



10/13/2026

Mark Tice
Resco Products, Inc. (RHI Magnesita)
6878 OSNABURG RD
East Canton, OH 44730

RE: DRAFT AIR POLLUTION PERMIT-TO-INSTALL AND OPERATE

Facility ID: 1576000771
Permit Number: P0131420
Permit Type: Administrative Modification
County: Stark

No	TOXIC REVIEW
No	SYNTHETIC MINOR TO AVOID MAJOR NSR
No	CEMS
No	MACT/GACT
No	NSPS
No	NESHAPS
No	NETTING
No	MODELING SUBMITTED
Yes	SYNTHETIC MINOR TO AVOID TITLE V
Yes	FEDERALLY ENFORCABLE PTIO (FEPTIO)
No	SYNTHETIC MINOR TO AVOID MAJOR GHG

Dear Permit Holder:

A draft of the Ohio Administrative Code (OAC) Chapter 3745-31 Air Pollution Permit-to-Install and Operate (PTIO) for the referenced facility has been issued for the emissions unit(s) listed in the Authorization section of the enclosed draft permit. This draft action is not an authorization to begin construction or modification of your emissions unit(s). The purpose of this draft is to solicit public comments on the permit. A public notice will appear in the Ohio Environmental Protection Agency Weekly Review and Public Notices website, [Weekly Review and Public Notices](#). A copy of the public notice and the draft permit are enclosed. This permit can be accessed electronically on the Ohio EPA document search webpage: [eDocument Search | Ohio Environmental Protection Agency](#). Comments will be accepted as a marked-up copy of the draft permit or in narrative format. Any comments must be sent to the following:

Andrea Moore
Permit Review/Development Section
Ohio EPA, DAPC
50 West Town Street Suite 700
PO Box 1049
Columbus, Ohio 43216-1049

and
Canton City Public Health Air Pollution Control
420 Market Ave.
Canton, OH 44702-1544

Comments and/or a request for a public hearing will be accepted within 30 days of the date the notice appears on the Ohio EPA Weekly Review and Public Notices website, [Weekly Review and Public Notices | Ohio Environmental Protection Agency](#). You will be notified if a public hearing is scheduled. A decision on issuing a final permit-to-install will be made after consideration of comments received and oral testimony if a public hearing is conducted. Any permit fee that will be due upon issuance of a final Permit-to-Install is indicated in the Authorization section. Please do not submit any payment now. If you have any questions, please contact Canton City Public Health Air Pollution Control at (330)489-3385.

Sincerely,

Robert Hodanbosi
Chief, Division of Air Pollution Control

cc: U.S. EPA Region 5 Via E-Mail Notification
Canton; Pennsylvania; West Virginia

PUBLIC NOTICE

The following matters are the subject of this public notice by the Ohio Environmental Protection Agency. The complete public notice, including any additional instructions for submitting comments, requesting information, a public hearing, or filing an appeal may be obtained at: [Weekly Review and Public Notices | Ohio Environmental Protection Agency](#) or Hearing Clerk, Ohio EPA, 50 W. Town St., Columbus, Ohio 43215. Ph: 614-644-3037 email: HClerk@epa.ohio.gov

Draft Air Pollution Permit-to-Install and Operate Administrative Modification

Resco Products, Inc. (RHI Magnesita)
6878 OSNABURG RD
East Canton, OH 44730

ID#: P0131420

Date of Action: 10/13/2026

Permit Desc: FEPTIO to avoid Title V for both SO₂ and HAPs (HF) from existing Tunnel Kiln (P004) at clay brick manufacturing facility. Administrative modification to remove Tunnel Kiln (P003) and to establish new emission limitations and operational restrictions.

The permit can be accessed electronically and comments may be submitted at: <https://ohioepa.commentinput.com> - Search by entering the permit P0131420 in the "Search Projects" search box.



Permit Strategy Write-Up

1. Check all that apply:

☒ Synthetic Minor Determination

☐ Netting Determination

2. Source Description:

Resco Products, Inc. is an existing synthetic minor facility located on 6878 Osnaburg Rd, East Canton, OH (Stark County). This facility manufactures ceramic refractories (NAICS 327124 Clay Refractory Manufacturing). The facility currently is operating under a FEPTIO permit (P0104453) issued on 2/2/2017 for tunnel kilns P003 and P004. In 2018, tunnel kiln P003 was permanently shut down. Additionally, the facility has been exceeding the HF emissions factor limit of 0.30 lb HF/ton brick established in P0104453 and has been working with Canton APC on a new synthetic minor strategy to resolve this issue.

This permit will be processed as an administrative modification of P0104453 to remove tunnel kiln P003 and to change the emissions limitations and operational restrictions as outlined further below.

3. Facility Emissions and Attainment Status:

The facility is located in an attainment area for all criteria pollutants. The facility, in Osnaburg Township, is located in an Appendix A area with respect to fugitive dust (ref OAC rules 3745-17-08(B) and 3745-17-07(B)(1)). The facility was identified as a major source in an attainment area because PTE for SO₂ ≥ 100 tpy based on rule-based PTE calculations from 1995 and HF ≥ 10 tpy (HAP) based on 2005 stack test results. Therefore, the facility requested federally enforceable production limits for SO₂ and HF for the tunnel kilns to avoid TV and Subpart SSSSS in their initial FESOP application from 2006, that was eventually issued as FEPTIO P0104453 on 2/2/2017. The facility has not reported any actual emissions exceeding the 100 tpy or 10 tpy thresholds. Per the definition of Major Stationary Source under 3745-31-01(M)(5)(d) and 3745-77-01(M)(2), fugitive emissions are not included in major source determinations for the facility since it is not a listed source. Permit application A0080896 submitted on 1/13/2026 for this facility's non-FEPTIO EUs (associated with separate PTIO P0139566) includes total facility-wide emissions in the Synthetic Minor Strategy (December 2025 version) before controls/restrictions and after controls/restriction. The permit writer used these emission calculations and 2005 stack test data to generate the information in these tables.

Facility-wide Potential Fugitive Emissions (ton/yr)

EU	PM	PM10	PM2.5	NOx	CO	VOC	SO2	HF	Other HAPs
F001 (roadways)	3.1	0.79	0.079	0	0	0	0	0	0
F005 (roll crusher)	5.3	2.4	2.4	0	0	0	0	0	0
P004 (tunnel kiln #2)	0	0	0	0	0	0	0	0	0
P038 (raw mat'l batching)	0	0	0	0	0	0	0	0	0
P903 (raw mat'l handling)	0.73	0.32	0.32	0	0	0	0	0	0
P940 (AMG mat'l handling)	0	0	0	0	0	0	0	0	0
Total	9	4	3	0	0	0	0	0	0
Total HAPs								0	



Facility-wide Potential Stack Emissions after controls unrestricted throughput (ton/yr)

EU	PM	PM10	PM2.5	NOx	CO	VOC	SO2	HF	Other HAPs
F001 (roadways)	0	0	0	0	0	0	0	0	0
F005 (roll crusher)	0	0	0	0	0	0	0	0	0
P004 (tunnel kiln #2)	21	19	19	9	13	5	96	19	4
P038 (raw mat'l batching)	1.5	1.5	1.5	0	0	0	0	0	0
P903 (raw mat'l handling)	0.32	0.15	0.03	0	0	0	0	0	0
P940 (AMG mat'l handling)	0.41	0.21	0.21	0	0	0	0	0	0
Total	23	21	21	9	13	5	96	19	4
Total HAPs								23	

Facility-wide Potential Stack Emissions after controls and restricted throughput (ton/yr)

EU	PM	PM10	PM2.5	NOx	CO	VOC	SO2	HF	Other HAPs
F001 (roadways)	0	0	0	0	0	0	0	0	0
F005 (roll crusher)	0	0	0	0	0	0	0	0	0
P004 (tunnel kiln #2)	21	19	19	9	13	5	83.2	9.5	4
P038 (raw mat'l batching)	1.5	1.5	1.5	0	0	0	0	0	0
P903 (raw mat'l handling)	0.32	0.15	0.03	0	0	0	0	0	0
P940 (AMG mat'l handling)	0.41	0.21	0.21	0	0	0	0	0	0
Total	23	21	21	9	13	5	83.2	9.5	4
Total HAPs								13.5	

De minimis EUs [none are a source of HF]:

G001 (gas tanks no longer in service)	P048 (hydraulic press 1)
P028 (NATCO shuttle kiln)	P050 (hydraulic press 2)
P039 (AMG brick dryer)	P051 (Y-Press 2)
P041 (tunnel kiln #2 dryer)	P052 (Y-Press 3)
P044 (liquids)	P053 (Y-Press 4)
P045 (mortars)	P054 (Y-Press 5)
P046 (silos)	P055 (Y-Press 6)
P047 (bat bagging)	T004 (storage tank)
P049 (tunnel kiln #1 dryer)	T005 (storage tank)

4. Source Emissions:

P004 (Tunnel Kiln#2): Natural gas-fired tunnel kiln with a maximum heat capacity of 31.26 MMBtu/hr producing alumina ladle brick with 5.13 ton/hr maximum throughput capacity of unfired brick. This throughput capacity is different from the previous permit (P0104453) which was for 4.75 ton/hr maximum production capacity of fired brick. This was changed because the material throughput should be the production capacity of unfired brick. On 1/6/2023, the facility provided the ratio of unfired brick and fired brick, which is 1.08. Therefore, the maximum throughput capacity equals $4.75 \times 1.08 = 5.13$ ton/hr. Worst-case brick formulation



testing for fluorine and sulfur was conducted in January 2023 that was used to calculate PTE for HF and SO₂ as submitted in A0073580 on 2/22/2023 associated with this FEPTIO P0131420.

This emission unit emits HF, HCl, SO₂, NO_x, PE/PM₁₀, CO and VOC emissions.

The source of HF and SO₂ emissions from this emissions unit is from uncalcined raw materials containing sulfur and fluorine in the dry feed mix that includes clay and phosphoric acid used as a binding agent. Conservative assumptions are considered as follows:

- a) all fluorine in the unfired brick is emitted as hydrogen fluoride (HF).
- b) all sulfur in the unfired brick is emitted as sulfur dioxide (SO₂).

NO_x, additional SO₂, PE/PM₁₀, CO and VOC emissions come from natural gas burning. The maximum potential to emit (PTE) of P004 without annual throughput restrictions is shown below along with a summary of changes from active to new permit.

