TITLE V PERMIT RENEWAL APPLICATION

Guardian Fiberglass, Inc. > Inwood

GUARDIAN

Permit No. R30-00300012-2008

TRINITY CONSULTANTS
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March 2013

Project 133901.0020

Trinity Consultants

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Guardian Fiberglass's Inwood Facility (Guardian) manufactures fiberglass roll and batt insulation in Inwood, West Virginia. This facility currently operates in accordance with West Virginia Depart of Environmental Protection (WVDEP) Division of Air Quality Title V operating permit R30-00300012-2008, last issued October 1, 2008.

The current Title V permit expires October 1, 2013. Guardian is submitting this timely and complete permit renewal application by the renewal submission deadline of April 1, 2013 (i.e., six months before the expiration of the current permit) in accordance with Series 30, Section 4.1.a.3 of the WVDEP Division of Air Quality (DAQ) Code of State Rules (C.S.R.) §45-30-4.1.a.3. Presuming WVDEP finds this application administratively complete, Guardian may continue to operate the Inwood facility under the terms of the existing Title V permit until the renewed permit is issued, even if this issuance would occur after the current permit's expiration date.

1.1. FACILITY DESCRIPTION

Guardian's Inwood facility is a wool fiberglass manufacturing facility covered under Standard Industrial Classification (SIC) Code 3296. The facility has the potential to operate 24 hours per day, 7 days per week. The facility consists of a raw materials receiving area and batch mixing point, electric melters, a series of natural gas fueled heaters, resin sprayers, curing ovens, and storage tanks. An area map and a plot plan of the facility is included as Appendix A and B, respectively.

The Inwood facility can produce two insulation types, a resinated product or a nonresinated product. The facility receives raw materials that are mixed into batch and the batch is then melted to form glass. The molten glass is separated into streams by use of a Forehearth and fiber is spun into strands by the means of fiberizers. In resinated fiberglass production, the fibers are collected to form a blanket, sprayed with a binder resin, and then cured in a three-zone oven. Upon exiting the curing oven the blanket is cooled via "cooling table". The cooled blanket is then cut to size in rolls and batts of insulation per customer demand. The nonresinated product is collected into a blanket and cut to size.

A description of each source is included below. Process flow diagrams are included in Appendix C.

1.1.1. Combustion Sources

There are numerous combustion sources at the site. A series of natural gas fueled heaters run in the forming area of the facility. These heaters are involved in keeping the glass flowing until it reaches the final step of formation. In the curing area there is a natural gas fueled oven. There are several natural gas fueled binder water heaters and several make-up air heaters. Additional combustion sources are the diesel-powered emergency generators and a fire pump engine.

1.1.2. Fugitive Sources

The fugitive sources at the Inwood facility include cooling towers, dust from roadways, resin binder wax, drift and off-gassing from sprayed adhesive and printing, and dust from raw materials handling and storage. The baghouse is responsible for controlling the emissions generated from raw materials handling and storage.

1.1.3. Storage Tanks

The tanks used the Inwood facility are mainly small tanks used for holding liquids associated with the resin portion of the process. The resin process involves formaldehyde, phenol, and methanol. Additional tanks are used for adhesive and printing liquids. Guardian has included all approved storage tanks in the application.

1.1.4. Melt Tank

The melt tank is an electric-powered steady-level melting tank for producing spun glass. While there are no combustion emissions associated with the melter, emissions are generated due to its nature of being a large and sustained high-temperature thermal source.

1.1.5. Miscellaneous Sources

The Inwood facility contains online and offline laminators. Emissions from these operations are insignificant as the VOC content in the laminate adhesive is negligible.

1.2. FACILITY CHANGES

There have been several minor changes since the most recent Title V permit was issued. These include:

- An additional spinner has been added to Line 1 (ES13A). This additional spinner does not increase the maximum throughput of 8,000 lbs/hr for the line.
- There have been minor control device changes to the cold end of the facility, where the fiberglass product is collected, cut, and packaged. Units that were designed to be routed to a scrubber are now routed to a cyclone and screen room.
- The natural gas boiler (ESSHB14) has been removed from service.

Note that Guardian has included condensable particulate matter emissions in this application. However, compliance is demonstrated using EPA Method 5, per Condition 3.3.8 of the current Title V permit. The most recent compliance testing demonstrated compliance with the PM emission limitations.

1.3. TITLE V RENEWAL APPLICATION ORGANIZATION

This Title V permit renewal application is organized as follows:

- Section 2 contains an overview of regulatory applicability for the Inwood Facility;
- Section 3 contains sample emission source calculations;
- Section 4 contains the required WVDEP application forms;
- Attachment A contains an area map;
- Attachment B contains a plot plan;
- Attachment C contains a process flow diagram;
- Attachment D contains the WVDEP Title V equipment table;
- Attachment E contains a WVDEP emission unit form for each emission unit at the Inwood Facility; and
- Attachment I contains site-wide emission calculations.

This section documents the applicability determinations made for Federal and State air quality regulations. Regulations potentially applicable to Guardian are detailed in the "*Applicable Requirements*" sections of forms provided by the WVDEP contained in Section 4 of this report.

Additional details on applicability for several regulations are presented in this section. Specifically, the remainder of this section summarizes the air permitting requirements and key air quality regulations that apply to the operation of the Inwood facility. This review is presented to supplement and/or add clarification to the information provided in the WVDEP Title V application forms, which fulfill the requirement to include citations and descriptions of applicable statutory and administrative code requirements.

In addition to providing a summary of applicable requirements, this section of the application also provides non-applicability determinations for certain regulations, allowing the WVDEP to confirm that identified regulations are not applicable to the Inwood facility. Note that explanations of non-applicability are limited to those regulations for which there may be some question of applicability specific to the operations at the Inwood facility. Regulations that are categorically non-applicable are not discussed (e.g., NSPS Subpart J, *Standards of Performance for Petroleum Refineries*).

2.1. PREVENTION OF SIGNIFICANT DETERIORATION (PSD) SOURCE CLASSIFICATION

Federal construction permitting programs regulate new sources of attainment pollutants under Prevention of Significant Deterioration (PSD) and new sources of non-attainment pollutants under Non-Attainment New Source Review (NNSR). PSD and NNSR regulations apply when a major source makes a change, such as installing new equipment or modifying existing equipment, and a significant increase in emissions results from the change. The Inwood facility is located in Berkeley County, which is classified as attainment for all pollutants, except fine particulate ($PM_{2.5}$). Therefore, NNSR is potentially applicable only with respect to $PM_{2.5}$. The Inwood facility is a major source with respect to the PSD program. Because the Title V permit renewal process is not intended to accommodate any changes or modifications to the facility that are not currently permitted at the facility, NNSR/PSD permitting is not triggered by this activity but could be by future activities at the site.

2.2. TITLE V OPERATING PERMIT PROGRAM

Title 40 of the Code of Federal Regulations Part 70 (40 CFR 70) establishes the federal Title V operating permit program. West Virginia has incorporated the provisions of this federal program in its Title V operating permit program in CSR 45-30. The major source thresholds with respect to the West Virginia Title V operating permit program regulations are 10 tons per year (tpy) of a single HAP, 25 tpy of any combination of HAP, 100,000 tpy of greenhouse gases (as carbon dioxide equivalents [CO_2e]), and 100 tpy of other regulated pollutants. The potential emissions of at least one regulated pollutant exceed the corresponding threshold(s) at this facility. Therefore, the Inwood facility is classified as a major source for Title V purposes. The Inwood facility currently operates under Title V operating permit No. R30-00300012-2008. This renewal application is being submitted to meet the requirements of the Title V program.

2.3. NEW SOURCE PERFORMANCE STANDARDS

New Source Performance Standards (NSPS), located in 40 CFR 60, require new, modified, or reconstructed sources to control emissions to the level achievable by the best demonstrated technology as specified in the applicable provisions. Moreover, any source subject to an NSPS is also subject to the general provisions of NSPS

Subpart A, except where expressly noted. The following is a summary of applicability and non-applicability determinations for NSPS regulations of relevance to the Inwood facility.

2.3.1. NSPS Subparts K, Ka, and Kb

These subparts apply to storage tanks of certain sizes constructed, reconstructed, or modified during various time periods. Subpart K applies to storage tanks constructed, reconstructed, or modified prior to 1978, and Subpart Ka applies to those constructed, reconstructed, or modified prior to 1984. Both Subparts K and Ka apply to storage tanks with a capacity greater than 40,000 gallons. Subpart Kb applies to volatile organic liquid (VOL) storage tanks constructed, reconstructed, or modified after July 23, 1984 with a capacity equal to or greater than 75 m^3 (~19,813 gallons). All storage tanks at the Inwood facility have a capacity less than 75 m^3. Therefore, Subparts K, Ka, and Kb do not apply to the storage tanks at the Inwood facility.

2.3.2. NSPS Subpart CC –Glass Manufacturing Plants

These subparts apply to glass melting furnaces constructed after June 15, 1979. This subpart does not apply to furnaces that produce less than 4.55 Mg (5 tons) of glass per day and all-electric melters. An all-electric melter is a melting furnace in which all of the heat is provided by electric current, although some fossil fuel may be charged to the furnace as raw material only. The furnaces at the Inwood facility qualifies as all-electric melters and therefore Subpart CC does not apply.

2.3.3. NSPS Subpart IIII – Stationary Compression Ignition Internal Combustion Engines

This Subpart applies to manufacturers, owners, and operators of stationary compression ignition internal combustion engines (ICE) that have been constructed, reconstructed, or modified after various dates, the earliest of which is July 11, 2005. All three diesel fired engines at the facility were in use on site prior to 2004. Therefore, NSPS Subpart IIII does not apply to the ICE at the Inwood facility.

2.3.4. NSPS Subpart JJJJ – Stationary Spark Ignition Internal Combustion Engines

This subpart applies to manufacturers, owners, and operators of stationary spark ignition internal combustion engines (ICE) that have been constructed, reconstructed, or modified after various dates, the earliest of which is June 12, 2006. All of the engines at the Inwood facility, including emergency generators, are compression ignition IC engines, and therefore the requirements of this subpart do not apply.

2.3.5. NSPS Subpart PPP – Wool Fiberglass Insulation Manufacturing Plants

This subpart applies to each rotary spin wool fiberglass insulation manufacturing line constructed, modified, or reconstructed after February 7, 1984. Subpart PPP applies to the Inwood facility. Subpart PPP sets a particulate matter standard of 11.0 lbs/ton glass pulled. Facilities comply with the mass emission rate via monitoring operations and using control devices. Subpart PPP prescribes recordkeeping and reporting activities associated with maintaining the elected control device. The Inwood facility is currently in compliance with Subpart PPP, as incorporated into the current Title V permit.

2.3.6. Non-Applicability of All Other NSPS

NSPS are developed for particular industrial source categories. Other than NSPS developed for glass manufacturing plants (Subparts CC) and associated equipment (Subparts K-Kb), the applicability of a particular NSPS to the Inwood facility can be readily ascertained based on the industrial source category covered. All other NSPS are categorically not applicable to wool fiberglass insulation manufacturing facilities.

2.4. NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAP)

40 CFR Part 61 NESHAP standards are defined for specific pollutants while Part 63 NESHAP are for Source Categories where allowable emission limits are established on the basis of a Maximum Achievable Control Technology (MACT) determination for a particular major source. A major source of HAP is defined as having potential emissions in excess of 25 tpy for total HAP and/or potential emissions in excess of 10 tpy for any individual HAP. Part 63 NESHAP apply to sources in specifically regulated industrial source categories (CAA Section 112(d)) or on a case-by-case basis (Section 112(g)) for facilities not regulated as a specific industrial source type. The Inwood facility is classified as a major source of HAP.

Besides 40 CFR 63 Subpart A (NESHAP Subpart A), which is similar to 40 CFR 60 Subpart A (NSPS Subpart A), the following NESHAP could potentially apply to the Inwood facility:

- 40 CFR Part 61 Subpart N –Inorganic Arsenic Emissions From Glass Manufacturing Plants
- 40 CFR Part 63 Subpart Q –Industrial Process Cooling Towers
- 40 CFR Part 63 Subpart NNN –Hazardous Air Pollutants for Wool Fiberglass Manufacturing
- 40 CFR Part 63 Subpart HHHH –Hazardous Air Pollutants for Wet-Formed Fiberglass Mat Production
- 40 CFR Part 63 Subpart ZZZZ – Stationary Reciprocating Internal Combustion Engines (RICE)
- 40 CFR Part 63 Subpart DDDDD – Major Source Industrial, Commercial, and Institutional Boilers and Process Heaters

The applicability of these NESHAP Subparts is discussed in the following sections.

2.4.1. 40 CFR 61 Subpart N –Inorganic Arsenic Emissions From Glass Manufacturing Plants

This NESHAP applies to glass melting furnaces that use commercial arsenic as a raw material. Since the Inwood facility does not use any arsenic as a raw material this subpart does not apply.

2.4.2. 40 CFR 63 Subpart Q –Industrial Process Cooling Towers

This NESHAP applies to industrial process cooling towers that remove heat from any chemical or industrial process as well as any combination of heating, ventilation, or cooling systems that uses chromium in the recirculating water as part of the system's water treatment. This requirement does not apply to the Inwood facility. If at any time Guardian become applicable to this requirement the proper notifications will be performed and records kept.

2.4.3. 40 CFR 63 Subpart NNN –Hazardous Air Pollutants for Wool Fiberglass Manufacturing

This NESHAP applies to equipment located at wool fiberglass manufacturing facilities, as defined as manufacturing wool fiberglass on a rotary spin manufacturing line or on a flame attenuation manufacturing line.

Guardian is subject to and in compliance with the emission limits, work practices, monitoring, recordkeeping, and reporting prescribed in Subpart NNN, as incorporated into the current Title V permit.

2.4.4. 40 CFR 63 Subpart HHHH - Hazardous Air Pollutants for Wet-Formed Fiberglass Mat Production

This NESHAP applies to drying and curing ovens at wet-formed fiberglass mat production facilities. Guardian's Inwood facility is a wool-fiberglass production facility that produces insulation whereas the wet-formed

fiberglass is a material used in the manufacture of asphalt roofing products (shingles and rolls). Therefore, Subpart HHHH does not apply to the Inwood facility.

2.4.5. 40 CFR 63 Subpart ZZZZ – Stationary Reciprocating Internal Combustion Engines

This NESHAP applies to stationary reciprocating combustion engines (RICE) at major and minor sources. The engines are classified as 4-stroke compression-ignition emergency units. The emergency engines are rated at greater than 500 horsepower (hp), with the fire engine is rated at less than 500 hp. The engines must meet the definition of emergency in §63.6675, which includes references to §63.6640(f).

The newest backup generator (ESDG13) is classified as a new emergency unit and, therefore, is only subject to initial notification requirements. The existing units, (ESDG12 and ESFW11) are classified as existing units. The generator is not subject to any RICE requirements, while the fire pump is subject to the requirements of Subpart ZZZZ. Per 40 CFR §63.6625(h), Guardian will minimize the fire pump engine's time spent at idle and minimize the engine's startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes. Additionally, Guardian is required to comply with the requirements in Table 2c of Subpart ZZZZ, which include changing the oil filter, air cleaner, and belts and hoses on a periodic basis. The compliance date for the fire pump is May 3, 2013.

2.4.6. 40 CFR 63 Subpart DDDDD – Industrial, Commercial, and Institutional Boilers and Process Heaters

This MACT standard applies to industrial, commercial, and institutional boilers and process heaters of various sizes and fuel types at major sources of HAP emissions. Guardian's Inwood facility is considered a major source for HAP. The recently finalized rule, effective April 1, 2013, includes exemptions for hot water heaters, which includes units heating water (not steam), rated at less than 1.6 MMbtu/hr. The water heaters (ESWH15) at the Inwood facility qualify for this exemption. The air makeup units are used to heat the manufacturing building and not used for process heat or steam and, therefore, are not subject to Subpart DDDDD. Based on these exemptions, there are no units at the Inwood facility subject to Subpart DDDDD.

2.5. COMPLIANCE ASSURANCE MONITORING

Under 40 CFR 64, the Compliance Assurance Monitoring (CAM) regulations, facilities are required to prepare and submit monitoring plans for certain emissions units with the initial or renewal Title V operating permit application. CAM Plans are intended to provide an on-going and reasonable assurance of compliance with emission limits for sources that utilize active control devices where existing Title V permit requirements may not be considered sufficient. CAM plans are required to be submitted in the initial Title V permit renewal, unless significant modifications have occurred at the facility. CAM applicability was addressed in the last renewal and applicability is addressed in the current Title V permit. As no significant modifications, as defined in Part 64, have occurred, CAM applicability has not changed.

2.6. WEST VIRGINIA SIP REGULATIONS

Guardian's Inwood facility is currently permitted under the regulations contained in West Virginia's Title 45 Legislative Rule Department of Environmental Protection Office of Air Quality (WVDEP regulations). A federal operating permit must be issued by the agency upon determination that the facility can reasonably be expected to comply with the WVDEP regulations and all applicable federal requirements. This section of the application highlights applicability of specific West Virginia State Implementation Plan (SIP) regulations that may apply to the Inwood facility.

2.6.1. 45 CSR 2: To Prevent and Control Particulate Air Pollution From Combustion of Fuel in Indirect Heat Exchangers

Compliance with this requirement shall be determined in keeping with 40 CFR Part 60, Appendix A, Method 9 or by using approved measurements from continuous opacity monitoring systems. Visible emissions are not expected since only natural gas is combusted in the applicable units, and emissions from sources that burn natural gas have low variability. Therefore, fuel recordkeeping will be adequate to demonstrate compliance. In addition, since the combustion units have maximum design heat inputs less than 10 MMBtu/hr, the units are exempted from the requirements of sections 4 through 6, 8 and 9 as specified in Section 11.

2.6.2. 45 CSR 4: To Prevent and Control the Discharge of Air Pollutants into the Air Which Causes or Contributes to an Objectionable Odor

The Inwood facility is subject to this requirement. In accordance with the Title V permit, Guardian maintains appropriate records and takes appropriate response measures of all odor complaints.

2.6.3. 45 CSR 7: To Prevent and Control Particulate Matter Emissions from Manufacturing Processes

The Inwood facility is generally subject to these requirements, which include particulate matter and opacity limitations for manufacturing operations, based on process weight rate. Except where more stringent, these limits are incorporated into the current Title V permit.

2.6.4. 45 CSR 10: To Prevent and Control Air Pollution from the Emission of Sulfur Oxides

This regulation is potentially applicable to the heaters at the Inwood facility as they produce heat or power by indirect heat transfer and are, by definition, "fuel burning units." However, the units are below the 10MMBtu/hr exemption per 45 CSR 10 Section 10.1. Additionally, the engines are not subject to this regulation as identified in the current Title V permit.

2.6.5. 45 CSR 17: To Prevent and Control Particulate Matter Air Pollution From Materials Handling, Preparation, Storage and Other Sources of Fugitive Particulate Matter

In accordance with the Title V permit, the Inwood facility will take appropriate response measures to control emissions of fugitive particulate matter.

2.6.6. 45 CSR 27: To Prevent and Control Emissions of Toxic Air Pollutants

The storage tanks at the Inwood facility are potentially subject to this regulation. Given the low level of emissions from these small storage tanks, no additional control measures are required. The remaining process operations that contain toxic air pollutants as defined in this regulation are subject to a Federal NESHAP rule (Subpart NNN), which exempts process equipment from this state regulation.

2.6.7. 45 CSR 30: Requirements for Operating Permits

The Inwood facility is subject to the requirement for an operating permit. The station's Title V permit (R30-00300012-2008) was issued under this rule and this renewal application satisfies the application requirements of 45 CSR 30. Also under this rule, the Inwood facility is subject to operating under the requirements set forth in the issued Title V permit. This application is being submitted to fulfill the permit renewal requirements.

3. SAMPLE EMISSION SOURCE CALCULATIONS

This section contains a detailed description of the calculation methodology used to determine the proposed emission rates for all affected sources at the Inwood facility. Detailed emission calculations are included in Appendix I of this application. It should be noted that condensable PM emissions are included in the emission calculations. However, compliance with emission limitations in demonstrated through EPA Method 5, which does not include condensable PM.

3.1. COMBUSTION SOURCES

For the combustion sources (heaters, water heaters, emergency generators, and fire pump) appropriate EPA-published emission factors were chosen and were then multiplied by the heat input capacity of each unit (MMBtu/hr) in order to determine the tpy and lb/hr emissions of CO, PM, PM_{10}, $PM_{2.5}$, NO_x, SO_2, VOC, and HAPs.

As an example, CO emissions for Binder Water Heaters (EP-20):

Rated Heat Input = 0.375 MMBtu/hr
Permitted Hours per year = 8,760 hours
CO Emission Factor: 20 lbs per million cubic feet of natural gas burned

Emissions = Heat Input * Emission Factor * Permitted Hours * 1 ton/2000 lbs = 1.44 tpy
= (20 lbs CO/MMCF) x (375 MBtu/hr) x (1 CF/MBtu) x (1 MMCF/10^6 CF)
= 0.008 lbs CO/hr *or*
= 0.033 tons per year

3.2. FIBERGLASS PRODUCTION PROCESS

Calculations of pollutants are based on multiplying the process rate (lbs material/hr) by the emission factor (lbs/ton material processed). These calculations are based on a maximum production capacity of 8,000 lbs per hour per production line. Appropriate emission factors were taken from published data, stack test data, and permit limits. Note that the emission calculations include condensable particulate matter emissions based on stack test data taken from similar sources.

The wool fiberglass production operations on Line No. 2 can be operated as a resinated or nonresinated line. For emission calculation purposes, the worst-case operational mode was selected.

3.3. FUGITIVE SOURCES

Particulate matter emissions from raw materials handling were characterized by the USEPA in Section 11.13 Glass Fiber Manufacturing of AP-42 for unloading and conveying, storage bins, and mixing and weighing operations. Potential particulate matter emissions from these operations at Guardian Fiberglass are controlled with bag filter dust collectors and vented to the in-plant environment. Emission factors were taken from Table 11.13-2 of the AP-42. Particulate matter emissions are controlled with bag filter dust collectors as well as process enclosures. These controls reduce the emissions with a control efficiency of 99%. Emissions are calculated as follows:

E_{PM} = (Production Rate, tons per unit time) x (PM Emission Factor) x (1-0.99)

Emissions associated with raw materials storage are VOC emissions originating from resin and binder storage. Simple working and breathing losses from the storage tanks are calculated as in section 3.4 of this document. Additional emissions are generated as the storage vessels are opened and the contents mixed in a pre-react mixing tank. Due to the vapor pressures of the VOCs in use it is estimated that only 2% of the available mass of VOCs in the ingredients used in the Pre-React Mixing tanks are lost to the indoor air as fugitive emissions. These emissions are calculated as follows:

E_{VOC} = (lbs VOC/ gal Mixed Binder) x (gal Binder/yr) x (2%)

3.4. STORAGE BINS & TANKS

Emissions from the storage tanks at the Inwood facility were estimated using EPA's AP-42 Section 7.1, *Organic Liquid Storage Tanks* emission calculations, along with physical parameters of the storage tanks, and physical properties, storage temperatures, and throughput volumes of the materials stored in the tank. Emissions from all other tanks at the Inwood facility are considered negligible. The storage tanks represented on this application are located inside the operations building and therefore, are kept near a constant temperature.

3.5. MISCELLANOUS SOURCES

The cooling tower PM emission calculations are based on cooling water circulation flow rates and drift eliminator efficiency. Calculations assume that all particulates are less than 1 µm in diameter.

Particulate matter originating from the paved road on site was estimated using the calculations and tables from AP-42 13.2.1.3. It was decided that the Municipal Solid Waste Landfill was the best approximation for the Guardian facility from Table 13.2-1.3.

Additional coating emissions (e.g., inkjet identification, lamination, etc.) are calculated using a mass balance and assuming all VOC are emitted to atmosphere.

3.6. GREENHOUSE GAS (GHG) EMISSIONS

Greenhouse gases were calculated following 40 CFR 98 Subparts C and N. Subpart C covers GHGs from combustion sources which includes internal combustion engines and the facility's space and water heaters. Subpart C emissions are based on fuel usage rates and Subpart C provided emission factors. Subpart N covers the glass manufacturing industry as a whole. Raw materials used in glass manufacture have the potential to emit carbon dioxide as they are melted to make glass. Guardian obtained emission factors from their raw materials suppliers. These vendor specific emission factors, in combination with raw materials throughputs, provide the basis for the carbon dioxide emission calculations.

4. WVDEP APPLICATION FORMS

The WVDEP permit application forms contained in this renewal application include facility-wide and emission source specific forms for the renewal of the Inwood facility Title V permit. The completed Title V permit forms are included in this section.

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF AIR QUALITY

601 57th Street SE

Charleston, WV 25304

Phone: (304) 926-0475

www.wvdep.org/daq

TITLE V PERMIT APPLICATION - GENERAL FORMS

Section 1: General Information

1. **Name of Applicant (As registered with the WV Secretary of State's Office):** Guardian Fiberglass, Inc.	**2. Facility Name or Location:** 4812 Tabler Station Road Inwood, WV 25428
3. DAQ Plant ID No.: 0003 — 00012	**4. Federal Employer ID No. (FEIN):** 382560723

5. **Permit Application Type:**

☐ Initial Permit — When did operations commence? 07/20/1998

☒ Permit Renewal — What is the expiration date of the existing permit? 10/1/2013

☐ Update to Initial Permit Application

6. Type of Business Entity:

☒ Corporation ☐ Governmental Agency

☐ Partnership ☐ Limited Partnership

8. Number of onsite employees:

175

7. Is the Applicant the:

☐ Owner ☒ Operator ☐ Both

If the Applicant is not both the owner and operator, please provide the name and address of the other party.

Guardian Fiberglass, Inc.

1000 E North Street

Albion, MI 49224

9. Governmental Code:

☒ Privately owned and operated; 0

☐ Federally owned and operated; 1

☐ State government owned and operated; 2

☐ County government owned and operated; 3

☐ Municipality government owned and operated; 4

☐ District government owned and operated; 5

10. Business Confidentiality Claims

Does this application include confidential information (per 45CSR31)? ☐ Yes ☒ No

If yes, identify each segment of information on each page that is submitted as confidential, and provide justification for each segment claimed confidential, including the criteria under 45CSR§31-4.1, and in accordance with the DAQ's *"PRECAUTIONARY NOTICE-CLAIMS OF CONFIDENTIALITY"* guidance.

11. Mailing Address

Street or P.O. Box: 4812 Tabler Station Road		
City: Inwood	**State:** WV	**Zip:** 25428
Telephone Number: (304) 267-6085	**Fax Number:** (304) 267-6885	

12. Facility Location

Street: 4812 Tabler Station Road	**City:** Inwood	**County:** Berkeley
UTM Easting: 756.55 km	**UTM Northing:** 4365.50 km	**Zone:** ☒ 17 or ☐ 18

Directions:

From Martinsburg, take I-81 southwest to Tabler Station Road, Exit 8 (County Route 32). Site is located on the southeast corner of the I-81 and County Route 32 intersection.

Portable Source? ☐ Yes ☒ No

Is facility located within a nonattainment area? ☒ Yes ☐ No	**If yes, for what air pollutants?** Fine Particule (PM 2.5) Designations
Is facility located within 50 miles of another state? ☒ Yes ☐ No	**If yes, name the affected state(s).** Virginia Maryland
Is facility located within 100 km of a Class I Area[1]? ☒ Yes ☐ No **If no, do emissions impact a Class I Area[1]?** ☐ Yes ☐ No	**If yes, name the area(s).** Shenandoah National Park

[1] *Class I areas include Dolly Sods and Otter Creek Wilderness Areas in West Virginia, and Shenandoah National Park and James River Face Wilderness Area in Virginia.*

13. Contact Information

Responsible Official: James Lankford		**Title:** Plant Manager
Street or P.O. Box: 4812 Tabler Station Road		
City: Inwood	**State:** WV	**Zip:** 25428
Telephone Number: (304) 267-6085	**Fax Number:**	
E-mail address: jameslankford@bp.guardian.com		
Environmental Contact: Jonathan Russell		**Title:** EHS Specialist
Street or P.O. Box: 4812 Tabler Station Road		
City: Inwood	**State:** WV	**Zip:** 25428
Telephone Number: (304) 267-6085 x 328	**Fax Number:** (304) 267-6885	
E-mail address: jonathanrussell@bp.guardian.com		
Application Preparer: Tom Muscenti		**Title:** Managing Consultant
Company: Trinity Consultants, Inc.		

Street or P.O. Box: 4500 Brooktree Rd., Suite 103		
City: Wexford	**State:** PA	**Zip:** 15090
Telephone Number: (724) 935-2611	**Fax Number:** (724) 935-2622	
E-mail address: tmuscenti@trinityconsultants.com		

14. Facility Description

List all processes, products, NAICS and SIC codes for normal operation, in order of priority. Also list any process, products, NAICS and SIC codes associated with any alternative operating scenarios if different from those listed for normal operation.

Process	Products	NAICS	SIC
Wool fiberglass manufacturing	Rolls and batts of fiberglass insulation	327993	3296

Provide a general description of operations.

Raw Materials are mixed into batch and the batch is then melted to form glass. The molten glass is separated into streams by use of a Forehearth and fiber is spun into strands by the means of fiberizers. The fibers are collected to form a blanket then cured in a three-zone oven. Upon exiting the curing oven the blanket is cooled via "cooling table". The cooled blanket is then cut to size in rolls and batts of insulation per customer demand.

15. Provide an **Area Map** showing plant location as **ATTACHMENT A**.

16. Provide a **Plot Plan(s)**, e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is located as **ATTACHMENT B**. For instructions, refer to "Plot Plan - Guidelines."

17. Provide a detailed **Process Flow Diagram(s)** showing each process or emissions unit as **ATTACHMENT C**. Process Flow Diagrams should show all emission units, control equipment, emission points, and their relationships.

Section 2: Applicable Requirements

18. Applicable Requirements Summary

Instructions: Mark all applicable requirements.

☒ SIP	☐ FIP
☐ Minor source NSR (45CSR13)	☒ PSD (45CSR14)
☐ NESHAP (45CSR15)	☐ Nonattainment NSR (45CSR19)
☒ Section 111 NSPS	☒ Section 112(d) MACT standards
☐ Section 112(g) Case-by-case MACT	☐ 112(r) RMP
☐ Section 112(i) Early reduction of HAP	☐ Consumer/commercial prod. reqts., section 183(e)
☐ Section 129 Standards/Reqts.	☐ Stratospheric ozone (Title VI)
☐ Tank vessel reqt., section 183(f)	☐ Emissions cap 45CSR§30-2.6.1
☐ NAAQS, increments or visibility (temp. sources)	☒ 45CSR27 State enforceable only rule
☐ 45CSR4 State enforceable only rule	☐ Acid Rain (Title IV, 45CSR33)
☐ Emissions Trading and Banking (45CSR28)	☐ **C**ompliance **A**ssurance **M**onitoring (40CFR64) * Please see Attachment H

☐ NO_x Budget Trading Program Non-EGUs (45CSR1)	☐ NO_x Budget Trading Program EGUs (45CSR26)

19. Non Applicability Determinations

List all requirements which the source has determined not applicable and for which a permit shield is requested. The listing shall also include the rule citation and the reason why the shield applies.

