

STATE OF MISSOURI

PERMIT BOOK



DEPARTMENT OF NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number:

08 2 0 1 4 - 0 1 5

Project Number: 2013-09-049

Installation Number: 159-0009

Parent Company: Pittsburgh Corning Corporation

Parent Company Address: 800 Presque Isle Drive, Pittsburgh, PA 15239

Installation Name: Pittsburgh Corning Corporation

Installation Address: 2700 West 16th Street, Sedalia, MO 65301

Location Information: Pettis County, S5, T45N, R21W

Application for Authority to Construct was made for:

Installation of a new glass furnace and cullet quench system. This review was conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

Standard Conditions (on reverse) are applicable to this permit.

Standard Conditions (on reverse) and Special Conditions are applicable to this permit.

AUG 26 2014

EFFECTIVE DATE

Handwritten signature of Kyna L. Moody in black ink.

DIRECTOR OR DESIGNEE
DEPARTMENT OF NATURAL RESOURCES

STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review. In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the Department's Air Pollution Control Program of the anticipated date of start up of these air contaminant sources. The information must be made available within 30 days of actual startup. Also, you must notify the Department of Natural Resources Regional office responsible for the area within which you are located within 15 days after the actual start up of these air contaminant sources.

A copy of this permit and permit review shall be kept at the installation address and shall be made available to Department of Natural Resources' personnel upon request.

You may appeal this permit or any of the listed special conditions to the Administrative Hearing Commission (AHC), P.O. Box 1557, Jefferson City, MO 65102, as provided in RSMo 643.075.6 and 621.250.3. If you choose to appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC.

If you choose not to appeal, this certificate, the project review and your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant sources(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit at (573) 751-4817. If you prefer to write, please address your correspondence to the Missouri Department of Natural Resources, Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176, attention: Construction Permit Unit.

Page No.	3
Permit No.	
Project No.	2013-09-049

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

The special conditions listed in this permit were included based on the authority granted the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10. "Conditions required by permitting authority."

Pittsburgh Corning Corporation
Pettis County, S5, T45N, R21W

1. Superseding Condition
 - A. The conditions of this permit supersedes Special Condition 2 found in the previously issued construction permit 022009-010 issued by the Air Pollution Control Program.

2. Nitrogen Oxides (NO_x) Emission Limitation
 - A. Pittsburgh Corning Corporation shall emit less than 40.0 tons of NO_x in any consecutive 12-month period from the following equipment
 - 1) Tank 7 sodium nitrate use (S-36)
 - 2) Tank 7 combustion (S-36 gas)
 - 3) Cullet Dryer (S-34 D)

 - B. Pittsburgh Corning Corporation shall emit less than 250.0 tons of NO_x in any consecutive 12-month period from the entire installation (see table 1).

 - C. Attachment A and Attachment B or equivalent forms, such as electronic forms, approved by the Air Pollution Control Program shall be used to demonstrate compliance with Special Conditions 2.A and 2.B.

3. Sulfuric Oxides (SO_x) Emission Limitation
 - A. Pittsburgh Corning Corporation shall emit less than 250.0 tons of SO_x in any consecutive 12-month period from the entire installation (see table 1).

 - B. Attachment C or equivalent forms, such as electronic forms, approved by the Air Pollution Control Program shall be used to demonstrate compliance with Special Conditions 3.A.

4. Control Device Requirement-Baghouse
 - A. Pittsburgh Corning Corporation shall control emissions from the equipment listed below using baghouses as specified in the permit application.