Unrestricted PTE of P004 (Tunnel kiln #2)

Pollutant	Unrestricted Potential to emit (PTE) (ton/yr)	Reference of EF
HF	19	Per application A0073580 and based on worst-case formulation testing performed in 2023, 0.91 lb HF/ton brick x 4.75 ton brick/hr x 8760 ÷ 2000
SO ₂	96	Per application A0073580 and based on worst-case formulation testing performed in 2023, 4.6 lb SO ₂ /ton brick x 4.75 ton brick/hr x 8760 ÷ 2000
HCl	3.54	Per application A0073580 and based on AP-42 Table 11.3-4 for natural gas-fired tunnel kilns: 0.17 lb HCl/ton x 4.75 ton brick/hr x 8760 ÷ 2000
PM	21	Per application A0073580, 0.96 lb/ton of fired brick AP-42 Table 11.3-2, SCC 3-05-003-11 total PE (filterable and condensable) multiplied by 4.75 tons/hr maximum fired brick production rate. Plus natural gas total PE emissions using 7.6 lb/mmcf from AP-42 Table 1.4-2 and 268 mmscf/yr maximum throughput.
PM ₁₀	19	Per application A0073580, 0.87 lb/ton of fired brick AP-42 Table 11.3-2, SCC 3-05-003-11 total PM ₁₀ (filterable and condensable) multiplied by 4.75 tons/hr maximum fired brick production rate Plus natural gas total PE emissions using 7.6 lb/mmcf from AP-42 Table 1.4-2 and 268 mmscf/yr maximum throughput.
NO _x	9.08	2.07 lb/hr, May 2005 stack test result (highest run, Run #2) with 40% margin multiplied by 8760 hr/year maximum
CO	13.18	3.01 lb/hr, May 2005 stack test result (highest run, Run #3) with 40% margin multiplied by 8760 hr/year maximum
VOC	4.78	1.09 lb/hr, May 2005 stack test result (highest run, Run #3) with 40% margin multiplied by 8760 hr/year maximum



Summary table of the limitation changes from superseded permit to new permit
[see Section 6 for an explanation of the changes]

	Permit P0104453 (TK #1 – P003 & TK #2 – P004)	Permit P0131420 (TK #2 – P004)
Facility-wide Definitions	- Clay shall refer to a raw material containing fluorine and/or sulfur (excluding previously-fired or calcined material) that is later blended together with one or more other materials that together comprise the ingredients of a given product manufactured at this facility. - Type of clay shall refer to one of the specific “clay” raw materials identified by a code and/or trade name for use as one of the ingredients in products manufactured at this facility.	- Dry feed shall refer to a raw material containing fluorine and/or sulfur that is later blended together with one or more other materials that together comprise the ingredients of a given product manufactured at this facility. This material can either be uncalcined or calcined. - Type of dry feed shall refer to one of the specific “dry feed” raw materials identified by a code and/or trade name for use as one of the ingredients in products manufactured at this facility. - Calcined shall refer to dry feed that has undergone thermal processing, also known as previously-fired. - Dry feed mix shall refer to the mixture of raw materials (dry or wet) that are used to make the brick
Production limits	≤43,000 tons/yr (rolling 12-mo) combined [for fired brick]	None. Use content limits.
Other operational limits	- Use of only natural gas - Use of only calcined materials except for raw fireclay - No unapproved materials without prior OEPA approval	Use of only natural gas
Content limits	- Fluorine ≤1,021 lb/mo (combined) - Sulfur ≤8,242 lb/mo (combined)	- Fluorine ≤18,050 lb/yr (rolling 12-mo) [based on annual restriction of 9.5 ton HF/yr] - Sulfur ≤83,200 lb/yr (rolling 12-mo) [based on a reduced production throughput of 31,000 ton/yr unfired brick, which is less than the maximum throughput of 44,938 ton/yr unfired brick, and the 2005 stack test run #3 rate of 19.67 lb SO₂/hr]
Emission Limits [Per OAC rule 3745-31-05(D)]	- HF ≤0.30 lb/ton brick, 6.45 tpy - SO₂ ≤4.60 lb/ton brick, 98.9 tpy - PM₁₀ ≤0.45 lb/ton brick, 9.68 tpy - VOC ≤3.87 tpy - NO_x ≤7.31 tpy - CO ≤10.54 tpy	- HF ≤2.17 lb/hr and ≤9.5 tpy (rolling 12-mo) - SO₂ ≤27.54 lb/hr and ≤83.20 tpy (rolling 12-mo) - HCl ≤0.81 lb/hr and ≤3.54 tpy (rolling 12-mo) - PE/PM₁₀ ≤4.79 lb/hr and ≤20.99 ton/yr (rolling 12-mo) - VOC ≤1.09 lb/hr and ≤4.78 ton/yr (rolling 12-mo)



		• $\text{NO}_x \leq 2.07 \text{ lb/hr}$ and $\leq 9.08 \text{ ton/yr}$ (rolling 12-mo) • $\text{CO} \leq 3.01 \text{ lb/hr}$ and $\leq 13.18 \text{ ton/yr}$ (rolling 12-mo)
Monitoring & recordkeeping	• Daily VE checks. • Quarterly fluorine & sulfur testing of each clay type. • Certificates of analysis for fluorine & sulfur wt. percentage of the phosphoric-acid shipments. • Monthly records of production, feed-material amounts, fluorine & sulfur wt. percentages, and rolling-sum of PE/PM₁₀, VOC, SO₂, NO_x, CO, HF.	• Daily VE checks; frequency can step down to weekly, monthly, quarterly after consecutive clean periods. • Fluorine & sulfur testing or certificates of analysis for each shipment of raw materials containing sulfur and fluorine to get %wt values used to determine monthly F & S content of the raw material used each month. • Monthly logs of production, total F, S, HF and SO₂, and fuel use if not natural gas. • Compliance with PE/PM₁₀, HCl, VOC, NO_x, and CO limits assumed based on unrestricted max PTE and no monitoring or recordkeeping required.
Testing	• None	• Emissions testing for HF, HCl, PE, SO₂, VOC, NO_x, CO, Metal HAP, H₂S, and VE.

5. Conclusion:

This permit P0131420 will be processed as an administrative modification of P0104453 to remove tunnel kiln P003 and establish new emissions limitations and operational restrictions. This is not considered a Ch31 modification since no physical changes or changes in the method of operation have occurred for P004 resulting in the changes in emission limitations.

Due to the change in the synthetic minor emission limitations and operational restrictions, this permit is required to be issued draft with a 30-day public comment period, and then final, so these new restrictions become federally enforceable. The issuance of this permit will affectively restrict this facility below the MACT major-HAP source thresholds for the facility to continue to avoid Title V and Major MACT applicability.

6. Please provide additional notes or comments as necessary:

Synthetic minor strategy

- 1) Facility-wide definitions were updated to clarify raw materials used in the tunnel kiln for monitoring and recordkeeping based on mass balance calculations of dry feed. Updated the use of term "Clay" to more generic language since it was discovered the facility uses a variety of dry materials in this EU so "clay" was too narrow.
- 2) OAC rule 3745-31-05(D) is applied to the facility since SO₂ is higher than 100 tpy based on the Ch18 limitation ($56.81 \text{ lb SO}_2/\text{hr} \times 8760 = 248.83 \text{ ton/yr}$), and the maximum potential to emit of HF is higher than 10 ton/yr based on the following calculations:

$5.13 \text{ t/hr unfired brick} \times 50\% \text{ clay (max formulation provided in permit application A0073580)} = 2.565 \text{ t/hr clay.}$

Based on emission reports submitted from 2018-2025 of actual ton/month usage, there was a max of ~250 ton/month clay and ~50 ton/month acid, making that $50/250 = 20\%$ acid to clay ratio.



$2.565 \text{ t/hr clay} \times 20\% \text{ acid to clay} = 0.513 \text{ t/hr acid}$

$2.565 \text{ t/hr clay} \times 8760 \text{ hr/yr} = 22469.4 \text{ t/yr clay}$

$0.513 \text{ t/hr acid} \times 8760 \text{ hr/yr} = 4493.88 \text{ t/yr acid}$

Based on emission reports submitted from 2018-2025 of actual usage, there was a max testing value of 0.05%F for clay and 0.4%F for acid:

$22,469.4 \text{ t/yr clay} \times 0.05\%F = 11.23 \text{ t/yr F from clay}$

$4,493.88 \text{ t/yr acid} \times 0.4\%F = 17.98 \text{ t/yr F from acid}$

$11.23 + 17.98 = 29.21 \text{ t/yr F total}$

$29.21 \text{ t/yr F} \times (20/19) = 30.75 \text{ t/yr HF}$

Note: These calculations use the same emissions monitoring approach as used in the permit, so it shows what would be possible if there was no restriction on fluoride throughput.

In accordance with synthetic minor strategy guidance, emission limitations in 12-month rolling format and operational restrictions in 12-month rolling format were established, as further described below.

Previously, the strategy to limit HF and SO₂ included a lb/ton HF and lb/ton SO₂, which resulted in exceedances of the 0.30 lb/ton HF limit when low production rates occurred. To address the difficulty the facility has been having in meeting the HF limit when production rates were low but they were processing a higher F product, an initial strategy was devised based on the January 2023 worst-case brick formulation testing where material throughput was limited based on fluorine and sulfur content test results from worst-case unfired brick formulations with the highest phosphoric acid and the highest clay. This strategy was determined to be insufficient to demonstrate compliance with emission limitations since the permittee requested to continue to use raw material testing and mass balance calculations instead of unfired brick formulations testing.

The current strategy updates the lb/ton to a lb/hr format which addresses the facility's difficulty with the lb/ton format. The strategy establishes new HF and SO₂ emission limitations based on the 2005 stack test results where the highest HF and SO₂ rates from the three runs conducted were chosen to represent the HF and SO₂ short-term limits in lb/hr plus 40% added to provide a margin for error. This differs from the prior strategy which used the 2005 stack test 3-run average plus 15% converted to lb/ton. Compliance with the short-term limits will be determined by emissions testing as required in this permit. Therefore, there is no ongoing recordkeeping for the short-term limits.

