee, Corporate Environmental Compliance Manager
2. David Van Meter, Safety Manager
3. Gary Garand, Plant Manager
4. Jack Bezlyk, Health and Safety Coordinator
5. Frank Wilhelm, Maintenance Supervisor
6. Emily Burgoyne, Operations Manager

Contact Email Address: Mark Lee – mlee@masonite.com and David Van Meter – dvanmeter@masonite.com

Purpose of Inspection: To assess compliance with the Clean Air Act and the facility's active air operating permit

Facility Type: Door manufacturing facility

Regulations Central to Inspection: The facility's active air operating permit

Arrival Time: 10:15 AM CST, left facility from approximately 12:00 PM to 1:00 PM
Departure Time: 4:40 PM CST

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. Reason: Not a small business
☒ Provided CBI warning to facility

The following information was obtained verbally from facility personnel unless otherwise noted.

Process Description:
Masonite Corp. has three primary operations at their Marshfield facility – a particle board operation, a mineral core operation, and a door plant.

Raw material for the particle board operation (known as "green feed" or "green chips") is transferred from trucks to silos where they are stored prior to processing. The silos (P70-72) are controlled with a baghouse during loading and unloading. Green chips are transferred from the silos to a weigh belt, sent to a hammermill where they are pulverized, and then sent to a dryer (P08) where they are dried to a specific moisture content. The dryer is heated with natural gas and sander dust. The dryer vents to a cyclone that separates residual product from PM. PM is sent to a multiclone (C08) and drops into a hopper. The multiclone exhaust is partially recirculated and partially vented outside. After the product is dried, it is sent to a former, where three resins are added. It is then poured into a press (P09), where the material is cut and pressed into 9-feet by 7-feet slabs. The slabs go through a final board cooler (P10) before being stacked for future storage or processing. The press is controlled by a thermal oxidizer (C09).

Raw materials for the mineral core operation – silica, vermiculite, and lime – are stored in three silos (P74-76). Raw materials are filtered for size and sent to a mixer, where they are mixed with additives and become a slurry. The mixer is controlled by a rotoclone (C55), which picks up PM with water and discharges to the sewer. The slurry is poured into pans, baked into slabs in autoclaves, and then sent to either a natural gas dryer or a steam dryer. The slabs are sent to a wet side sander (P561), which is controlled with a baghouse, and cut down before being warehoused. For further processing, slabs are cut and assembled in a molder area (P61), which is controlled by a baghouse, and then sent to a dry side sander (P54), which is controlled by a different

baghouse. An adhesive and glue sizer are applied in this process. The slabs are then dried in a natural gas-fired heat tunnel.

Particle board and mineral core slabs are sent to the door plant for finishing. The slabs are sent to a machining line where a door skin (i.e., lead or veneer) is applied. This is completed in one of three ways: with a polyurethane adhesive, a hot press (heated), or a cold press (ambient temperature). The cold press process is used for custom doors, such as those that are oversized or have a lead skin. Lead door skins can be applied to particle board slabs in a lead cell using the cold press. The lead cell is controlled with a baghouse and produces hazardous waste. After door skins are applied, the slabs are machined and sent to either one of two coating lines (P16 and P17) or a spray booth (P18). Approximately 90-95% of slabs are sent to a coating line. On these lines, the veneer is sanded down, and a water-based stain and other sealants are applied. The top side of the door is then dried in UV ovens before being flipped over and dried on the back side. The remaining slabs are sent to the spray booth, where a solvent-based topcoat is manually sprayed onto the slabs.

Masonite Corp. has two propane storage tanks with an approximate capacity of 40,000 gallons each, several fixed-roof resin tanks, a 500-gallon capacity diesel tank, a 300-gallon capacity gasoline tank, and two used oil tanks (one outdoor tank with a 500-gallon capacity, and one indoor tank with a 300-gallon capacity). Wastewater is generated from boilers, chillers, and the mineral core slurry and discharged to the sewer. Solids in the mineral core wastewater are settled out before it is discharged.