N/A

☐ Permit Shield

20. Facility-Wide Applicable Requirements

List all facility-wide applicable requirements. For each applicable requirement, include the rule citation and/or permit with the condition number.

Permit R14-0015H:

3.1.1 Open burning. The open burning of refuse by any person, firm, corporation, association or public agency is prohibited except as noted in 45 CSR §6-3.1.

3.1.2. Open burning exemptions. The exemptions listed in 45CSR§6-3.1 are subject to the following stipulation: Upon notification by the Secretary, no person shall cause, suffer, allow or permit any form of open burning during existing or predicated periods of atmospheric stagnation. Notification shall be made by such means as the Secretary may deem necessary and feasible.

3.1.3. Asbestos. The permittee is responsible for thoroughly inspecting the facility, or part of the facility, prior to commencement of demolition or renovation for the presence of asbestos and complying with 40 C.F.R. § 61.145, 40 CFR §61.148, and 40CFR§61.150. The permittee, owner or operator must notify the Secretary at least ten (10) working days prior to the commencement of any asbestos removal on the forms prescribed by the Secretary if the permittee is subject to the notification requirements of 40CFR§61.145(b)(3)(i). The USEPA, the Division of Waste Management and the Bureau for Public Health-Environmental Health require a copy of this notice to be sent to them.

3.1.4. Odor. No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public.

3.1.5. Permanent shutdown. A source which has not operated at least 500 hours in one 12-month period within the previous five (5) year time period may be considered permanently shutdown, unless such source can provide to the Secretary, with reasonable specificity, information to the contrary. All permits may be modified or revoked and/or reapplication or application for new permits may be required for any source determined to be permanently shutdown.

3.1.6. Standby plan for reducing emissions. When requested by the Secretary, the permittee shall prepare standby plans for reducing the emission of air pollutants in accordance with the objectives set forth in Tables I, II and III of 45 CSR 11.

☐ Permit Shield

For all facility-wide applicable requirements listed above, provide monitoring/testing / recordkeeping / reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number and/or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Permit R14-0015H:

3.3.1. Stack Testing. As per provisions set forth in this permit or as otherwise required by the Secretary, in accordance with the West Virginia code, underlying regulations, permits and orders, the permittee shall conduct test(s) to determine compliance with the emission limitations set forth in this permit and/or established or set forth in underlying documents. The Secretary, or his duly authorized representative, may at his option witness or conduct such test(s). Should the Secretary exercise his option to conduct such test(s), the operator shall provide all necessary sampling connection and sampling ports to be located in such manner as the Secretary may require, power for test equipment and the required safety equipment, such as scaffolding, railing and ladders, to comply with generally accepted good safety practices. Such tests shall be conducted in accordance with the methods and

procedures set forth in this permit or as otherwise approved or specified by the Secretary in accordance with the following:

a. The Secretary may on a source specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with 40 CFR Parts 60, 61, and 63 in accordance with the Secretary's delegated authority and any established equivalency determinate methods which are applicable. If a testing method is specified or approved which effectively replaces a test method specified in the permit, the permit may be reviewed in accordance with 45CSR§13-4 or 45CSR§13-5.4 as applicable.

b. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with applicable requirements which do not involve federal delegation. In specifying or approving such alternative testing to the test methods, the Secretary, to the extent possible, shall utilize the same equivalency criteria as would be used in approving such changes under Section 3.3.1.A of this permit. If a testing method is specified or approved which effectively replaces a test method specified in the permit, the permit may be revised in accordance with 45CSR§13-4 or 45CSR§13-5.4 as applicable.

c. All periodic test to determine mass emissions limits from or air pollutant concentration in discharge stacks and such other tests as specified in this permit shall be conducted in accordance with an approved test protocol. Unless previously approved, such protocols shall be submitted to the Secretary in writing at least thirty (30) days prior to any testing and shall contain the information set forth by the Secretary. In addition, the permittee shall notify the Secretary at least fifteen (15) days prior to any testing so the Secretary man have the opportunity to observe such tests. This notification shall include the actual date and time during which the test will be conducted and, if appropriate, verification that the tests will fully conform to a referenced protocol previously approved by the Secretary.

3.4.1. Retention of records. The permittee shall maintain records of all information (including monitoring data, support information, reports and notifications) required by this permit recorded in a form suitable and readily available for expeditious inspection and review. Support information includes all calibration and maintenance records and all original strip-chart recordings for continuous monitoring or instrumentation. The files shall be maintained for at least five (5) years following the date of each occurrence, measurement, maintenance, corrective action, report, or records. At a minimum, the most recent two (2) years of data shall be maintained on site, the remaining three (3) years of data may be maintained off site, but must remain accessible within a reasonable time. Where appropriate, the permittee may maintain records electronically (on a computer, on computer floppy disks, CDs, DVDs, or magnetic tape disks), on microfilm, or on microfiche.

34.2. Odors. For the purposes of 45CSR4, the permittee shall maintain a record of all odor complaints received, any investigation performed in response to such a compliant, and any responsive action(s) taken.

3.5.1. Responsible official. Any application form, report, or compliance certification required by this permit to be submitted to the DAQ and/or USEPA shall contain a certification by the responsible official that states that, based on formation and belief formed after reasonable inquiry, the statements and information in the document are true, accurate and complete.

3.5.2. Confidential information. A permittee may request confidential treatment of the submission of reporting required by this permit pursuant to the limitations and procedures of W.Va. Code§22-5-10 and 45CSR31.

3.5.3. Correspondence. All notices, requests, demands, submissions and other communications required or permitted to be made to the Sectary of DEP and/or USEPA shall be made in writing and shall be deemed to have been duly given when delivered by and/or mailed first class with postage prepaid to the address(es) set forth below or to such other person or address as the Secretary of the Department of Environmental Protection may designate.
3.5.4.1 In accordance with 45 CSR30-Operating Permit Program, the permittee shall submit a Certified Emissions Statement (CES) and pay fees on an annual basis in accordance the submittal requirements of the Division of Air Quality. A receipt of the appropriate fee shall be maintained on the premises for with the receipt has been issued, and shall be made immediately available for inspection by the Secretary and his/her duly authorized representative.

3.5.5. Emission Inventory. At such times(s) as the Secretary may designate, the permittee herein shall prepare and submit an emission inventory for the previous year, addressing the emission from the facility and/or process(es) authorized herein, in accordance with the emission inventory submittal requirements of the Division of Air Quality. After initial submittal, the Secretary may, based upon the type and quantity of the pollutants emitted, establish a frequency other than on an annual basis.

Are you in compliance with all facility-wide applicable requirements? ☒ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

21. Active Permits/Consent Orders		
Permit or Consent Order Number	Date of Issuance MM/DD/YYYY	List any Permit Determinations that Affect the Permit *(if any)*
R30-00300012-2008	10/1/2008	
R14-0015K	09/24/2009	

22. Inactive Permits/Obsolete Permit Conditions		
Permit Number	Date of Issuance	Permit Condition Number

Section 3: Facility-Wide Emissions

23. Facility-Wide Emissions Summary [Tons per Year]	
Criteria Pollutants	Potential Emissions
Carbon Monoxide (CO)	256.5
Nitrogen Oxides (NO_X)	158.1
Lead (Pb)	0.003
Particulate Matter (PM_{10})[1]	162.2
Total Particulate Matter (TSP)	165.2
Sulfur Dioxide (SO_2)	0.3
Volatile Organic Compounds (VOC)	125.6
Hazardous Air Pollutants[2]	Potential Emissions
Formaldehyde	28.1
Methanol	82.5
Phenol	54.3
Chrome	0.032
Regulated Pollutants other than Criteria and HAP	Potential Emissions
Formic Acid	13.6
Ammonia	163.9
Carbon Dioxide Equivalents (CO_2e)	92,500

[1]Condensable PM and PM_{10} are components of TSP.
[2]For HAPs that are also considered PM or VOCs, emissions should be included in both the HAPs section and the Criteria Pollutants section.

Section 4: Insignificant Activities

24. Insignificant Activities (Check all that apply)		
☒	1.	Air compressors and pneumatically operated equipment, including hand tools.
☐	2.	Air contaminant detectors or recorders, combustion controllers or shutoffs.
☒	3.	Any consumer product used in the same manner as in normal consumer use, provided the use results in a duration and frequency of exposure which are not greater than those experienced by consumer, and which may include, but not be limited to, personal use items; janitorial cleaning supplies, office supplies and supplies to maintain copying equipment.
☒	4.	Bathroom/toilet vent emissions.
☒	5.	Batteries and battery charging stations, except at battery manufacturing plants.
☒	6.	Bench-scale laboratory equipment used for physical or chemical analysis, but not lab fume hoods or vents. Many lab fume hoods or vents might qualify for treatment as insignificant (depending on the applicable SIP) or be grouped together for purposes of description.
☐	7.	Blacksmith forges.
☒	8.	Boiler water treatment operations, not including cooling towers.
☒	9.	Brazing, soldering or welding equipment used as an auxiliary to the principal equipment at the source.
☐	10.	CO_2 lasers, used only on metals and other materials which do not emit HAP in the process.
☐	11.	Combustion emissions from propulsion of mobile sources, except for vessel emissions from Outer Continental Shelf sources.
☒	12.	Combustion units designed and used exclusively for comfort heating that use liquid petroleum gas or natural gas as fuel.
☒	13.	Comfort air conditioning or ventilation systems not used to remove air contaminants generated by or released from specific units of equipment.
☒	14.	Demineralized water tanks and demineralizer vents.
☐	15.	Drop hammers or hydraulic presses for forging or metalworking.
☒	16.	Electric or steam-heated drying ovens and autoclaves, but not the emissions from the articles or substances being processed in the ovens or autoclaves or the boilers delivering the steam.
☐	17.	Emergency (backup) electrical generators at residential locations.
☐	18.	Emergency road flares.
☒	19.	Emission units which do not have any applicable requirements and which emit criteria pollutants (CO, NO_x, SO_2, VOC and PM) into the atmosphere at a rate of less than 1 pound per hour and less than 10,000 pounds per year aggregate total for each criteria pollutant from all emission units. Please specify all emission units for which this exemption applies along with the quantity of criteria pollutants emitted on an hourly and annual basis: Emissions from the following tanks are negligible: Diesel storage tank 500 gallons Diesel Storage tank 300 gallons Gasoline storage tank 250 gallons Kerosene Storage tank 500 gallons
☐	20.	Emission units which do not have any applicable requirements and which emit hazardous air pollutants into the atmosphere at a rate of less than 0.1 pounds per hour and less than 1,000 pounds per year aggregate total for all HAPs from all emission sources. This limitation cannot be used for any source which emits dioxin/furans nor for toxic air pollutants as per 45CSR27. Please specify all emission units for which this exemption applies along with the quantity of hazardous air pollutants emitted on an hourly and annual basis:
☐	21.	Environmental chambers not using hazardous air pollutant (HAP) gases.
☐	22.	Equipment on the premises of industrial and manufacturing operations used solely for the purpose of preparing food for human consumption.
☐	23.	Equipment used exclusively to slaughter animals, but not including other equipment at slaughterhouses, such as rendering cookers, boilers, heating plants, incinerators, and electrical power generating equipment.
☒	24.	Equipment used for quality control/assurance or inspection purposes, including sampling equipment

24. Insignificant Activities (Check all that apply)		
		used to withdraw materials for analysis.
☒	25.	Equipment used for surface coating, painting, dipping or spray operations, except those that will emit VOC or HAP.
☒	26.	Fire suppression systems.
☐	27.	Firefighting equipment and the equipment used to train firefighters.
☐	28.	Flares used solely to indicate danger to the public.
☒	29.	Fugitive emission related to movement of passenger vehicle provided the emissions are not counted for applicability purposes and any required fugitive dust control plan or its equivalent is submitted.
☒	30.	Hand-held applicator equipment for hot melt adhesives with no VOC in the adhesive formulation.
☒	31.	Hand-held equipment for buffing, polishing, cutting, drilling, sawing, grinding, turning or machining wood, metal or plastic.
☐	32.	Humidity chambers.
☐	33.	Hydraulic and hydrostatic testing equipment.
☒	34.	Indoor or outdoor kerosene heaters.
☒	35.	Internal combustion engines used for landscaping purposes.
☐	36.	Laser trimmers using dust collection to prevent fugitive emissions.
☐	37.	Laundry activities, except for dry-cleaning and steam boilers.
☒	38.	Natural gas pressure regulator vents, excluding venting at oil and gas production facilities.
☐	39.	Oxygen scavenging (de-aeration) of water.
☐	40.	Ozone generators.
☒	41.	Plant maintenance and upkeep activities (e.g., grounds-keeping, general repairs, cleaning, painting, welding, plumbing, re-tarring roofs, installing insulation, and paving parking lots) provided these activities are not conducted as part of a manufacturing process, are not related to the source's primary business activity, and not otherwise triggering a permit modification. (Cleaning and painting activities qualify if they are not subject to VOC or HAP control requirements. Asphalt batch plant owners/operators must still get a permit if otherwise requested.)
☒	42.	Portable electrical generators that can be moved by hand from one location to another. "Moved by Hand" means that it can be moved without the assistance of any motorized or non-motorized vehicle, conveyance, or device.
☒	43.	Process water filtration systems and demineralizers.
☒	44.	Repair or maintenance shop activities not related to the source's primary business activity, not including emissions from surface coating or de-greasing (solvent metal cleaning) activities, and not otherwise triggering a permit modification.
☒	45.	Repairs or maintenance where no structural repairs are made and where no new air pollutant emitting facilities are installed or modified.
☐	46.	Routing calibration and maintenance of laboratory equipment or other analytical instruments.
☐	47.	Salt baths using nonvolatile salts that do not result in emissions of any regulated air pollutants. Shock chambers.
☐	48.	Shock chambers.
☐	49.	Solar simulators.
☒	50.	Space heaters operating by direct heat transfer.
☐	51.	Steam cleaning operations.
☐	52.	Steam leaks.
☐	53.	Steam sterilizers.
☐	54.	Steam vents and safety relief valves.
☒	55.	Storage tanks, reservoirs, and pumping and handling equipment of any size containing soaps, vegetable oil, grease, animal fat, and nonvolatile aqueous salt solutions, provided appropriate lids and covers are utilized.
☒	56.	Storage tanks, vessels, and containers holding or storing liquid substances that will not emit any VOC or HAP. Exemptions for storage tanks containing petroleum liquids or other volatile organic liquids should be based on size limits such as storage tank capacity and vapor pressure of liquids stored and are

24. Insignificant Activities (Check all that apply)		
		not appropriate for this list.
☐	57.	Such other sources or activities as the Director may determine.
☐	58.	Tobacco smoking rooms and areas.
☒	59.	Vents from continuous emissions monitors and other analyzers.

Section 5: Emission Units, Control Devices, and Emission Points

25. Emission Units Table
Fill out the **Emission Units Table** and provide it as **ATTACHMENT D**.
26. Emission Units Form(s)
For each emission unit listed in the **Emission Units Table**, fill out and provide an **Emission Unit Form** as **ATTACHMENT E**.
For each emission unit not in compliance with an applicable requirement, fill out a **Schedule of Compliance Form** as **ATTACHMENT F**.
27. Control Devices
For each control device listed in the **Emission Units Table**, fill out and provide an **Air Pollution Control Device Form** as **ATTACHMENT G**.
For any control device that is required on an emission unit in order to meet a standard or limitation for which the potential pre-control device emissions of an applicable regulated air pollutant is greater than or equal to the Title V Major Source Threshold Level, refer to the **Compliance Assurance Monitoring (CAM) Form(s)** for CAM applicability. Fill out and provide these forms, if applicable, for each Pollutant Specific Emission Unit (PSEU) as **ATTACHMENT H**.

Section 6: Certification of Information

28. Certification of Truth, Accuracy and Completeness and Certification of Compliance

Note: This Certification must be signed by a responsible official. Applications without a signed certification will be returned as incomplete.

a. Certification of Truth, Accuracy and Completeness

I certify that I am a responsible official (as defined at 45CSR§30-2.38) and am accordingly authorized to make this submission on behalf of the owners or operators of the source described in this document and its attachments. I certify under penalty of law that I have personally examined and am familiar with the statements and information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine and/or imprisonment.

b. Compliance Certification

Except for requirements identified in the Title V Application for which compliance is not achieved, I, the undersigned hereby certify that, based on information and belief formed after reasonable inquiry, all air contaminant sources identified in this application are in compliance with all applicable requirements.

Responsible official (type or print)

Name: James Lankford	Title: Plant Manager

Responsible official's signature:

Signature: _____ Signature Date: _____

(Must be signed and dated in blue ink)

Note: Please check all applicable attachments included with this permit application:

☒	ATTACHMENT A: Area Map
☒	ATTACHMENT B: Plot Plan(s)
☒	ATTACHMENT C: Process Flow Diagram(s)
☒	ATTACHMENT D: Emission Units Table
☒	ATTACHMENT E: Emission Unit Form(s)
☐	ATTACHMENT F: Schedule of Compliance Form(s) **N/A**
☒	ATTACHMENT G: Air Pollution Control Device Form(s)
☐	ATTACHMENT H: Compliance Assurance Monitoring (CAM) Form(s) **N/A**

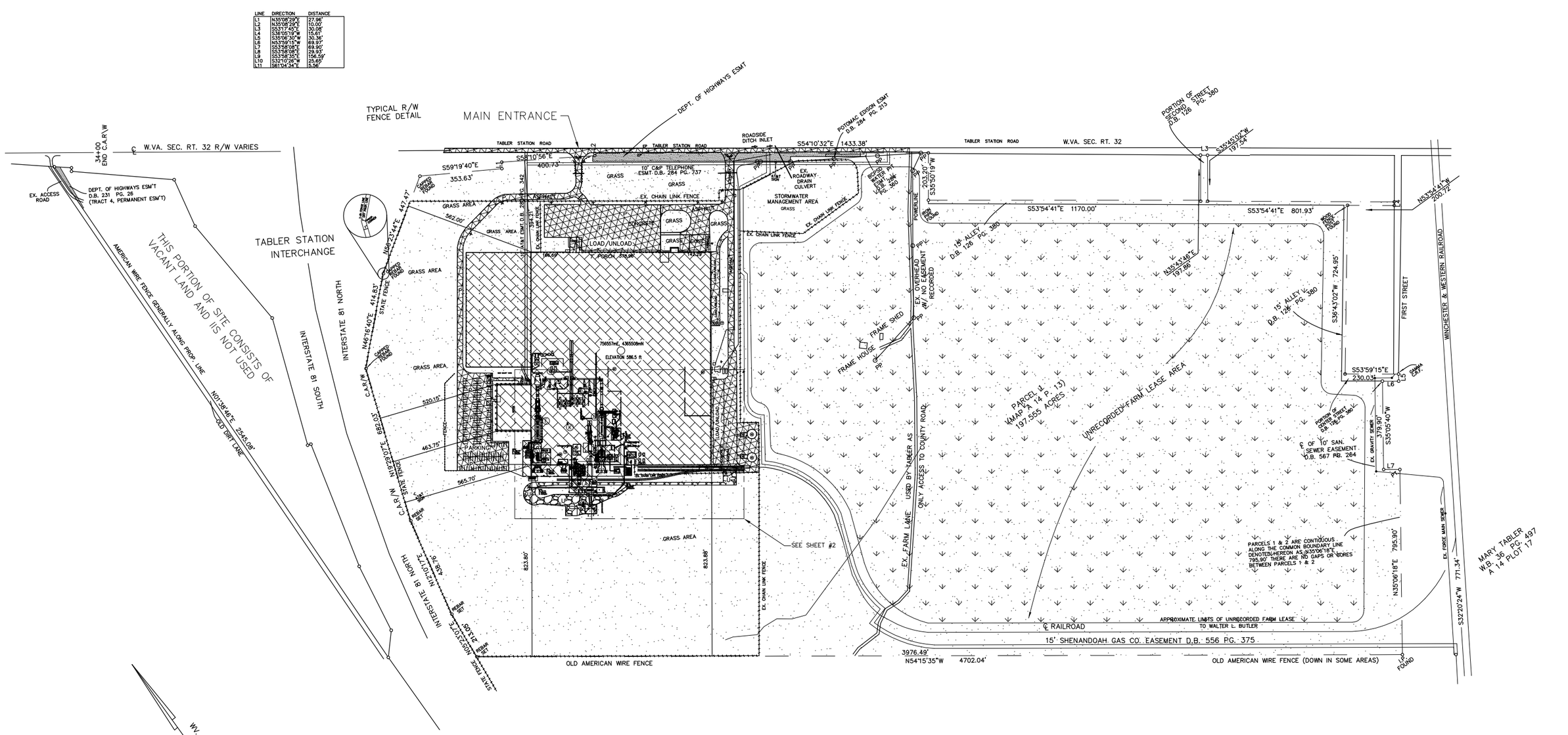
All of the required forms and additional information can be found and downloaded from, the DEP website at www.wvdep.org/daq, requested by phone (304) 926-0475, and/or obtained through the mail.

APPENDIX A: AREA MAP

Appendix A. Area Map

Figure 1. Area map showing the location of the Guardian facility in relation to nearby roads and towns. The arrow in the legend points north.

APPENDIX B: PLOT PLAN



GUARDIAN FIBERGLASS

INWOOD FACILITY

TITLE V MAP

NOTE

FOR PROCESS/ACTIVITY AREA NAMES AND EMISSION POINTS CONSISTENT WITH ATTACHMENT D – TITLE V EQUIPMENT TABLE, SEE SHEET #2.

KEY

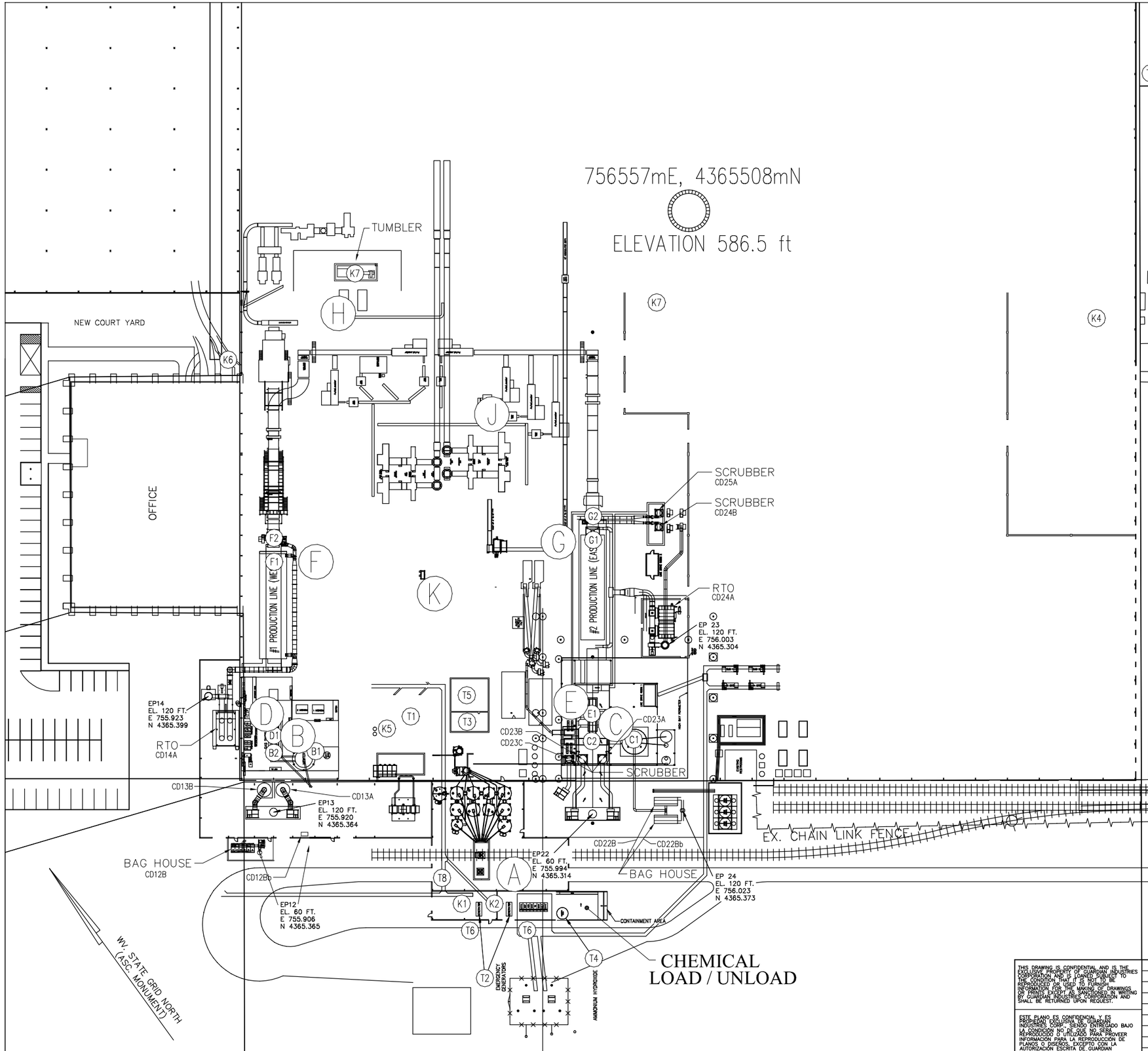
1. ▭ – INDICATES DEPT. OF HIGHWAYS EASEMENT
2. ▨ – INDICATES ROOFED AREA
3. ▨ – INDICATES CONCRETE/ASPHALT (P)
4. ▭ – INDICATES GRASS
5. ▨ – INDICATES GRAVEL (U)
6. — · — · — INDICATES PROPERTY LINE
7. -+-+-+-+- INDICATES FENCE LINE

REV NO.	ISSUE	DATE	BY
-	RELEASED	00 MTH 2007	???

GUARDIAN FIBERGLASS, INC.
4812 TABLER STATION RD.
INWOOD, WV. 25428

STATE OPERATION PERMIT MAPS
INWOOD, WV

DRAWN BY	DATE	SCALE
TLH	02AUG07	1"=200'
CHKD. BY	NO.	SHEET
RO	66-170-001	1 OF 2



GROUP	AREA	ID. NO.	NAME	EMISSION POINTS
001	A		RAW MATERIAL HANDLING	FP11
002	B		MELTING & REFINING LINE 1	EP12
	B1	ES12C	MELTER	
	B2	ES12E	FOREHEARTH	
003	C		MELTING & REFINING LINE 2	EP22
	C1	ES22C	MELTER	
	C2	ES22E	FOREHEARTH	
004	D		FORMING & COLLECTION LINE 1	EP13
	D1	ES13A	FIBERIZERS	
005	E		FORMING & COLLECTION LINE 2	EP23
	E1	ES23A	FIBERIZERS	
006	F		CURING & COOLING LINE 1	EP14
	F1	ES14A	OVEN	
	F2	ES14B	COOLING TABLE	
007	G		CURING & COOLING LINE 2	EP24
	G1	ES24A	OVEN	
	G2	ES24B	COOLING TABLE	
008	H		FACING, SIZING & PACKAGING LINE 1	FP15
	J		FACING, SIZING & PACKAGING LINE 2	FP15
009	K		SUPPORT FACILITIES (MAINTENANCE)	
	K1	ESDG12	EMERGENCY GENERATOR (LINE 1)	EP16
	K2	ESDG13	EMERGENCY GENERATOR (LINE 2)	EP17
	K3	ESFW11	2 EMERGENCY FIRE WATER TANKS	EP18
	K4	ESSHB14	INDUSTRIAL HEATING BOILER	EP21
	K5	ESHW15	5: 0.75 MMBTU/HR WATER HEATERS	EP20
	K6	ESSH15	8.525 MMBTU/HR MAKEUP AIR HANDLING UNIT	EP19
	K7	ESSH16	7.875 MMBTU/HR MAKEUP AIR HANDLING UNIT	EP22

AREA	STORAGE TANKS
T1	BINDER ROOM
T2	GENERATOR DIESEL
T3	HOT OIL OR WAX EMULSION
T4	AMMONIUM HYDROXIDE
T5	RESIN STORAGE
T6	DIESEL FUEL
T7	GASOLINE STORAGE
T8	KEROSENE

GUARDIAN FIBERGLASS
INWOOD FACILITY
TITLE V MAP

REV NO.	ISSUE	DATE	BY
-	RELEASED	00 MTH 2007	???

