



State of Ohio Environmental Protection Agency

Street Address:

Mailing Address:

Lazarus Gov. Center TELE: (614) 644-3020 FAX: (614) 644-2329

Lazarus Gov.
Center

**RE: DRAFT PERMIT TO INSTALL MODIFICATION
LAKE COUNTY**

CERTIFIED MAIL

Application No: 02-13174

Fac ID: 0243160086

DATE: 8/24/2004

GE Quartz, Inc. - Willoughby Plant
Louise Watson
4901 Campbell Rd
Willoughby, OH 44094

You are hereby notified that the Ohio Environmental Protection Agency has made a draft action recommending that the Director issue a Permit to Install modification for the air contaminant source(s) [emissions unit(s)] shown on the enclosed draft permit modification. 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 proposed installation. A public notice concerning the draft permit will appear in the Ohio EPA Weekly Review and the newspaper in the county where the facility will be located. Public comments will be accepted by the field office within 30 days of the date of publication in the newspaper. Any comments you have on the draft permit modification should be directed to the appropriate field office within the comment period. A copy of your comments should also be mailed to Robert Hodanbosi, Division of Air Pollution Control, Ohio EPA, P.O. Box 1049, Columbus, OH, 43266-0149.

A Permit to Install modification may be issued in proposed or final form based on the draft action, any written public comments received within 30 days of the public notice, or record of a public meeting if one is held. You will be notified in writing of a scheduled public meeting. Upon issuance of a final Permit to Install modification a fee of \$ 0 will be due. Please do not submit any payment now.

The Ohio EPA is urging companies to investigate pollution prevention and energy conservation. Not only will this reduce pollution and energy consumption, but it can also save you money. If you would like to learn ways you can save money while protecting the environment, please contact our Office of Pollution Prevention at (614) 644-3469. If you have any questions about this draft permit, please contact the field office where you submitted your application, or Mike Ahern, Field Operations & Permit Section at (614) 644-3631.

Sincerely,

Michael W. Ahern, Manager
Permit Issuance and Data Management Section
Division of Air Pollution Control

CC: USEPA

NEDO

PA

LAKE COUNTY

PUBLIC NOTICE

**ISSUANCE OF DRAFT PERMIT TO INSTALL 02-13174 FOR AN AIR CONTAMINANT SOURCE FOR
GE Quartz, Inc. - Willoughby Plant**

On 8/24/2004 the Director of the Ohio Environmental Protection Agency issued a draft action of a Permit To Install an air contaminant source for **GE Quartz, Inc. - Willoughby Plant**, located at **4901 Campbell Road, Willoughby, Ohio**.

Installation of the air contaminant source identified below may proceed upon final issuance of Permit To Install 02-13174:

Administrative modification of synthetic minor PTI 02-13174 for various emissions units.

Comments concerning this draft action, or a request for a public meeting, must be sent in writing to the address identified below no later than thirty (30) days from the date this notice is published. All inquiries concerning this draft action may be directed to the contact identified below.

Dennis Bush, Ohio EPA, Northeast District Office, 2110 East Aurora Road, Twinsburg, OH 44087
[(330)425-9171]



**Permit To Install
Terms and Conditions**

**Issue Date: To be entered upon final issuance
Effective Date: To be entered upon final issuance**

DRAFT MODIFICATION OF PERMIT TO INSTALL 02-13174

Application Number: 02-13174
Facility ID: 0243160086
Permit Fee: **To be entered upon final issuance**
Name of Facility: GE Quartz, Inc. - Willoughby Plant
Person to Contact: Louise Watson
Address: 4901 Campbell Rd
Willoughby, OH 44094

Location of proposed air contaminant source(s) [emissions unit(s)]:

**4901 Campbell Road
Willoughby, Ohio**

Description of proposed emissions unit(s):

Administrative modification of synthetic minor PTI 02-13174 for various emissions units.

The above named entity is hereby granted a modification to the permit to install described above pursuant to Chapter 3745-31 of the Ohio Administrative Code. Issuance of this modification does not constitute expressed or implied approval or agreement that, if constructed or modified in accordance with the plans included in the application, the above described source(s) of environmental pollutants will operate in compliance with applicable State and Federal laws and regulations, and does not constitute expressed or implied assurance that if constructed or modified in accordance with those plans included in the application, the above described source(s) of pollutants will be granted the necessary operating permits.

This permit is granted subject to the conditions attached hereto.

Ohio Environmental Protection Agency

Director

Part I - GENERAL TERMS AND CONDITIONS

A. State and Federally Enforceable Permit To Install General Terms and Conditions

1. Monitoring and Related Recordkeeping and Reporting Requirements

- a. Except as may otherwise be provided in the terms and conditions for a specific emissions unit, the permittee shall maintain records that include the following, where applicable, for any required monitoring under this permit:
 - i. The date, place (as defined in the permit), and time of sampling or measurements.
 - ii. The date(s) analyses were performed.
 - iii. The company or entity that performed the analyses.
 - iv. The analytical techniques or methods used.
 - v. The results of such analyses.
 - vi. The operating conditions existing at the time of sampling or measurement.
- b. Each record of any monitoring data, testing data, and support information required pursuant to this permit shall be retained for a period of five years from the date the record was created. Support information shall include, but not be limited to, all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by this permit. Such records may be maintained in computerized form.
- c. Except as may otherwise be provided in the terms and conditions for a specific emissions unit, the permittee shall submit required reports in the following manner:
 - i. Reports of any required monitoring and/or recordkeeping of federally enforceable information shall be submitted to the appropriate Ohio EPA District Office or local air agency.
 - ii. Quarterly written reports of (i) any deviations from federally enforceable emission limitations, operational restrictions, and control device operating parameter limitations, excluding deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06, that have been detected by the testing, monitoring and recordkeeping requirements specified in this permit, (ii) the probable cause of such deviations, and (iii) any corrective actions or preventive measures taken, shall be made to the appropriate Ohio EPA District Office or local air agency. The written

reports shall be submitted quarterly, i.e., by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. See B.9 below if no deviations occurred during the quarter.

- iii. Written reports, which identify any deviations from the federally enforceable monitoring, recordkeeping, and reporting requirements contained in this permit shall be submitted to the appropriate Ohio EPA District Office or local air agency every six months, i.e., by January 31 and July 31 of each year for the previous six calendar months. If no deviations occurred during a six-month period, the permittee shall submit a semi-annual report, which states that no deviations occurred during that period.
- iv. Each written report shall be signed by a responsible official certifying that, based on information and belief formed after reasonable inquiry, the statements and information in the report are true, accurate, and complete.

2. Scheduled Maintenance/Malfunction Reporting

Any scheduled maintenance of air pollution control equipment shall be performed in accordance with paragraph (A) of OAC rule 3745-15-06. The malfunction, i.e., upset, of any emissions units or any associated air pollution control system(s) shall be reported to the appropriate Ohio EPA District Office or local air agency in accordance with paragraph (B) of OAC rule 3745-15-06. (The definition of an upset condition shall be the same as that used in OAC rule 3745-15-06(B)(1) for a malfunction.) The verbal and written reports shall be submitted pursuant to OAC rule 3745-15-06.

Except as provided in that rule, any scheduled maintenance or malfunction necessitating the shutdown or bypassing of any air pollution control system(s) shall be accompanied by the shutdown of the emission unit(s) that is (are) served by such control system(s).

3. Risk Management Plans

If the permittee is required to develop and register a risk management plan pursuant to section 112(r) of the Clean Air Act, as amended, 42 U.S.C. 7401 et seq. ("Act"), the permittee shall comply with the requirement to register such a plan.

4. Title IV Provisions

If the permittee is subject to the requirements of 40 CFR Part 72 concerning acid rain, the permittee shall ensure that any affected emissions unit complies with those requirements. Emissions exceeding any allowances that are lawfully held under Title IV of the Act, or any

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regulations adopted thereunder, are prohibited.

5. Severability Clause

A determination that any term or condition of this permit is invalid shall not invalidate the force or effect of any other term or condition thereof, except to the extent that any other term or condition depends in whole or in part for its operation or implementation upon the term or condition declared invalid.

6. General Requirements

- a. The permittee must comply with all terms and conditions of this permit. Any noncompliance with the federally enforceable terms and conditions of this permit constitutes a violation of the Act, and is grounds for enforcement action or for permit revocation, revocation and reissuance, or modification, or for denial of a permit renewal application.
- b. It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the federally enforceable terms and conditions of this permit.
- c. This permit may be modified, reopened, revoked, or revoked and reissued, for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or revocation, or of a notification of planned changes or anticipated noncompliance does not stay any term and condition of this permit.
- d. This permit does not convey any property rights of any sort, or any exclusive privilege.
- e. The permittee shall furnish to the Director of the Ohio EPA, or an authorized representative of the Director, upon receipt of a written request and within a reasonable time, any information that may be requested to determine whether cause exists for modifying, reopening or revoking this permit or to determine compliance with this permit. Upon request, the permittee shall also furnish to the Director or an authorized representative of the Director, copies of records required to be kept by this permit. For information claimed to be confidential in the submittal to the Director, if the Administrator of the U.S. EPA requests such information, the permittee may furnish such records directly to the Administrator along with a claim of confidentiality.

7. Fees

The permittee shall pay fees to the Director of the Ohio EPA in accordance with ORC section 3745.11 and OAC Chapter 3745-78. The permittee shall pay all applicable Permit To Install fees

within 30 days after the issuance of this Permit To Install.

8. Federal and State Enforceability

Only those terms and conditions designated in this permit as federally enforceable, that are required under the Act, or any of its applicable requirements, including relevant provisions designed to limit the potential to emit of a source, are enforceable by the Administrator of the U.S. EPA, the State, and citizens under the Act. All other terms and conditions of this permit shall not be federally enforceable and shall be enforceable under State law only.

9. Compliance Requirements

- a. Any document (including reports) required to be submitted and required by a federally applicable requirement in this permit shall include a certification by a responsible official that, based on information and belief formed after reasonable inquiry, the statements in the document are true, accurate, and complete.
- b. Upon presentation of credentials and other documents as may be required by law, the permittee shall allow the Director of the Ohio EPA or an authorized representative of the Director to:
 - i. At reasonable times, enter upon the permittee's premises where a source is located or the emissions-related activity is conducted, or where records must be kept under the conditions of this permit.
 - ii. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit, subject to the protection from disclosure to the public of confidential information consistent with ORC section 3704.08.
 - iii. Inspect at reasonable times any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit.
 - iv. As authorized by the Act, sample or monitor at reasonable times substances or parameters for the purpose of assuring compliance with the permit and applicable requirements.
- c. The permittee shall submit progress reports to the appropriate Ohio EPA District Office or local air agency concerning any schedule of compliance for meeting an applicable requirement. Progress reports shall be submitted semiannually, or more frequently if

specified in the applicable requirement or by the Director of the Ohio EPA. Progress reports shall contain the following:

- i. Dates for achieving the activities, milestones, or compliance required in any schedule of compliance, and dates when such activities, milestones, or compliance were achieved.
- ii. An explanation of why any dates in any schedule of compliance were not or will not be met, and any preventive or corrective measures adopted.

10. Permit To Operate Application

- a. If the permittee is required to apply for a Title V permit pursuant to OAC Chapter 3745-77, the permittee shall submit a complete Title V permit application or a complete Title V permit modification application within twelve (12) months after commencing operation of the emissions units covered by this permit. However, if the proposed new or modified source(s) would be prohibited by the terms and conditions of an existing Title V permit, a Title V permit modification must be obtained before the operation of such new or modified source(s) pursuant to OAC rule 3745-77-04(D) and OAC rule 3745-77-08(C)(3)(d).
- b. If the permittee is required to apply for permit(s) pursuant to OAC Chapter 3745-35, the source(s) identified in this Permit To Install is (are) permitted to operate for a period of up to one year from the date the source(s) commenced operation. Permission to operate is granted only if the facility complies with all requirements contained in this permit and all applicable air pollution laws, regulations, and policies. Pursuant to OAC Chapter 3745-35, the permittee shall submit a complete operating permit application within ninety (90) days after commencing operation of the source(s) covered by this permit.

11. Best Available Technology

As specified in OAC Rule 3745-31-05, all new sources must employ Best Available Technology (BAT). Compliance with the terms and conditions of this permit will fulfill this requirement.

12. Air Pollution Nuisance

The air contaminants emitted by the emissions units covered by this permit shall not cause a public nuisance, in violation of OAC rule 3745-15-07.

B. State Only Enforceable Permit To Install General Terms and Conditions

1. Compliance Requirements

The emissions unit(s) identified in this Permit to Install shall remain in full compliance with all applicable State laws and regulations and the terms and conditions of this permit.

2. Reporting Requirements

The permittee shall submit required reports in the following manner:

- a. Reports of any required monitoring and/or recordkeeping of state-only enforceable information shall be submitted to the appropriate Ohio EPA District Office or local air agency.
- 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 state-only required 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 preventive measures which have been or will be taken, shall be submitted to the appropriate Ohio EPA District Office or 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 31, April 30, July 31, and October 31 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.)

3. Permit Transfers

Any transferee of this permit shall assume the responsibilities of the prior permit holder. The appropriate Ohio EPA District Office or local air agency must be notified in writing of any transfer of this permit.

4. Termination of Permit To Install

This permit to install shall terminate within eighteen months of the effective date of the permit to install if the owner or operator has not undertaken a continuing program of installation or modification or has not entered into a binding contractual obligation to undertake and complete within a reasonable time a continuing program of installation or modification. This deadline may be extended by up to 12 months if application is made to the Director within a reasonable time before the termination date and the party shows good cause for any such extension.

5. Construction of New Sources(s)

The proposed emissions unit(s) shall be constructed in strict accordance with the plans and application submitted for this permit to the Director of the Ohio Environmental Protection Agency. There may be no deviation from the approved plans without the express, written approval of the Agency. Any deviations from the approved plans or the above conditions may lead to such sanctions and penalties as provided under Ohio law. Approval of these plans does not constitute an assurance that the proposed facilities will operate in compliance with all Ohio laws and regulations. Additional facilities shall be installed upon orders of the Ohio Environmental Protection Agency if the proposed sources cannot meet the requirements of this permit or cannot meet applicable standards.

If the construction of the proposed emissions unit(s) has already begun or has been completed prior to the date the Director of the Environmental Protection Agency approves the permit application and plans, the approval does not constitute expressed or implied assurance that the proposed facility has been constructed in accordance with the approved plans. The action of beginning and/or completing construction prior to obtaining the Director's approval constitutes a violation of OAC rule 3745-31-02. Furthermore, issuance of the Permit to Install does not constitute an assurance that the proposed source will operate in compliance with all Ohio laws and regulations. Approval of the plans in any case is not to be construed as an approval of the facility as constructed and/or completed. Moreover, issuance of the Permit to Install is not to be construed as a waiver of any rights that the Ohio Environmental Protection Agency (or other persons) may have against the applicant for starting construction prior to the effective date of the permit. Additional facilities shall be installed upon orders of the Ohio Environmental Protection Agency if the proposed facilities cannot meet the requirements of this permit or cannot meet applicable standards.

6. Public Disclosure

The facility is hereby notified that this permit, and all agency records concerning the operation of this permitted source, are subject to public disclosure in accordance with OAC rule 3745-49-03.

7. Applicability

This Permit to Install is applicable only to the emissions unit(s) identified in the Permit To Install. Separate application must be made to the Director for the installation or modification of any other emissions unit(s).

8. Construction Compliance Certification

If applicable, the applicant shall provide Ohio EPA with a written certification (see enclosed form if applicable) that the facility has been constructed in accordance with the Permit To Install application and the terms and conditions of the Permit to Install. The certification shall be provided to Ohio EPA upon completion of construction but prior to startup of the source.

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9. **Additional Reporting Requirements When There Are No Deviations of Federally Enforceable Emission Limitations, Operational Restrictions, or Control Device Operating Parameter Limitations (See Section A of This Permit)**

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 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters.

C. **Permit To Install Summary of Allowable Emissions**

The following information summarizes the total allowable emissions, by pollutant, based on the individual allowable emissions of each air contaminant source identified in this permit.

**SUMMARY (for informational purposes only)
 TOTAL PERMIT TO INSTALL ALLOWABLE EMISSIONS**

<u>Pollutant</u>	<u>Tons Per Year</u>
NOx	249.45
PE	69.63

Part II - FACILITY SPECIFIC TERMS AND CONDITIONS

A. State and Federally Enforceable Permit To Install Facility Specific Terms and Conditions

I EMISSION LIMITATIONS:

NO_x POTENTIAL TO EMIT ANALYSIS for permitted, non permitted, restricted and non restricted emissions units , under restricted conditions and EMISSION LIMITATIONS

The italicized items at the bottom of the following table are either classified as trivial units or insignificant units that do not have NO_x emissions limitations. Entry of 'D' in the VOC or CO columns denotes DeMinimis emissions level on an unrestricted Potential to Emit (PTE) basis.

TABLE 1

Ohio EPA Unit number	Source Description	Restricted Operating hours, fuel usage or pieces produced	Ohio EPA Allowable NO_x Emission Rate lbs/hr	Potential NO_x Emissions (8760 hours or permit by rule exempt)	Restricted Potential Annual NO_x Emissions (limited, hours production or fuel usage)
1	2	3	4	5	6
B001& B002 combo	Titusville Boilers-10.9 mmBtu/hr each	122 mmscf NG/rolling 12 months combined		4.55 TPY each (9.1 combo)	<i>6.10 TPY rolling, 12 month summation ;)</i>
Z049 &Z050	CB Boilers for Process H₂O 7.323 mmBtu/hr each	74 Mmscf per 12 month period combined	0.70 lb/hr each; 1.40 lbs/hr combo	3.06 TPY each 6.12TPY combo	3.7 TPY rolling, 12 month summation combined

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B007	Ajax Boiler 4.0mmBtu/hr removed	—	—	—	—
B008	Emergency Generators 1 & 2 4.88 mmBtu/hr; 7.04 mmBtu/hr respectively	7299 gallons diesel fuel/yr rolling summation all combined (B008, B010, B015, B016)	#1 15.62 Lbs/hr #2 22.53 Lbs/hr	#1 3.9 TPY #2 5.63 TPY @500 hrs/yr each	1.6 TPY NOx (Gen 1-5 combined with restricted fuel usage)
B010	Emergency Generator #3, 11.26 mmBtu/hr	500 HRS/GEN Maximum OR→ 7299 gallons/yr rolling summation all combined (B008, B010, B015, B016)	36.03 Lbs/hr	9.01 TPY @ 500 hrs/yr	1.6 TPY NOx (Gen 1-5 combined with restricted fuel usage)
B015 & B016	Emergency generators 4-5 11.73mmBtu/h r each (Not permitted)		#4 37.54 Lbs/hr #5 37.54 Lbs/hr	#4 9.38 TPY #5 9.38TPY @ 500 hrs/yr	
P001	Sand Prep Process and Tumblers 4&5 (electric) and Calciners (1-5) (natural gas)	limit natural gas usage to 112 mmscf per rolling, 12 month summation for calciners (1-16)	0.118 lb/hr per calciner	0.52 TPY per calciner	5.6 TPY rolling 12 month summation all 16 combined
P022	Calciner #6 (natural gas)		1.89 lbs/hr all 16 combined	5.6 TPY rolling summation all 16 combined	
Z002-Z0 11	Calciners (7-16) (natural gas)				

P006	Arc fusion machine #5 (limit of 26,667 crucibles per rolling, 12-month summation for arc fusion machine #5;	1.36 lbs/hr 0.075 lb/crucible	6 TPY	1 TPY per rolling, 12 month summation
P026	Arc fusion machine #6 proposed		38.96 lbs/hr for CM 6 and 7 combined *19.48 lbs/hr 2.19 lbs NOx/crucible		31.8 TPY based on a rolling 12-month summation combined
P031	Arc fusion machine #7		38.96 lbs/hr for CM 6 and 7 combined *19.48 lbs/hr 2.19 lbs NOx/crucible		31.8 TPY based on a rolling 12-month summation combined
P025, and P032-P036	Lathes 16-21 1.26 mmBtu/hr each	limit of natural gas usage 30.29 mmscf per year based on a rolling, 12-month summation, all production lathes combined	15.23 lbs/hr each	66.70 lbs/hr each	194.1 TPY based on a rolling 12-month summation from all lathes combined including emissions units P025, P032-P043 combined.

P037-P042	Lathes 22-27 2.21 mmBtu/hr each	limit of natural gas usage 30.29 mmscf per year based on a rolling, 12-month summation, all production lathes combined	26.72 lbs/hr each	117.03 TPY each	194.1 TPY based on a rolling 12-month summation from all lathes combined including emissions units P025, P032-P043 combined.
P043	Repair Lathes (4)		10.82 lbs/hr combined	31.57 TPY combined	
P043	Repair Bench Lathes (2) and crucible repair lathes		.33 lb/hr	1.46 TPY combined	
P028	Presintering ovens 5 and 6 (electric)	—	—	0	0
P029	Addition of tumbler #6 to P001	see P001	see P001	see P001	see P001
P030	LD lathes 28 and 29 Removed				
Insignifi- cant emission s units					
B004	Fire Pump House Boiler (Hot Water)	None	0.10 lb/hr	0.42 TPY	0.42 TPY

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<i>B011 Exempt by 3745-31- 03(A)(4)(a)</i>	<i>North natural gas engine 1520 BTU/hr 138 HP (RECORD KEEPING Required)</i>	<i>NONE</i>	<i>3.30 lbs/hr</i>	<i>0.83 TPY</i>	<i>0.83 TPY</i>
<i>B012 Exempt by 3745-31- 03(A)(4)(a)</i>	<i>South natural gas engine 1410 BTU/hr 128 HP (RECORD KEEPING Required)</i>	<i>None</i>	<i>3.10 lbs/hr</i>	<i>0.78 TPY</i>	<i>0.78 TPY</i>
<i>Z042</i>	<i>Southwest NG Engine #3</i>	<i>500 Hours</i>	<i>3.10 lb/hr</i>	<i>0.78 TPY</i>	<i>0.78 TPY</i>
<i>P011</i>	<i>Tubing furnaces (1-6) electric with H2 pilot light</i>	<i>None</i>	<i>0.0091 lb/hr</i>	<i>0.040 TPY combined</i>	<i>0.04 TPY</i>
<i>P024</i>	<i>Tubing furnaces (7-15) electric with H2 pilot light</i>	<i>None</i>	<i>0.0144 lb/hr</i>	<i>0.0627 TPY combined</i>	<i>0.0627 TPY combined</i>

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<i>Z024</i>	<i>Tubing furnaces (16-19, 21, 50&51) electric with H2 pilot light</i>	<i>None</i>	<i>0.012 lb/hr</i>	<i>0.0509 TPY combined</i>	<i>0.0509 TPY combined</i>
<i>Z051</i>	<i>Tubing furnaces (52-54) electric with H2 pilot light</i>	<i>None</i>	<i>0.005 lb/hr</i>	<i>0.022 TPY combined</i>	<i>0.022 TPY combined</i>
<i>Z054</i>	<i>Harper Presintering Oven</i>	<i>None</i>	<i>0.94 lb/hr</i>	<i>0.41 TPY</i>	<i>0.41 TPY</i>
<i>Z055</i>	<i>Sintering furnaces H-L, End plug sintering furnace, static sintering furnace and Muffle furnaces 3&4</i>	<i>None</i>	<i>0.109 lb/hr combined</i>	<i>0.48 TPY combined</i>	<i>0.48 TPY combined</i>
<i>Z056</i>	<i>Maintenance-Hot</i>	<i>None</i>	<i>0.09 lb/hr</i>	<i>0.40 TPY</i>	<i>0.40 TPY</i>
<i>Z057</i>	<i>Ceiling fans (natural gas)</i>	<i>None</i>	<i>0.08 lb/hr</i>	<i>0.35 TPY combined</i>	<i>0.35 TPY combined</i>
<i>P014 & P016</i>	<i>Presintering ovens w/fume incinerator (1-4) Harrop</i>	<i>None</i>	<i>0.094 lb/hr</i>	<i>0.41 TPY</i>	<i>0.41 TPY</i>

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<i>Z026</i>	<i>Seal gas furnace (Removed)</i>	—	—	—	—
<i>Z027</i>	<i>Graphite furnace (natural gas) Removed</i>	—	—	—	—
<i>Z058</i>	<i>Glazers (2 production and a fiber optic)</i>	<i>None</i>		<i>0.1 tpy</i>	<i>0.1tpy</i>
<i>Total (Insig & DeMin)</i>	<i>Subtotal of Insignificant per Title V and DeMinimis Emissions as presented in Red above</i>				<i>5.13 NOx</i>
Fugitive Emission					
Total					249.45 NOx

**The 19.48 pounds per hour limitation is the potential to emit for each of these emissions units; therefore, monitoring, record keeping, and reporting requirements are not needed for these emission limitations.*

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The maximum NO_x emissions for all emissions units listed in Table 1 and Table 2 shall not exceed 249.45 tons per year based upon a rolling 12-month summation . The potential of unrestricted trivial emissions units at this facility shall also be included in the actual annual total. To ensure enforceability during the first 12 calendar months of operation after the effective date of this permit to install , the facility wide sum of NO_x emissions from all NO_x emitting units at this facility shall not exceed the following:

CALENDAR MONTH(S) FOLLOWING PTI EFFECTIVE DATE	NO _x EMISSIONS (TONS)
1-1	80
1-2	95
1-3	110
1-4	125
1-5	140
1-6	155
1-7	169
1-8	184
1-9	199
1-10	214
1-11	229
1-12	249.45

For the determination of facility-wide actual NO_x emissions to assure Synthetic Minor status, all sources of emissions, regardless of the size and permit exemption status, shall be included in the summation.

Boiler NO_x emissions calculations are based on emission factors for boilers from AP-42, Table 1.4-5, 7/98. Emergency Generator NO_x emissions calculations, subject to this synthetic minor determination, are based on emission factors from AP-42, Table 3.4-1, 10/96, with a diesel fuel heat content of 19,300 BTU/lb and a density of 7.1 lbs/gallon. Calciner emissions calculations are based on emission factors from AP-42, Table 1.4-5, 7/98 (Emission Factors for Small Boilers). NO_x emissions for Crucible Machine #5 are based on emission factors resulting from a 12/96 stack test at GE Newark and NO_x emissions for Crucible Machines 6 and 7 are based on emission factors resulting from a 3/98 stack test at GE Newark. LD production lathes 16-27, and all repair and bench lathes emissions calculations are based on emission factors resulting from a 3/98 stack test at GE Newark.

Tables I and II contain all of the emissions units that must be included in the permittee's calculation of the rolling, 12-month NO_x emissions for the entire facility. Table I identifies the emissions units for which

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the rolling, 12-month emissions will be calculated based upon the actual operating conditions during the rolling, 12-month period. Table II identifies the emissions units for which the potentials to

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emit will be used for the emissions during the rolling, 12-month period.

II. OPERATIONAL RESTRICTIONS:

The following insignificant emissions units shall be restricted by the following fuel usage, and hours of operation in accordance with OAC rule 3745-31-05(C).

The maximum annual and hourly operating and/or usage rolling restrictions for all insignificant emissions units that emit NOx are listed in the following table by emissions unit identification number.

In order to insure federal enforceability for the first twelve calendar months following the effective date of this Permit to Install, the permittee shall limit operating hours and/or material usage for the emissions units listed as required in the following table. After the first twelve calendar months of operation following the effective date of this Permit to Install, compliance with the annual NOx emission limitation shall be based upon monthly rolling, 12 consecutive month summations of NOx emissions.

All of the following limits are first year cumulative consecutive month summations:

Table II

Year/ Month	Z049-50 CB Boilers 74 mmscf ng /yr rolling (mmscf ng)	P001, P022, Z002-Z011 Calciners 1-16 112 mmscf ng/yr rolling summation (mmscf ng)
1-1	8	13
1-2	14	22
1-3	20	31
1-4	26	40
1-5	32	49
1-6	38	58
1-7	44	67
1-8	50	76
1-9	56	85
1-10	62	94

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1-11	68	103
1-12	74	112

III. MONITORING AND RECORD KEEPING REQUIREMENTS

1. The permittee shall maintain monthly records of the following information in accordance with OAC rule 3745-31-05(C):
 - a. During the first 12 calendar months of operation following the effective date of this Permit to Install,
 - i. the cumulative individual natural gas usage in million standard cubic feet (Mmscf) for emissions units Z049 and Z050;
 - ii. the cumulative individual natural gas usage in million standard cubic feet (Mmscf) for emissions units P001, P022, and Z002 - Z011;
 - iii. the cumulative NOx emissions for each calendar month for all of the above emissions units;
 - iv. beginning after the first 12 calendar months of operation following the effective date of this Permit to Install, the rolling consecutive 12-month cumulative summation of NOx from each of the above emissions units ; and
 - v. the total NOx emissions from all emissions units listed in Table 1 of these terms and conditions.

IV. REPORTING REQUIREMENTS-FACILITY-WIDE

1. The permittee shall submit quarterly deviation (excursion) reports that identify all exceedances of the following:
 - a. the cumulative individual natural gas usage in million standard cubic feet (Mmscf) for emissions units Z049 and Z050;
 - b. the cumulative individual natural gas usage in million standard cubic feet (Mmscf) for emissions units P001, P022, and Z002 - Z011;
 - c. the rolling, 12-month, facility-wide limitation for NOx emissions; and

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- d. for the first 12 calendar months of operation following the effective date of this Permit to Install, the maximum monthly allowable NOx emissions levels.

These reports shall be submitted in accordance with Part A.1.c. in the General Terms and Conditions of this permit.

B. State Only Enforceable Permit To Install Facility Specific Terms and Conditions

None

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Part III - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
B001-Titusville natural gas fired boiler (10.9 mmBtu/hr)	OAC rule 3745-31-05(C)	The combined NOx emissions from emissions units B001 and B002 shall not exceed 6.1 tons per year based on rolling, 12-month summations.
	OAC rule 3745-17-10(B)(1)	Particulate emissions from this boiler shall not exceed 0.020 pound per million Btu of actual heat input.
	OAC rule 3745-17-07(A)	Visible particulate emissions from the stack serving this emissions unit shall not exceed twenty percent opacity, as a six-minute average, except as provided by rule.
	OAC rule 3745-21-08	See A.I.2.b.
	OAC rule 3745-23-06(B)	See A.I.2.b.

2. Additional Terms and Conditions

- 2.a Per OAC rule 3745-18-06(A), this emissions unit is exempt from paragraphs (D), (F), and (G) because the emissions unit only burns natural gas as fuel. OAC rule 3745-18-06

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imposes no requirements on fuel burning equipment that burns only natural gas.

- 2.b** The permittee has satisfied the "best available control techniques and operating practices" required pursuant to OAC rule 3745-21-08(B) by complying with all applicable rules.

On November 5, 2002, OAC rule 3745-21-08 was revised to delete paragraph (B); therefore, paragraph (B) is no longer part of the State regulations. However, that rule revision has not yet been submitted to the U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). When the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-21-08, the requirement to satisfy the "best available control techniques and operating practices" will no longer exist as part of the federally-approved SIP for Ohio, and this term and condition will no longer be applicable to this emissions unit.

The permittee has satisfied the "latest available control techniques and operating practices" required pursuant to OAC rule 3745-23-06(B) by complying with all applicable rules.

- 2.c** This emissions unit is capable of burning only natural gas. Any change to an alternate fuel will require the permittee to obtain a permit to install.

II Operational Restrictions

1. The maximum quantity of natural gas burned in emissions units B001 and B002, combined, shall not exceed 122 million standard cubic feet of natural gas per year, based on rolling 12-month summations of the fuel usages. To ensure enforceability of this provision during the first twelve (12) months following the effective date of this Permit to Install, the permittee shall not exceed the following natural gas usage restrictions:

CALENDAR MONTH(S) FOLLOWING PTI EFFECTIVE DATE	ALLOWABLE CUMULATIVE TOTAL VOLUME of NATURAL GAS USAGE (B001 and B002 COMBINED)
	(mmscf)
1-1	40
1-2	48
1-3	55
1-4	63
1-5	70
1-6	77
1-7	85

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1-8	92
1-9	100
1-10	107
1-11	115
1-12	122

After the first 12 calendar months of operation following the effective date of this Permit to Install, the permittee shall comply with the annual natural gas usage limitation based on rolling, 12-month summations of the fuel usages.

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III Monitoring and/or Recordkeeping

1. By the effective date of this permit, the permittee shall install a natural gas flow meter on the natural gas supply line for this emissions unit to allow for monitoring and recording the natural gas fuel consumption.
2. The permittee shall monitor and record the following information for emissions units B001 and B002 combined, on a monthly basis:
 - a. the total amount of natural gas used;
 - b. the total amount of NO_x emitted per month;
 - c. after the first twelve months of operation following the effective date of this Permit to Install, the total amount of natural gas used based on a rolling, 12-month summation; and
 - d. after the first twelve months of operation following the effective date of this Permit to Install, the total amount of NO_x emitted, in tons, based on a rolling, 12-month summations of the monthly emissions.

The NO_x emissions shall be calculated by multiplying the total amount of natural gas used, in mmscf, by 100 lbs of NO_x per mmscf of natural gas, which is the emission factor from Table 1.4-1 of AP-42 (7/98), and dividing by 2000 lbs per ton.

The rolling, 12-month summation of individual NO_x emissions shall be calculated by adding the individual NO_x emissions for the preceding 11 calendar months plus the total NO_x emissions for the current calendar month.

Also, during the first 12 months of operation following the effective date of this Permit to Install, the permittee shall record the cumulative natural gas usage, in mmscf, for each calendar month.

IV Reporting Requirements

1. All reports or notifications shall be submitted to the Northeast District Office of the Ohio EPA as required in Section A.1.c. of the General Terms and Conditions of this Permit unless otherwise stated.
2. The permittee shall submit quarterly deviation (excursion) reports that identify for emissions units B001 and B002, combined, each record showing an exceedance of:

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- a. the rolling, 12-month restriction for fuel usage; and/or
 - b. the rolling 12-month NOx emission limitation.
3. For the first 12 months after the effective date of this Permit to Install, the permittee shall submit quarterly deviation (excursion) reports that identify, for emissions units B001 and B002, combined, all exceedances of the monthly cumulative natural gas usage limitations.

V Testing Requirements

1. Compliance with the emission limitations in Section A.I.1. of these terms and conditions shall be determined in accordance with the following methods:

- 1.a Emission Limitation

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

Applicable Compliance Method

If required by the Ohio EPA, compliance shall be determined through visible particulate emissions observations performed in accordance with Method 9, Visible Determination of the Opacity of Emissions from Stationary Sources, 40 CFR, Part 60, Appendix A, and the procedures specified in OAC rule 3745-17-03(B)(1).