Page No.	4
Permit No.	
Project No.	2013-09-049

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

- 1) Batch Mixing (S-02)
 - 2) Batch Conveying (S-02A)
 - 3) Batch Unloading (S-05D)
 - 4) Tank 7 (S-36)
- B. The baghouses shall be operated and maintained in accordance with the manufacturer's specifications. The baghouse shall be equipped with a gauge or meter, which indicates the pressure drop across the control device. These gauges or meters shall be located such that Department of Natural Resources' employees may easily observe them.
- C. Replacement filters for the baghouses shall be kept on hand at all times. The bags shall be made of fibers appropriate for operating conditions expected to occur (i.e. temperature limits, acidic and alkali resistance, and abrasion resistance).
- D. Pittsburgh Corning Corporation shall monitor and record the operating pressure drop across the baghouses at least once every 24 hours while the equipment is operating. The operating pressure drop shall be maintained within the design conditions specified by the manufacturer's performance warranty.
- E. Pittsburgh Corning Corporation shall maintain a copy of the baghouse manufacturer's performance warranty on site.
- F. Pittsburgh Corning Corporation shall maintain an operating and maintenance log for the baghouses which shall include the following:
- 1) Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions; and
 - 2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.
5. Control Measure – Capture Efficiency (100%)
- A. Pittsburgh Corning Corporation shall totally enclose the following handling equipment and maintain negative pressure for the purpose of maximizing the capture efficiency of particulate emissions.
- 1) Batch Mixing (S-02)
 - 2) Batch Conveying (S-02A)
 - 3) Batch Unloading (S-05D)
 - 4) Tank 7 (S-36)

Page No.	5
Permit No.	
Project No.	2013-09-049

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

- B. If any openings or holes should appear on emission units listed in Special Condition 5.A. due to wear or maintenance activities these openings or holes shall maintain negative pressure.
 - C. Pittsburgh Corning Corporation shall demonstrate negative pressure at all emission unit openings listed in Special Condition 5.A by using visual indicators such as streamers, talc puff test, negative pressure gauges, flags, etc. at openings that are not closed during normal operations. These openings shall include but are not limited to head boxes, drop point opening, etc. All openings, when operating, must indicate the presence of negative pressure for compliance. Inspections shall occur daily.
 - D. Pittsburgh Corning Corporation shall maintain an operating and maintenance log for the storage equipment and process equipment which shall include the following:
 - 1) Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions.
 - 2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.
 - 3) A record of regular inspection schedule, the date and results of all inspections, including any actions or maintenance activities that result from the inspections. Either paper copy or electronic formats are acceptable.
6. Record Keeping and Reporting Requirements
- A. Pittsburgh Corning Corporation shall maintain all records required by this permit for not less than five years and shall make them available immediately to any Missouri Department of Natural Resources' personnel upon request. These records shall include MSDS for all materials used
 - B. Pittsburgh Corning Corporation shall report to the Air Pollution Control Program's Compliance/Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than 10 days after the end of the month during which any record required by this permit show an exceedance of a limitation imposed by this permit.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE
SECTION (5) REVIEW

Project Number: 2013-09-049
Installation ID Number: 159-0009
Permit Number:

Pittsburgh Corning Corporation
2700 West 16th Street
Sedalia, MO 65301

Complete: September 26, 2013

Parent Company:
Pittsburgh Corning Corporation
800 Presque Isle Drive
Pittsburgh, PA 15239

Pettis County, S5, T45N, R21W

REVIEW SUMMARY

- Pittsburgh Corning Corporation has applied for authority to install a new glass furnace and cullet quench system.
- HAP emissions are expected from the proposed equipment. The HAP of concern from this process is manganese.
- 40 CFR 60 Subpart CC, "Standards of Performance for Glass Manufacturing Plants" applies to the equipment.
- 40 CFR 63 Subpart SSSSSS, "New Emissions Standards for Hazardous Air Pollutants for Glass Manufacturing Area Sources, applies to the proposed equipment.
- Baghouses are being used to control the particulate emissions from the equipment in this permit.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of NO_x are conditioned below de minimis levels.
- This installation is located in Pettis County, an attainment area for all criteria pollutants.
- This installation is not on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. The installation's major source level is 250 tons per year and fugitive emissions are not counted toward major source applicability.
- Ambient air quality modeling was not performed since potential emissions of the

application are limited below de minimis levels.