GUARDIAN FIBERGLASS, INC.
4812 TABLER STATION RD.
INWOOD, WV. 25428

STATE OPERATION PERMIT MAPS
INWOOD, WV

DRAWN BY	DATE	SCALE
TLH	02AUG07	1"=200'
CHKD. BY	NO.	SHEET
RO	66-170-001	2 OF 2

APPENDIX C: PROCESS FLOW DIAGRAM

Guardian Fiberglass, Inc.
Simplified Process Flow Diagram

Indoor Fugitives, FP11

ES1A/CD1A

Raw Materials Storage Bin
(Sand)
w/Whirl Air Bin
Vent DC Model 195-42

ES1B/CD1B

Raw Materials Storage Bin
(Borax)
w/Whirl Air Bin
Vent DC Model 195-42

ES1C/CD1B

Raw Materials Storage Bin
(Borax)
w/Whirl Air Bin
Vent DC Model 195-42

ES1D/CD1D

Raw Materials Storage Bin
(Soda Ash)
w/Whirl Air Bin
Vent DC Model 195-42

ES1E/CD1D

Raw Materials Storage Bin
(Soda Ash)
w/Whirl Air Bin
Vent DC Model 195-42

ES1F/CD1F

Raw Materials Storage Bin
(Aplite)
w/Whirl Air Bin
Vent DC Model 195-42

ES1G/CD1G

Raw Materials Storage Bin
(Lime)
w/Whirl Air Bin
Vent DC Model 195-42

ES1H/CD1I

Raw Materials Storage Bin
(Purchased Cullet)
w/Whirl Air Bin
Vent DC Model 195-42

ES1I/CD1I

Raw Materials Storage Bin
(Purchased Cullet)
w/Whirl Air Bin
Vent DC Model 195-42

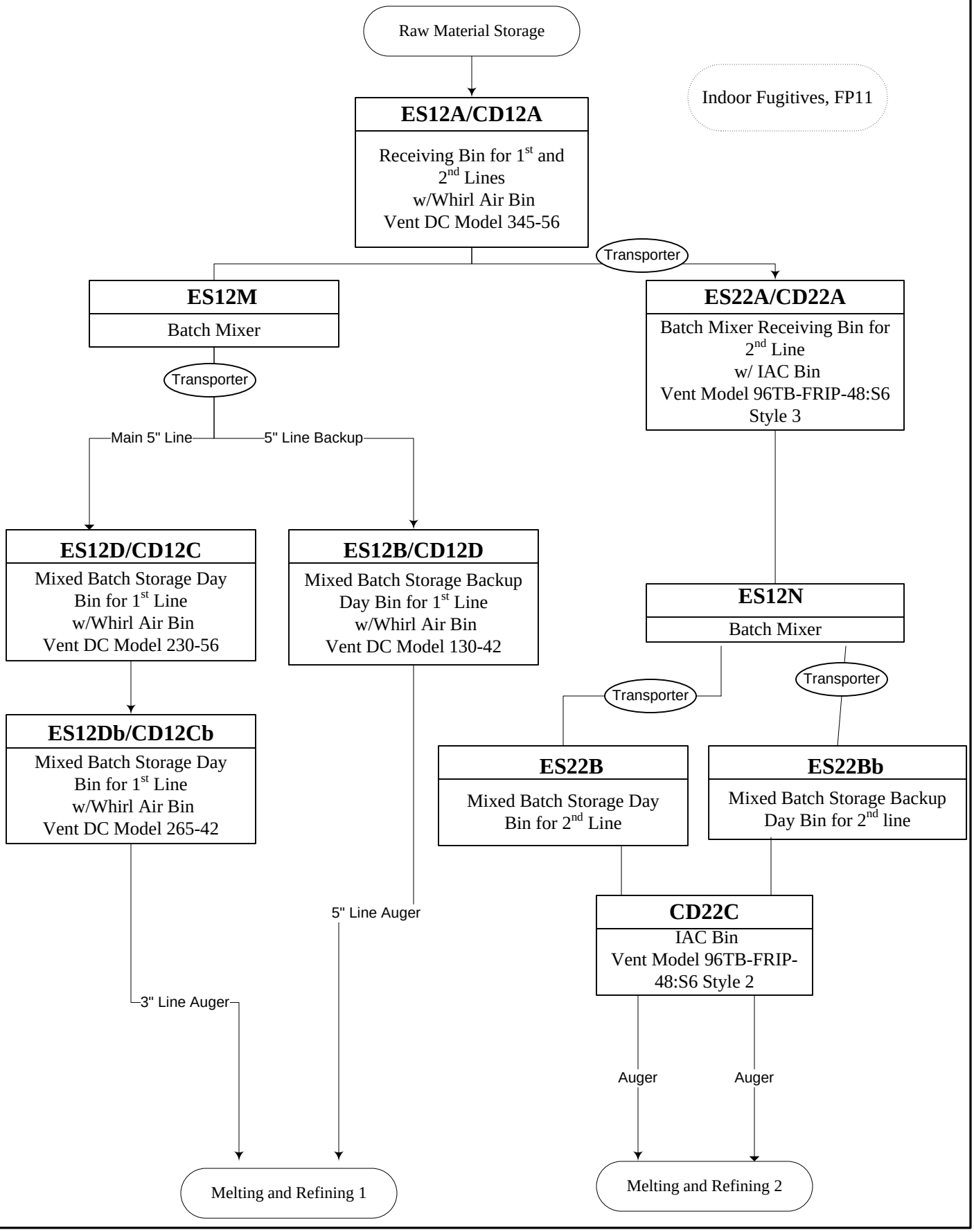
ES1J/CD1F

Raw Materials Storage Bin
(Guardian Cullet)
w/Whirl Air Bin
Vent DC Model 195-42

ES1K/CD1K

Raw Materials Storage Bin
(Baghouse Dust)
w/Whirl Air Bin
Vent DC Model 55-30

Guardian Fiberglass, Inc.
Simplified Process Flow Diagram



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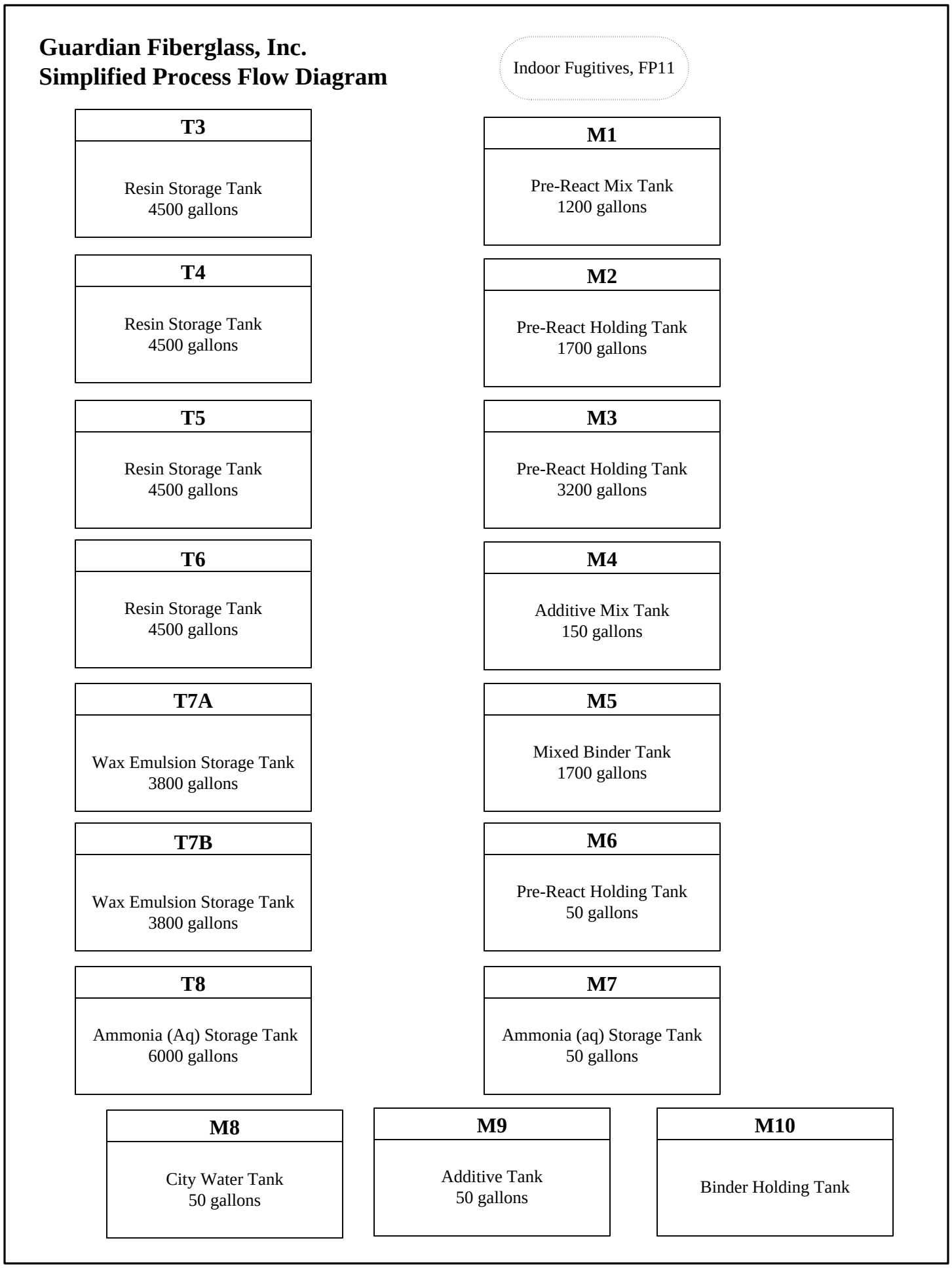
Guardian Fiberglass, Inc.
Simplified Process Flow Diagram



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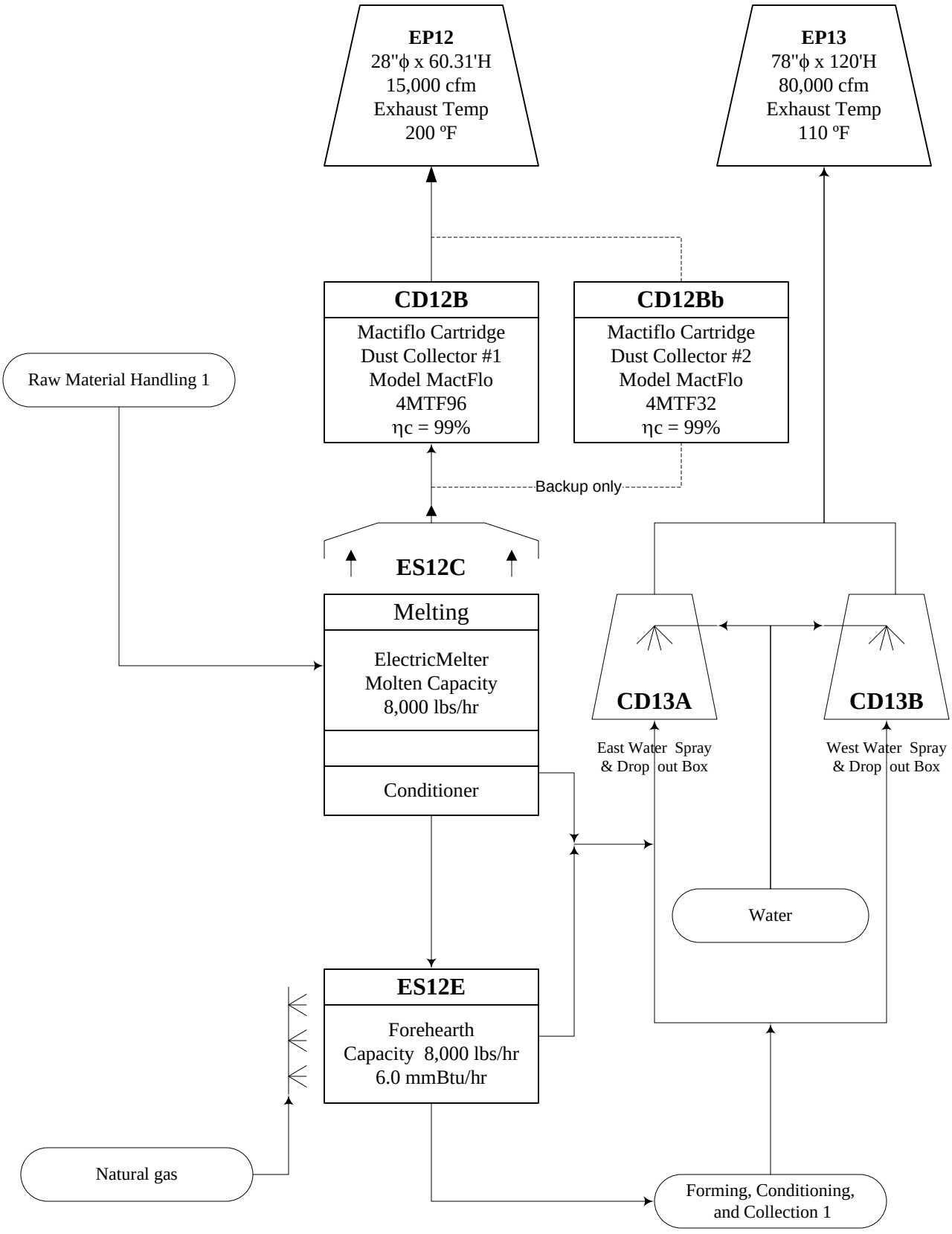
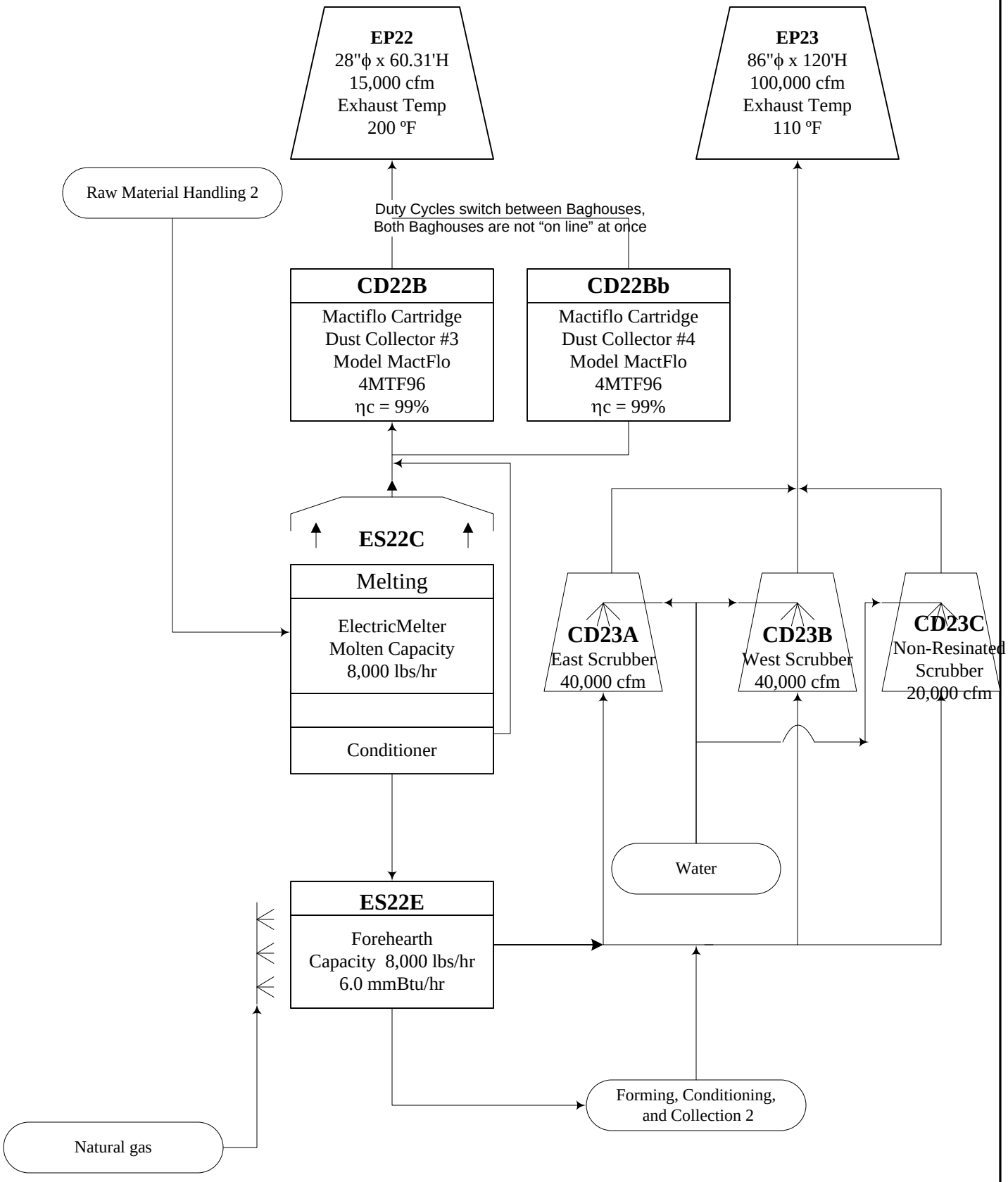
Guardian Fiberglass, Inc.
Simplified Process Flow Diagram



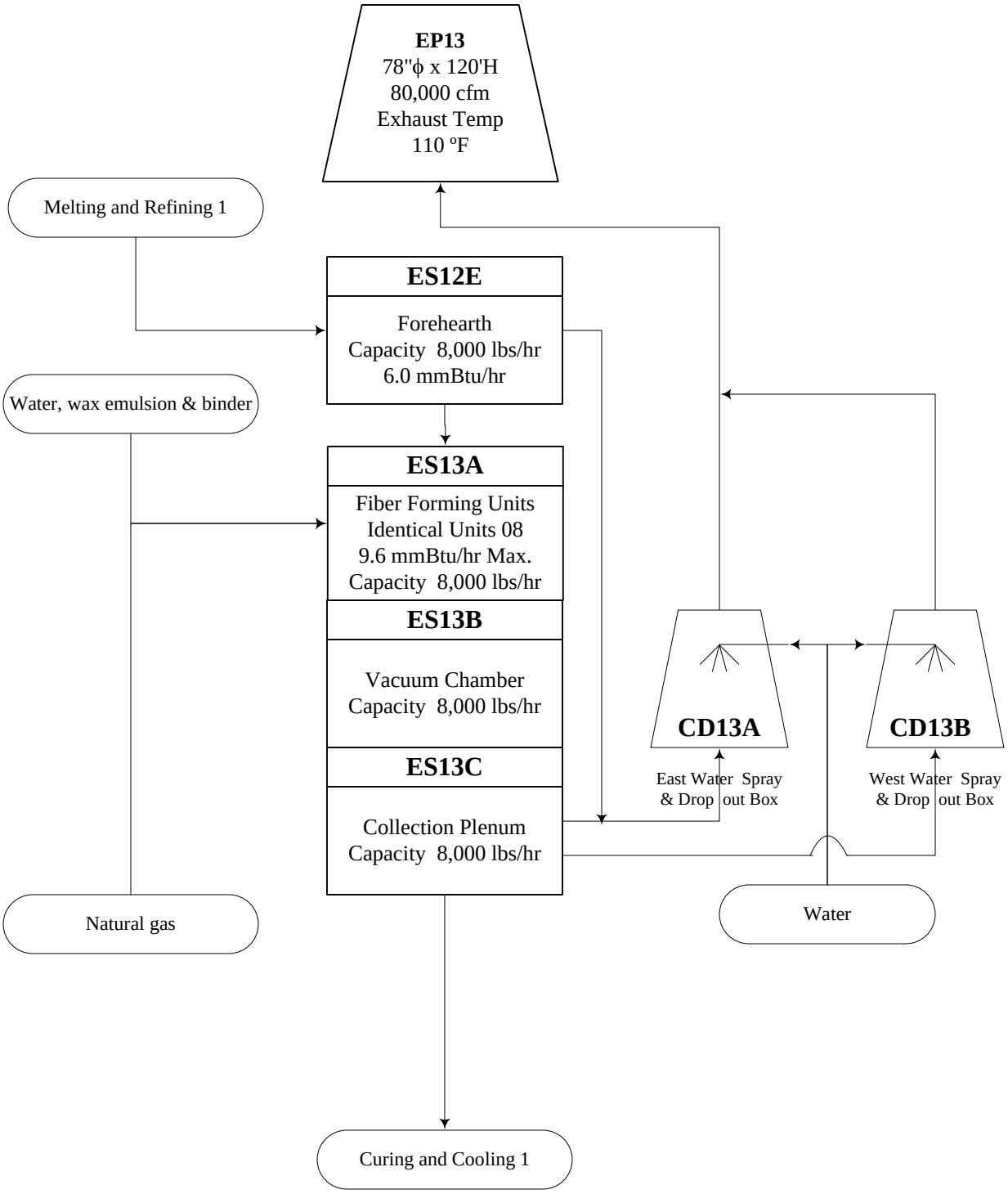
03/26/13

Guardian Fiberglass, Inc.
Simplified Process Flow Diagram

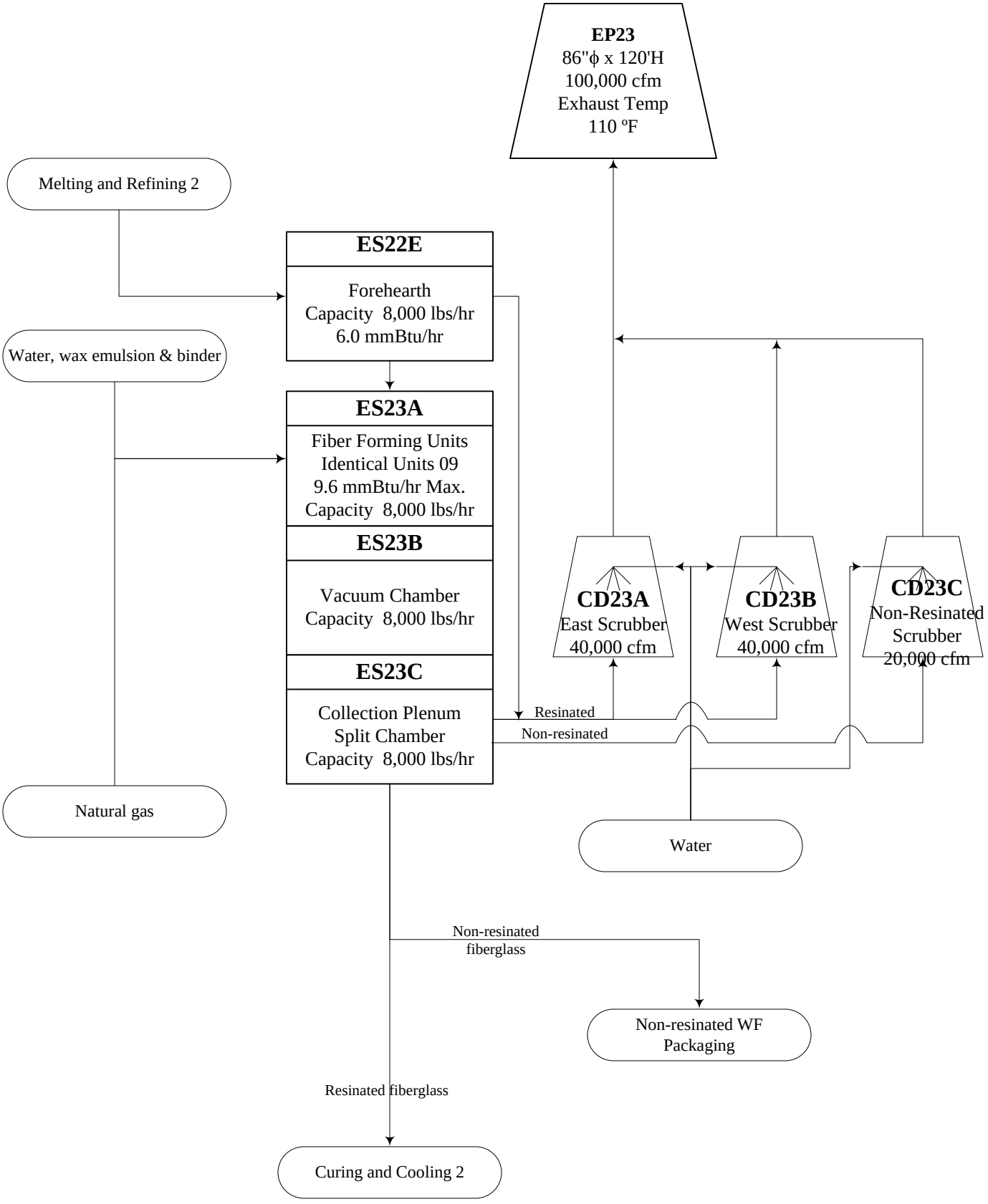


03/26/13

Guardian Fiberglass, Inc.
Simplified Process Flow Diagram



Guardian Fiberglass, Inc.
Simplified Process Flow Diagram



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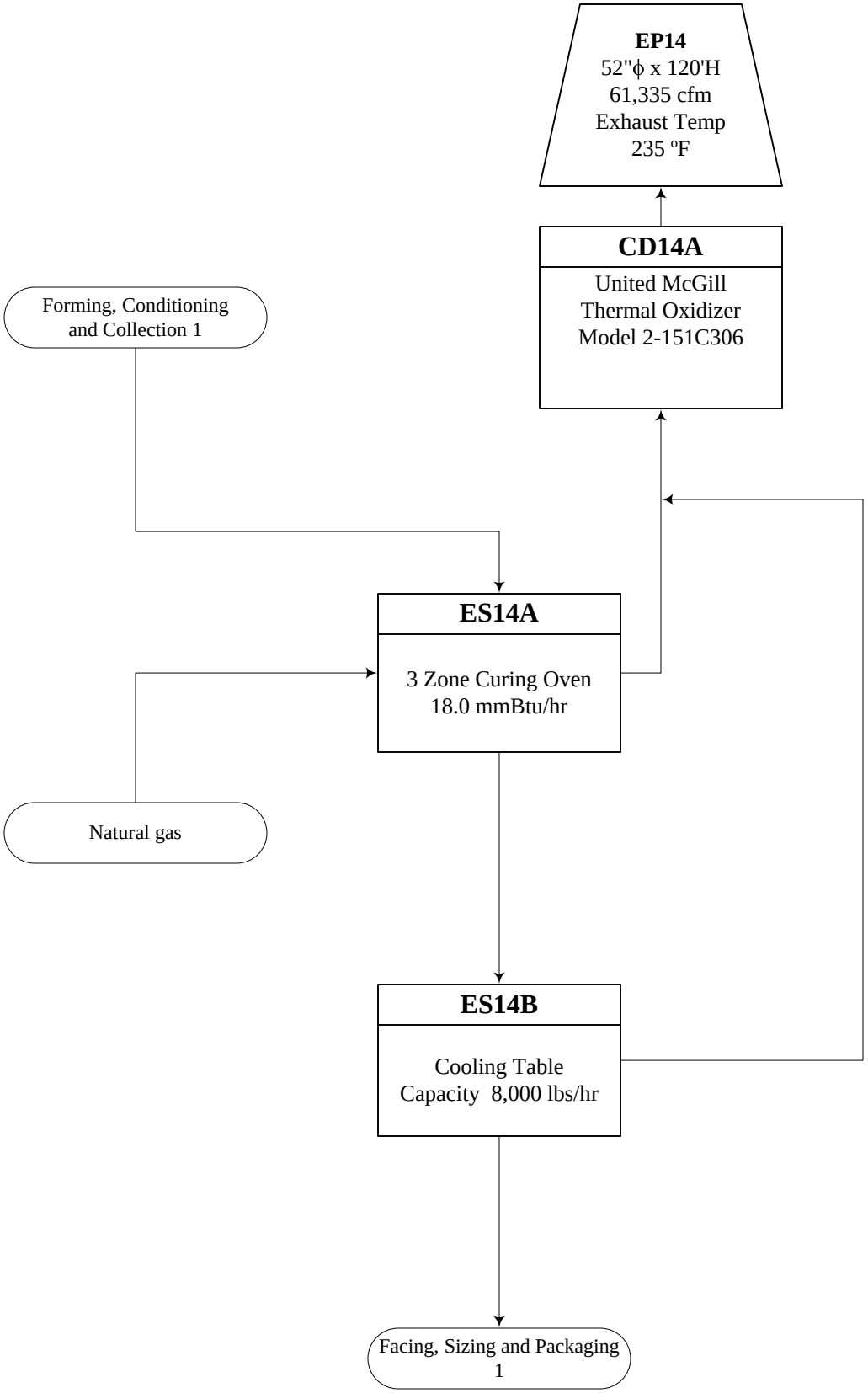
Guardian Fiberglass, Inc.
Simplified Process Flow Diagram



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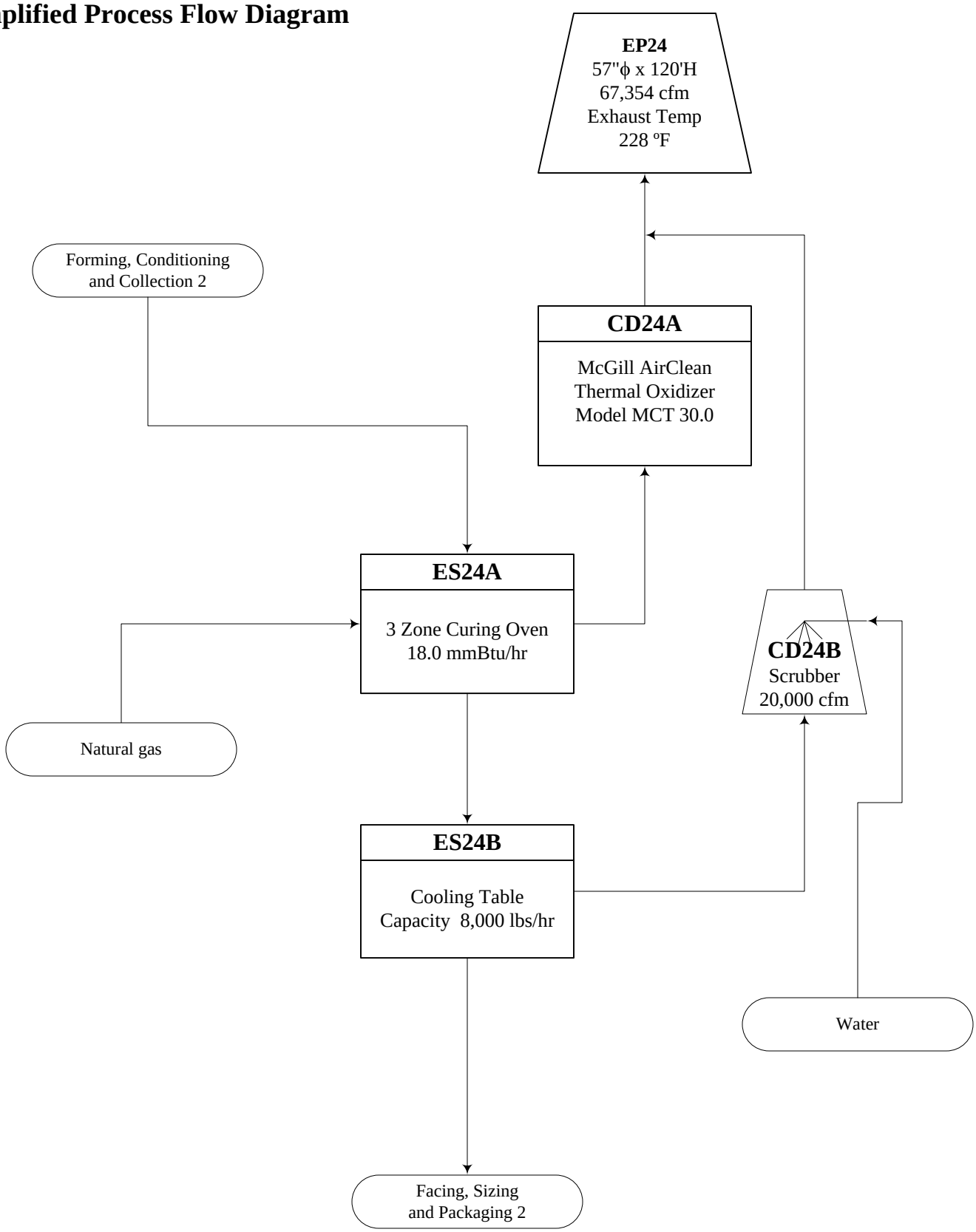
Guardian Fiberglass, Inc.
Simplified Process Flow Diagram