Fluorine and sulfur content operational restrictions were revised to values that would restrict HF to 9.5 tpy and SO₂ to 83.2 tpy, and converted from lb/month to lb per 12-month rolling format, as shown:

- $9.5 \text{ ton}_{\text{HF}}/\text{yr} \times (19/20) \times 2000 \text{ lb/ton} = 18,050 \text{ pounds}_F/\text{yr}$
 - 9.5 tpy was selected by multiplying 2.17 lb_{HF}/hr by 8760 hr/yr then dividing by 2000.
- $83.20 \text{ ton}_{\text{SO}_2}/\text{yr} \times 32/64 \times 2000 \text{ lb/ton} = 83,200 \text{ lb}_S/\text{yr}$
 - 83.20 tpy was selected by multiplying 27.54 lb_{SO2}/hr by 5.13 ton_{unfired brick}/hr to get 5.37 lb_{SO2}/ton multiplied by 31,000 ton_{unfired brick}/yr. The 31,000 value was proposed by the facility in their permit application as a restricted throughput value. Based on emission reports submitted from 2018-2025 of actual usage, the maximum monthly usage of fired brick is 1444 tons/month; when multiplied by 1.08 this converts to 1560 tons/month of unfired brick; when multiplied by 12 months/yr, this becomes 18,720 tons/yr, which is less than the 31,000 tons/yr basis.



The prior lb/mo type of limitation was too restrictive to allow for fluctuations on different brick formulations produced throughout the year and the monthly value was not directly related to any emission limitation. It also did not follow the proper synthetic minor restriction format of 12-month rolling. These limits were updated to 12-month rolling format to fix these issues.

The production limits in the previous permit were removed since they were duplicative, didn't directly correlate to HF and SO₂ emissions and the content limitations were adequate by themselves to restrict HF and SO₂ emissions.

Raw materials testing/monitoring was revised to require testing of each shipment of raw materials containing sulfur and fluorine instead of monthly composite sampling for sulfur and fluorine content. More detail was added to this section to clarify the testing is for all raw materials that may contain sulfur and fluorine, not only clay and acid. Also added was the option to get a certificate of analysis instead of performing the sampling/testing themselves for the raw materials. Additionally, monthly fluorine and sulfur content for conversion to HF and SO₂ are based on mass balance calculations representing brick formulations of actual production; this was not changed from the prior permit approach but clarified in this permit.

The operational restriction related to use of only fire clay and no unapproved materials was removed. It was discovered the facility uses a variety of materials, some of which are uncalcined that are not fireclay, and this has always been the way that they have operated, so this term was inaccurate. The similar operational restriction contained in the facility-wide terms was also removed for the same reasons.

- 3) Due to the potential of HCl emissions from brick manufacturing operations, a short-term lb/hr and rolling 12-mo limit was established based on AP-42, Table 11.3-4 for natural gas-fired tunnel kilns and max throughput capacity, representing the max PTE without restricted throughput. This was based on the permit application information. The addition of HCl to the emission limitations was necessary to properly restrict HAP emissions below the major-HAP thresholds to keep the facility non-major status and for more enforceability based on emissions testing being required in this permit.
- 4) PE/PM₁₀ limits were established based on AP-42, Table 11.3-2, for natural gas-fired tunnel kilns and AP-42, Table 1.4-2 for natural gas combustion. The permittee requested this approach as opposed to the prior PE/PM₁₀ short-term limit and rolling 12-month period from superseded permit P0104453 which were based on a 1988 stack test result and an annual production limitation. The permittee asked for the total PM (filterable and condensable) emission factor from AP-42 Table 11.3-2 be used as a surrogate for PM₁₀, even though that table contains a PM₁₀ specific emission factor.
- 5) VOC, NO_x, and CO limits were established based on the 2005 stack test results where the highest representative lb/hr rate from the three runs conducted were chosen to represent each short-term limit plus 40% added to provide a margin for error to determine the max PTE without restricted throughput. This differs from the prior strategy which used the 2005 stack test 3-run average plus 15% converted to lb/ton. Previously not established for VOC, NO_x, and CO, short-term limits were added for more enforceability based on emissions testing being required in this permit.
- 6) HCl, PE/PM₁₀, VOC, NO_x, and CO emission limits represent the maximum PTE for this EU without restricted throughput and are less than major source threshold. No monitoring/recordkeeping are required to demonstrate compliance. Even though the maximum PTE for these pollutants are well below the respective pollutant major thresholds, the emission limitations for these pollutants remain part of the federally enforceable limitations per OAC rule 3745-31-05(D) to reflect their potential to emit since another rule, like



BAT, does not apply to this source for these pollutants. It also allows PE/PM₁₀ to be less than the applicable OAC rule 3745-17-11 limitation.

- 7) Emissions testing for HF, HCl, PE, SO₂, VOC, NO_x, CO, Metal HAP, H₂S, and VE was established to be conducted within 6 months of permit issuance to determine compliance with the emissions limitations in the this permit and for additional discovery. This was decided since the permittee had some uncertainty to the representation of the 2005 stack test to their current operations, was uncertain if emissions escape the kiln through the dryers, and if the kiln was a source of Metal HAP and H₂S. It will also provide information for the determination of a reduction factor that can be used in the ongoing emission calculations to reflect the amount of F and S not converted to HCl and SO₂. The results of the testing will provide current information to know if the permit restrictions need updated further.

7. Total Permit Allowable Emissions Summary (for informational purposes only):

<u>Pollutant</u>	<u>Tons Per Year</u>
PE/PM ₁₀	20.99
SO ₂	83.20
CO	13.18
NO _x	9.08
VOC	4.78
HF	9.5
HCl	3.54



**Environmental
Protection
Agency**

DRAFT

Division of Air Pollution Control
Permit-to-Install and Operate
for

Resco Products, Inc. (RHI Magnesita)

Facility ID:	1576000771
Permit Number:	P0131420
Permit Type:	Administrative Modification
Issued:	10/13/2026
Effective:	To be entered upon final issuance
Expiration:	To be entered upon final issuance



Division of Air Pollution Control
Permit-to-Install and Operate

for

Resco Products, Inc. (RHI Magnesita)

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Authorization

Facility ID: 1576000771
Application Number(s): A0070589, M0005489, M0005396, A0073580A0070589, M0005489, M0005396, A0073580
Permit Number: P0131420
Permit Description: FEPTIO to avoid Title V for both SO₂ and HAPs (HF) from existing Tunnel Kiln (P004) at clay brick manufacturing facility. Administrative modification to remove Tunnel Kiln (P003) and to establish new emission limitations and operational restrictions.
Permit Type: Administrative Modification
Permit Fee: \$750.00 *DO NOT send payment at this time, subject to change before final issuance*
Issue Date: 10/13/2026
Effective Date: To be entered upon final issuance
Expiration Date: To be entered upon final issuance
Permit Evaluation Report (PER) Annual Date: To be entered upon final issuance

This document constitutes issuance of a Permit-to-Install and Operate for the emissions unit(s) identified on the following page to:

Resco Products, Inc. (RHI Magnesita)
6878 OSNABURG RD
East Canton, OH 44730

Ohio Environmental Protection Agency (EPA) District Office or local air agency responsible for processing and administering your permit:

Canton City Public Health Air Pollution Control
420 Market Ave.
Canton, OH 44702-1544
(330)489-3385

The above-named entity is hereby granted this Permit-to-Install and Operate for the air contaminant source(s) (emissions unit(s)) listed in this section pursuant to Chapter 3745-31 of the Ohio Administrative Code. Issuance of this permit does not constitute expressed or implied approval or agreement that, if constructed or modified in accordance with the plans included in the application, the described emissions unit(s) will operate in compliance with applicable State and Federal laws and regulations.

This permit is granted subject to the conditions attached hereto.

Ohio Environmental Protection Agency

John Logue
Director

Authorization (continued)

Permit Number: P0131420

Permit Description: FEPTIO to avoid Title V for both SO₂ and HAPs (HF) from existing Tunnel Kiln (P004) at clay brick manufacturing facility. Administrative modification to remove Tunnel Kiln (P003) and to establish new emission limitations and operational restrictions.

Permits for the following Emissions Unit(s) or groups of Emissions Units are in this document as indicated below:

Emissions Unit ID:	P004
Company Equipment ID:	Tunnel Kiln #2
Superseded Permit Number:	P0104453
General Permit Category and Type:	Not Applicable

List of Commonly Used Abbreviations

AP-42 = U.S. EPA's Compilation of Air Pollution Emissions Factors	HVLP = high volume, low pressure	PER = Permit Evaluation Report
ASTM = American Society for Testing and Materials	LAER = lowest achievable emission rate	PM = particulate matter
BACT = Best Available Control Technology	lb(s)/hr = pound(s) per hour	PM ₁₀ = particulate matter with an aerodynamic diameter less than or equal to 10 microns
BAT = Best Available Technology	LDAR = leak detection and repair	PM _{2.5} = particulate matter with an aerodynamic diameter less than or equal to 2.5 microns
CAA = Clean Air Act	LPG = liquefied petroleum gas/propane	ppb = parts per billion
CAM = compliance assurance monitoring	MACT = maximum achievable control technology	ppm = parts per million
CEMS = continuous emissions monitoring system	MAGLC = maximum acceptable ground level concentration	PSD = Prevention of Significant Deterioration
CFC = chlorofluorocarbon	mg/m ³ = milligrams per cubic meter	psi = pounds per square inch
CFR = Code of Federal Regulations	MM = million	psia = pounds per square inch absolute
CH ₄ = methane	MMBtu = million British Thermal Units	PTE = potential-to-emit
CI = compression ignition	MSDS = material safety data sheet	PTI = Permit-to-Install
CO = carbon monoxide	MSW = municipal solid waste	PTIO = Permit-to-Install and Operate
CO ₂ = carbon dioxide	NAAQS = National Ambient Air Quality Standard	PTO = Permit-to-Operate
COM = continuous opacity monitor	NESHAP = National Emission Standard for Hazardous Air Pollutants	PWR = process weight rate
DAPC = Division of Air Pollution Control	NG = natural gas	RACM = reasonably available control measures
DO/LAA = District Office/Local Air Agency	ng/m ³ = nanograms per cubic meter	RACT = reasonably available control technology
dscf = dry standard cubic foot	NH ₃ = ammonia	RATA = relative accuracy test audit
EAC = emissions activity category	NMHC = non-methane hydrocarbons	RTO = regenerative thermal oxidizer
eDocs = electronic documents database	NMOC = non-methane organic compound	SB265 = Senate Bill 265
ERAC = Environmental Review Appeals Commission	NO = nitrogen oxide	scfm = standard cubic feet per minute
ESP = electrostatic precipitator	NO ₂ = nitrogen dioxide	SI = spark ignition
EU = emissions unit	NO _x = nitrogen oxides	SIP = State Implementation Plan
FEPTIO = Federally Enforceable Permit-to-Install and Operate	NSPS = New Source Performance Standard	SO ₂ = sulfur dioxide
FER = Fee Emissions Report	NSR = New Source Review	SSMP = startup, shutdown, and malfunction plan
FR = Federal Register	NTV = Non-Title V	TDS = total dissolved solids
GACT = generally achievable control technology	O&M = operation and maintenance	TLV = threshold limit value
GHG = greenhouse gases	OAC = Ohio Administrative Code	TO = thermal oxidizer
gr/dscf = grains per dry standard cubic foot	OC = organic compound	TPH = ton(s) per hour
H ₂ S = hydrogen sulfide	Ohio EPA = Ohio Environmental Protection Agency	TPY = ton(s) per year
H ₂ SO ₄ = sulfuric acid	ORC = Ohio Revised Code	TSP = total suspended particulates
HAP = hazardous air pollutant	Pb = lead	VE = visible emissions
HCl = hydrogen chloride	PBR = Permit-By-Rule	VMT = vehicle miles traveled
HF = hydrogen fluoride	PCB = polychlorinated biphenyl	VOC = volatile organic compound
Hg = mercury	PE = particulate emissions	WPP = work practice plan
hp = horsepower	PEMS = predictive emissions monitoring system	µg/m ³ = micrograms per cubic meter

A. Standard Terms and Conditions

1. What does this permit-to-install and operate (PTIO) allow me to do?

This permit allows you to install and operate the emissions unit(s) identified in this PTIO. You must install and operate the unit(s) in accordance with the application you submitted and all the terms and conditions contained in this PTIO, including emission limits and those terms that ensure compliance with the emission limits (for example, operating, recordkeeping and monitoring requirements).