- 1.b Emission Limitation

The emissions shall not exceed 0.020 pound of particulate emissions per mmBtu of actual heat input.

Applicable Compliance Method

For the use of natural gas, compliance shall be determined by dividing the AP-42 (Fifth Edition, Table 1.4-2, 7/98) emission factor for natural gas combustion (1.9 lbs/mmcf) by the heating value of natural gas (1050 Btu/cu ft).

If required by the Ohio EPA, the permittee shall determine compliance with this emission limitation in accordance with 40 CFR Part 60, Appendix A, Methods 1 through 5 and the procedures specified in OAC rule 3745-17-03(B)(9).

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Facility ID: 0243160086

Emissions Unit ID: B001

1.c Emission Limitation -

The NOx emissions shall not exceed 6.1 tons per year for emissions units B001 and B002 combined, based on a rolling 12-month summation of the NOx emissions.

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Applicable Compliance Method:

Compliance with the tons per year limitation shall be determined by the record keeping in Section A.III.2.

Compliance with the pound per hour emission limitation shall be demonstrated by multiplying the maximum hourly heat input capacity of the boiler (10.9 MmBtu/hr) by the emission factor from "Compilation of Air Pollutant Emission Factors", Table 1.4-1 (7/98) for natural gas combustion (100 lbs of NO_x per mmscf), and dividing by the heat content of natural gas (1050 Btu/cu ft). If required by the Ohio EPA, the permittee shall demonstrate compliance with this emission limitation in accordance with 40 CFR Part 60 Appendix A, Methods 1-4 and 7.

VI Miscellaneous Requirements

None

GE Q1

PTI A

Emissions Unit ID: B001

Issued: To be entered upon final issuance**B. State Only Enforceable Section****I. Applicable Emissions Limitations and/or Control Requirements**

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	<u>Applicable Emissions <u>Limitations/Control</u> <u>Measures</u></u>
B001 - Titusville natural gas-fired boiler (10.9 mmBtu/hr)	None	None

2. Additional Terms and Conditions

None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

VI. Miscellaneous Requirements

None

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Emissions Unit ID: B001

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Part III - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
B002-Titusville natural gas fired boiler (10.9 mmBtu/hr)	OAC rule 3745-31-05(C)	The combined NOx emissions from emissions units B001 and B002 shall not exceed 6.1 tons per year based on rolling, 12-month summations.
	OAC rule 3745-17-10(B)(1)	Particulate emissions from this boiler shall not exceed 0.020 pound per million Btu of actual heat input.
	OAC rule 3745-17-07(A)	Visible particulate emissions from the stack serving this emissions unit shall not exceed twenty percent opacity, as a six-minute average, except as provided by rule.
	OAC rule 3745-21-08	See A.I.2.b.
	OAC rule 3745-23-06(B)	See A.I.2.b.

2. Additional Terms and Conditions

- 2.a Per OAC rule 3745-18-06(A), this emissions unit is exempt from paragraphs (D), (F), and (G) because the emissions unit only burns natural gas as fuel. OAC rule 3745-18-06 imposes no requirements on fuel burning equipment that burns only natural gas.

- 2.b** The permittee has satisfied the "best available control techniques and operating practices" required pursuant to OAC rule 3745-21-08(B) by complying with all applicable rules.

On November 5, 2002, OAC rule 3745-21-08 was revised to delete paragraph (B); therefore, paragraph (B) is no longer part of the State regulations. However, that rule revision has not yet been submitted to the U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). When the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-21-08, the requirement to satisfy the "best available control techniques and operating practices" will no longer exist as part of the federally-approved SIP for Ohio, and this term and condition will no longer be applicable to this emissions unit.

The permittee has satisfied the "latest available control techniques and operating practices" required pursuant to OAC rule 3745-23-06(B) by complying with all applicable rules.

- 2.c** This emissions unit is capable of burning only natural gas. Any change to an alternate fuel will require the permittee to obtain a permit to install.

II Operational Restrictions

1. The maximum quantity of natural gas burned in emissions units B001 and B002, combined, shall not exceed 122 million standard cubic feet of natural gas per year, based on rolling 12-month summations of the fuel usages. To ensure enforceability of this provision during the first twelve (12) months following the effective date of this Permit to Install, the permittee shall not exceed the following natural gas usage restrictions:

CALENDAR MONTH(S) FOLLOWING PTI EFFECTIVE DATE	ALLOWABLE CUMULATIVE TOTAL VOLUME of NATURAL GAS USAGE (B001 and B002 COMBINED)
--	---

	(mmscf)
1-1	40
1-2	48
1-3	55
1-4	63
1-5	70
1-6	77
1-7	85
1-8	92
1-9	100
1-10	107
1-11	115
1-12	122

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Emissions Unit ID: B002

After the first 12 calendar months of operation following the effective date of this Permit to Install, the permittee shall comply with the annual natural gas usage limitation based on rolling, 12-month summations of the fuel usages.

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III Monitoring and/or Recordkeeping

1. By the effective date of this permit, the permittee shall install a natural gas flow meter on the natural gas supply line for this emissions unit to allow for monitoring and recording the natural gas fuel consumption.
2. The permittee shall monitor and record the following information for emissions units B001 and B002 combined, on a monthly basis:
 - a. the total amount of natural gas used;
 - b. the total amount of NO_x emitted per month;
 - c. after the first twelve months of operation following the effective date of this Permit to Install, the total amount of natural gas used based on a rolling, 12-month summation; and
 - d. after the first twelve months of operation following the effective date of this Permit to Install, the total amount of NO_x emitted, in tons, based on a rolling, 12-month summations of the monthly emissions.

The NO_x emissions shall be calculated by multiplying the total amount of natural gas used, in mmscf, by 100 lbs of NO_x per mmscf of natural gas, which is the emission factor from Table 1.4-1 of AP-42 (7/98), and dividing by 2000 lbs per ton.

The rolling, 12-month summation of individual NO_x emissions shall be calculated by adding the individual NO_x emissions for the preceding 11 calendar months plus the total NO_x emissions for the current calendar month.

Also, during the first 12 months of operation following the effective date of this Permit to Install, the permittee shall record the cumulative natural gas usage, in mmscf, for each calendar month.

IV Reporting Requirements

1. All reports or notifications shall be submitted to the Northeast District Office of the Ohio EPA as required in Section A.1.c. of the General Terms and Conditions of this Permit unless otherwise stated.
2. The permittee shall submit quarterly deviation (excursion) reports that identify for emissions units B001 and B002, combined, each record showing an exceedance of:

- a. the rolling, 12-month restriction for fuel usage; and/or
 - b. the rolling 12-month NOx emission limitation.
3. For the first 12 months after the effective date of this Permit to Install, the permittee shall submit quarterly deviation (excursion) reports that identify, for emissions units B001 and B002, combined, all exceedances of the monthly cumulative natural gas usage limitations.

V Testing Requirements

1. Compliance with the emission limitations in Section A.I.1. of these terms and conditions shall be determined in accordance with the following methods:

- 1.a Emission Limitation

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

Applicable Compliance Method

If required by the Ohio EPA, compliance shall be determined through visible particulate emissions observations performed in accordance with Method 9, Visible Determination of the Opacity of Emissions from Stationary Sources, 40 CFR, Part 60, Appendix A, and the procedures specified in OAC rule 3745-17-03(B)(1).

- 1.b Emission Limitation

The emissions shall not exceed 0.020 pound of particulate emissions per mmBtu of actual heat input.

Applicable Compliance Method

For the use of natural gas, compliance shall be determined by dividing the AP-42 (Fifth Edition, Table 1.4-2, 7/98) emission factor for natural gas combustion (1.9 lbs/mmcu ft) by the heating value of natural gas (1050 Btu/cu ft).

If required by the Ohio EPA, the permittee shall determine compliance with this emission limitation in accordance with 40 CFR Part 60, Appendix A, Methods 1 through 5 and the procedures specified in OAC rule 3745-17-03(B)(9).

- 1.c Emission Limitation -

The NOx emissions shall not exceed 6.1 tons per year for emissions units B001 and B002 combined, based on a rolling 12-month summation of the NOx emissions.

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Applicable Compliance Method:

Compliance with the tons per year limitation shall be determined by the record keeping in Section A.III.2.

Compliance with the pound per hour emission limitation shall be demonstrated by multiplying the maximum hourly heat input capacity of the boiler (10.9 mmBtu/hr) by the emission factor from "Compilation of Air Pollutant Emission Factors", Table 1.4-1 (7/98) for natural gas combustion (100 lbs of NO_x per mmscf), and dividing by the heat content of natural gas (1,050 Btu/cu ft). If required by the Ohio EPA, the permittee shall demonstrate compliance with this emission limitation in accordance with 40 CFR Part 60 Appendix A, Methods 1-4 and 7.

VI Miscellaneous Requirements

None

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B. State Only Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
B002 - Titusville natural gas-fired boiler (10.9 mmBtu/hr)		

2. Additional Terms and Conditions

None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

VI. Miscellaneous Requirements

None

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Emissions Unit ID: B002

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Part III - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
B008 - Emergency Diesel Generator 1- 4.88 mmBtu/hr (697 horsepower and 520 kW); and	OAC rule 3745-31-05(A)(3)	NOx emissions from generators 1 and 2 shall not exceed 15.62 pounds per hour and 22.53 pounds per hour, respectively.
Emergency Diesel Generator 2- 7.04 mmBtu/hr (1006 horsepower and 750 kW)	OAC rule 3745-31-05(C)	The requirements of this rule also include compliance with OAC rules 3745-31-05(C), 3745-17-07, 3745-17-11, 3745-18-06, 3745-21-08(B), and 3745-23-06.
The requirements of this permit supersede those requirements included in Permit to Install number 02-7485 issued on May 18, 1994.	OAC rule 3745-21-08(B)	Combined NOx emissions from emissions units B008, B010, B015 and B016 shall not exceed 1.6 tons per year based on a rolling, 12-month summation.
	OAC rule 3745-23-06(B)	See A.I.2.b below.
	OAC rule 3745-17-11(B)(5) (b)	See A.I.2.b below.
	OAC rule 3745-18-06(G)	Particulate emissions from each generator shall not exceed 0.062 lb/mmBtu (See A.I.2.a below.).
	OAC rule 3745-17-07(A)	Exempt, pursuant to OAC rule 3745-18-06(B)

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

2. Additional Terms and Conditions

- 2.a** The emission limitation specified in this rule citation has been revised based upon a change in the applicable emission factor contained in USEPA reference document AP-42, Fifth Edition, Compilation of Air Pollution Emission Factors. The revised rule was adopted by the Director of Ohio EPA in December, 1997. The USEPA has agreed to consider this revised rule as federally enforceable during the time from the effective date of USEPA approval of this limitation as a revision to the Ohio SIP for particulate matter.
- 2.b** The permittee has satisfied the "best available control techniques and operating practices" required pursuant to OAC rule 3745-21-08(B) by committing to comply with the best available technology requirements established in this Permit to Install.

On November 5, 2002, OAC rule 3745-21-08 was revised to delete paragraph (B); therefore, paragraph (B) is no longer part of the State regulations. However, that rule revision has not yet been submitted to the U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). When the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-21-08, the requirement to satisfy the "best available control techniques and operating practices" will no longer exist as part of the federally-approved SIP for Ohio, and this term and condition will no longer be applicable to this emissions unit.

The permittee has satisfied the "latest available control techniques and operating practices" required pursuant to OAC rule 3745-23-06(B) by committing to comply with the best available technology requirements established pursuant to OAC rule 3745-31-05(A)(3) in this Permit to Install.

II. Operational Restrictions

1. The permittee shall burn only diesel fuel in this emissions unit.
2. The maximum quantity of diesel fuel burned in emissions units B008, B010, B015, and B016

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(Emergency Diesel Generators 1, 2, 3, 4 and 5) combined shall not exceed 7,299 gallons based on a rolling 12-month summation of fuel usage.

3. In the event of an extended public electric utility service outage (longer than 16 hours total), the permittee may operate any and all of the emergency generators (B008, B010, B015, and B016) in excess of the diesel fuel oil use limit in section A.II.2, as an emergency provision of this permit. During any time of such operation under this emergency provision, the permittee shall not operate any crucible machines, production lathes, or repair lathes. Regardless of an emergency condition, the permittee shall continue to comply with the facility-wide NOx emission limits in section A.I.

III. Monitoring and/or Recordkeeping Requirements

1. The permittee shall properly install, calibrate, maintain, and operate a diesel fuel flow meter on the diesel fuel tank that supplies emissions units B008, B010, B015 and B016 to allow for accurate determination of the diesel fuel consumption.
2. The permittee shall monitor and record the following information for this emissions unit on a monthly basis:
 - a. the total amount of diesel fuel used in gallons per month in emissions units B008, B010, B015 and B016 combined;
 - b. the total amount of NO_x emitted per month from emissions units B008, B010, B015, and B016 combined;
 - c. the total amount of diesel fuel used based on a rolling, 12-month summation in gallons/year in emissions units B008, B010, B015 and B016 combined; and
 - d. the total amount of NO_x emitted per year based on a rolling, 12-month summation from emissions units B008, B010, B015, and B016 combined.

IV. Reporting Requirements

1. All reports shall be submitted as required in Section A.1.c. of the General Terms and Conditions of this Permit to Install unless otherwise stated.
2. The permittee shall submit quarterly deviation (excursion) reports that identify any record showing an exceedance of the rolling, 12-month limitation for fuel usage in emissions units B008, B010, B015 and B016, combined.

V. Testing Requirements

1. Compliance with the emission limitations specified in Section A.I of this permit shall be determined in accordance with the following methods:

- a. Emission Limitation:

0.062 lb/mmBtu particulate emissions from each generator

Applicable Compliance Method:

Compliance with this emission limitation for generator 1 (4.88 mmBtu/hr) and generator 2 (7.04 mmBtu/hr) shall be determined by the emission factor found in "Compilation of Air Pollutant Emission Factors", Table 3.4-2 (10/96) for diesel (0.062 lb PM/mmBtu).

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If required by the Ohio EPA, the permittee shall demonstrate compliance with this emissions limitation in accordance with 40 CFR Part 60, Appendix A, Methods 1 through 5 and the procedures specified in OAC rule 3745-17-03(B)(10).

b. Emission Limitation:

NOx emissions from generators 1 and 2 shall not exceed 15.62 pounds per hour and 22.53 pounds per hour, respectively and 1.6 tons of NOx emissions from emissions units B008, B010, B015 and B016, combined based on a rolling, 12-month summation.

Applicable Compliance Method:

Compliance shall be demonstrated by multiplying the maximum rated heat input of the generator by the emission factor from "Compilation of Air Pollutant Emission Factors" Table 3.4-1(10/96) for NOx (3.2 lbs/mmBtu) and the record keeping and monitoring requirements of Section A.III.2 .

If required by the Ohio EPA, the permittee shall demonstrate compliance with this emission limitation in accordance with 40 CFR Part 60, Appendix A Methods 1-4 and Method 7 and the requirements of OAC rule 3745-31-05.

c. Emission Limitation:

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

Applicable Compliance Method:

If required by the Ohio EPA, by the Ohio EPA,, compliance shall be determined through visible emissions observations performed in accordance with 40 CFR Part 60 Appendix A, Method 9 and the procedures specified in OAC rule 3745-17-03(B)(1).

VI. Miscellaneous Requirements

None

GE Q1

PTI A

Emissions Unit ID: B002

Issued: To be entered upon final issuance

B. State Only Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
<p>B008 - Emergency Diesel Generator 1- 4.88 mmBtu/hr (697 horsepower and 520 kW); and</p> <p>Emergency Diesel Generator 2- 7.04 mmBtu/hr (210 horsepower and 750 kW)</p> <p>The requirements of this permit supersede those requirements included in Permit to Install number 02-7485 issued on May 18, 1994.</p>		

2. Additional Terms and Conditions

None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

VI. Miscellaneous Requirements

None

GE Q1

PTI A

Emissions Unit ID: B010

Issued: To be entered upon final issuance

Part III - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>
B010 - Emergency Diesel Generator 3- 11.26 mmBtu/hr (1609 horsepower and 1200 kW) The requirements of this permit supersede those requirements identified in Permit to Install number 02-7485 issued on May 18, 1994.	OAC rule 3745-23-06(B)
	OAC rule 3745-17-07(A)
	OAC rule 3745-31-05(A)(3)
	OAC rule 3745-31-05(C)
	OAC rule 3745-17-11(B)(5)(b)
	OAC rule 3745-18-06(G)
	OAC rule 3745-21-08(B)

GE Q1

PTI A

Emissions Unit ID: B010

Issued: To be entered upon final issuance

Applicable Emissions
Limitations/Control
Measures

Oxides of nitrogen (NOx) emissions from this emissions unit shall not exceed 36.03 pounds per hour.

The requirements of this rule also include compliance with OAC rule 3745-31-05(C), 3745-17-07, 3745-17-11, 3745-18-06, 3745-21-08(B), and 3745-23-06.

Combined NOx emissions from emissions units B008, B010, B015 and B016 shall not exceed 1.6 tons per year based on a rolling, 12-month summation.

Particulate emissions from this emissions unit shall not exceed 0.062 lb/mmBtu (See A.I.2.a below).

Sulfur dioxide emissions from this emissions unit shall not exceed 0.50 pound of sulfur dioxide per mmBtu of actual heat input.

See A.I.2.b below.

See A.I.2.b below.

Visible particulate emissions

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

Issued: To be entered upon final issuance

2. Additional Terms and Conditions

2.a The emission limitation specified in this rule citation has been revised based upon a change in the applicable emission factor contained in USEPA reference document AP-42, Fifth Edition, Compilation of Air Pollution Emission Factors. The revised rule was adopted by the Director of Ohio EPA in December, 1997. The USEPA has agreed to consider this revised rule as federally enforceable during the time from the effective date of USEPA approval of this limitation as a revision to the Ohio SIP for particulate matter.

2.b The permittee has satisfied the "best available control techniques and operating practices" required pursuant to OAC rule 3745-21-08(B) by committing to comply with the best available technology requirements established in this Permit to Install.

On November 5, 2002, OAC rule 3745-21-08 was revised to delete paragraph (B); therefore, paragraph (B) is no longer part of the State regulations. However, that rule revision has not yet been submitted to the U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). When the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-21-08, the requirement to satisfy the "best available control techniques and operating practices" will no longer exist as part of the federally-approved SIP for Ohio, and this term and condition will no longer be applicable to this emissions unit.

The permittee has satisfied the "latest available control techniques and operating practices" required pursuant to OAC rule 3745-23-06(B) by committing to comply with the best available technology requirements established pursuant to OAC rule 3745-31-05(A)(3) in this Permit to Install.

2.c The diesel fuel oil burned in this unit, shall have a sulfur content which is sufficient to comply with the allowable sulfur dioxide emission limitation of 0.5 pound of sulfur dioxide per mmBtu of actual heat input, on an "as received" basis.

II. Operational Restrictions

1. The permittee shall burn only diesel fuel oil in this emissions unit.
2. The maximum quantity of fuel oil burned in emissions units B008, B010, B015, and B016 (Emergency Diesel Generators 1, 2, 3, 4 and 5) combined shall not exceed 7299 gallons based on a rolling 12-month summation of fuel usage.
3. In the event of an extended public electric utility service outage (longer than 16 hours total), the

Emissions Unit ID: B010

permittee may operate any and all of the emergency generators (B008, B010, B015, and B016) in excess of the diesel fuel oil use limit in section A.II.2, as an emergency provision of this permit. During any time of such operation under this emergency provision, the permittee shall not operate any crucible machines, production lathes, or repair lathes. Regardless of an emergency condition, the permittee shall continue to comply with the facility-wide NOx emission limits in section A.I.

III. Monitoring and/or Recordkeeping Requirements

1. The permittee shall properly install, calibrate, maintain, and operate a diesel fuel flow meter on the diesel fuel tank that supplies emissions units B008, B010, B015 and B016 to allow for accurate determination of the diesel fuel consumption.
2. The permittee shall monitor and record the following information for these emissions units on a monthly basis:
 - a. the total amount of diesel fuel used in gallons per month in emissions units B008, B010, B015 and B016 combined;
 - b. the total amount of NOx emitted per month from emissions units B008, B010, B015, and B016 combined;
 - c. the total amount of diesel fuel used based on a rolling 12 month summation in gallons/year in emissions units B008, B010, B015 and B016 combined;
 - d. the total amount of NOx emitted per year based on a rolling 12 month summation from emissions units B008, B010, B015, and B016 combined.
3. For each shipment of fuel oil received for burning in this emissions unit, the permittee shall maintain records of the total quantity of fuel oil received, the permittee's or fuel oil supplier's analyses for sulfur content and heat content, and the calculated sulfur dioxide emission rate in lb(s) per mmBtu.
4. The permittee shall collect or require the fuel oil supplier to collect a representative grab sample for each shipment of fuel oil that is received for burning in this emissions unit. The permittee shall perform or require the supplier to perform the analyses for sulfur content and heat content in accordance with the following ASTM methods:
 - a. ASTM method D4294, ASTM method D240, or ASTM method 6010 for sulfur content; and
 - b. ASTM method D240 for heat content.

Alternative equivalent methods may be used upon written approval by the Northeast District Office of the Ohio EPA.

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Emissions Unit ID: B010

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IV. Reporting Requirements

1. All reports shall be submitted as required in Section A.1.c. of the General Terms and Conditions of this Permit to Install unless otherwise stated.
2. The permittee shall submit quarterly deviation (excursion) reports that identify any record showing an exceedance of the rolling , 12-month limitation for fuel usage in emissions units B008, B010, B015 and B016 combined .
3. The permittee shall submit quarterly deviation (excursion) reports that identify any record (calculation) showing an exceedance of the 0.5 lb sulfur dioxide limit per million BTU of heat input limitation.

V. Testing Requirements

1. Compliance with the emission limitations specified in Section A.I of this permit shall be determined in accordance with the following methods:

- a. Emission Limitation:

0.062 lb/mmBtu particulate emissions

Applicable Compliance Method:

Compliance with this emission limitation shall be demonstrated by the emission factor found in " Compilation of Air Pollutant Emission Factors", Table 3.4-2 (10/96) for diesel (0.062 lb PM/mmBtu).

If required by the Ohio EPA, the permittee shall demonstrate compliance with this emissions limitation in accordance with 40 CFR Part 60, Appendix A, Methods 1 through 5 and the procedures specified in OAC rule 3745-17-03(B)(10).

- b. Emission Limitation:

0.5 pound of sulfur dioxide per mmBtu of actual heat input

Applicable Compliance Method:

Compliance shall be based on the records required by Section A.III.3. of this permit. The sulfur dioxide emission rate shall be calculated in accordance with the formula specified in

OAC rule 3745-18-04(F)(2) as follows:

$$ER = 1 \times 10^6 / H \times D \times S \times 1.974$$

where ER = the emission rate in lbs of sulfur dioxide per mmBtu;
 H = the heat content of the liquid fuel in BTU per gallon;
 D = the density of the liquid fuel in pounds per gallon; and
 S = the decimal fraction of sulfur in the liquid fuel.

c. Emission Limitation:

NOx emissions from this generator shall not exceed 36.03 pounds per hour and 1.6 tons from emissions units B008, B010, B015 and B016, combined based on a rolling, 12-month summation.

Applicable Compliance Method:

Compliance shall be demonstrated by multiplying the maximum rated heat input of the generator (11.26 mmBtu/hr) by the emission factor from "Compilation of Air Pollutant Emission Factors" (AP-42), Table 3.4-1(10/96) for NOx (3.2 lbs/mmBtu) and the record keeping and monitoring requirements of Section A.III.2 .

If required by the Ohio EPA, the permittee shall demonstrate compliance with this emission limitation in accordance with 40 CFR Part 60, Appendix A Methods 1-4 and Method 7 and the requirements of OAC rule 3745-31-05.

d. Emission Limitation:

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

Applicable Compliance Method:

If required by the Ohio EPA, compliance shall be determined through visible emissions observations performed in accordance with 40 CFR Part 60 Appendix A, Method 9 and the procedures specified in OAC rule 3745-17-03(B)(1).

VI. Miscellaneous Requirements

None

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PTI A

Emissions Unit ID: B010

Issued: To be entered upon final issuance

B. State Only Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
B010 - Emergency Diesel Generator 3- 11.26 mmBtu/hr (1609 horsepower and 1200 kW)	None	None
The requirements of this permit supersede those requirements identified in Permit to Install number 02-7485 issued on May 18, 1994.		

2. Additional Terms and Conditions

None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

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Issued: To be entered upon final issuance

Emissions Unit ID: B010

V. Testing Requirements

None

VI. Miscellaneous Requirements

None

GE Q1

PTI A

Emissions Unit ID: B015

Issued: To be entered upon final issuance

Part III - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>
B015 - Emergency Generator 4 - 11.73 mmBtu/hr (1676 horsepower and 1250 kW)	OAC rule 3745-31-05(A)(3) OAC rule 3745-21-08(B) OAC rule 3745-23-06(B) OAC rule 3745-31-05(C) OAC rule 3745-17-07(A) OAC rule 3745-17-11(B)(5)(b) OAC rule 3745-18-06(G)

Applicable Emissions
Limitations/Control
Measures

Oxides of nitrogen (NOx) emissions from this emissions unit shall not exceed 37.54 pounds per hour.

The requirements of this rule also include compliance with OAC rule 3745-31-05(C), 3745-17-07, 3745-17-11, 3745-18-06, 3745-21-08(B), and 3745-23-06.

Combined NOx emissions from emissions units B008, B010, B015 and B016 shall not exceed 1.6 tons per year based on a rolling 12-month summation.

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

Particulate emissions from this generator shall not exceed 0.0697 lb/mmBtu. (See A.I.2.a below.)

Sulfur dioxide emissions from this generator shall not exceed 0.5 pound of sulfur dioxide per mmBtu of actual heat input.

See A.I.2.b below.

See A.I.2.b below.

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2. Additional Terms and Conditions

2.a The emission limitation specified in this rule citation has been revised based upon a change in the applicable emission factor contained in USEPA reference document AP-42, Fifth Edition, Compilation of Air Pollution Emission Factors. The revised rule was adopted by the Director of Ohio EPA in December, 1997. The USEPA has agreed to consider this revised rule as federally enforceable during the time from the effective date of USEPA approval of this limitation as a revision to the Ohio SIP for particulate matter.

2.b The permittee has satisfied the "best available control techniques and operating practices" required pursuant to OAC rule 3745-21-08(B) by committing to comply with the best available technology requirements established in this Permit to Install.

On November 5, 2002, OAC rule 3745-21-08 was revised to delete paragraph (B); therefore, paragraph (B) is no longer part of the State regulations. However, that rule revision has not yet been submitted to the U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). When the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-21-08, the requirement to satisfy the "best available control techniques and operating practices" will no longer exist as part of the federally-approved SIP for Ohio, and this term and condition will no longer be applicable to this emissions unit.

The permittee has satisfied the "latest available control techniques and operating practices" required pursuant to OAC rule 3745-23-06(B) by committing to comply with the best available technology requirements established pursuant to OAC rule 3745-31-05(A)(3) in this Permit to Install.

2.c The diesel fuel oil burned in this unit, shall have a sulfur content which is sufficient to comply with the allowable sulfur dioxide emission limitation of 0.5 pound of sulfur dioxide per mmBtu of actual heat input, on an "as received" basis.

II. Operational Restrictions

1. The permittee shall burn only fuel oil in this emissions unit.
2. The maximum quantity of diesel fuel burned in emissions units B008, B010, B015, and B016 (Emergency Diesel Generators 1, 2, 3, 4 and 5) combined shall not exceed 7,299 gallons based on a rolling 12-month summation of fuel usage.
3. In the event of an extended public electric utility service outage (longer than 16 hours total), the

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permittee may operate any and all of the emergency generators (B008, B010, B015, and B016) in excess of the diesel fuel oil use limit in section A.II.2, as an emergency provision of this permit. During any time of such operation under this emergency provision, the permittee shall not operate any crucible machines, production lathes, or repair lathes. Regardless of an emergency condition, the permittee shall continue to comply with the facility-wide NOx emission limits in section A.I.

III. Monitoring and/or Recordkeeping Requirements

1. The permittee shall properly install, calibrate, maintain, and operate a diesel fuel flow meter on the diesel fuel tank that supplies emissions units B008, B010, B015 and B016 to allow for accurate determination of the diesel fuel consumption.
2. The permittee shall monitor and record the following information for these emissions units on a monthly basis:
 - a. the total amount of diesel fuel used in gallons per month in emissions units B008, B010, B015 and B016 combined;
 - b. the total amount of NOx emitted per month from emissions units B008, B010, B015, and B016 combined;
 - c. the total amount of diesel fuel used based on a rolling 12 month summation in gallons/year in emissions units B008, B010, B015 and B016 combined;
 - d. the total amount of NOx emitted per year based on a rolling 12 month summation from emissions units B008, B010, B015, and B016 combined.
3. For each shipment of fuel oil received for burning in this emissions unit, the permittee shall maintain records of the total quantity of fuel oil received, the permittee's or fuel oil supplier's analyses for sulfur content and heat content, and the calculated sulfur dioxide emission rate in lb(s) per mmBtu.
4. The permittee shall collect or require the fuel oil supplier to collect a representative grab sample for each shipment of fuel oil that is received for burning in this emissions unit. The permittee shall perform or require the supplier to perform the analyses for sulfur content and heat content in accordance with the following ASTM methods:
 - a. ASTM method D4294, ASTM method D240, or ASTM method 6010 for sulfur content; and

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PTI A

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Facility ID: 0243160086

Emissions Unit ID: B015

- b. ASTM method D240 for heat content.

Alternative equivalent methods may be used upon written approval by the Northeast District Office of the Ohio EPA.

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IV. Reporting Requirements

1. All reports shall be submitted to the Northeast District Office of the Ohio EPA as required in Section A.1.c. of the General Terms and Conditions of this Permit to Install unless otherwise stated.
2. The permittee shall submit quarterly deviation (excursion) reports that identify any record showing an exceedance of the rolling , 12-month limitation for fuel usage in emissions units B008, B010, B015 and B016 combined.
3. The permittee shall submit quarterly deviation (excursion) reports that identify any record (calculation) showing an exceedance of the 0.5 lb sulfur dioxide limit per million BTU of heat input limitation.

V. Testing Requirements

1. Compliance with the emission limitations specified in Section A.I of this permit shall be determined in accordance with the following methods:

- a. Emission Limitation:

0.062 lb/mmBtu particulate emissions

Applicable Compliance Method:

Compliance with this emission limitation shall be demonstrated by the emission factor found in " Compilation of Air Pollutant Emission Factors", Table 3.4-2-1 (10/96) for diesel (0.062 lb PM/mmBtu).

If required by the Ohio EPA, the permittee shall demonstrate compliance with this emissions limitation in accordance with 40 CFR Part 60, Appendix A, Methods 1 through 5 and the procedures specified in OAC rule 3745-17-03(B)(10).

- b. Emission Limitation:

0.5 pound of sulfur dioxide per mmBtu of actual heat input

Applicable Compliance Method:

Compliance shall be based on the records required by Section A.III.3. of this permit. The

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sulfur dioxide emission rate shall be calculated in accordance with the formula specified in OAC rule 3745-18-04(F)(2) as follows:

$$ER = 1 \times 10^6 / H \times D \times S \times 1.974$$

where ER = the emission rate in lbs of sulfur dioxide per mmBtu;

H = the heat content of the liquid fuel in BTU per gallon;

D= the density of the liquid fuel in pounds per gallon; and

S = the decimal fraction of sulfur in the liquid fuel.

c. Emission Limitation:

NOx emissions from this emissions unit shall not exceed 37.54 pounds per hour and 1.6 tons per year of NOx based on a rolling 12- month summation of all 4 emissions units (B008, B010, B015 and B016) combined.

Applicable Compliance Method:

Compliance shall be demonstrated by multiplying the maximum rated heat input of the generator(11.73 mmBtu/hr) by the emission factor from "Compilation of Air Pollutant Emission Factors" (AP-42), Table 3.4-1(10/96) for NOx (3.2 lbs/mmBtu) and the record keeping and monitoring requirements of Section A.III.2 .

If required by the Ohio EPA, the permittee shall demonstrate compliance with this emission limitation in accordance with 40 CFR Part 60, Appendix A Methods 1-4 and Method 7 and the requirements of OAC rule 3745-31-05.

d. Emission Limitation:

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

Applicable Compliance Method:

If required by the Ohio EPA, compliance shall be determined through visible emissions observations performed in accordance with 40 CFR Part 60 Appendix A, Method 9 and the procedures specified in OAC rule 3745-17-03(B)(1).

VI. Miscellaneous Requirements

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PTI A

Issued

Facility ID: 0243160086

Emissions Unit ID: B015

None

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PTI A

Emissions Unit ID: B015

Issued: To be entered upon final issuance

B. State Only Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
B015 - Emergency Generator 4 - 11.73 mmBtu/hr (1676 horsepower and 1250 kW)		

2. Additional Terms and Conditions

None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

VI. Miscellaneous Requirements

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GE Q1

PTI A

Issued: To be entered upon final issuance

Emissions Unit ID: B015

None

Part III - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>
B016 - Emergency Generator 5 - 11.73 mmBtu/hr (1676 horsepower and 1250 kW)	OAC rule 3745-23-06(B)
	OAC rule 3745-17-07(A)
	OAC rule 3745-31-05(A)(3)
	OAC rule 3745-31-05(C)
	OAC rule 3745-17-11(B)(5) (b)
	OAC rule 3745-18-06(G)
	OAC rule 3745-21-08(B)

Applicable Emissions
Limitations/Control
Measures

Oxides of nitrogen (NOx) emissions from this emissions unit shall not exceed 37.54 pounds per hour.

The requirements of this rule also include compliance with OAC rule 3745-31-05(C), 3745-17-07, 3745-17-11, 3745-18-06, 3745-21-08(B), and 3745-23-06.

Combined NOx emissions from emissions units B008, B010, B015 and B016 shall not exceed 1.6 tons per year based on a rolling annual summation.

Particulate emissions from this emissions unit shall not exceed 0.062 lb/mmBtu. (See A.I.2.a below.).

Sulfur dioxide emissions from this generator shall not exceed 0.50 pound of sulfur dioxide per mmBtu of actual heat input.

See A.I.2.b below.

See A.I.2.b below.

Visible particulate emissions

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

2. Additional Terms and Conditions

2.a The emission limitation specified in this rule citation has been revised based upon a change in the applicable emission factor contained in USEPA reference document AP-42, Fifth Edition, Compilation of Air Pollution Emission Factors. The revised rule was adopted by the Director of Ohio EPA in December, 1997. The USEPA has agreed to consider this revised rule as federally enforceable during the time from the effective date of USEPA approval of this limitation as a revision to the Ohio SIP for particulate matter.

