

AIR EMISSION SUMMARY

9/10/1998 PTI 15-1343 Issue Date

The air contaminant sources listed below comprise the Permit to Install for **METROPOLITAN INDUSTRIES** located in **STARK** County. The sources listed below shall not exceed the emission limits/control requirements contained in the table. This condition in no way limits the applicability of any other state or federal regulations. Additionally, this condition does not limit the applicability of additional special terms and conditions of this permit.

<u>Ohio EPA Source Number</u>	<u>Source Identification Description</u>	<u>BAT Determination</u>	<u>Applicable Federal & OAC Rules</u>	<u>Permit Allowable Mass Emissions and/or Control/Usage Requirements</u>
P015	6 MMBtu/hr 694 lbs/hr gas-fired ceramic tile tunnel kiln; Keith Tunnel Kiln #5	Limit of sulfur content of raw materials, natural gas usage	3745-17-07(A) (1) (12/17/98) 3745-17-11 (12/17/98) 3745-18-06(E) (1) (10/31/96) 3745-31-05 (4/12/98)	Visible emission limit from stack of 20% opacity except as provided by rule 2.02 lbs PM/PM ₁₀ /hr BAT is more restrictive 4.65 lbs SO ₂ /hr BAT is more restrictive PM/PM ₁₀ : 0.685 pound/hour; 3 tons/year sulfur dioxide: 3.04 pounds/hour; 13.3 tons/year volatile organic compounds: 0.086 pound/hour; 0.375 ton/year nitrogen oxides: 0.385 pound/hour; 1.69 tons/year carbon monoxide: 0.063 pound/hour; 0.284 ton/year hydrogen fluorides: 0.385 pound/hour; 1.69 tons/year 294 pounds of sulfur in raw materials per week

P016	2 MMBtu/hr 480 lbs/hr gas-fired ceramic tile shuttle kiln; SK #6	Limit of sulfur content of raw materials, natural gas usage	3745-17-07(A) (1) (12/17/98)	Visible emission limit from stack of 20% opacity except as provided by rule
			3745-17-11 (12/17/98)	1.58 lbs PM/PM ₁₀ /hr BAT is more restrictive
			3745-18-06(E) (1) (10/31/96)	3.21 lbs SO ₂ /hr BAT is more restrictive
			3745-31-05 (4/12/98)	PM/PM ₁₀ : 0.228 pound/hour; 1 ton/year sulfur dioxide: 1.01 pounds/hour; 4.44 tons/year volatile organic compounds: 0.0285 pound/hour; 0.125 ton/year nitrogen oxides: 0.128 pound/hour; 0.563 ton/year carbon monoxide: 50 pounds/hour; 5.05 tons/year hydrogen fluorides: 0.128 pound/hour; 0.563 ton/year 98 pounds of sulfur in raw materials per week
P017	six glazing/engobing tile spray booths with three wet filter systems	wet filter systems and internal exhaust	3745-17-07(A) (1) (12/17/98)	Visible particulate emissions of fugitive dust escaping from the building housing this emissions unit shall not exceed 20% opacity for a three-minute average
			3745-17-08 (12/17/98)	BAT is more restrictive
			3745-31-05 (4/12/98)	PM/PM ₁₀ : 0.7 pound/hour 3.06 tons/year

SUMMARY
TOTAL PERMIT TO INSTALL ALLOWABLE EMISSIONS

<u>Pollutant</u>	<u>Tons/Year</u>
PM/PM ₁₀	7.066
SO ₂	17.74
VOC	0.5
NO _x	2.253
CO	5.334
Hydrogen fluorides	2.253

Note: The information contained under the Summary of Emissions section of the Permit to Install is for informational purposes only and is not enforceable.

ADDITIONAL SPECIAL TERMS AND CONDITIONS

I. Emissions Unit P015 - Keith Kiln #5

A. Operational Restrictions (P015)

1. The only fuel to be burned in this emissions unit shall be natural gas.
2. The total amount of sulfur in the raw materials used in this emissions unit shall not exceed 294 pounds in any week. In order to verify that this limit has not been exceeded, daily samples shall be taken of the raw materials (clay and shale) used in tile production. A composite sample, accumulated from a seven-day period, will be analyzed to determine the weekly weighted average sulfur content of the raw materials used to make tiles that week. Each week this procedure should be repeated. The amount of sulfur shall be determined by multiplying the tons of raw material (dry weight) used in a week times the weekly weighted average sulfur content of the raw materials.
3. The stack servicing this emissions unit shall be a minimum of 60 feet in height.