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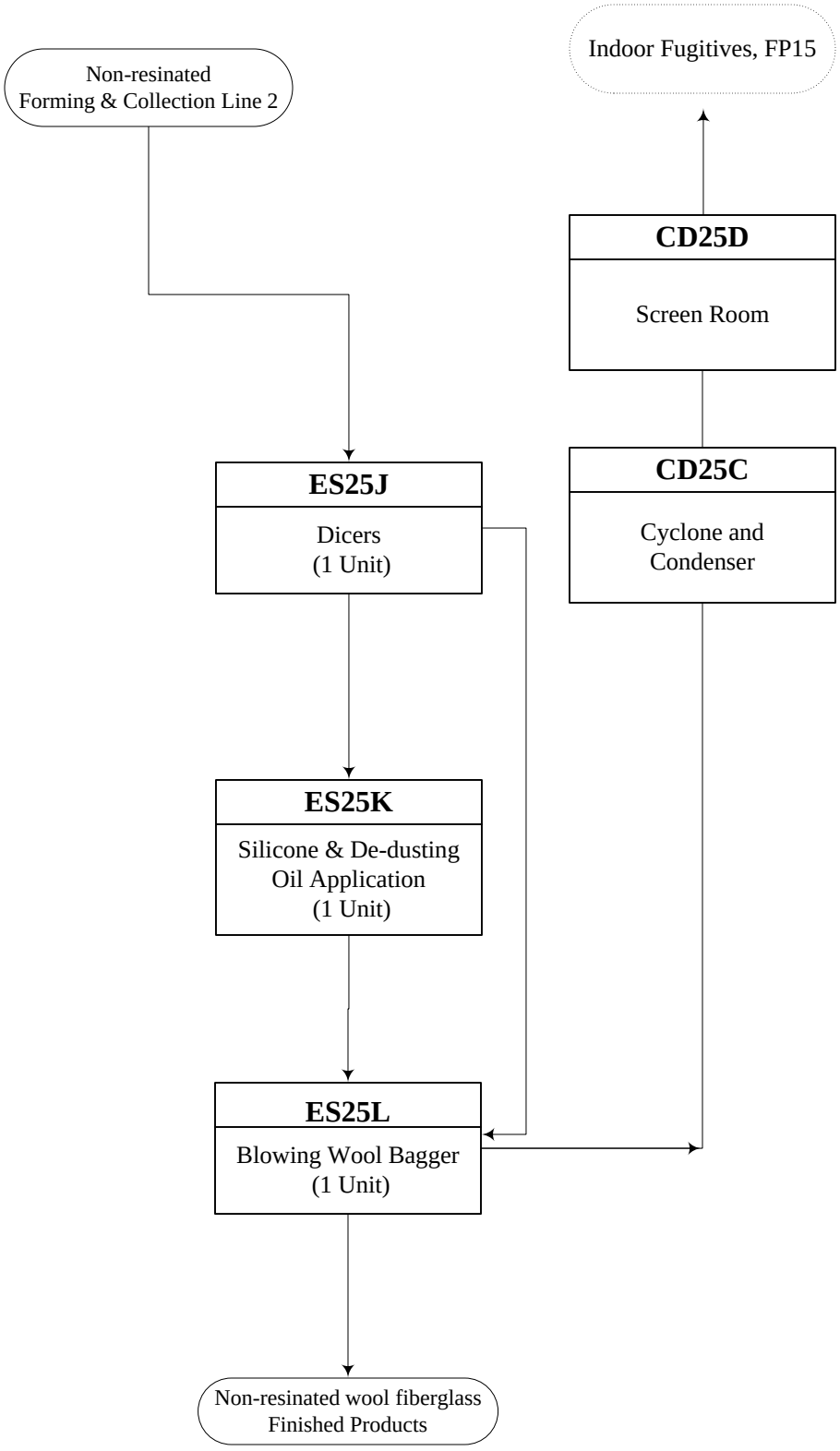
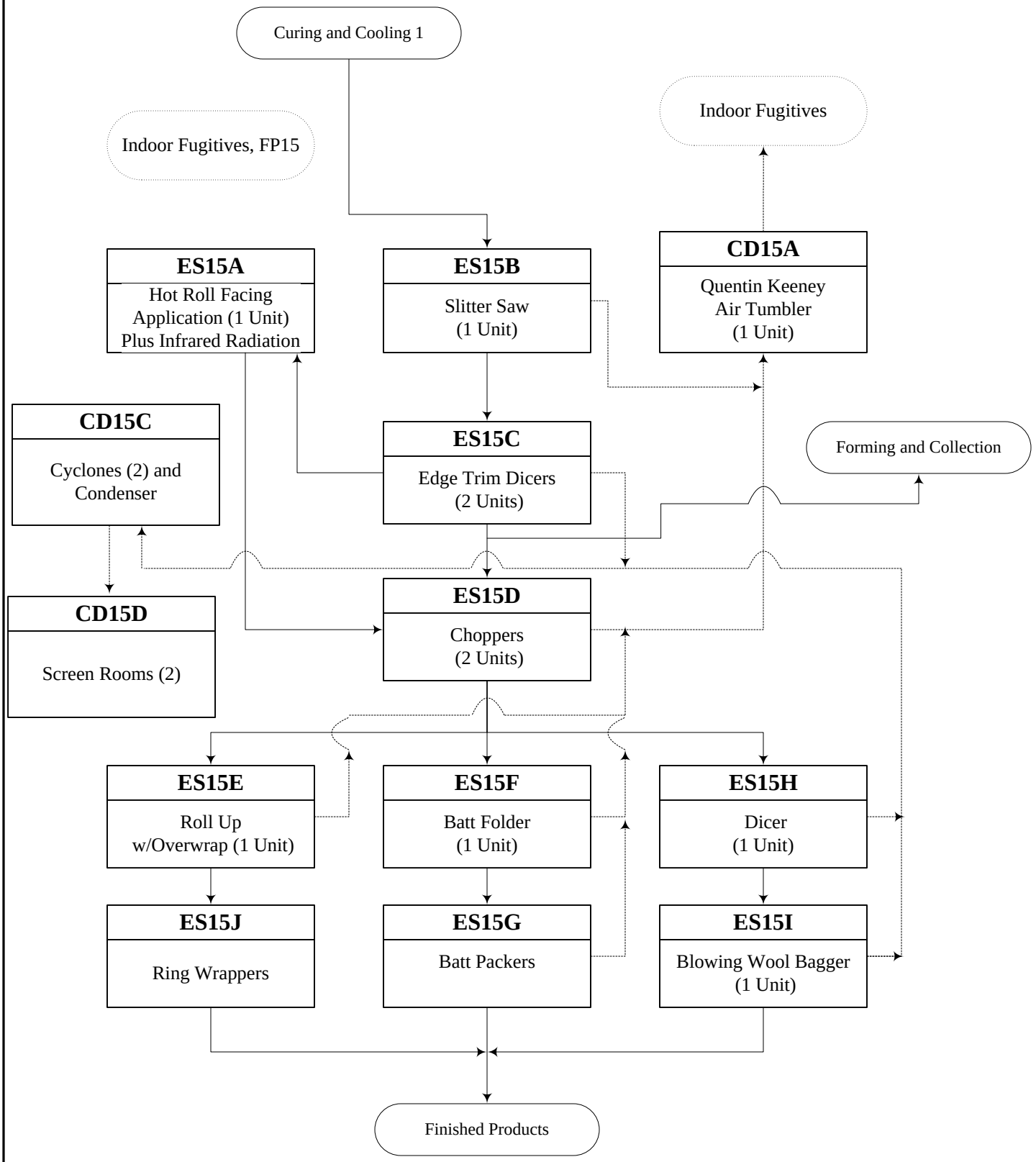
Guardian Fiberglass, Inc.
Simplified Process Flow Diagram



Guardian Fiberglass, Inc.
Simplified Process Flow Diagram



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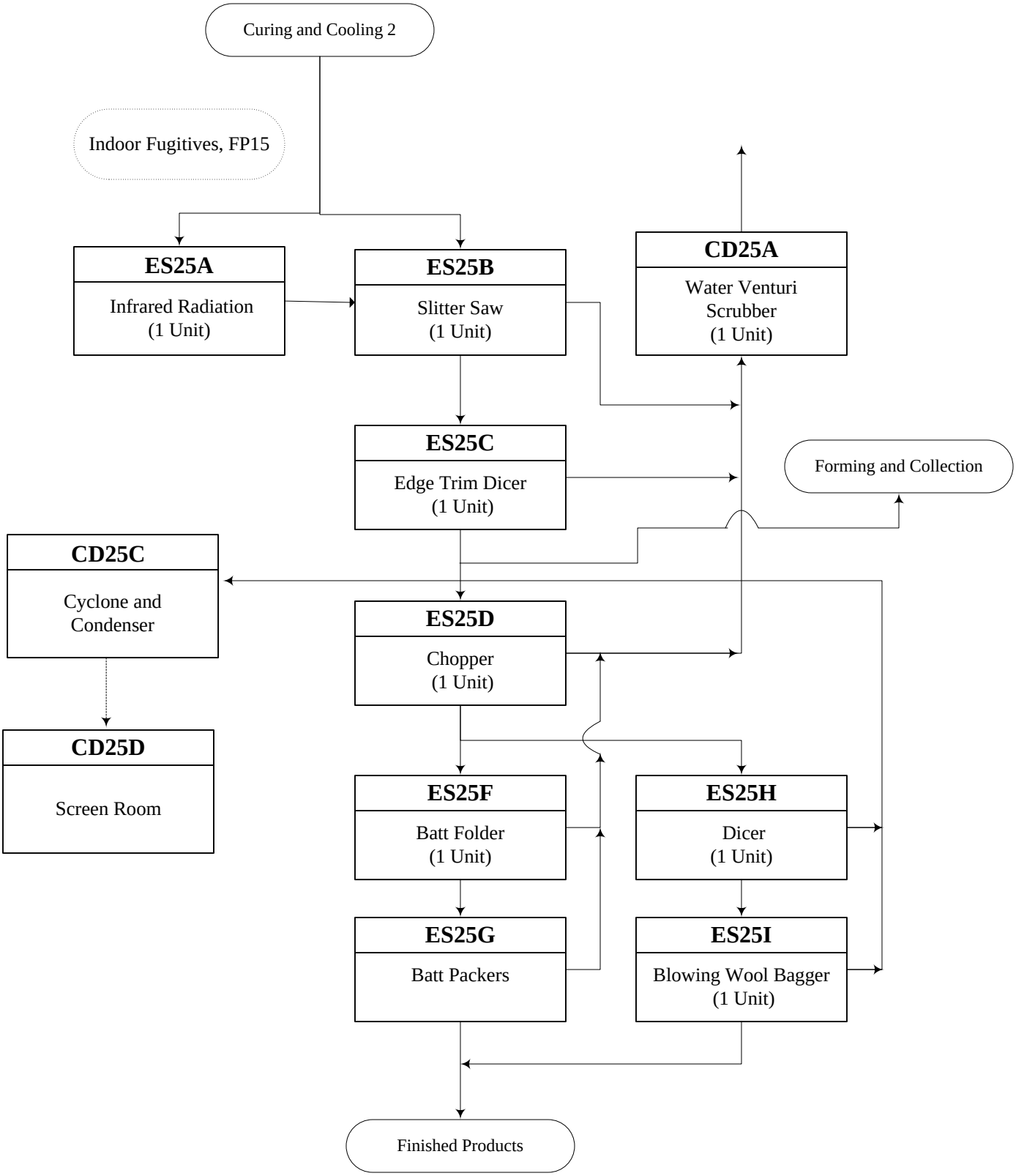
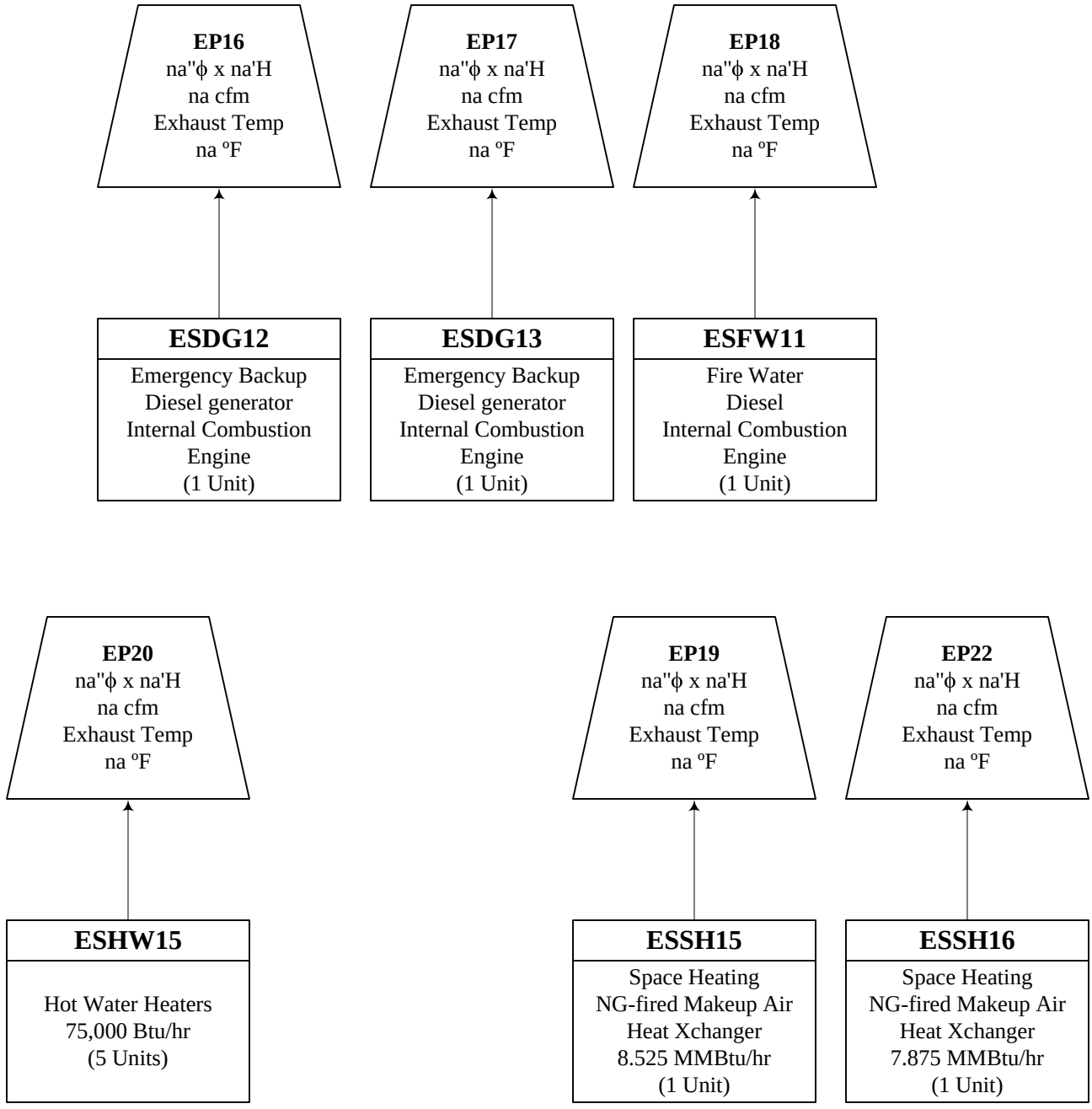
Guardian Fiberglass, Inc.
Simplified Process Flow Diagram



Guardian Fiberglass, Inc.
Simplified Process Flow Diagram



APPENDIX D: WVDEP TITLE V EQUIPMENT TABLE

ATTACHMENT D - Emission Units Table

(includes all emission units at the facility except those designated as insignificant activities in Section 4, Item 24 of the General Forms)

Emission Unit ID[1]	Emission Point ID[1]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Control Device[1]
RAW MATERIAL HANDLING OPERATIONS (Group 001)					
ES1A	FP11	Raw Material Storage Bin for Sand	07/25/1998	178.35 tons	CD1A
CD1A	FP11	Whirl-Air Flow Bin Vent DC Model 195-42	07/25/1998	585 acfm	None
ES1B	FP11	Raw Material Storage Bin for Borax	07/25/1998	137.45 tons	CD1B
CD1B	FP11	Whirl-Air Flow Bin Vent DC Model 195-42	07/25/1998	585 acfm	None
ES1C	FP11	Raw Material Storage Bin for Borax	07/25/1998	137.45 tons	CD1B
ES1D	FP11	Raw Material Storage Bin for Soda Ash	07/25/1998	137.45 tons	CD1D
CD1D	FP11	Whirl-Air Flow Bin Vent DC Model 195-42	07/25/1998	585 acfm	None
ES1E	FP11	Raw Material Storage Bin for Soda Ash	07/25/1998	137.45 tons	CD1D
ES1F	FP11	Raw Material Storage Bin for Aplite	07/25/1998	137.45 tons	CD1F
CD1F	FP11	Whirl-Air Flow Bin Vent DC Model 195-42	07/25/1998	585 acfm	None
ES1G	FP11	Raw Material Storage Bin for Lime	07/25/1998	109.50 tons	CD1G
CD1G	FP11	Whirl-Air Flow Bin Vent DC 2 Model 195-42	07/25/1998	585 acfm	None
ES1H	FP11	Raw Material Storage Bin for Purchased Cullet	07/25/1998	108.50 tons	CD1I
ES1I	FP11	Raw Material Storage Bin for Purchased Cullet	07/25/1998	108.50 tons	CD1I
CD1I	FP11	Whirl-Air Flow Bin Vent DC 2 Model:195-42	07/25/1998	585 acfm	None
ES1J	FP11	Raw Material Storage Bin for Guardian Cullet	07/25/1998	137.45 tons	CD1F
ES1K	FP11	Raw Material Storage Bin for Baghouse Dust	07/25/1998	75.00 tons	CD1K
CD1K	FP11	Whirl-Air Flow Bin Vent DC 2 Model: 55-30	07/25/1998	165 acfm	None
ES12A	FP11	Batch Mixers' Receiving Bin For 1st & 2nd Lines	07/25/1998	8,000 lbs	CD12A
CD12A	FP11	Whirl-Air Flow Bin Vent DC Model:345-56	07/25/1998	1,035 acfm	None
ES22A	FP11	Batch Mixer Receiving Bin for 2nd Line	2004	8,000 lbs	CD22A
CD22A	FP11	IAC Bin-Vent Model:96TB-FRIP-48:S6, Style 3	2004	2,917 acfm	None
ES12B	FP11	Mixed Batch Storage Backup Day Bin for 1st Line (5" Line)	07/25/1998	21.72 tons	CD12D
CD12D	FP11	Whirl-Air Flow Bin Vent DC Model:130-42	07/25/1998	390 acfm	None
ES22B	FP11	Mixed Batch Storage Day Bin for 2nd Line (1 Hour)	2004	6.675 tons	CD22C

CD22C	FP11	IAC Bin-Vent Model:96TB-FRIP-48:S6. Style 2	2004	2917 acfm	None
ES22Bb	FP11	Mixed Batch Storage Backup Day Bin for 2nd Line (8 Hour)	2004	42.2 tons	CD22C
ES12D	FP11	Mixed Batch Storage Day Bin for 1st Line	07/25/1998	39.0 tons	CD12C
CD12C	FP11	Whirl-Air Flow Bin Vent DC Model:230-56	07/25/1998	690 acfm	None
ES12Db	FP11	Mixed Batch Storage Day Bin for 1st Line	07/25/1998	1.31 tons	CD12Cb
CD12Cb	FP11	Whirl-Air Flow Bin Vent DC Model:265-42	07/25/1998	795 acfm	None
TANKS (Group 001)					
T3	FP11	Resin Storage Tank	07/25/1998	4,500 gallons	NA
T4	FP11	Resin Storage Tank	07/25/1998	4,500 gallons	NA
T5	FP11	Resin Storage Tank	07/25/1998	4,500 gallons	NA
T6	FP11	Resin Storage Tank	07/25/1998	4,500 gallons	NA
T7A	FP11	Dedusting Oil/ Wax Emulsion Storage Tank	07/25/1998	3,800 gallons	NA
T7B	FP11	Dedusting Oil/ Wax Emulsion Storage Tank	07/25/1998	3,800 gallons	NA
T8	FP11	Ammonia (aqueous) Storage Tank	07/25/1998	6,000 gallons	NA
M1	FP11	Pre-React Mix Tank Tank Type: Fixed Covers, an access hatch with cover, and an opening for the Mixing Impeller Shaft.	07/25/1998	1,200 gallons	NA
M2	FP11	Pre-React Holding Tank Tank Type: Fixed covers, an access hatch with cover, and an opening for the Mixing Impeller Shaft.	07/25/1998	1,700 gallons	NA
M3	FP11	Pre-React Holding Tank	07/25/1998	3,200 gallons	NA
M4	FP11	Additive Mix Tank	07/25/1998	150 gallons	NA
M5	FP11	Mix Binder Tank	07/25/1998	1,700 gallons	NA
M6	FP11	Pre-React Holding Tank	07/25/1998	50 gallons	NA
M7	FP11	Ammonia (aqueous) Storage Tank	07/25/1998	50 gallons	NA
M8	FP11	Process Water Tank	07/25/1998	50 gallons	NA
M9	FP11	Additive Tank	07/25/1998	50 gallons	NA
M10	FP11	Binder Holding Tank	TBD	750 gallons	NA
FP11		In-Plant Fugitive Emissions Released	07/25/1998		NA
MELTING & REFINING LINE 1 Group(002) [8,000 lbs/hr or 35,040 TPY Production Rate]					
ES12C	EP12	Melter Hood for 1st Line Custom Built by Guardian Fiberglass	07/25/1998	4.0 TPH	CD12B and CD12Bb
CD12B	EP12	Mactiflo Cartridge Dust Collector Filter Model: MactFlo 4MTF96 Configuration: Closed Pressure Filter Material: Polyester Cartridge Filter Cleaning Method: Pulse Air Captured Efficiency: 99%	07/25/1998	15,000 acfm	None

		Filter Area: 10,560 ft^2.			
CD12Bb (Backup)	EP12	Mactiflo Cartridge Dust Collector Model: MactFlo 4MTF32 Filter Configuration: Closed Pressure Filter Material: Polyester Cartridge Filter Cleaning Method: Pulse Air Captured Efficiency: 99% Filter Area: 3,520 ft^2.	07/25/1998	10,000 acfm	None
ES12E	EP12 and EP13	Forehearth for 1st Line Natural Gas Fired Brick Holding Process Heater Tank Max Heat Input Rate: 6.0 MMBtu/hr Custom Design by Guardian Fiberglass	4/11-26/07	8,000 lbs/hr of Molten Glass	CD13A and CD13B
CD13A (East Side)	EP13	Water Spray with Dropout Boxes Type: Wet Collecting System Captured Efficiency: 99%	07/25/1998	40,000 cfm	None
CD13B (West Side)	EP13	Water Spray with Dropout Boxes Type: Wet Collecting System Captured Efficiency: 99%	07/25/1998	40,000 cfm	None
MELTING & REFINING LINE 2 Group(003) [8,000 lbs/hr or 35,040 TPY Production Rate]					
ES22C	EP22	Melter Hood for 2nd Line Custom Built by Guardian Fiberglass	2004	4.0 TPH	CD22B and CD22Bb (Duty Cycled)
CD22B (Duty Cycled)	EP22	Mactiflo Cartridge Dust Collector Model: MactFlo 4MTF96 Configuration: Closed Pressure Filter Material: Fabric Filter Cleaning Method: Pulse Air Captured Efficiency: 99% Filter Area: 10,560 ft^2.	2004	15,000 acfm	None
CD22Bb (Duty Cycled)	EP22	Mactiflo Cartridge Dust Collector Model: MactFlo 4MTF96 Configuration: Closed Pressure Filter Material: Fabric Filter Cleaning Method: Pulse Air Captured Efficiency: 99% Filter Area: 10,560 ft^2	2004	15,000 acfm	None
ES22E	EP23	Forehearth for 2nd Line	2004	8,000 lbs/hr of Molten Glass	CD23A, CD23B, CD23C

		Natural Gas Fired Brick Holding Process Heater Tank Max Heat Input Rate: 6.0 MMBtu/hr Custom Design by Guardian Fiberglass			
CD23A (East Side)	EP23	Water Venturi Scrubbers Manufacturer: Fisher-Klosterman, Inc. Model: MS-850H Captured Efficiency: 99% Scrubbing Liquid: Water	2004	40,000 cfm	None
CD23B (West Side)	EP23	Water Venturi Scrubbers Manufacturer: Fisher-Klosterman, Inc. Model: MS-850H Captured Efficiency: 99% Scrubbing Liquid: Water	2004	40,000 cfm	None
CD23C (Non-resinated)	EP23	Water Venturi Scrubbers Manufacturer: Fisher-Klosterman, Inc. Model: MS-650H Captured Efficiency: 99% Scrubbing Liquid: Water	2004	20,000 cfm	None
FORMING AND COLLECTING 1 Group (004)					
ES13A	EP13	Fiber Forming Units with Advanced Water-Jet Rings Forming Process Heater Natural Gas Fired Max Heat Input Rate: 9.60 MMBtu/hr Custom Design by Guardian Fiberglass	07/25/1998	8,000 lbs/hr	CD13A and CD13B
ES13B	EP13	Vacuum Chamber for 1st Line Custom Design by Guardian Fiberglass	07/25/1998	8,000 lbs/hr	CD13A and CD13B
ES13C	EP13	Collection Plenum for 1st Line Custom Design by Guardian Fiberglass	07/25/1998	8,000 lbs/hr	CD13A and CD13B
FORMING AND COLLECTING 2 Group (005)					
ES23A	EP23	Fiber Forming Units with Advanced Water-Jet Rings Forming Process Heaters Natural Gas Fired Max Heat Input Rate: 9.60 MMBtu/hr Custom Design by Guardian Fiberglass	2004	8,000 lbs/hr	CD23A, CD23B, CD23C
ES23B	EP23	Vacuum Chamber for 2nd Line Custom Design by Guardian Fiberglass	2004	8,000 lbs/hr	CD23A, CD23B, CD23C
ES23C	EP23	Collection Plenum for 2nd Line	2004	8,000 lbs/hr	CD23A, CD23B, CD23C

		Custom Design by Guardian Fiberglass			
CURING AND COOLING LINE 1 Group (006)					
ES14A	EP14	3 Zone Curing Oven for 1st Line Manufacturer: B&M Steel of New Castle Indiana Natural Gas Fired Max Heat Input Rate: 18.0 MMBtu/hr	07/25/1998	8,000 lbs/hr	CD14A
CD14A	EP14	Thermal Oxidizer Manufacturer: United McGill Corp. Model No.: 2-151C306 Control Efficiency: 95% for VOC	07/25/1998	2.628 $MMft^3$ / hr at 150.0 ^oF	None
ES14B	EP14	Cooling Table for 1st Line	07/25/1998	8,000 lbs/hr	CD14A
CURING AND COOLING LINE 2 Group (007)					
ES24A	EP24	3 Zone Curing Oven for 2nd Line Manufacturer: B&M Steel of New Castle Indiana Natural Gas Fired Max Heat Input Rate: 18.0 MMBtu/hr	2004	8,000 lbs/hr	CD24A
CD24A	EP24	McGill AirClean RTO Thermal Oxidizer Manufacturer: McGill AirClean Model No.: MCT 30.0 Captured Efficiency: 95% for VOC	2004	1.785 $MMft^3$ / hr at 250.0 ^oF	None
ES24B	EP24	Cooling Table for 2nd Line	2004	8,000 lbs/hr	CD24B
CD24B	EP24	Water Venturi Scrubbers Manufacturer: Fisher-Klosterman, Inc. Model: MS-650H Captured Efficiency: 99% Scrubbing Liquid: Water	2004	20,000 cfm	None
FACING SIZING & PACKAGING for 1st Line Group (008)					
ES15A	FP15	Hot Roll – Facing Application Manufacturer: Budzar Model No.: 10T-180180-G0L Type: Electric Hot Oil Heater	07/25/1998	50-400^{O}F @ 180 GPM	None
ES15Aa	FP15	Infrared Radiation – Facing Application Manufacturer: SOLARONICS IRT Model No.: IRT-MiniFlex Type: Electric	2004	50-400^{O}F @ 200 amps	CD15A
ES15B	FP15	Slitter Saw Manufacturer: Guardian Fiberglass	07/25/1998	NA	CD15A

		Model No.: NA Type: NA			
CD15A	FP15	Wet Collection System (Dynamic Separator) Manufacturer: Quentin Keeney Type: Air Tumber Model No.: 35-W-C Captured Efficiency: 80 %	07/25/1998	20,000 cfm	None
ES15C	FP15	Edge Trimmer and Dicers (or Cubes) Manufacturer: Guardian Fiberglass Model No.: NA Type: NA	07/25/1998	NA	CD15C and CD15D
ES15D	FP15	Choppers Manufacturer: United Tool Model No.: UX-431 Type: NA	07/25/1998	NA	CD15A
ES15E	FP15	Roll Up Manufacturer: Kaibel & Sieber Model No.: WM87-3000 Type: NA	07/25/1998	NA	CD15A
ES15F	FP15	Batt Folder Manufacturer: Guardian Fiberglass Model No.: NA Type: NA	07/25/1998	NA	CD15A
ES15G	FP15	Batt Packers Manufacturer: Guardian Fiberglass Model No.: NA Type: NA	07/25/1998	NA	CD15A
ES15H	FP15	Dicers or Cubers Manufacturer: Guardian Fiberglass Model No.: NA Type: NA	07/25/1998	NA	CD15C and CD15D
ES15I	FP15	Blowing Wool Bagger Manufacturer: Guardian Fiberglass Model No.: NA Type: NA	07/25/1998	NA	CD15C and CD15D
ES15J	FP15	Ring Wrapper Manufacturer: Samuel Strapping Systems	07/25/1998	NA	CD15A

		Model No.: SOA750 Type: NA			
CD15C	FP15	Dual Cyclone and Condenser Manufacturer: OMNI S.P.A Model No.: ARP 2400	2006	NA	CD15D
CD15D	FP15	Screen Rooms (2) 8’ x 8’ x 16’ Woven Plyester Capture Efficiency 95%	2007/2012	Total 20,000 cfm	CD15D
FACING SIZING & PACKAGING for 2nd Line Group (008)					
ES25A	FP15	Infrared Radiation – Facing Application Manufacturer: SOLARONICS IRT Model No.: IRT-MiniFlex Type: Electric	2004	50-400^{O}F @ 200 amps	None
ES25B	FP15	Slitter Saw Manufacturer: Guardian Fiberglass Model No.: NA Type: NA	2004	NA	CD25A
CD25A		Water Venturi Scrubbers Manufacturer: Fisher-Klosterman, Inc. Model: MS-650H Captured Efficiency: 85% Scrubbing Liquid: Water	2004	20,000 cfm	None
ES25C	FP15	Edge Trimmer and Dicers (or Cubes) Manufacturer: Guardian Fiberglass Model No.: NA Type: NA	2004	NA	CD25A
ES25D	FP15	Choppers Manufacturer: United Tool Model No.: UX-431 Type: NA	2004	NA	CD25A
ES25F	FP15	Batt Folder Manufacturer: Guardian Fiberglass Model No.: NA Type: NA	2004	NA	CD25A
ES25G	FP15	Batt Packers Manufacturer: Guardian Fiberglass	2004	NA	CD25A

		Model No.: NA Type: NA			
ES25H	FP15	Dicers or Cubers Manufacturer: Guardian Fiberglass Model No.: NA Type: NA	2004	NA	CD25C
ES25I	FP15	Blowing Wool Bagger Manufacturer: Guardian Fiberglass Model No.: NA Type: NA	2004	NA	CD25C
CD25C	FP15	Dual Cyclone and Condenser Manufacturer: Van Dommele	2004	NA	CD25D
CD25D	FP15	Screen Room 8' x 8' x 16' Woven Plyester Capture Efficiency 95%	2007/2012	10,000 cfm	CD25D
ES25J	FP15	Dicers Manufacturer: Guardian Fiberglass Model No.: NA Type: NA	2004	NA	CD25A
ES25K	FP15	Silicone & De-Dusting Oil Application Manufacturer: Guardian Fiberglass Model No.: NA Type: NA	2004	NA	CD25B
ES25L	FP15	Blowing Wool Bagger Manufacturer: Guardian Fiberglass Model No.: NA Type: NA	2004	NA	CD25B
SUPPORT FACILITIES Group (009)					
ESDG12	EP16	Emergency Generator For Line #1 Manufacturer: Caterpillar Diesel Fired Internal Combustion Engine Engine Model No.: 3406 Fuel: Diesel	07/25/1998	400.2 MMBtu/hr (Limited to 500 hours of operation) (500 Gallon Fuel Tank)	None
ESDG13	EP17	Emergency Generator For Line #2 Manufacturer: Caterpillar Diesel Fired Internal Combustion Engine Engine Model No.: 3456	2004	400.2 MMBtu/hr (Limited to 500 hours of operation) (250 Gallon Fuel	None

		Fuel: Diesel		Tank)	
ESFW11	EP18	Emergency Fire Water Manufacturer: Cummins Diesel Fired Internal Combustion Engine Model No.: NT-855-F1 Horsepower: 255 HP Fuel: Diesel	07/25/1998	1000 gallons of Diesel Fuel (265 Gallon Fuel Tank)	None
ESHW15	EP20	5-0.075 MMBtu/hr Water Heater Fuel: Pipeline Quality Natural Gas	07/25/1998	0.375 MMBtu/hr	
ESSH15	EP19	Air Handling Unit: Rapid Engineering, Model: 4089 Fuel: Pipeline Quality Natural Gas	07/25/1998	8.525 MMBtu/hr	
ESSH16	EP22	Air Handling Unit; Rapid Engineering, Model: 4089 Fuel: Pipeline Quality Natural Gas	2004	7.875 MMBtu/hr	

[1]For 45CSR13 permitted sources, the numbering system used for the emission points, control devices, and emission units should be consistent with the numbering system used in the 45CSR13 permit. For grandfathered sources, the numbering system should be consistent with registrations or emissions inventory previously submitted to DAQ. For emission points, control devices, and emissions units which have not been previously labeled, use the following 45CSR13 numbering system: 1S, 2S, 3S,... or other appropriate description for emission units; 1C, 2C, 3C,... or other appropriate designation for control devices; 1E, 2E, 3E, ... or other appropriate designation for emission points.