2.b The permittee has satisfied the "best available control techniques and operating practices" required pursuant to OAC rule 3745-21-08(B) by committing to comply with the best available technology requirements established in this Permit to Install.

On November 5, 2002, OAC rule 3745-21-08 was revised to delete paragraph (B); therefore, paragraph (B) is no longer part of the State regulations. However, that rule revision has not yet been submitted to the U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). When the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-21-08, the requirement to satisfy the "best available control techniques and operating practices" will no longer exist as part of the federally-approved SIP for Ohio, and this term and condition will no longer be applicable to this emissions unit.

The permittee has satisfied the "latest available control techniques and operating practices" required pursuant to OAC rule 3745-23-06(B) by committing to comply with the best available technology requirements established pursuant to OAC rule 3745-31-05(A)(3) in this Permit to Install.

2.c The diesel fuel oil burned in this unit, shall have a sulfur content which is sufficient to comply with the allowable sulfur dioxide emission limitation of 0.5 pound of sulfur dioxide per mmBtu of actual heat input, on an "as received" basis.

II. Operational Restrictions

1. The permittee shall burn only diesel fuel oil in this emissions unit.
2. The maximum quantity of fuel oil burned in emissions units B008, B010, B015, and B016 (Emergency Diesel Generators 1, 2, 3, 4 and 5) combined shall not exceed 7,299 gallons based on a rolling 12-month summation of fuel usage.
3. In the event of an extended public electric utility service outage (longer than 16 hours total), the

permittee may operate any and all of the emergency generators (B008, B010, B015, and B016) in excess of the diesel fuel oil use limit in section A.II.2, as an emergency provision of this permit. During any time of such operation under this emergency provision, the permittee shall not operate any crucible machines, production lathes, or repair lathes. Regardless of an emergency condition, the permittee shall continue to comply with the facility-wide NOx emission limits in section A.I.

III. Monitoring and/or Recordkeeping Requirements

1. The permittee shall properly install, calibrate, maintain, and operate a diesel fuel flow meter on the diesel fuel tank that supplies emissions units B008, B010, B015 and B016 to allow for accurate determination of the diesel fuel consumption.
2. The permittee shall monitor and record the following information for these emissions units on a monthly basis:
 - a. the total amount of diesel fuel used in gallons per month in emissions units B008, B010, B015 and B016 combined;
 - b. the total amount of NOx emitted per month from emissions units B008, B010, B015, and B016 combined;
 - c. the total amount of diesel fuel used based on a rolling 12 month summation in gallons/year in emissions units B008, B010, B015 and B016 combined;
 - d. the total amount of NOx emitted per year based on a rolling 12 month summation from emissions units B008, B010, B015, and B016 combined.
3. For each shipment of fuel oil received for burning in this emissions unit, the permittee shall maintain records of the total quantity of fuel oil received, the permittee's or fuel oil supplier's analyses for sulfur content and heat content, and the calculated sulfur dioxide emission rate in lb(s) per mmBtu.
4. The permittee shall collect or require the fuel oil supplier to collect a representative grab sample for each shipment of fuel oil that is received for burning in this emissions unit. The permittee shall perform or require the supplier to perform the analyses for sulfur content and heat content in accordance with the following ASTM methods:
 - a. ASTM method D4294, ASTM method D240, or ASTM method 6010 for sulfur content; and
 - b. ASTM method D240 for heat content.

Alternative equivalent methods may be used upon written approval by the Northeast District Office of the Ohio EPA.

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GE Quartz, Inc. - Willoughby Plant

PTI A

Issued

Facility ID: 0243160086

Emissions Unit ID: B016

IV. Reporting Requirements

1. All reports shall be submitted as required in Section A.1.c. of the General Terms and Conditions of this Permit to Install unless otherwise stated.
2. The permittee shall submit quarterly deviation (excursion) reports that identify any record showing an exceedance of the rolling , 12-month limitation for fuel usage in emissions units B008, B010, B015 and B016 combined .
3. The permittee shall submit quarterly deviation (excursion) reports that identify any record (calculation) showing an exceedance of the 0.5 lb sulfur dioxide limit per million BTU of heat input limitation.
4. The permittee shall submit quarterly deviation (excursion) reports that identify each day a fuel other than diesel fuel oil is used in this emissions unit.

V. Testing Requirements

1. Compliance with the emission limitations specified in Section A.I of this permit shall be determined in accordance with the following methods:

- a. Emission Limitation:

0.062 lb/mmBtu particulate emissions

Applicable Compliance Method:

Compliance with this emission limitation shall be demonstrated by the emission factor found in " Compilation of Air Pollutant Emission Factors", Table 3.4-2 (10/96) for diesel (0.062 lb PM/mmBtu).

If required by the Ohio EPA, the permittee shall demonstrate compliance with this emissions limitation in accordance with 40 CFR Part 60, Appendix A, Methods 1 through 5 and the procedures specified in OAC rule 3745-17-03(B)(10).

- b. Emission Limitation:

0.5 pound of sulfur dioxide per mmBtu of actual heat input

Applicable Compliance Method:

Compliance shall be based on the records required by Section A.III.3. of this permit. The sulfur dioxide emission rate shall be calculated in accordance with the formula specified in OAC rule 3745-18-04(F)(2) as follows:

$$ER = 1 \times 10^6 / H \times D \times S \times 1.974$$

where ER = the emission rate in lbs of sulfur dioxide per mmBtu;

H = the heat content of the liquid fuel in BTU per gallon;

D= the density of the liquid fuel in pounds per gallon; and

S = the decimal fraction of sulfur in the liquid fuel.

c. Emission Limitation:

NOx emissions from this emissions unit shall not exceed 37.54 pounds per hour and 1.6 tons per year of NOx based on a rolling annual summation of all 4 emissions units (B008, B010, B015 and B016) combined.

Applicable Compliance Method:

Compliance shall be demonstrated by multiplying the maximum rated heat input of the generator(11.73 mmBtu/hr) by the emission factor from "Compilation of Air Pollutant Emission Factors" (AP-42), Table 3.4-1(10/96) for NOx (3.2 lbs/mmBtu) and the record keeping and monitoring requirements of Section A.III.2 .

If required by the Ohio EPA, the permittee shall demonstrate compliance with this emission limitation in accordance with 40 CFR Part 60, Appendix A Methods 1-4 and Method 7 and the requirements of OAC rule 3745-31-05.

d. Emission Limitation:

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

Applicable Compliance Method:

If required by the Ohio EPA, compliance shall be determined through visible emissions observations performed in accordance with 40 CFR Part 60 Appendix A, Method 9 and the procedures specified in OAC rule 3745-17-03(B)(1).

VI. Miscellaneous Requirements

None

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Emissions Unit ID: B016

Issued: To be entered upon final issuance**B. State Only Enforceable Section****I. Applicable Emissions Limitations and/or Control Requirements**

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
B016 - Emergency Generator 5 - 11.73 mmBtu/hr (1676 horsepower and 1250 kW)		

2. Additional Terms and Conditions

None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

VI. Miscellaneous Requirements

None

Part III - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	OAC rule 3745-17-07(A)
P025 - Large diameter lathe number 16 (natural gas fired) 1.26 MmBtu/hr; H2 pilot	OAC rule 3745-31-05(A)(3)	OAC rule 3745-17-11(B)(1)
		OAC rule 3745-18-06(E)
		OAC rule 3745-21-08
		OAC rule 3745-23-06(B)
	OAC rule 3745-31-05(C)	

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Emissions Unit ID: P025

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Applicable Emissions
Limitations/Control
Measures

not exceed twenty percent opacity, as a six- minute average, except as provided by rule.

NOx emissions shall not exceed 15.23 pounds per hour from this emissions unit. (The 15.23 pounds per hour limitation is the potential to emit for this emissions unit; therefore, monitoring, record keeping, and reporting requirements are not needed for this emission limitation.)

The total particulate emissions from the stack serving this emissions unit, shall not exceed 0.551 pound per hour based on Table I of OAC rule 3745-17-11 (with a maximum process weight rate of 100 pounds per hour).

See A.I.2.a.

See A.I.2.b.

See A.I.2.b

The total particulate emissions from the stack serving this emissions unit, shall not exceed 2.4 tons per year.

The requirements of this rule also include compliance with the requirements of OAC rules 3745-17-07(A), 3745-17-11(B), 3745-18-06, 3745-21-08, and 3745-23-06(B).

NOx emissions shall not exceed 194.1 TPY based on rolling 12-month summations for all production, repair and bench lathes (emissions units P025 and P032-P043), combined.

Visible particulate emissions from the stack associated with this emissions unit shall

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2. Additional Terms and Conditions

- 2.a** Because the process weight rate for this individual lathe is less than 1000 lbs per hour, this emissions unit is exempt from the requirements of this rule.
- 2.b** The permittee has satisfied the "best available control techniques and operating practices" required pursuant to OAC rule 3745-21-08(B) by committing to comply with the best available technology requirements established in this permit to install.

On November 5, 2002, OAC rule 3745-21-08 was revised to delete paragraph (B); therefore, paragraph (B) is no longer part of the State regulations. However, that rule revision has not yet been submitted to the U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). When the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-21-08, the requirement to satisfy the "best available control techniques and operating practices" will no longer exist as part of the federally-approved SIP for Ohio, and this term and condition will no longer be applicable to this emissions unit.

The permittee has satisfied the "latest available control techniques and operating practices" required pursuant to OAC rule 3745-23-06(B) by committing to comply with the best available technology requirements established pursuant to OAC rule 3745-31-05(A)(3) in this permit to install.

- 2.c** The permittee operates a ventilation system intended to vent all emissions from this emissions unit to the stack. However, it is understood that a small fraction of the NOx formed may not be captured and vented to the stack. The permittee assessed the capture efficiency of the capture hoods and ventilation system on the lathes at the GE Quartz Newark Plant, which is similar to the operation at the Willoughby plant*. NOx was measured on March 11, 1999 at the general ventilation exhaust vents for the room containing the lathes. The NOx emissions from the room vents were compared to the calculated NOx stack emissions for the lathes that were operating on March 11, 1999 (based on representative emission rates from stack testing of the lathes in 1998). The room vent emissions were a

Emissions Unit ID: P025

very small fraction, 0.21 percent, of the stack emissions. Therefore, the emission factors for the lathes that are based on the 1998 stack tests have been increased by 0.21 percent to account for the small amount of NO_x that may not be captured by the local ventilation system and may be emitted through other room vents.

* The results of this evaluation are described in the report "Emissions Capture Efficiency Assessment for Quartz Crucible Machines and LD Lathes" prepared by Parsons Engineering Science, Inc. (June 1999) submitted to GE Quartz, Inc. Newark Quartz Plant. This report was sent to Ohio EPA on June 9, 1999.

2.d All particulate emissions from this emissions unit shall be vented to the stack.

2.e This emissions unit is capable of burning only natural gas and hydrogen.

II Operational Restrictions

- The maximum annual fuel usage for this emissions unit and all the production lathes (emissions units P025 and P032-P042), combined, shall not exceed 30.29 million standard cubic feet of natural gas based on rolling, 12-month summations.
- To ensure enforceability during the first twelve (12) months of operation following the effective date of this Permit to Install, the permittee shall not exceed the following natural gas usage levels for all 12 production lathes (emissions units P025 and P032-P042):

MONTH(S) FOLLOWING PTI EFFECTIVE DATE	MAXIMUM ALLOWABLE CUMULATIVE FUEL USAGE (mmscf) (natural gas)
1-1	10.0
1-2	11.8
1-3	13.6
1-4	15.5
1-5	17.3
1-6	19.1
1-7	21.0
1-8	22.8
1-9	24.6
1-10	26.5
1-11	28.4
1-12	30.29

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After the first 12 calendar months of operation following the effective date of this Permit to Install, the permittee shall comply with the annual natural gas usage limitations based on rolling, 12-month summations.

III Monitoring and/or Recordkeeping

1. The permittee shall perform daily checks, when this 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. the total duration of any visible emission incident; and
 - c. any corrective actions taken to eliminate the visible emissions.

The permittee may reduce the frequency of visual observations for this emissions unit from daily to weekly readings if the following conditions are met:

- d. for 30 days this emissions unit's visual observations indicate no visible emissions; and
 - e. the permittee continues to comply with all the record keeping requirements specified in section A.III.1.
- The permittee shall revert to daily readings for this emissions unit if any visible emissions are observed. The permittee may again reduce the frequency of visual observations from daily to weekly after obtaining 30 consecutive days of observations with no visible emissions for this emissions unit.
2. The permittee shall maintain monthly records of the following information for emissions units P025 and P032-P042, combined:
 - a. the total natural gas usage;
 - b. the rolling, 12-month natural gas usage;
 - c. the rolling, 12-month NO_x emissions.

Also, during the first 12 calendar months of operation, after the effective date of this Permit to Install, the permittee shall record the cumulative natural gas usage, for all production lathes (emissions units P025 and P032-P042), combined.

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Total NO_x monthly emissions, in tons, resulting from the natural gas usage in all production lathes (emissions units P025 and P032-P042), combined, shall be calculated using the following equation:

$$\text{NO}_x, \text{ in tons} = \frac{\text{total natural gas usage (mmscf/month)} \times 12.09 \text{ lbs/mmBtu}}{1050 \text{ mmBtu/mmscf} \times 1 \text{ ton/2000 lbs}}$$

The emission factor for NO_x is based on a 1998 stack test and equals 12.09 lbs/mmBtu. Including fugitive emissions not captured by local exhaust ventilation (see explanation in A.I.2.c). The natural gas usage is for emissions units P025 and P032 through P042, combined. The heat content of natural gas = 1050 mmBtu/mmscf.

Monthly results shall be summed to obtain the annual and rolling NO_x emissions.

IV Reporting Requirements

1. The permittee shall submit semiannual written reports that:
 - a. identify all days during which any visible particulate emissions were observed from the stack serving this emissions unit; and
 - b. describe any corrective actions taken to eliminate the visible particulate emissions.

These reports shall be submitted to the Northeast District Office of the Ohio EPA by January 31 and July 31 of each year and shall cover the previous 6-month period.
2. The permittee shall submit quarterly deviation (excursion) reports that identify all exceedances of the following:
 - a. after the first twelve calendar months of operation following the effective date of this Permit to Install, the rolling, 12-month limitations for natural gas fuel usage for all production lathes (emissions units P025 and P032-P042), combined; and
 - b. for the first 12 calendar months of operation following the effective date of this Permit to Install, the monthly allowable cumulative fuel usage for natural gas for all production lathes (emissions units P025 and P032-P042), combined.
3. The permittee shall submit annual reports that specify the total amount of natural gas used and the total amount of NO_x emitted from emissions units P025 and P032-P042, combined for the previous calendar year by April 15 of the following year.

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V Testing Requirements

1. Compliance with the emission limitations in Section A.I.1. of these terms and conditions shall be determined in accordance with the following methods:

- a. Emission Limitation

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

Applicable Compliance Method

If required by the Ohio EPA, compliance shall be determined by Method 9, Visible Determination of the Opacity of Emissions from Stationary Sources, 40 CFR Part 60, Appendix A, as specified in OAC rule 3745-17-03(B)(1).

- b. Emission Limitation

0.551 pound per hour and 2.4 tons per year of particulate emissions

Applicable Compliance Method

If required by the Ohio EPA, compliance with the hourly particulate emission limit above shall be determined in accordance with OAC rule 3745-17-03 and Method 5 of 40 CFR Part 60, Appendix A.

Because the annual particulate limit was established by multiplying the short-term limit of 0.551 lb/hr by 8,760 hours of operation per year and dividing by 2000 lbs/ton, compliance with the annual limit is assumed provided that compliance with the hourly limit is maintained.

- c. Emission Limitation

NO_x emissions shall not exceed 15.23 pounds per hour from this emissions unit, and 194.1 TPY, based on rolling 12-month summations from all production, repair and bench lathes, emissions units P025, P032-P043 combined.

Applicable Compliance Method

If required by the Ohio EPA, compliance with the hourly NO_x emission limitation above,

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shall be determined by using Method 7 of 40 CFR Part 60, Appendix A.

Compliance with the rolling, 12-month NO_x emission limitation shall be determined using the equations and record keeping in Section A.III.2. and summing the 12-month rolling NO_x emissions from emissions units P025, P032-P043.

2. Emissions units P025, P032, P033, P034, P035, and P036 are essentially identical and may be used interchangeably. The permittee shall conduct, or have conducted, emission testing of the mass

Emissions Unit ID: P025

emission rates for particulate emissions and NO_x for one of these 6 emissions units in accordance with the following:

- a. The initial emission testing for NO_x and particulate emissions shall be conducted within 12 months after the effective date of this Permit to Install.

The permittee has demonstrated that all 6 production lathes rated at 1.26 mmBtu/hr (emissions units P025, and P032-P036) are essentially identical in operation, size and capacity, configuration and product line ; therefore; the Ohio EPA is allowing the permittee to test one representative unit, at or near maximum capacity, to demonstrate compliance for each of these 6 emissions units..

- b. The emission testing shall be conducted to determine compliance with the allowable emission rates for particulate emissions and NO_x.
- c. The following test methods from 40 CFR Part 60, Appendix A, shall be employed to determine compliance with the allowable emission rates for particulate and NO_x respectively:

Method 5 " Determination of Particulate Emissions from Stationary Sources" and Method 7 "Determination of Nitrogen Oxide Emissions from Stationary Sources and the requirements of OAC rule 3745-31-05.

- d. The tests shall be conducted while the emissions unit is operating at or near its maximum capacity, unless otherwise specified by the Northeast District of the Ohio EPA.

Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Ohio EPA Northeast District Office and the Lake County General Health District. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person(s) who will be conducting the tests.

Failure to submit such notification for review and approval prior to the tests may result in the Ohio EPA Northeast District Office's refusal to accept the results of the emissions tests.

Personnel from the Ohio EPA Northeast District Office and/or Lake County General Health District shall be permitted to witness the tests, 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.

A comprehensive written report of the results of the emissions tests shall be signed by the person or persons responsible for the tests and submitted to the Northeast District Office of the Ohio EPA within 30 days following completion of the tests. The permittee may request additional time for the submittal of the written report, where warranted, with prior approval from the Northeast

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District Office of the Ohio EPA.

VI Miscellaneous Requirements

None

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Issued: To be entered upon final issuance**B. State Only Enforceable Section****I. Applicable Emissions Limitations and/or Control Requirements**

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
P025 - Large diameter lathe number 16 (natural gas fired) 1.26 MmBtu/hr; H2 pilot	None	None

2. Additional Terms and Conditions

None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

VI. Miscellaneous Requirements

None

Part III - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	
P026 - Electric Crucible machine # 6, equipped with a primary dust collector, and sand feed systems, equipped with a primary dust collector, a secondary dust collector, including vacuum pumps, each with a mist eliminator, and the blockhouse vent.	OAC rule 3745-31-05(A)(3)	OAC rule 3745-31-05(C)
		OAC rule 3745-17-07(A)
		OAC rule 3745-17-07(B)
		OAC rule 3745-17-08(B)
		OAC rule 3745-17-11(B)(1)

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	<p style="text-align: center;"><u>Applicable Emissions Limitations/Control Measures</u></p>	
<p>OAC rule 3745-21-08</p>	<p>Nitrogen oxides (NOx) emissions from this emissions unit shall not exceed 19.48 pounds per hour. (The 19.48 pounds per hour limitation is the potential to emit for this emissions unit; therefore, monitoring, record keeping, and reporting requirements are not needed for this emission limitation.) See A.I.2.d. and A.I.2.e.</p>	<p>emissions units P026 and P031, shall not exceed 31.8 tons per rolling, 12-month period. (See A.I.2.e.)</p>
<p>OAC rule 3745-23-06(B)</p>	<p>The total particulate emissions from this emissions unit (P026) alone, that are released through stacks serving this emissions unit, shall not exceed 7.1 tons per year.</p>	<p>Visible particulate emissions from each uncontrolled stack serving this emissions unit, shall not exceed twenty percent opacity, as a six-minute average, except as provided by rule.</p>
	<p>There shall be no visible fugitive particulate emissions from this emissions unit .</p>	<p>In accordance with paragraph (B)(11)(e) of OAC rule 3745-17-07, the requirements of OAC rule 3745-17-07(B) shall not apply to this emissions unit.</p>
	<p>There shall be no visible emissions from the exhausts from the fabric filter dust collectors.</p>	<p>See A.I.2.c.</p>
	<p>Best available control measures that are sufficient to eliminate visible emissions of fugitive dust shall be employed for this emissions unit. (See A.I.2.a.)</p>	<p>The total particulate emissions from this emissions unit, from the stacks serving this emissions unit, shall not exceed 1.62 pounds per hour based on Table I of OAC rule 3745-17-11(with a maximum process weight rate of 500 pounds per hour). See Section A.I.2.f.</p>
	<p>The requirements of this rule also include compliance with the requirements of OAC rules 3745-17-07(A), 3745-17-11(B), 3745-21-08, and 3745-23-06(B).</p>	<p>See A.I.2.b</p>
	<p>The combined NOx emissions from</p>	<p>See A.I.2.b.</p>

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2. Additional Terms and Conditions

- 2.a** The permittee shall eliminate visible emissions of fugitive dust through the employment of best available control measures. These measures shall include, but not be limited to, the following:
- i. the use of adequate hooding or equivalent capture devices for the crucible filling, arc fusion, crucible cooling operations, and for the sand storage and transfer equipment; and

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- ii. all fugitive dust captured shall be vented to the dust collectors.

By employing best available control measures, visible emissions of fugitive dust from any non-stack egress points from the building shall be eliminated.

- 2.b** The permittee has satisfied the "best available control techniques and operating practices" required pursuant to OAC rule 3745-21-08(B) by committing to comply with the best available technology requirements established in this Permit to Install.

On November 5, 2002, OAC rule 3745-21-08 was revised to delete paragraph (B); therefore, paragraph (B) is no longer part of the State regulations. However, that rule revision has not yet been submitted to the U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). When the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-21-08, the requirement to satisfy the "best available control techniques and operating practices" will no longer exist as part of the federally-approved SIP for Ohio, and this term and condition will no longer be applicable to this emissions unit.

The permittee has satisfied the "latest available control techniques and operating practices" required pursuant to OAC rule 3745-23-06(B) by committing to comply with the best available technology requirements established pursuant to OAC rule 3745-31-05(A)(3) in this Permit to Install.

- 2.c** This facility is not located in an Appendix A area; therefore, in accordance with OAC rule 3745-17-08(A)(1), OAC rule 3745-17-08(B) is not applicable to this emissions unit.

- 2.d** The permittee conducts the NO_x-emitting step of this process within an enclosure and operates a ventilation system intended to vent all emissions from this enclosure to the enclosure exhaust stack. The permittee determined that a similar enclosure at the GE Quartz Newark Plant meets the requirements for a Permanent Total Enclosure as defined in 40 CFR, Part 51, Appendix M, Method 204*. However, it is understood that a small fraction of the NO_x formed (not quantified) may not be captured and vented to the enclosure stack at the end of the process step when doors to the enclosure are opened.

* The results of this evaluation are described in the report "Emissions Capture Efficiency Assessment for Quartz Crucible Machines and LD Lathes" prepared by Parsons Engineering Science, Inc. (June 1999) submitted to GE Quartz, Inc. Newark Quartz Plant. This report was sent to Ohio EPA on June 9, 1999. The NO_x emissions from the cooling of the crucible machines shall be vented to the stack.

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- 2.e** The maximum rate of NO_x emissions from CM6 and CM7 (P026 and P031) combined shall not exceed 31.8 tons per year, based on rolling, 12-month summations of the monthly emissions.

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The production rate of variable size crucibles, for both crucible machines numbers 6 and 7, combined (emissions units P026 and P031), shall be restricted such that the sum of the emissions from the production of all sizes of crucibles is less than the allowable NOx emission rate. The emission rate for each size of crucible shall be based on the following equation:

[number of crucibles produced of a particular size] x [the emission factor for that size from the most recent stack test] = NOx emissions

The following NOx emission factors are from the stack testing performed in March of 1998 at the GE Newark facility.

12 inch crucibles(510/520)	0.63	pound/crucible
12 inch crucibles(530)	0.98	pound/crucible
14 inch crucibles(510/520)	1.65	pounds/crucible
14 inch crucibles(530)	2.19	pounds/crucible
16 inch crucibles(510/520)	2.57	pounds/crucible
16 inch crucibles(530)	2.12	pounds/crucible
18 inch crucibles	2.85	pounds/crucible

To ensure enforceability of this provision during the first twelve (12) months of operation following the effective date of this Permit to Install, the permittee shall not exceed the following cumulative NOx emission limitations:

CALENDAR MONTH(S) FOLLOWING PTI EFFECTIVE DATE	TOTAL ALLOWABLE, CUMULATIVE NOx EMISSIONS (TPY) (P026 & P031, combined)
1-1	10.0
1-2	12.0
1-3	14.0
1-4	16.0
1-5	18.0
1-6	20.0
1-7	22.0
1-8	24.0
1-9	26.0
1-10	28.0
1-11	30.0
1-12	31.8

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After the first twelve calendar months of operation following the effective date of this Permit to Install, compliance with the NO_x combined emissions limitation of 31.8 tons per year, shall be based upon rolling, twelve-month summations of the NO_x emission rates.

- 2.f** The maximum rate of particulate emissions (PE) shall not exceed 1.62 pounds per hour, based on daily emissions and operating hours.

The production rate of the crucibles shall be restricted such that total emissions from all emission points are no greater than the allowable particulate emission rate. For emissions from the blockhouse stack (F), the emission rate for each size of crucible shall be based on the following equation:

[number of crucibles produced of a particular size] x [the emission factor for that size from the most recent stack test] = PE

The following particulate emission factors are from the stack testing performed in May of 1998 at the GE Newark facility:

12 inch and 14 inch crucibles: all types	0.171 pound/crucible
16 inch crucibles: all types	0.232 pound/crucible
18 inch crucibles	0.366 pound/crucible

PE from the other stacks for this emissions unit shall be assumed equal to the maximum emissions, based on the application for this Permit to Install, and as shown in Section V.1.c of these terms and conditions.

II Operational Restrictions

- The permittee shall produce only one size (diameter) of crucible each hour. Changeover from production of crucibles of one size to a different size shall be conducted such that production of the second size crucible begins in a different hour than production of the first size ended.
- Crucible production may be calculated on a daily average basis based on daily production and operating hours, however, crucible production for each hour from this emissions unit shall not exceed the following:

<u>Crucible Size</u>	<u>Maximum Production</u> (crucibles/hour)
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12 inch and 14 inch crucibles: all types	8.5 *
--	-------

16 inch crucibles: all types	6.5*
18 inch crucibles	4

* Production of a crucible may begin in one hour and end in the next hour.

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III Monitoring and/or Recordkeeping

1. The permittee shall perform daily checks, when this emissions unit is in operation and when the weather conditions allow, for any visible particulate emissions from the stacks serving this emissions unit and for any visible fugitive particulate emissions from the building egress points (i.e., building windows, doors, roof monitors, etc.) 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. the total duration of any visible emission incident; and
 - c. any corrective actions taken to eliminate the visible emissions.

The permittee may reduce the frequency of visual observations for this emissions unit from daily to weekly readings if the following conditions are met:

- a. for 30 days this emissions unit's visual observations indicate no visible emissions; and
- b. the permittee continues to comply with all the record keeping requirements specified in section A.III.2.

The permittee shall revert to daily readings for this emissions unit if any visible emissions are observed. The permittee may again reduce the frequency of visual observations from daily to weekly after obtaining 30 days of observations with no visible emissions for this emissions unit.

3. The permittee shall maintain monthly records of the following information for emissions units P026 and P031:
 - a. the number of crucibles of each size produced;
 - b. the NO_x emission factor for each size of crucible produced;
 - c. the total NO_x emissions from all crucibles produced, in pounds and tons;
 - d. during the first 12 calendar months of operation following the effective date of this Permit to Install, the cumulative NO_x emissions, in tons; and

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- e. beginning after the first 12 calendar months of operation following the effective date of this Permit to Install, the rolling, 12-month summation of the NO_x emissions, in tons.
4. The permittee shall maintain daily records of the following information for this emissions unit:
 - a. the number of crucibles of each size produced;
 - b. the hours of operation; and
 - c. the average hourly particulate emission rate, in pounds per hour.

IV Reporting Requirements

1. The permittee shall submit semiannual written reports that:
 - a. identify all days during which any visible fugitive particulate emissions were observed from the egress points (i.e., building windows, doors, roof monitors, etc.) serving this emissions unit; and
 - b. describe any corrective actions taken to eliminate the visible fugitive particulate emissions.

These reports shall be submitted to the Northeast District Office of the Ohio EPA by January 31 and July 31 of each year and shall cover the previous 6-month period.

2. The permittee shall submit semiannual written reports that:
 - a. identify all days during which any visible particulate emissions were observed from the stacks serving this emissions unit; and
 - b. describe any corrective actions taken to eliminate the visible particulate emissions.

These reports shall be submitted to the Northeast District Office of the Ohio EPA by January 31 and July 31 of each year and shall cover the previous 6-month period.

3. The permittee shall submit quarterly deviation (excursion) reports that identify all exceedances of the following:
 - a. for the first 12 calendar months of operation following the effective date of this Permit to Install, the allowable, monthly, cumulative NO_x emission limitation for emissions units P026 and P031, combined; and

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- b. after the first 12 calendar months of operation following the effective date of this Permit to Install, the rolling, 12-month NOx emission limitation for emissions units P026 and P031, combined.
4. The permittee shall submit annual reports that summarize the total annual emissions of NOx emitted from this emissions unit.

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These reports shall be submitted to the Northeast District Office of the Ohio EPA by April 15 of each year and shall cover the previous calendar year.

5. The permittee shall submit quarterly deviation (excursion) reports that identify any exceedances of the hourly particulate emission limitation, through emission testing or calculated on a daily average basis.

V Testing Requirements

1. Compliance with the emissions limitations in Section A.I.1. of these terms and conditions shall be determined in accordance with the following methods:

- a. Emission Limitation

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

Applicable Compliance Method

If required by the Ohio EPA, compliance shall be determined by Method 9, Visible Determination of the Opacity of Emissions from Stationary Sources, 40 CFR Part 60, Appendix A, as specified in OAC rule 3745-17-03(B)(1).

- b. Emission Limitation

There shall be no visible fugitive particulate emissions from this emissions unit .

Applicable Compliance Method

If required by the Ohio EPA, compliance with the above visible emission limitation shall be determined using Method 22 of 40 CFR, Part 60, Appendix A.

- c. Emission Limitation

The total particulate emissions from this emissions unit, from the stacks serving this emissions unit, shall not exceed 1.62 pounds per hour based on Table I of OAC rule 3745-17-11 and a maximum process weight (PWR) of 500 pounds per hour, and 7.1 tons per year particulate emissions.

Applicable Compliance Method

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Compliance with the particulate limits above, shall be determined in accordance with the following:

If required by the Ohio EPA, emission testing shall be performed for each stack and fabric filter dust collector outlet to demonstrate compliance with the allowable hourly mass emission rate.

The following test method(s) and procedures shall be employed to determine compliance with the allowable mass emission rate:

Methods 1-5 of 40 CFR Part 60, Appendix A.

Performance testing shall be conducted in accordance with OAC rule 3745-17-03(B)(10).

Because the allowable annual mass emission rate was established by multiplying the short-term limit of 1.62 lbs per hour of particulate emissions by 8760 hours of operation per year and dividing by 2000 lbs/ton, compliance with the annual limit is assumed providing that compliance with the short-term limit is maintained.

In addition, compliance with the hourly PE limitation may be determined as follows:

pounds per hour PE = L + F + C + V

where:

L = the maximum emissions, in pound per hour, from sand loading into crucible pots
 = 498 lbs/hr x 0.116 lb/ton x 0.01 x 1 ton/2000 lbs

F = emissions, in pound per hour, from crucible forming through electric arc fusion,
 based on the record keeping in section A.III.3 and the following formula:

[number of crucibles produced of a particular size] x [the emission factor for that size
 from the most recent stack test]

C = the maximum emissions, in pound per hour, from crucible cooling after fusion
 = 498 lbs/hr x 0.116 lb/ton x 0.01 x 1 ton/2000 lbs

V = the maximum emissions, in pound per hour, from vacuum pumps
 = 2 x 0.05 lb/hr

The emission factor of 0.116 lb/ton for sand transfer was derived based on information provided in AP-42, 5th edition, Volume I, Chapter 11, Mineral Products Industry, Table 11.12-2, January 1995.

d. Emission Limitation

The allowable hourly NO_x emission rate is 19.48 pounds per hour.

Applicable Compliance Method

Compliance with the hourly emission rate shall be demonstrated by the record keeping in A.III.4. and by emission testing using the following test methods:

Methods 1-4 and 7 of 40 CFR Part 60, Appendix A "Determination of Nitrogen Oxides Emissions from Stationary Sources".

e. Emission Limitation

NO_x emissions from CM6 and CM7 (P026 and P031) combined shall not exceed 31.8 tons per year, based on rolling, 12-month summations of the monthly emissions.

Applicable Compliance Method

Compliance with the above limitation shall be demonstrated by the record keeping in section A.III.2 of these terms and conditions.

Compliance with the rolling, 12-month NO_x emission limitation shall be determined in accordance with the equation in section A.I.2.e. and record keeping in section A.III.2 of these terms and conditions and results summed with the rolling, 12-month NO_x emissions from P031.

The permittee shall calculate the rolling, 12-month NO_x emissions in accordance with the equation specified in section A.III.2 of these terms and conditions.

2.a Emission Testing Requirements

The permittee shall conduct, or have conducted, emission testing for this emissions unit in accordance with the following requirements:

- i. The initial emission testing shall be conducted within 12 months after the effective date of this Permit to Install.
- ii. The emission testing shall be conducted for each uncontrolled stack, and shall be conducted to demonstrate compliance with the allowable hourly mass emission rate for

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particulate emissions, the allowable hourly mass emission rate for NOx emissions, where NOx is or could be emitted, and to determine the NOx emission factors for crucible production. For the purposes of emission testing, the blockhouse stack and vacuum pumps emissions shall be determined and included in the compliance determination.

- iii. The following test method(s) and procedures shall be employed to determine compliance with the allowable mass emission rates for particulate emissions and NOx and to determine emission factors for NOx:

Methods 1-5 and 7 of 40 CFR Part 60, Appendix A.

- iv. The test shall be conducted while the emissions unit is operating at or near its maximum capacity unless otherwise specified or approved by the Northeast District Office of the Ohio EPA.

- 2.b Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Northeast District Office of the Ohio EPA and Lake County General Health District. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person(s) who will be conducting the test(s).