B. Monitoring and/or Recordkeeping Requirements (P015)

1. The permittee shall maintain records of the following:
 - a. Weekly weighted average sulfur content of raw

materials in percent;

- b. Weekly production rate for the kiln;
- c. The amount of sulfur in the raw materials used in this kiln in pounds for each week.

C. Reporting Requirements (P015)

1. The permittee shall submit quarterly deviation (excursion) reports of any week when the amount of sulfur in the raw materials used in this kiln exceeded 294 pounds.
2. The permittee shall submit required reports in the following manner:
 - a. reports of any required monitoring and/or recordkeeping information shall be submitted to the Canton City Health Department, Air Pollution Control Division, 420 North Market Avenue, Canton Ohio 44702; and,
 - b. except as otherwise may be provided in the terms and conditions for a specific emissions unit, quarterly written reports of (a) any deviations (excursions) from emission limitations, operational restrictions, and control device operating parameter limitations that have been detected by the testing monitoring, and recordkeeping requirements specified in this permit, (b) the probable cause of such deviations, and (c) any corrective actions or preventative measures which have been or will be taken, shall be submitted to the Canton Local Air Agency. If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report which states that no deviations occurred during that quarter. The reports shall be submitted quarterly, i.e., by January 15, April 15, July 15, and October 15 of each year and shall cover the previous calendar quarters. (These quarterly reports shall exclude deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06.)

D. Compliance Methods and Emission Testing Requirements (P015)

1. Compliance with the emissions limitations of this permit shall be determined in accordance with the following methods:
 - a. Emission Limitation
0.685 lb PM/PM₁₀/hr

Applicable Compliance Method

Stack testing of an existing large kiln developed an emission factor of 0.004 lb PM/PM₁₀/ft³. This corresponds to a maximum emission rate of 0.685 lbs PM/PM₁₀/hr for this kiln.

b. Emission Limitation

3.04 lbs SO₂/hr

Applicable Compliance Method

The weekly limit of 294 pounds of sulfur converts to 1.75 pounds sulfur/hr. 1.75 lbs/hr x 2 (conversion of S to SO₂) x 0.87 (13% retention rate for sulfur) = 3.04 lbs SO₂/hr.

c. Emission Limitation

0.086 lb VOC/hr

Applicable Compliance Method

Stack testing of an existing large kiln developed an emission factor of 0.0005 lb VOC/ft³. This corresponds to a maximum emission rate of 0.086 lb VOC/hr for this kiln.

d. Emission Limitation

0.385 lb NO_x/hr

Applicable Compliance Method

Stack testing of an existing large kiln developed an emission factor of 0.002 lb NO_x/ft³. This corresponds to a maximum emission rate of 0.385 lb NO_x/hr for this kiln.

e. Emission Limitation

0.385 lb hydrogen fluorides/hr

Applicable Compliance Method

Stack testing of an existing large kiln developed an emission factor of 0.002 lb HF/ft³. This corresponds to a maximum emission rate of 0.385 lb HF/hr for this kiln.

f. Emission Limitation

0.063 lb CO/hr

Applicable Compliance Method

CF. The

The AP42 emission factor for CO is 21 lbs/106 maximum natural gas usage rate is 3,000 CF/hr which converts to 0.063 lb CO/hr.

g. Visible Emissions Limitation

20% as a 6-minute average

Applicable Compliance Method

Method 9 if required

h. Emission Limitation

3 tons PM/PM₁₀/yr
13.3 tons SO₂/yr
0.375 ton VOC/yr
1.69 tons NO_x/yr
1.69 tons HF/yr
0.284 ton CO/yr

Applicable Compliance Method

The ton/year limitation was developed by multiplying the lb/hr limitation by the maximum operating schedule of 8760 hrs/yr and dividing by 2000 lbs/ton. Therefore, provided compliance is shown with the hourly limitation, compliance will also be shown with the annual limitation.

