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

SUBJECT:	CLEAN AIR ACT INSPECTION REPORT RHI Magnesita, Ashtabula, OH
FROM:	Valeria Apolinario, Environmental Engineer AECAB (MN/OH)
THRU:	Brian Dickens, Section Supervisor AECAB (MN/OH)
TO:	File

BASIC INFORMATION

Facility Name: RHI Magnesita

Facility Location: 4741 Kister Court, Ashtabula, OH 44004

Date of Inspection: March 22, 2023

EPA Inspector(s):
1. Valeria Apolinario, Environmental Engineer
2. Laura Neudorf, Environmental Engineer
3. Meaghan Pashen, Environmental Engineer

Other Attendees:
1. Kevin Spurlin, Production & Supply Chain Manager
2. Gerard McKillen, Research & Development Engineer

Contact Email Address: kevin.spurlin@RHIMagnesita.com

Purpose of Inspection: to determine compliance with the VOC-related requirements of the facility's Permit-to-Install-and Operate (PTIO).

Facility Type: Nonmetallic Mineral Product Manufacturing

Regulations Central to Inspection: The facility's PTIO (P0130728) includes the following summarized requirements:

For each afterburner (AB) associated with the emission units:

The permittee shall perform an inspection of the AB on at least a quarterly basis. Each inspection shall consist of internal and visual inspections in accordance with the manufacturer's recommendations and shall include a physical inspection of the unit and checks of associated equipment, including but not limited to burners, controls, dampers, valves, and monitoring and recording equipment. The permittee shall maintain a record of the results of each quarterly inspection of the AB.

The permittee shall maintain and calibrate the AB in accordance with the manufacturer's recommendations with preventative maintenance performed on at least an annual basis. The permittee shall maintain a record of the results of each annual maintenance and calibration of the AB.

For Curing Oven and AB 1 (P001): All VOC emissions are to be vented to AB 1 when the curing oven is in operation.

For Kiln No. 1 and AB 2 (P002): All VOC emissions are to be vented to AB 2 for the first 3.5 hours of each firing cycle of the kiln. The kiln temperature must reach 900°C within the first 3.5 hours of each firing cycle of the kiln.

For Kiln No. 2 and AB 3 (P003): All VOC emissions are to be vented to AB 3 for the first 4.5 hours of each firing cycle of the kiln. The kiln temperature must reach 900°C within the first 4.5 hours of each firing cycle of the kiln.

For each afterburner, the acceptable average combustion temperature, for any 3-hour block of time when the emissions unit controlled by the AB is in operation, should not be more than 50 degrees Fahrenheit below the average temperature measured during the most recent emissions test.

Arrival Time: 9:28 AM
Departure Time: 11:51 AM

Inspection Type:
☒ Unannounced Inspection
☐ Announced Inspection

OPENING CONFERENCE

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

The following information was obtained verbally from Kevin Spurlin and Gerard McKillen unless otherwise noted.

Company Ownership: The facility is currently undergoing ownership change from Veitsch-Radex to MAGUS. On April 4, 2023, staff stated that the ownership transfer was expected to occur in Q2 2023.

Process Description:

The facility produces refractory materials that are mainly utilized in the steel industry. Raw materials, such as alumina and graphite with additives, are brought in totes and unloaded into a mixer. Glycol or phenolic resins are added as well. Once mixed, the material is screw fed into a dryer that operates at approximately 120 °C to form the ceramic bond. This product is granular and dropped into bulk bags. The granular product is inserted into molds and pressed into various shapes.

Pressed pieces are then staged into a curing oven on stillages; approximately twenty pieces are staged in each stillage for every curing cycle. The curing process lasts for about 14 hours.

After the curing oven, the pieces can go through two different areas for further processing. Approximately 70% of the pieces are sprayed with a glaze at a glaze spray booth and then fired in Kiln No. 1. Approximately 30% of the pieces are fired in Kiln No.2 and then dip glazed. The former is fired under closed fire; pieces are stacked in cans to protect the pieces from oxygen. The latter are open fired.

At the glaze spray booth, the pieces are heated and then moved to an auto sprayer. At the dip glaze area, an infrared heater is used to dry the glaze after it has been applied.

After the glazing and firing process, pieces are finished through grinding and are packaged and shipped.

Staff Interview: The facility operates 24 hours a day, 5 days a week and has a total of 62 employees. Throughput has grown each month and is currently at 120 tons per month.

The temperature setpoint for all afterburners was established in a performance test in 2004. Prior to its current PTIO, the afterburners operated for the entire Kiln No.1 and Kiln No.2 cycles. The facility undertook an engineering study and determined that most VOC emissions occur in the beginning of the Kiln cycles, leading to the current PTIO requirements. EPA requested both the 2004 performance tests and the results of the facility's engineering study.

Staff was unsure if inspections or preventative maintenance are conducted on the afterburners. EPA requested documentation of inspections, if available, for later review.

TOUR INFORMATION

EPA Tour of the Facility: Yes

Data Collected and Observations:

The tour began at the mixing area. EPA noted seeing a large resin tank. Facility staff stated that the capacity of the tank was approximately 23,000 kilograms of phenolic resin.