Failure to submit such notification for review and approval prior to the test(s) may result in the Ohio EPA Northeast District Office's refusal to accept the results of the emission test(s).

- 2.c Personnel from the Northeast District Office of the Ohio EPA and local air agency shall be permitted to witness the test(s), 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.
- 2.d 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 Northeast District Office of the Ohio EPA 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 Northeast District Office of the Ohio EPA.

VI Miscellaneous Requirements

None

B. State Only Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
P026 - Electric Crucible machine # 6, equipped with a primary dust collector, and sand feed systems, equipped with a primary dust collector, a secondary dust collector, including vacuum pumps, each with a mist eliminator, and the blockhouse vent.	None	None

2. Additional Terms and Conditions

None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

V. Testing Requirements

None

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VI. Miscellaneous Requirements

None

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Part III - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>
P031 - Electric Crucible machine # 7, equipped with a primary dust collector, and sand feed systems, equipped with a primary dust collector, a secondary dust collector, including vacuum pumps, each with a mist eliminator, and the blockhouse vent.	OAC rule 3745-31-05(A)(3) OAC rule 3745-31-05(C) OAC rule 3745-17-07(A) OAC rule 3745-17-07(B) OAC rule 3745-17-08(B)

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OAC rule 3745-17-11(B)(1)	Applicable Emissions <u>Limitations/Control Measures</u>	The combined NOx emissions from emissions units P026 and P031, shall not exceed 31.8 tons per rolling, 12-month period. (See A.I.2.e.)
OAC rule 3745-21-08	Nitrogen oxides (NOx) emissions from this emissions unit shall not exceed 19.48 pounds per hour. (The 19.48 pounds per hour limitation is the potential to emit for this emissions unit; therefore, monitoring, record keeping, and reporting requirements are not needed for this emission limitation.)	Visible particulate emissions from each uncontrolled stack serving this emissions unit, shall not exceed twenty percent opacity, as a six-minute average, except as provided by rule.
OAC rule 3745-23-06(B)	See A.I.2.d. and A.I.2.e.	In accordance with paragraph (B)(11)(e) of OAC rule 3745-17-07, the requirements of OAC rule 3745-17-07(B) shall not apply to this emissions unit.
	The total particulate emissions from this emissions unit (P031) alone, that are released through stacks serving this emissions unit, shall not exceed 7.1 tons per year.	See A.I.2.c.
	There shall be no visible fugitive particulate emissions from this emissions unit .	The total particulate emissions from this emissions unit, from the stacks serving this emissions unit, shall not exceed 1.62 pounds per hour based on Table I of OAC rule 3745-17-11(with a maximum process weight rate of 500 pounds per hour). See Section A.I.2.f.
	There shall be no visible emissions from the exhausts from the fabric filter dust collectors.	See A.I.2.b
	Best available control measures that are sufficient to eliminate visible emissions of fugitive dust shall be employed for this emissions unit. (See A.I.2.a.)	See A.I.2.b.
	The requirements of this rule also include compliance with the requirements of OAC rules 3745-17-07(A), 3745-17-11(B), 3745-21-08, and 3745-23-06(B).	

2. Additional Terms and Conditions

2.a The permittee shall eliminate visible emissions of fugitive dust through the employment of best available control measures. These measures shall include, but not be limited to, the following:

- i. the use of adequate hooding or equivalent capture devices for the crucible filling, arc fusion, crucible cooling operations, and for the sand storage and transfer equipment; and
- ii. all fugitive dust captured shall be vented to the dust collectors.

By employing best available control measures, visible emissions of fugitive dust from any non-stack egress points from the building shall be eliminated.

2.b The permittee has satisfied the "best available control techniques and operating practices" required pursuant to OAC rule 3745-21-08(B) by committing to comply with the best available technology requirements established in this Permit to Install.

On November 5, 2002, OAC rule 3745-21-08 was revised to delete paragraph (B); therefore, paragraph (B) is no longer part of the State regulations. However, that rule revision has not yet been submitted to the U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). When the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-21-08, the requirement to satisfy the "best available control techniques and operating practices" will no longer exist as part of the federally-approved SIP for Ohio, and this term and condition will no longer be applicable to this emissions unit.

The permittee has satisfied the "latest available control techniques and operating practices" required pursuant to OAC rule 3745-23-06(B) by committing to comply with the best available technology requirements established pursuant to OAC rule 3745-31-05(A)(3) in this Permit to Install.

2.c This facility is not located in an Appendix A area; therefore, in accordance with OAC rule 3745-17-08(A)(1), OAC rule 3745-17-08(B) is not applicable to this emissions unit.

2.d The permittee conducts the NO_x-emitting step of this process within an enclosure and operates a ventilation system intended to vent all emissions from this enclosure to the enclosure exhaust stack. The permittee determined that a similar enclosure at the GE Quartz Newark Plant meets the requirements for a Permanent Total Enclosure as defined in 40 CFR, Part 51, Appendix M, Method 204*. However, it is understood that a small fraction of the NO_x formed (not quantified) may not be captured and vented to the enclosure stack at the end of the process step when doors to the enclosure are opened.

* The results of this evaluation are described in the report "Emissions Capture Efficiency

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Assessment for Quartz Crucible Machines and LD Lathes" prepared by Parsons Engineering Science, Inc. (June 1999) submitted to GE Quartz, Inc. Newark Quartz Plant. This report was sent to Ohio EPA on June 9, 1999. The NOx emissions from the cooling of the crucible machines shall be vented to the stack.

- 2.e** The maximum rate of NOx emissions from CM6 and CM7 (P026 and P031) combined shall not exceed 31.8 tons per year, based on rolling, 12-month summations of the monthly emissions.

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The production rate of variable size crucibles, for both crucible machines numbers 6 and 7, combined (emissions units P026 and P031), shall be restricted such that the sum of the emissions from the production of all sizes of crucibles is less than the allowable NOx emission rate. The emission rate for each size of crucible shall be based on the following equation:

[number of crucibles produced of a particular size] x [the emission factor for that size from the most recent stack test] = NOx emissions

The following NOx emission factors are from the stack testing performed in March of 1998 at the GE Newark facility:

12 inch crucibles(510/520)	0.63	pound/crucible
12 inch crucibles(530)	0.98	pound/crucible
14 inch crucibles(510/520)	1.65	pounds/crucible
14 inch crucibles(530)	2.19	pounds/crucible
16 inch crucibles(510/520)	2.57	pounds/crucible
16 inch crucibles(530)	2.12	pounds/crucible
18 inch crucibles	2.85	pounds/crucible

To ensure enforceability of this provision during the first twelve (12) months of operation following the effective date of this Permit to Install, the permittee shall not exceed the following cumulative NOx emission limitations:

CALENDAR MONTH(S) FOLLOWING PTI EFFECTIVE DATE	TOTAL ALLOWABLE, CUMULATIVE NOx EMISSIONS (TPY) (P026 & P031, combined)
1-1	10.0
1-2	12.0
1-3	14.0
1-4	16.0
1-5	18.0
1-6	20.0
1-7	22.0
1-8	24.0
1-9	26.0
1-10	28.0
1-11	30.0
1-12	31.8

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After the first twelve calendar months of operation following the effective date of this Permit to Install, compliance with the NOx combined emissions limitation of 31.8 tons per year, shall be based upon rolling, twelve-month summations of the NOx emission rates.

- 2.f** The maximum rate of particulate emissions (PE) shall not exceed 1.62 pounds per hour, based on daily emissions and operating hours.

The production rate of the crucibles shall be restricted such that total emissions from all emission points are no greater than the allowable particulate emission rate. For emissions from the blockhouse stack (F), the emission rate for each size of crucible shall be based on the following equation:

$$[\text{number of crucibles produced of a particular size}] \times [\text{the emission factor for that size from the most recent stack test}] = \text{PE}$$

The following particulate emission factors are from the stack tests performed in May of 1998 at the Newark facility:

12 inch and 14 inch crucibles: all types	0.171 pound/crucible
16 inch crucibles: all types	0.232 pound/crucible
18 inch crucibles	0.366 pound/crucible

PE from the other stacks for this emissions unit shall be assumed equal to the maximum emissions, based on the application for this Permit to Install, and as shown in Section V.1.c of these terms and conditions.

II Operational Restrictions

1. The permittee shall produce only one size (diameter) of crucible each hour. Changeover from production of crucibles of one size to a different size shall be conducted such that production of the second size crucible begins in a different hour than production of the first size ended.
2. Crucible production may be calculated on a daily average basis based on daily production and operating hours, however, crucible production for each hour from this emissions unit shall not exceed the following:

<u>Crucible Size</u>	<u>Maximum Production</u> (crucibles/hour)
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12 inch and 14 inch crucibles: all types	8.5 *
16 inch crucibles: all types	6.5*
18 inch crucibles	4

* Production of a crucible may begin in one hour and end in the next hour.

III Monitoring and/or Recordkeeping

1. The permittee shall perform daily checks, when this emissions unit is in operation and when the weather conditions allow, for any visible particulate emissions from the stacks serving this emissions unit and for any visible fugitive particulate emissions from the building egress points (i.e., building windows, doors, roof monitors, etc.) 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. the total duration of any visible emission incident; and
 - c. any corrective actions taken to eliminate the visible emissions.

The permittee may reduce the frequency of visual observations for this emissions unit from daily to weekly readings if the following conditions are met:

- a. for 30 days this emissions unit's visual observations indicate no visible emissions; and
- b. the permittee continues to comply with all the record keeping requirements specified in section A.III.2.

The permittee shall revert to daily readings for this emissions unit if any visible emissions are observed. The permittee may again reduce the frequency of visual observations from daily to weekly after obtaining 30 days of observations with no visible emissions for this emissions unit.

2. The permittee shall maintain monthly records of the following information for emissions units P026 and P031:
 - a. the number of crucibles of each size produced;
 - b. the NO_x emission factor for each size of crucible produced;
 - c. the total NO_x emissions from all crucibles produced, in pounds and tons;
 - d. during the first 12 calendar months of operation following the effective date of this Permit to Install, the cumulative NO_x emissions, in tons; and

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- e. beginning after the first 12 calendar months of operation following the effective date of this Permit to Install, the rolling, 12-month summation of the NOx emissions, in tons.

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3. The permittee shall maintain daily records of the following information for this emissions unit:
 - a. the number of crucibles of each size produced;
 - b. the hours of operation; and
 - c. the average hourly particulate emission rate, in pounds per hour.

IV Reporting Requirements

1. The permittee shall submit semiannual written reports that:
 - a. identify all days during which any visible fugitive particulate emissions were observed from the egress points (i.e., building windows, doors, roof monitors, etc.) serving this emissions unit; and
 - b. describe any corrective actions taken to eliminate the visible fugitive particulate emissions.

These reports shall be submitted to the Northeast District Office of the Ohio EPA by January 31 and July 31 of each year and shall cover the previous 6-month period.

2. The permittee shall submit semiannual written reports that:
 - a. identify all days during which any visible particulate emissions were observed from the stacks serving this emissions unit; and
 - b. describe any corrective actions taken to eliminate the visible particulate emissions.

These reports shall be submitted to the Northeast District Office of the Ohio EPA by January 31 and July 31 of each year and shall cover the previous 6-month period.

3. The permittee shall submit quarterly deviation (excursion) reports that identify all exceedances of the following:
 - a. for the first 12 calendar months of operation following the effective date of this Permit to Install, the allowable, monthly, cumulative NO_x emission limitation for emissions units P026 and P031, combined; and
 - b. after the first 12 calendar months of operation following the effective date of this Permit to Install, the rolling, 12-month NO_x emission limitation for emissions units P026 and

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P031, combined.

4. The permittee shall submit annual reports that summarize the the total annual emissions of NOx emitted from this emissions unit.

These reports shall be submitted to the Northeast District Office of the Ohio EPA by April 15 of each year and shall cover the previous calendar year.

5. The permittee shall submit quarterly deviation (excursion) reports that identify any exceedances of the hourly particulate emission limitation, through emission testing or calculated on a daily average basis.

V Testing Requirements

1. Compliance with the emissions limitations in Section A.I.1. of these terms and conditions shall be determined in accordance with the following methods:

- a. Emission Limitation

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

Applicable Compliance Method

If required by the Ohio EPA, compliance shall be determined by Method 9, Visible Determination of the Opacity of Emissions from Stationary Sources, 40 CFR Part 60, Appendix A, as specified in OAC rule 3745-17-03(B)(1).

- b. Emission Limitation

There shall be no visible fugitive particulate emissions from this emissions unit .

Applicable Compliance Method

If required by the Ohio EPA, compliance with the above visible emission limitation shall be determined using Method 22of 40 CFR, Part 60, Appendix A.

- c. Emission Limitation

The total particulate emissions from this emissions unit, from the stacks serving this

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emissions unit, shall not exceed 1.62 pounds per hour based on Table I of OAC rule 3745-17-11 and a maximum process weight (PWR) of 500 pounds per hour, and 7.1 tons per year particulate emissions.

Applicable Compliance Method

Compliance with the particulate limits above, shall be determined in accordance with the following:

If required by the Ohio EPA, emission testing shall be performed for each stack and fabric filter dust collector outlet to demonstrate compliance with the allowable hourly mass emission rate.

The following test method(s) and procedures shall be employed to determine compliance with the allowable mass emission rate:

Methods 1-5 of 40 CFR Part 60, Appendix A.

Performance testing shall be conducted in accordance with OAC rule 3745-17-03(B)(10).

Because the allowable annual mass emission rate was established by multiplying the short-term limit of 1.62 lbs per hour of particulate emissions by 8760 hours of operation per year and dividing by 2000 lbs/ton, compliance with the annual limit is assumed providing that compliance with the short-term limit is maintained.

In addition, compliance with the hourly PE limitation may be determined as follows:

$$\text{pounds per hour PE} = L + F + C + V$$

where:

$$L = \text{the maximum emissions, in pound per hour, from sand loading into crucible pots} \\ = 498 \text{ lbs/hr} \times 0.116 \text{ lb/ton} \times 0.01 \times 1 \text{ ton/2000 lbs}$$

$$F = \text{emissions, in pound per hour, from crucible forming through electric arc fusion,} \\ \text{based on the record keeping in section A.III.3 and the following formula:}$$

$$[\text{number of crucibles produced of a particular size}] \times [\text{the emission factor for that size} \\ \text{from the most recent stack test}]$$

$$C = \text{the maximum emissions, in pound per hour, from crucible cooling after fusion} \\ = 498 \text{ lbs/hr} \times 0.116 \text{ lb/ton} \times 0.01 \times 1 \text{ ton/2000 lbs}$$

$$V = \text{the maximum emissions, in pound per hour, from vacuum pumps} \\ = 2 \times 0.05 \text{ lb/hr}$$

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The emission factor of 0.116 lb/ton for sand transfer was derived based on information provided in AP-42, 5th edition, Volume I, Chapter 11, Mineral Products Industry, Table 11.12-2, January 1995.

d. Emission Limitation

The allowable hourly NO_x emission rate is 19.48 pounds per hour.

Applicable Compliance Method

Compliance with the hourly emission rate shall be demonstrated by the record keeping in A.III.4. and by emission testing using the following test methods:

Methods 1-4 and 7 of 40 CFR Part 60, Appendix A "Determination of Nitrogen Oxides Emissions from Stationary Sources".

e. Emission Limitation

NO_x emissions from CM6 and CM7 (P026 and P031) combined shall not exceed 31.8 tons per year, based on rolling, 12-month summations of the monthly emissions.

Applicable Compliance Method

Compliance with the above limitation shall be demonstrated by the record keeping in section A.III.2 of these terms and conditions.

Compliance with the rolling, 12-month NO_x emission limitation shall be determined in accordance with the equation in section A.I.2.e. and record keeping in section A.III.2 of these terms and conditions and results summed with the 12-month rolling NO_x emissions from P026 .

2.a Emission Testing Requirements

The permittee shall conduct, or have conducted, emission testing for this emissions unit in accordance with the following requirements:

- i. The initial emission testing shall be conducted within 12 months after the effective date of this permit to install.

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- ii. The emission testing shall be conducted for each uncontrolled stack , and shall be conducted to demonstrate compliance with the allowable hourly mass emission rate for particulate emissions, the allowable hourly mass emission rate for NOx emissions, where NOx is or could be emitted, and to determine the NOx emission factors for crucible production. For the purposes of emission testing, the blockhouse stack and vacuum pumps emissions shall be determined and included in the compliance determination.
 - iii. The following test method(s) and procedures shall be employed to determine compliance with the allowable mass emission rates for particulate emissions and NOx and to determine emission factors for NOx:

Methods 1-5 and 7 of 40 CFR Part 60, Appendix A.
 - iv. The test shall be conducted while the emissions unit is operating at or near its maximum capacity unless otherwise specified or approved by the Northeast District Office of the Ohio EPA.
- 2.b Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Northeast District Office of the Ohio EPA and Lake County General Health District. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person(s) who will be conducting the test(s).
- Failure to submit such notification for review and approval prior to the test(s) may result in the Ohio EPA Northeast District Office's refusal to accept the results of the emission test(s).
- 2.c Personnel from the Northeast District Office of the Ohio EPA and local air agency shall be permitted to witness the test(s), 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.
- 2.d 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 Northeast District Office of the Ohio EPA 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 Northeast District Office of the Ohio EPA.

VI Miscellaneous Requirements

None

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Emissions Unit ID: P031

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B. State Only Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
P031 - Electric Crucible machine # 7, equipped with a primary dust collector, and sand feed systems, equipped with a primary dust collector, a secondary dust collector, including vacuum pumps, each with a mist eliminator, and the blockhouse vent.	None	None

2. Additional Terms and Conditions

None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

IV. Reporting Requirements

None

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Issued

Facility ID: 0243160086

Emissions Unit ID: P031

V. Testing Requirements

None

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Emissions Unit ID: P031

VI. Miscellaneous Requirements

None

Part III - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>
<p>P006 - Electric Crucible machine # 5, with dust collector, including vacuum pumps, each with a mist eliminator, and the crucible forming enclosure vent, cutting station and cooling table</p>	<p>OAC rule 3745-31-05(A)(3)</p>
<p>The requirements of this permit supersede those requirements identified in Permit to Install number 02-535 issued on April 6, 1979.</p>	<p>OAC rule 3745-31-05(C)</p>
	<p>OAC rule 3745-17-07(A)</p>
	<p>OAC rule 3745-17-07(B)</p>
	<p>OAC rule 3745-17-08(B)</p>
	<p>OAC rule 3745-17-11(B)(1)</p>

	<p style="text-align: center;"><u>Applicable Emissions Limitations/Control Measures</u></p>	<p>from this emissions unit shall not exceed 1.0 ton per rolling, 12-month period.</p>
<p>OAC rule 3745-21-08</p>	<p>Nitrogen oxides (NOx) emissions from this emissions unit shall not exceed 1.36 pounds per hour (The 1.36 pounds per hour limitation is the potential to emit for this emissions unit; therefore, monitoring, record keeping, and reporting requirements are not needed for this emission limitation.)</p>	<p>Visible particulate emissions from any uncontrolled stack serving this emissions unit shall not exceed twenty percent opacity, as a six-minute average, except as provided by rule.</p>
<p>OAC rule 3745-23-06(B)</p>	<p>The total particulate emissions from this emissions unit alone, that are released through any stack serving this emissions unit, shall not exceed 2.4 tons per year.</p>	<p>In accordance with paragraph (B)(11)(e) of OAC rule 3745-17-07, the requirements of OAC rule 3745-17-07(B) shall not apply to this emissions unit.</p>
	<p>There shall be no visible fugitive particulate emissions from this emissions unit .</p>	<p>See A.I.2.c. The total particulate emissions from this emissions unit from the stacks serving this emissions unit shall not exceed 0.551 pound per hour based on Table I of OAC rule 3745-17-11 and a maximum process weight rate of 100 pounds per hour.</p>
	<p>There shall be no visible emissions from the exhausts from the fabric filter dust collectors.</p>	<p>See A.I.2.b. See A.I.2.b.</p>
	<p>Best available control measures that are sufficient to eliminate visible emissions of fugitive dust shall be employed for this emissions unit. (See A.I.2.a.)</p>	
	<p>The requirements of this rule also include compliance with the requirements of OAC rules 3745-17-07(A), 3745-17-11(B), 3745-21-08, and 3745-23-06(B).</p>	
	<p>Nitrogen oxides (NOx) emissions</p>	

2. Additional Terms and Conditions

2.a The permittee shall eliminate visible emissions of fugitive dust through the employment of best available control measures. These measures shall include, but not be limited to, the following:

- i. the use of adequate hooding or equivalent capture devices for the crucible filling, arc fusion, crucible cooling operations, and for the sand storage and transfer equipment; and
- ii. all fugitive dust captured shall be vented to the dust collector.

By employing best available control measures, visible emissions of fugitive dust from any non-stack egress points from the building shall be eliminated.

2.b The permittee has satisfied the "best available control techniques and operating practices" required pursuant to OAC rule 3745-21-08(B) by committing to comply with the best Permit to Install available technology requirements established pursuant to OAC rule 3745-31-05(A)(3) in this Permit to Install.

On November 5, 2002, OAC rule 3745-21-08 was revised to delete paragraph (B); therefore, paragraph (B) is no longer part of the State regulations. However, that rule revision has not yet been submitted to the U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). When the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-21-08, the requirement to satisfy the "best available control techniques and operating practices" will no longer exist as part of the federally-approved SIP for Ohio, and this term and condition will no longer be applicable to this emissions unit.

The permittee has satisfied the "latest available control techniques and operating practices" required pursuant to OAC rule 3745-23-06(B) by committing to comply with the best available technology requirements established in Permit to Install 02-13174.

2.c This facility is not located in an Appendix A area; therefore, in accordance with OAC rule 3745-17-08(A)(1), OAC rule 3745-17-08(B) is not applicable to this emissions unit.

2.d The permittee conducts the NO_x-emitting step of this process within an enclosure and operates a ventilation system intended to vent all emissions from this enclosure to the enclosure exhaust stack. The permittee determined that a similar enclosure at the GE Quartz Newark Plant meets the requirements for a Permanent Total Enclosure as defined

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in 40 CFR, Part 51, Appendix M, Method 204*. However, it is understood that a small fraction of the NOx formed (not quantified) may not be captured and vented to the enclosure stack at the end of the process step when doors to the enclosure are opened.

* The results of this evaluation are described in the report "Emissions Capture Efficiency Assessment for Quartz Crucible Machines and LD Lathes" prepared by Parsons Engineering Science, Inc. (June 1999) submitted to GE Quartz, Inc. Newark Quartz Plant. This report was sent to Ohio EPA on June 9, 1999. The NOx emissions from the cooling of the crucible machines shall be vented to the stack.

II Operational Restrictions

1. The maximum production rate of crucibles of any size, for this emissions unit, based on rolling, 12-month summations of the production rates, shall not exceed 26,667.

To ensure enforceability of this provision during the first twelve (12) months of operation following the effective date of this Permit to Install, the permittee shall not exceed the following crucible production restrictions and emission limitations:

CALENDAR MONTHS FOLLOWING PTI EFFECTIVE DATE	TOTAL CUMULATIVE ALLOWABLE CRUCIBLES PRODUCED (P006 only)
1-1	8800
1-2	10,424
1-3	12,048
1-4	13,673
1-5	15,297
1-6	16,921
1-7	18,546
1-8	20,170
1-9	21,794
1-10	23,419
1-11	25,043
1-12	26,667

2. After the first twelve calendar months of operation following the effective date of this Permit to Install, compliance with the annual crucible production restriction of 26,667 shall be based upon rolling, twelve-month summations of the crucible production rates.

III Monitoring and/or Recordkeeping

1. The permittee shall perform daily checks, when this emissions unit is in operation and when the weather conditions allow, for any visible particulate emissions from the stacks (including the dust collector) serving this emissions unit and for any visible fugitive particulate emissions from the building egress points (i.e., building windows, doors, roof monitors, etc) 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. the total duration of any visible emission incident; and
 - c. any corrective actions taken to eliminate the visible emissions.

The permittee may reduce the frequency of visual observations for this emissions unit from daily to weekly readings if the following conditions are met:

- a. for 30 days the facility's visual observations indicate no visible emissions; and

- b. the permittee continues to comply with all the record keeping requirements specified in section A.III.2.

The permittee shall revert to daily readings for this emissions unit if any visible emissions are observed. The permittee may again reduce the frequency of visual observations from daily to weekly after obtaining 30 days of observations with no visible emissions for this emissions unit.

2. The permittee shall maintain monthly records of the following for this emissions unit:
 - a. the number of crucibles produced;
 - b. beginning after the first 12 calendar months of operation following the effective date of this Permit to Install, the rolling, 12-month summation of the crucible production figures;
 - c. the monthly total emissions of NO_x, in tons, calculated in accordance with Section A.III.4. ; and
 - d. beginning after the first 12 calendar months of operation following the effective date of this Permit to Install, the rolling, 12-month summation of the NO_x emissions, in tons.

Also, during the first 12 calendar months of operation after the effective date of this Permit to Install, the permittee shall record the cumulative crucible production and NO_x emissions for this emissions unit for each calendar month.

3. The permittee shall calculate NO_x emissions in accordance with the following equation:

NO_x monthly emissions, in tons, = number of crucibles x 0.075 lb/unit x 1ton/2000lb

where:

The crucible number is the number of crucibles produced by crucible machine #5.

The NO_x emission factor of 0.075 lb/unit is based on the 1996 stack tests at the Newark facility.

Monthly NO_x emissions shall be totaled to obtain the rolling and annual emissions.

IV Reporting Requirements

1. The permittee shall submit semiannual written reports that:
 - a. identify all days during which any visible fugitive particulate emissions were observed from the egress points (i.e., building windows, doors, roof monitors, etc.) serving this emissions unit; and

- b. describe any corrective actions taken to eliminate the visible fugitive particulate emissions.

These reports shall be submitted to the Northeast District Office of the Ohio EPA by January 31 and July 31 of each year and shall cover the previous 6-month period.

2. The permittee shall submit semiannual written reports that:
 - a. identify all days during which any visible particulate emissions were observed from the stacks serving this emissions unit; and
 - b. describe any corrective actions taken to eliminate the visible particulate emissions.
3. The permittee shall submit quarterly deviation (excursion) reports, as specified in Part I.A.1.c. of these terms and conditions, that identify all exceedances of the following:
 - a. after the first 12 months of operation following the effective date of this Permit to Install, the rolling, 12-month limitation on crucible production;
 - b. after the first 12 months of operation following the effective date of this Permit to Install the rolling, 12-month NO_x emission limitation; and
 - c. for the first 12 calendar months of operation following the effective date of this Permit to Install, the maximum allowable, monthly cumulative crucible production levels.
4. The permittee shall submit annual reports of the following information:
 - a. the crucible production rate for this emissions unit; and
 - b. the total emissions of NO_x from this emissions unit.

These reports shall be submitted to the Northeast District Office of the Ohio EPA by April 15 of each year and shall cover the previous calendar year.

V Testing Requirements

1. Compliance with the emissions limitations in Section A.I.1. of these terms and conditions shall be determined in accordance with the following methods:
 - a. Emission Limitation

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

Applicable Compliance Method

If required by the Ohio EPA, compliance shall be determined by Method 9, Visible Determination of the Opacity of Emissions from Stationary Sources, 40 CFR Part 60, Appendix A, as specified in OAC rule 3745-17-03(B)(1).

b. Emission Limitation

There shall be no visible fugitive particulate emissions from this emissions unit .

Applicable Compliance Method

If required by the Ohio EPA, compliance with the above visible emission limitation shall be determined using Method 22 of 40 CFR, Part 60, Appendix A.

c. Emission Limitation

The total particulate emissions from this emissions unit alone, from the stacks serving this emissions unit , shall not exceed 0.551 pound per hour, based on Table I of OAC rule 3745-17-11 and based on a maximum process weight (PWR) of 100 pounds per hour, and 2.41 tons per year particulate emissions;

Applicable Compliance Method

Compliance with the particulate limits above, shall be determined in accordance with the following:

If required by the Ohio EPA, emission testing shall be performed for each stack and mist eliminator outlet to demonstrate compliance with the allowable hourly mass emission rate.

The following test method(s) and procedures shall be employed to determine compliance with the allowable mass emission rate:

Methods 1-5 of 40 CFR Part 60, Appendix A.

Performance testing shall be conducted in accordance with OAC rule 3745-17-03(B)(10).

Compliance with the allowable annual mass emission rate shall be demonstrated by multiplying the actual hourly emission rate by the actual hours of operation during the year and dividing by 2000.

- d. Emission Limitation
- i. The allowable hourly NO_x emission rate of 1.36 pounds per hour.
 - ii. The allowable rolling, 12-month NO_x emission rate of 1.0 ton.

Applicable Compliance Method

If required by the Ohio EPA, compliance with the hourly emission rate shall be demonstrated by emission testing using the following test methods:

Methods 1-4 and 7 of 40 CFR Part 60, Appendix A "Determination of Nitrogen Oxides Emissions from Stationary Sources".

The permittee shall calculate the rolling, 12-month NO_x emissions in accordance with the equation and record keeping specified in Part A.III.4 of these terms and conditions.

2.a Emission Testing Requirements

The permittee shall conduct, or have conducted, emission testing for this emissions unit in accordance with the following requirements:

- i. The emission testing shall be conducted within 12 months after the effective date of this Permit to Install.
- ii. The emission testing shall be conducted for each uncontrolled stack and each mist eliminator outlet and shall be conducted to demonstrate compliance with the allowable hourly mass emission for particulate emissions and the allowable hourly mass emission rate for NO_x emissions, where NO_x is or could be emitted, and to determine a NO_x emission factor for crucible production. For the purposes of emission testing, the crucible forming enclosure vent and vacuum pumps emissions shall be determined and included in the compliance determination.
- iii. The following test method(s) and procedures shall be employed to determine compliance with the allowable mass emission rates for particulate emissions and NO_x and to determine the emission factor for NO_x:

Methods 1-5 and 7 of 40 CFR Part 60, Appendix A.

- iv. The test shall be conducted while the emissions unit is operating at or near its maximum

capacity unless otherwise specified or approved by the Northeast District Office of the Ohio EPA.

- 2.b Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Northeast District Office of the Ohio EPA and Lake County General Health District. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person(s) who will be conducting the test(s).

Failure to submit such notification for review and approval prior to the test(s) may result in the Ohio EPA Northeast District Office's refusal to accept the results of the emission test(s).

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- 2.c Personnel from the Northeast District Office of the Ohio EPA and local air agency shall be permitted to witness the test(s), 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.
- 2.d 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 Northeast District Office of the Ohio EPA 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 Northeast District Office of the Ohio EPA.

VI Miscellaneous Requirements

None

B. State Only Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
<p>P006 - Electric Crucible machine # 5, with dust collector, including vacuum pumps, each with a mist eliminator, and the crucible forming enclosure vent, cutting station and cooling table</p> <p>The requirements of this permit supercede those requirements identified in Permit to Install number 02-535 issued on April 6, 1979.</p>	<p>None</p>	<p>None</p>

2. Additional Terms and Conditions

None

II. Operational Restrictions

None

III. Monitoring and/or Recordkeeping Requirements

None

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IV. Reporting Requirements

None

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Emissions Unit ID: P006

V. Testing Requirements

None

VI. Miscellaneous Requirements

None

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Emissions Unit ID: P032

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Applicable Emissions Limitations/Control Measures	The total particulate emissions from the stack serving this emissions unit, shall not exceed 0.551 pound per hour based on Table I of OAC rule 3745-17-11 (with a maximum process weight rate of 100 pounds per hour).
NOx emissions shall not exceed 15.23 pounds per hour from this emissions unit (The 15.23 pounds per hour limitation is the potential to emit for this emissions unit; therefore, monitoring, record keeping, and reporting requirements are not needed for this emission limitation.)	See A.I.2.a. See A.I.2.b. See A.I.2.b
The requirements of this rule also include compliance with the requirements of OAC rules 3745-17-07(A), 3745-17-11(B), 3745-18-06, 3745-21-08, and 3745-23-06(B).	
The total particulate emissions from the stack serving this emissions unit, shall not exceed 2.4 tons per year.	
NOx emissions shall not exceed 194.1 TPY based on rolling 12-month summations for all production, repair and bench lathes (emissions units P025 and P032-P043), combined.	
Visible particulate emissions from any stack associated with this emissions unit shall not exceed twenty percent opacity, as a six-minute average, except as provided by rule.	

2. Additional Terms and Conditions

2.a Because the process weight rate for this individual lathe is less than 1000 lbs per hour, this emissions unit is exempt from the requirements of this rule.

2.b The permittee has satisfied the "best available control techniques and operating practices" required pursuant to OAC rule 3745-21-08(B) by committing to comply with the best available technology requirements established in this Permit to Install.

On November 5, 2002, OAC rule 3745-21-08 was revised to delete paragraph (B); therefore, paragraph (B) is no longer part of the State regulations. However, that rule revision has not yet been submitted to the U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). When the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-21-08, the requirement to satisfy the "best available control techniques and operating practices" will no longer exist as part of the federally-approved SIP for Ohio, and this term and condition will no longer be applicable to this emissions unit.

The permittee has satisfied the "latest available control techniques and operating practices" required pursuant to OAC rule 3745-23-06(B) by committing to comply with the best available technology requirements established pursuant to OAC rule 3745-31-05(A)(3) in this Permit to Install.

2.c The permittee operates a ventilation system intended to vent all emissions from this emissions unit to the stack. However, it is understood that a small fraction of the NOx formed may not be captured and vented to the stack. The permittee assessed the capture efficiency of the capture hoods and ventilation system on the lathes at the GE Quartz Newark Plant, which is similar to the operation at the Willoughby plant*. NOx was measured on March 11, 1999 at the general ventilation exhaust vents for the room containing the lathes. The NOx emissions from the room vents were compared to the calculated NOx stack emissions for the lathes that were operating on March 11, 1999 (based on representative emission rates from stack testing of the lathes in 1998). The room vent emissions were a very small fraction, 0.21 percent, of the stack emissions. Therefore, the emission factors for the lathes that are based on the 1998 stack tests have been increased by 0.21 percent to account for the small amount of NOx that may not be captured by the local ventilation system and may be emitted through other room vents.

* The results of this evaluation are described in the report "Emissions Capture Efficiency Assessment for Quartz Crucible Machines and LD Lathes" prepared by Parsons Engineering Science, Inc. (June 1999) submitted to GE Quartz, Inc. Newark Quartz Plant. This report was sent to Ohio EPA on June 9, 1999.

2.d All particulate emissions from this emissions unit shall be vented to the stack.

2.e This emissions unit is capable of burning only natural gas and hydrogen.