- Emissions testing is not required for the equipment.
- A Part 70 Operating Permit application has been received by the Air Pollution Control Program for this installation. Additional information may be required for this project upon request.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

Pittsburgh Corning Corporation operates a cellular glass insulation facility in Sedalia, Missouri. The installation receives sand by hopper style truck and rail. Pittsburgh Corning Corporation is considered a major source with respect to operating permits. Pittsburgh Corning was considered a major source under New Source Review permits. However, during the review of this project, Pittsburgh Corning Corporation requested voluntary limits of NO_x and SO_x below the major source level for the entire installation. Therefore, Pittsburgh Corning Corporation should be considered a synthetic minor source with regards to construction permits. The following table displays emission units at the Pittsburgh Corning Corporation that have a potential to emit NO_x or SO_x.

Table 1: Emission Units with the Potential to Emit NO_x or SO_x

Emission Unit	Description	Pollutant (NO _x or SO _x)
S-6A	Tank 4	Both
	Tank 4 (gas)	
	Tank 4 (pulverized coal)	
S-7A	Forehearth/tube draw	Both
S-10	Cellulating	SO _x
	Cellulating (gas)	Both
S-24	Annealing (gas)	Both
S-25	Space heaters	Both
S-28	Generator	Both
S-34 A-D	Cullet Dryers	Both
S-36	Tank 7	Both
	Tank 7 (gas)	

The following New Source Review permits have been issued to Pittsburgh Corning Corporation from the Air Pollution Control Program.

Table 2: Permit History

Permit Number	Description
0579-011	Modification of rotary kiln.
1190-014	Installation of a cellular glass finishing line.
0592-010	Installation of foaming & annealing oven.
0793-023	Installation of a glass melting tank (Tank 3).
0894-015	Addition of two (2) ball mills.
1294-006	Addition of manganese dioxide to glass batch.
1294-007	Resuming operation of auxiliary glass unloading & grinding equipment.
0696-017	Addition of aluminum sulfate to existing glass batch process.
0899-014	Installation of two (2) Foamglas® block printers.
0799-020	Temporary permit for the installation of gluing process & cutting machines for the Foamglas® blocks.
0999-004	Replacement of the existing diesel generator with a new 300 hp diesel generator.
0799-020A	Amendment to temporary permit for the installation of gluing process & cutting machines for the Foamglas® blocks.
082001-025	Installation of natural gas fired burners with a combined total rating of ten (10) MMBtu/hr and to increase the electric boosting system in order to melt Green Glass in Tank 4. This addition will not increase the maximum capacity of Tank 4. In addition, this permit modifies the Special Conditions of Permit No. 0793-023.
1294-007A	Modification to monthly manganese dioxide recordkeeping sheet.
062008-003	Installation of a cullet quench system.
022009-010	Supercede production limit from 143 tons per day to 168 tons per day
022009-010A	Truck receiving changes

PROJECT DESCRIPTION

Pittsburgh Corning Corporation has requested confidentiality for some of the information included in this review. A confidential version of this permit can be found under project number 2013-09-056.

Pittsburgh Corning Corporation has applied for authority to construct a new glass furnace and cullet quenching system. Glass will be drawn from the natural gas-fired furnace and fractured in water to make glass cullet. The new furnace has a maximum heat input rate equal to ■■■ MMBtu/hr and will allow up to ■■■■ tons of glass production per hour. As a result of this project, this installation is now capable of producing up to ■■■■ tons of glass per hour. Some of the glass cullet produced will be cellulated and annealed and the remainder of the cullet will be shipped offsite. The furnaces and glass cullet production are not bottlenecked due to the ability to ship cullet offsite. However, the portion of the cullet that is cellulated and annealed will remain bottlenecked. The new cullet dryer, S-34 D, has a maximum hourly heat input equal to ■■■■ MMBtu/hr.

The fractured glass will then be dried by natural gas-fired dryers (S-34 A through D). The dryers will have a combined maximum heat input rate equal to ██████ MMBtu/hr.

Pittsburgh Corning Corporation is still capable of cellulating and annealing up to ██████ tons of glass cullet per hour. Cellulating furnaces heat the cullet to a specific temperature for a specified time. Annealing lehrs gradually decrease the glass temperature. Annealing is a slow, controlled cooling that prevents internal stresses in the final product. Annealing rates at this installation cannot exceed ██████ tons of glass per hour without the installation of new lehrs, as increasing the annealing rate would allow internal stresses in the final product.