E. Miscellaneous Requirements (P015)

None.

II. Emissions Unit P016 - Shuttle Kiln #6

A. Operational Restrictions (P016)

1. The only fuel to be burned in this emissions unit shall be natural gas.
2. The total amount of sulfur in the raw materials used in this emissions unit shall not exceed 98 pounds in any week. In order to verify that this limit has not been exceeded, daily samples shall be taken of the raw materials (clay and shale) used in tile production. A composite sample, accumulated from a seven-day period, will be analyzed to determine the weekly weighted average sulfur content of the raw materials used to make tiles that week. Each week this procedure should be repeated. The amount of sulfur shall be determined by multiplying the tons of raw material

(dry weight) used in a week times the weekly weighted average sulfur content of the raw materials.

3. The stack servicing this emissions unit shall be a minimum of 147 feet in height.

B. Monitoring and/or Recordkeeping Requirements (P016)

1. The permittee shall maintain records of the following:
 - a. Weekly weighted average sulfur content of raw materials in percent;
 - b. Weekly production rate for the kiln;
 - c. The amount of sulfur in the raw materials used in this kiln in pounds for each week.

C. Reporting Requirements (P016)

1. The permittee shall submit quarterly deviation (excursion) reports of any week when the amount of sulfur in the raw materials used in this kiln exceeded 98 pounds.
2. The permittee shall submit required reports in the following manner:
 - a. reports of any required monitoring and/or recordkeeping information shall be submitted to the Canton City Health Department, Air Pollution Control Division, 420 North Market Avenue, Canton Ohio 44702; and,
 - b. except as otherwise may be provided in the terms and conditions for a specific emissions unit, quarterly written reports of (a) any deviations (excursions) from emission limitations, operational restrictions, and control device operating parameter limitations that have been detected by the testing, monitoring, and recordkeeping requirements specified in this permit, (b) the probable cause of such deviations, and (c) any corrective actions or preventative measures which have been or will be taken, shall be submitted to the Canton Local Air Agency. If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report which states that no deviations occurred during that quarter. The reports shall be submitted quarterly, i.e., by January 15, April 15, July 15, and October 15 of each year and shall cover the previous calendar quarters. (These quarterly reports shall exclude deviations resulting from

malfunctions reported in accordance with OAC rule 3745-15-06.)

D. Compliance Methods and Emission Testing Requirements (P016)

1. Compliance with the emissions limitations of this permit shall be determined in accordance with the following methods:

a. Emission Limitation

0.228 lb PM/PM₁₀/hr

Applicable Compliance Method

Stack testing of an existing large kiln developed an emission factor of 0.004 lb PM/PM₁₀/ft³. This corresponds to a maximum emission rate of 0.228 lb PM/PM₁₀/hr for this kiln.

b. Emission Limitation

1.01 lbs SO₂/hr

Applicable Compliance Method

The weekly limit of 294 pounds of sulfur converts to 1.75 pounds sulfur/hr. 1.75 lbs/hr x 2 (conversion of S to SO₂) x 0.87 (13% retention rate for sulfur) = 1.01 lbs SO₂/hr.

c. Emission Limitation

0.0285 lb VOC/hr

Applicable Compliance Method

Stack testing of an existing large kiln developed an emission factor of 0.0005 lb VOC/ft³. This corresponds to a maximum emission rate of 0.0285 lb VOC/hr for this kiln.

d. Emission Limitation

0.128 lb NO_x/hr

Applicable Compliance Method

Stack testing of an existing large kiln developed an emission factor of 0.002 lb NO_x/ft³. This corresponds to a maximum emission rate of 0.128 lb NO_x/hr for this kiln.

e. Emission Limitation

0.128 lb hydrogen fluorides/hr

Applicable Compliance Method

Stack testing of an existing large kiln developed an emission factor of 0.002 lb HF/ft³. This corresponds to a maximum emission rate of 0.128 lb HF/hr for this kiln.