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II Operational Restrictions

1. The maximum annual fuel usage for this emissions unit and all the production lathes (emissions units P025 and P032-P042), combined, shall not exceed 30.29 million standard cubic feet of natural gas based on rolling, 12-month summations.
2. To ensure enforceability during the first twelve (12) months of operation following the effective date of this Permit to Install, the permittee shall not exceed the following natural gas usage levels for all 12 production lathes (emissions units P025 and P032-P042):

MONTH(S) FOLLOWING PTI EFFECTIVE DATE	MAXIMUM ALLOWABLE CUMULATIVE FUEL USAGE (mmscf) (natural gas)
1-1	10.0
1-2	11.8
1-3	13.6
1-4	15.5
1-5	17.3
1-6	19.1
1-7	21.0
1-8	22.8
1-9	24.6
1-10	26.5
1-11	28.4
1-12	30.29

After the first 12 calendar months of operation following the effective date of this Permit to Install, the permittee shall comply with the annual natural gas usage limitations based on rolling, 12-month summations.

III Monitoring and/or Recordkeeping

1. The permittee shall perform daily checks, when this 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. the total duration of any visible emission incident; and
- c. any corrective actions taken to eliminate the visible emissions.

The permittee may reduce the frequency of visual observations for this emissions unit from daily to weekly readings if the following conditions are met:

- a. for 30 days this emissions unit's visual observations indicate no visible emissions; and
- b. the permittee continues to comply with all the record keeping requirements specified in section A.III.1.

The permittee shall revert to daily readings for this emissions unit if any visible emissions are observed. The permittee may again reduce the frequency of visual observations from daily to weekly after obtaining 30 consecutive days of observations with no visible emissions for this emissions unit.

2. The permittee shall maintain monthly records of the following information for emissions units P025 and P032-P042, combined:
 - a. the total natural gas usage;
 - b. the rolling, 12-month natural gas usage;
 - c. the rolling, 12-month NO_x emissions.

Also, during the first 12 calendar months of operation, after the effective date of this permit to install, the permittee shall record the cumulative natural gas usage, for all production lathes (emissions units P025 and P032-P042), combined.

Total NO_x monthly emissions, in tons, resulting from the natural gas usage in all production lathes (emissions units P025 and P032-P042), combined, shall be calculated using the following equation:

$$\text{NO}_x, \text{ in tons} = \text{total natural gas usage (mmscf/month)} \times 12.09 \text{ lbs/mmBtu} \times \frac{1}{1050 \text{ mmBtu/mmscf}} \times 1 \text{ ton/2000 lbs}$$

The emission factor for NO_x is based on a 1998 stack test and equals 12.09 lbs/mmBtu. Including fugitive emissions not captured by local exhaust ventilation (see explanation in A.I.2.c). The natural gas usage is for emissions units P025 and P032 through P042, combined. The heat content of natural gas = 1050 mmBtu/mmscf.

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Monthly results shall be summed to obtain the annual and 12-month rolling NOx emissions.

IV Reporting Requirements

1. The permittee shall submit semiannual written reports that:
 - a. identify all days during which any visible particulate emissions were observed from the stack serving this emissions unit; and
 - b. describe any corrective actions taken to eliminate the visible particulate emissions.

These reports shall be submitted to the Northeast District Office of the Ohio EPA by January 31 and July 31 of each year and shall cover the previous 6-month period.

2. The permittee shall submit quarterly deviation (excursion) reports that identify all exceedances of the following:
 - a. after the first twelve calendar months of operation following the effective date of This Permit to Install, the rolling, 12-month limitations for natural gas fuel usage for all production lathes (emissions units P025 and P032-P042), combined; and
 - b. for the first 12 calendar months of operation following the effective date of this Permit to Install, the monthly allowable cumulative fuel usage for natural gas for all production lathes (emissions units P025 and P032-P042), combined.

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3. The permittee shall submit annual reports that specify the total amount of natural gas used and the total amount of NO_x emitted from emissions units P025 and P032-P042 for the previous calendar year by April 15 of the following year.

V Testing Requirements

1. Compliance with the emission limitations in Section A.I.1. of these terms and conditions shall be determined in accordance with the following methods:

- a. Emission Limitation

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

Applicable Compliance Method

If required by the Ohio EPA, compliance shall be determined by Method 9, Visible Determination of the Opacity of Emissions from Stationary Sources, 40 CFR Part 60, Appendix A, as specified in OAC rule 3745-17-03(B)(1).

- b. Emission Limitation

0.551 pound per hour and 2.4 tons per year of particulate emissions

Applicable Compliance Method

If required by the Ohio EPA, compliance with the hourly particulate emission limit above shall be determined in accordance with OAC rule 3745-17-03 and Method 5 of 40 CFR Part 60, Appendix A.

Because the annual particulate limit was established by multiplying the short-term limit of 0.551 lb/hr by 8,760 hours of operation per year and dividing by 2000 lbs/ton, compliance with the annual limit is assumed provided that compliance with the hourly limit is maintained.

- c. Emission Limitation

NO_x emissions shall not exceed 15.23 pounds per hour from this emissions unit, and 194.1 TPY, based on rolling 12-month summations from all production, repair and bench lathes, emissions units P025, P032-P043 combined.

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Applicable Compliance Method

If required by the Ohio EPA, compliance with the hourly NO_x emission limitation above, shall be determined by using Method 7 of 40 CFR Part 60, Appendix A.

Compliance with the rolling, 12-month NO_x emission limitation shall be determined using the equations and record keeping in Section A.III.2. and summing the 12-month rolling NO_x emissions from emissions units P025, P032 through P043.

2. Emissions units P025, P032, P033, P034, P035, and P036 are essentially identical and may be used interchangeably. The permittee shall conduct, or have conducted, emission testing of the mass emission rates for particulate emissions and NO_x for one of these 6 emissions units in accordance with the following:

- a. The initial emission testing for NO_x and particulate emissions shall be conducted within 12 months after the effective date of this Permit to Install.

The permittee has demonstrated that all 6 production lathes rated at 1.26 mmBtu/hr (emissions units P025, and P032-P036) are essentially identical in operation, size and capacity, configuration and product line ; therefore; the Ohio EPA is allowing the permittee to test one representative unit, at or near maximum capacity, to demonstrate compliance for each of these 6 emissions units.

- b. The emission testing shall be conducted to determine compliance with the allowable emission rates for particulate emissions and NO_x.

- c. The following test methods from 40 CFR Part 60, Appendix A, shall be employed to determine compliance with the allowable emission rates for particulate and NO_x respectively:

Method 5 "Determination of Particulate Emissions from Stationary Sources" and Method 7 "Determination of Nitrogen Oxide Emissions from Stationary Sources and the requirements of OAC rule 3745-31-05.

- d. The tests shall be conducted while the emissions unit is operating at or near its maximum capacity, unless otherwise specified by the Northeast District of the Ohio EPA.

Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Ohio EPA Northeast District Office and the Lake County General Health District. The "Intent to Test" notification shall describe in detail the proposed test methods and

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PTI A-111111-02-12174

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Facility ID: 0243160086

Emissions Unit ID: P032

procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person(s) who will be conducting the tests.

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Failure to submit such notification for review and approval prior to the tests may result in the Ohio EPA Northeast District Office's refusal to accept the results of the emissions tests.

Personnel from the Ohio EPA Northeast District Office and/or Lake County General Health District shall be permitted to witness the tests, 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.

A comprehensive written report of the results of the emissions tests shall be signed by the person or persons responsible for the tests and submitted to the Northeast District Office of the Ohio EPA within 30 days following completion of the tests. The permittee may request additional time for the submittal of the written report, where warranted, with prior approval from the Northeast District Office of the Ohio EPA.

VI Miscellaneous Requirements

None

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B. State Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
P032 - Large diameter lathe number17 (natural gas fired) 1.26 mmBtu/hr; H2 pilot		

2. Additional Terms and Conditions

2.a None

II Operational Restrictions

None

III Monitoring and/or Recordkeeping

None

IV Reporting Requirements

None

V Testing Requirements

Issued: To be entered upon final issuance

None

VI Miscellaneous Requirements

None

Part III - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>
P033 - Large diameter lathe number 18 (natural gas fired) 1.26 mmBtu/hr; H2 pilot	OAC rule 3745-31-05(A)(3)
	OAC rule 3745-31-05(C)
	OAC rule 3745-17-07(A)

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	<u>Applicable Emissions Limitations/Control Measures</u>	
OAC rule 3745-17-11(B)(1)	<p>NOx emissions shall not exceed 15.23 pounds per hour from this emissions unit (The 15.23 pounds per hour limitation is the potential to emit for this emissions unit; therefore, monitoring, record keeping, and reporting requirements are not needed for this emission limitation.)</p>	<p>The total particulate emissions from the stack serving this emissions unit, shall not exceed 0.551 pound per hour based on Table I of OAC rule 3745-17-11 (with a maximum process weight rate of 100 pounds per hour).</p> <p>See A.I.2.a.</p> <p>See A.I.2.b</p> <p>See A.I.2.b</p>
OAC rule 3745-18-06(E)	<p>The requirements of this rule also include compliance with the requirements of OAC rules 3745-17-07(A), 3745-17-11(B), 3745-18-06, 3745-21-08, and 3745-23-06(B).</p>	
OAC rule 3745-21-08	<p>The total particulate emissions from the stack serving this emissions unit, shall not exceed 2.4 tons per year.</p>	
OAC rule 3745-23-06(B)	<p>NOx emissions shall not exceed 194.1 TPY based on rolling 12-month summations for all production, repair and bench lathes (emissions units P025 and P032-P043), combined.</p>	
	<p>Visible particulate emissions from any stack associated with this emissions unit shall not exceed twenty percent opacity, as a six-minute average, except as provided by rule.</p>	

2. Additional Terms and Conditions

2.a Because the process weight rate for this individual lathe is less than 1000 lbs per hour, this emissions unit is exempt from the requirements of this rule.

2.b The permittee has satisfied the "best available control techniques and operating practices" required pursuant to OAC rule 3745-21-08(B) by committing to comply with the best available technology requirements established in this Permit to Install.

On November 5, 2002, OAC rule 3745-21-08 was revised to delete paragraph (B); therefore, paragraph (B) is no longer part of the State regulations. However, that rule revision has not yet been submitted to the U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). When the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-21-08, the requirement to satisfy the "best available control techniques and operating practices" will no longer exist as part of the federally-approved SIP for Ohio, and this term and condition will no longer be applicable to this emissions unit.

The permittee has satisfied the "latest available control techniques and operating practices" required pursuant to OAC rule 3745-23-06(B) by committing to comply with the best available technology requirements established pursuant to OAC rule 3745-31-05(A)(3) in this Permit to Install.

2.c The permittee operates a ventilation system intended to vent all emissions from this emissions unit to the stack. However, it is understood that a small fraction of the NO_x formed may not be captured and vented to the stack. The permittee assessed the capture efficiency of the capture hoods and ventilation system on the lathes at the GE Quartz Newark Plant, which is similar to the operation at the Willoughby plant*. NO_x was measured on March 11, 1999 at the general ventilation exhaust vents for the room containing the lathes. The NO_x emissions from the room vents were compared to the calculated NO_x stack emissions for the lathes that were operating on March 11, 1999 (based on representative emission rates from stack testing of the lathes in 1998). The room vent emissions were a very small fraction, 0.21 percent, of the stack emissions. Therefore, the emission factors for the lathes that are based on the 1998 stack tests have been increased by 0.21 percent to account for the small amount of NO_x that may not be captured by the local ventilation system and may be emitted through other room vents.

* The results of this evaluation are described in the report "Emissions Capture Efficiency Assessment for Quartz Crucible Machines and LD Lathes" prepared by Parsons Engineering Science, Inc. (June 1999) submitted to GE Quartz, Inc. Newark Quartz Plant. This report was sent to Ohio EPA on June 9, 1999.

2.d All particulate emissions from this emissions unit shall be vented to the stack.

2.e This emissions unit is capable of burning only natural gas and hydrogen.

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II Operational Restrictions

1. The maximum annual fuel usage for this emissions unit and all the production lathes (emissions units P025 and P032-P042), combined, shall not exceed 30.29 million standard cubic feet of natural gas based on rolling, 12-month summations.
2. To ensure enforceability during the first twelve (12) months of operation following the effective date of this Permit to Install, the permittee shall not exceed the following natural gas usage levels for all 12 production lathes (emissions units P025 and P032-P042):

MONTH(S) FOLLOWING PTI EFFECTIVE DATE	MAXIMUM ALLOWABLE CUMULATIVE FUEL USAGE (mmscf) (natural gas)
1-1	10.0
1-2	11.8
1-3	13.6
1-4	15.5
1-5	17.3
1-6	19.1
1-7	21.0
1-8	22.8
1-9	24.6
1-10	26.5
1-11	28.4
1-12	30.29

After the first 12 calendar months of operation following the effective date of this Permit to Install, the permittee shall comply with the annual natural gas usage limitations based on rolling, 12-month summations.

III Monitoring and/or Recordkeeping

1. The permittee shall perform daily checks, when this 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. the total duration of any visible emission incident; and
- c. any corrective actions taken to eliminate the visible emissions.

The permittee may reduce the frequency of visual observations for this emissions unit from daily to weekly readings if the following conditions are met:

- a. for 30 days this emissions unit's visual observations indicate no visible emissions; and
- b. the permittee continues to comply with all the record keeping and monitoring requirements specified in section A.III.1.

The permittee shall revert to daily readings for this emissions unit if any visible emissions are observed. The permittee may again reduce the frequency of visual observations from daily to weekly after obtaining 30 consecutive days of observations with no visible emissions for this emissions unit.

2. The permittee shall maintain monthly records of the following information for emissions units P025 and P032-P042, combined:
 - a. the total natural gas usage;
 - b. the rolling, 12-month natural gas usage;
 - c. the rolling, 12-month NO_x emissions.

Also, during the first 12 calendar months of operation, after the effective date of this Permit to Install, the permittee shall record the cumulative natural gas usage, for all production lathes (emissions units P025 and P032-P042), combined.

Total NO_x monthly emissions, in tons, resulting from the natural gas usage in all production lathes (emissions units P025 and P032-P042), combined, shall be calculated using the following equation:

$$\text{NO}_x, \text{ in tons} = \text{total natural gas usage (mmscf/month)} \times \frac{12.09 \text{ lbs/mmBtu}}{1050 \text{ mmBtu/mmscf}} \times \frac{1 \text{ ton}}{2000 \text{ lbs}}$$

The emission factor for NO_x is based on a 1998 stack test and equals 12.09 lbs/mmBtu. Including fugitive emissions not captured by local exhaust ventilation (see explanation in A.I.2.c). The natural gas usage is for emissions units P025 and P032 through P042, combined.

The heat content of natural gas = 1050 mmBtu/mmscf.

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Monthly results shall be summed to obtain the annual and 12-month rolling NOx emissions.

IV Reporting Requirements

1. The permittee shall submit semiannual written reports that:
 - a. identify all days during which any visible particulate emissions were observed from the stack serving this emissions unit; and
 - b. describe any corrective actions taken to eliminate the visible particulate emissions.

These reports shall be submitted to the Northeast District Office of the Ohio EPA by January 31 and July 31 of each year and shall cover the previous 6-month period.

2. The permittee shall submit quarterly deviation (excursion) reports that identify all exceedances of the following:
 - a. after the first twelve calendar months of operation following the effective date of this Permit to Install, the rolling, 12-month limitations for natural gas fuel usage for all production lathes (emissions units P025 and P032-P042), combined; and

Emissions Unit ID: P033

- b. for the first 12 calendar months of operation following the effective date of this Permit to Install, the monthly allowable cumulative fuel usage for natural gas for all production lathes (emissions units P025 and P032-P042), combined.
3. The permittee shall submit annual reports that specify the total amount of natural gas used and the total amount of NOx emitted from emissions units P025 and P032-P042 for the previous calendar year by April 15 of the following year.

V Testing Requirements

1. Compliance with the emission limitations in Section A.I.1. of these terms and conditions shall be determined in accordance with the following methods:

- a. Emission Limitation

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

Applicable Compliance Method

If required by the Ohio EPA, compliance shall be determined by Method 9, Visible Determination of the Opacity of Emissions from Stationary Sources, 40 CFR Part 60, Appendix A, as specified in OAC rule 3745-17-03(B)(1).

- b. Emission Limitation

0.551 pound per hour and 2.4 tons per year of particulate emissions

Applicable Compliance Method

If required by the Ohio EPA, compliance with the hourly particulate emission limit above shall be determined in accordance with OAC rule 3745-17-03 and Method 5 of 40 CFR Part 60, Appendix A.

Because the annual particulate limit was established by multiplying the short-term limit of 0.551 lb/hr by 8,760 hours of operation per year and dividing by 2000 lbs/ton, compliance with the annual limit is assumed provided that compliance with the hourly limit is maintained.

- c. Emission Limitation

NOx emissions shall not exceed 15.23 pounds per hour from this emissions unit, and 194.1 TPY, based on rolling 12-month summations from all production, repair and bench lathes, emissions units P025, P032-P043 combined.

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Applicable Compliance Method

If required by the Ohio EPA, compliance with the hourly NO_x emission limitation above, shall be determined by using Method 7 of 40 CFR Part 60, Appendix A.

Compliance with the rolling, 12-month NO_x emission limitation shall be determined using the equations and record keeping in Section A.III.2. and summing the 12-month rolling NO_x emissions from emissions units P025, and P032 through P043.

2. Emissions units P025, P032, P033, P034, P035, and P036 are essentially identical and may be used interchangeably. The permittee shall conduct, or have conducted, emission testing of the mass emission rates for particulate emissions and NO_x for one of these 6 emissions units in accordance with the following:
 - a. The initial emission testing for NO_x and particulate emissions shall be conducted within 12 months after the effective date of this Permit to Install.

The permittee has demonstrated that all 6 production lathes rated at 1.26 mmBtu/hr (emissions units P025, and P032-P036) are essentially identical in operation, size and capacity, configuration and product line ; therefore; the Ohio EPA is allowing the permittee to test one representative unit, at or near maximum capacity, to demonstrate compliance for each of these 6 emissions units.
 - b. The emission testing shall be conducted to determine compliance with the allowable emission rates for particulate emissions and NO_x.
 - c. The following test methods from 40 CFR Part 60, Appendix A, shall be employed to determine compliance with the allowable emission rates for particulate and NO_x respectively:

Method 5 " Determination of Particulate Emissions from Stationary Sources" and Method 7 "Determination of Nitrogen Oxide Emissions from Stationary Sources and the requirements of OAC rule 3745-31-05.
 - d. The tests shall be conducted while the emissions unit is operating at or near its maximum capacity, unless otherwise specified by the Northeast District of the Ohio EPA.

Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Ohio EPA Northeast District Office and the Lake County General Health District. The "Intent to Test" notification shall describe in detail the proposed test methods and

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Issued**Facility ID: 0243160086**

Emissions Unit ID: P033

procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person(s) who will be conducting the tests.

Failure to submit such notification for review and approval prior to the tests may result in the Ohio EPA Northeast District Office's refusal to accept the results of the emissions tests.

Personnel from the Ohio EPA Northeast District Office and/or Lake County General Health District shall be permitted to witness the tests, 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.

A comprehensive written report of the results of the emissions tests shall be signed by the person or persons responsible for the tests and submitted to the Northeast District Office of the Ohio EPA within 30 days following completion of the tests. The permittee may request additional time for the submittal of the written report, where warranted, with prior approval from the Northeast District Office of the Ohio EPA.

VI Miscellaneous Requirements

None

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B. State Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
P033 - Large diameter lathe number 18 (natural gas fired) 1.26 mmBtu/hr; H2 pilot		

2. Additional Terms and Conditions

2.a None

II Operational Restrictions

None

III Monitoring and/or Recordkeeping

None

IV Reporting Requirements

None

V Testing Requirements

None

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Emissions Unit ID: P033

VI Miscellaneous Requirements

None

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Part III - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>
P034 - Large diameter lathe number 19 (natural gas fired) 1.26 mmBtu/hr; H2 pilot	OAC rule 3745-31-05(A)(3) OAC rule 3745-17-07(A)
	OAC rule 3745-17-11(B)(1)
	OAC rule 3745-18-06(E)
	OAC rule 3745-21-08
	OAC rule 3745-31-05(C)

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OAC rule 3745-23-06(B)

Applicable Emissions
Limitations/Control Measures

NOx emissions shall not exceed 15.23 pounds per hour from this emissions unit (The 15.23 pounds per hour limitation is the potential to emit for this emissions unit; therefore, monitoring, record keeping, and reporting requirements are not needed for this emission limitation.)

The requirements of this rule also include compliance with the requirements of OAC rules 3745-17-07(A), 3745-17-11(B), 3745-18-06, 3745-21-08, and 3745-23-06(B).

The total particulate emissions from the stack serving this emissions unit, shall not exceed 2.4 tons per year.

NOx emissions shall not exceed 194.1 TPY based on rolling 12-month summations for all production, repair and bench lathes (emissions units P025 and P032-P043), combined.

Visible particulate emissions from any stack associated with this emissions unit shall not exceed twenty percent opacity, as a six-minute average, except as provided by rule.

The total particulate emissions from the stack serving this emissions unit, shall not exceed 0.551 pound per hour based on Table I of OAC rule 3745-17-11 (with a maximum process weight rate of 100 pounds per hour).

See A.I.2.a.

See A.I.2.b.

See A.I.2.b.

2. Additional Terms and Conditions

2.a Because the process weight rate for this individual lathe is less than 1000 lbs per hour, this emissions unit is exempt from the requirements of this rule.

2.b The permittee has satisfied the "best available control techniques and operating practices" required pursuant to OAC rule 3745-21-08(B) by committing to comply with the best available technology requirements established in this Permit to Install.

On November 5, 2002, OAC rule 3745-21-08 was revised to delete paragraph (B); therefore, paragraph (B) is no longer part of the State regulations. However, that rule revision has not yet been submitted to the U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). When the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-21-08, the requirement to satisfy the "best available control techniques and operating practices" will no longer exist as part of the federally-approved SIP for Ohio, and this term and condition will no longer be applicable to this emissions unit.

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The permittee has satisfied the "latest available control techniques and operating practices" required pursuant to OAC rule 3745-23-06(B) by committing to comply with the best available technology requirements established pursuant to OAC rule 3745-31-05(A)(3) in this Permit to Install.

- 2.c** The permittee operates a ventilation system intended to vent all emissions from this emissions unit to the stack. However, it is understood that a small fraction of the NO_x formed may not be captured and vented to the stack. The permittee assessed the capture efficiency of the capture hoods and ventilation system on the lathes at the GE Quartz Newark Plant, which is similar to the operation at the Willoughby plant*. NO_x was measured on March 11, 1999 at the general ventilation exhaust vents for the room containing the lathes. The NO_x emissions from the room vents were compared to the calculated NO_x stack emissions for the lathes that were operating on March 11, 1999 (based on representative emission rates from stack testing of the lathes in 1998). The room vent emissions were a very small fraction, 0.21 percent, of the stack emissions. Therefore, the emission factors for the lathes that are based on the 1998 stack tests have been increased by 0.21 percent to account for the small amount of NO_x that may not be captured by the local ventilation system and may be emitted through other room vents.

* The results of this evaluation are described in the report "Emissions Capture Efficiency Assessment for Quartz Crucible Machines and LD Lathes" prepared by Parsons Engineering Science, Inc. (June 1999) submitted to GE Quartz, Inc. Newark Quartz Plant. This report was sent to Ohio EPA on June 9, 1999.

- 2.d** All particulate emissions from this emissions unit shall be vented to the stack.
- 2.e** This emissions unit is capable of burning only natural gas and hydrogen.

II Operational Restrictions

1. The maximum annual fuel usage for this emissions unit and all the production lathes (emissions units P025 and P032-P042), combined, shall not exceed 30.29 million standard cubic feet of natural gas based on rolling, 12-month summations.
2. To ensure enforceability during the first twelve (12) months of operation following the effective date of this Permit to Install, the permittee shall not exceed the following natural gas usage levels for all production lathes (emissions units P025 and P032-P042):

MONTH(S) FOLLOWING PTI EFFECTIVE DATE	MAXIMUM ALLOWABLE CUMULATIVE FUEL USAGE
--	---

	(mmscf) (natural gas)
1-1	10.0
1-2	11.8
1-3	13.6
1-4	15.5
1-5	17.3
1-6	19.1
1-7	21.0
1-8	22.8
1-9	24.6
1-10	26.5
1-11	28.4
1-12	30.29

After the first 12 calendar months of operation following the effective date of this Permit to Install, the permittee shall comply with the annual natural gas usage limitations based on rolling, 12-month summations.

III Monitoring and/or Recordkeeping

1. The permittee shall perform daily checks, when this 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. the total duration of any visible emission incident; and
 - c. any corrective actions taken to eliminate the visible emissions.

The permittee may reduce the frequency of visual observations for this emissions unit from daily to weekly readings if the following conditions are met:

- a. for 30 days this emissions unit's visual observations indicate no visible emissions; and
- b. the permittee continues to comply with all the record keeping requirements specified in section A.III.1.

The permittee shall revert to daily readings for this emissions unit if any visible emissions are observed. The permittee may again reduce the frequency of visual observations from daily to weekly after obtaining 30 consecutive days of observations with no visible emissions for this emissions unit.

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2. The permittee shall maintain monthly records of the following information for emissions units P025 and P032-P042, combined:
 - a. the total natural gas usage;
 - b. the rolling, 12-month natural gas usage;
 - c. the rolling, 12-month NOx emissions.

Also, during the first 12 calendar months of operation, after the effective date of this Permit to Install, the permittee shall record the cumulative natural gas usage, for all production lathes (emissions units and P032-P042), combined.

Total NOx monthly emissions, in tons, resulting from the natural gas usage in all production lathes (emissions units P025 and P032-P042), combined, shall be calculated using the following equation:

$$\text{NOx, in tons} = \text{total natural gas usage (mmscf/month) } \times 12.09 \text{ lbs/mmBtu } \times \\ 1050 \text{ mmBtu/mmscf } \times 1 \text{ ton/2000 lbs}$$

The emission factor for NOx is based on a 1998 stack test and equals 12.09 lbs/mmBtu. Including fugitive emissions not captured by local exhaust ventilation (see explanation in A.I.2.c). The natural gas usage is for emissions units P025 and P032 through P042, combined.

The heat content of natural gas = 1050 mmBtu/mmscf.

Monthly results shall be summed to obtain the annual and 12-month rolling NOx emissions.

IV Reporting Requirements

1. The permittee shall submit semiannual written reports that:
 - a. identify all days during which any visible particulate emissions were observed from the stack serving this emissions unit; and
 - b. describe any corrective actions taken to eliminate the visible particulate emissions.

These reports shall be submitted to the Northeast District Office of the Ohio EPA by January 31 and July 31 of each year and shall cover the previous 6-month period.

2. The permittee shall submit quarterly deviation (excursion) reports that identify all exceedances of the following:
 - a. after the first twelve calendar months of operation following the effective date of this Permit to Install, the rolling, 12-month limitations for natural gas fuel usage for all production lathes (emissions units P025 and P032-P042), combined; and
 - b. for the first 12 calendar months of operation following the effective date of this Permit to Install, the monthly allowable cumulative fuel usage for natural gas for all production lathes (emissions units P025 and P032-P042), combined.
3. The permittee shall submit annual reports that specify the total amount of natural gas used and the total amount of NO_x emitted from emissions units P025 and P032-P042 for the previous calendar year by April 15 of the following year.

V Testing Requirements

1. Compliance with the emission limitations in Section A.I.1. of these terms and conditions shall be determined in accordance with the following methods:

- a. Emission Limitation

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

Applicable Compliance Method

If required by the Ohio EPA, compliance shall be determined by Method 9, Visible Determination of the Opacity of Emissions from Stationary Sources, 40 CFR Part 60, Appendix A, as specified in OAC rule 3745-17-03(B)(1).

- b. Emission Limitation

0.551 pound per hour and 2.4 tons per year of particulate emissions

Applicable Compliance Method

If required by the Ohio EPA, compliance with the hourly particulate emission limit above shall be determined in accordance with OAC rule 3745-17-03 and Method 5 of 40 CFR Part 60, Appendix A.

Because the annual particulate limit was established by multiplying the short-term limit of 0.551 lb/hr by 8,760 hours of operation per year and dividing by 2000 lbs/ton, compliance with the annual limit is assumed provided that compliance with the hourly limit is

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Emissions Unit ID: P034

maintained.

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c. Emission Limitation

NOx emissions shall not exceed 15.23 pounds per hour from this emissions unit, and 194.1 TPY, based on rolling 12-month summations from all production, repair and bench lathes, emissions units P025, P032-P043 combined.

Applicable Compliance Method

If required by the Ohio EPA, compliance with the hourly NOx emission limitation above, shall be determined by using Method 7 of 40 CFR Part 60, Appendix A.

Compliance with the rolling, 12-month NOx emission limitation shall be determined using the equations and record keeping in Section A.III.2. and summing the 12-month rolling NOx emissions from emissions units P025, and P032 through P043.

2. Emissions units P025, P032, P033, P034, P035, and P036 are essentially identical and may be used interchangeably. The permittee shall conduct, or have conducted, emission testing of the mass emission rates for particulate emissions and NOx for one of these 6 emissions units in accordance with the following:
- a. The initial emission testing for NOx and particulate emissions shall be conducted within 12 months after the effective date of this Permit to Install.

The permittee has demonstrated that all 6 production lathes rated at 1.26 mmBtu/hr (emissions units P025, and P032-P036) are essentially identical in operation, size and capacity, configuration and product line ; therefore; the Ohio EPA is allowing the permittee to test one representative unit, at or near maximum capacity, to demonstrate compliance for each of these 6 emissions units.
 - b. The emission testing shall be conducted to determine compliance with the allowable emission rates for particulate emissions and NOx.
 - c. The following test methods from 40 CFR Part 60, Appendix A, shall be employed to determine compliance with the allowable emission rates for particulate and NOx respectively:

Method 5 " Determination of Particulate Emissions from Stationary Sources" and Method 7 "Determination of Nitrogen Oxide Emissions from Stationary Sources and the requirements of OAC rule 3745-31-05.

Emissions Unit ID: P034

- d. The tests shall be conducted while the emissions unit is operating at or near its maximum capacity, unless otherwise specified by the Northeast District of the Ohio EPA.

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Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Ohio EPA Northeast District Office and the Lake County General Health District. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person(s) who will be conducting the tests.

Failure to submit such notification for review and approval prior to the tests may result in the Ohio EPA Northeast District Office's refusal to accept the results of the emissions tests.

Personnel from the Ohio EPA Northeast District Office and/or Lake County General Health District shall be permitted to witness the tests, 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.

A comprehensive written report of the results of the emissions tests shall be signed by the person or persons responsible for the tests and submitted to the Northeast District Office of the Ohio EPA within 30 days following completion of the tests. The permittee may request additional time for the submittal of the written report, where warranted, with prior approval from the Northeast District Office of the Ohio EPA.

VI Miscellaneous Requirements

None

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B. State Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
P034 - Large diameter lathe number 19 (natural gas fired) 1.26 mmBtu/hr; H2 pilot		

2. Additional Terms and Conditions

2.a None

II Operational Restrictions

None

III Monitoring and/or Recordkeeping

None

IV Reporting Requirements

None

V Testing Requirements

None

VI Miscellaneous Requirements

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None

Part III - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	
P035- Large diameter lathe number 20 (natural gas fired) 1.26 mmBtu/hr; H2 pilot	OAC rule 3745-31-05(A)(3)	OAC rule 3745-31-05(C)
		OAC rule 3745-17-07(A)
		OAC rule 3745-17-11(B)(1)

Emissions Unit ID: P035

	Applicable Emissions <u>Limitations/Control Measures</u>	3745-17-11 (with a maximum process weight rate of 100 pounds per hour).
OAC rule 3745-18-06(E)		
OAC rule 3745-21-08	NOx emissions shall not exceed 15.23 pounds per hour from this emissions unit (The 15.23 pounds per hour limitation is the potential to emit for this emissions unit; therefore, monitoring, record keeping, and reporting requirements are not needed for this emission limitation.)	See A.I.2.a.
OAC rule 3745-23-06(B)	The requirements of this rule also include compliance with the requirements of OAC rules 3745-17-07(A), 3745-17-11(B), 3745-18-06, 3745-21-08, and 3745-23-06(B).	See A.I.2.b.
	The total particulate emissions from the stack serving this emissions unit, shall not exceed 2.4 tons per year.	See A.I.2.b.
	NOx emissions shall not exceed 194.1 TPY based on rolling 12-month summations for all production, repair and bench lathes (emissions units P025 and P032-P043), combined.	
	Visible particulate emissions from any stack associated with this emissions unit shall not exceed twenty percent opacity, as a six-minute average, except as provided by rule.	
	The total particulate emissions from the stack serving this emissions unit, shall not exceed 0.551 pound per hour based on Table I of OAC rule	

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2. Additional Terms and Conditions

2.a Because the process weight rate for this individual lathe is less than 1000 lbs per hour, this emissions unit is exempt from the requirements of this rule.

2.b The permittee has satisfied the "best available control techniques and operating practices" required pursuant to OAC rule 3745-21-08(B) by committing to comply with the best available technology requirements established in this Permit to Install.

On November 5, 2002, OAC rule 3745-21-08 was revised to delete paragraph (B); therefore, paragraph (B) is no longer part of the State regulations. However, that rule revision has not yet been submitted to the U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). When the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-21-08, the requirement to satisfy the "best available control techniques and operating practices" will no longer exist as part of the federally-approved SIP for Ohio, and this term and condition will no longer be applicable to this emissions unit.

The permittee has satisfied the "latest available control techniques and operating practices" required pursuant to OAC rule 3745-23-06(B) by committing to comply with the best available technology requirements established pursuant to OAC rule 3745-31-05(A)(3) in this Permit to Install.

2.c The permittee operates a ventilation system intended to vent all emissions from this emissions unit to the stack. However, it is understood that a small fraction of the NO_x formed may not be captured and vented to the stack. The permittee assessed the capture efficiency of the capture hoods and ventilation system on the lathes at the GE Quartz Newark Plant, which is similar to the operation at the Willoughby plant*. NO_x was measured on March 11, 1999 at the general ventilation exhaust vents for the room containing the lathes. The NO_x emissions from the room vents were compared to the calculated NO_x stack emissions for the lathes that were operating on March 11, 1999 (based on representative emission rates from stack testing of the lathes in 1998). The room vent emissions were a very small fraction, 0.21 percent, of the stack emissions. Therefore, the emission factors for the lathes that are based on the 1998 stack tests have been increased by 0.21 percent to account for the small amount of NO_x that may not be captured by the local ventilation system and may be emitted through other room vents.