Pittsburgh Corning Corporation plans to ship some of the glass cullet. The existing equipment and whether material throughput increases are expected are shown in Table 3 below. Therefore, the glass cullet production and shipping portion is not bottlenecked by the cellulating and annealing processes. Pittsburgh Corning Corporation can produce up to ██████ tons of glass cullet per hour.

Some of the existing equipment at the installation will be utilized in conjunction with the new glass production equipment. The rail unloading (S-01), truck unloading (S-01A), batch mixing (S-02), and batch conveying (S-02A) will be utilized with the production of glass within the new furnace.

Table 3: Emission Units

Emission Unit	Description	Emission Increase (Yes/No)
S-01	Rail unloading	Yes
S-01A	Truck unloading	Yes
S-01B	Sand delivery	Yes
S-02	Batch mixing	Yes
S-02A	Batch conveying	Yes
S-03	Cullet pile	No
S-04	Batch hauling	Yes
S-05A	Batch unloading	No
S-06A	Tank 4	No
S-07A	Forhearth/tube draw	No
S-08	Cullet crushing	No
S-09	Batch dispensing	No
S-10	Cellulating	No
S-11	Mold coating	No
S-12	Mold spraying	No
S-13	Finishing	No
S-13B	Spraying ware	No
S-13C	Tar pot	No
S-14	Stratafab	No
S-15	Scrap crushing	No
S-16	Scrap hauling	No

S-18	Scrap unloading	No
S-22	Milling	No
S-22A	Mill screening	No
S-22B	Ground batch unloading	No
S-24	Annealing	No
S-25	Space heaters	No
S-28	Generator	No
S-29	Glass unloading	No
S-30	Auxiliary grinding	No
S-31	Auxiliary transport	No
S-32	DC unloading	No
S-33	Solvent cleaners	No
S-34 A-C	Cullet dryers	No
T-1	Kerosene tank	No
T-2	Gasoline tank	No
T-3	Diesel tank	No

During the review of this project, Pittsburgh Corning Corporation requested a voluntary de minimis NO_x emission limitation to avoid the refined modeling requirement found in 10 CSR 10-6.060 Section (6). As a result of this voluntary emission limitation, potential emissions of the other criteria pollutants were indirectly limited to de minimis levels.

EMISSIONS/CONTROLS EVALUATION

The emission factors and control efficiencies used in this analysis were obtained from the following sections of the EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition:

- Section 1.4 *Natural Gas Combustion*, July 1998
- Section 3.3 *Gasoline and Diesel Industrial Engines*, October 1996
- Section 11.13 *Glass Fiber Manufacturing*, September 1985
- Section 13.2.1 *Paved Roads*, January 2011
- Section 13.2.4 *Aggregate Handling and Storage Piles*, November 2006

Potential to emit of SO_x for Tank 7 glass production is based on a stoichiometric mass balance approach. Potential to emit of NO_x from Tank 7 is based on a previous stack test for Tank 4 glass production. The potential emissions of other pollutants from Tank 7 glass production were based on emission factors obtained from EPA's Factor Information Retrieval Data System (FIRE) for SCC 3-05-014-03. Potential particulate emissions from rail unloading (S-01) and truck unloading (S-02) were estimated using a predictive emission factor equation from AP-42 Section 13.2.4 assuming a worst case moisture content and a mean wind speed equal to 10 miles per hour.

Baghouses will be used to control particulate emissions from batch mixing (S-02), batch conveying (S-02A), batch unloading (S-05D), and tank 7 (S-36). Combined control and capture efficiencies equal to [REDACTED] were assumed for all particulate emissions associated with batch mixing (S-02), batch conveying (S-02A), batch unloading (S-5D), and tank 7

(S-36) due to baghouse use and total enclosure as specified in Special Condition 5 of this permit. Pittsburgh Corning Corporation supplied manufacturer's documentation regarding control efficiency.

Some of the existing equipment at the installation will be utilized in conjunction with the new glass production equipment. The rail unloading (S-01), truck unloading (S-01A), and batch mixing (S-02) will be utilized with the production of glass within the new furnace. Therefore, the particulate emissions from the previously constructed emission points (S-01, S-01A, S-02) were evaluated using potential to emit minus baseline actual emissions calculation. The baseline actual emissions for these emission points are based on the average 12-month throughput from the period between January 2011 and December 2012. Potential to emit minus baseline actual emission data for the existing equipment can be found in Table 4 below.