2. Who is responsible for complying with this permit?

The person identified on the "Authorization" page, above, is responsible for complying with this permit until the permit is revoked, terminated, or transferred. "Person" means a person, firm, corporation, association, or partnership. The words "you," "your," or "permittee" refer to the "person" identified on the "Authorization" page above.

The permit applies only to the emissions unit(s) identified in the permit. If you install or modify any other equipment that requires an air permit, you must apply for an additional PTIO(s) for these sources.

3. What records must I keep under this permit?

You must keep all records required by this permit, including monitoring data, test results, strip-chart recordings, calibration data, maintenance records, and any other record required by this permit for five years from the date the record was created. You can keep these records electronically, provided they can be made available to Ohio EPA during an inspection at the facility. Failure to make requested records available to Ohio EPA upon request is a violation of this permit requirement.

4. What are my permit fees and when do I pay them?

There are two fees associated with permitted air contaminant sources in Ohio:

- a) PTIO fee. This one-time fee is based on a fee schedule in accordance with Ohio Revised Code (ORC) section 3745.11 or based on a time and materials charge for permit application review and permit processing if required by the Director.

You will be sent an invoice for this fee after you receive this PTIO and payment is due within 30 days of the invoice date. You are required to pay the fee for this PTIO even if you do not install or modify your operations as authorized by this permit.

- b) Annual emissions fee. Ohio EPA will assess a separate fee based on the total annual emissions from your facility. You self-report your emissions in accordance with Ohio Administrative Code (OAC) Chapter 3745-78. This fee assessed is based on a fee schedule in ORC section 3745.11 and funds Ohio EPA's permit compliance oversight activities. For facilities that are permitted as synthetic minor sources, the fee schedule is adjusted annually for inflation. Ohio EPA will notify you when it is time to report your emissions and to pay your annual emission fees.

5. When does my PTIO expire, and when do I need to submit my renewal application?

This permit expires on the date identified at the beginning of this permit document (see "Authorization" page above) and you must submit a renewal application to renew the permit. Ohio EPA will send a renewal notice to you approximately six months prior to the expiration date of this permit. However, it is very important that you submit a complete renewal permit application (either electronically through Ohio EPA's eBusiness Center: Air Services web service or postmarked prior to expiration of this permit) even if you do not receive the renewal notice.



If a complete renewal application is submitted before the expiration date, Ohio EPA considers this a timely application for purposes of ORC section 119.06, and you are authorized to continue operating the emissions unit(s) covered by this permit beyond the expiration date of this permit until final action is taken by Ohio EPA on the renewal application.

6. What happens to this permit if my project is delayed or I do not install or modify my source?

This PTIO expires 18 months after the issue date identified on the "Authorization" page above unless otherwise specified if you have not (1) started constructing the new or modified emission sources identified in this permit, or (2) entered into a binding contract to undertake such construction. This deadline can be extended once by 12 months, provided you apply to Ohio EPA for this extension within a reasonable time before the 18-month period has ended and you can show good cause for any such extension.

7. What reports must I submit under this permit?

An annual permit evaluation report (PER) is required in addition to any malfunction reporting required by OAC rule 3745-15-06 or other specific rule-based reporting requirement identified in this permit. Your PER due date is identified in the Authorization section of this permit.

8. If I am required to obtain a Title V operating permit in the future, what happens to the operating provisions and permit evaluation report (PER) obligations under this permit?

If you are required to obtain a Title V permit under OAC Chapter 3745-77 in the future, the permit-to-operate portion of this permit will be superseded by the issued Title V permit. From the effective date of the Title V permit forward, this PTIO will effectively become a PTI (permit-to-install) in accordance with OAC rule 3745-31-02(B). The following terms and conditions of this permit will no longer be applicable after issuance of the Title V permit: Section B, Term 1.b) and Section C, for each emissions unit, Term a)(2).

The PER requirements in this permit remain effective until the date the Title V permit is issued and is effective and cease to apply after the effective date of the Title V permit. The final PER obligation will cover operations up to the effective date of the Title V permit and must be submitted on or before the submission deadline identified in this permit on the last day prior to the effective date of the Title V permit.

9. What are my obligations when I perform scheduled maintenance on air pollution control equipment?

You must perform scheduled maintenance of air pollution control equipment in accordance with OAC rule 3745-15-06(A). If scheduled maintenance requires shutting down or bypassing any air pollution control equipment, you must also shut down the emissions unit(s) served by the air pollution control equipment during maintenance, unless the conditions of OAC rule 3745-15-06(A)(3) are met. Any emissions that exceed permitted amount(s) under this permit (unless specifically exempted by rule) must be reported as deviations in the annual permit evaluation report (PER), including nonexempt excess emissions that occur during approved scheduled maintenance.

10. Do I have to report malfunctions of emissions units or air pollution control equipment? If so, how must I report?

If you have a reportable malfunction of any emissions unit(s) or any associated air pollution control system, you must report this to the Canton City Public Health Air Pollution Control in accordance with OAC rule 3745-15-06(B). Malfunctions that must be reported are those that result in emissions that exceed permitted emission levels. It is your responsibility to evaluate control equipment breakdowns and operational upsets to determine if a reportable malfunction has occurred.

If you have a malfunction but determine that it is not a reportable malfunction under OAC rule 3745-15-06(B), it is recommended that you maintain records associated with control equipment breakdown or process upsets. Although it is not a requirement of this permit, Ohio EPA recommends that you maintain records for non-reportable malfunctions.

11. Can Ohio EPA or my local air agency inspect the facility where the emission unit(s) is/are located?

Yes. Under Ohio law, the Director or his/her authorized representative may inspect the facility, conduct tests, examine records or reports to determine compliance with air pollution laws and regulations and the terms and conditions of this permit. You must provide, within a reasonable time, any information Ohio EPA requests either verbally or in writing.

12. What happens if one or more emissions units operated under this permit is/are shut down permanently?

Ohio EPA can terminate the permit terms associated with any permanently shut down emissions unit. "Shut down" means the emissions unit has been physically removed from service or has been altered in such a way that it can no longer operate without a subsequent "modification" or "installation" as defined in OAC Chapter 3745-31.

You should notify Ohio EPA of any emissions unit that is permanently shut down by submitting a certification that identifies the date on which the emissions unit was permanently shut down. The certification must be submitted by an authorized official from the facility. You cannot continue to operate an emission unit once the certification has been submitted to Ohio EPA by the authorized official.

You must comply with all recordkeeping and reporting for any permanently shut down emissions unit in accordance with the provisions of the permit, regulations or laws that were enforceable during the period of operation, such as the requirement to submit a PER, air fee emission report, or malfunction report. You must also keep all records relating to any permanently shut down emissions unit, generated while the emissions unit was in operation, for at least five years from the date the record was generated.

Again, you cannot resume operation of any emissions unit certified by the authorized official as being permanently shut down without first applying for and obtaining a permit pursuant to OAC Chapter 3745-31.

13. Can I transfer this permit to a new owner or operator?

You can transfer this permit to a new owner or operator. If you transfer the permit, the new owner or operator must follow the procedures in OAC Chapter 3745-31-07, including notifying Ohio EPA or the local air agency of the change in ownership or operator within thirty days of the transfer date. Any transferee of this permit shall assume the responsibilities of the transferor permit holder.

14. Does compliance with this permit constitute compliance with OAC rule 3745-15-07, "air pollution nuisance"?

This permit and OAC rule 3745-15-07 prohibit operation of the air contaminant source(s) regulated under this permit in a manner that causes a nuisance. Ohio EPA can require additional controls or modification of the requirements of this permit through enforcement orders or judicial enforcement action if, upon investigation, Ohio EPA determines existing operations are causing a nuisance.

15. What happens if a portion of this permit is determined to be invalid?

If a portion of this permit is determined to be invalid, the remainder of the terms and conditions remain valid and enforceable. The exception is where the enforceability of terms and conditions are dependent on the term or condition that was declared invalid.

B. Facility-Wide Terms and Conditions



1. This permit document constitutes a PTI issued in accordance with ORC 3704.03(F) and a PTO issued in accordance with ORC 3704.03(G).
 - a) For the purpose of a PTI document, the facility-wide T&C identified below are federally enforceable with the exception of those listed below which are enforceable under state law only.
 - (1) None.
 - b) For the purpose of a PTO document, the facility-wide T&C identified below are enforceable under state law only with the exception of those listed below which are federally enforceable.
 - (1) None.
2. Definitions - for the purpose of this permit:
 - a) Dry feed shall refer to a raw material containing fluorine and/or sulfur that is later blended together with one or more other materials that together comprise the ingredients of a given product manufactured at this facility. This material can either be uncalcined or calcined.
 - b) Type of dry feed shall refer to one of the specific "dry feed" raw materials identified by a code and/or trade name for use as one of the ingredients in products manufactured at this facility.
 - c) Brick shall refer to any product produced in the tunnel kiln whether it is a refractory brick or any other various types.
 - d) Calcined shall refer to dry feed that has undergone thermal processing, also known as previously-fired.
 - e) Dry feed mix shall refer to the mixture of raw materials (dry or wet) that are used to make the brick

C. Emissions Unit Terms and Conditions



1. P004, Tunnel Kiln #2

Operations, Property and/or Equipment Description:

Tunnel Kiln #2: 31.26 MMBtu/hr natural gas-fired Tunnel kiln producing alumina ladle brick with 5.13 ton/hr unfired brick and 4.75 ton/hr fired brick maximum throughput capacity. The tunnel kiln layout consists of three zones: preheat, firing, and cooling. The tunnel kiln stack originates from the preheat zone and exhausts to the atmosphere. An exhaust fan in the preheat zone pulls combustion gases from the natural gas burners in the firing zone and exhausts them through the tunnel kiln stack. Waste heat from the cooling zone is directed to a separate tunnel kiln dryer (#2 dryer EU P041 or #1 dryer EU P049) where unfired brick is dried by the waste heat before entering the tunnel kiln to be fired.

a) This permit document constitutes a PTI issued in accordance with ORC 3704.03(F) and a PTO issued in accordance with ORC 3704.03(G).