APPENDIX E: WVDEP EMISSION UNIT FORMS

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
ES12C, ES12E (Group 002)	Melter Hood and Forehearth Line 1	CD12B, CD12Bb, CD13A & CD13B

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
The melter hood covers a 8,000 lb/hr, electrically fired, water-cooled, brick lined melting unit that is used to melt batch. The hood contains a 15,000 cfm Mactiflo cartridge dust collector that controls particulate emissions from the charging and operation of the melter. Emissions from the melter exhaust vertically from fabric filters to the outside ambient air through Stack EP12. The molten glass flows from the Melters to Forehearths, natural gas fired, brick holding tanks. The Forehearth for Line 1 has natural gas burners with a maximum rated heat input of 6.0MMBtu/hr. The Forehearth splits the molten glass flow and presents a consistent glass flow (pull rates) to each fiber forming unit. Forehearth emissions are combined with forming / collection system emissions and passed through a set of water sprays with drop-out boxes before being discharged into the air.

Manufacturer:	**Model number:**	**Serial number:**
Guardian Fiberglass	NA	NA

Construction date:	**Installation date:**	**Modification date(s):**
1998	07/25/1998	04/26/2007

Design Capacity (examples: furnaces - tons/hr, tanks - gallons):
4.00TpH- ES12C
8,000 lbs/hr- ES12E

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
4.00 TpH- ES12C 8,000 lbs/hr- ES12E	35,040 TpY	Guardian operates 24 hours per day, 365 days a year.

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? __x_Yes ___ No ES12E- Forehearth	**If yes, is it?** _**X** Indirect Fired ___Direct Fired
Maximum design heat input and/or maximum horsepower rating: 8.6 MM Btu/Hr	**Type and Btu/hr rating of burners:** Pre Mix Tunnel Burner 8.6 MM Btu/Hr

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
Max. 8,200 CFH & 71,750 CF/Yr

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	NA	NA	1047.7

Emissions Data

Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	2.92	12.79

Nitrogen Oxides (NO_X)	0.12	0.53
Lead (Pb)	0.00006	0.00028
Particulate Matter ($PM_{2.5}$)	0.54	2.38
Particulate Matter (PM_{10})	0.54	2.38
Total Particulate Matter (TSP)	0.54	2.38
Sulfur Dioxide (SO_2)	0.0005	0.002
Volatile Organic Compounds (VOC)	0.88	3.85
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Hexavalent Chromium	0.00029	0.00125
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
CO_2e	2,800	12,400

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).
The emission factors and TPY listed above for CO NO_x,, VOC and PM are from Permit R14-0015 emission limits. The emission factor for SO_2 was obtained for the January 1999 stack test and the emission factor for Hexavalent Chromium was obtained from the Albion, MI 2006 stack test. Lead is an impurity in the raw materials and is calculated based on raw material usage.

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

Permit to Modify R14-0015K:

4.1.1. The permittee shall operate a resinated (bonded) fiberglass insulation line identified as 1st line with associated emission EP12 (melter stack), EP13 (collection stack), and EP14 (incinerator stack). This line shall be operated and maintained in accordance with the following operational and emission limitations:

a. Production of fiberglass insulation from this line shall not exceed 8,000 pounds of glass pulled per hour or 35,040 TPY. Compliance with this limit shall be based on a 12-month rolling total;
b. Emissions from the line shall not exceed the following limits with respect to the corresponding emission point and pollutant;

Emission Point	CO lb/TGP	NO_x lb/TGP	PM lb/TGP	PM_{10} lb/TGP	VOC* lb/TGP	HCOH lb/TGP	Phenol lb/TGP	NH_3 lb/TGP
EP12	0.73	0.03	0.07	0.07				
EP13	5.28	0.32	3.47	3.47	2.86	0.80	1.55	3.77
EP14	1.13	3.75	0.46	0.46				0.87

*VOC emissions shall not include methane and ethane

c. Exhaust from the electric melter shall be vented into a closed loop system that routes this stream directly to either one of identified baghouses (CD12B or CD12Bb) at all times when the line is operating.
d. The fiberizers and Forehearth of the line shall be operated in such a manner the following air to fuel ratios are not exceeded:
Thermox Gas Ratio Setting for the fiberizers: 962 millvolts
Thermox Gas Ratio Setting for the forehearths: 823 millvolts
e. Exhaust from the Forehearth and fiberizers of this line shall be vented into a closed loop system that routs this

stream directly to either one of identified water sprays with drop-out boxes (CD13A or CD13B) at all times when the line is operating.

4.1.3 The following condition applies to both production lines.

a. A bag leak detection system (BLDS) shall be installed and operated on the fabric filter baghouses identified as CD12B, CD12Bb, CD22B, and CD22Bb. Each BLDS shall be installed, maintained, and operated in accordance with 40CFR63.13839(b)(1) and U.S. EPA guidance document, "Fabric Filter Bag Leak Detection Guidance" (EPA-454/R-98-015, September 1997);

4.1.4 The permitted shall, to the extent practicable, install maintain, and operate all pollution control equipment listed in Section 1.0 and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary. **[45CSR§13-5.11.]**

NSPS Subpart PPP and MACT Subpart NNN

____ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Permit to Modify R14-0015K:

4.2.2 The permittee shall maintain records of the recorded data from the stipulated devices in condition 4.1.3.b. through g. in accordance with condition 3.4.1 of this permit.

4.2.6 The permittee shall install, calibrate, maintain, and operated two Thermox premix (air to fuel) analyzers to measure and record the air to fuel ratio being fed to the fiberizers and forehearth for each production line. Each analyzer shall be maintain in such a way that the analyzer is available to analyze samples 90 percent of the time for greater. Each analyzer shall be calibrated once a month in accordance with the manufacturer's specifications and follow the Quality & Assurance guidelines recommended by the manufacturer. Readings shall be taken and recorded twice a day with a minimum of ten hours between readings. Records of such readings and calibrations shall be maintain in accordance with condition 3.4.1.

4.3.1 For the purposes of demonstrating initial compliance with operations and emission limitation in condition 4.1.1., 4.1.2., and 40 CFR §63.(a), the permittee shall conduct performance testing of the 1st and 2nd lines within 180 days after issuance of this permit. Such testing shall determine the VOC, formaldehyde, and phenol emission rates from the collection and incinerator stacks of the both production lines. This testing shall establish and/or verify the operating parameters for the respective control devices of the production line. This testing shall be conducted as outline in the following:

a. General Testing Requirements:
   i. This testing shall consist of three test runs. Each test run must last at least one hour;
   ii. Each test run must be conducted with the production line operating at no less 90 percent capacity;

NSPS Subpart PPP and MACT Subpart NNN

Are you in compliance with all applicable requirements for this emission unit? _**X**_ Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
ES14A, ES14B (Group 006)	3 Zone Curing Oven and Cooling Table	CD14A

Provide a description of the emission unit (type, method of operation, design parameters, etc.):

The collected fibers, coated with binder, are conveyed to a three (3) zone natural gas-fired, recirculating heated air oven of Guardian Fiberglass design. While the fiberglass blanket is in the oven it is sized to thickness and the binder is cured by means of the recirculating heated air. A cooling section is provided downstream of the curing oven, where ambient plant air is drawn through the cured fiberglass blanket. The maximum rated heat input of the curing oven is 18.0 mmBtu/hr. Potential regulated air pollutant emissions from the curing sections of the wool fiberglass manufacturing line are collected and controlled with a thermal oxidizer. The curing table utilizes a McGill AirClean (formerly United McGill) Thermal Oxidizer that exhausts through Stack No. EP14. Potential particulate emissions from the cooling section exhaust through the incinerator.

Manufacturer:	**Model number:**	**Serial number:**
Guardian Fiberglass	NA	NA
Construction date:	**Installation date:**	**Modification date(s):**
1998	07/25/1998	NA

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 8,000 lbs/hr

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
8,000 lbs/hr	35,040 Tons per Year	The facility operates 24 hours a day, 365 days a year.

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? _x_ Yes __ No ES14A- Curing Oven	**If yes, is it?** ___ Indirect Fired __x_Direct Fired
Maximum design heat input and/or maximum horsepower rating: 18.0 MM Btu/Hr	**Type and Btu/hr rating of burners:** Nozzle Mix Burner 18.0 mmBtu/hr nat'l gas-fired

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
Natural Gas
Max./Hr.: 17,150 CFH Nat. Gas
Max/Yr : 150,234 CF

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	NA	NA	1047.7

Emissions Data

Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	4.52	19.8

Nitrogen Oxides (NO_X)	15	65.7
Lead (Pb)	0.0000212	0.000093
Particulate Matter ($PM_{2.5}$)	2.16	9.46
Particulate Matter (PM_{10})	2.16	9.46
Total Particulate Matter (TSP)	2.16	9.46
Sulfur Dioxide (SO_2)	0.0003	0.001
Volatile Organic Compounds (VOC)	0.96	4.205
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Formaldehyde	0.68	2.99
Methanol	0.24	1.03
Phenol	1.2	5.23
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
Ammonia	3.48	15.24
Formic Acid	0.160	0.701
Carbon Dioxide Equivalent (CO_2e)	2,110	9,220

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

The emission factors and TPY listed above for CO NO_x, PM, VOC Phenol, Ammonia and Formaldehyde are from Permit R14-0015H. The Lead is an impurity in the raw material and is calculated based on usage. Methanol emission factor was obtained from the October 2005 stack test, and Formic Acid was obtained from the October 2006 test. SO_2 was obtained form the January 1999 stack test. Condensable PM was calculated based on stack test data. CO2e was calculated according to 40 CFR 98 Subparts C and N as appropriate.

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or <u>construction permit</u> with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

<u>Permit to Modify R14-0015K:</u>

4.1.1. The permittee shall operate a resinated (bonded) fiberglass insulation line identified as 1st line with associated emission EP12 (melter stack), EP13 (collection stack), and EP14 (incinerator stack). This line shall be operated and maintained in accordance with the following operational and emission limitations:

a. Production of fiberglass insulation from this line shall not exceed 8,000 pounds of glass pulled per hour or 35,040 TPY. Compliance with this limit shall be based on a 12-month rolling total;
b. Emissions from the line shall not exceed the following limits with respect to the corresponding emission point and pollutant;

Emission Point	CO lb/TGP	NO_x lb/TGP	PM lb/TGP	PM_{10} lb/TGP	VOC* lb/TGP	HCOH lb/TGP	Phenol lb/TGP	NH_3 lb/TGP
EP12	0.73	0.03	0.07	0.07				
EP13	5.28	0.32	3.47	3.47	2.86	0.80	1.55	3.77

EP14	1.13	3.75	0.46	0.46				0.87

lb/TGP = pounds of pollutant per ton of glass pulled.
*VOC emissions shall not include methane and ethane

f. Exhaust from the curing oven shall be vented into a closed loop system that routes this stream directly to the United McGill Thermal Oxidizer identified as CD14A at all times when the line is operating. The oxidizer shall be operated and maintained in accordance with the following;
   i. The temperature of combustion chamber shall not fall below 1,500°F or the average temperature recorded during the most recent performance testing that demonstrated compliance with the VOC, formaldehyde, and phenol emissions limits. Compliance with this limit shall be based on rolling three hour average.
   ii. The oxidizer shall not consume more than 5,000 cubic feet of natural gas per hour or 43.8 MMscf per year.

4.1.3 The following conditions apply to both production lines.

g. A device that continuous measurers and records the temperature of the combustion chamber for each thermal oxidizer shall be installed, calibrated, maintained, and continuously operated. Such device shall be certified by the manufacturer to be accurate within ±one (1) degrees Fahrenheit.

4.1.4 The permittee shall, to the extent practicable, install maintain, and operate all pollution control equipment listed in Section 1.0 and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary. **[45CSR§13-5.11.]**

____ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

4.2.1 The permittee shall monitor and record the hourly production on a daily basis for each line. These records shall include the monthly total and the 12-month rolling total for each line respectively. Such records shall be maintained in accordance with condition 3.4.1.

4.2.2 The permittee shall maintain records of the recorded data from the stipulated devices in condition 4.1.3.b. through g. in accordance with condition 3.4.1 of this permit.

4.3.1 For the purposes of demonstrating initial compliance with operational and emission limitation in condition 4.1.1., 4.1.2., and 40 CFR §63.(a), the permittee shall conduct performance testing of the 1st and 2nd lines within 180 days after issuance of this permit. Such testing shall determine the VOC, formaldehyde, and phenol emission rates from the collection and incinerator stacks of the both production lines. This testing shall establish and/or verify the operating parameters for the respective control devices of the production line. This testing shall be conducted as outline in the following:

a. General Testing Requirements:
   i. This testing shall consist of three test runs. Each test run must last at least one hour;
   ii. Each test run must be conducted with the production line operating at no less 90 percent capacity;
   iii. During each test run, sampling of the collection and incinerator must occur simultaneously to each other;
   viii. During such testing, the permittee shall measure and record all of the operating parameters respective to the production line as noted in condition 4.3.1. in fifteen (15) minute intervals. The arithmetic average shall be calculated for each parameters using all of recorded measurements. Such measurements and arithmetic averages shall be included with the testing report;

b. Demonstrating compliance with the VOC emission limit shall be conducted with a method(s) approved by the Director. The permittee may propose a testing method as part of the required protocol of condition 3.4.1.;

c. Demonstrating compliance with the formaldehyde limits be conducted in accordance with U.S. EPA method 316 or Method 318;

d. Demonstrating compliance with the phenol limits be conducted in accordance with U.S. EPA Method 318 or 320 or other method approved by the Director;

e. Compliance with the VOC, formaldehyde, and phenol limits shall be determined by taking sum of the arithmetic average of the respective pollutant from the collection stack and incinerator stack. The reported emission rates shall be in terms of pounds per ton of glass pulled.

f. Such testing shall be conducted in accordance with 3.3.1.

4.3.2. Within 180 days after completing modification of the 1st line to be capable of producing 8,000 pounds of glass pulled per hour, the permittee shall conduct performance testing to demonstrate compliance with the carbon dioxide PM, VOC, formaldehyde, and phenol emission limits. Stack testing shall be conducted as prescribe in condition 4.3.1. for VOC, formaldehyde, and phenol. For PM, such testing shall be conducted as outline in condition 4.3.4. This testing shall establish and/or verify the operating parameters for the respective control devices of the production line.

4.3.3 Once every five years, the permittee shall conduct emission testing to demonstrate compliance with the permitted CO and NO_x emission limits in 4.1.1.b and 4.1.2b for the collection stack (EP13 and EP23) and incinerator stack (EP14 and EP24) of each production line and to verify and/or establish maximum Thermox readings in millivolts for the fiberizers and Forehearth as stipulated in 4.1.1d. and 4.1.2.d. This testing shall be conducted as outline in 3.3.1., 4.3.1.a, and as follows:

a. Demonstrating compliance with the carbon monoxide limits be conducted in accordance with U.S. EPA method 10;
b. Demonstrating compliance with the oxides of nitrogen limits be conducted in accordance with U.S. EPA Method 7E.

4.3.4 Once every 5 years or within 180 days that when the production line will be producing a product with a LOI greater than the previous compliance test that demonstrated compliance with the permitted PM limits of this permit, the permittee shall conduct performance testing to determine the PM emission rate of the collection and incinerator stacks of the respective production line. Such testing shall be conducted as outlined in condition 4.3.1.a. and U.S.EPA Method 5E. This testing shall establish and/or verify the operating parameters for the respective control devices of the production line.

4.3.5 Should the permittee elect to change binder formula or produce a product with a LOI that is greater than the one that was produced during a compliance test that demonstrated compliance with the permitted VOC, formaldehyde, and phenol limits of this permit, the permittee shall conduct performance testing within 180 days of after making such change to demonstrate compliance with the VOC, formaldehyde, and phenol emission limits. Such testing shall be conducted as prescribed in conditions 3.3.1. and 4.3.1. for VOC, formaldehyde, and phenol of the respective line that the change is effecting. This testing shall establish and/or verify the operating parameters for the respective control devices of the production line.

4.4.1. Record of monitoring. The permittee shall keep records of monitoring information that include the following:

a. The date, place as defined in this permit and time of sampling or measurements;
b. The date(s) analyses were performed;
c. The company or entity that performed the analyses;
d. The analytical techniques or methods used;
e. The results of the analyses; and
f. The operating conditions existing at the time of sampling or measurement.

Are you in compliance with all applicable requirements for this emission unit? _x__Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID numbers:	**Emission unit names:**	**List any control devices associated with these emission units:**
ES1A, ES1B, ES1C, ES1D, ES1E, ES1F, ES1G, ES1H, ES1I, ES1J, ES1K, ES12A, ES12B, ES12D, ES12Db, ES22A, ES22B & ES22Bb	Raw Material Storage Silos for Sand, Borax, Soda Ash, Aplite, Guardian Cullet, Soda Lime Cullet (Purchased), Lime & Baghouse Dust and Raw Material Storage Silos for Mixed Batch	CD1A, CD1B, CD1D, CD1F, CD1I , CD1G, CD1K, CD12A, CD12C, CD12Cb, CD12D, CD22A & CD22C

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
Sand, Borax, Soda Ash, Aplite, Cullet and Lime is pneumatically conveyed from the delivery trucks or railroad cars to storage bins, where they are kept until needed in the process. Baghouse dust and Guardian Cullet are recycled from the process and pneumatically conveyed into a silo for reuse. The mixed raw ingredients (batch) are then conveyed to storage bins until needed in the process.

Manufacturer:	**Model numbers:**	**Serial numbers:**
Whirl Air Flow	45-100 12-0X43-0, 60-100 12 12-0X43-0, 70-100 11-0X43-0, 60-100 10-0X43-0 & 70-100 12-0X32-0	I 15864-1, I 15867-3, I 15867-4, I 15867-1, I 15867-2, I 15867-5, I 15867-6, I 15866-1, I 15866-2, I 15865-1 & I 17227-1
Construction date: 1997	**Installation date:** 07/25/1998	**Modification date(s):** NA

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 178.35 Tons

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
18,400 lbs	80,592 tons	The facility operates 24 hours a day 365 days a year.

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? ___Yes _**X**_ No	**If yes, is it?** ___ Indirect Fired ___Direct Fired
Maximum design heat input and/or maximum horsepower rating: NA	**Type and Btu/hr rating of burners:** NA

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
NA

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
NA			

Emissions Data

Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	NA	NA
Nitrogen Oxides (NO_X)	NA	NA

Lead (Pb)	NA	NA
Particulate Matter ($PM_{2.5}$)	0.35	1.53
Particulate Matter (PM_{10})	0.35	1.53
Total Particulate Matter (TSP)	0.35	1.53
Sulfur Dioxide (SO_2)	NA	NA
Volatile Organic Compounds (VOC)	NA	NA
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
NA	NA	NA
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
NA	NA	NA

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

The above emission factor was obtained from AP-42 Table11.13-2 for Glass Fiber Manufacturing and computed with the maximum production capacity listed above.

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or <u>construction permit</u> with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

R14-0015, Condition 5.1.1 The following storage devices shall be equipped and operated with the corresponding control devices:

Equipment Number	Description	Control Equipment	Control Number
ES1A	Raw Material Storage Bin (Sand)	Whirl-Air Flow Bin-Vent Model 195-42	CD1A
ES1B	Raw Material Storage Bin (Borax)	Whirl-Air Flow Bin-Vent Model 195-42	CD1B
ES1C	Raw Material Storage Bin (Borax)	Whirl-Air Flow Bin-Vent Model 195-42	CD1B
ES1D	Raw Material Storage Bin (Soda Ash)	Whirl-Air Flow Bin-Vent Model 195-42	CD1D
ES1E	Raw Material Storage Bin (Soda Ash)	Whirl-Air Flow Bin-Vent Model 195-42	CD1D
ES1F	Raw Material Storage Bin (Aplite)	Whirl-Air Flow Bin-Vent Model 195-42	CD1F
ES1G	Raw Material Storage Bin (Lime)	Whirl-Air Flow Bin-Vent Model 195-42	CD1G
ES1H	Raw Material Storage Bin (Purchased Cullet)	Whirl-Air Flow Bin-Vent Model 195-42	CD1I
ES1I	Raw Material Storage Bin (Purchased Cullet)	Whirl-Air Flow Bin-Vent Model 195-42	CD1I
ES1J	Raw Material Storage Bin (Guardian Cullet)	Whirl-Air Flow Bin-Vent Model 195-42	CD1F

	ES1K	Raw Material Storage Bin (Baghouse Dust)	Whirl-Air Flow Bin-Vent Model 55-30	CD1K

____ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)
NA

Are you in compliance with all applicable requirements for this emission unit? _**X**_ Yes ___ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
ES22C, ES22E Group 003	Melter Hood and Forehearth for the 2nd Line	CD22B, CD22Bb, CD23A, CD23B & CD23C

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
The melter hood covers a 8,000 lb/hr, electrically fired, water-cooled and brick lined melting unit that is used to melt batch. The hood discharges to a 15,000 cfm Mactiflo cartridge dust collector that controls particulate emissions from the charging and operation of the melter. Emissions from the melter exhaust vertically from fabric filters to the outside ambient air through Stack EP22. The molten glass flows from the Melter to the Forehearth which is a natural gas fired and brick lined holding tank. The Forehearth for Line 2 has natural gas burners with a maximum rated heat input of 6.0 MMBtu/hr. The Forehearth splits the molten glass flow and presents a consistent glass flow (pull rates) to each fiber forming unit. Forehearth emissions are combined with forming / collection system emissions and passed through a set of scrubbers before being discharged into the air.

Manufacturer:	**Model number:**	**Serial number:**
Guardian Fiberglass	NA	NA

Construction date:	**Installation date:**	**Modification date(s):**
2004	2004	NA

Design Capacity (examples: furnaces - tons/hr, tanks - gallons):
ES22C- 4.0 TPH
ES22E- 8,000 lbs/hr

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
ES22C- 4.0 TPH ES22E- 8,000 lbs/hr	35,040 TpY	Guardian Fiberglass operates 24 hours a day, 365 days a year.

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? __x Yes ___ No ES22E- Forehearth	**If yes, is it?** _x_ Indirect Fired ___Direct Fired
Maximum design heat input and/or maximum horsepower rating: 6.0 MM Btu/Hr	**Type and Btu/hr rating of burners:** Pre Mix Tunnel Burner 8.6 MM Btu/Hr

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
Max. 8,200 CFH & 71,750 CF/Yr

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	NA	NA	1047.7

Emissions Data

Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	2.92	12.79

Nitrogen Oxides (NO_X)	0.12	0.53
Lead (Pb)	0.00006	0.00028
Particulate Matter ($PM_{2.5}$)	0.54	2.38
Particulate Matter (PM_{10})	0.54	2.38
Total Particulate Matter (TSP)	0.54	2.38
Sulfur Dioxide (SO_2)	0.0005	0.002
Volatile Organic Compounds (VOC)	0.88	3.9
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Hexavalent Chromium	0.00029	0.00125
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
Carbon Dioxide (CO_2e)	2,800	12,400

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).
The emission factors and TPY listed above for CO NO_x, and PM are from Permit R14-0015H. The emission factor for Hexavalent Chrome was obtained from the Albion, MI 2006 stack test and the Lead is an impurity in the raw material and is calculated based on usage. SO_2 was obtained form the January 1999 stack test while VOC was obtained from the May 2005 stack test. Condensable PM was calculated based on stack test data. CO_2e was calculated based on 40 CFR 98 Subparts C and N as appropriate.

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or <u>construction permit</u> with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

<u>Permit to Modify R14-0015K:</u>

4.1.2 The permittee shall operate a fiberglass insulation line identified as 2nd line with associated emission EP22 (melter stack), EP23 (collection stack), and EP24 (incinerator stack). This line shall be operated and maintained in accordance with the following operational and emission limitations:

a. Production fiberglass insulation from this line shall not exceed 8,000 pounds of glass pulled per hour and 35,040 TPY. Compliance with this limit shall be based on a 12-month rolling total;

b. Emissions from the line shall not exceed the following limits with respect to the corresponding emission point and pollutant:

Emission Point	CO lb/TGP	NO_x lb/TGP	PM lb/TGP	PM_{10} lb/TGP	VOC* lb/TGP	HCOH lb/TGP	Phenol lb/TGP	NH_3 lb/TGP
EP22	0.73	0.03	0.07	0.07				
EP23	5.28	0.32	3.25	3.25	2.86	0.8	1.55	3.77
EP24	1.31	3.75	0.93	0.93				0.87

lb/TGP = pounds of pollutant per ton of glass pulled.
*VOC emissions shall not include methane and ethane

c. Exhaust from the electric melter shall be vented into a closed loop system that routes this stream directly to either on of identified baghouses (CD12B or CD12Bb) at all times when the line is operating;

d. The fiberizers and forehearth of the line shall be operated in such a manner the following air to fuel ratios are not exceeded:

Thermox Gas Ratio Setting for the fiberizers: 962 millivolts
Thermox Gas Ratio Setting for the forehearths: 823 millivolts

e. Exhaust from the Forehearth and fiberizers of this line shall be vented into a closed loop system that routes this stream directly to one of three venturi scrubbers (CD23A, CD23B, or CD23C). Scrubbers CD23A and CD23B shall be operated when resinated fiberglass is being produced. Scrubber CD23C shall be operated when non-resinated fiberglass is being produced;

4.1.3 The following condition applies to both production lines.

a. A bag leak detection system (BLDS) shall be installed and operated on the fabric filter baghouses identified as CD12B, CD12Bb, CD22B, and CD22Bb. Each BLDS shall be installed, maintained, and operated in accordance with 40CFR63.13839(b)(1) and U.S. EPA guidance document, "Fabric Filter Bag Leak Detection Guidance" (EPA-454/R-98-015, September 1997);

4.1.4 The permitted shall, to the extent practicable, install, maintain, and operate all pollution control equipment listed in Section 1.0 and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary. **[45CSR§13-5.11.]**

NSPS NNN and MACT PPP

____ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Permit to Modify R14-0015K:

4.2.2 The permittee shall maintain records of the recorded data from the stipulated devices in condition 4.1.3.b. through g. in accordance with condition 3.4.1 of this permit.

4.2.6 The permittee shall install, calibrate, maintain, and operated two Thermox premix (air to fuel) analyzers to measure and record the air to fuel ratio being fed to the fiberizers and forehearth for each production line. Each analyzer shall be maintain in such a way that the analyzer is available to analyze samples 90 percent of the time for greater. Each analyzer shall be calibrated once a month in accordance with the manufacturer's specifications and follow the Quality & Assurance guidelines recommended by the manufacturer. Readings shall be taken and recorded twice a day with a minimum of ten hours between readings. Records of such readings and calibrations shall be maintain in accordance with condition 3.4.1.

4.3.1 For the purposes of demonstrating initial compliance with operations and emission limitation in condition 4.1.1., 4.1.2., and 40 CFR §63.(a), the permittee shall conduct performance testing of the 1st and 2nd lines within 180 days after issuance of this permit. Such testing shall determine the VOC, formaldehyde, and phenol emission rates from the collection and incinerator stacks of the both production lines. This testing shall establish and/or verify the operating parameters for the respective control devices of the production line. This testing shall be conducted as outline in the following:

a. General Testing Requirements:
   i. This testing shall consist of three test runs. Each test run must last at least one hour;
   ii. Each test run must be conducted with the production line operating at no less 90 percent capacity;

Are you in compliance with all applicable requirements for this emission unit? _**X**_ Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
ES23A, ES23B and ES23 C Group 005	Fiberizers, Vacuum Chamber and Collection Plenum for 2nd Line	CD23A, CD23B and CD23C

Provide a description of the emission unit (type, method of operation, design parameters, etc.):

Fiber forming units (or fiberizers) are positioned below orifices in the bottom of the Forehearth to receive the molten glass stream, and "spin" it into glass fibers. For the 2nd production line, there are nine (9) or more fiberizers with a total material throughput capacity of 8,000 pounds per hour of wool fiberglass production. The fiberizers use centrifugal force, natural gas heat, and compressed air blast to form the fibers. The natural gas fired process heater will have a maximum rated heat input of 9.6 mmBtu/hr. Conditioned fiber from the fiberizers is pulled down onto the collection chain in the vacuum chamber, by fans located downstream of the collection plenum. The collection plenum is a box where the vacuum chamber exhaust is impinged with a water spray to control particulates. The exiting exhaust on the 2nd production line is passed through scrubbers and finally to the discharge stack.

Manufacturer:	**Model number:**	**Serial number:**
Guardian Fiberglass	NA	NA
Construction date:	**Installation date:**	**Modification date(s):**
2004	2004	NA

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 8,000 lbs/hr

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
8,000 lbs/hr	35,040 Tons per Year	The facility operates 24 hours a day, 365 days a year.