Table 4: Potential to Emit Minus Baseline Actual Emissions Data (tpy)

Pollutant	Potential to Emit	Baseline Actual Emissions	Potential Increase
PM	10.1	2.55	7.55
PM ₁₀	4.35	1.21	3.14
PM _{2.5}	0.69	0.24	0.45

Baseline actual emissions are based on 12-month average actual throughputs from S-01, S-01A, and S-02 from January 2011 to December 2012

During the review of this project, Pittsburgh Corning Corporation requested a voluntary NO_x de minimis limit for this project. Cullet Dryer D (S-34D), Tank 7 (S-36), and Tank 7 combustion (S-36 gas) are affected by the voluntary NO_x de minimis limit. Table 5 below shows the indirectly limited potential emissions associated with combustion equipment of the application.

Table 5: Conditioned Potential Emissions from Combustion of the Application (tpy)

Pollutant	Potential to Emit	Conditioned Potential Emissions
PM	0.388	0.17
PM ₁₀	0.995	0.44
PM _{2.5}	0.986	0.43
SO _x	61.38	26.86
NO _x	91.39	<40.0
VOC	1.51	0.66
CO	9.99	4.37
HAPs	0.90	0.40

The following table provides an emissions summary for this project. Existing potential emissions were taken from permit number 022009-010. Existing actual emissions were taken from the installation's 2013 EIQ. Potential emissions of the application represent the potential of the new equipment and modified equipment, assuming continuous operation (8760 hours per year). New installation conditioned potential includes the conditioned potential emissions that are indirectly limited by the voluntary NO_x de minimis limit as stated in Special Condition 2.A. of this permit. In addition to the voluntary NO_x de minimis limit, Pittsburgh Corning Corporation has requested an installation wide NO_x limit below the major source level (Special Condition 2.B.) and an

installation wide SO_x limit below the major source level (Special Condition 3.A.).

Table 6: Emissions Summary (tons per year)

Pollutant	Regulatory <i>De Minimis</i> Levels	Existing Potential Emissions	Existing Actual Emissions (2013 EIQ)	Potential Emissions of the Application	Conditioned Potential of the Application*	New Installation Conditioned Potential*
PM	25.0	N/D	N/D	12.02	7.71	N/D
PM ₁₀	15.0	82.4	36.35	5.88	3.57	87.72
PM _{2.5}	10.0	N/D	28.95	2.10	0.88	N/D
SO _x	40.0	288.6	64.83	61.37	26.86	<250.0
NO _x	40.0	<250.0	139.12	91.39	<40.0	<250.0
VOC	40.0	11.57	12.48	1.51	0.66	12.23
CO	100.0	70.98	42.57	9.99	4.37	75.35
GHG (CO ₂ e)	100,000	N/D	N/D	13,054.8	N/D	N/D
GHG (mass)	100.0/250.0	N/D	N/D	12,976.3	N/D	N/D
HAPs	10.0/25.0	1.06	0.11	0.905	0.4	1.46

N/A = Not Applicable; N/D = Not Determined

*Conditioned potential accounts for indirect limiting of combustion emissions from the voluntary NO_x de minimis limit as well as potential to emit minus baseline actual emissions from existing equipment.

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. The projects potential emissions of NO_x are conditioned to the de minimis level.

APPLICABLE REQUIREMENTS

Pittsburgh Corning Corporation shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved. For a complete list of applicable requirements for your installation, please consult your operating permit.