* The results of this evaluation are described in the report "Emissions Capture Efficiency Assessment for Quartz Crucible Machines and LD Lathes" prepared by Parsons Engineering Science, Inc. (June 1999) submitted to GE Quartz, Inc. Newark Quartz Plant.

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This report was sent to Ohio EPA on June 9, 1999.

2.d All particulate emissions from this emissions unit shall be vented to the stack.

2.e This emissions unit is capable of burning only natural gas and hydrogen.

II Operational Restrictions

1. The maximum annual fuel usage for this emissions unit and all the production lathes (emissions units P025 and P032-P042), combined, shall not exceed 30.29 million standard cubic feet of natural gas based on rolling, 12-month summations.
2. To ensure enforceability during the first twelve (12) months of operation following the effective date of this Permit to Install, the permittee shall not exceed the following natural gas usage levels for all 12 production lathes (emissions units P025 and P032-P042):

MONTH(S) FOLLOWING PTI EFFECTIVE DATE	MAXIMUM ALLOWABLE CUMULATIVE FUEL USAGE (mmscf) (natural gas)
1-1	10.0
1-2	11.8
1-3	13.6
1-4	15.5
1-5	17.3
1-6	19.1
1-7	21.0
1-8	22.8
1-9	24.6
1-10	26.5
1-11	28.4
1-12	30.29

After the first 12 calendar months of operation following the effective date of this Permit to Install, the permittee shall comply with the annual natural gas usage limitations based on rolling, 12-month summations.

III Monitoring and/or Recordkeeping

1. The permittee shall perform daily checks, when this 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. the total duration of any visible emission incident; and
 - c. any corrective actions taken to eliminate the visible emissions.

The permittee may reduce the frequency of visual observations for this emissions unit from daily to weekly readings if the following conditions are met:

- a. for 30 days this emissions unit's visual observations indicate no visible emissions; and
- b. the permittee continues to comply with all the record keeping requirements specified in section A.III.1.

The permittee shall revert to daily readings for this emissions unit if any visible emissions are observed. The permittee may again reduce the frequency of visual observations from daily to weekly after obtaining 30 consecutive days of observations with no visible emissions for this emissions unit.

2. The permittee shall maintain monthly records of the following information for emissions units P025 and P032-P042, combined:
 - a. the total natural gas usage;
 - b. the rolling, 12-month natural gas usage;
 - c. the rolling, 12-month NO_x emissions.

Also, during the first 12 calendar months of operation, after the effective date of this Permit to Install, the permittee shall record the cumulative natural gas usage, for all production lathes (emissions units P025 and P032-P042), combined.

Total NO_x monthly emissions, in tons, resulting from the natural gas usage in all production lathes (emissions units P025 and P032-P042), combined, shall be calculated using the following equation:

$$\text{NO}_x, \text{ in tons} = \frac{\text{total natural gas usage (mmscf/month)} \times 12.09 \text{ lbs/mmBtu}}{1050 \text{ mmBtu/mmscf} \times 1 \text{ ton/2000 lbs}}$$

The emission factor for NO_x is based on a 1998 stack test and equals 12.09 lbs/mmBtu. Including fugitive emissions not captured by local exhaust ventilation (see explanation in A.I.2.c). The natural gas usage is for emissions units P025 and P032 through P042, combined.

The heat content of natural gas = 1050 mmBtu/mmscf.

Monthly results shall be summed to obtain the annual and rolling NO_x emissions.

IV Reporting Requirements

1. The permittee shall submit semiannual written reports that:
 - a. identify all days during which any visible particulate emissions were observed from the stack serving this emissions unit; and
 - b. describe any corrective actions taken to eliminate the visible particulate emissions.

These reports shall be submitted to the Northeast District Office of the Ohio EPA by January 31 and July 31 of each year and shall cover the previous 6-month period.

2. The permittee shall submit quarterly deviation (excursion) reports that identify all exceedances of the following:
 - a. after the first twelve calendar months of operation following the effective date of this Permit to Install, the rolling, 12-month limitations for natural gas fuel usage for all production lathes (emissions units P025 and P032-P042), combined; and
 - b. for the first 12 calendar months of operation following the effective date of this Permit to Install, the monthly allowable cumulative fuel usage for natural gas for all production lathes (emissions units P025 and P032-P042), combined.
3. The permittee shall submit annual reports that specify the total amount of natural gas used and the total amount of NO_x emitted from emissions units P025 and P032-P042 for the previous calendar year by April 15 of the following year.

V Testing Requirements

1. Compliance with the emission limitations in Section A.I.1. of these terms and conditions shall be determined in accordance with the following methods:
 - a. Emission Limitation

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

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Applicable Compliance Method

If required by the Ohio EPA, compliance shall be determined by Method 9, Visible Determination of the Opacity of Emissions from Stationary Sources, 40 CFR Part 60, Appendix A, as specified in OAC rule 3745-17-03(B)(1).

b. Emission Limitation

0.551 pound per hour and 2.4 tons per year of particulate emissions

Applicable Compliance Method

If required by the Ohio EPA, compliance with the hourly particulate emission limit above shall be determined in accordance with OAC rule 3745-17-03 and Method 5 of 40 CFR Part 60, Appendix A.

Because the annual particulate limit was established by multiplying the short-term limit of 0.551 lb/hr by 8,760 hours of operation per year and dividing by 2000 lbs/ton, compliance with the annual limit is assumed provided that compliance with the hourly limit is maintained.

c. Emission Limitation

NO_x emissions shall not exceed 15.23 pounds per hour from this emissions unit, and 194.1 TPY, based on rolling 12-month summations from all production, repair and bench lathes, emissions units P025, P032-P043 combined.

Applicable Compliance Method

If required by the Ohio EPA, compliance with the hourly NO_x emission limitation above, shall be determined by using Method 7 of 40 CFR Part 60, Appendix A.

Compliance with the rolling, 12-month NO_x emission limitation shall be determined using the equations and record keeping in Section A.III.2. and summing the 12-month rolling NO_x emissions from emissions units P025, and P032 through P043.

2. Emissions units P025, P032, P033, P034, P035, and P036 are essentially identical and may be used interchangeably. The permittee shall conduct, or have conducted, emission testing of the

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mass emission rates for particulate emissions and NO_x for one of these 6 emissions units in accordance with the following:

- a. The initial emission testing for NO_x and particulate emissions shall be conducted within 12 months after the effective date of this Permit to Install.

The permittee has demonstrated that all 6 production lathes rated at 1.26 mmBtu/hr (emissions units P025, and P032-P036) are essentially identical in operation, size and capacity, configuration and product line ; therefore; the Ohio EPA is allowing the permittee to test one representative unit, at or near maximum capacity, to demonstrate compliance for each of these 6 emissions units.

- b. The emission testing shall be conducted to determine compliance with the allowable emission rates for particulate emissions and NO_x.

- c. The following test methods from 40 CFR Part 60, Appendix A, shall be employed to determine compliance with the allowable emission rates for particulate and NO_x respectively:

Method 5 " Determination of Particulate Emissions from Stationary Sources" and Method 7 "Determination of Nitrogen Oxide Emissions from Stationary Sources and the requirements of OAC rule 3745-31-05.

- d. The tests shall be conducted while the emissions unit is operating at or near its maximum capacity, unless otherwise specified by the Northeast District of the Ohio EPA.

Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Ohio EPA Northeast District Office and the Lake County General Health District. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person(s) who will be conducting the tests.

Failure to submit such notification for review and approval prior to the tests may result in the Ohio EPA Northeast District Office's refusal to accept the results of the emissions tests.

Personnel from the Ohio EPA Northeast District Office and/or Lake County General Health District shall be permitted to witness the tests, 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.

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Facility ID: 0243160086

Emissions Unit ID: P035

A comprehensive written report of the results of the emissions tests shall be signed by the person or persons responsible for the tests and submitted to the Northeast District Office of the Ohio EPA within 30 days following completion of the tests. The permittee may request additional time for the submittal of the written report, where warranted, with prior approval from the Northeast District Office of the Ohio EPA.

VI Miscellaneous Requirements

None

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B. State Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
P035- Large diameter lathe number 20 (natural gas fired) 1.26 mmBtu/hr; H2 pilot		

2. Additional Terms and Conditions

- 2.a None

II Operational Restrictions

None

III Monitoring and/or Recordkeeping

None

IV Reporting Requirements

None

V Testing Requirements

None

VI Miscellaneous Requirements

GE Q1

PTI A

Emissions Unit ID: P036

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None

Part III - Terms and Conditions for Emissions Units

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

Operations, Property, and/or Equipment	<u>Applicable Rules/Requirements</u>	
P036- Large diameter lathe number 21 (natural gas fired) 1.26 mmBtu/hr; H2 pilot	OAC rule 3745-31-05(A)(3)	OAC rule 3745-31-05(C)
		OAC rule 3745-17-07(A)
		OAC rule 3745-17-11(B)(1)

Emissions Unit ID: P036

OAC rule 3745-18-06(E)

Applicable Emissions
 Limitations/Control Measures

See A.I.2.a.

OAC rule 3745-21-08

See A.I.2.a.

OAC rule 3745-23-06(B)

NOx emissions shall not exceed 15.23 pounds per hour from this emissions unit (The 15.23 pounds per hour limitation is the potential to emit for this emissions unit; therefore, monitoring, record keeping, and reporting requirements are not needed for this emission limitation.)

See A.I.2.b.

See A.I.2.b

The requirements of this rule also include compliance with the requirements of OAC rules 3745-17-07(A), 3745-17-11(B), 3745-18-06, 3745-21-08, and 3745-23-06(B).

The total particulate emissions from the stack serving this emissions unit, shall not exceed 2.4 tons per year.

NOx emissions shall not exceed 194.1 TPY based on rolling 12-month summations for all production, repair and bench lathes (emissions units P025 and P032-P043), combined.

Visible particulate emissions from any stack associated with this emissions unit shall not exceed twenty percent opacity, as a six-minute average, except as provided by rule.

The total particulate emissions from the stack serving this emissions unit, shall not exceed 0.551 pound per hour based on Table I of OAC rule 3745-17-11 (with a maximum process weight rate of 100 pounds per hour).

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2. Additional Terms and Conditions

2.a Because the process weight rate for this individual lathe is less than 1000 lbs per hour, this emissions unit is exempt from the requirements of this rule.

2.b The permittee has satisfied the "best available control techniques and operating practices" required pursuant to OAC rule 3745-21-08(B) by committing to comply with the best available technology requirements established in this Permit to Install.

On November 5, 2002, OAC rule 3745-21-08 was revised to delete paragraph (B); therefore, paragraph (B) is no longer part of the State regulations. However, that rule revision has not yet been submitted to the U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). When the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-21-08, the requirement to satisfy the "best available control techniques and operating practices" will no longer exist as part of the federally-approved SIP for Ohio, and this term and condition will no longer be applicable to this emissions unit.

The permittee has satisfied the "latest available control techniques and operating practices" required pursuant to OAC rule 3745-23-06(B) by committing to comply with the best available technology requirements established pursuant to OAC rule 3745-31-05(A)(3) in this Permit to Install.

2.c The permittee operates a ventilation system intended to vent all emissions from this emissions unit to the stack. However, it is understood that a small fraction of the NO_x formed may not be captured and vented to the stack. The permittee assessed the capture efficiency of the capture hoods and ventilation system on the lathes at the GE Quartz Newark Plant, which is similar to the operation at the Willoughby plant*. NO_x was measured on March 11, 1999 at the general ventilation exhaust vents for the room containing the lathes. The NO_x emissions from the room vents were compared to the calculated NO_x stack emissions for the lathes that were operating on March 11, 1999 (based on representative emission rates from stack testing of the lathes in 1998). The room vent emissions were a very small fraction, 0.21 percent, of the stack emissions. Therefore, the emission factors for the lathes that are based on the 1998 stack tests have been increased by 0.21 percent to account for the small amount of NO_x that may not be captured by the local ventilation system and may be emitted through other room vents.

* The results of this evaluation are described in the report "Emissions Capture Efficiency Assessment for Quartz Crucible Machines and LD Lathes" prepared by Parsons Engineering Science, Inc. (June 1999) submitted to GE Quartz, Inc. Newark Quartz Plant.

This report was sent to Ohio EPA on June 9, 1999.

- 2.d** All particulate emissions from this emissions unit shall be vented to the stack.
- 2.e** This emissions unit is capable of burning only natural gas and hydrogen.

II Operational Restrictions

- 1. The maximum annual fuel usage for this emissions unit and all the production lathes (emissions units P025 and P032-P042), combined, shall not exceed 30.29 million standard cubic feet of natural gas based on rolling, 12-month summations.
- 2. To ensure enforceability during the first twelve (12) months of operation following the effective date of this Permit to Install, the permittee shall not exceed the following natural gas usage levels for all 12 production lathes (emissions units P025 and P032-P042):

MONTH(S) FOLLOWING PTI EFFECTIVE DATE	MAXIMUM ALLOWABLE CUMULATIVE FUEL USAGE (mmscf) (natural gas)
1-1	10.0
1-2	11.8
1-3	13.6
1-4	15.5
1-5	17.3
1-6	19.1
1-7	21.0
1-8	22.8
1-9	24.6
1-10	26.5
1-11	28.4
1-12	30.29

After the first 12 calendar months of operation following the effective date of this Permit to Install, the permittee shall comply with the annual natural gas usage limitations based on rolling, 12-month summations.

III Monitoring and/or Recordkeeping

- 1. The permittee shall perform daily checks, when this 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

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log:

- a. the color of the emissions;
- b. the total duration of any visible emission incident; and
- c. any corrective actions taken to eliminate the visible emissions.

The permittee may reduce the frequency of visual observations for this emissions unit from daily to weekly readings if the following conditions are met:

- a. for 30 days this emissions unit's visual observations indicate no visible emissions; and
- b. the permittee continues to comply with all the record keeping requirements specified in section A.III.1.

The permittee shall revert to daily readings for this emissions unit if any visible emissions are observed. The permittee may again reduce the frequency of visual observations from daily to weekly after obtaining 30 consecutive days of observations with no visible emissions for this emissions unit.

2. The permittee shall maintain monthly records of the following information for emissions units P025 and P032-P042, combined:
 - a. the total natural gas usage;
 - b. the rolling, 12-month natural gas usage;
 - c. the rolling, 12-month NO_x emissions.

Also, during the first 12 calendar months of operation, after the effective date of this Permit to Install, the permittee shall record the cumulative natural gas usage, for all production lathes (emissions units P025 and P032-P042), combined.

Total NO_x monthly emissions, in tons, resulting from the natural gas usage in all production lathes (emissions units P025 and P032-P042), combined, shall be calculated using the following equation:

$$\text{NO}_x, \text{ in tons} = \text{total natural gas usage (mmscf/month)} \times \frac{12.09 \text{ lbs/mmBtu}}{1050 \text{ mmBtu/mmscf}} \times \frac{1 \text{ ton}}{2000 \text{ lbs}}$$

The emission factor for NO_x is based on a 1998 stack test and equals 12.09 lbs/mmBtu. Including fugitive emissions not captured by local exhaust ventilation (see explanation in A.I.2.c). The natural gas usage is for emissions units P025 and P032 through P042, combined.

The heat content of natural gas = 1050 mmBtu/mmscf.

Monthly results shall be summed to obtain the annual and rolling NO_x emissions.

IV Reporting Requirements

1. The permittee shall submit semiannual written reports that:
 - a. identify all days during which any visible particulate emissions were observed from the stack serving this emissions unit; and
 - b. describe any corrective actions taken to eliminate the visible particulate emissions.

These reports shall be submitted to the Northeast District Office of the Ohio EPA by January 31 and July 31 of each year and shall cover the previous 6-month period.

2. The permittee shall submit quarterly deviation (excursion) reports that identify all exceedances of the following:
 - a. after the first twelve calendar months of operation following the effective date of this Permit to Install, the rolling, 12-month limitations for natural gas fuel usage for all production lathes (emissions units P025 and P032-P042), combined; and
 - b. for the first 12 calendar months of operation following the effective date of this Permit to Install, the monthly allowable cumulative fuel usage for natural gas for all production lathes (emissions units P025 and P032-P042), combined.
3. The permittee shall submit annual reports that specify the total amount of natural gas used and the total amount of NO_x emitted from emissions units P025 and P032-P042 for the previous calendar year by April 15 of the following year.

V Testing Requirements

1. Compliance with the emission limitations in Section A.I.1. of these terms and conditions shall be determined in accordance with the following methods:
 - a. Emission Limitation

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

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Applicable Compliance Method

If required by the Ohio EPA, compliance shall be determined by Method 9, Visible Determination of the Opacity of Emissions from Stationary Sources, 40 CFR Part 60, Appendix A, as specified in OAC rule 3745-17-03(B)(1).

b. Emission Limitation

0.551 pound per hour and 2.4 tons per year of particulate emissions

Applicable Compliance Method

If required by the Ohio EPA, compliance with the hourly particulate emission limit above shall be determined in accordance with OAC rule 3745-17-03 and Method 5 of 40 CFR Part 60, Appendix A.

Because the annual particulate limit was established by multiplying the short-term limit of 0.551 lb/hr by 8,760 hours of operation per year and dividing by 2000 lbs/ton, compliance with the annual limit is assumed provided that compliance with the hourly limit is maintained.

c. Emission Limitation

NOx emissions shall not exceed 15.23 pounds per hour from this emissions unit, and 194.1 TPY, based on rolling 12-month summations from all production, repair and bench lathes, emissions units P025, P032-P043 combined.

Applicable Compliance Method

If required by the Ohio EPA, compliance with the hourly NOx emission limitation above, shall be determined by using Method 7 of 40 CFR Part 60, Appendix A.

Compliance with the rolling, 12-month NOx emission limitation shall be determined using the equations and record keeping in Section A.III.2. and summing the 12-month rolling NOx emissions from emissions units P025, and P032 through P043.

2. Emissions units P025, P032, P033, P034, P035, and P036 are essentially identical and may be used interchangeably. The permittee shall conduct, or have conducted, emission testing of the mass emission rates for particulate emissions and NOx for one of these 6 emissions units in

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accordance with the following:

- a. The initial emission testing for NO_x and particulate emissions shall be conducted within 12 months after the effective date of this Permit to Install.

The permittee has demonstrated that all 6 production lathes rated at 1.26 mmBtu/hr (emissions units P025, and P032-P036) are essentially identical in operation, size and capacity, configuration and product line ; therefore; the Ohio EPA is allowing the permittee to test one representative unit, at or near maximum capacity, to demonstrate compliance for each of these 6 emissions units.

- b. The emission testing shall be conducted to determine compliance with the allowable emission rates for particulate emissions and NO_x.
- c. The following test methods from 40 CFR Part 60, Appendix A, shall be employed to determine compliance with the allowable emission rates for particulate and NO_x respectively:

Method 5 " Determination of Particulate Emissions from Stationary Sources" and Method 7 "Determination of Nitrogen Oxide Emissions from Stationary Sources and the requirements of OAC rule 3745-31-05.

- d. The tests shall be conducted while the emissions unit is operating at or near its maximum capacity, unless otherwise specified by the Northeast District of the Ohio EPA.

Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Ohio EPA Northeast District Office and the Lake County General Health District. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person(s) who will be conducting the tests.

Failure to submit such notification for review and approval prior to the tests may result in the Ohio EPA Northeast District Office's refusal to accept the results of the emissions tests.

Personnel from the Ohio EPA Northeast District Office and/or Lake County General Health District shall be permitted to witness the tests, 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.

GE Quartz, Inc. - Willoughby Plant**PTI A****Issued****Facility ID: 0243160086**

Emissions Unit ID: P036

A comprehensive written report of the results of the emissions tests shall be signed by the person or persons responsible for the tests and submitted to the Northeast District Office of the Ohio EPA within 30 days following completion of the tests. The permittee may request additional time for the submittal of the written report, where warranted, with prior approval from the Northeast District Office of the Ohio EPA.

VI Miscellaneous Requirements

None

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B. State Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
P036- Large diameter lathe number 21 (natural gas fired) 1.26 mmBtu/hr; H2 pilot		

2. Additional Terms and Conditions

2.a None

II Operational Restrictions

None

III Monitoring and/or Recordkeeping

None

IV Reporting Requirements

None

V Testing Requirements

None

VI Miscellaneous Requirements

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GE Q1

PTI A

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Emissions Unit ID: P036

None

Issued

Emissions Unit ID: P037

Applicable Emissions
Limitations/Control Measures

See A.I.2.a.

See A.I.2.b.

NOx emissions shall not exceed 26.72 pounds per hour from this emissions unit. (The 26.72 pounds per hour limitation is the potential to emit for this emissions unit; therefore, monitoring, record keeping, and reporting requirements are not needed for this emission limitation.)

See A.I.2.b

The requirements of this rule also include compliance with the requirements of OAC rules 3745-17-07(A), 3745-17-11(B), 3745-18-06, 3745-21-08, and 3745-23-06(B).

The total particulate emissions from the stack serving this emissions unit, shall not exceed 2.4 tons per year.

NOx emissions shall not exceed 194.1 TPY based on rolling 12-month summations for all production, repair and bench lathes (emissions units P025 and P032-P043), combined.

Visible particulate emissions from any stack associated with this emissions unit shall not exceed twenty percent opacity, as a six-minute average, except as provided by rule.

The total particulate emissions from the stack serving this emissions unit, shall not exceed 0.551 pound per hour based on Table I of OAC rule 3745-17-11 (with a maximum process weight rate of 100 pounds per hour).

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2. Additional Terms and Conditions

2.a Because the process weight rate for this individual lathe is less than 1000 lbs per hour, this emissions unit is exempt from the requirements of this rule.

2.b The permittee has satisfied the "best available control techniques and operating practices" required pursuant to OAC rule 3745-21-08(B) by committing to comply with the best available technology requirements established in this Permit to Install.

On November 5, 2002, OAC rule 3745-21-08 was revised to delete paragraph (B); therefore, paragraph (B) is no longer part of the State regulations. However, that rule revision has not yet been submitted to the U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). When the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-21-08, the requirement to satisfy the "best available control techniques and operating practices" will no longer exist as part of the federally-approved SIP for Ohio, and this term and condition will no longer be applicable to this emissions unit.

The permittee has satisfied the "latest available control techniques and operating practices" required pursuant to OAC rule 3745-23-06(B) by committing to comply with the best available technology requirements established pursuant to OAC rule 3745-31-05(A)(3) in this Permit to Install.

2.c The permittee operates a ventilation system intended to vent all emissions from this emissions unit to the stack. However, it is understood that a small fraction of the NO_x formed may not be captured and vented to the stack. The permittee assessed the capture efficiency of the capture hoods and ventilation system on the lathes at the GE Quartz Newark Plant, which is similar to the operation at the Willoughby plant*. NO_x was measured on March 11, 1999 at the general ventilation exhaust vents for the room containing the lathes. The NO_x emissions from the room vents were compared to the calculated NO_x stack emissions for the lathes that were operating on March 11, 1999 (based on representative emission rates from stack testing of the lathes in 1998). The room vent emissions were a very small fraction, 0.21 percent, of the stack emissions. Therefore, the emission factors for the lathes that are based on the 1998 stack tests have been increased by 0.21 percent to account for the small amount of NO_x that may not be captured by the local ventilation system and may be emitted through other room vents.

* The results of this evaluation are described in the report "Emissions Capture Efficiency Assessment for Quartz Crucible Machines and LD Lathes" prepared by Parsons Engineering Science, Inc. (June 1999) submitted to GE Quartz, Inc. Newark Quartz Plant.

This report was sent to Ohio EPA on June 9, 1999.

- 2.d** All particulate emissions from this emissions unit shall be vented to the stack.
- 2.e** This emissions unit is capable of burning only natural gas and hydrogen.

II Operational Restrictions

- 1. The maximum annual fuel usage for this emissions unit and all the production lathes (emissions units P025 and P032-P042), combined, shall not exceed 30.29 million standard cubic feet of natural gas based on rolling, 12-month summations.
- 2. To ensure enforceability during the first twelve (12) months of operation following the effective date of this Permit to Install, the permittee shall not exceed the following natural gas usage levels for all production lathes (emissions units P025 and P032-P042):

MONTH(S) FOLLOWING PTI EFFECTIVE DATE	MAXIMUM ALLOWABLE CUMULATIVE FUEL USAGE (mmscf) (natural gas)
1-1	10.0
1-2	11.8
1-3	13.6
1-4	15.5
1-5	17.3
1-6	19.1
1-7	21.0
1-8	22.8
1-9	24.6
1-10	26.5
1-11	28.4
1-12	30.29

After the first 12 calendar months of operation following the effective date of this Permit to Install, the permittee shall comply with the annual natural gas usage limitations based on rolling, 12-month summations.

III Monitoring and/or Recordkeeping

- 1. The permittee shall perform daily checks, when this 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

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log:

- a. the color of the emissions;
- b. the total duration of any visible emission incident; and
- c. any corrective actions taken to eliminate the visible emissions.

The permittee may reduce the frequency of visual observations for this emissions unit from daily to weekly readings if the following conditions are met:

- a. for 30 days this emissions unit's visual observations indicate no visible emissions; and
- b. the permittee continues to comply with all the record keeping requirements specified in section A.III.1.

The permittee shall revert to daily readings for this emissions unit if any visible emissions are observed. The permittee may again reduce the frequency of visual observations from daily to weekly after obtaining 30 consecutive days of observations with no visible emissions for this emissions unit.

2. The permittee shall maintain monthly records of the following information for emissions units P025 and P032-P042, combined:
 - a. the total natural gas usage;
 - b. the rolling, 12-month natural gas usage;
 - c. the rolling, 12-month NO_x emissions.

Also, during the first 12 calendar months of operation, after the effective date of this Permit to Install, the permittee shall record the cumulative natural gas usage, for all production lathes (emissions units P025 and P032-P042), combined.

Total NO_x monthly emissions, in tons, resulting from the natural gas usage in all production lathes (emissions units P025 and P032-P042), combined, shall be calculated using the following equation:

$$\text{NO}_x, \text{ in tons} = \text{total natural gas usage (mmscf/month)} \times \frac{12.09 \text{ lbs/mmBtu}}{1050 \text{ mmBtu/mmscf}} \times \frac{1 \text{ ton}}{2000 \text{ lbs}}$$

The emission factor for NO_x is based on a 1998 stack test and equals 12.09 lbs/mmBtu. Including fugitive emissions not captured by local exhaust ventilation (see explanation in A.I.2.c). The natural gas usage is for emissions units P025 and P032 through P042, combined.

The heat content of natural gas = 1050 mmBtu/mmscf.

Monthly results shall be summed to obtain the annual and rolling NO_x emissions.

IV Reporting Requirements

1. The permittee shall submit semiannual written reports that:
 - a. identify all days during which any visible particulate emissions were observed from the stack serving this emissions unit; and
 - b. describe any corrective actions taken to eliminate the visible particulate emissions.

These reports shall be submitted to the Northeast District Office of the Ohio EPA by January 31 and July 31 of each year and shall cover the previous 6-month period.

2. The permittee shall submit quarterly deviation (excursion) reports that identify all exceedances of the following:
 - a. after the first twelve calendar months of operation following the effective date of this Permit to Install, the rolling, 12-month limitations for natural gas fuel usage for all production lathes (emissions units P025 and P032-P042), combined; and
 - b. for the first 12 calendar months of operation following the effective date of this Permit to Install, the monthly allowable cumulative fuel usage for natural gas for all production lathes (emissions units P025 and P032-P042), combined.
3. The permittee shall submit annual reports that specify the total amount of natural gas used and the total amount of NO_x emitted from emissions units P025 and P032-P042 for the previous calendar year by April 15 of the following year.

V Testing Requirements

1. Compliance with the emission limitations in Section A.I.1. of these terms and conditions shall be determined in accordance with the following methods:
 - a. Emission Limitation

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

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Applicable Compliance Method

If required by the Ohio EPA, compliance shall be determined by Method 9, Visible Determination of the Opacity of Emissions from Stationary Sources, 40 CFR Part 60, Appendix A, as specified in OAC rule 3745-17-03(B)(1).

b. Emission Limitation

0.551 pound per hour and 2.4 tons per year of particulate emissions

Applicable Compliance Method

If required by the Ohio EPA, compliance with the hourly particulate emission limit above shall be determined in accordance with OAC rule 3745-17-03 and Method 5 of 40 CFR Part 60, Appendix A.

Because the annual particulate limit was established by multiplying the short-term limit of 0.551 lb/hr by 8,760 hours of operation per year and dividing by 2000 lbs/ton, compliance with the annual limit is assumed provided that compliance with the hourly limit is maintained.

c. Emission Limitation

NO_x emissions shall not exceed 26.72 pounds per hour from this emissions unit, and 194.1 TPY, based on rolling 12-month summations from all production, repair and bench lathes, emissions units P025, P032-P043 combined.

Applicable Compliance Method

If required by the Ohio EPA, compliance with the hourly NO_x emission limitation above, shall be determined by using Method 7 of 40 CFR Part 60, Appendix A.

Compliance with the rolling, 12-month NO_x emission limitation shall be determined using the equations and record keeping in Section A.III.2. and summing the 12-month rolling NO_x emissions from emissions units P025, and P032 through P043.

2. Emissions units P037, P038, P039, P040, P041, and P042 are essentially identical and may be used interchangeably. The permittee shall conduct, or have conducted, emission testing of the mass emission rates for particulate emissions and NO_x for one of these 6 emissions units in

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accordance with the following:

- a. The initial emission testing for NO_x and particulate emissions shall be conducted within 12 months after the effective date of this Permit to Install.

The permittee has demonstrated that all 6 production lathes rated at 2.21 mmBtu/hr (emissions units P037 through P042) are essentially identical in operation, size and capacity, configuration and product line ; therefore; the Ohio EPA is allowing the permittee to test one representative unit, at or near maximum capacity, to demonstrate compliance for each of these 6 emissions units.

- b. The emission testing shall be conducted to determine compliance with the allowable emission rates for particulate emissions and NO_x.
- c. The following test methods from 40 CFR Part 60, Appendix A, shall be employed to determine compliance with the allowable emission rates for particulate and NO_x respectively:

Method 5 " Determination of Particulate Emissions from Stationary Sources" and Method 7 "Determination of Nitrogen Oxide Emissions from Stationary Sources and the requirements of OAC rule 3745-31-05.

- d. The tests shall be conducted while the emissions unit is operating at or near its maximum capacity, unless otherwise specified by the Northeast District of the Ohio EPA.

Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Ohio EPA Northeast District Office and the Lake County General Health District. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person(s) who will be conducting the tests.

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Emissions Unit ID: P037

Failure to submit such notification for review and approval prior to the tests may result in the Ohio EPA Northeast District Office's refusal to accept the results of the emissions tests.

Personnel from the Ohio EPA Northeast District Office and/or Lake County General Health District shall be permitted to witness the tests, 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.

A comprehensive written report of the results of the emissions tests shall be signed by the person or persons responsible for the tests and submitted to the Northeast District Office of the Ohio EPA within 30 days following completion of the tests. The permittee may request additional time for the submittal of the written report, where warranted, with prior approval from the Northeast District Office of the Ohio EPA.

VI Miscellaneous Requirements

None

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B. State Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
P037- Large diameter lathe number 22 (natural gas fired) 1.26 mmBtu/hr; H2 pilot		

2. Additional Terms and Conditions

- 2.a None

II Operational Restrictions

None

III Monitoring and/or Recordkeeping

None

IV Reporting Requirements

None

V Testing Requirements

None

VI Miscellaneous Requirements

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None

Part III - Terms and Conditions for Emissions Units

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

Operations, Property, <u>and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	
P038- Large diameter lathe number 23 (natural gas fired) 2.21 mmBtu/hr; H2 pilot	OAC rule 3745-31-05(A)(3)	OAC rule 3745-31-05(C)
		OAC rule 3745-17-07(A)
		OAC rule 3745-17-11(B)(1)

	Applicable Emissions <u>Limitations/Control Measures</u>	per hour).
OAC rule 3745-18-06(E)	NOx emissions shall not exceed	See A.I.2.a.
OAC rule 3745-21-08	26.72 pounds per hour from this	See A.I.2.b.
OAC rule 3745-23-06(B)	emissions unit (The 26.72 pounds	See A.I.2.b.
	per hour limitation is the potential to	
	emit for this emissions unit;	
	therefore, monitoring, record	
	keeping, and reporting requirements	
	are not needed for this emission	
	limitation.)	
	The requirements of this rule also	
	include compliance with the	
	requirements of OAC rules 3745-	
	17-07(A), 3745-17-11(B), 3745-18-	
	06, 3745-21-08, and 3745-23-	
	06(B).	
	The total particulate emissions from	
	the stack serving this emissions	
	unit, shall not exceed 2.4 tons per	
	year.	
	NOx emissions shall not exceed	
	194.1 TPY based on rolling 12-	
	month summations for all	
	production, repair and bench lathes	
	(emissions units P025 and P032-	
	P043), combined.	
	Visible particulate emissions from	
	any stack associated with this	
	emissions unit shall not exceed	
	twenty percent opacity, as a six-	
	minute average, except as provided	
	by rule.	
	The total particulate emissions from	
	the stack serving this emissions unit,	
	shall not exceed 0.551 pound per	
	hour based on Table I of OAC rule	
	3745-17-11 (with a maximum	
	process weight rate of 100 pounds	

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2. Additional Terms and Conditions

2.a Because the process weight rate for this individual lathe is less than 1000 lbs per hour, this emissions unit is exempt from the requirements of this rule.

2.b The permittee has satisfied the "best available control techniques and operating practices" required pursuant to OAC rule 3745-21-08(B) by committing to comply with the best available technology requirements established in this Permit to Install.

On November 5, 2002, OAC rule 3745-21-08 was revised to delete paragraph (B); therefore, paragraph (B) is no longer part of the State regulations. However, that rule revision has not yet been submitted to the U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). When the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-21-08, the requirement to satisfy the "best available control techniques and operating practices" will no longer exist as part of the federally-approved SIP for Ohio, and this term and condition will no longer be applicable to this emissions unit.

The permittee has satisfied the "latest available control techniques and operating practices" required pursuant to OAC rule 3745-23-06(B) by committing to comply with the best available technology requirements established pursuant to OAC rule 3745-31-05(A)(3) in this Permit to Install.

2.c The permittee operates a ventilation system intended to vent all emissions from this emissions unit to the stack. However, it is understood that a small fraction of the NO_x formed may not be captured and vented to the stack. The permittee assessed the capture efficiency of the capture hoods and ventilation system on the lathes at the GE Quartz Newark Plant, which is similar to the operation at the Willoughby plant*. NO_x was measured on March 11, 1999 at the general ventilation exhaust vents for the room containing the lathes. The NO_x emissions from the room vents were compared to the calculated NO_x stack emissions for the lathes that were operating on March 11, 1999 (based on representative emission rates from stack testing of the lathes in 1998). The room vent emissions were a very small fraction, 0.21 percent, of the stack emissions. Therefore, the emission factors for the lathes that are based on the 1998 stack tests have been increased by 0.21 percent to account for the small amount of NO_x that may not be captured by the local ventilation system and may be emitted through other room vents.