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? __x_Yes __ No	**If yes, is it?** ___ Indirect Fired __x_Direct Fired
Maximum design heat input and/or maximum horsepower rating: 9.6 mmBtu/hr	**Type and Btu/hr rating of burners:** Pre Mix Tunnel Burner 9.6 mmBtu/hr

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
Natural Gas Max. Nat. Gas Usage Per Hour: 8,000 CFH
Max. Nat. Gas Usage Per Year: 70.08 MM CF

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	NA	NA	1047.7

Emissions Data

Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	21.12	92.51

Nitrogen Oxides (NO_X)	1.28	5.61
Lead (Pb)	0.00022	0.00095
Particulate Matter ($PM_{2.5}$)	13.96	61.14
Particulate Matter (PM_{10})	13.96	61.14
Total Particulate Matter (TSP)	13.96	61.14
Sulfur Dioxide (SO_2)	0.004	0.018
Volatile Organic Compounds (VOC)	10.48	45.9
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Chromium	0.003	0.015
Formaldehyde	2.52	11.04
Methanol	9.12	19.95
Phenol	5	21.9
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
Formic Acid	1.39	6.1
Ammonia	15.08	66.05
Carbon Dioxide Equivalent (CO_2e)	1,100	4,900

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

The emission factors and TPY listed above for CO NO_x, PM, VOC Phenol, Ammonia and Formaldehyde are from Permit R14-0015H. The emission factor for Chrome was obtained from the Mineral Wells, MS 2000 stack test and the Lead is an impurity in the raw material and is calculated based on usage. Methanol emission factor was obtained from the October 2006 stack test, along with Formic Acid. SO_2 was obtained form the January 1999 stack test. Condensable PM was calculated based on stack test data. Carbon dioxide equivalents were calculated based on 40 CFR 98 Subpart C and N as appropriate.

*** These emissions are a combined limit with EP24.**

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or <u>construction permit</u> with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

<u>Permit to Modify R14-0015K:</u>

4.1.2 The permittee shall operate a fiberglass insulation line identified as 2nd line with associated emission EP22 (melter stack), EP23 (collection stack), and EP24 (incinerator stack). This line shall be operated and maintained in accordance with the following operational and emission limitations:

a. 4.1.2. Production fiberglass insulation from this line shall not exceed 8,000 pounds of glass pulled per hour and 35,040 TPY. Compliance with this limit shall be based on a 12-month rolling total;

b. Emissions from the line shall not exceed the following limits with respect to the corresponding emission point and pollutant:

Emission	CO	NO_x	PM	PM_{10}	VOC*	HCOH	Phenol	NH_3

Point	lb/TGP	lb/TGP	lb/TGP	lb/TGP	lb/TGP	lb/TGP	lb/TGP	lb/TGP
EP22	0.73	0.03	0.07	0.07				
EP23	5.28	0.32	3.25	3.25	2.86	0.8	1.55	3.77
EP24	1.31	3.75	0.93	0.93				0.87

lb/TGP = pounds of pollutant per ton of glass pulled.
*VOC emissions shall not include methane and ethane

d. The fiberizers and forehearth of the line shall be operated in such a manner the following air to fuel ratios are not exceeded:

Thermox Gas Ratio Setting for the fiberizers: 962 millivolts
Thermox Gas Ratio Setting for the forehearths: 823 millivolts

e. Exhaust from the Forehearth and fiberizers of this line shall be vented into a closed loop system that routes this stream directly to one of three venturi scrubbers (CD23A, CD23B, or CD23C). Scrubbers CD23A and CD23B shall be operated when resinated fiberglass is being produced. Scrubber CD23C shall be operated when non-resinated fiberglass is being produced;

g. A continuous pull rate monitor shall be install, calibrate, and maintain that measured and records the glass pull rate of the line on an hourly basis. **[40CFR§63.1383.(k)]**

4.1.3 The following conditions apply to both production lines.

b. Each fiberizer that produces resinated (bonded) fiberglass shall be equipped, maintained, and operated with a advance water-jet ring to minimize formaldehyde emissions from the fiber forming process;

c. A device that continuous measures and records the pressure drop across the scrubber shall be installed, calibrated, maintained, and operated for each venturi scrubber (CD23A,CD23B, CD23C, and CD24B). Such device is to be certified by its manufacture to be accurate within ± 250 Pascal's (± 1 inch water gauge) over its operating range.

d. A device that continuous measures and records the scrubbing liquid flow to each scrubber and drop-out box shall be installed, calibrate, maintain, and operated for each venturi scrubber and drop-out box (CD13A, CD13B, CD23A, CD23B, CD23C, and CD24B). Such device is to be certified by its manufacturer to be accurate within ± 5 percent over its operating range; and

f. A device that continuous measures and records the amount of binder applied to the product shall be installed, maintained, calibrated, and operated for each production line. Such device is to be certified by its manufacturer to be accurate within ± 5 percent over its operating range.

4.1.4 The permitted shall, to the extent practicable, install maintain, and operate all pollution control equipment listed in Section 1.0 and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary. **[45CSR§13-5.11.]**

____ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

4.2.1 The permittee shall monitor and record the hourly production on a daily basis for each line. These records shall include the monthly total and the 12-month rolling total for each line respectively. Such records shall be maintained in accordance with condition 3.4.1.

4.2.2 The permittee shall maintain records of the recorded data from the stipulated devices in condition 4.1.3.b. through g. in accordance with condition 3.4.1 of this permit.

4.3.1 For the purposes of demonstrating initial compliance with operations and emission limitation in condition 4.1.1., 4.1.2., and 40 CFR §63.(a), the permittee shall conduct performance testing of the 1st and 2nd lines within 180 days after issuance of this permit. Such testing shall determine the VOC, formaldehyde, and phenol emission rates from the collection and incinerator stacks of the both production lines. This testing shall establish and/or verify the operating parameters for the respective control devices of the production line. This testing shall be conducted as outline in the following:

a. General Testing Requirements:

i. This testing shall consist of three test runs. Each test run must last at least one hour;
ii. Each test run must be conducted with the production line operating at no less 90 percent capacity;
iii. During each test run, sampling of the collection and incinerator must occur simultaneously to each other;
viii. During such testing, the permittee shall measure and record all of the operating parameters respective to the production line as noted in condition 4.3.1. in fifteen (15) minute intervals. The arithmetic average shall be calculated for each parameters using all of recorded measurements. Such measurements and arithmetic averages shall be included with the testing report;

b. Demonstrating compliance with the VOC emission limit shall be conducted with a method(s) approved by the Director. The permittee may propose a testing method as part of the required protocol of condition 3.4.1.;
c. Demonstrating compliance with the formaldehyde limits be conducted in accordance with U.S. EPA method 316 or Method 318;
d. Demonstrating compliance with the phenol limits be conducted in accordance with U.S. EPA Method 318 or 320 or other method approved by the Director;
e. Compliance with the VOC, formaldehyde, and phenol limits shall be determined by taking sum of the arithmetic average of the respective pollutant from the collection stack and incinerator stack. The reported emission rates shall be in terms of pounds per ton of glass pulled.
f. Such testing shall be conducted in accordance with 3.3.1.

4.3.3 Once every five years, the permittee shall conduct emission testing to demonstrate compliance with the permitted CO and NO_x emission limits in 4.1.1.b and 4.1.2b for the collection stack (EP13 and EP23) and incinerator stack (EP14 and EP24) of each production line and to verify and/or establish maximum Thermox readings in millivolts for the fiberizers and Forehearth as stipulated in 4.1.1d. and 4.1.2.d. This testing shall be conducted as outline in 3.3.1., 4.3.1.a, and as follows:

a. Demonstrating compliance with the carbon monoxide limits be conducted in accordance with U.S. EPA method 10;
b. Demonstrating compliance with the oxides of nitrogen limits be conducted in accordance with U.S. EPA Method 7E.

4.3.4 Once every 5 years or within 180 days that when the production line will be producing a product with a LOI greater than the previous compliance test that demonstrated compliance with the permitted PM limits of this permit, the permittee shall conduct performance testing to determine the PM emission rate of the collection and incinerator stacks of the respective production line. Such testing shall be conducted as outlined in condition 4.3.1.a. and USEPA Method 5E. This testing shall establish and/or verify the operating parameters for the respective control devices of the production line.

4.3.5 Should the permittee elect to change binder formula or produce a product with a LOI that is greater than the one that was produced during a compliance test that demonstrated compliance with the permitted VOC, formaldehyde, and phenol limits of this permit, the permittee shall conduct performance testing within 180 days of after making such change to demonstrate compliance with the VOC, formaldehyde, and phenol emission limits. Such testing shall be conducted as prescribed in conditions 3.3.1. and 4.3.1. for VOC, formaldehyde, and phenol of the respective line that the change is effecting. This testing shall establish and/or verify the operating parameters for the respective control devices of the production line.

4.4.1. Record of monitoring. The permittee shall keep records of monitoring information that include the following:

a. The date, place as defined in this permit and time of sampling or measurements;
b. The date(s) analyses were performed;
c. The company or entity that performed the analyses;
d. The analytical techniques or methods used;
e. The results of the analyses; and
f. The operating conditions existing at the time of sampling or measurement.

Are you in compliance with all applicable requirements for this emission unit? _**X**_ Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
ES24A, ES24B (Group 007)	3 Zone Curing Oven and Cooling Table	CD24A, CD24B

Provide a description of the emission unit (type, method of operation, design parameters, etc.):

The collected fibers, coated with binder, are conveyed to a three (3) natural gas-fired, recalculating heated air oven of Guardian Fiberglass design. While the fiberglass blanket is in the oven it is sized to thickness and the binder is cured by means of the recirculating heated air. A cooling section is provided downstream of the curing oven, where ambient plant air is drawn through the cured fiberglass blanket. The maximum rated heat input of the curing oven is 18.0 mmBtu/hr. Potential regulated air pollutant emissions from the curing section of the wool fiberglass manufacturing line are collected and controlled with a thermal oxidizer. The curing line utilizes a McGill AirClean Thermal Oxidizer that exhausts through Stack No. EP24. Potential particulate emissions from the cooling section exhaust are controlled with a scrubber system, and exhausted to Stack No. EP24, which vertically discharges to the outside ambient air.

Manufacturer:	**Model number:**	**Serial number:**
Guardian Fiberglass	NA	NA
Construction date:	**Installation date:**	**Modification date(s):**
2004	2004	NA

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 8,000 lbs/hr

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
8,000 lbs/hr	35,040 Tons per Year	The facility operates 24 hours a day, 365 days a year.

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? _x_ Yes __ No	**If yes, is it?** ___ Indirect Fired _x__Direct Fired
Maximum design heat input and/or maximum horsepower rating: 18.0 MM Btu/Hr	**Type and Btu/hr rating of burners:** Nozzle Mix Burner 18.0 mmBtu/hr

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
Natural Gas
Max./Hr.: 17,150 CFH Nat. Gas Max/Yr : 150,234 CF

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	NA	NA	1047.7

Emissions Data

Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	5.24	22.95

Nitrogen Oxides (NO_X)	15	65.7
Lead (Pb)	0.000038	0.000165
Particulate Matter ($PM_{2.5}$)	4.04	17.70
Particulate Matter (PM_{10})	4.04	17.70
Total Particulate Matter (TSP)	4.04	17.70
Sulfur Dioxide (SO_2)	0.0003	0.001
Volatile Organic Compounds (VOC)	0.96	4.21
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Formaldehyde	0.68	2.98
Methanol	0.235	1.03
Phenol	1.2	5.26
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
Ammonia	3.48	15.24
Formic Acid	0.16	0.701
Carbon Dioxide (CO_2e)	2,200	9,700

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

The emission factors and TPY listed above for CO NO_x, PM, VOC Phenol, Ammonia and Formaldehyde are from Permit R14-0015H. The Lead is an impurity in the raw material and is calculated based on usage. Methanol emission factor was obtained from the October 2006 stack test, while Formic Acid was obtained from the May 2005 test. SO_2 was obtained form the January 1999 stack test. Condensable PM was calculated based on stack test data. Carbon dioxide equivalents were calculated following 40 CFR 98 Subpart C and N as appropriate.

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or <u>construction permit</u> with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

<u>Permit to Modify R14-0015K:</u>

4.1.2 The permittee shall operate a fiberglass insulation line identified as 2nd line with associated emission EP22 (melter stack), EP23 (collection stack), and EP24 (incinerator stack). This line shall be operated and maintained in accordance with the following operational and emission limitations:

a. Production fiberglass insulation from this line shall not exceed 8,000 pounds of glass pulled per hour and 35,040 TPY. Compliance with this limit shall be based on a 12-month rolling total;

b. Emissions from the line shall not exceed the following limits with respect to the corresponding emission point and pollutant:

Emission Point	CO lb/TGP	NO_x lb/TGP	PM lb/TGP	PM_{10} lb/TGP	VOC* lb/TGP	HCOH lb/TGP	Phenol lb/TGP	NH_3 lb/TGP
EP22	0.73	0.03	0.07	0.07				
EP23	5.28	0.32	3.25	3.25	2.86	0.8	1.55	3.77
EP24	1.31	3.75	0.93	0.93				0.87

lb/TGP = pounds of pollutant per ton of glass pulled.
*VOC emissions shall not include methane and ethane

f. exhaust from the curing oven shall be vented into a closed loop system that routes this stream directly to the McGill AirClean Thermal Oxidizer identified as CD24A at all times when the line is operating. The oxidizer shall be operated and maintained in accordance with the following:

i. The temperature of combustion chamber shall not fall below 1,500°F or the average temperature recorded during the most recent performance testing that demonstrated compliance with the VOC, formaldehyde, and phenol emissions limits. Compliance with this limit shall be based on rolling three hour average.

ii. The oxidizer shall not consume more than 5,000 cubic feet of natural gas per hour or 43.8 MMscf per year.

h. Exhaust from the cooling table of this line shall be vented into a closed loop system that routes this stream directly to a venturi scrubber (CD24B) at all times when the line is operating.

4.1.3 The following conditions apply to both production lines.

c. A device that continuous measures and records the pressure drop across the scrubber shall be installed, calibrated, maintained, and operated for each venturi scrubber (CD23A,CD23B, CD23C, and CD24B). Such device is to be certified by its manufacture to be accurate within ± 250 Pascal's (± 1 inch water gauge) over its operating range.

d. A device that continuous measures and records the scrubbing liquid flow to each scrubber and drop-out box shall be installed, calibrated, maintained, and operated for teach venture scrubber and drop-out box (CD13A, CD13B, CD23A, CD23B, Cd23C, and CD24B). Such device is to be certified by its manufacturer to be accurate within ± 5 percent over its operating range; and

g. a device that continuous measurers and records the temperature of the combustion chamber for each thermal oxidizer shall be installed, calibrated, maintained, and continuously operated. Such device shall be certified by the manufacturer to be accurate within ±one (1) degrees Fahrenheit.

4.1.4 The permittee shall, to the extent practicable, install maintain, and operate all pollution control equipment listed in Section 1.0 and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary. **[45CSR§13-5.11.]**

____ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

4.2.2 The permittee shall maintain records of the recorded data from the stipulated devices in condition 4.1.3.b. through g. in accordance with condition 3.4.1 of this permit.

4.2.5. The permittee shall monitor and record the product LOI and density of the each resinated product manufactured. The frequency of such monitoring shall not be no less than once every eight hours. The LOI and density shall be determined using the methods prescribed in Appendix A and C of 40 CFR 63, Subpart NNN respectively. **[40CFR§631383.(l)]**

4.3.1 For the purposes of demonstrating initial compliance with operational and emission limitation in condition 4.1.1., 4.1.2., and 40 CFR §63.(a), the permittee shall conduct performance testing of the 1st and 2nd lines within 180 days after issuance of this permit. Such testing shall determine the VOC, formaldehyde, and phenol emission rates from the collection and incinerator stacks of the both production lines. This testing shall establish and/or verify the operating parameters for the respective control devices of the production line. This testing shall be conducted as outline in the following:

a. General Testing Requirements:

i. This testing shall consist of three test runs. Each test run must last at least one hour;

ii. Each test run must be conducted with the production line operating at no less 90 percent capacity;

iii. During each test run, sampling of the collection and incinerator must occur simultaneously to each other;

v. The line must be producing a product with the highest LOI expected to be produce by this line;
vii. During such testing, the permittee shall measure and record the free-formaldehyde content of the resin, the binder formulation used, and the product LOI, and density;
viii. During such testing, the permittee shall measure and record all of the operating parameters respective to the production line as noted in condition 4.3.1. in fifteen (15) minute intervals. The arithmetic average shall be calculated for each parameters using all of recorded measurements. Such measurements and arithmetic averages shall be included with the testing report;

b. Demonstrating compliance with the VOC emission limit shall be conducted with a method(s) approved by the Director. The permittee may propose a testing method as part of the required protocol of condition 3.4.1.;
c. Demonstrating compliance with the formaldehyde limits be conducted in accordance with U.S. EPA method 316 or Method 318;
d. Demonstrating compliance with the phenol limits be conducted in accordance with U.S. EPA Method 318 or 320 or other method approved by the Director;
e. Compliance with the VOC, formaldehyde, and phenol limits shall be determined by taking sum of the arithmetic average of the respective pollutant from the collection stack and incinerator stack. The reported emission rates shall be in terms of pounds per ton of glass pulled.
f. Such testing shall be conducted in accordance with 3.3.1.

4.3.3 Once every five years, the permittee shall conduct emission testing to demonstrate compliance with the permitted CO and NO_x emission limits in 4.1.1.b and 4.1.2b for the collection stack (EP13 and EP23) and incinerator stack (EP14 and EP24) of each production line and to verify and/or establish maximum Thermox readings in millivolts for the fiberizers and Forehearth as stipulated in 4.1.1d. and 4.1.2.d. This testing shall be conducted as outline in 3.3.1., 4.3.1.a, and as follows:

a. Demonstrating compliance with the carbon monoxide limits be conducted in accordance with U.S. EPA method 10;
b. Demonstrating compliance with the oxides of nitrogen limits be conducted in accordance with U.S. EPA Method 7E.

4.3.4 Once every 5 years or within 180 days that when the production line will be producing a product with a LOI greater than the previous compliance test that demonstrated compliance with the permitted PM limits of this permit, the permittee shall conduct performance testing to determine the PM emission rate of the collection and incinerator stacks of the respective production line. Such testing shall be conducted as outlined in condition 4.3.1.a. and USEPA Method 5E. This testing shall establish and/or verify the operating parameters for the respective control devices of the production line.

4.3.5 Should the permittee elect to change binder formula or produce a product with a LOI that is greater than the one that was produced during a compliance test that demonstrated compliance with the permitted VOC, formaldehyde, and phenol limits of this permit, the permittee shall conduct performance testing within 180 days of after making such change to demonstrate compliance with the VOC, formaldehyde, and phenol emission limits. Such testing shall be conducted as prescribe in conditions 3.3.1. and 4.3.1. for VOC, formaldehyde, and phenol of the respective line that the change is effecting. This testing shall establish and/or verify the operating parameters for the respective control devices of the production line.

4.4.1. Record of monitoring. The permittee shall keep records of monitoring information that include the following:
a. The date, place as defined in this permit and time of sampling or measurements;
b. The date(s) analyses were performed;
c. The company or entity that performed the analyses;
d. The analytical techniques or methods used;
e. The results of the analyses; and
f. The operating conditions existing at the time of sampling or measurement.

Are you in compliance with all applicable requirements for this emission unit? _**X**_ Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
ESDG12 ESDG13	Emergency Backup Generator For Line #1 Melter Emergency Backup Generator For Line #2 Melter	None

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
Diesel-fired internal combustion engines.

Manufacturer:	**Model number:**	**Serial number:**
Caterpillar Line #1 Caterpiller Line #2	Gen. Set: SR4B,Engine: 3406 Gen. Set:SR4, Engine: 3456	Line #1: 9DR02112 Line #2: CERO.0702
Construction date:	**Installation date:** Line #1 07/25/1998 Line #2 2004	**Modification date(s):**

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): Line #1 Diesel Fuel Tank: 500 gallons
Line #2 Diesel Fuel Tank: 250 gallons

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
NA	500 hrs/yr	Guardian Fiberglass operates 24 hours a day and 365 days a year.

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? _X__Yes ___ No	**If yes, is it?** ___ Indirect Fired _x__Direct Fired
Maximum design heat input and/or maximum horsepower rating: Line #1, Engine Model 3406: 587 Brake Horsepower Line #2, Engine Model 3456: 610 Brake Horsepower	**Type and Btu/hr rating of burners:** NA

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
Diesel is the primary fuel type and has an annual limit of 500 hours of operation per year.
Line #1, Engine Model 3406, 587 Brake Horsepower: 29.2 gph for 14,600 gallons annually
Line #2, Engine Model 3456: 610 Brake Horsepower: 27.6 gph for 13,800 gallons annually

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Diesel	< 500 ppm	< 0.01%	139,000

Emissions Data

Criteria Pollutants	Potential Emissions- Each	
	PPH	TPY
Carbon Monoxide (CO)	4. 8	1.2
Nitrogen Oxides (NO_X)	20.1	5.0
Lead (Pb)	0	0

Particulate Matter ($PM_{2.5}$)	0.7	0.2
Particulate Matter (PM_{10})	0.7	0.2
Total Particulate Matter (TSP)	0.7	0.2
Sulfur Dioxide (SO_2)	0.4	0.1
Volatile Organic Compounds (VOC)	0.2	0.1
Hazardous Air Pollutants	Potential Emissions	
	lb/hr	TPY
NA	NA	NA
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	lb/hr	TPY
Carbon Dioxide Equivalent (CO_2e)	1,300	320

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

Emissions for PM, NO_x, CO, SO_2 and VOC's came from the Permit to Modify R14-0015H. Carbon dioxide equivalents were calculated following 40 CFR 98 Subpart C as appropriate.

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

Permit to Modify R14-0015K**:**

5.1.3 Emissions of the following pollutants to the atmosphere from the associated emission points shall not exceed the following:

Caterpillar 3406 (Emission Point EP16)		
Pollutant	**Maximum Allowable Emission Rate**	
	lb/hr	TPY
Particulate Matter	0.52	0.1
Sulfur Dioxide	3.8	0.9
Nitrogen Oxides	17.35	4.3
Carbon Monoxide	3.24	0.8
Volatile Organic Compounds	0.60	0.2

Caterpillar 3456 (Emission Point EP17)		
Pollutant	**Maximum Allowable Emission Rate**	
	lb/hr	**TPY**
Particulate Matter	0.52	0.1
Sulfur Dioxide	3.8	0.9

Nitrogen Oxides	17.35	4.3
Carbon Monoxide	3.24	0.8
Volatile Organic Compounds	0.9	0.2

5.1.3 The two Caterpillar 3406 (ID. No. ESDG12 and ESDG13) and Cummins NT-855-F1 (ID. No. ESFW11) internal combustion engines shall not operate more than 500 hours per year, calculated as the sum during a consecutive 12-month period.

5.1.4. The two Caterpillar 3406 and Cummins NT-855-F1 internal combustion engines shall not consume a fuel with a sulfur content of greater than 0.5 percent by weight.

RICE MACT is not applicable outside of compliance with emergency provisions.

____ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting, which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Permit to Modify R14-0015K:
5.2.3. The permittee shall monitor and record the hours of operation of the engines for the generators and fire water pumps. Such records shall be maintain in accordance with 3.4.1.

5.4.4. The permittee shall maintain records of sulfur content of the fuel oil received and/or vendors contractual sulfur specifications for the fuel oil.

Are you in compliance with all applicable requirements for this emission unit? _**X**_ Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
ESFW11	Emergency Backup Fire Water Diesel Engine Driven Pump	None

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
The emergency backup fire water pump engine is a Cummins diesel Model NT-855-F1 with an estimated engine rating of 255 hp and consumes a maximum of 14 gals/hr of diesel fuel. The engine only runs during an emergency situation and maintenance.

Manufacturer:	**Model number:**	**Serial number:**
Cummins Engine Co. Columbus, Indiana	NT-855-F1	Engine No.:10472815
Construction date:	**Installation date:**	**Modification date(s):**
NA	1977	NA

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): Diesel Fuel Storage Tank: 265 Gallons

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
14 gals	500 hours/year 7,000 gallons diesel	Guardian operates 24 hours a day and 365 days a year.

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? __X_Yes ___ No	**If yes, is it?** ___ Indirect Fired _X_Direct Fired
Maximum design heat input and/or maximum horsepower rating: This unit has horsepower of 255 HP.	**Type and Btu/hr rating of burners:** NA

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
Diesel is the only fuel used in the engine. The maximum hourly usage is 14 gallons/hour and the maximum annual usage is 7,000 gallons, based on 14 gallons per hour times the permit limit of 500 hours per year.

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Diesel	< 500 ppm	<0.01%	139,000

Emissions Data

Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	1.8	0.46
Nitrogen Oxides (NO_X)	8.5	2.1
Lead (Pb)	0	0
Particulate Matter ($PM_{2.5}$)	0.59	0.15

Particulate Matter (PM_{10})	0.59	0.15
Total Particulate Matter (TSP)	0.59	0.15
Sulfur Dioxide (SO_2)	0.56	0.14
Volatile Organic Compounds (VOC)	0.69	0.17
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
NA	NA	NA
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
Carbon Dioxide Equivalent (CO_2e)	320	80

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

The above emission factors were obtained from Permit to Modify R14-0015H. Carbon dioxide equivalents were calculated following 40 CFR 98 Subpart C and N as appropriate.

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or <u>construction permit</u> with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

<u>Permit to Modify R14-0015K:</u>

5.1.3 Emissions of the following pollutants to the atmosphere from the associated emission points shall not exceed the following:

Cummins NT-855-F1 (Emission Point EP18)		
Pollutant	**Maximum Allowable Emission Rate**	
	lb/hr	TPY
Particulate Matter	0.59	0.15
Sulfur Dioxide	0.56	0.14
Nitrogen Oxides	8.5	2.1
Carbon Monoxide	1.8	0.46
Volatile Organic Compounds	0.69	0.17

5.1.3. The two Caterpillar 3406 (ID. No. ESDG12 and ESDG13) and Cummins NT-855-F1 (ID. No. ESFW11) internal combustion engines shall not operate more than 500 hours per year, calculated as the sum during a consecutive 12 month period.

5.1.4.The two Caterpillar 3406 and Cummins NT-855-F1 internal combustion engines shall not consume a fuel with a sulfur content of greater than 0.5 percent by weight.

Work practice requirements in RICE MACT for emergency engines.

____ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Permit to Modify R14-0015K:

5.2.3. The permittee shall monitor and record the hours of operation of the engines for the generators and fire water pumps. Such records shall be maintain in accordance with 3.4.1.

5.4.4. The permittee shall maintain records of sulfur content of the fuel oil received and/or vendors contractual sulfur specifications for the fuel oil.

Are you in compliance with all applicable requirements for this emission unit? _**X**_ Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: ESSH15	**Emission unit name:** Line #1 Makeup Air Handling Unit	**List any control devices associated with this emission unit:** None

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
Makeup air handling unit provides exterior ambient air to the interior of the plant year around. The MHU has a 8,525,000 BTU/HR natural gas heating unit component to heat the incoming exterior ambient air during the cold weather months.

Manufacturer: Rapid Engineering, Inc.	**Model number:** 4089 MUA	**Serial number:** 009598
Construction date: NA	**Installation date:** 07/25/1998	**Modification date(s):** NA

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 8.525 MMBtu/hr

Maximum Hourly Throughput: 0	**Maximum Annual Throughput:** NA	**Maximum Operating Schedule:** Guardian Fiberglass operates 24 hours a day and 365 days a year.

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? _X__Yes ___ No	**If yes, is it?** ___ Indirect Fired _**X**_Direct Fired
Maximum design heat input and/or maximum horsepower rating: 8,525,000 BTU/HR	**Type and Btu/hr rating of burners:** Maxon NP-LE AIRFLOW LOW EMISSIONS Line Burner @8.525 MMBtu/hr

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
Natural Gas will be used at a maximum rate of 8,136.9 cu. Ft. per hour for no more than six (6) cold weather months per year for a total estimated 35,151,408 cu. Ft. per year.

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	NA	NA	1047.7/cu. Ft.

Emissions Data

Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	0.17	0.75
Nitrogen Oxides (NO_X)	0.85	3.73
Lead (Pb)	0	0
Particulate Matter ($PM_{2.5}$)	0.03	0.11
Particulate Matter (PM_{10})	0.03	0.11
Total Particulate Matter (TSP)	0.03	0.11

Sulfur Dioxide (SO_2)	0.005	0.02
Volatile Organic Compounds (VOC)	0.05	0.20
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
NA	NA	NA
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
Ammonia	0.153	0.67
Carbon Dioxide Eqivalent (CO_2e)	1000	4400

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).
Seasonal emissions occur from the combustion of natural gas in the 8.525 MMBtu/hr make up air handling units. Using the EPA's FIRE database, SCC Code No. 1-05-002-06 for space heaters in industrial use presents an emission factor of 20 lbs CO, 5.3 lbs VOC's, 100 lbs Nox, 0.6 lbsSO2, 18 lbs NH3 and 3 lbs PM per million cubic feet (MMCF) of natural gas burned. The above emissions are calculated with the unit operating 8,760 hrs per year. Carbon dioxide equivalents were calculated following 40 CFR 98 Subparts C as appropriate.

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or <u>construction permit</u> with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.
<u>Permit to Modify R14-0015K:</u>
5.1.5. the 14.6 MMBtu/hr boiler (ID No. ESSHB14), 8.5 MMBTU/hr makeup air handling unit (ID. No. ESSH15), 7.875 MMBtu/hr air handling unit (ID No. ESSH16), and five (5) 75 Mbtu/hr binder water heaters (ID No. ESHW15) shall only be fired with pipeline quality natural gas.

5.1.7. Emissions of the following pollutants to the atmosphere from the 8.5 MMBTU/hr makeup air handling unit (ID. No. ESSH15) shall not exceed the following:

Pollutant	Hourly Emission Rate	Annual Emission Rate
	lb/hr	TPY
Particulate Matter	0.03	0.11
Particulate Matter-10	0.03	0.11
Nitrogen Oxides	0.85	3.7
Carbon Monoxide	0.17	0.75
Volatile Organic Compounds	0.05	0.20

____ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)
NA

Are you in compliance with all applicable requirements for this emission unit? _<u>X</u>_ Yes ___No

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: ESSH16	**Emission unit name:** Line #2 Makeup Air Handling Unit	**List any control devices associated with this emission unit:** None

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
Makeup air handling unit provides exterior ambient air to the interior of the plant year around. The MHU has a 7,875,000 BTU/HR natural gas heating unit component to heat the incoming exterior ambient air during the cold weather months.

Manufacturer: Rapid Engineering, Inc.	**Model number:** 4089 MUA	**Serial number:** 049138
Construction date: NA	**Installation date:** 2004	**Modification date(s):** NA

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 7.875 MMBtu/hr

Maximum Hourly Throughput: 0	**Maximum Annual Throughput:** NA	**Maximum Operating Schedule:** Guardian Fiberglass operates 24 hours a day and 365 days a year.

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? _X__Yes ___ No	**If yes, is it?** ___ Indirect Fired _**X**_Direct Fired
Maximum design heat input and/or maximum horsepower rating: 7,875,000 BTU/HR	**Type and Btu/hr rating of burners:** Maxon NP-LE AIRFLOW LOW EMISSIONS Line Burner @7.875 MMBtu/hr

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
Natural Gas will be used at a maximum rate of 7,516.5 cu. Ft. per hour for no more than six (6) cold weather months per year for a total estimated 32,471,280 cu. Ft. per year.

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	NA	NA	1047.7/cu. Ft.