EPA moved on to the curing oven and kilns. The curing oven was not operating at the time of inspection. EPA examined the control panels at Kiln No.1 and Kiln No.2. The elapsed time of the Kiln No.1 cycle at the time of inspection was approximately 357 minutes (5 hours and 57 minutes). Kiln No.1 had reached 900°C approximately 3.5 hours prior to the time of the inspection (see Appendix A, Image 5). Staff stated that Kiln No.2 had just started its cycle. Kiln No. 2 was operating at approximately 156 °C at the time of inspection (see Appendix A, Image 6). Both afterburners were operating at the time of the inspection.

EPA toured the facility with a FLIR camera. FLIR videos were taken at the glaze spray booth, outside Kiln No.1, and the dip glaze area. U.S. EPA noted seeing vapors through the FLIR from the glaze spray booth, cooling pieces outside of Kiln No.1, and the dip glaze area (see Appendix B, 1, 2, 5, and 6).

Photos and/or Videos: were 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:

- The date (mm/dd/yyyy) of ownership transfer of the facility from Veitsch America to RHI Magnesita
- Information regarding assumed liabilities in the ownership transfer purchase agreement
- Performance Tests
    - Last performance test report for all afterburners, including process data recorded during the performance test
    - Engineering test report sent to Ohio EPA where the afterburners for each kiln were turned off approximately 3.5 hours into the process and emissions were tested. Include process data recorded during the test.
    - Any other reports for testing performed to determine that emissions are only produced in the kilns within the first few hours of a cycle
    - 2004 performance test report for all afterburners, including process data recorded during the performance test
- Safety Data Sheets
    - Resins used in the mixing section (if more than 10 different resins are used, provide the SDS sheets for the 10 most used)
    - Glazes used in the spray glazing section (if more than 10 different glazes are used, provide the SDS sheets for the 10 most used)

  - Glazes used in the dip glazing section (if more than 10 different glazes are used, provide the SDS sheets for the 10 most used)
- 2022 total emissions report for the facility, including emission calculations and any emission factors used. If the report is not completed, provide the information for 2021.
- Provide documentation of the last annual inspection for each afterburner
- Provide records of the temperature of the product and glaze during spraying from February 28 to March 27, if kept. If not kept, state whether you anticipate the product and glaze to be at room temperature during spraying.
- Provide records of the temperature of the product and glaze in the dip glaze and freeflow portion of the process from February 28 to March 27, if kept. If not kept, state whether you anticipate the product and glaze to be at room temperature at this point in the process.
- Provide the temperature charts of the curing oven and kilns with its associated afterburner from 3/13/2022-3/24/2022. These may take the form of the PIMS charts shown during the inspection.
- Clarify if the tube dryer in the mixing process vents to the outside

Concerns: EPA explained to the facility that the FLIR camera visualizes volatile emissions and that vapors were seen exiting from the glaze spray booth, cooling pieces that had exited Kiln No.1, and the dip glaze area. EPA requested information on glaze formulations to further understand the origin of these vapors. EPA expressed concern that afterburner inspections may not be conducted quarterly, and that preventative maintenance may not be conducted annually.

DIGITAL SIGNATURES

Report Author: VALERIA APOLINARIO Digitally signed by VALERIA APOLINARIO Date: 2023.05.19 13:57:59 -05'00'

Section Supervisor: NATALIE SCHULZ Digitally signed by NATALIE SCHULZ Date: 2023.05.19 14:11:43 -05'00' for Brian Dickens

APPENDICES AND ATTACHMENTS

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

APPENDIX A: DIGITAL IMAGE LOG

1. **Inspector Name:** Valeria Apolinario	2. **Archival Record Location:** R5 Electronic Records Center

Image Number	File Name	Date and Time (incl. Time zone and DST)	Description of Image
1	IMG_0334.JPG	2023:03:22 10:21:45	Mixing area: tube dryer
2	IMG_0335.JPG	2023:03:22 10:21:49	Mixing area: tube dryer
3	IMG_0336.JPG	2023:03:22 10:28:07	Curing oven afterburner
4	IMG_0337.JPG	2023:03:22 10:29:59	Spray Glaze Ductwork to Ambient Air
5	IMG_0338.JPG	2023:03:22 10:42:29	Kiln No. 1 Data showing afterburner and kiln temperature over the past 24 hours.
6	IMG_0339.JPG	2023:03:22 11:06:56	Kiln No. 2 Data showing afterburner and kiln temperature at the time of inspection.
7	IMG_0340.JPG	2023:03:22 11:10:38	Baghouse for finishing
8	IMG_0341.JPG	2023:03:22 11:10:48	Dip glaze Area
9	IMG_0342.JPG	2023:03:22 11:12:53	Welding area-no ductwork to ambient area

APPENDIX B: OGI VIDEO LOG

1. Inspector Name: Meaghan Pashen	**2. Archival Record Location:** R5 Electronic Records Center

Video Number	File Name	Date and Time (incl. Time zone and DST)	Description of Image
1	MOV_3059.mp4	3/22/2023*	Glaze spray booth
2	MOV_3060.mp4	3/22/2023*	Glaze spray booth
3	MOV_3061.mp4	3/22/2023*	Kiln No.1 front
4	MOV_3062.mp4	3/22/2023*	Kiln No.1 side
5	MOV_3063.mp4	3/22/2023*	Pieces cooling outside Kiln No.1
6	MOV_3064.mp4	3/22/2023*	N/A: Corrupted File
7	MOV_3065.mp4	3/22/2023*	Dip glaze area

*Time Metadata did not preserve from FLIR videos