Staff Interview: The particle board operation operates 24 hours per day, 7 days per week excluding holidays. The mineral core operation operates with two shifts 5 days per week from 6:45 AM to 2:45 PM and 6:45 PM to 2:45 AM. The door plant operates with two shifts 5 days per week from 6:45 AM to 2:45 PM and 2:45 PM to 10:45 PM. The facility has approximately 400 total employees. Green chips are hardwood with a 2% softwood contamination allowance; loads with more than 2% softwood are rejected. Sander dust used in the particle board dryer comes from particle board processed in-house, and it is used as a supplement to natural gas. The particle board dryer inlet temperature is monitored and typically ranges between 350 and 500°F during normal operation. The thermal oxidizer typically operates around 1435°F, and neither differential pressure nor stack pressure are monitored to evaluate thermal oxidizer capture. The thermal oxidizer primarily controls formaldehyde and methanol emissions. The facility has four on-site employees that are certified in Method 9. Method 9 was performed during the rotoclone startup in 2018 and during stack testing.

A portion of Masonite Corp.'s baghouses exhaust indoors and are not included in the facility's air operating permit. Baghouses that exhaust outdoors include the mineral core dry side sander baghouse (on P54), the mineral core wet side sander baghouse (on P561), the molder area baghouse (on P61), and the green chip silo baghouse (on P70), as well as the spray booth overspray filters (C18), the fabric filter on the sand dust storage silo (on P73), and fabric filers on mineral core storage silos (on P74-76). Baghouse bags are generally replaced once per year. If pressure drop is high, blacklight checks are performed for tears, and bags with visible tears are replaced. The green chip silo baghouse is used when material is added and removed from the silos, and inspections are performed on this baghouse approximately once every three weeks.

The pressure drop of the baghouse on the wet side sander is recorded every eight hours. The pressure drop of the baghouse on the molder area is regularly recorded, and inspections are performed on this baghouse approximately once every three months.

TOUR INFORMATION

EPA Tour of the Facility: Yes

Data Collected and Observations:
The particle board press was observed to have an upset during the inspection, during which vapors were observed to escape the thermal oxidizer inlets (see Appendix B, Videos 2 and 3). A strong odor was noted near the solvent spray booth. Large amounts of PM buildup were observed throughout the indoor portion of the facility (see Appendix A, Images 9-11).

Photos and/or Videos: were taken during the inspection.

CLOSING CONFERENCE

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

Requested documents:

- Latest full PM performance test report for the wood dryer in the particle board plant (P08 and P08A).
- If not included for the item above, the full PM performance test report for the wood dryer that shows how the quantity of sander dust burned correlates to energy output (MMBtu) – in other words, a test showing that X pounds of sander dust burned produces X amount of energy.
- Latest full formaldehyde performance test report for the wood dryer system, and if not available, a statement on whether this test has been scheduled, and if so, the projected date of the next test.
- Latest full PM performance test report for the board press (P09), and if not available, a statement on whether this test has been scheduled, and if so, the projected date of the next test.
- Latest full VOC/HAP performance test report for the board press and RTO (P09 and C09) that includes a minimum combustion chamber temperature for the RTO and the associated destruction efficiency.
- Records showing the monthly quantity of sander dust burned at the wood dryer for the last 3 years.
- The maximum process weight rate for the wood dryer based on its design capacity (the total rate of all materials that can be introduced to the process except liquid fuels, gaseous fuels and air)
- Throughput records for quantity of material processed each month through the wood dryer for the last 3 years.
- Continuously monitored temperature records (once every 15 minutes) of the RTO combustion chamber for the month of January 2023.