Emissions Data

Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	0.16	0.69
Nitrogen Oxides (NO_X)	0.79	3.45
Lead (Pb)	0	0
Particulate Matter ($PM_{2.5}$)	0.02	0.10

Particulate Matter (PM_{10})	0.02	0.10
Total Particulate Matter (TSP)	0.02	0.10
Sulfur Dioxide (SO_2)	0.005	0.02
Volatile Organic Compounds (VOC)	0.05	0.2
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
NA	NA	NA
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
Ammonia	0.142	0.62
Carbon dioxide equivalents (CO_2e)	920	4,000

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

Seasonal emissions occur from the combustion of natural gas in the 7.875 MMBtu/hr make up air handling units. Using the EPA's FIRE database, SCC Code No. 1-05-002-06 for space heaters in industrial use presents an emission factor of 20 lbs CO, 5.3 lbs VOC's, 100 lbs Nox, 0.6 lbsSO2, 18 lbs NH3 and 3 lbs PM per million cubic feet (MMCF) of natural gas burned. The emissions from the make up air handling units, as fugitive point F29, to the in-plant environment. The above emissions are calculated with the unit operating 8,760 hrs per year. Carbon dioxide equivalents were calculated following 40 CFR 98 Subparts C as appropriate.

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or <u>construction permit</u> with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

<u>Permit to Modify R14-0015K:</u>
5.1.5. the 14.6 MMBtu/hr boiler (ID No. ESSHB14), 8.5 MMBTU/hr makeup air handling unit (ID. No. ESSH15), 7.875 MMBtu/hr air handling unit (ID No. ESSH16), and five (5) 75 Mbtu/hr binder water heaters (ID No. ESHW15) shall only be fired with pipeline quality natural gas.

____ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)
NA

Are you in compliance with all applicable requirements for this emission unit? _**<u>X</u>**_ Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
ES15A, ES15Aa ES15B, ES15C, ES15D, ES15E, ES15F, ES15G, ES15H, ES15I, ES15J (Group 008)	Facing, Sizing and Packaging for Line 1	CD15A

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
After the cured fiberglass blanket comes out of the oven, facing paper is applied (if desired) then the blanket is cut to size and width per customer demand. The fiberglass is then packaged accordingly and shipped to the customer.

Manufacturer:	**Model number:**	**Serial number:**
ES15A- Budzar	ES15A- 10T-180180-G0L	NA
ES15Aa- SOLARONICS IRT	ES15Aa- IRT-MiniFlex	NA
ES15B, ES15C, ES15F, ES15G, ES15H, ES15I- Guardian Fiberglass	ES15B, ES15C, ES15F, ES15G, ES15H, ES15I- NA	NA
ES15D- United Tool	ES15D- UX-431	NA
ES15E- Kaibel & Sieber	ES15E- WM2000 (Roller) & PSL-3000 (Film Applicator)	116 &174
ES15J- Samuel Strapping Systems	ES15J- SOA750	NA

Construction date:	**Installation date:**	**Modification date(s):**
1998	07/25/1998	NA

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 8,000 lbs/hr

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
8,000 lbs/hr	35,040 TPY	The facility operates 24 hours a day 365 days a year.

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? ___Yes _**X**_ No	**If yes, is it?** ___ Indirect Fired ___Direct Fired
Maximum design heat input and/or maximum horsepower rating:	**Type and Btu/hr rating of burners:**

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
NA

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
NA	NA	NA	NA

Emissions Data

Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	0	0
Nitrogen Oxides (NO_X)	0	0
Lead (Pb)	0	0

Particulate Matter ($PM_{2.5}$)	0.11	0.49
Particulate Matter (PM_{10})	0.11	0.49
Total Particulate Matter (TSP)	0.11	0.49
Sulfur Dioxide (SO_2)	0	0
Volatile Organic Compounds (VOC)	1.21	5.34
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
NA	NA	NA
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
NA	NA	NA

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

A PM emission factor of 0.05 lbs PM per ton of wool processed is presented on page C-65 of "Wool Fiberglass Insulation Manufacturing - Background Information for Proposed Standards" USEPA-450-3-83-002A. A representative (or conservative) VOC emission factor of 1.86 lbs VOC per ton of asphalt blowing coating produced, which is used by the asphalt manufacturing industry, was obtained from the USEPA FIRE database to obtain emission numbers for the facing application.

Guardian uses an ink printing system to print product codes on the finished product. The emissions from the ink printing system are uncontrolled and released, as fugitive emissions, to the in-plant environment. Emission rates are based on actual 2006 yearly ink usage in Inwood and actual 2001 solvent usage in Kingman. Therefore, the actual maximum annual VOC emission rate is estimated using a 1.7 variation factor based on actual data.

Determination of fugitive VOC emissions for spray adhesive based on a material balance is as follows: Emission rates are calculated using the Inwood, WV 2005 adhesive usage of 595 gallons. Total glass production rate was 50,614 tons or 0.0118 per TGP.

Potential particulate matter (PM) emissions from the sizing and packaging area are collected and controlled by two Air Tumbler control devices. The sizing and packaging area consists of trimming and rolling, the K&S Roll Machine, the blowing wool bagger, and packaging machinery. The Air Tumblers use cyclonic flow and wet impingement control techniques for the removal of particulates from the exhaust gas stream. The particulate matter removal efficiency for the Air Tumbler and scrubber are assumed to be 50% or greater. The PM exhaust concentration is assumed to be less than 0.005 lbs PM per 1000 lbs of exhaust air.

Potential PM emissions for the sizing and packaging area are estimated by multiplying the PM exhaust outlet concentration by the control devices rated volumetric air flowrate and by the control efficiency of 90% for the building as a process enclosure, as follows:

E =(0.005 lbs PM per 1000 lbs Air) x (Total Air Flowrate of control devices, cfm) x (units of conversion) x (1 - 90%)

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or <u>construction permit</u> with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

<u>Permit to Modify, R14-0015K</u>

5.1.2 The permittee shall install, maintain, and operate the Quentin Keeney Air Tumblers (CD15A), the Fisher

Klosterman Scrubber (CD25A) and the bag filter dust collector (CD25B) in such a way that the PM and PM-10 emission from FP15 do not exceed 0.25 pounds per hour and/or 1.1 tons per year.

5.1.14 The permitted shall, to the extent practicable, install maintain, and operate all pollution control equipment listed in Section 1.0 and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary. **[45CSR§13-5.11.]**

____ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Permit to Modify, R14-0015K

5.4.2. Record of maintenance of Air Pollution Control Equipment. For all pollution control equipment listed in Section 1.0, the permittee shall maintain accurate records of all required pollution control equipment inspection and/or preventative maintenance procedures.

5.4.3 Record of Malfunctions of Air Pollution control Equipment. For all air pollution control equipment listed in Section 1.0, the permittee shall maintain records of the occurrence and duration of any malfunction or operational shutdown of the air pollution control equipment during which excess emissions occur. For each such case, the following information shall be recorded:

a. The equipment involved.
b. Steps taken to minimize emissions during the event.
c. The duration of the event.
d. The estimated increase in emissions during the event.

For each such case associated with an equipment malfunction, the additional information shall also be recorded:

e. The cause of the malfunction
f. Steps taken to correct the malfunction

Any changes or modifications to equipment or procedures that would help prevent future recurrences of the malfunction.

Are you in compliance with all applicable requirements for this emission unit? _**X**_ Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
ES25A, ES25B, ES25C, ES25D, ES25F, ES25G, ES25H, ES25I (Group 008)	Facing, Sizing and Packaging for Line 2 Resinated	CD25A

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
After the cured fiberglass blanket comes out of the oven, facing paper is applied (if desired) then the blanket is cut to size and width per customer demand. The fiberglass is then packaged accordingly and shipped to the customer.

Manufacturer:	**Model number:**	**Serial number:**
ES25A- SOLARONICS ES25B, ES25C, ES25F, ES25G, ES25H, ES25I-Guardian Fiberglass ES25D- United Tool	ES25A- IRT MiniFlex ES25B, ES25C, ES25F, ES25G, ES25H, ES25I- NA ES25D- UX-431	NA
Construction date: 2004	**Installation date:** 2004	**Modification date(s):** NA

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 8,000 lbs/hr

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
8,000 lbs/hr	35,040 TPY	The facility operates 24 hours a day 365 days a year.

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? ___Yes _**X**_ No	**If yes, is it?** ___ Indirect Fired ___Direct Fired
Maximum design heat input and/or maximum horsepower rating: NA	**Type and Btu/hr rating of burners:** NA

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
NA

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
NA	NA	NA	NA

Emissions Data

Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	0	0
Nitrogen Oxides (NO_X)	0	0
Lead (Pb)	0	0
Particulate Matter ($PM_{2.5}$)	0.11	0.49
Particulate Matter (PM_{10})	0.11	0.49
Total Particulate Matter (TSP)	0.11	0.49

Sulfur Dioxide (SO_2)	0	0
Volatile Organic Compounds (VOC)	1.21	5.34
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
NA	NA	NA
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
NA	NA	NA

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

A PM emission factor of 0.05 lbs PM per ton of wool processed is presented on page C-65 of "Wool Fiberglass Insulation Manufacturing - Background Information for Proposed Standards" USEPA-450-3-83-002A. A representative (or conservative) VOC emission factor of 1.86 lbs VOC per ton of asphalt blowing coating produced, which is used by the asphalt manufacturing industry, was obtained from the USEPA FIRE database to obtain emission numbers for the facing application.

Guardian uses an ink printing system to print product codes on the finished product. The emissions from the ink printing system are uncontrolled and released, as fugitive emissions, to the in-plant environment. Emission rates are based on actual 2006 yearly ink usage in Inwood and actual 2001 solvent usage in Kingman. Therefore, the actual maximum annual VOC emission rate is estimated using a 1.7 variation factor based on actual data.

Determination of fugitive VOC emissions for spray adhesive based on a material balance is as follows: Emission rates are calculated using the Inwood, WV 2005 adhesive usage of 595 gallons. Total glass production rate was 50,614 tons or 0.0118 per TGP.

Potential particulate matter (PM) emissions from the sizing and packaging area are collected and controlled by two Air Tumbler control devices. The sizing and packaging area consists of trimming and rolling, the K&S Roll Machine, the blowing wool bagger, and packaging machinery. The Air Tumblers use cyclonic flow and wet impingement control techniques for the removal of particulates from the exhaust gas stream. The particulate matter removal efficiency for the Air Tumbler and scrubber are assumed to be 50% or greater. The PM exhaust concentration is assumed to be less than 0.005 lbs PM per 1000 lbs of exhaust air.

Potential PM emissions for the sizing and packaging area are estimated by multiplying the PM exhaust outlet concentration by the control devices rated volumetric air flowrate and by the control efficiency of 90% for the building as a process enclosure, as follows:

E =(0.005 lbs PM per 1000 lbs Air) x (Total Air Flowrate of control devices, cfm) x (units of conversion) x (1 - 90%)

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or <u>construction permit</u> with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

<u>Permit to Modify, R14-0015K</u>

5.1.2 The permittee shall install, maintain, and operate the Quentin Keeney Air Tumblers (CD15A), the Fisher Klosterman Scrubber (CD25A) and the bag filter dust collector (CD25B) in such a way that the PM and PM-10 emission from FP15 do not exceed 0.25 pounds per hour and/or 1.1 tons per year.

5.1.14 The permitted shall, to the extent practicable, install maintain, and operate all pollution control equipment listed in Section 1.0 and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this

permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary. **[45CSR§13-5.11.]**

____ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Permit to Modify, R14-0015K

5.4.2. Record of maintenance of Air Pollution Control Equipment. For all pollution control equipment listed in Section 1.0, the permittee shall maintain accurate records of all required pollution control equipment inspection and/or preventative maintenance procedures.

5.4.3 Record of Malfunctions of Air Pollution control Equipment. For all air pollution control equipment listed in Section 1.0, the permittee shall maintain records of the occurrence and duration of any malfunction or operational shutdown of the air pollution control equipment during which excess emissions occur. For each such case, the following information shall be recorded:

a. The equipment involved.
b. Steps taken to minimize emissions during the event.
c. The duration of the event.
d. The estimated increase in emissions during the event.

For each such case associated with an equipment malfunction, the additional information shall also be recorded:

e. The cause of the malfunction
f. Steps taken to correct the malfunction
g. Any changes or modifications to equipment or procedures that would help prevent future recurrences of the malfunction.

Are you in compliance with all applicable requirements for this emission unit? _**X**_ Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
ES25J, ES25K, ES25L	Line 2 Facing Sizing Packaging operating as a Non-Resinated Line	CD25B

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
After leaving the fiberizers, the glass is diced and silicone and de-dusting oil is applied. The finished product is then sent to the blowing wool baggers and packaged accordingly.

Manufacturer:	**Model number:**	**Serial number:**
Guardian Fiberglass	NA	NA
Construction date:	**Installation date:**	**Modification date(s):**
2004	2004	NA

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 8,000 lbs/hr

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
8,000 lbs/hr	35,040 TPY	The facility operates 24 hours a day 365 days a year.

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? ___Yes _x__ No	**If yes, is it?** ___ Indirect Fired ___Direct Fired
Maximum design heat input and/or maximum horsepower rating: NA	**Type and Btu/hr rating of burners:** NA

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
NA

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
NA	NA	NA	NA

Emissions Data

Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	NA	NA
Nitrogen Oxides (NO_X)	NA	NA
Lead (Pb)	NA	NA
Particulate Matter ($PM_{2.5}$)	0.11	0.49
Particulate Matter (PM_{10})	0.11	0.49
Total Particulate Matter (TSP)	0.11	0.49
Sulfur Dioxide (SO_2)	NA	NA

Volatile Organic Compounds (VOC)	1.25	5.48
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
NA	NA	NA
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
NA	NA	NA

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

Potential particulate matter (PM) emissions from the non-resinated packaging area are collected and controlled by"tube sock filters" and subsequently exhausted, as fugitive emisions to the in-plant environment. The estimated allowable PM exhaust concentration will be less than 0.005 lbs PM per 1000 lbs of exhaust air. Potential PM emissions for the sizing and packaging area are estimated by multiplying the PM exhaust outlet concentration by the control devices rated volumetric air flowrate and by the control efficiency provided by the enclosure, as follows:

E =(0.005 lbs PM per 1000 lbs Air) x (Total Air Flowrate of control devices, cfm) x (units of conversion) x (1 - 90 %)

Guardian uses an ink printing system to print product codes on the finished product. The emissions from the ink printing system are uncontrolled and released, as fugitive emissions, to the in-plant environment. Emission rates are based on actual 2004 yearly ink usage in Albion and actual 2001 solvent usage in Kingman. Therefore, the actual maximum annual VOC emission rate is estimated using a 1.25 variation factor based on actual data.

The annual VOC emissions from the application of de-dusting oil, anti-stat and silicone are estimated using the assumption that all VOC in the de-dusting oil, anti-stat and silicone used are released as fugitive emissions within the facility and a 1.50 variability factor, based on maximum usage data.

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or <u>construction permit</u> with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

<u>Permit to Modify, R14-0015K</u>

5.1.2 The permittee shall install, maintain, and operate the Quentin Keeney Air Tumblers (CD15A), the Fisher Klosterman Scrubber (CD25A) and the bag filter dust collector (CD25B) in such a way that the PM and PM-10 emission from FP15 do not exceed 0.25 pounds per hour and/or 1.1 tons per year.

5.1.14 The permitted shall, to the extent practicable, install maintain, and operate all pollution control equipment listed in Section 1.0 and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary. **[45CSR§13-5.11.]**

____ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

<u>Permit to Modify, R14-0015K</u>

5.4.2. Record of maintenance of Air Pollution Control Equipment. For all pollution control equipment listed in

Section 1.0, the permittee shall maintain accurate records of all required pollution control equipment inspection and/or preventative maintenance procedures.

5.4.3 Record of Malfunctions of Air Pollution control Equipment. For all air pollution control equipment listed in Section 1.0, the permittee shall maintain records of the occurrence and duration of any malfunction or operational shutdown of the air pollution control equipment during which excess emissions occur. For each such case, the following information shall be recorded:

a. The equipment involved.
b. Steps taken to minimize emissions during the event.
c. The duration of the event.
d. The estimated increase in emissions during the event.

For each such case associated with an equipment malfunction, the additional information shall also be recorded:

e. The cause of the malfunction
f. Steps taken to correct the malfunction

Any changes or modifications to equipment or procedures that would help prevent future recurrences of the malfunction.

Are you in compliance with all applicable requirements for this emission unit? ___Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
M1, M2, M3, M4, M5, M6, M7, M8, M9, M10	Binder Mix Tanks	None

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
Eight day tanks positioned to feed raw binder materials to a calibrated mixing pump to keep one "mixed binder" tank stocked with mixed binder for distribution to production lines.

Manufacturer:	**Model number:**	**Serial number:**
Guradian Fiberglass Installed	NA	NA

Construction date:	**Installation date:**	**Modification date(s):**
NA	07/25/1998	September 2005 Converted M-3 Process Water Tank into a Pre-React Holding Tank, TBD – M10 addition

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): M1-1,200 gallons; M2-1,700 gallons; M3-3,200 gallons; M4-150 gallons; M5-1,700 gallons; M6-M9- 50 gallons, M10 – 750 gallons

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
901 gallons	7,888,866 gallons	Guardian Fiberglass operates 24 hours a day and 365 days a year.

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? ___Yes _**X**_ No	**If yes, is it?** ___ Indirect Fired ___Direct Fired
Maximum design heat input and/or maximum horsepower rating: NA	**Type and Btu/hr rating of burners:** NA

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
NA

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
NA			

Emissions Data

Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	0	0
Nitrogen Oxides (NO_X)	0	0
Lead (Pb)	0	0
Particulate Matter ($PM_{2.5}$)	0	0
Particulate Matter (PM_{10})	0	0
Total Particulate Matter (TSP)	0	0

Sulfur Dioxide (SO_2)	0	0
Volatile Organic Compounds (VOC)	1.45	6.34
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Formaldehyde	0.004	0.018
Phenol	0.0004	0.002
Methanol	0.12	0.52
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
NA	NA	NA

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

The batch mixing process for the Pre-React tanks is similar to the batch mixing processes that occur in the paint manufacturing industry. Under Section 6.4 Paint and Varnish of AP-42, it is estimated that 1 to 2% of the solvents (or VOCs) are lost from paint mixing operations. The solvents used in paint manufacturing are typically high vapor pressure solvents that are designed to flash off during the application of the paint. The VOCs (e.g. formaldehyde, phenol) found in Pre-Act Mixing Tanks have a strong affinity towards water, which results in a lower mixed vapor pressure than those of common paint solvents. Therefore, it is estimated that only 2% of the available mass of VOCs in the ingredients used in the Pre-React Mixing Tanks are lost to the indoor air as fugitive emissions.

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or <u>construction permit</u> with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

<u>Permit to Modify R14-0015K:</u>

5.1.11. The pre-react tanks (mixing tank M1 and holding tanks M2 and M3)) shall not be operated in such a manner where the combined total potential to emit of VOC from these source exceed over 11.8 tons of VOCs per year.

5.1.12. Fugitive emissions from equipment (e.g. pipes, pumps, flanges, etc.), which is placed in toxic air pollutant service, as defined by 45CSR27-2.11, shall be integrated into the existing Leak Detection And Repair program. This Leak Detection and Repair program shall comply with the provision of 40 CFR 61 Subpart V. All reports and notification required by Subpart V shall be submitted to the Director instead of the U.S. EPA Administrator. All records required under Subpart V shall be maintain in accordance with 3.4.1. **[45CSR§27-10.3.]**

____ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

<u>Permit to Modify R14-0015K:</u>

4.2.4. The permittee shall monitor and record the formulation of each batch of binder used.

Are you in compliance with all applicable requirements for this emission unit? _<u>X</u>_ Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
T3, T4, T5, T6	Resin Storage Tanks	None

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
Storage tanks for the raw Resin that is used in the formulation of binder. The tanks are installed in a refrigerated /secondary containment room and are interconnected to prevent overflow.

Manufacturer:	**Model number:**	**Serial number:**
Guardian Fiberglass, Inc.	NA	NA
Construction date:	**Installation date:**	**Modification date(s):**
NA	07/25/1998	NA

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 4,500 gallons per tank

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
130.4 gallons	1,692,850 gallons	Guardian Fiberglass operates 24 hours a day and 365 days a year.

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? ___Yes _x__ No	**If yes, is it?** ___ Indirect Fired ___Direct Fired
Maximum design heat input and/or maximum horsepower rating: NA	**Type and Btu/hr rating of burners:** NA

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
NA

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
NA			

Emissions Data

Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	0	0
Nitrogen Oxides (NO_X)	0	0
Lead (Pb)	0	0
Particulate Matter ($PM_{2.5}$)	0	0
Particulate Matter (PM_{10})	0	0
Total Particulate Matter (TSP)	0	0
Sulfur Dioxide (SO_2)	0	0

Volatile Organic Compounds (VOC)	0.0036	0.016
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Formaldehyde	0.0021	0.009
Phenol	0	0
Methanol	0.015	0.006
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
NA	NA	NA

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

U.S.EPA tanks program equations (U.S.EPA "Compilation of Air Pollutant Emission Factors" (AP-42), February, 1995, Section 7.1.3.1).

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or <u>construction permit</u> with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

<u>Permit to Modify R14-0015K:</u>

5.1.8. The amount of resin consumed shall not exceed over 1,692,850 gallons per year, calculated as the sum during a consecutive 12-month period.

5.1.10. The four resin (T3, T4, T5, and T6) and two de-dusting oil/wax emulsion (T7a and T7b) storage tanks shall not be operated in such a manner where the combine total potential to emit of VOCs exceed over 1,695 pounds of VOCs per year.

____ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

<u>Permit to Modify R14-0015K:</u>

5.2.1. The permittee shall monitor and record on a monthly basis the amount of resin consumed at the permitted facility. Such records shall be maintain in accordance with 3.4.1.

5.5.1. The permittee shall report to the Director or his/her authorized representative of any abnormal release and/or spill of fifty pounds or more of formaldehyde within twenty-four (24) hours of knowledge of the incident. Within seven (7) days after knowledge of the incident, the permittee shall submit a written report to the Director stating the details of the incident. Record of such report shall be maintained in accordance with condition 3.4.1. **[45CSR§27-10.4.]**

Are you in compliance with all applicable requirements for this emission unit? _**<u>X</u>**_Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
T7A, T7B	Dedusting Oil/Emulsion Wax Storage Tanks	None

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
Storage tanks for the Dedusting Oil/Wax that is used in the binder or applied to the product after the binder.

Manufacturer:	**Model number:**	**Serial number:**
Guardian Fiberglass, Inc.	NA	NA

Construction date:	**Installation date:**	**Modification date(s):**
NA	07/25/1998	Converted from dedusting oil to emulsion wax June 2007.

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 3,800 gallons per tank

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
166 pounds	1,144,095 pounds	Guardian Fiberglass operates 24 hours a day and 365 days a year.

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? ___Yes _**X**_ No	**If yes, is it?** ___ Indirect Fired ___Direct Fired
Maximum design heat input and/or maximum horsepower rating: NA	**Type and Btu/hr rating of burners:** NA

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
NA

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
NA			

Emissions Data

Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	0	0
Nitrogen Oxides (NO_X)	0	0
Lead (Pb)	0	0
Particulate Matter ($PM_{2.5}$)	0	0
Particulate Matter (PM_{10})	0	0
Total Particulate Matter (TSP)	0	0
Sulfur Dioxide (SO_2)	0	0

Volatile Organic Compounds (VOC)	0.0000041	0.00002
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
NA	NA	NA
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
NA	NA	NA

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

U.S.EPA tanks program equations (U.S.EPA "Compilation of Air Pollutant Emission Factors" (AP-42), February, 1995, Section 7.1.3.1).

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or <u>construction permit</u> with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

<u>Permit to Modify R14-0015K:</u>

5.1.9. The amount of de-dusting oil consumed shall not exceed 1,144,095 gallons per year, calculated as the sum during a consecutive 12-month period.

5.1.10. The four resin (T3, T4, T5, and T6) and two de-dusting oil/wax emulsion (T7a and T7b) storage tanks shall not be operated in such a manner where the combine total potential to emit of VOCs exceed over 1,695 pounds of VOCs per year.

____ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

<u>Permit to Modify R14-0015K:</u>

5.2.2. The Permittee shall monitor and record on a monthly basis the amount of de-dusting oil and wax emulsion consumed at the permitted facility.

Are you in compliance with all applicable requirements for this emission unit? _**<u>X</u>** Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
T8	Aqueous Ammonia Storage Tank	None

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
Fiberglass, reinforced, storage tank for the Aqua Ammonia that is used in the binder.

Manufacturer:	**Model number:**	**Serial number:**
Iatec Process Storage Systems	CVF-108-6153-5	113808

Construction date:	**Installation date:**	**Modification date(s):**
06/03	07/25/1998	Tank Replaced 2003

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 6,153 gallons per tank

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
21.5 Gallons	188,024 Gallons	Guardian Fiberglass operates 24 hours a day and 365 days a year.

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? ___Yes _**X**_ No	**If yes, is it?** ___ Indirect Fired ___Direct Fired
Maximum design heat input and/or maximum horsepower rating: NA	**Type and Btu/hr rating of burners:** NA

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
NA

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
NA			

Emissions Data

Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	NA	NA
Nitrogen Oxides (NO_X)	NA	NA
Lead (Pb)	NA	NA
Particulate Matter ($PM_{2.5}$)	NA	NA
Particulate Matter (PM_{10})	NA	NA
Total Particulate Matter (TSP)	NA	NA
Sulfur Dioxide (SO_2)	NA	NA

Volatile Organic Compounds (VOC)	NA	NA
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
NA	NA	NA
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
NA	NA	NA

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

NA

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or <u>construction permit</u> with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

<u>Permit to Modify R14-0015K:</u>

5.1.12. Fugitive emissions from equipment (e.g. pipes, pumps, flanges, etc.), which is placed in toxic air pollutant service, as defined by 45CSR27-2.11, shall be integrated into the existing Leak Detection And Repair program. This Leak Detection and Repair program shall comply with the provision of 40 CFR 61 Subpart V. All reports and notification required by Subpart V shall be submitted to the Director instead of the U.S. EPA Administrator. All records required under Subpart V shall be maintain in accordance with 3.4.1. **[45CSR§27-10.3.]**

____ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

NA

Are you in compliance with all applicable requirements for this emission unit? _**<u>X</u>**_ Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
ES13A, ES13B and ES13C (Group 004)	Fiberizers, Vacuum Chamber and Collection Plenum	CD13A and CD13B

Provide a description of the emission unit (type, method of operation, design parameters, etc.):

Fiber forming units (or fiberizers) are positioned below orifices in the Forehearth to receive the molten glass stream, and "spun" into glass fibers. There are eight (8) fiberizers with a total material throughput capacity of 8,000 pounds per hour. Cooling water, de-dusting wax or oil and binder is applied to the fiber just below the fiberizers. Each fiberizer is configured with an advanced water-jet ring, a process modification that reduces volatilization of potential regulated air pollutants. Conditioned fiber from the fiberizers is pulled down onto the collection chain in the vacuum chamber, by fans located downstream of the collection plenum. The collection plenum is a box where the vacuum chamber exhaust is impinged with a water spray to control particulates. The exiting exhaust is then accelerated through a transition duct and drop-out box (where it is subjected to additional water sprays) then to the fans, and finally to the discharge (collection) stack.

Manufacturer:	**Model number:**	**Serial number:**
Guardian Fiberglass	NA	NA
Construction date:	**Installation date:**	**Modification date(s):**
NA	07/25/1998	NA

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 8,000 lbs/hr

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
8,000 lbs/hr	35,040 Tons per Year	The facility operates 24 hours a day, 365 days a year.

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? _x__Yes __ No	**If yes, is it?** ___ Indirect Fired _x_Direct Fired
Maximum design heat input and/or maximum horsepower rating: 8.4MM BTU/Hr	**Type and Btu/hr rating of burners:** Pre Mix Tunnel Burner 8.4 mmBtu/hr nat'l gas-fired

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
Natural Gas Max. Nat. Gas Usage Per Hour: 8,000 CFH
Max. Nat. Gas Usage Per Year: 70.08 MM CF

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	NA	NA	1047.7

Emissions Data

Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	21.12	92.51
Nitrogen Oxides (NO_X)	1.28	5.61

Lead (Pb)	0.00022	0.00095
Particulate Matter ($PM_{2.5}$)	14.84	65.00
Particulate Matter (PM_{10})	14.84	65.00
Total Particulate Matter (TSP)	14.84	65.00
Sulfur Dioxide (SO_2)	0.004	0.018
Volatile Organic Compounds (VOC)	10.48	45.90
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Chromium	0.003	0.015
Formaldehyde	2.52	11.04
Methanol	9.12	39.95
Phenol	5	21.9
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
Ammonia	15.08	66.05
Formic Acid	1.392	6.096
Carbon Dioxide Equivalent (CO_2e)	980	4,300

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

The emission factors and TPY listed above for CO, NO_x, PM, VOC, SO_2 Phenol, Ammonia and Formaldehyde are from Permit R14-0015 emission limits. The emission factor for Chrome was obtained from the Mineral Wells, MS 2000 stack test and the Lead is an impurity in the raw material and is calculated based on usage. Methanol emission factor was obtained from the stack test, along with Formic Acid. Condensable PM speciation is based on stack test data. CO_2e was calculated following 40 CFR 98 Subparts C and N as appropriate.

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or <u>construction permit</u> with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

<u>Permit to Modify R14-0015K:</u>

4.1.1. The permittee shall operate a resinated (bonded) fiberglass insulation line identified as 1st line with associated emission EP12 (melter stack), EP13 (collection stack), and EP14 (incinerator stack). This line shall be operated and maintained in accordance with the following operational and emission limitations:

a. Production of fiberglass insulation from this line shall not exceed 8,000 pounds of glass pulled per hour or 35,040 TPY. Compliance with this limit shall be based on a 12-month rolling total;
b. Emissions from the line shall not exceed the following limits with respect to the corresponding emission point and pollutant;

Emission Point	CO lb/TGP	NO_x lb/TGP	PM lb/TGP	PM_{10} lb/TGP	VOC* lb/TGP	HCOH lb/TGP	Phenol lb/TGP	NH_3 lb/TGP
EP12	0.73	0.03	0.07	0.07				
EP13	5.28	0.32	3.47	3.47	2.86	0.80	1.55	3.77

EP14	1.13	3.75	0.46	0.46				0.87

lb/TGP = pounds of pollutant per ton of glass pulled.
*VOC emissions shall not include methane and ethane

d. The fiberizers and Forehearth of the line shall be operated in such a manner the following air to fuel ratios are not exceeded:

Thermox Gas Ratio Setting for the fiberizers: 962 millvolts
Thermox Gas Ratio Setting for the forehearths: 823 millvolts

e. Exhaust from the Forehearth and fiberizers of this line shall be vented into a closed loop system that routs this stream directly to either one of identified water sprays with drop-out boxes (CD13A or CD13B) at all times when the line is operating.