GENERAL REQUIREMENTS

- *Submission of Emission Data, Emission Fees and Process Information*, 10 CSR 10-6.110
- *Operating Permits*, 10 CSR 10-6.065
- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*, 10 CSR 10-6.170

- *Restriction of Emission of Visible Air Contaminants*, 10 CSR 10-6.220
- *Restriction of Emission of Odors*, 10 CSR 10-6.165

SPECIFIC REQUIREMENTS

- *New Source Performance Regulations*, 10 CSR 10-6.070
 - *Standards of Performance for Glass Manufacturing Plants*, 40 CFR Part 60, Subpart CC
- *MACT Regulations*, 10 CSR 10-6.075
 - *National Emission Standards for Glass Manufacturing Area Sources*, 40 CFR Part 63, Subpart SSSSSS
- *Restriction of Emission of Sulfur Compounds*, 10 CSR 10-6.260
- *Restriction of Particulate Matter Emissions From Fuel Burning Equipment Used for Indirect Heating*, 10 CSR 10-6.405

STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be granted with special conditions.

J Luebbert
New Source Review Unit

Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, received September 26, 2013, designating Pittsburgh Corning Corporation as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.

Attachment A – NO_x Compliance Worksheet

Pittsburgh Corning Corporation
 Pettis County, S5, T45N, R21W
 Project Number: 2013-09-049
 Installation ID Number: 159-0009
 Permit Number: _____

This sheet covers: _____
 (month, year)

	Column A	Column B	Column C	Column D	Column E
Production Process	Amount Processed	Conversion Factor	Correction Factor	Emission Factor	NO _x Emissions (tons)
Sodium Nitrate Use	Tons	0.541	1		(a)
Natural Gas Use	MMCF			100 lb/MMCF	(b)
(c) Total NO _x Emission Calculated for this Month (tons)					
(d) 12-Month Rolling NO _x Emissions Total from Previous Month (tons)					
(e) Monthly NO _x Emissions Total from this Month Last Year (tons)					
(f) Current 12- Month Rolling Total NO _x Emissions (tons)					

- a) Calculate using the equation $\text{Column E} = \text{Column A} \times \text{Column B} \times \text{Column C}$
- b) Calculate using the equation $\text{Column E} = \text{Column A} \times \text{Column D} / 2000$
- c) Calculate by adding NO_x emissions for this month
- f) Calculate using the equation $(f) = (c) + (d) - (e)$

A 12-month rolling total of NO_x emissions less than 40.0 tons indicates compliance with Special Condition 2.A.

Attachment B – Installation Wide NO_x Compliance Worksheet

Pittsburgh Corning Corporation
 Pettis County, S5, T45N, R21W
 Project Number: 2013-09-049
 Installation ID Number: 159-0009
 Permit Number: _____

This sheet covers _____.
 (month, year)

Column A	Column B	Column C	Column D
Description	Amount Processed	NO _x Emission Factor	(a) NO _x Emissions (tons)
Sodium Nitrate Used in Tank 4	Tons	0.465	
Sodium Nitrate Used in Tank 7	Tons	0.541	
Coal Used in Glass Production	Tons	34 lb/ton	
Natural Gas Combusted	MMCF	100 lb/MMcf	
Distillate Oil Combusted	Mgal	47 lb/Mgal	
Liquefied Petroleum Gas Combusted	Mgal	19 lb/Mgal	
Emergency Diesel Generator	Mgal	604 lb/Mgal	
(b) Total NO _x Emissions Calculated for this Month in Tons:			
(c) 12-Month NO _x Emissions Total From Previous Month's Worksheet B, in Tons:			
(d) Monthly NO _x Emissions Total (b) from Previous Year's Worksheet B, In Tons:			
(e) Current 12-month Total of NO _x Emissions in Tons			

- a) Calculate using the following equation: Column B x Column C / 2000
- b) Calculate by adding all NO_x emissions from this month
- c) Record the 12-month NO_x emission total from Previous Month's Worksheet B: (e)_{last month}
- d) Record the monthly NO_x emissions from this month last year: (b)_{this month last year}
- e) Calculate using the following equation: (e) = (b) + (c) - (d)

A 12-month rolling total of NO_x emissions less than 250.0 tons indicates compliance with Special Condition 2.B.