- Annual inspection records that show the date and initials of the person that performed each inspection, a list of the items inspected, and any maintenance or repairs performed as a result of each inspection for the last 3 years for the following equipment:
    a. RTO (C09)
    b. Multiclone (C08)
    c. Rotoclone (C55)
    d. Baghouse for the dry sander and core assembly (P54)
    e. Baghouse for the mineral core wet side sanders and hog (P561 and P562)
    f. Baghouse for wood saws, sanders, and molder (P61)
    g. Baghouse for the three storage silos (P70-72)
    h. Bin vent filters for the mineral core lime, vermiculite, and sand storage silos (P74-76)
    i. Bin vent filter for the mineral core vermiculite storage silo (P75)
- Daily pressure drop records for the multiclone (C08), rotoclone (C55), and baghouses associated with processes P54, P561/562, P61, and P70-72 for the month of January 2023.
- Records of when each baghouse associated with P54, P561/562, P61, and P70-72 was emptied and the quantity of material emptied each time for the last 3 years.
- Safety data sheets for the "purple resin", any other resins used, all adhesives used to adhere door skins, and all solvent-based sprays, including labels associated with each SDS to indicate where they are used in the process.
- Date(s) of construction, reconstruction, and modification of each propane tank and resin tank.
- Maximum capacity of each propane tank and resin tank.
- Safety data sheets for the material typically stored in each propane tank and resin tank along with each SDS's corresponding tank.
- Emission calculations for VOCs, HAPs, and PM for the last 3 years in electronic spreadsheet format (.xlsx or similar), showing emission factors and their basis along with any capture assumptions made in the calculations.
- Malfunction, prevention, and abatement plan.
- Fugitive dust control plan.
- Semi-annual monitoring reports for the last 3 years.

Concerns: Thermal oxidizer capture efficiency

DIGITAL SIGNATURES

Report Author: Laura Neudorf Digitally signed by Laura Neudorf Date: 2023.04.12 09:39:26 -05'00'

Section Supervisor: SARAH MARSHALL Digitally signed by SARAH MARSHALL Date: 2023.04.13 14:18:27 -05'00'

APPENDICES AND ATTACHMENTS

1. Appendix A: Digital Image Log
2. Appendix B: Digital Video Log

APPENDIX A: DIGITAL IMAGE LOG

1. **Inspector Name:** Laura Neudorf	2. **Archival Record Location:** R5 Electronic Records Center

Image Number	File Name	Date and Time (CST)	Description of Image
1	IMG_0386.JPG	3/14/23 3:00 PM	Facility map – needs to be updated such that the dryer is where the cold press is in this photo
2	IMG_0387.JPG	3/14/23 3:14 PM	Particle board dryer control board
3	IMG_0388.JPG	3/14/23 3:18 PM	Interlock system for cyclones
4	IMG_0390.JPG	3/14/23 3:23 PM	Particle board dryer and multiclone stack
5	IMG_0391.JPG	3/14/23 3:24 PM	Trench stream – boiler condensate
6	IMG_0392.JPG	3/14/23 3:27 PM	Green chip silos and silo baghouse
7	IMG_0393.JPG	3/14/23 3:31 PM	After adding solid resin before press
8	IMG_0396.JPG	3/14/23 3:38 PM	After press and before rotoclone
9	IMG_0397.JPG	3/14/23 3:49 PM	Area beneath mixer and rotoclone
10	IMG_0398.JPG	3/14/23 3:52 PM	Dried mineral core slurry
11	IMG_0399.JPG	3/14/23 3:57 PM	Dry side sander
12	IMG_0400.JPG	3/14/23 4:01 PM	Wet side sander
13	IMG_0401.JPG	3/14/23 4:15 PM	Polyurethane application on the PUR line
14	IMG_0402.JPG	3/14/23 4:20 PM	Lead cell
15	IMG_0403.JPG	3/14/23 4:20 PM	Hazardous waste from lead cell
16	IMG_0404.JPG	3/14/23 4:22 PM	Solvent spray booth
17	IMG_0405.JPG	3/14/23 4:23 PM	Solvent spray booth

APPENDIX B: DIGITAL VIDEO LOG

1. Inspector Name: Laura Neudorf	**2. Archival Record Location:** R5 Electronic Records Center

Video Number	File Name	Date and Time (CST)	Description of Video
1	MVI_0389.MP4	3/14/23 3:20 PM	Multiclone outlet
2	MVI_0394.MP4	3/14/23 3:32 PM	Particle board press – holes in the ceiling are the thermal oxidizer inlets
3	MVI_0395.MP4	3/14/23 3:33 PM	Particle board press during an upset