(1) For the purpose of a PTI document, the EU T&C identified below are federally enforceable with the exception of those listed below which are enforceable under state law only.

a. b)(1)e., b)(2)c.

(2) For the purposes of a PTO document, the EU T&C identified below are enforceable under state law only with the exception of those listed below which are federally enforceable.

a. b)(1)a., c)(1)-(2), d)(3)-(5), e)(2), f)(1)a.-c., f)(2)a.-b.

b) Applicable Emissions Limitations and/or Control Requirements

(1) The specific operation(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures are identified below. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
a.	OAC rule 3745-31-05(D) [Synthetic minor to avoid Title V and 40 CFR 63 Subpart SSSSS]	Hydrogen fluoride (HF) emissions shall not exceed 2.17 lb/hr and 9.5 tons per rolling 12-month period. Sulfur dioxide (SO ₂) emissions shall not exceed 27.54 lb/hr and 83.20 tons per rolling 12-month period. Hydrogen chloride (HCl) emissions shall not exceed 0.81 lb/hr and 3.54 tons per rolling 12-month period. PE/PM ₁₀ shall not exceed 4.79 lb/hr and 20.99 tons per rolling 12-month period.



		VOC emissions shall not exceed 1.09 lb/hr and 4.78 tons per rolling 12-month period. NO _x emissions shall not exceed 2.07 lb/hr and 9.08 tons per rolling 12-month period. CO emissions shall not exceed 3.01 lb/hr and 13.18 tons per rolling 12-month period. See b)(2)a. and b)(2)e.
b.	OAC rule 3745-17-07(A) [Visible particulate emission limitations for stack emissions]	Visible particulate emissions (PE) from the stacks serving this emissions unit shall not exceed 20% opacity, as a 6-minute average, except as provided by rule.
c.	OAC rule 3745-17-11(B) [Restrictions on particulate emissions from industrial processes]	Particulate emissions shall not exceed 11.65 lb _{PE} /hr. This emission limitation is less stringent than the emission limitation pursuant to OAC rule 3745-31-05(D). See b)(2)b. and f)(1)e. below.
d.	OAC rule 3745-18-06(E) [Sulfur Dioxide Regulations]	Sulfur dioxide (SO ₂) emissions shall not exceed 56.81 lb _{SO2} /hr. This emission limitation is less stringent than the emission limitation pursuant to OAC rule 3745-31-05(D). See f)(1)f. below.
e.	ORC 3704.03(F)(3)(c) and (F)(4) OAC rule 3745-114-01 [Toxic Air Contaminants]	Exempt. See b)(2)c.
f.	OAC rule 3745-31-05(A)(3) [Best available technology (BAT) requirements]	Exempt. See b)(2)d.

(2) Additional Terms and Conditions

- a. The permittee shall apply for and, if required, obtain a modification to this permit or obtain a new final federally enforceable permit-to-install and operate (FEPTIO) prior to making any change to equipment, change in fuels burned, change in the method of operation, change in materials used, or any other change to this emissions unit that results in an increase in the allowable emissions or results in an increase in emissions of greater than the de minimis levels in OAC rule 3745-15-05 for any type of air contaminant not previously emitted.



- b. The allowable emission rate for particulate emissions allowed by OAC rule 3745-17-11 is more than the Potential to Emit for this emissions unit. Therefore, no monitoring, record keeping, or reporting is required to demonstrate compliance.
 - c. Modeling to demonstrate compliance with, the “Toxic Air Contaminant Statute”, ORC 3704.03(F)(3)(c), (F)(4) and OAC Rule 3745-114-01 was not required because the air contaminant source was installed before January 1, 1974 and has not since been modified.
 - d. Best available technology (BAT) requirements pursuant to OAC rule 3745-31-05(A)(3) do not apply to EU P004 since this EU was installed prior to January 1, 1974 and has not since been modified, so it doesn’t meet the definition of a “new source” in OAC rule 3745-31-01(N)(3).
 - e. The hourly and annual emission limitations for PE/PM₁₀, HCl, VOC, NO_x, and CO represent the maximum potential-to-emit for this emissions unit without restricted throughput. Therefore, compliance with the hourly and annual limitations for PE/PM₁₀, HCl, VOC, NO_x, and CO shall be assumed and no monitoring or recordkeeping is required to demonstrate compliance with these emission limitations.
- c) Operational Restrictions
 - (1) The permittee has requested a federally enforceable limitation on production in order to restrict the federally enforceable potential to emit, as follows.
 - a. The total amount of fluorine in the unfired brick production fired in this emissions unit shall not exceed 18,050 pounds per rolling 12-month period.
 - b. The total amount of sulfur in the unfired brick production fired in this emissions unit shall not exceed 83,200 pounds per rolling 12-month period.
 - (2) The permittee shall burn only natural gas as fuel in this emissions unit.
- d) Monitoring and/or Recordkeeping Requirements
 - (1) The permittee shall perform checks per the frequency specified in term d)(2) when the emissions unit is in operation and when the weather conditions allow, for any visible particulate emissions from the stack serving this emissions unit. The presence or absence of any visible emissions shall be noted in an operations log. If visible emissions are observed, the permittee shall also note the following in the operations log:
 - a. the color of the emissions;
 - b. whether the emissions are representative of normal operations;
 - c. if the emissions are not representative of normal operations, the cause of the abnormal emissions;
 - d. the total duration of any visible emissions incident; and
 - e. any corrective actions taken to eliminate the visible emissions.



If visible emissions are present, a visible emission event has occurred. The observer does not have to document the exact start and end times for the visible emission event under item d above or continue the daily check until the event has ended. The observer may indicate that the visible emission event was continuous during the observation period (or, if known, continuous during the operation of the emissions unit). With respect to the documentation of corrective actions, the observer may indicate that no corrective actions were taken if the visible emissions were representative of normal operations, or specify the minor corrective actions that were taken to ensure that the emissions unit continued to operate under normal conditions, or specify the corrective actions that were taken to eliminate abnormal visible emissions.

- (2) The checks required by term d)(1) above shall be performed in accordance with the following frequency schedule:
 - a. Daily: Perform once per day, on each day the emissions unit is in operation, during the time the emissions unit is operating;
 - b. Weekly: If no visible emissions are detected from the stack in 10 consecutive daily checks performed per "a", the permittee may decrease the frequency to conduct the checks once every calendar week of operation of the emissions unit. If visible stack emissions are detected during these weekly checks, the permittee must resume the daily checks performed per "a."
 - c. Monthly: If no visible emissions are detected from the stack in 4 consecutive weekly checks performed per "b", the permittee may decrease the frequency to conduct the checks once every 21 days of operation of the emission unit (one calendar month). If visible stack emissions are detected during these checks, the permittee must resume the checks per the frequency in "b";
 - d. Quarterly: If no visible emissions are detected from the stack in 3 consecutive monthly checks performed per "c", the permittee may decrease the frequency to conduct the checks once every 60 days of operation of the emission unit (3 calendar months). If visible stack emissions are detected during these checks, the permittee must resume the checks per the frequency in "c".
- (3) Monitored fluorine and sulfur content: The permittee shall obtain and maintain records for both the fluorine and sulfur content (% by weight) of each received shipment of raw materials containing sulfur and fluorine.
 - a. Maintain a list of all uncalcined raw materials in the dry feed mix (dry feed, acid, binders, etc) in use.
 - b. Maintain a list of all uncalcined raw materials in the dry feed mix (dry feed, acid, binders, etc) in use that have been confirmed to not contain sulfur and fluorine. Materials tested that have shown results of below method detection limit (MDL) for sulfur and fluorine will be considered to not contain sulfur and fluorine.
 - c. The permittee shall conduct laboratory testing with each shipment of each raw material containing sulfur (S) and fluorine (F) using the following procedure.



- i. The batch number for each raw material shipment containing S and F used in the formulations for this emissions unit shall be recorded.
 - ii. One sample will be collected from each raw material (i.e. clay, phosphoric acid, etc.) shipment used in the formulations for this emissions unit following receipt of the shipment. Shipments are typically monthly.
 - iii. Following sample collection, the samples representing each raw material shipment will be sent to a local lab for testing.
 - iv. Once the results are received, each test result is converted to weight percentages of F and S content for each raw material for their respective months of when that raw material shipment was in use. The results will be kept by batch number and type of raw material.
 - v. The monthly amount of each type of raw material shipment containing S and F (i.e. clay, phosphoric acid, etc.) used each month will be determined based on the formulations used for production.
 - vi. For each month, the F and S content results will be used to calculate the total F and S in each raw material used during that month by multiplying the content results by the monthly amount of the corresponding raw material used.
- d. As an alternative to the testing required in d)(3)c. above, the permittee shall obtain a certificate of analysis showing the fluorine and sulfur content (% by weight) from the material manufacturer for any and/or all of the shipments of raw materials containing sulfur (S) and fluorine (F).
- (4) The permittee shall maintain monthly records of the following information that utilize the calculations shown in f)(1)a.-b.:
 - a. the name of each type of unfired brick (aka formulation) produced during the month;
 - b. the amount of each type of unfired brick (aka formulation) produced during the month, in tons, per month;
 - c. the total amount of unfired brick production for this emissions unit, in tons, per month;
 - d. the total amount of fired brick production for this emissions unit, in tons, per month;
 - e. the amount of each raw material containing sulfur and fluorine used for each type of unfired brick, in tons, per month;
 - f. the total amount of each raw material containing sulfur and fluorine used, in tons, per month;
 - g. the amount of fluorine and sulfur content in each raw material used from the records maintained in d)(3) in percent by weight for each month;
 - h. the total amount of fluorine and sulfur content in the unfired brick production, in pounds, per month;