f. Emission Limitation

50 lbs CO/hr

Applicable Compliance Method

Reduction mode firing occurs only during 1/2 hour per batch. During this mode, the emission factor used is [for natural gas inert gas generator] and is 0.1 lb CO/CF. 0.1 lb CO/CF x 1000 CF/hr x 1/2 (only 30 minutes of reduction) = 50 lbs CO/hr.

g. Visible Emissions Limitation

20% as a 6-minute average

Applicable Compliance Method

Method 9 if required

h. Emission Limitation

1 ton PM/PM₁₀/yr
4.44 tons SO₂/yr
0.125 ton VOC/yr
0.563 ton NO_x/yr
0.563 ton HF/yr

Applicable Compliance Method

The ton/year limitation was developed by multiplying the lb/hr limitation by the maximum operating schedule of 8760 hrs/yr and dividing by 2000 lbs/ton. Therefore, provided compliance is shown with the hourly limitation, compliance will also be shown with the annual limitation.

i. Emission Limitation

5.05 tons CO/yr

Applicable Compliance Method

Reduction Mode

0.1 lb CO/CF x 4,800,000 cf/yr divided by
2000 lbs/ton x 30 min. reduction/1440 min
total batch =
5 tons CO/yr

Regular Operation

21 lbs CO/MMCF x 4.8 MMCF/yr divided by
2000 lbs/ton = 0.05 ton/yr

E. Miscellaneous Requirements (P016)

None.

III. Emissions Unit P017 - Tile Spray Booths

A. Operational Restrictions (P017)

1. There shall be no VOCs present in either the glaze or the engobe sprayed.
2. At least 99% of the overspray from the six spray booths shall be captured and vented to one of the three wet filter systems.
3. The exhaust from all three of the wet filter systems shall be internally vented inside a building.
4. Visible particulate emissions of fugitive dust escaping from the building housing this emissions unit shall not exceed 20% opacity for a three-minute average.

B. Monitoring and/or Recordkeeping Requirements (P017)

1. The permittee shall do daily checks when the emissions unit is in operation for visible particulate emissions coming from the exhaust of the wet filter systems. 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;
 - e. any corrective actions taken to eliminate the

visible emissions.

C. Reporting Requirements (P017)

The permittee shall submit semiannual written reports which (a) identify all days during which any visible particulate emissions were observed from the exhaust of the wet filter systems and (b) describe any corrective actions taken to eliminate the visible particulate emissions. These reports shall be submitted to the Canton LAA by January 31 and July 31 of each year and shall cover the previous 6-month period.

D. Compliance Methods and Emission Testing Requirements (P017)

1. Compliance with the emissions limitations of this permit shall be determined in accordance with the following methods:

a. Emission Limitation

0.7 lb PM/PM₁₀/hr

Applicable Compliance Method

Emissions from exhaust of water wash

360 g/sq ft(glaze usage rate) times 178 sq ft/hr times 0.5 (50% transfer eff.) times 0.01 (99% control eff. of water wash) times 0.5 (50% control eff of building) = 0.35 lb/hr

Emissions from fugitive overspray

360 g/sq ft(glaze usage rate) times 178 sq ft/hr times 0.5 (50% transfer eff.) times 0.01 (99% capture eff.) times 0.5 (50% control eff of building) = 0.35 lb/hr

b. Emission Limitation

3.06 tons PM/PM₁₀/yr

Applicable Compliance Method

The ton/year limitation was developed by multiplying the lb/hr limitation by the maximum operating schedule of 8760 hrs/yr and dividing by 2000 lbs/ton. Therefore, provided compliance is shown with the hourly limitation, compliance will also be shown with the annual limitation.

c. Visible Emission Limitation

Visible particulate emissions of fugitive dust escaping from the building housing this emissions unit shall not exceed 20% opacity for a three-minute average.

Applicable Compliance Method

Method 9 if required

E. Miscellaneous Requirements (P017)

None.

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New Source Review Discussion
for
Installation of
PTI #15-1343

Background Information

Metropolitan Industries wants to install a tunnel kiln, a shuttle kiln and a glaze/engobe spray booth. The shuttle kiln will be vented to a 45 meter existing stack that already services 4 much larger kilns. This stack had to be this tall because of modeling for hydrogen fluorides. The tunnel kiln will have its own stack.