* The results of this evaluation are described in the report "Emissions Capture Efficiency Assessment for Quartz Crucible Machines and LD Lathes" prepared by Parsons Engineering Science, Inc. (June 1999) submitted to GE Quartz, Inc. Newark Quartz Plant.

This report was sent to Ohio EPA on June 9, 1999.

- 2.d** All particulate emissions from this emissions unit shall be vented to the stack.
- 2.e** This emissions unit is capable of burning only natural gas and hydrogen.

II Operational Restrictions

- The maximum annual fuel usage for this emissions unit and all the production lathes (emissions units P025 and P032-P042), combined, shall not exceed 30.29 million standard cubic feet of natural gas based on rolling, 12-month summations.
- To ensure enforceability during the first twelve (12) months of operation following the effective date of this Permit to Install, the permittee shall not exceed the following natural gas usage levels for all 12 production lathes (emissions units P025 and P032-P042):

MONTH(S) FOLLOWING PTI EFFECTIVE DATE	MAXIMUM ALLOWABLE CUMULATIVE FUEL USAGE (mmscf) (natural gas)
1-1	10.0
1-2	11.8
1-3	13.6
1-4	15.5
1-5	17.3
1-6	19.1
1-7	21.0
1-8	22.8
1-9	24.6
1-10	26.5
1-11	28.4
1-12	30.29

After the first 12 calendar months of operation following the effective date of this Permit to Install, the permittee shall comply with the annual natural gas usage limitations based on rolling, 12-month summations.

III Monitoring and/or Recordkeeping

- The permittee shall perform daily checks, when this 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

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log:

- a. the color of the emissions;
- b. the total duration of any visible emission incident; and
- c. any corrective actions taken to eliminate the visible emissions.

The permittee may reduce the frequency of visual observations for this emissions unit from daily to weekly readings if the following conditions are met:

- a. for 30 days this emissions unit's visual observations indicate no visible emissions; and
- b. the permittee continues to comply with all the record keeping requirements specified in section A.III.1.

The permittee shall revert to daily readings for this emissions unit if any visible emissions are observed. The permittee may again reduce the frequency of visual observations from daily to weekly after obtaining 30 consecutive days of observations with no visible emissions for this emissions unit.

2. The permittee shall maintain monthly records of the following information for emissions units P025 and P032-P042, combined:
 - a. the total natural gas usage;
 - b. the rolling, 12-month natural gas usage;
 - c. the rolling, 12-month NO_x emissions.

Also, during the first 12 calendar months of operation, after the effective date of this Permit to Install, the permittee shall record the cumulative natural gas usage, for all production lathes (emissions units P025 and P032-P042), combined.

Total NO_x monthly emissions, in tons, resulting from the natural gas usage in all production lathes (emissions units P025 and P032-P042), combined, shall be calculated using the following equation:

$$\text{NO}_x, \text{ in tons} = \text{total natural gas usage (mmscf/month)} \times 12.09 \text{ lbs/mmBtu} \times \frac{1}{1050 \text{ mmBtu/mmscf}} \times 1 \text{ ton/2000 lbs}$$

The emission factor for NO_x is based on a 1998 stack test and equals 12.09 lbs/mmBtu. Including fugitive emissions not captured by local exhaust ventilation (see explanation in A.I.2.c). The natural gas usage is for emissions units P025 and P032 through P042, combined.

The heat content of natural gas = 1050 mmBtu/mmscf.

Monthly results shall be summed to obtain the annual and rolling NO_x emissions.

IV Reporting Requirements

1. The permittee shall submit semiannual written reports that:
 - a. identify all days during which any visible particulate emissions were observed from the stack serving this emissions unit; and
 - b. describe any corrective actions taken to eliminate the visible particulate emissions.

These reports shall be submitted to the Northeast District Office of the Ohio EPA by January 31 and July 31 of each year and shall cover the previous 6-month period.

2. The permittee shall submit quarterly deviation (excursion) reports that identify all exceedances of the following:
 - a. after the first twelve calendar months of operation following the effective date of this Permit to Install, the rolling, 12-month limitations for natural gas fuel usage for all production lathes (emissions units P025 and P032-P042), combined; and
 - b. for the first 12 calendar months of operation following the effective date of this Permit to Install, the monthly allowable cumulative fuel usage for natural gas for all production lathes (emissions units P025 and P032-P042), combined.
3. The permittee shall submit annual reports that specify the total amount of natural gas used and the total amount of NO_x emitted from emissions units P025 and P032-P042 for the previous calendar year by April 15 of the following year.

V Testing Requirements

1. Compliance with the emission limitations in Section A.I.1. of these terms and conditions shall be determined in accordance with the following methods:
 - a. Emission Limitation

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

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Applicable Compliance Method

If required by the Ohio EPA, compliance shall be determined by Method 9, Visible Determination of the Opacity of Emissions from Stationary Sources, 40 CFR Part 60, Appendix A, as specified in OAC rule 3745-17-03(B)(1).

b. Emission Limitation

0.551 pound per hour and 2.4 tons per year of particulate emissions

Applicable Compliance Method

If required by the Ohio EPA, compliance with the hourly particulate emission limit above shall be determined in accordance with OAC rule 3745-17-03 and Method 5 of 40 CFR Part 60, Appendix A.

Because the annual particulate limit was established by multiplying the short-term limit of 0.551 lb/hr by 8,760 hours of operation per year and dividing by 2000 lbs/ton, compliance with the annual limit is assumed provided that compliance with the hourly limit is maintained.

c. Emission Limitation

NO_x emissions shall not exceed 26.72 pounds per hour from this emissions unit, and 194.1 TPY, based on rolling 12-month summations from all production, repair and bench lathes, emissions units P025, P032-P043 combined.

Applicable Compliance Method

If required by the Ohio EPA, compliance with the hourly NO_x emission limitation above, shall be determined by using Method 7 of 40 CFR Part 60, Appendix A.

Compliance with the rolling, 12-month NO_x emission limitation shall be determined using the equations and record keeping in Section A.III.2. and summing the 12-month rolling NO_x emissions from emissions units P025, and P032 through P043.

2. Emissions units P037, P038, P039, P040, P041, and P042 are essentially identical and may be used interchangeably. The permittee shall conduct, or have conducted, emission testing of the mass emission rates for particulate emissions and NO_x for one of these 6 emissions units in

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accordance with the following:

- a. The initial emission testing for NO_x and particulate emissions shall be conducted within 12 months after the effective date of this Permit to Install.

The permittee has demonstrated that all 6 production lathes rated at 2.21 mmBtu/hr (emissions units P037 through P042) are essentially identical in operation, size and capacity, configuration and product line ; therefore; the Ohio EPA is allowing the permittee to test one representative unit, at or near maximum capacity, to demonstrate compliance for each of these 6 emissions units.

- b. The emission testing shall be conducted to determine compliance with the allowable emission rates for particulate emissions and NO_x.
- c. The following test methods from 40 CFR Part 60, Appendix A, shall be employed to determine compliance with the allowable emission rates for particulate and NO_x respectively:

Method 5 " Determination of Particulate Emissions from Stationary Sources" and Method 7 "Determination of Nitrogen Oxide Emissions from Stationary Sources and the requirements of OAC rule 3745-31-05.

- d. The tests shall be conducted while the emissions unit is operating at or near its maximum capacity, unless otherwise specified by the Northeast District of the Ohio EPA.

Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Ohio EPA Northeast District Office and the Lake County General Health District. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person(s) who will be conducting the tests.

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Emissions Unit ID: P038

Failure to submit such notification for review and approval prior to the tests may result in the Ohio EPA Northeast District Office's refusal to accept the results of the emissions tests.

Personnel from the Ohio EPA Northeast District Office and/or Lake County General Health District shall be permitted to witness the tests, 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.

A comprehensive written report of the results of the emissions tests shall be signed by the person or persons responsible for the tests and submitted to the Northeast District Office of the Ohio EPA within 30 days following completion of the tests. The permittee may request additional time for the submittal of the written report, where warranted, with prior approval from the Northeast District Office of the Ohio EPA.

VI Miscellaneous Requirements

None

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B. State Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
P038- Large diameter lathe number 23 (natural gas fired) 2.21 mmBtu/hr; H2 pilot		

2. Additional Terms and Conditions

2.a None

II Operational Restrictions

None

III Monitoring and/or Recordkeeping

None

IV Reporting Requirements

None

V Testing Requirements

None

VI Miscellaneous Requirements

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None

Part III - Terms and Conditions for Emissions Units

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

Operations, Property, <u>and/or Equipment</u>	Applicable Rules/Requirements	
P039- Large diameter lathe number 24 (natural gas fired) 2.21 mmBtu/hr; H2 pilot	OAC rule 3745-31-05(A)(3)	OAC rule 3745-31-05(C)
		OAC rule 3745-17-07(A)
		OAC rule 3745-17-11(B)(1)

Emissions Unit ID: P039

	Applicable Emissions <u>Limitations/Control Measures</u>	per hour).
OAC rule 3745-18-06(E)		See A.I.2.a.
OAC rule 3745-21-08	NOx emissions shall not exceed	See A.I.2.b.
	26.72 pounds per hour from this	
OAC rule 3745-23-06(B)	emissions unit. (The 26.72 pounds	See A.I.2.b
	per hour limitation is the potential to	
	emit for this emissions unit;	
	therefore, monitoring, record	
	keeping, and reporting requirements	
	are not needed for this emission	
	limitation.)	
	The requirements of this rule also	
	include compliance with the	
	requirements of OAC rules	
	3745-31-05(C) , 3745-17-07(A),	
	3745-17-11(B), 3745-18-06, 3745-	
	21-08, and 3745-23-06(B).	
	The total particulate emissions from	
	the stack serving this emissions	
	unit, shall not exceed 2.4 tons per	
	year.	
	NOx emissions shall not exceed	
	194.1 TPY based on rolling 12-	
	month summations for all	
	production, repair and bench lathes	
	(emissions units P025 and P032-	
	P043), combined.	
	Visible particulate emissions from	
	any stack associated with this	
	emissions unit shall not exceed	
	twenty percent opacity, as a six-	
	minute average, except as provided	
	by rule.	
	The total particulate emissions from	
	the stack serving this emissions unit,	
	shall not exceed 0.551 pound per	
	hour based on Table I of OAC rule	
	3745-17-11 (with a maximum	
	process weight rate of 100 pounds	

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2. Additional Terms and Conditions

2.a Because the process weight rate for this individual lathe is less than 1000 lbs per hour, this emissions unit is exempt from the requirements of this rule.

2.b The permittee has satisfied the "best available control techniques and operating practices" required pursuant to OAC rule 3745-21-08(B) by committing to comply with the best available technology requirements established in this Permit to Install.

On November 5, 2002, OAC rule 3745-21-08 was revised to delete paragraph (B); therefore, paragraph (B) is no longer part of the State regulations. However, that rule revision has not yet been submitted to the U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). When the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-21-08, the requirement to satisfy the "best available control techniques and operating practices" will no longer exist as part of the federally-approved SIP for Ohio, and this term and condition will no longer be applicable to this emissions unit.

The permittee has satisfied the "latest available control techniques and operating practices" required pursuant to OAC rule 3745-23-06(B) by committing to comply with the best available technology requirements established pursuant to OAC rule 3745-31-05(A)(3) in this Permit to Install.

2.c The permittee operates a ventilation system intended to vent all emissions from this emissions unit to the stack. However, it is understood that a small fraction of the NO_x formed may not be captured and vented to the stack. The permittee assessed the capture efficiency of the capture hoods and ventilation system on the lathes at the GE Quartz Newark Plant, which is similar to the operation at the Willoughby plant*. NO_x was measured on March 11, 1999 at the general ventilation exhaust vents for the room containing the lathes. The NO_x emissions from the room vents were compared to the calculated NO_x stack emissions for the lathes that were operating on March 11, 1999 (based on representative emission rates from stack testing of the lathes in 1998). The room vent emissions were a very small fraction, 0.21 percent, of the stack emissions. Therefore, the emission factors for the lathes that are based on the 1998 stack tests have been increased by 0.21 percent to account for the small amount of NO_x that may not be captured by the local ventilation system and may be emitted through other room vents.

* The results of this evaluation are described in the report "Emissions Capture Efficiency Assessment for Quartz Crucible Machines and LD Lathes" prepared by Parsons Engineering Science, Inc. (June 1999) submitted to GE Quartz, Inc. Newark Quartz Plant.

This report was sent to Ohio EPA on June 9, 1999.

- 2.d** All particulate emissions from this emissions unit shall be vented to the stack.
- 2.e** This emissions unit is capable of burning only natural gas and hydrogen.

II Operational Restrictions

- The maximum annual fuel usage for this emissions unit and all the production lathes (emissions units P025 and P032-P042), combined, shall not exceed 30.29 million standard cubic feet of natural gas based on rolling, 12-month summations.
- To ensure enforceability during the first twelve (12) months of operation following the effective date of this Permit to Install, the permittee shall not exceed the following natural gas usage levels for all 12 production lathes (emissions units P025 and P032-P042):

MONTH(S) FOLLOWING PTI EFFECTIVE DATE	MAXIMUM ALLOWABLE CUMULATIVE FUEL USAGE (mmscf) (natural gas)
1-1	10.0
1-2	11.8
1-3	13.6
1-4	15.5
1-5	17.3
1-6	19.1
1-7	21.0
1-8	22.8
1-9	24.6
1-10	26.5
1-11	28.4
1-12	30.29

After the first 12 calendar months of operation following the effective date of this Permit to Install, the permittee shall comply with the annual natural gas usage limitations based on rolling, 12-month summations.

III Monitoring and/or Recordkeeping

- The permittee shall perform daily checks, when this 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

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log:

- a. the color of the emissions;
- b. the total duration of any visible emission incident; and
- c. any corrective actions taken to eliminate the visible emissions.

The permittee may reduce the frequency of visual observations for this emissions unit from daily to weekly readings if the following conditions are met:

- a. for 30 days this emissions unit's visual observations indicate no visible emissions; and
- b. the permittee continues to comply with all the record keeping requirements specified in section A.III.1.

The permittee shall revert to daily readings for this emissions unit if any visible emissions are observed. The permittee may again reduce the frequency of visual observations from daily to weekly after obtaining 30 consecutive days of observations with no visible emissions for this emissions unit.

2. The permittee shall maintain monthly records of the following information for emissions units P025 and P032-P042, combined:
 - a. the total natural gas usage;
 - b. the rolling, 12-month natural gas usage;
 - c. the rolling, 12-month NO_x emissions.

Also, during the first 12 calendar months of operation, after the effective date of this Permit to Install, the permittee shall record the cumulative natural gas usage, for all production lathes (emissions units P025 and P032-P042), combined.

Total NO_x monthly emissions, in tons, resulting from the natural gas usage in all production lathes (emissions units P025 and P032-P042), combined, shall be calculated using the following equation:

$$\text{NO}_x, \text{ in tons} = \text{total natural gas usage (mmscf/month)} \times \frac{12.09 \text{ lbs/mmBtu}}{1050 \text{ mmBtu/mmscf}} \times \frac{1 \text{ ton}}{2000 \text{ lbs}}$$

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The emission factor for NO_x is based on a 1998 stack test and equals 12.09 lbs/mmBtu. Including fugitive emissions not captured by local exhaust ventilation (see explanation in A.I.2.c). The natural gas usage is for emissions units P025 and P032 through P042, combined.

The heat content of natural gas = 1050 mmBtu/mmscf.

Monthly results shall be summed to obtain the annual and rolling NO_x emissions.

IV Reporting Requirements

1. The permittee shall submit semiannual written reports that:
 - a. identify all days during which any visible particulate emissions were observed from the stacks serving this emissions unit; and
 - b. describe any corrective actions taken to eliminate the visible particulate emissions.

These reports shall be submitted to the Northeast District Office of the Ohio EPA by January 31 and July 31 of each year and shall cover the previous 6-month period.

2. The permittee shall submit quarterly deviation (excursion) reports that identify all exceedances of the following:
 - a. after the first twelve calendar months of operation following the effective date of this Permit to Install, the rolling, 12-month limitations for natural gas fuel usage for all production lathes (emissions units P025 and P032-P042), combined; and

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- b. for the first 12 calendar months of operation following the effective date of this Permit to Install, the monthly allowable cumulative fuel usage for natural gas for all production lathes (emissions units P025 and P032-P042), combined.
3. The permittee shall submit annual reports that specify the total amount of natural gas used and the total amount of NO_x emitted from emissions units P025 and P032-P042 for the previous calendar year by April 15 of the following year.

V Testing Requirements

1. Compliance with the emission limitations in Section A.I.1. of these terms and conditions shall be determined in accordance with the following methods:

- a. Emission Limitation

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

Applicable Compliance Method

If required by the Ohio EPA, compliance shall be determined by Method 9, Visible Determination of the Opacity of Emissions from Stationary Sources, 40 CFR Part 60, Appendix A, as specified in OAC rule 3745-17-03(B)(1).

- b. Emission Limitation

0.551 pound per hour and 2.4 tons per year of particulate emissions

Applicable Compliance Method

If required by the Ohio EPA, compliance with the hourly particulate emission limit above shall be determined in accordance with OAC rule 3745-17-03 and Method 5 of 40 CFR Part 60, Appendix A.

Because the annual particulate limit was established by multiplying the short-term limit of 0.551 lb/hr by 8,760 hours of operation per year and dividing by 2000 lbs/ton, compliance with the annual limit is assumed provided that compliance with the hourly limit is maintained.

- c. Emission Limitation

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NOx emissions shall not exceed 26.72 pounds per hour from this emissions unit, and 194.1 TPY, based on rolling 12-month summations from all production, repair and bench lathes, emissions units P025, P032-P043 combined.

Applicable Compliance Method

If required by the Ohio EPA, compliance with the hourly NOx emission limitation above, shall be determined by using Method 7 of 40 CFR Part 60, Appendix A.

Compliance with the rolling, 12-month NOx emission limitation shall be determined using the equations and record keeping in Section A.III.2. and summing the 12-month rolling NOx emissions from emissions units P025, and P032 through P043.

2. Emissions units P037, P038, P039, P040, P041, and P042 are essentially identical and may be used interchangeably. The permittee shall conduct, or have conducted, emission testing of the mass emission rates for particulate emissions and NOx for one of these 6 emissions units in accordance with the following:
 - a. The initial emission testing for NOx and particulate emissions shall be conducted within 12 months after the effective date of this Permit to Install.

The permittee has demonstrated that all 6 production lathes rated at 2.21 mmBtu/hr (emissions units P037 through P042) are essentially identical in operation, size and capacity, configuration and product line ; therefore; the Ohio EPA is allowing the permittee to test one representative unit, at or near maximum capacity, to demonstrate compliance for each of these 6 emissions units.

- b. The emission testing shall be conducted to determine compliance with the allowable emission rates for particulate emissions and NOx.
- c. The following test methods from 40 CFR Part 60, Appendix A, shall be employed to determine compliance with the allowable emission rates for particulate and NOx respectively:

Method 5 " Determination of Particulate Emissions from Stationary Sources" and Method 7 "Determination of Nitrogen Oxide Emissions from Stationary Sources and the requirements of OAC rule 3745-31-05.

- d. The tests shall be conducted while the emissions unit is operating at or near its maximum

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capacity, unless otherwise specified by the Northeast District of the Ohio EPA.

Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Ohio EPA Northeast District Office and the Lake County General Health District. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person(s) who will be conducting the tests.

Failure to submit such notification for review and approval prior to the tests may result in the Ohio EPA Northeast District Office's refusal to accept the results of the emissions tests.

Personnel from the Ohio EPA Northeast District Office and/or Lake County General Health District shall be permitted to witness the tests, 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.

A comprehensive written report of the results of the emissions tests shall be signed by the person or persons responsible for the tests and submitted to the Northeast District Office of the Ohio EPA within 30 days following completion of the tests. The permittee may request additional time for the submittal of the written report, where warranted, with prior approval from the Northeast District Office of the Ohio EPA.

VI Miscellaneous Requirements

None

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B. State Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
P039- Large diameter lathe number 24 (natural gas fired) 2.21 mmBtu/hr; H2 pilot		

2. Additional Terms and Conditions

None

II Operational Restrictions

None

III Monitoring and/or Recordkeeping

None

IV Reporting Requirements

None

V Testing Requirements

None

VI Miscellaneous Requirements

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None

Part III - Terms and Conditions for Emissions Units

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>
P040- Large diameter lathe number 25 (natural gas fired) 2.21 mmBtu/hr; H2 pilot	OAC rule 3745-31-05(A)
	OAC rule 3745-31-05(C)
	OAC rule 3745-17-07(A)
	OAC rule 3745-17-11(B)(1)

Emissions Unit ID: P040

	Applicable Emissions <u>Limitations/Control Measures</u>	process weight rate of 100 pounds per hour).
OAC rule 3745-18-06(E)		See A.I.2.a.
OAC rule 3745-21-08	NOx emissions shall not exceed 26.72 pounds per hour from this emissions unit. (The 26.72 pounds per hour limitation is the potential to emit for this emissions unit; therefore, monitoring, record keeping, and reporting requirements are not needed for this emission limitation.)	See A.I.2.b.
OAC rule 3745-23-06(B)	The requirements of this rule also include compliance with the requirements of OAC rules 3745-17-07(A), 3745-17-11(B), 3745-18-06, 3745-21-08, and 3745-23-06(B).	See A.I.2.b.
	The total particulate emissions from the stack serving this emissions unit, shall not exceed 2.4 tons per year.	
	NOx emissions shall not exceed 194.1 TPY based on rolling 12-month summations for all production, repair and bench lathes (emissions units P025 and P032-P043), combined.	
	Visible particulate emissions from any stack associated with this emissions unit shall not exceed twenty percent opacity, as a six-minute average, except as provided by rule.	
	The total particulate emissions from the stack serving this emissions unit, shall not exceed 0.551 pound per hour based on Table I of OAC rule 3745-17-11 (with a maximum	

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2. Additional Terms and Conditions

2.a Because the process weight rate for this individual lathe is less than 1000 lbs per hour, this emissions unit is exempt from the requirements of this rule.

2.b The permittee has satisfied the "best available control techniques and operating practices" required pursuant to OAC rule 3745-21-08(B) by committing to comply with the best available technology requirements established in this Permit to Install.

On November 5, 2002, OAC rule 3745-21-08 was revised to delete paragraph (B); therefore, paragraph (B) is no longer part of the State regulations. However, that rule revision has not yet been submitted to the U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). When the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-21-08, the requirement to satisfy the "best available control techniques and operating practices" will no longer exist as part of the federally-approved SIP for Ohio, and this term and condition will no longer be applicable to this emissions unit.

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The permittee has satisfied the "latest available control techniques and operating practices" required pursuant to OAC rule 3745-23-06(B) by committing to comply with the best available technology requirements established pursuant to OAC rule 3745-31-05(A)(3) in this Permit to Install.

- 2.c** The permittee operates a ventilation system intended to vent all emissions from this emissions unit to the stack. However, it is understood that a small fraction of the NO_x formed may not be captured and vented to the stack. The permittee assessed the capture efficiency of the capture hoods and ventilation system on the lathes at the GE Quartz Newark Plant, which is similar to the operation at the Willoughby plant*. NO_x was measured on March 11, 1999 at the general ventilation exhaust vents for the room containing the lathes. The NO_x emissions from the room vents were compared to the calculated NO_x stack emissions for the lathes that were operating on March 11, 1999 (based on representative emission rates from stack testing of the lathes in 1998). The room vent emissions were a very small fraction, 0.21 percent, of the stack emissions. Therefore, the emission factors for the lathes that are based on the 1998 stack tests have been increased by 0.21 percent to account for the small amount of NO_x that may not be captured by the local ventilation system and may be emitted through other room vents.

* The results of this evaluation are described in the report "Emissions Capture Efficiency Assessment for Quartz Crucible Machines and LD Lathes" prepared by Parsons Engineering Science, Inc. (June 1999) submitted to GE Quartz, Inc. Newark Quartz Plant. This report was sent to Ohio EPA on June 9, 1999.

- 2.d** All particulate emissions from this emissions unit shall be vented to the stack.
- 2.e** This emissions unit is capable of burning only natural gas and hydrogen.

II Operational Restrictions

1. The maximum annual fuel usage for this emissions unit and all the production lathes (emissions units P025 and P032-P042), combined, shall not exceed 30.29 million standard cubic feet of natural gas based on rolling, 12-month summations.
2. To ensure enforceability during the first twelve (12) months of operation following the effective date of this Permit to Install, the permittee shall not exceed the following natural gas usage levels for all 12 production lathes (emissions units P025 and P032-P042):

MONTH(S) FOLLOWING	MAXIMUM ALLOWABLE CUMULATIVE FUEL
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PTI EFFECTIVE DATE	USAGE (mmscf) (natural gas)
1-1	10.0
1-2	11.8
1-3	13.6
1-4	15.5
1-5	17.3
1-6	19.1
1-7	21.0
1-8	22.8
1-9	24.6
1-10	26.5
1-11	28.4
1-12	30.29

After the first 12 calendar months of operation following the effective date of this Permit to Install, the permittee shall comply with the annual natural gas usage limitations based on rolling, 12-month summations.

III Monitoring and/or Recordkeeping

1. The permittee shall perform daily checks, when this 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. the total duration of any visible emission incident; and
 - c. any corrective actions taken to eliminate the visible emissions.

The permittee may reduce the frequency of visual observations for this emissions unit from daily to weekly readings if the following conditions are met:

- a. for 30 days this emissions unit's visual observations indicate no visible emissions; and
- b. the permittee continues to comply with all the record keeping requirements specified in section A.III.1.

The permittee shall revert to daily readings for this emissions unit if any visible emissions are observed. The permittee may again reduce the frequency of visual observations from daily to

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weekly after obtaining 30 consecutive days of observations with no visible emissions for this emissions unit.

2. The permittee shall maintain monthly records of the following information for emissions units P025 and P032-P042, combined:
 - a. the total natural gas usage;
 - b. the rolling, 12-month natural gas usage;
 - c. the rolling, 12-month NO_x emissions.

Also, during the first 12 calendar months of operation, after the effective date of this Permit to Install, the permittee shall record the cumulative natural gas usage, for all production lathes (emissions units P025 and P032-P042), combined.

Total NO_x monthly emissions, in tons, resulting from the natural gas usage in all production lathes (emissions units P025 and P032-P042) (16-27), combined, shall be calculated using the following equation:

$$\text{NO}_x, \text{ in tons} = \frac{\text{total natural gas usage (mmscf/month)} \times 12.09 \text{ lbs/mmBtu}}{1050 \text{ mmBtu/mmscf} \times 1 \text{ ton/2000 lbs}}$$

The emission factor for NO_x is based on a 1998 stack test and equals 12.09 lbs/mmBtu. Including fugitive emissions not captured by local exhaust ventilation (see explanation in A.I.2.c). The natural gas usage is for emissions units P025 and P032 through P042, combined.

The heat content of natural gas = 1050 mmBtu/mmscf.

Monthly results shall be summed to obtain the annual and rolling NO_x emissions.

IV Reporting Requirements

1. The permittee shall submit semiannual written reports that:
 - a. identify all days during which any visible particulate emissions were observed from the stack serving this emissions unit; and
 - b. describe any corrective actions taken to eliminate the visible particulate emissions.

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These reports shall be submitted to the Northeast District Office of the Ohio EPA by January 31 and July 31 of each year and shall cover the previous 6-month period.

2. The permittee shall submit quarterly deviation (excursion) reports that identify all exceedances of the following:
 - a. after the first twelve calendar months of operation following the effective date of this Permit to Install, the rolling, 12-month limitations for natural gas fuel usage for all production lathes (emissions units P025 and P032-P042), combined; and
 - b. for the first 12 calendar months of operation following the effective date of this Permit to Install, the monthly allowable cumulative fuel usage for natural gas for all production lathes (emissions units P025 and P032-P042), combined.
3. The permittee shall submit annual reports that specify the total amount of natural gas used and the total amount of NOx emitted from emissions units P025 and P032-P042 for the previous calendar year by April 15 of the following year.

V Testing Requirements

1. Compliance with the emission limitations in Section A.I.1. of these terms and conditions shall be determined in accordance with the following methods:

- a. Emission Limitation

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

Applicable Compliance Method

If required by the Ohio EPA, compliance shall be determined by Method 9, Visible Determination of the Opacity of Emissions from Stationary Sources, 40 CFR Part 60, Appendix A, as specified in OAC rule 3745-17-03(B)(1).

- b. Emission Limitation

0.551 pound per hour and 2.4 tons per year of particulate emissions

Applicable Compliance Method

If required by the Ohio EPA, compliance with the hourly particulate emission limit above shall be determined in accordance with OAC rule 3745-17-03 and Method 5 of 40 CFR Part 60, Appendix A.

Because the annual particulate limit was established by multiplying the short-term limit of

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0.551 lb/hr by 8,760 hours of operation per year and dividing by 2000 lbs/ton, compliance with the annual limit is assumed provided that compliance with the hourly limit is maintained.

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c. Emission Limitation

NO_x emissions shall not exceed 26.72 pounds per hour from this emissions unit, and 194.1 TPY, based on rolling 12-month summations from all production, repair and bench lathes, emissions units P025, P032-P043 combined.

Applicable Compliance Method

If required by the Ohio EPA, compliance with the hourly NO_x emission limitation above, shall be determined by using Method 7 of 40 CFR Part 60, Appendix A.

Compliance with the rolling, 12-month NO_x emission limitation shall be determined using the equations and record keeping in Section A.III.2. and summing the 12-month rolling NO_x emissions from emissions units P025, and P032 through P043.

2. Emissions units P037, P038, P039, P040, P041, and P042 are essentially identical and may be used interchangeably. The permittee shall conduct, or have conducted, emission testing of the mass emission rates for particulate emissions and NO_x for one of these 6 emissions units in accordance with the following:
- a. The initial emission testing for NO_x and particulate emissions shall be conducted within 12 months after the effective date of this Permit to Install.

The permittee has demonstrated that all 6 production lathes rated at 2.21 mmBtu/hr (emissions units P037 through P042) are essentially identical in operation, size and capacity, configuration and product line ; therefore; the Ohio EPA is allowing the permittee to test one representative unit, at or near maximum capacity, to demonstrate compliance for each of these 6 emissions units.
 - b. The emission testing shall be conducted to determine compliance with the allowable emission rates for particulate emissions and NO_x.
 - c. The following test methods from 40 CFR Part 60, Appendix A, shall be employed to determine compliance with the allowable emission rates for particulate and NO_x respectively:

Method 5 " Determination of Particulate Emissions from Stationary Sources" and Method 7 "Determination of Nitrogen Oxide Emissions from Stationary Sources and the requirements of OAC rule 3745-31-05.

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- d. The tests shall be conducted while the emissions unit is operating at or near its maximum capacity, unless otherwise specified by the Northeast District of the Ohio EPA.

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Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Ohio EPA Northeast District Office and the Lake County General Health District. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person(s) who will be conducting the tests.

Failure to submit such notification for review and approval prior to the tests may result in the Ohio EPA Northeast District Office's refusal to accept the results of the emissions tests.

Personnel from the Ohio EPA Northeast District Office and/or Lake County General Health District shall be permitted to witness the tests, 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.

A comprehensive written report of the results of the emissions tests shall be signed by the person or persons responsible for the tests and submitted to the Northeast District Office of the Ohio EPA within 30 days following completion of the tests. The permittee may request additional time for the submittal of the written report, where warranted, with prior approval from the Northeast District Office of the Ohio EPA.

VI Miscellaneous Requirements

None

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B. State Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
P040- Large diameter lathe number 25 (natural gas fired) 2.21 mmBtu/hr; H2 pilot		

2. Additional Terms and Conditions

None

II Operational Restrictions

None

III Monitoring and/or Recordkeeping

None

IV Reporting Requirements

None

V Testing Requirements

None

VI Miscellaneous Requirements

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None

Part III - Terms and Conditions for Emissions Units

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	
P041- Large diameter lathe number 26 (natural gas fired) 2.21 mmBtu/hr; H2 pilot	OAC rule 3745-31-05(A)(3)	OAC rule 3745-31-05(C)
		OAC rule 3745-17-07(A)
		OAC rule 3745-17-11(B)(1)

Emissions Unit ID: P041

	Applicable Emissions <u>Limitations/Control Measures</u>	per hour).
OAC rule 3745-18-06(E)	NOx emissions shall not exceed 26.72 pounds per hour from this emissions unit. (The 26.72 pounds per hour limitation is the potential to emit for this emissions unit; therefore, monitoring, record keeping, and reporting requirements are not needed for this emission limitation.)	See A.I.2.a.
OAC rule 3745-21-08		See A.I.2.b.
OAC rule 3745-23-06(B)		See A.I.2.b.
	<p>The requirements of this rule also include compliance with the requirements of OAC rules 3745-17-07(A), 3745-17-11(B), 3745-18-06, 3745-21-08, and 3745-23-06(B).</p> <p>The total particulate emissions from the stack serving this emissions unit, shall not exceed 2.4 tons per year.</p> <p>NOx emissions shall not exceed 194.1 TPY based on rolling 12-month summations for all production, repair and bench lathes (emissions units P025 and P032-P043), combined.</p> <p>Visible particulate emissions from any stack associated with this emissions unit shall not exceed twenty percent opacity, as a six-minute average, except as provided by rule.</p> <p>The total particulate emissions from the stack serving this emissions unit, shall not exceed 0.551 pound per hour based on Table I of OAC rule 3745-17-11 (with a maximum process weight rate of 100 pounds</p>	

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2. Additional Terms and Conditions

2.a Because the process weight rate for this individual lathe is less than 1000 lbs per hour, this emissions unit is exempt from the requirements of this rule.

2.b The permittee has satisfied the "best available control techniques and operating practices" required pursuant to OAC rule 3745-21-08(B) by committing to comply with the best available technology requirements established in this Permit to Install.

On November 5, 2002, OAC rule 3745-21-08 was revised to delete paragraph (B); therefore, paragraph (B) is no longer part of the State regulations. However, that rule revision has not yet been submitted to the U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). When the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-21-08, the requirement to satisfy the "best available control techniques and operating practices" will no longer exist as part of the federally-approved SIP for Ohio, and this term and condition will no longer be applicable to this emissions unit.