- i. the rolling, 12-month summation of fluorine and sulfur content in the unfired brick production calculated by adding the current month's content to the total content for the preceding eleven calendar months;
 - j. the total amount of hydrogen fluoride (HF) and sulfur dioxide (SO₂) emissions, in pounds and tons for each month; and
 - k. the rolling, 12-month summation of the HF and SO₂ emissions in tons per year calculated by adding the current month's emissions to the emissions for the preceding eleven calendar months.
 - (5) For each day during which the permittee burns a fuel other than natural gas in this emissions unit, the permittee shall maintain a record of the type and quantity of fuel burned.
- e) Reporting Requirements
 - (1) All applications, notifications, or reports required in writing are to be submitted through Ohio EPA's eBusiness Center: Air Services online web portal. Hardcopy submissions will be accepted on an as-needed basis if the permittee cannot submit the required documents through Air Services. In the event of a hardcopy submission, the post-marked date or the date the document is delivered in person will be recognized as the date submitted. Electronic submittal of applications, notifications, or reports to Ohio EPA fulfills the requirement to submit information to the director, the appropriate DO/LAA, and/or any other individual or organization identified as a recipient unless otherwise specified in this permit. Consistent with OAC rule 3745-15-03, the application, notification or report is considered submitted on the date the submittal is successful using a valid electronic signature. Signature by the signatory authority may be represented as provided through procedures established in Air Services.
 - (2) The permittee shall submit quarterly deviation (excursion) reports that identify the following:
 - a. all deviations (excursions) of the following emission limitations, operational restrictions and/or control device operating parameter limitations that restrict the potential to emit (PTE) of any regulated air pollutant and have been detected by the monitoring, record keeping and/or testing requirements in this permit:
 - i. all exceedances of the rolling 12-month period sulfur and/or fluorine content limitations listed in term c)(1);
 - ii. all exceedances of the rolling, 12-month summation of the HF and/or SO₂, emission limitations listed in term b)(1)a.;
 - iii. all exceedances of the pound per hour emission limitations listed in term b)(1)a. based on emission testing results per term f)(3); and
 - iv. all days of non-compliance with the fuel restriction listed in c)(2), along with the type and quantity of non-compliant fuel burned.
 - b. the probable cause of each deviation (excursion);
 - c. any corrective actions that were taken to remedy the deviations (excursions) or prevent future deviations (excursions); and



d. the magnitude and duration of each deviation (excursion).

If no deviations (excursions) occurred during a calendar quarter, the permittee shall submit a report that states that no deviations (excursions) occurred during the quarter.

The quarterly reports shall be submitted each year by January 31 (covering October to December), April 30 (covering January to March), July 31 (covering April to June), and October 31 (covering July to September), unless an alternative schedule has been established and approved by the Director (the appropriate DO/LAA).

(3) The permittee shall submit an annual PER to the Ohio EPA. The PER must be submitted by the due date identified in the Authorization section of this permit. The PER shall cover a reporting period of no more than twelve months for each air contaminant source identified in this permit. The permittee shall identify the following information in the annual PER in accordance with the appropriate monitoring requirements in section d) above:

- a. the sulfur and/or fluorine content, in pounds, for all 12-months of the PER period; and
- b. the rolling, 12-month summation of the HF and SO₂ emissions for all 12-months of the PER period.

f) **Testing Requirements**

(1) Compliance with the Emissions Limitations and/or Control Requirements specified in section b) of these terms and conditions shall be determined in accordance with the following methods:

a. Emissions Limitation

Hydrogen fluoride (HF) emissions shall not exceed 2.17 lb/hr and 9.5 tons per rolling 12-month period.

Applicable Compliance Method

Ongoing compliance with the tons per rolling 12-month limit shall be based on the monitoring and recordkeeping requirements found in terms d)(3)-(4) and the following calculation methods for the monthly emissions of HF:

First, for each type of uncalcined raw material containing sulfur and fluorine (dry feed, acid, binders, etc.) used during the month, the permittee shall determine the total quantity of that type of raw material used, in tons, by multiplying the quantity of each type of unfired brick produced during the month, in tons, by the content of that type of raw material in the formulation for that type of unfired brick, expressed as a weight fraction, and summing the products over all types of unfired brick produced during the month.

$$X_j = \sum_i (B_i \times W_{ij})$$

Where:

X_j = tons of raw material type j used during the month, recorded under term d)(4)g.



B_i = tons of unfired brick of type i produced during the month, recorded under term d)(4)c.

W_{ij} = content of raw material type j in the formulation for unfired brick type i , expressed as a decimal fraction by weight

i = each type of unfired brick produced during the month

j = each type of raw material used during the month

Second, the permittee shall determine the total fluorine in the unfired brick production for the month, in pounds, by multiplying the total quantity of each type of raw material used during the month, in tons, by 2,000 pounds per ton and by the fluorine content of that type of raw material for that month determined under term d)(3), expressed as a weight percentage and divided by 100, and summing the products over all types of raw material used during the month.

$$F = \sum_j \left[X_j \times 2,000 \frac{\text{lb}}{\text{ton}} \times \frac{C_j^F}{100} \right]$$

Where:

F = total fluorine in the unfired brick production for the month, in pounds, recorded under term d)(4)i.

C_j^F = fluorine content of raw material type j for the month, in percent by weight, determined under term d)(3)

Third, the permittee shall determine the monthly HF emissions from unfired brick, in pounds, by multiplying the total fluorine for the month from unfired brick, in pounds, by the ratio of the molecular weight of HF to F. The monthly HF emissions from unfired brick, in tons, shall be the monthly HF emissions from unfired brick in pounds divided by 2,000 pounds per ton. All fluorine used during the month is assumed to be emitted as HF.

$$HF_{lb} = F_{\text{from unfired brick}} \times \frac{20 \text{ lb/lb-mol HF}}{19 \text{ lb/lb-mol F}}$$

$$HF_{\text{ton}} = \frac{HF_{lb}}{2,000 \text{ lb/ton}}$$

The short-term HF emissions limitation was established by adjusting the highest rate in the May 2005 stack test results (run #3) by 40% to provide a margin for error as shown below:

$$\text{Short-term HF emissions} = 1.55 \text{ lb}_{\text{HF}}/\text{hr} \times 1.40 = 2.17 \text{ lb}_{\text{HF}}/\text{hr}$$

The annual emission limitation of 9.5 tons/yr for hydrogen fluoride was voluntarily accepted by the permittee as a synthetic minor limitation below 10 tons/yr in order to avoid Title V permitting requirements and major MACT source requirements. The amount of HF is calculated by multiplying the adjusted short-term HF emissions rate by 8760 hours and 1 ton/2000 pounds.

$$\text{Annual HF emissions} = 2.17 \text{ lb}_{\text{HF}}/\text{hr} \times 8760 \text{ hr/yr} \div 2000 \text{ lb/ton} = 9.5 \text{ ton}_{\text{HF}}/\text{yr}$$



All emissions are assumed to be stack emissions since they are collected at the preheat zone of the tunnel kiln and exhausted to the atmosphere via the tunnel kiln exhaust stack originating from the preheat zone.

As required in f)(3), HF lb/hr stack emissions compliance shall be determined based on emissions testing conducted according to the procedures specified in 40 CFR Part 60, Appendix A, Methods 1 through 4 and 26 or 26A.

b. Emission Limitation

Sulfur dioxide (SO₂) emissions shall not exceed 27.54 lb/hr and 83.20 tons per rolling 12-month period.

Applicable Compliance Method

Ongoing compliance with the tons per rolling 12-month limit shall be based on the monitoring and recordkeeping requirements found in terms d)(3)-(4) and the following calculation methods for the monthly emissions of SO₂:

First, the total quantity of each type of uncalcined raw material containing sulfur and fluorine (dry feed, acid, binders, etc) used during the month shall be as determined under term f)(1)a for calculation of X_j.

Second, the permittee shall determine the total sulfur in the unfired brick production for the month, in pounds, by multiplying the total quantity of each type of raw material used during the month, in tons, by 2,000 pounds per ton and by the sulfur content of that type of raw material for that month determined under term d)(3), expressed as a weight percentage and divided by 100, and summing the products over all types of raw material used during the month.

$$S = \sum_j \left[X_j \times 2,000 \frac{\text{lb}}{\text{ton}} \times \frac{C_j^S}{100} \right]$$

Where:

S = total sulfur in the unfired brick production for the month, in pounds, recorded under term d)(4)i.

X_j = tons of raw material type j used during the month as determined under term f)(1)a.

C_j^S = sulfur content of raw material type j for the month, in percent by weight, determined under term d)(3)

j = each type of raw material used during the month

Third, the permittee shall determine the monthly SO₂ emissions from unfired brick, in pounds, by multiplying the total sulfur for the month from unfired brick, in pounds, by the ratio of the molecular weight of SO₂ to S. The monthly SO₂ emissions from unfired brick, in tons, shall be the monthly SO₂ emissions from unfired brick in pounds divided by 2,000 pounds per ton. All sulfur used during the month is assumed to be emitted as SO₂.



$$SO_{2,lb} = S_{from\ unfired\ brick} \times \frac{64\ lb/lb-mol\ SO_2}{32\ lb/lb-mol\ S}$$

$$SO_{2,ton} = \frac{SO_{2,lb}}{2,000\ lb/ton}$$

The annual emission limitation of 83.20 tons/yr for sulfur dioxide was voluntarily accepted by the permittee as a secondary synthetic minor limitation to avoid Title V permitting requirements since it is more stringent than the limitation in OAC rule 3745-18-06. The amount of sulfur dioxide is calculated by increasing the highest short-term SO₂ emissions rate from the May 2005 stack testing data (run #3) by 40% to provide a margin for error, then dividing by the May 2005 test process rate of unfired brick to determine a production-based emission factor (the test was performed at maximum capacity). This value was then multiplied by a reduced annual production limitation of 31,000 tons/yr unfired brick and converted to tons.

Annual S emissions = Annual SO₂ emissions =

$$19.67\ lb_{SO_2\ test\ result}/hr \times 1.40 = 27.54\ lb_{SO_2}/hr$$

$$27.54\ lb_{SO_2}/hr \div 5.13\ ton_{unfired\ brick}/hr = 5.37\ lb_{SO_2}/ton_{unfired\ brick}$$

$$5.37\ lb_{SO_2}/ton_{unfired\ brick} \times 32/64 = 2.68\ lb_S/ton_{unfired\ brick}$$

$$2.68\ lb_S/ton_{unfired\ brick} \times 31,000\ ton_{unfired\ brick}/yr = 83,204\ lb_S/yr$$

$$83,204\ lb_S/yr \times 64/32 \div 2000\ lb/ton = 83.20\ ton_{SO_2}/yr$$

The short-term SO₂ emissions limitation was established by adjusting the highest short-term SO₂ emissions rate from the May 2005 stack test data (run #3) by adding 40% to provide a margin for error as shown below:

$$\text{Short-term SO}_2 \text{ emissions} = 19.67\ lb_{SO_2}/hr \times 1.40 = 27.54\ lb_{SO_2}/hr$$

All emissions are assumed to be stack emissions since they are collected at the preheat zone of the tunnel kiln and exhausted to the atmosphere via the tunnel kiln exhaust stack originating from the preheat zone.