New Source Review Issues

Metropolitan is a major PSD source because of facility sulfur dioxide emissions of greater than 250 TPY. It is also a Title V facility. The total allowable SO₂ emissions from the two new kilns will only be 17.74 TPY which is well below the 40 TPY PSD Major Modification Threshold for SO₂. The total allowable HF emissions from the two new kilns is 2.253 TPY, which is below the 3 TPY PSD Major Modification Threshold for HF. This PTI will, therefore, avoid NSR.

Using OAC 3745-18-06(E)(1), the PTE for P015 would be **20.37** TPY and for P016 would be 14.1 TPY. The total would be **34.47** TPY, which is below the 40 TPY threshold. These kilns are accepting limits on the amount of sulfur in the raw materials charged, but this limit reflects the sulfur content of raw materials that are normally used. Special low-sulfur raw materials are not required. These kilns are not being required to limit their production and could legally operate 8760 hours/year at their maximum production rate.

Minor Source Review Issues

Pursuant to OAC Rule 3745-31-05, new emissions units must comply with all applicable State and Federal air pollution regulations. This emissions unit is not subject to any Federal air requirements (i.e. NSPS, NESHAPS, MACT). At a minimum, all new emissions units must satisfy the State requirements in order to obtain a Permit to Install. Consequently, this emissions unit must comply with the applicable OAC air pollution regulations, employ Best Available Technology, comply with the Ohio EPA's Air Toxics Policy (if applicable), and comply with the minor source modeling requirement (if applicable).

The two kilns are subject to OAC Rules 3745-17-07, 3745-17-011 and 3745-18-06(E)(1). OAC 3745-17-07 establishes a 20% opacity limitation for stack emissions. OAC 3745-17-11 establishes limits for the PM emissions based on

PWR. OAC 3745-18-06(E) establishes limits for SO₂ emissions based on PWR. BAT established for this permit is more stringent than both of the aforementioned allowable limits.

The spray booths are subject to OAC rules 3745-17-07 and 3745-17-08. 3745-17-07 puts a limit for visible fugitive emissions of 20% for a three-minute average. 3745-17-08 requires that fugitive dust emissions be minimized or eliminated. 3745-17-11 does not apply because the emissions from the wet filters are internally exhausted and any emissions will be as fugitive dust from exhaust fans or other openings in the building. 3745-21 does not apply because no VOCs are found in either the glazing or the engobing material.

Best Available Technology

BAT for the kilns consists of requiring natural gas as the only fuel to be used. It also establishes limits on the amount of sulfur in the raw materials. Limits for PM/PM₁₀, SO₂, VOC, NO_x, CO, and HF have been established as part of BAT.

BAT for the spray booths consists of requiring that at least 99% of the overspray is vented to wet filters. Internal exhaust is also required.

Modeling

The model output was analyzed to identify the maximum ambient ground level concentrations of fluorides, particulate matter and sulfur dioxide at or beyond the facility fence line, and to confirm that the predicted ground-level concentrations of fluoride for the entire source, not just the three new emissions units, did not exceed the ambient levels approved by the Ohio EPA. As discussed with Bill Spires of Ohio EPA, the monthly average ISCST may be used for comparison to the 30-day fluoride standard. The sulfur dioxide and particulates modeling was completed to demonstrate that the entire source, once again not just the three new emissions units, does not exceed one-half of the respective PSD increment per Ohio EPA policy. Computer modeling results, using ISCST3 and 1985 through 1989 meteorological data from the Canton-Akron Airport with the potential from all six kilns shows a maximum 30-day average-fluoride concentration of 0.229 ug/m³. The maximum 3-hour, 24-hour, and annual ground-level SO₂ concentrations were 35.2 ug/m³, 11.1 ug/m³, and 1.05 ug/m³, respectively. The maximum 24-hour and annual ground-level particulate concentrations were 3.03 ug/m³, and 2.81 ug/m³, respectively. All results were below the guidelines of 0.5 ug/m³ for fluoride and one-half the respective Class II PSD increments in 40 CFR 52.21 as presented in Table 2.

Air Toxics Policy

Fluorides are air toxics but compliance with the 0.5 ug/m³ standard is all that is required.

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