The permittee has satisfied the "latest available control techniques and operating practices" required pursuant to OAC rule 3745-23-06(B) by committing to comply with the best available technology requirements established pursuant to OAC rule 3745-31-05(A)(3) in this Permit to Install.

2.c The permittee operates a ventilation system intended to vent all emissions from this emissions unit to the stack. However, it is understood that a small fraction of the NO_x formed may not be captured and vented to the stack. The permittee assessed the capture efficiency of the capture hoods and ventilation system on the lathes at the GE Quartz Newark Plant, which is similar to the operation at the Willoughby plant*. NO_x was measured on March 11, 1999 at the general ventilation exhaust vents for the room containing the lathes. The NO_x emissions from the room vents were compared to the calculated NO_x stack emissions for the lathes that were operating on March 11, 1999 (based on representative emission rates from stack testing of the lathes in 1998). The room vent emissions were a very small fraction, 0.21 percent, of the stack emissions. Therefore, the emission factors for the lathes that are based on the 1998 stack tests have been increased by 0.21 percent to account for the small amount of NO_x that may not be captured by the local ventilation system and may be emitted through other room vents.

* The results of this evaluation are described in the report "Emissions Capture Efficiency Assessment for Quartz Crucible Machines and LD Lathes" prepared by Parsons Engineering Science, Inc. (June 1999) submitted to GE Quartz, Inc. Newark Quartz Plant.

This report was sent to Ohio EPA on June 9, 1999.

- 2.d** All particulate emissions from this emissions unit shall be vented to the stack.
- 2.e** This emissions unit is capable of burning only natural gas and hydrogen.

II Operational Restrictions

- The maximum annual fuel usage for this emissions unit and all the production lathes (emissions units P025 and P032-P042), combined, shall not exceed 30.29 million standard cubic feet of natural gas based on rolling, 12-month summations.
- To ensure enforceability during the first twelve (12) months of operation following the effective date of this Permit to Install, the permittee shall not exceed the following natural gas usage levels for all 12 production lathes (emissions units P025 and P032-P042):

MONTH(S) FOLLOWING PTI EFFECTIVE DATE	MAXIMUM ALLOWABLE CUMULATIVE FUEL USAGE (mmscf) (natural gas)
1-1	10.0
1-2	11.8
1-3	13.6
1-4	15.5
1-5	17.3
1-6	19.1
1-7	21.0
1-8	22.8
1-9	24.6
1-10	26.5
1-11	28.4
1-12	30.29

After the first 12 calendar months of operation following the effective date of this Permit to Install, the permittee shall comply with the annual natural gas usage limitations based on rolling, 12-month summations.

III Monitoring and/or Recordkeeping

- The permittee shall perform daily checks, when this 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

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log:

- a. the color of the emissions;
- b. the total duration of any visible emission incident; and
- c. any corrective actions taken to eliminate the visible emissions.

The permittee may reduce the frequency of visual observations for this emissions unit from daily to weekly readings if the following conditions are met:

- a. for 30 days this emissions unit's visual observations indicate no visible emissions; and
- b. the permittee continues to comply with all the record keeping requirements specified in section A.III.1.

The permittee shall revert to daily readings for this emissions unit if any visible emissions are observed. The permittee may again reduce the frequency of visual observations from daily to weekly after obtaining 30 consecutive days of observations with no visible emissions for this emissions unit.

2. The permittee shall maintain monthly records of the following information for emissions units P025 and P032-P042, combined:
 - a. the total natural gas usage;
 - b. the rolling, 12-month natural gas usage;
 - c. the rolling, 12-month NO_x emissions.

Also, during the first 12 calendar months of operation, after the effective date of this Permit to Install, the permittee shall record the cumulative natural gas usage, for all production lathes (emissions units P025 and P032-P042), combined.

Total NO_x monthly emissions, in tons, resulting from the natural gas usage in all production lathes (emissions units P025 and P032-P042), combined, shall be calculated using the following equation:

$$\text{NO}_x, \text{ in tons} = \text{total natural gas usage (mmscf/month)} \times \frac{12.09 \text{ lbs/mmBtu}}{1050 \text{ mmBtu/mmscf}} \times \frac{1 \text{ ton}}{2000 \text{ lbs}}$$

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Emissions Unit ID: P041

The emission factor for NO_x is based on a 1998 stack test and equals 12.09 lbs/mmBtu. Including fugitive emissions not captured by local exhaust ventilation (see explanation in A.I.2.c). The natural gas usage is for emissions units P025 and P032 through P042, combined.

The heat content of natural gas = 1050 mmBtu/mmscf.

Monthly results shall be summed to obtain the annual and rolling NO_x emissions.

IV Reporting Requirements

1. The permittee shall submit semiannual written reports that:
 - a. identify all days during which any visible particulate emissions were observed from the stack serving this emissions unit; and
 - b. describe any corrective actions taken to eliminate the visible particulate emissions.

These reports shall be submitted to the Northeast District Office of the Ohio EPA by January 31 and July 31 of each year and shall cover the previous 6-month period.

2. The permittee shall submit quarterly deviation (excursion) reports that identify all exceedances of the following:
 - a. after the first twelve calendar months of operation following the effective date of this Permit to Install, the rolling, 12-month limitations for natural gas fuel usage for all production lathes (emissions units P025 and P032-P042), combined; and

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- b. for the first 12 calendar months of operation following the effective date of this Permit to Install, the monthly allowable cumulative fuel usage for natural gas for all production lathes (emissions units P025 and P032-P042), combined.
3. The permittee shall submit annual reports that specify the total amount of natural gas used and the total amount of NO_x emitted from emissions units P025 and P032-P042 for the previous calendar year by April 15 of the following year.

V Testing Requirements

1. Compliance with the emission limitations in Section A.I.1. of these terms and conditions shall be determined in accordance with the following methods:

- a. Emission Limitation

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

Applicable Compliance Method

If required by the Ohio EPA, compliance shall be determined by Method 9, Visible Determination of the Opacity of Emissions from Stationary Sources, 40 CFR Part 60, Appendix A, as specified in OAC rule 3745-17-03(B)(1).

- b. Emission Limitation

0.551 pound per hour and 2.4 tons per year of particulate emissions

Applicable Compliance Method

If required by the Ohio EPA, compliance with the hourly particulate emission limit above shall be determined in accordance with OAC rule 3745-17-03 and Method 5 of 40 CFR Part 60, Appendix A.

Because the annual particulate limit was established by multiplying the short-term limit of 0.551 lb/hr by 8,760 hours of operation per year and dividing by 2000 lbs/ton, compliance with the annual limit is assumed provided that compliance with the hourly limit is maintained.

- c. Emission Limitation

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NOx emissions shall not exceed , 26.72 pounds per hour from this emissions unit, and 194.1 TPY, based on rolling 12-month summations from all production, repair and bench lathes, emissions units P025, P032-P043 combined.

Applicable Compliance Method

If required by the Ohio EPA, compliance with the hourly NOx emission limitation above, shall be determined by using Method 7 of 40 CFR Part 60, Appendix A.

Compliance with the rolling, 12-month NOx emission limitation shall be determined using the equations and record keeping in Section A.III.2. and summing the 12-month rolling NOx emissions from emissions units P025, and P032 through P043.

2. Emissions units P037, P038, P039, P040, P041, and P042 are essentially identical and may be used interchangeably. The permittee shall conduct, or have conducted, emission testing of the mass emission rates for particulate emissions and NOx for one of these 6 emissions units in accordance with the following:
 - a. The initial emission testing for NOx and particulate emissions shall be conducted within 12 months after the effective date of this Permit to Install.

The permittee has demonstrated that all 6 production lathes rated at 2.21 mmBtu/hr (emissions units P037 through P042) are essentially identical in operation, size and capacity, configuration and product line ; therefore; the Ohio EPA is allowing the permittee to test one representative unit, at or near maximum capacity, to demonstrate compliance for each of these 6 emissions units.
 - c. The following test methods from 40 CFR Part 60, Appendix A, shall be employed to determine compliance with the allowable emission rates for particulate and NOx respectively:

Method 5 " Determination of Particulate Emissions from Stationary Sources" and Method 7 "Determination of Nitrogen Oxide Emissions from Stationary Sources and the requirements of OAC rule 3745-31-05.
 - d. The tests shall be conducted while the emissions unit is operating at or near its maximum capacity, unless otherwise specified by the Northeast District of the Ohio EPA.

Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to

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Emissions Unit ID: P041

Test" notification to the Ohio EPA Northeast District Office and the Lake County General Health District. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person(s) who will be conducting the tests.

Failure to submit such notification for review and approval prior to the tests may result in the Ohio EPA Northeast District Office's refusal to accept the results of the emissions tests.

Personnel from the Ohio EPA Northeast District Office and/or Lake County General Health District shall be permitted to witness the tests, 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.

A comprehensive written report of the results of the emissions tests shall be signed by the person or persons responsible for the tests and submitted to the Northeast District Office of the Ohio EPA within 30 days following completion of the tests. The permittee may request additional time for the submittal of the written report, where warranted, with prior approval from the Northeast District Office of the Ohio EPA.

VI Miscellaneous Requirements

None

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B. State Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
P041- Large diameter lathe number 26 (natural gas fired) 2.21 mmBtu/hr; H2 pilot		

2. Additional Terms and Conditions

None

II Operational Restrictions

None

III Monitoring and/or Recordkeeping

None

IV Reporting Requirements

None

V Testing Requirements

None

VI Miscellaneous Requirements

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None

Part III - Terms and Conditions for Emissions Units

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

Operations, Property, <u>and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	
P042- Large diameter lathe number 27 (natural gas fired) 2.21 mmBtu/hr; H2 pilot	OAC rule 3745-31-05(A)(3)	OAC rule 3745-31-05(C)
		OAC rule 3745-17-07(A)
		OAC rule 3745-17-11(B)(1)

Emissions Unit ID: P042

	<u>Applicable Emissions Limitations/Control Measures</u>	
OAC rule 3745-18-06(E)	NOx emissions shall not exceed 26.72 pounds per hour from this emissions unit. (The 26.72 pounds per hour limitation is the potential to emit for this emissions unit; therefore, monitoring, record keeping, and reporting requirements are not needed for this emission limitation.)	See A.I.2.a.
OAC rule 3745-21-08		See A.I.2.b.
OAC rule 3745-23-06(B)		See A.I.2.b.
	<p>The requirements of this rule also include compliance with the requirements of OAC rules 3745-17-07(A), 3745-17-11(B), 3745-18-06, 3745-21-08, and 3745-23-06(B).</p> <p>The total particulate emissions from the stack serving this emissions unit, shall not exceed 2.4 tons per year.</p> <p>NOx emissions shall not exceed 194.1 TPY based on rolling 12-month summations for all production lathes , repair and bench (emissions units P025 and P032-P043), combined.</p> <p>Visible particulate emissions from any stack associated with this emissions unit shall not exceed twenty percent opacity, as a six-minute average, except as provided by rule.</p> <p>The total particulate emissions from the stack serving this emissions unit, shall not exceed 0.551 pound per hour based on Table I of OAC rule 3745-17-11 (with a maximum process weight rate of 100 pounds per hour).</p>	

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2. Additional Terms and Conditions

2.a Because the process weight rate for this individual lathe is less than 1000 lbs per hour, this emissions unit is exempt from the requirements of this rule.

2.b The permittee has satisfied the "best available control techniques and operating practices" required pursuant to OAC rule 3745-21-08(B) by committing to comply with the best available technology requirements established in this Permit to Install.

On November 5, 2002, OAC rule 3745-21-08 was revised to delete paragraph (B); therefore, paragraph (B) is no longer part of the State regulations. However, that rule revision has not yet been submitted to the U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). When the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-21-08, the requirement to satisfy the "best available control techniques and operating practices" will no longer exist as part of the federally-approved SIP for Ohio, and this term and condition will no longer be applicable to this emissions unit.

The permittee has satisfied the "latest available control techniques and operating practices" required pursuant to OAC rule 3745-23-06(B) by committing to comply with the best available technology requirements established pursuant to OAC rule 3745-31-05(A)(3) in this Permit to Install.

2.c The permittee operates a ventilation system intended to vent all emissions from this emissions unit to the stack. However, it is understood that a small fraction of the NO_x formed may not be captured and vented to the stack. The permittee assessed the capture efficiency of the capture hoods and ventilation system on the lathes at the GE Quartz Newark Plant, which is similar to the operation at the Willoughby plant*. NO_x was measured on March 11, 1999 at the general ventilation exhaust vents for the room containing the lathes. The NO_x emissions from the room vents were compared to the calculated NO_x stack emissions for the lathes that were operating on March 11, 1999 (based on representative emission rates from stack testing of the lathes in 1998). The room vent emissions were a very small fraction, 0.21 percent, of the stack emissions. Therefore, the emission factors for the lathes that are based on the 1998 stack tests have been increased by 0.21 percent to account for the small amount of NO_x that may not be captured by the local ventilation system and may be emitted through other room vents.

* The results of this evaluation are described in the report "Emissions Capture Efficiency Assessment for Quartz Crucible Machines and LD Lathes" prepared by Parsons Engineering Science, Inc. (June 1999) submitted to GE Quartz, Inc. Newark Quartz Plant.

This report was sent to Ohio EPA on June 9, 1999.

- 2.d** All particulate emissions from this emissions unit shall be vented to the stack.
- 2.e** This emissions unit is capable of burning only natural gas and hydrogen.

II Operational Restrictions

- The maximum annual fuel usage for this emissions unit and all the production lathes (emissions units P025 and P032-P042), combined, shall not exceed 30.29 million standard cubic feet of natural gas based on rolling, 12-month summations.
- To ensure enforceability during the first twelve (12) months of operation following the effective date of PTI 02-13174, the permittee shall not exceed the following natural gas usage levels for all 12 production lathes (emissions units P025 and P032-P042):

MONTH(S) FOLLOWING PTI EFFECTIVE DATE	MAXIMUM ALLOWABLE CUMULATIVE FUEL USAGE (mmscf) (natural gas)
1-1	10.0
1-2	11.8
1-3	13.6
1-4	15.5
1-5	17.3
1-6	19.1
1-7	21.0
1-8	22.8
1-9	24.6
1-10	26.5
1-11	28.4
1-12	30.29

After the first 12 calendar months of operation following the effective date of this Permit to Install, the permittee shall comply with the annual natural gas usage limitations based on rolling, 12-month summations.

III Monitoring and/or Recordkeeping

- The permittee shall perform daily checks, when this 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

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log:

- a. the color of the emissions;
- b. the total duration of any visible emission incident; and
- c. any corrective actions taken to eliminate the visible emissions.

The permittee may reduce the frequency of visual observations for this emissions unit from daily to weekly readings if the following conditions are met:

- a. for 30 days this emissions unit's visual observations indicate no visible emissions; and
- b. the permittee continues to comply with all the record keeping requirements specified in section A.III.1.

The permittee shall revert to daily readings for this emissions unit if any visible emissions are observed. The permittee may again reduce the frequency of visual observations from daily to weekly after obtaining 30 consecutive days of observations with no visible emissions for this emissions unit.

2. The permittee shall maintain monthly records of the following information for emissions units P025 and P032-P042, combined:
 - a. the total natural gas usage;
 - b. the rolling, 12-month natural gas usage;
 - c. the rolling, 12-month NO_x emissions.

Also, during the first 12 calendar months of operation, after the effective date of this Permit to Install, the permittee shall record the cumulative natural gas usage, for all production lathes (emissions units P025 and P032-P042), combined.

Total NO_x monthly emissions, in tons, resulting from the natural gas usage in all production lathes (emissions units P025 and P032-P042), combined, shall be calculated using the following equation:

$$\text{NO}_x, \text{ in tons} = \text{total natural gas usage (mmscf/month)} \times \frac{12.09 \text{ lbs/mmBtu}}{1050 \text{ mmBtu/mmscf}} \times \frac{1 \text{ ton}}{2000 \text{ lbs}}$$

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Emissions Unit ID: P042

The emission factor for NO_x is based on a 1998 stack test and equals 12.09 lbs/mmBtu. Including fugitive emissions not captured by local exhaust ventilation (see explanation in A.I.2.c). The natural gas usage is for emissions units P025 and P032 through P042, combined.

The heat content of natural gas = 1050 mmBtu/mmscf.

Monthly results shall be summed to obtain the annual and rolling NO_x emissions.

IV Reporting Requirements

1. The permittee shall submit semiannual written reports that:
 - a. identify all days during which any visible particulate emissions were observed from the stack serving this emissions unit; and
 - b. describe any corrective actions taken to eliminate the visible particulate emissions.

These reports shall be submitted to the Northeast District Office of the Ohio EPA by January 31 and July 31 of each year and shall cover the previous 6-month period.

2. The permittee shall submit quarterly deviation (excursion) reports that identify all exceedances of the following:
 - a. after the first twelve calendar months of operation following the effective date of this Permit to Install, the rolling, 12-month limitations for natural gas fuel usage for all production lathes (emissions units P025 and P032-P042), combined; and

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- b. for the first 12 calendar months of operation following the effective date of this Permit to Install, the monthly allowable cumulative fuel usage for natural gas for all production lathes (emissions units P025 and P032-P042), combined.
3. The permittee shall submit annual reports that specify the total amount of natural gas used and the total amount of NO_x emitted from emissions units P025 and P032-P042, combined for the previous calendar year by April 15 of the following year.

V Testing Requirements

1. Compliance with the emission limitations in Section A.I.1. of these terms and conditions shall be determined in accordance with the following methods:

- a. Emission Limitation

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

Applicable Compliance Method

If required by the Ohio EPA, compliance shall be determined by Method 9, Visible Determination of the Opacity of Emissions from Stationary Sources, 40 CFR Part 60, Appendix A, as specified in OAC rule 3745-17-03(B)(1).

- b. Emission Limitation

0.551 pound per hour and 2.4 tons per year of particulate emissions

Applicable Compliance Method

If required by the Ohio EPA, compliance with the hourly particulate emission limit above shall be determined in accordance with OAC rule 3745-17-03 and Method 5 of 40 CFR Part 60, Appendix A.

Because the annual particulate limit was established by multiplying the short-term limit of 0.551 lb/hr by 8,760 hours of operation per year and dividing by 2000 lbs/ton, compliance with the annual limit is assumed provided that compliance with the hourly limit is maintained.

- c. Emission Limitation

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NOx emissions shall not exceed 26.72 pounds per hour from this emissions unit, and 194.1 TPY, based on rolling 12-month summations from all production, repair and bench lathes, emissions units P025, P032-P043 combined.

Applicable Compliance Method

If required by the Ohio EPA, compliance with the hourly NOx emission limitation above, shall be determined by using Method 7 of 40 CFR Part 60, Appendix A.

Compliance with the rolling, 12-month NOx emission limitation shall be determined using the equations and record keeping in Section A.III.2. and summing the 12-month rolling NOx emissions from emissions units P025, and P032 through P043.

2. Emissions units P037, P038, P039, P040, P041, and P042 are essentially identical and may be used interchangeably. The permittee shall conduct, or have conducted, emission testing of the mass emission rates for particulate emissions and NOx for one of these 6 emissions units in accordance with the following:
 - a. The initial emission testing for NOx and particulate emissions shall be conducted within 12 months after the effective date of this Permit to Install.

The permittee has demonstrated that all 6 production lathes rated at 2.21 mmBtu/hr (emissions units P037 through P042) are essentially identical in operation, size and capacity, configuration and product line ; therefore; the Ohio EPA is allowing the permittee to test one representative unit, at or near maximum capacity, to demonstrate compliance for each of these 6 emissions units.

- b. The emission testing shall be conducted to determine compliance with the allowable emission rates for particulate emissions and NOx.
 - c. The following test methods from 40 CFR Part 60, Appendix A, shall be employed to determine compliance with the allowable emission rates for particulate and NOx respectively:

Method 5 " Determination of Particulate Emissions from Stationary Sources" and Method 7 "Determination of Nitrogen Oxide Emissions from Stationary Sources and the requirements of OAC rule 3745-31-05.

- d. The tests shall be conducted while the emissions unit is operating at or near its maximum

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Emissions Unit ID: P042

capacity, unless otherwise specified by the Northeast District of the Ohio EPA.

Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Ohio EPA Northeast District Office and the Lake County General Health District. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person(s) who will be conducting the tests.

Failure to submit such notification for review and approval prior to the tests may result in the Ohio EPA Northeast District Office's refusal to accept the results of the emissions tests.

Personnel from the Ohio EPA Northeast District Office and/or Lake County General Health District shall be permitted to witness the tests, 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.

A comprehensive written report of the results of the emissions tests shall be signed by the person or persons responsible for the tests and submitted to the Northeast District Office of the Ohio EPA within 30 days following completion of the tests. The permittee may request additional time for the submittal of the written report, where warranted, with prior approval from the Northeast District Office of the Ohio EPA.

VI Miscellaneous Requirements

None

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B. State Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
P042- Large diameter lathe number 27 (natural gas fired) 2.21 mmBtu/hr; H2 pilot		

2. Additional Terms and Conditions

None

II Operational Restrictions

None

III Monitoring and/or Recordkeeping

None

IV Reporting Requirements

None

V Testing Requirements

None

VI Miscellaneous Requirements

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None

Part III - Terms and Conditions for Emissions Units

A. State and Federally Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>
P043-four (4) repair lathes [0.78, 0.58, 0.78 and 0.48 mmBtu/hr each]; and two (2) bench repair lathes (0.02 mmBtu/hr each)	OAC rule 3745-31-05(A)(3)

Emissions Unit ID: P043

	<p style="text-align: center;"><u>Applicable Emissions Limitations/Control Measures</u></p>	
OAC rule 3745-31-05(C)		NOx emissions shall not exceed 194.1 TPY based on rolling 12-month summations for all
	NOx emissions shall not exceed 10.82 pounds per hour and 0.33 lb/hr from all repair lathes combined	production, repair and bench lathes, emissions units P025 and P032-P043, combined.
	and both bench repair lathes, respectively; and 194.1 TPY based	Visible particulate emissions from any stack associated with this
OAC rule 3745-17-07(A)	on rolling 12-month summations for all production, repair and bench	emissions unit shall not exceed twenty percent opacity, as a six-
	lathes, P025 and P032-P043, combined. (The 10.82 pounds per hour and the 0.33 lb/hr limitations	minute average, except as provided by rule.
	are the potentials to emit for the components of this emissions unit;	In accordance with paragraph (B)(11)(e) of OAC rule 3745-17-07,
OAC rule 3745-17-07(B)	therefore, monitoring, record keeping, and reporting requirements	the requirements of OAC rule 3745-17-07(B) shall not apply to this
	are not needed for this emission limitation.)	emissions unit.
	The requirements of this rule also include compliance with the	See A.I.2.g.
OAC rule 3745-17-08(B)	requirements of OAC rule 3745-31-05(C), 3745-17-07(A),	
	3745-17-11(B), 3745-18-06, 3745-21-08, and 3745-23-06(B).	The emission limitation specified by this rule is less stringent than the
OAC rule 3745-17-11(B)(1)		emission limitation established pursuant to OAC rule
	The particulate emissions from each individual lathe in this	3745-31-05(A)(3).
	emissions unit, shall not exceed 0.551 pounds per hour based on	See A.I.2.a.
OAC rule 3745-18-06(E)	Table I of OAC rule 3745-17-11 (with a maximum process weight	See A.I.2.b.
	rate of 100 pounds per hour for each lathe).	See A.I.2.b.
OAC rule 3745-21-08		
	The particulate emissions from each lathe in this emissions	
OAC rule 3745-23-06(B)	unit, shall not exceed 2.41 tons per year.	
	There shall be no visible fugitive particulate emissions from the bench	
	repair lathes.	

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2. Additional Terms and Conditions

- 2.a** Because the process weight rate for each individual lathe is less than 1000 lbs per hour, this emissions unit is exempt from the requirements of this rule.
- 2.b** The permittee has satisfied the "best available control techniques and operating practices" required pursuant to OAC rule 3745-21-08(B) by committing to comply with the best available technology requirements established in this Permit to Install.

On November 5, 2002, OAC rule 3745-21-08 was revised to delete paragraph (B); therefore, paragraph (B) is no longer part of the State regulations. However, that rule revision has not yet been submitted to the U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). When the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-21-08, the requirement to satisfy the "best available control techniques and operating practices" will no longer exist as part of the federally-approved SIP for Ohio, and this term and condition will no longer be applicable to this emissions unit.

The permittee has satisfied the "latest available control techniques and operating practices" required pursuant to OAC rule 3745-23-06(B) by committing to comply with the best available technology requirements established pursuant to OAC rule 3745-31-05(A)(3) in this Permit to Install.

- 2.c** The four repair lathes that are part of this emissions unit are each vented to a stack, and the two bench lathes vent to the room.
- 2.d** The permittee operates a ventilation system intended to vent all emissions from the four repair lathes in this emissions unit to their respective stacks. However, it is understood that a small fraction of the NO_x formed may not be captured and vented to the stack. The permittee assessed the capture efficiency of the capture hoods and ventilation system on the lathes at the GE Quartz Newark Plant, which is similar to the operation at the Willoughby plant*. NO_x was measured on March 11, 1999 at the general ventilation exhaust vents for the room containing the lathes. The NO_x emissions from the room vents were compared to the calculated NO_x stack emissions for the lathes that were operating on March 11, 1999 (based on representative emission rates from stack testing of the lathes in 1998). The room vent emissions were a very small fraction, 0.21 percent, of the stack emissions. Therefore, the emission factors for the lathes that are based on the 1998 stack tests have been increased by 0.21 percent to account for the small amount of NO_x that may not be captured by the local ventilation system and may be emitted through other room vents.

* The results of this evaluation are described in the report "Emissions Capture Efficiency Assessment for Quartz Crucible Machines and LD Lathes" prepared by Parsons Engineering Science, Inc. (June 1999) submitted to GE Quartz, Inc. Newark Quartz Plant. This report was sent to Ohio EPA on June 9, 1999. The NOx emissions from the cooling of the tubes produced on these lathes shall be vented to the stack.

2.e All particulate emissions from the 4 repair lathes shall be vented to the stacks.

2.f This emissions unit is capable of burning only hydrogen.

2.g This facility is not located in an Appendix A area; therefore, in accordance with OAC rule 3745-17-08(A)(1), OAC rule 3745-17-08(B) is not applicable to this emissions unit.

II Operational Restrictions

1. The maximum annual fuel usage for this emissions unit shall not exceed 1.29 million standard cubic feet of hydrogen, based on rolling, 12-month summations.
2. To ensure enforceability during the first twelve (12) months of operation following the effective date of this Permit to Install, the permittee shall not exceed the following hydrogen usage levels for all the combined equipment described above:

MONTH(S) FOLLOWING PTI EFFECTIVE DATE	MAXIMUM ALLOWABLE CUMULATIVE FUEL USAGE (mmscf) (hydrogen)
.	
1-1	0.43
1-2	0.50
1-3	0.58
1-4	0.66
1-5	0.74
1-6	0.82
1-7	0.89
1-8	0.97
1-9	1.05
1-10	1.13
1-11	1.21
1-12	1.29

After the first 12 calendar months of operation following the effective date of this Permit to Install, the permittee shall comply with the annual hydrogen fuel usage limitations based on rolling, 12-month summations.

III Monitoring and/or Recordkeeping

1. The permittee shall perform daily checks, when this emissions unit is in operation and when the

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weather conditions allow, for any visible particulate emissions from the stacks serving the 4 repair lathes and for any visible fugitive particulate emissions from the 2 bench lathes. 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. the total duration of any visible emission incident; and
- c. any corrective actions taken to eliminate the visible emissions.

The permittee may reduce the frequency of visual observations for this emissions unit from daily to weekly readings if the following conditions are met:

- a. for 30 days this emissions unit's visual observations indicate no visible emissions; and
- b. the permittee continues to comply with all the record keeping and monitoring requirements specified in section A.III.1.

The permittee shall revert to daily readings for this emissions unit if any visible emissions are observed. The permittee may again reduce the frequency of visual observations from daily to weekly after obtaining 30 consecutive days of observations with no visible emissions for this emissions unit.

2. The permittee shall maintain monthly records of the following information for this emissions unit:
 - a. the hydrogen usage;
 - b. the rolling, 12-month hydrogen usage;
 - c. the rolling 12-month NO_x emissions from this emissions unit; and
 - d. the rolling 12-month NO_x emissions from all production lathes, and repair and bench lathes (emissions units P025, P032-P043) combined.

Also, during the first 12 calendar months of operation, after the effective date of this Permit to Install, the permittee shall record the cumulative hydrogen fuel usage for this emissions unit for each calendar month.

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Total NOx monthly emissions, in tons, resulting from hydrogen usage from the 2 bench and 4 repair lathes, combined, shall be calculated using the following equation:

$$\text{NOx, in tons} = \frac{\text{total natural gas usage mmscf/month} \times 8.53 \text{ lbs/mmBtu}}{325 \text{ mmBtu/mmscf}} \times 1 \text{ ton/2000 lbs}$$

where:

The emission factor for NOx, based on a 1998 stack test, is 8.53 lbs/mmBtu. See explanation in A.I.2.d.

The hydrogen usage is for the 2 bench and 4 repair lathes, combined.

The heat content of hydrogen = 325 mmBtu/mmscf..

Monthly results for the hydrogen usage shall be summed to obtain the annual and rolling NOx emissions.

IV Reporting Requirements

1. The permittee shall submit semiannual written reports that:
 - a. identify all days during which any visible particulate emissions were observed from the stacks serving the 4 repair lathes and/or the 2 bench lathes; and
 - b. describe any corrective actions taken to eliminate the visible particulate emissions.

These reports shall be submitted to the Northeast District Office of the Ohio EPA by January 31 and July 31 of each year and shall cover the previous 6-month period.
2. The permittee shall submit quarterly deviation (excursion) reports that identify all exceedances of the following:
 - a. after the first 12 calendar months of operation following the effective date of this Permit to Install, the rolling, 12-month limitation for hydrogen usage for all repair and bench lathes (P043);
 - b. for the first 12 calendar months of operation following the effective date of this Permit to Install, the monthly allowable cumulative fuel usage for hydrogen for all repair and bench lathes; (P043).
3. The permittee shall submit annual reports that specify the total amounts of hydrogen and the total amount of NOx emitted from emissions units P025 and P032-P043, combined for the previous calendar year by April 15 of the following year.

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V Testing Requirements

1. Compliance with the emission limitations in Section A.I.1. of these terms and conditions shall be determined in accordance with the following methods:

- a. Emission Limitation

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

Applicable Compliance Method

If required by the Ohio EPA, compliance shall be determined by Method 9, Visible Determination of the Opacity of Emissions from Stationary Sources, 40 CFR Part 60, Appendix A, as specified in OAC rule 3745-17-03(B)(1).

- b. Emission Limitation

The particulate emissions from each individual lathe in this emissions unit, shall not exceed 0.551 pounds per hour based on Table I of OAC rule 3745-17-11 (with a maximum process weight rate of 100 pounds per hour for each lathe).

Applicable Compliance Method

If required by the Ohio EPA, for the repair lathes, compliance with the hourly particulate emission limit above shall be determined in accordance with OAC rule 3745-17-03 and Method 5 of 40 CFR Part 60, Appendix A. If required, for the bench lathes, compliance with the hourly particulate emission limit above shall be determined by material balance or some other method approved by Ohio EPA.

Because the annual particulate limit was established by multiplying the short-term limit of 1.85 lbs/hour by 8760 hours of operation per year and dividing by 2000 lbs/ton, compliance with the annual limit is assumed provided that compliance with the short-term hourly limit is maintained.

- c. Emission Limitation

NOx emissions shall not exceed 10.82 pounds per hour and 0.33 pound per hour from all repair, combined and both bench repair lathes, respectively, from this emissions unit, and 194.1 TPY, based on rolling 12-month summations from all production, repair and bench

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lathes, emissions units P025, P032-P043 combined.

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Applicable Compliance Method

If required by the Ohio EPA, compliance with the hourly NOx emission limitation above, shall be determined by using Method 7 of 40 CFR Part 60, Appendix A.

Compliance with the rolling, 12-month NOx emission limitation shall be determined in accordance with the equations and record keeping in Section A.III.2. of these terms and conditions and summed with the total 12-month rolling NOx emissions from all lathes.

d. Emission Limitation

There shall be no visible fugitive particulate emissions from the bench repair lathes.

Applicable Compliance Method

If required by the Ohio EPA, compliance with the above visible emission limitation shall be determined using Method 22 of 40 CFR, Part 60, Appendix A.

2. The permittee shall conduct, or have conducted, emission testing of the mass emission rates for particulate emissions and NOx for one of the repair lathes in this emissions unit in accordance with the following:
 - a. The initial emission testing for NOx and particulate emissions shall be conducted within 12 months following the effective date of this Permit to Install.

The permittee has demonstrated that all 4 repair lathes are essentially identical in operation, size and capacity, configuration and product line; therefore; the Ohio EPA is allowing the permittee to test one representative unit, at or near maximum capacity, to demonstrate compliance for each of these 4 lathes.
 - b. The emission testing shall be conducted to determine compliance with the allowable emission rates for particulate emissions and NOx.
 - c. The following test methods from 40 CFR Part 60, Appendix A, shall be employed to determine compliance with the allowable emission rates for particulate and NOx respectively:

Method 5 "Determination of Particulate Emissions from Stationary Sources" and Method 7 "Determination of Nitrogen Oxide Emissions from Stationary Sources and the requirements of OAC rule 3745-31-05.

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- d. The tests shall be conducted while the emissions unit is operating at or near its maximum capacity, unless otherwise specified by the Northeast District of the Ohio EPA.

Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Ohio EPA Northeast District Office and the Lake County General Health District. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person(s) who will be conducting the tests.

Failure to submit such notification for review and approval prior to the tests may result in the Ohio EPA Northeast District Office's refusal to accept the results of the emissions tests.

Personnel from the Ohio EPA Northeast District Office and/or Lake County General Health District shall be permitted to witness the tests, 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.

A comprehensive written report of the results of the emissions tests shall be signed by the person or persons responsible for the tests and submitted to the Northeast District Office of the Ohio EPA within 30 days following completion of the tests. The permittee may request additional time for the submittal of the written report, where warranted, with prior approval from the Northeast District Office of the Ohio EPA.

VI Miscellaneous Requirements

None

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B. State Enforceable Section

I. Applicable Emissions Limitations and/or Control Requirements

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

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
P043-four (4) repair lathes [0.78, 0.58, 0.78 and 0.48 mmBtu/hr each]; and two (2) bench repair lathes (0.02 mmBtu/hr each)	None	None

2. Additional Terms and Conditions

2.a None

II Operational Restrictions

None

III Monitoring and/or Recordkeeping

None

IV Reporting Requirements

None

V Testing Requirements

None

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VI Miscellaneous Requirements

None