As required in f)(3), SO₂ lb/hr stack emissions compliance shall be determined based on emissions testing conducted according to the procedures specified in 40 CFR Part 60, Appendix A, Methods 1 through 4 and 6 or 6C.

c. Emission Limitation

HCl emissions shall not exceed 0.81 lb/hr and 3.54 tons per rolling 12-month period.

PE/PM₁₀ shall not exceed 4.79 lb/hr and 20.99 tons per rolling 12-month period.

VOC emissions shall not exceed 1.09 lb/hr and 4.78 tons per rolling 12-month period.

NO_x emissions shall not exceed 2.07 lb/hr and 9.08 tons per rolling 12-month period.

CO emissions shall not exceed 3.01 lb/hr and 13.18 tons per rolling 12-month period.

Applicable Compliance Method

HCl emissions calculation:



Maximum annual fired brick emissions were calculated based on the maximum throughput capacity of 4.75 ton_{Fired Brick}/hr for this emissions unit and multiplied by the emissions factor of 0.17 lb_{HCl}/ton_{Fired Brick} from the AP-42 Table 11.3-4 for Natural gas-fired kilns at Brick manufacturing operations, then multiplied by 8760 hr/yr and divided by 2000 lb/ton:

$$\text{Annual Brick HCl emissions} = 0.17 \text{ lb}_{\text{HCl}}/\text{ton} \times 4.75 \text{ ton}_{\text{FIRED BRICK}}/\text{hr} \times 8760 \text{ hr/yr} \div 2000 \text{ lb} = 3.54 \text{ ton}_{\text{HCl}}/\text{yr}$$

The maximum hourly potential to emit was calculated by multiplying the maximum throughput capacity of 4.75 ton_{Fired Brick}/hr for this emissions unit by the emissions factor of 0.17 lb_{HCl}/ton_{Fired Brick} from the AP-42 Table 11.3-4:

$$\text{Hourly Brick HCl emissions} = 0.17 \text{ lb}_{\text{HCl}}/\text{ton} \times 4.75 \text{ ton}_{\text{Fired Brick}}/\text{hr} = 0.81 \text{ lb}_{\text{HCl}}/\text{hr}$$

PE/PM₁₀ emissions calculation:

Maximum annual fired brick emissions were calculated based on the maximum throughput capacity of 4.75 ton_{Fired Brick}/hr for this emissions unit and multiplied by the emissions factor* of 0.96 lb_{PM}/ton_{Fired Brick} for total particulate (filterable and condensable PM) from the AP-42 Table 11.3-2 for Natural gas-fired kilns at Brick manufacturing operations, then multiplied by 8760 hr/yr and divided by 2000 lb/ton:

$$\text{Annual Brick PM emissions} = 0.96 \text{ lb}_{\text{PM}}/\text{ton} \times 4.75 \text{ ton}_{\text{FIRED BRICK}}/\text{hr} \times 8760 \text{ hr/yr} \div 2000 \text{ lb} = 19.97 \text{ ton}_{\text{PM}}/\text{yr}$$

*The permittee has selected to use the PM emission factor as a surrogate for PM₁₀ emissions. AP-42 Table 11.3-2 has 0.87 lb_{PM10}/ton_{Fired Brick} for total PM₁₀ (filterable and condensable PM), which is less than the selected surrogate emission factor.

Maximum annual natural gas combustion emissions were calculated based on the maximum gas usage of 268 MMcf/yr for this emissions unit and multiplied by the emissions factor** of 7.6 lb_{PM}/MMcf from the AP-42 Table 1.4-2, then divided by 2000 lb/ton:

$$\text{Annual NG PM emissions} = 7.6 \text{ lb}_{\text{PM}}/\text{MMcf} \times 268 \text{ MMcf/yr} \div 2000 \text{ lb} = 1.02 \text{ ton}_{\text{PM}}/\text{yr}$$

**According to AP-42 Table 1.4-2, all PM is considered size PM₁₀ or smaller.

The annual emissions limitation was established by adding the maximum annual natural gas combustion emissions to the maximum annual fired brick emissions.

$$\text{Total Annual PM emissions} = 19.97 \text{ ton}_{\text{PM}}/\text{yr} + 1.02 \text{ ton}_{\text{PM}}/\text{yr} = 20.99 \text{ ton}_{\text{PM}}/\text{yr}$$

Maximum hourly potential to emit of fired brick emissions were calculated by multiplying the maximum throughput capacity of 4.75 ton_{Fired Brick}/hr for this emissions unit by the emissions factor* of 0.96 lb_{PM}/ton_{Fired Brick} for total particulate (filterable and condensable PM) from the AP-42 Table 11.3-2 for Natural gas-fired kilns at Brick manufacturing operations.



$$\text{Hourly Brick PM emissions} = 0.96 \text{ lb}_{\text{PM}}/\text{ton} \times 4.75 \text{ ton}_{\text{FIRED BRICK}}/\text{hr} = 4.56 \text{ lb}_{\text{PM}}/\text{hr}$$

Maximum hourly potential to emit of natural gas combustion emissions were calculated based on the maximum gas usage of 268 MMcf/yr for this emissions unit and multiplied by the emissions factor** of 7.6 lb_{PM}/MMcf from the AP-42 Table 1.4-2, then divided by 8760 hr/yr.

$$\text{Hourly NG PM emissions} = 7.6 \text{ lb}_{\text{PM}}/\text{MMcf} \times 268 \text{ MMcf}/\text{yr} \div 8760 \text{ hr}/\text{yr} = 0.23 \text{ lb}_{\text{PM}}/\text{hr}$$

The maximum total hourly potential to emit was established by adding the maximum hourly potential to emit of natural gas combustion emissions to the maximum hourly potential to emit of fired brick emissions.

$$\text{Total Hourly PM emissions} = 4.56 \text{ lb}_{\text{PM}}/\text{hr} + 0.23 \text{ lb}_{\text{PM}}/\text{hr} = 4.79 \text{ lb}_{\text{PM}}/\text{hr}$$

Note: the prior PE/PM₁₀ emissions limitation of 9.68 tons per rolling 12-month period from the superseded permit P0104453 was based on a 1988 stack test result and an annual production limitation. Additionally, compliance with the prior hourly PM emission rate was demonstrated by the 1988 stack test that had results of 1.76 lb_{PM}/hr, which is much less than the newly established limitation. The permittee requested the above approaches which provide higher values.

VOC emissions calculation:

The maximum hourly potential to emit was calculated based on the highest short-term VOC emissions rate from Run #3 of the May 2005 stack test result (tested at a maximum throughput capacity of 4.75 ton_{FIRED BRICK}/hr). The result was increased by 40% to provide a margin for error.

$$\text{VOC EF} = 0.78 \text{ lb}_{\text{VOC}}/\text{hr} \times 1.40 = 1.09 \text{ lb}_{\text{VOC}}/\text{hr}$$

The maximum annual potential to emit was calculated by multiplying the maximum hourly potential to emit by 8760 hr/yr, then dividing by 2000 lb/ton:

$$\text{VOC} = 1.09 \text{ lb}_{\text{VOC}}/\text{hr} \times 8760 \text{ hr}/\text{yr} \div 2000 \text{ lb}/\text{ton} = 4.78 \text{ ton}_{\text{VOC}}/\text{yr}$$

NO_x emissions calculation:

The maximum hourly potential to emit was calculated based on the highest short-term NO_x emissions rate from Run #2 of the May 2005 stack test result (tested at a maximum throughput capacity of 4.75 ton_{FIRED BRICK}/hr). The result was increased by 40% to provide a margin for error.

$$\text{NO}_x \text{ EF} = 1.48 \text{ lb}_{\text{NO}_x}/\text{hr} \times 1.40 = 2.07 \text{ lb}_{\text{NO}_x}/\text{hr}$$

The maximum annual potential to emit was calculated by multiplying the maximum hourly potential to emit by 8760 hr/yr, then dividing by 2000 lb/ton:

$$\text{NO}_x = 2.07 \text{ lb}_{\text{NO}_x}/\text{hr} \times 8760 \text{ hr}/\text{yr} \div 2000 \text{ lb}/\text{ton} = 9.08 \text{ ton}_{\text{NO}_x}/\text{yr}$$

CO emissions calculation:



The maximum hourly potential to emit was calculated based on the highest short-term CO emissions rate from Run #3 of the May 2005 stack test result (tested at a maximum throughput capacity of 4.75 ton FIRED BRICK/hr). The result was increased by 40% to provide a margin for error.

$$\text{CO EF} = 2.15 \text{ lb}_{\text{CO}}/\text{hr} \times 1.40 = 3.01 \text{ lb}_{\text{CO}}/\text{hr}$$

The maximum annual potential to emit was calculated by multiplying the maximum hourly potential to emit by 8760 hr/yr, then dividing by 2000 lb/ton:

$$\text{CO} = 3.01 \text{ lb}_{\text{CO}}/\text{hr} \times 8760 \text{ hr/yr} \div 2000 \text{ lb/ton} = 13.18 \text{ ton}_{\text{CO}}/\text{yr}$$

The hourly and annual emission limitations for PE/PM₁₀, HCl, VOC, NO_x, and CO represent the maximum potential-to-emit for this emissions unit without restricted throughput. Therefore, compliance with the emission limitations shall be assumed.

All emissions are assumed to be stack emissions since they are collected at the preheat zone of the tunnel kiln and exhausted to the atmosphere via the tunnel kiln exhaust stack originating from the preheat zone.

As required in f)(3), PE, HCl, VOC, NO_x, and CO lb/hr stack emissions compliance shall be determined based on emissions testing conducted according to the procedures specified in 40 CFR Part 60, Appendix A, Methods 1 through 5, 26 or 26A, 25A, 7 or 7E, and 10, respectively, and 40 CFR Part 51, Appendix M, Method 202 for condensable PE.

d. Emission Limitation

Visible particulate emissions from the stack serving this emissions unit shall not exceed 20 percent opacity, as a six-minute average, except as provided by rule.