Attachment C – Installation Wide SO_x Compliance Worksheet

Pittsburgh Corning Corporation
 Pettis County, S5, T45N, R21W
 Project Number: 2013-09-049
 Installation ID Number: 159-0009
 Permit Number: _____

This sheet covers _____.
(month, year)

Column A	Column B	Column C	Column D
Description	Amount Processed	SO _x Emission Factor	(a) SO _x Emissions (tons)
Glass Produced	Tons	Average calculated as stoichiometric mass balance	
Coal Used in Glass Production	Tons	*39(S) lb/ton	
Natural Gas Combusted	MMCF	0.6 lb/MMcf	
Distillate Oil Combusted	Mgal	*152(S) lb/Mgal	
Liquefied Petroleum Gas Combusted	Mgal	**0.1(S) lb/Mgal	
Emergency Diesel Generator	Mgal	39.7 lb/Mgal	
(b) Total SO_x Emissions Calculated for this Month in Tons:			
(c) 12-Month SO_x Emissions Total From Previous Month's Worksheet C, in Tons:			
(d) Monthly SO_x Emissions Total (b) from Previous Year's Worksheet C, In Tons:			
(e) Current 12-month Total of SO_x Emissions in Tons			

- a) For glass production and emergency diesel generator SO_x emissions, a stoichiometric mass balance should be performed to determine SO_x emissions. For other processes, use the following equation: Column (D) = Column (B) x column (C) / 2000
- b) Add all applicable SO_x emissions for this month
- c) Record the 12-month SO_x emission total from Previous Month's Worksheet C: (e)_{last month}
- d) Record the monthly SO_x emissions from this month last year: (b)_{this month last year}
- e) Calculate using the following equation: (e) = (b) + (c) - (d)

*S indicates that the weight % of sulfur in the oil should be multiplied by the value given. For example, if the fuel is 1% sulfur, then S = 1

**S equals the sulfur content expressed in gr/100 ft³ gas vapor. For example, if the propane sulfur content is 0.18 gr/100 ft³, the emission factor would be (0.1 x 0.18) = 0.018 lb of SO₂/Mgal propane burned.

A 12-month rolling total of SO_x emissions less than 250.0 tons indicates compliance with Special Condition 3.A.

APPENDIX A

Abbreviations and Acronyms

%percent	m/s meters per second
°Fdegrees Fahrenheit	Mgal 1,000 gallons
acfmactual cubic feet per minute	MW megawatt
BACT Best Available Control Technology	MHDR maximum hourly design rate
BMPs Best Management Practices	MMBtu Million British thermal units
Btu British thermal unit	MMCF million cubic feet
CAM Compliance Assurance Monitoring	MSDS Material Safety Data Sheet
CAS Chemical Abstracts Service	NAAQS ... National Ambient Air Quality Standards
CEMS Continuous Emission Monitor System	NESHAPs National Emissions Standards for Hazardous Air Pollutants
CFR Code of Federal Regulations	NO_x nitrogen oxides
CO carbon monoxide	NSPS New Source Performance Standards
CO₂ carbon dioxide	NSR New Source Review
CO_{2e} carbon dioxide equivalent	PM particulate matter
COMS Continuous Opacity Monitoring System	PM_{2.5} particulate matter less than 2.5 microns in aerodynamic diameter
CSR Code of State Regulations	PM₁₀ particulate matter less than 10 microns in aerodynamic diameter
dscf dry standard cubic feet	ppm parts per million
EQ Emission Inventory Questionnaire	PSD Prevention of Significant Deterioration
EP Emission Point	PTE potential to emit
EPA Environmental Protection Agency	RACT Reasonable Available Control Technology
EU Emission Unit	RAL Risk Assessment Level
fps feet per second	SCC Source Classification Code
ft feet	scfm standard cubic feet per minute
GACT Generally Available Control Technology	SIC Standard Industrial Classification
GHG Greenhouse Gas	SIP State Implementation Plan
gpm gallons per minute	SMAL Screening Model Action Levels
gr grains	SO_x sulfur oxides
GWP Global Warming Potential	SO₂ sulfur dioxide
HAP Hazardous Air Pollutant	tph tons per hour
hr hour	tpy tons per year
hp horsepower	VMT vehicle miles traveled
lb pound	VOC Volatile Organic Compound
lbs/hr pounds per hour	
MACT Maximum Achievable Control Technology	
µg/m³micrograms per cubic meter	