In the paragraph above, “except as provided by rule” means the following: Except as provided in OAC rule 3745-17-07(A)(3), visible particulate emissions from the stack(s) serving this emissions unit shall not exceed 20 percent opacity as a six-minute average, except:

- i. visible particulate emissions may exceed 20 percent opacity, as a six-minute average, for not more than six consecutive minutes in any 60 minutes, but shall not exceed 60 percent opacity, as a six-minute average, at any time; and
- ii. the presence of uncombined water shall not be deemed a violation for failure of stack emissions meeting this requirement.

Applicable Compliance Method

Ongoing compliance is indicated by the monitoring and recordkeeping requirements in term d)(1)-(2) above.

As required in f)(3), compliance with the stack VE limitation shall be determined through VE observations performed in accordance with Method 9 of 40 CFR Part 60, Appendix A, and OAC rule 3745-17-03(B)(1)(a).

e. Emission Limitations

Filterable particulate emissions (PE/PM) shall not exceed 11.65 lb/hr



Applicable Compliance Method

The permit limit shown above was calculated based on the maximum process weight rate of 4.75 ton_{fired brick}/hr for this emissions unit, which omits water weight of the unfired brick and represents the materials that may result in particulate emissions, and the following equation from Table 1 in OAC rule 3745-17-11:

$$E = (4.10)(P)^{0.67}$$

where E = allowable filterable particulate emission rate in lb/hr and P = process weight rate in tons/hr.

$$E = (4.10)(4.75 \text{ ton}_{\text{fired brick}}/\text{hr})^{0.67} = 11.65 \text{ lb}_{\text{PM}}/\text{hr}$$

Table 1 was determined applicable because Figure II doesn't apply since the uncontrolled mass rate of emissions is less than 10 lb/hr as shown next.

Compliance shall be demonstrated by complying with the more stringent emission limitation listed in b)(1)a and f)(1)c for total particulate emissions (filterable and condensable), which is based on the maximum potential to emit of this source:

$$4.56 \text{ lb}_{\text{PM}}/\text{hr} < 11.65 \text{ lb}_{\text{PM}}/\text{hr}$$

Therefore, ongoing compliance is assumed. If required, the permittee shall demonstrate compliance with this emission limitation through emission tests for filterable particulate emissions performed in accordance with 40 CFR Part 60, Appendix A, Methods 1 through 5 and the procedures identified in OAC rule 3745-17-03(B)(10).

f. Emission Limitation

Sulfur dioxide (SO₂) from the stack serving this emission unit shall not exceed 56.81 pounds per hour.

Applicable Compliance Method

The permit limit shown above was calculated based on the maximum process weight rate of 4.75 ton_{fired brick}/hr for this emissions unit, which omits water weight of the unfired brick and represents the materials that may result in SO₂ emissions, and the following equation from OAC rule 3745-18-06(E)(1):

$$\text{AER} = 20 P^{0.67}$$

where AER = allowable emission rate of SO₂ (lb/hr) and P = process weight rate in tons/hr.

$$\text{AER} = 20 (4.75 \text{ ton}/\text{hr})^{0.67} = 56.81 \text{ lb}_{\text{SO}_2}/\text{hr}$$

Compliance shall be demonstrated by complying with the more stringent emission limitation listed in b)(1)a and f)(1)b, which is based on the maximum potential to emit of this source.

$$27.54 \text{ lb}_{\text{SO}_2}/\text{hr} < 56.81 \text{ lb}_{\text{SO}_2}/\text{hr}$$

Therefore, ongoing compliance is assumed. If required, the permittee shall demonstrate compliance with this emission limitation through emission tests



performed in accordance with 40 CFR Part 60, Appendix A, Methods 1 through 4 and 6 and the procedures identified in OAC rule 3745-18-04.

- (2) Compliance with the Operational Restrictions specified in section c) of these terms and conditions shall be determined in accordance with the following methods:

a. Operational Restriction

The total amount of fluorine in the unfired brick production fired in this emissions unit shall not exceed 18,050 pounds per rolling 12-month period.

Applicable Compliance Method

The fluorine in the unfired brick operation restriction was voluntarily accepted by the permittee as a synthetic minor limitation to keep the HF emissions below 10 tons/yr in order to avoid Title V permitting requirements and major MACT source requirements. The amount of fluorine in the unfired brick restriction is calculated by multiplying the annual emission limitation of 9.5 tons/yr for hydrogen fluoride by the molecular weights of F (19) to HF (20) and 2000 lb/ton.

$$9.5 \text{ ton}_{\text{HF}}/\text{yr} \times (19/20) \times 2000 \text{ lb/ton} = 18,050 \text{ pounds}_{\text{F}}/\text{yr}$$

Compliance shall be based on the monitoring and recordkeeping requirements found in terms d)(3)-(4).

b. Operational Restriction

The total amount of sulfur in the unfired brick production fired in this emissions unit shall not exceed 83,200 pounds per rolling 12-month period.

Applicable Compliance Method

The sulfur in the unfired brick operational restriction was voluntarily accepted by the permittee as a secondary synthetic minor limitation to avoid Title V permitting requirements since it is more stringent than the limitation in OAC rule 3745-18-06. The amount of sulfur in the unfired brick restriction is calculated by multiplying the annual emission limit of SO₂ by the ratio of the molecular weight of S (32) to the molecular weight of SO₂ (64) and converted to pounds.

$$83.20 \text{ ton}_{\text{SO}_2}/\text{yr} \times 32/64 \times 2000 \text{ lb/ton} = 83,200 \text{ lb}_\text{S}/\text{yr}$$

Compliance shall be based on the monitoring and recordkeeping requirements found in terms d)(3)-(4).

- (3) The permittee shall conduct, or have conducted, emission testing in accordance with the following requirements.

- a. The emissions testing shall be conducted within 6 months after issuance of this permit.
- b. The emission testing shall be conducted to demonstrate compliance with the lb/hr emission limitations for SO₂, HF, PE, HCl, VOC, NO_x, and CO as specified in b)(1)a. above and the visible particulate emissions limitation specified in b)(1)b. above. For evaluation purposes, testing shall also be conducted of metal-HAP and H₂S emissions.



- i. Testing shall be conducted at the kiln exhaust stack.
- ii. Testing shall also be conducted at exhaust from the dryer(s) which receives air from the kiln cooling section, to evaluate if any emissions exhaust from the kiln to the dryer(s), concurrently with the testing of the kiln exhaust stack. This cooling section exhaust testing shall include NO_x and CO as initial evaluation pollutants. If these pollutants show they are present, then testing of all pollutants listed in f)(3)b. above shall be conducted at this location. If these pollutants show they are not present, then it will be assumed that no emissions from the kiln exhaust to the dryer(s).
- c. The following test method(s) shall be employed to demonstrate compliance with the allowable mass emission rates:
 - i. for stack conditions, Methods 1-4 of 40 CFR Part 60, Appendix A;
 - ii. for HF and HCl, Method 26 or 26A of 40 CFR Part 60, Appendix A;
 - iii. for filterable PE, Method 5 of 40 CFR Part 60, Appendix A;
 - iv. for condensable PE, Method 202 of 40 CFR Part 51, Appendix M;
 - v. for SO₂, Method 6 or 6C of 40 CFR Part 60, Appendix A;
 - vi. for VOC, Method 25A of 40 CFR Part 60, Appendix A;
 - vii. for NO_x, Method 7 or 7E of 40 CFR Part 60, Appendix A;
 - viii. for CO, Method 10 of 40 CFR Part 60, Appendix A;
 - ix. for Metal HAP, Method 29 of 40 CFR Part 60, Appendix A;
 - x. for H₂S, Method 15 of 40 CFR Part 60, Appendix A;
 - xi. for visible particulate emissions, Method 9 of 40 CFR Part 60, Appendix A;
 - xii. Each test shall consist of three separate test runs using the applicable test method. Each test run shall be conducted for the time specified by the test method, or a minimum of 1 hour, whichever is longer. An arithmetic mean of the results of the three test runs shall be used to determine compliance with the allowable mass emission rate specified in f)(3)b. [consistent with 40 CFR 60.8(f)]; and
 - xiii. Each test location must be verified to be free of cyclonic flow (per Method 1) and evaluated for the existence of emission gas stratification and selection of sampling points (per Method 7E) [consistent with 40 CFR 60.8(h)].
- Alternative U.S. EPA-approved test methods may be used with prior approval from the appropriate Ohio EPA DO/LAA.
- d. During the emissions testing, the emissions unit shall be operated under operational conditions approved in advance by the appropriate Ohio EPA District Office or local air agency. Operational conditions that may need to be approved include, but are not limited to, the production rate, the type of material processed, material make-up



(solvent content, etc.), or control equipment operational limitations (burner temperature, precipitator voltage, etc.). In general, testing shall be done under “worst case” conditions expected during the life of the permit. As part of the information provided in the “Intent to Test” notification form described below, the permittee shall provide a description of the emissions unit operational conditions they will meet during the emissions testing and describe why they believe “worst case” operating conditions will be met. Prior to conducting the test(s), the permittee shall confirm with the appropriate Ohio EPA District Office or local air agency that the proposed operating conditions constitute “worst case”. Failure to test under the approved conditions may result in Ohio EPA not accepting the test results as a demonstration of compliance.

- e. The following shall be monitored and recorded for each test-run.
 - i. Production throughput in tons unfired brick/hr and tons fired brick/hr;
 - ii. Product formulation data that specify the mass fraction of all ingredients in the bricks that are processed during the performance test;
 - iii. The quantity of raw materials that contain sulfur and fluorine, in lbs., in the unfired brick processed during the performance test;
 - iv. The total quantity of sulfur and fluorine, in lbs., in the unfired brick processed during the performance test;
- f. Not later than 30 days prior to the proposed test date, the permittee shall submit an "Intent to Test" notification to the appropriate Ohio EPA DO/LAA. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time and date of the test and the persons who will be conducting the test. Failure to submit such notification for review and approval prior to the test(s) may result in the appropriate Ohio EPA DO/LAA 's refusal to accept the results of the emission test(s).
- g. Personnel from the appropriate Ohio EPA DO/LAA shall be permitted to witness the test, examine the testing equipment, and acquire data and information necessary to ensure that the operation of the emissions unit and the testing procedures provide a valid characterization of the emissions from the emissions unit and/or the performance of the control equipment.
- h. A comprehensive written report on the results of the emissions test(s) shall be signed by the person or persons responsible for the tests and submitted to the appropriate Ohio EPA DO/LAA within 30 days following completion of the test(s). The permittee may request additional time for the submittal of the written report, where warranted, with prior approval from the appropriate Ohio EPA DO/LAA.

g) Miscellaneous Requirements

- (1) None.