4.1.3 The following conditions apply to both production lines.

b. Each fiberizer that produces resinated (bonded) fiberglass shall be equipped, maintained, and operated with a advance water-jet ring to minimize formaldehyde emissions from the fiber forming process;
d. A device that continuous measures and records the scrubbing liquid flow to each scrubber and drop-out box shall be installed, calibrate, maintain, and operated for each venturi scrubber and drop-out box (CD13A, CD13B, CD23A, CD23B, CD23C, and CD24B). Such device is to be certified by its manufacturer to be accurate within ± 5 percent over its operating range; and
e. A device that continuous measures and records the scrubbing liquid pressure at delivery to each drop-out box shall be installed, calibrated, maintained, and operated for each drop-out box (CD13A and CD13B). Such device is to be certified by its manufacturer to be accurate within ± 5 percent over its operating range;
f. A device that continuous measures and records the amount of binder applied to the product shall be installed, maintained, calibrated, and operated for each production line. Such device is to be certified by its manufacturer to be accurate within ± 5 percent over its operating range.

4.1.4 The permitted shall, to the extent practicable, install maintain, and operate all pollution control equipment listed in Section 1.0 and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary. **[45CSR§13-5.11.]**

____ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

4.2.1 The permittee shall monitor and record the hourly production on a daily basis for each line. These records shall include the monthly total and the 12-month rolling total for each line respectively. Such records shall be maintained in accordance with condition 3.4.1.

4.2.2 The permittee shall maintain records of the recorded data from the stipulated devices in condition 4.1.3.b. through g. in accordance with condition 3.4.1 of this permit.

4.3.1 For the purposes of demonstrating initial compliance with operations and emission limitation in condition 4.1.1., 4.1.2., and 40 CFR §63.(a), the permittee shall conduct performance testing of the 1st and 2nd lines within 180 days after issuance of this permit. Such testing shall determine the VOC, formaldehyde, and phenol emission rates from the collection and incinerator stacks of the both production lines. This testing shall establish and/or verify the operating parameters for the respective control devices of the production line. This testing shall be conducted as outline in the following:

a. General Testing Requirements:
   i. This testing shall consist of three test runs. Each test run must last at least one hour;
   ii. Each test run must be conducted with the production line operating at no less 90 percent capacity;
   iii. During each test run, sampling of the collection and incinerator must occur simultaneously to each other;
   viii. During such testing, the permittee shall measure and record all of the operating parameters respective to the production line as noted in condition 4.3.1. in fifteen (15) minute intervals. The

arithmetic average shall be calculated for each parameters using all of recorded measurements. Such measurements and arithmetic averages shall be included with the testing report;

b. Demonstrating compliance with the VOC emission limit shall be conducted with a method(s) approved by the Director. The permittee may propose a testing method as part of the required protocol of condition 3.4.1.;
c. Demonstrating compliance with the formaldehyde limits be conducted in accordance with U.S. EA method 316 or Method 318;
d. Demonstrating compliance with the phenol limits be conducted in accordance with U.S. EPA Method 318 or 320 or other method approved by the Director;
e. Compliance with the VOC, formaldehyde, and phenol limits shall be determined by taking sum of the arithmetic average of the respective pollutant from the collection stack and incinerator stack. The reported emission rates shall be in terms of pounds per ton of glass pulled.
f. Such testing shall be conducted in accordance with 3.3.1.

4.3.2. Within 180 days after completing modification of the 1st line to be capable of producing 8,000 pounds of glass pulled per hour, the permittee shall conduct performance testing to demonstrate compliance with the carbon dioxide PM, VOC, formaldehyde, and phenol emission limits. Stack testing shall be conducted as prescribe in condition 4.3.1. for VOC, formaldehyde, and phenol. For PM, such testing shall be conducted as outline in condition 4.3.4. For carbon monoxide, such testing shall be conducted in accordance with U.S.EPA Method 10. This testing shall establish and/or verify the operating parameters for the respective control devices of the production line.

4.3.3 Once every five years, the permittee shall conduct emission testing to demonstrate compliance with the permitted CO and NO_x emission limits in 4.1.1.b and 4.1.2b for the collection stack (EP13 and EP23) and incinerator stack (EP14 and EP24) of each production line and to verify and/or establish maximum Thermox readings in millivolts for the fiberizers and Forehearth as stipulated in 4.1.1d. and 4.1.2.d. This testing shall be conducted as outline in 3.3.1., 4.3.1.a, and as follows:

a. Demonstrating compliance with the carbon monoxide limits be conducted in accordance with U.S. EPA method 10;
b. Demonstrating compliance with the oxides of nitrogen limits be conducted in accordance with U.S. EPA Method 7E.

4.3.4 Once every 5 years or within 180 days that when the production line will be producing a product with a LOI greater than the previous compliance test that demonstrated compliance with the permitted PM limits of this permit, the permittee shall conduct performance testing to determine the PM emission rate of the collection and incinerator stacks of the respective production line. Such testing shall be conducted as outlined in condition 4.3.1.a. and USEPA Method 5E. This testing shall establish and/or verify the operating parameters for the respective control devices of the production line.

4.3.5 Should the permittee elect to change binder formula or produce a product with a LOI that is greater than the one that was produced during a compliance test that demonstrated compliance with the permitted VOC, formaldehyde, and phenol limits of this permit, the permittee shall conduct performance testing within 180 days of after making such change to demonstrate compliance with the VOC, formaldehyde, and phenol emission limits. Such testing shall be conducted as prescribed in conditions 3.3.1. and 4.3.1. for VOC, formaldehyde, and phenol of the respective line that the change is effecting. This testing shall establish and/or verify the operating parameters for the respective control devices of the production line.

4.4.1. Record of monitoring. The permittee shall keep records of monitoring information that include the following:

a. The date, place as defined in this permit and time of sampling or measurements;
b. The date(s) analyses were performed;
c. The company or entity that performed the analyses;
d. The analytical techniques or methods used;
e. The results of the analyses; and
f. The operating conditions existing at the time of sampling or measurement.

Are you in compliance with all applicable requirements for this emission unit? _**X**_ Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
ESHW15	5 Binder Room Water Heaters	NA

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
5 Stand alone natural gas water heaters plumbed in parallel to supply hot water to the binder mixing process.

Manufacturer:	**Model number:**	**Serial number:**
Unit 1: State Unit 2: Bradford White Unit 3 Bradford White Unit 4: Vaguard Unit 5: Bradford White	Unit 1: SBS10076NE Unit 2: MI75S6BN Unit 3 MI75S6BN Unit 4: 2LAC9 Unit 5: MI75S6BN	Unit #1: J06M002319 Unit #2: GD13356259 Unit #3: HB14527179 Unit #4: VGLN0808104786 Unit #5: GE13396971
Construction date: NA	**Installation date:** Unit 1 07/25/1998	**Modification date(s):** Units 2 - 5 2011

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 98 Gallon Tank Capacity X 5 = 490 Gallons

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
125 Gallons Per Hour	1,095,000 Gallons Per Year	Guardian Fiberglass operates 24 hours a day and 365 days a year.

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? _**X**_ Yes ___ No	**If yes, is it?** __ Indirect Fired _**X**_ Direct Fired
Maximum design heat input and/or maximum horsepower rating: 75,100 BTU/HR	**Type and Btu/hr rating of burners:** Standing Pilot Model, Atmospheric Vented, Light Duty Commercial, GAMA Rated 80% Thermal Efficiency @ 75,100 btu/hr

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
Fuel Type: Natural Gas
Maximum Hourly Usage For Five Units: 358.4 cu. Ft.
Maximum Annual Usage For Five Units: 3,139,620.1 cu. Ft.

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	NA	NA	1047.7/cu. Ft.

Emissions Data

Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	0.008	0.03
Nitrogen Oxides (NO_X)	0.04	0.16
Lead (Pb)	0	0

Particulate Matter ($PM_{2.5}$)	0.001	0.0049
Particulate Matter (PM_{10})	0.001	0.0049
Total Particulate Matter (TSP)	0.001	0.0049
Sulfur Dioxide (SO_2)	0.0002	0.00099
Volatile Organic Compounds (VOC)	0.002	0.0087
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
NA	NA	NA
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
Ammonia	0.0068	0.02957
Carbon Dioxide Equivalents (CO_2e)	40	190

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

Fugitive emissions occur from the combustion of natural gas in each water heater. Using the EPA's FIRE database, SCC Code No. 1-05-002-06 for external boilers in industrial use presents an emission factor of 20 lbs CO, 5.3 lbs VOC's, 100 lbs NO_x, 0.6 lbs SO2, 18 lbs NH_3 and 3 lbs of PM per million cubic feet (MMCF) of natural gas burned. Carbon dioxide equivalents were calculated following 40 CFR 98 Subpart C and N as appropriate.

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or <u>construction permit</u> with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

<u>Permit to Modify R14-0015K:</u>
5.1.5. The 14.6 MMBtu/hr boiler (ID No. ESSHB14), 8.5 MMBTU/hr makeup air handling unit (ID. No. ESSH15), 7.875 MMBtu/hr air handling unit (ID No. ESSH16), and five (5) 75 Mbtu/hr binder water heaters (ID No. ESHW15) shall only be fired with pipeline quality natural gas.

____ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)
NA

Are you in compliance with all applicable requirements for this emission unit? _**<u>X</u>**_ Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

APPENDIX F: SCHEDULE OF COMPLIANCE

This section is not applicable.

APPENDIX G: WVDEP CONTROL DEVICE FORMS

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number: CD12A	**List all emission units associated with this control device.** ES12A (Batch Mixer's Receiving Bin For 1st & 2nd Lines)	
Manufacturer: Whirl-Air Flow	**Model number:** Bin Vent DC Model 345-56	**Installation date:** 07/25/1998

Type of Air Pollution Control Device:

_X_ Baghouse/Fabric Filter	___ Venturi Scrubber	___ Multiclone
___ Carbon Bed Adsorber	___ Packed Tower Scrubber	___ Single Cyclone
___ Carbon Drum(s)	___ Other Wet Scrubber	___ Cyclone Bank
___ Catalytic Incinerator	___ Condenser	___ Settling Chamber
___ Thermal Incinerator	___ Flare	___ Other (describe) _____
___ Wet Plate Electrostatic Precipitator		___ Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutant	Capture Efficiency	Control Efficiency
Particulate Matter	99%	99%

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.). Control device utilizes 345 square feet of filter cloth media with an air to cloth ratio of 3:1 for an acfm of 1,035.

Is this device subject to the CAM requirements of 40 C.F.R. 64? ___ Yes _**X**_ No

If Yes, **Complete ATTACHMENT H**

If No**, Provide justification.** The control device is a fugitive emission point and does not discharge to the atmosphere as the unit is enclosed.

Describe the parameters monitored and/or methods used to indicate performance of this control device.

NA

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number: CD12B	**List all emission units associated with this control device.** ES12C (Melter Hood For 1st Line)	
Manufacturer: MAC Equipment Co.	**Model number:** MactFlo 4MTF96	**Installation date:** 07/25/1998

Type of Air Pollution Control Device:

_X_ Baghouse/Fabric Filter	___ Venturi Scrubber	___ Multiclone
___ Carbon Bed Adsorber	___ Packed Tower Scrubber	___ Single Cyclone
___ Carbon Drum(s)	___ Other Wet Scrubber	___ Cyclone Bank
___ Catalytic Incinerator	___ Condenser	___ Settling Chamber
___ Thermal Incinerator	___ Flare	___ Other (describe) _____
___ Wet Plate Electrostatic Precipitator		___ Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutant	Capture Efficiency	Control Efficiency
Particulate Matter	99%	99%
Chromium	99%	99%

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.).

1. 15,000 acfm
2. Closed Pressure Configuration
3. 96 Polyester Cartridge Filters
4. 10,560 ft^2 of filter area
5. Cartridges Cleaned By Pulse Air

Is this device subject to the CAM requirements of 40 C.F.R. 64? ___ Yes _**X**__ No

If Yes, **Complete ATTACHMENT H**

If No**, Provide justification.**

1. Facility is subject to MACT under the NESHAP 40CFR Parts 61 & 63 CAM APPLICABILITY DETERMINATION (1.b. bullet 1)

2. Emission Limitations or Standards for which a WVDEP Division of Air Quality Title V permit specifies a continuous compliance determination method, as defined in 40 CFR Section 64.1 CAM APPLICABILITY DETERMINATION (1.b. bullet 4)

Describe the parameters monitored and/or methods used to indicate performance of this control device.
Differential Pressure, Incoming air temperature and Discharge Air pico Amps are all monitored. A bag leak detection system is installed and monitored accordingly.

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number: CD12Bb (Backup To CD12B)	**List all emission units associated with this control device.** ES12C (Melter Hood For 1st Line)	
Manufacturer: MAC Equipment Co.	**Model number:** MactFlo 4MTF32	**Installation date:** 07/25/1998

Type of Air Pollution Control Device:

_X_ Baghouse/Fabric Filter	___ Venturi Scrubber	___ Multiclone
___ Carbon Bed Adsorber	___ Packed Tower Scrubber	___ Single Cyclone
___ Carbon Drum(s)	___ Other Wet Scrubber	___ Cyclone Bank
___ Catalytic Incinerator	___ Condenser	___ Settling Chamber
___ Thermal Incinerator	___ Flare	___ Other (describe) _____
___ Wet Plate Electrostatic Precipitator		___ Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutant	Capture Efficiency	Control Efficiency
Particulate Matter	99%	99%
Chromium	99%	99%

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.).

1. 10,000 acfm
2. Closed Pressure Configuration
3. 32 Polyester Cartridge Filters
4. 3,530 ft^2 of filter area
5. Cartridges Cleaned By Pulse Air

Is this device subject to the CAM requirements of 40 C.F.R. 64? ___ Yes _**X**__ No

If Yes, **Complete ATTACHMENT H**

If No**, Provide justification.**

1. Facility is subject to MACT under the NESHAP 40CFR Parts 61 & 63 CAM APPLICABILITY DETERMINATION (1.b. bullet 1)

2. Emission Limitations or Standards for which a WVDEP Division of Air Quality Title V permit specifies a continuous compliance determination method, as defined in 40 CFR Section 64.1 CAM APPLICABILITY DETERMINATION (1.b. bullet 4)

Describe the parameters monitored and/or methods used to indicate performance of this control device.
Differential Pressure, Incoming air temperature and Discharge Air pico Amps are all monitored. A bag leak detection system is installed and monitored accordingly.

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number: CD12C	**List all emission units associated with this control device.** ES12D (Mixed Batch Storage Day Bin For 1st Line (3" Line)	
Manufacturer: Whirl-Air-Flow.	**Model number:** Bin Vent DC Model 230-56	**Installation date:** 07/25/1998

Type of Air Pollution Control Device:

_X_ Baghouse/Fabric Filter	___ Venturi Scrubber	___ Multiclone
___ Carbon Bed Adsorber	___ Packed Tower Scrubber	___ Single Cyclone
___ Carbon Drum(s)	___ Other Wet Scrubber	___ Cyclone Bank
___ Catalytic Incinerator	___ Condenser	___ Settling Chamber
___ Thermal Incinerator	___ Flare	___ Other (describe) _____
___ Wet Plate Electrostatic Precipitator		___ Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutant	Capture Efficiency	Control Efficiency
Particulate Matter	99%	99%

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.). Control device utilizes 230 square feet of filter cloth media with an air to cloth ratio of 3:1 for an acfm of 690.

Is this device subject to the CAM requirements of 40 C.F.R. 64? ___ Yes _**X**_ No

If Yes, **Complete ATTACHMENT H**

If No**, Provide justification.** The control device is a fugitive emission point and does not discharge to the atmosphere as the unit is enclosed.

Describe the parameters monitored and/or methods used to indicate performance of this control device.

NA

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number: CD12Cb	**List all emission units associated with this control device.** ES12Db (Mixed Batch Storage Day Bin For 1st Line (3" Line)	
Manufacturer: Whirl-Air Flow	**Model number:** Bin Vent DC Model 265-42	**Installation date:** 07/25/1998

Type of Air Pollution Control Device:

_X_ Baghouse/Fabric Filter	___ Venturi Scrubber	___ Multiclone
___ Carbon Bed Adsorber	___ Packed Tower Scrubber	___ Single Cyclone
___ Carbon Drum(s)	___ Other Wet Scrubber	___ Cyclone Bank
___ Catalytic Incinerator	___ Condenser	___ Settling Chamber
___ Thermal Incinerator	___ Flare	___ Other (describe) _____
___ Wet Plate Electrostatic Precipitator		___ Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutant	Capture Efficiency	Control Efficiency
Particulate Matter	99%	99%

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.). Control device utilizes 265 square feet of filter cloth media with an air to cloth ratio of 3:1 for an acfm of 795.

Is this device subject to the CAM requirements of 40 C.F.R. 64? ___ Yes _**X**_ No

If Yes, **Complete ATTACHMENT H**

If No**, Provide justification.** The control device is a fugitive emission point and does not discharge to the atmosphere as the unit is enclosed.

Describe the parameters monitored and/or methods used to indicate performance of this control device.

NA

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number: CD12D	**List all emission units associated with this control device.** ES12B (Mixed Batch Storage Backup Day Bin For 1st Line (5" Line)	
Manufacturer: Whirl-Air-Flow.	**Model number:** Bin Vent DC Model 130-42	**Installation date:** 07/25/1998

Type of Air Pollution Control Device:

_X_ Baghouse/Fabric Filter	___ Venturi Scrubber	___ Multiclone
___ Carbon Bed Adsorber	___ Packed Tower Scrubber	___ Single Cyclone
___ Carbon Drum(s)	___ Other Wet Scrubber	___ Cyclone Bank
___ Catalytic Incinerator	___ Condenser	___ Settling Chamber
___ Thermal Incinerator	___ Flare	___ Other (describe) _____
___ Wet Plate Electrostatic Precipitator		___ Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutant	Capture Efficiency	Control Efficiency
Particulate Matter	99%	99%

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.). Control device utilizes 130 square feet of filter cloth media with an air to cloth ratio of 3:1 for an acfm of 390.

Is this device subject to the CAM requirements of 40 C.F.R. 64? ___ Yes _**X**_ No

If Yes, **Complete ATTACHMENT H**

If No**, Provide justification.** The control device is a fugitive emission point and does not discharge to the atmosphere as the unit is enclosed.

Describe the parameters monitored and/or methods used to indicate performance of this control device.

NA

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number: CD13A (East Side)	**List all emission units associated with this control device.** ES12E (Forehearth For 1st Line); ES12A (8 Fiber Forming Units);ES12B (Vacuum Chamber) & ES13C (Collection Plenum)	
Manufacturer: Guardian Fiberglass, Inc	**Model number:** NA	**Installation date:** 07/25/1998

Type of Air Pollution Control Device:

__ _ Baghouse/Fabric Filter	___ Venturi Scrubber	___ Multiclone
___ Carbon Bed Adsorber	___ Packed Tower Scrubber	___ Single Cyclone
___ Carbon Drum(s)	___ Other Wet Scrubber	___ Cyclone Bank
___ Catalytic Incinerator	___ Condenser	___ Settling Chamber
___ Thermal Incinerator	___ Flare	_X_ Other (describe) Water Spray with Dropout Boxes
___ Wet Plate Electrostatic Precipitator		___ Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutant	Capture Efficiency	Control Efficiency
Particulate Matter	99%	30%

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.).
40,000 acfm or air from the plenums to the drop out box and the liquid pressure to drop out box is 7-60 psig. The liquid flow rate has a design maximum of 680 gal/min, however the average expected flow rate is 350 gal/min. The pressure drop through the drop out box is 3-13 inches of water.

Is this device subject to the CAM requirements of 40 C.F.R. 64? ___ Yes _**X**_ No

If Yes, **Complete ATTACHMENT H**

If No**, Provide justification.**

1. Facility is subject to MACT under the NESHAP 40CFR Parts 61 & 63 CAM APPLICABILITY DETERMINATION (1.b. bullet 1)
2. Emission Limitations or Standards for which a WVDEP Division of Air Quality Title V permit specifies a continuous compliance determination method, as defined in 40 CFR Section 64.1 CAM APPLICABILITY DETERMINATION (1.b. bullet 4)

Describe the parameters monitored and/or methods used to indicate performance of this control device.

1. The pressure drop across the scrubber in inches water and the liquid flow rate in GPM is recorded to indicate performance.

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number: CD13B (West Side)	**List all emission units associated with this control device.** ES12E (Forehearth For 1st Line); ES13A (8 Fiber Forming Units);ES13B (Vacuum Chamber) & ES13C (Collection Plenum)	
Manufacturer: Guardian Fiberglass, Inc	**Model number:** NA	**Installation date:** 07/25/1998

Type of Air Pollution Control Device:

__ _ Baghouse/Fabric Filter	___ Venturi Scrubber	___ Multiclone
___ Carbon Bed Adsorber	___ Packed Tower Scrubber	___ Single Cyclone
___ Carbon Drum(s)	___ Other Wet Scrubber	___ Cyclone Bank
___ Catalytic Incinerator	___ Condenser	___ Settling Chamber
___ Thermal Incinerator	___ Flare	_X_ Other (describe) Water Spray with Dropout Boxes
___ Wet Plate Electrostatic Precipitator		___ Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutant	Capture Efficiency	Control Efficiency
Particulate Matter	99%	30%

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.).
40,000 acfm or air from the plenums to the drop out box and the liquid pressure to drop out box is 7-60 psig. The liquid flow rate has a design maximum of 680 gal/min, however the average expected flow rate is 350 gal/min. The pressure drop through the drop out box is 3-13 inches of water.

Is this device subject to the CAM requirements of 40 C.F.R. 64? ___ Yes _**X**_ No

If Yes, **Complete ATTACHMENT H**

If No**, Provide justification.**

1. Facility is subject to MACT under the NESHAP 40CFR Parts 61 & 63 CAM APPLICABILITY DETERMINATION (1.b. bullet 1)

2. Emission Limitations or Standards for which a WVDEP Division of Air Quality Title V permit specifies a continuous compliance determination method, as defined in 40 CFR Section 64.1 CAM APPLICABILITY DETERMINATION (1.b. bullet 4)

Describe the parameters monitored and/or methods used to indicate performance of this control device.
The pressure drop across the scrubber in inches water and the liquid flow rate in GPM are recorded to indicate performance.

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number: CD14A	**List all emission units associated with this control device.** ES14A (3 Zone Curing Oven For 1st Line), ES14B (Cooling Table for 1st Line)	
Manufacturer: United McGill Corp.	**Model number:** 2-151C306	**Installation date:** 07/25/1998

Type of Air Pollution Control Device:

_ _ Baghouse/Fabric Filter	___ Venturi Scrubber	___ Multiclone
___ Carbon Bed Adsorber	___ Packed Tower Scrubber	___ Single Cyclone
___ Carbon Drum(s)	___ Other Wet Scrubber	___ Cyclone Bank
___ Catalytic Incinerator	___ Condenser	___ Settling Chamber
_X_ Thermal Incinerator	___ Flare	___ Other (describe) _____
___ Wet Plate Electrostatic Precipitator		___ Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutant	Capture Efficiency	Control Efficiency
VOC	99%	95%
Phenol	99%	94%
Formaldehyde	99%	94%
Ammonia	99%	91%
Carbon Monoxide	99%	53%
Methanol	99%	94%

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.).
2.628 $MMft^3/hr$ @ 250.0^oF with a minimum operating temperature set by stack testing. There are 4 poppet type dampers and 2 Maxon burners controlled by a PLC system with temperature indicator. The RTO also has an auto shutoff for flow, flame loss or over temperature.

Is this device subject to the CAM requirements of 40 C.F.R. 64? ___ Yes _**X**_ No

If Yes, **Complete ATTACHMENT H**

If No**, Provide justification.** 1. Facility is subject to MACT under the NESHAP 40CFR Parts 61 & 63 CAM APPLICABILITY DETERMINATION (1.b. bullet 1)

2. Emission Limitations or Standards for which a WVDEP Division of Air Quality Title V permit specifies a continuous compliance determination method, as defined in 40 CFR Section 64.1 CAM APPLICABILITY DETERMINATION (1.b. bullet 4)

Describe the parameters monitored and/or methods used to indicate performance of this control device.

A 3 Hour Average Combustion Chamber Temperature is recorded.

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number: CD15A	**List all emission units associated with this control device.** ES15B (Slitter Saw; ES 15C (Edge Trimmer & Dicers); ES15D (Choppers); ES15E (Roll Up); ES15F (Batt Folder);ES15G (Batt Packers); ES15H (Dicers) & ES15I (Blowing Wool Bagger)	
Manufacturer: Quentin Keeney	**Model number:** 35-W-C	**Installation date:** 07/25/1998

Type of Air Pollution Control Device:

___ Baghouse/Fabric Filter	___ Venturi Scrubber	___ Multiclone
___ Carbon Bed Adsorber	___ Packed Tower Scrubber	___ Single Cyclone
___ Carbon Drum(s)	___ Other Wet Scrubber	___ Cyclone Bank
___ Catalytic Incinerator	___ Condenser	___ Settling Chamber
___ Thermal Incinerator	___ Flare	_**X**_ Other (describe) _ Wet Collection System (Dynamic Separator)
___ Wet Plate Electrostatic Precipitator		___ Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutant	Capture Efficiency	Control Efficiency
Particulate Matter	80%	90%

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.).

The air tumbler is a dynamic wet dust collector. Its action depends on the energy of the air flowing through it and the use of water to trap the particulate matter.

Is this device subject to the CAM requirements of 40 C.F.R. 64? ____ Yes _**X**_ No

If Yes, **Complete ATTACHMENT H**

If No**, Provide justification.** The control device is a fugitive emission point and does not discharge to the atmosphere as the unit is enclosed.

Describe the parameters monitored and/or methods used to indicate performance of this control device.

NA

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number: CD15C	**List all emission units associated with this control device.** ES15H (Dicers) & ES15I (Blowing Wool Bagger)	
Manufacturer: OMNI S.P.A	**Model number:** ARP 2400	**Installation date:** 2006

Type of Air Pollution Control Device:

___ Baghouse/Fabric Filter	___ Venturi Scrubber	___ Multiclone
___ Carbon Bed Adsorber	___ Packed Tower Scrubber	__X_ Single Cyclone
___ Carbon Drum(s)	___ Other Wet Scrubber	___ Cyclone Bank
___ Catalytic Incinerator	_X__ Condenser	___ Settling Chamber
___ Thermal Incinerator	___ Flare	_ _ Other (describe)
___ Wet Plate Electrostatic Precipitator		___ Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutant	Capture Efficiency	Control Efficiency
Particulate Matter	80%	90%

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.).

The unit separates out any airborne fiberglass particles and send the collected material to the screen room.

Is this device subject to the CAM requirements of 40 C.F.R. 64? ____ Yes _**X**_ No

If Yes, **Complete ATTACHMENT H**

If No**, Provide justification.** The control device is a fugitive emission point and does not discharge to the atmosphere as the unit is enclosed.

Describe the parameters monitored and/or methods used to indicate performance of this control device.

NA

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number: CD15D	**List all emission units associated with this control device.** ES15H (Dicers) & ES15I (Blowing Wool Bagger)	
Manufacturer: Guardian Fiberglass	**Model number:** NA	**Installation date:** 2007/2012

Type of Air Pollution Control Device:

___ Baghouse/Fabric Filter	___ Venturi Scrubber	___ Multiclone
___ Carbon Bed Adsorber	___ Packed Tower Scrubber	___ Single Cyclone
___ Carbon Drum(s)	___ Other Wet Scrubber	___ Cyclone Bank
___ Catalytic Incinerator	___ Condenser	___ Settling Chamber
___ Thermal Incinerator	___ Flare	_**X**_ Other (describe) _ Screen Room
___ Wet Plate Electrostatic Precipitator		___ Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutant	Capture Efficiency	Control Efficiency
Particulate Matter	95%	90%

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.).

The screen room is a woven polyester capture device.

Is this device subject to the CAM requirements of 40 C.F.R. 64? ____ Yes _**X**_ No

If Yes, **Complete ATTACHMENT H**

If No**, Provide justification.** The control device is a fugitive emission point and does not discharge to the atmosphere as the unit is enclosed.

Describe the parameters monitored and/or methods used to indicate performance of this control device.

NA

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number:	**List all emission units associated with this control device.**	
CD1A For ES1A; CD1B For ES1B & ES1C; CD1D For ES1D & ES1E; CD1F For ES1F & ES1J; CD1G For ES1G; & CD1I For ES1H & ES1I	ES1A (Sand); ES1B & ES1C (Borax); ES1D & ES1E (Soda Ash); ES1f (Aplite) & ES1J (Guardian Cullet); ES1G (Lime) & ES1H & ES1I (Purchased Cullet)	
Manufacturer: Whirl-Air Flow Bin Vent	**Model number:** Bin Vent DC 195-42	**Installation date:** 07/25/1998

Type of Air Pollution Control Device:

_X_ Baghouse/Fabric Filter ___ Venturi Scrubber ___ Multiclone

___ Carbon Bed Adsorber ___ Packed Tower Scrubber ___ Single Cyclone

___ Carbon Drum(s) ___ Other Wet Scrubber ___ Cyclone Bank

___ Catalytic Incinerator ___ Condenser ___ Settling Chamber

___ Thermal Incinerator ___ Flare ___ Other (describe) _____

___ Wet Plate Electrostatic Precipitator ___ Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutant	Capture Efficiency	Control Efficiency
Particulate Matter	99%	99%

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.). Control device utilizes 195 square feet of filter cloth media with an air to cloth ratio of 3:1 for an acfm of 585.

Is this device subject to the CAM requirements of 40 C.F.R. 64? ___ Yes _**X**_ No

If Yes, **Complete ATTACHMENT H**

If No**, Provide justification.** The control device is a fugitive emission point and does not discharge to the atmosphere as the unit is enclosed.

Describe the parameters monitored and/or methods used to indicate performance of this control device.

NA

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number: CD1K	**List all emission units associated with this control device.** ES1K (Baghouse Dust)	
Manufacturer: Whirl-Air Flow	**Model number:** Bin Vent DC Model 55-30	**Installation date:** 07/25/1998

Type of Air Pollution Control Device:

_X_ Baghouse/Fabric Filter	___ Venturi Scrubber	___ Multiclone
___ Carbon Bed Adsorber	___ Packed Tower Scrubber	___ Single Cyclone
___ Carbon Drum(s)	___ Other Wet Scrubber	___ Cyclone Bank
___ Catalytic Incinerator	___ Condenser	___ Settling Chamber
___ Thermal Incinerator	___ Flare	___ Other (describe) _____
___ Wet Plate Electrostatic Precipitator		___ Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutant	Capture Efficiency	Control Efficiency
Particulate Matter	99%	99%

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.). Control device utilizes 55 square feet of filter cloth media with an air to cloth ratio of 3:1 for an acfm of 165.

Is this device subject to the CAM requirements of 40 C.F.R. 64? ___ Yes _**X**_ No

If Yes, **Complete ATTACHMENT H**

If No**, Provide justification.** The control device is a fugitive emission point and does not discharge to the atmosphere as the unit is enclosed.

Describe the parameters monitored and/or methods used to indicate performance of this control device.
NA

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number: CD22A	**List all emission units associated with this control device.** ES22A (Batch Mixer Receiving Bin For 2nd Line)	
Manufacturer: IAC	**Model number:** Bin Vent Model 96TB-FRIP	**Installation date:** 2004

Type of Air Pollution Control Device:

_X_ Baghouse/Fabric Filter	___ Venturi Scrubber	___ Multiclone
___ Carbon Bed Adsorber	___ Packed Tower Scrubber	___ Single Cyclone
___ Carbon Drum(s)	___ Other Wet Scrubber	___ Cyclone Bank
___ Catalytic Incinerator	___ Condenser	___ Settling Chamber
___ Thermal Incinerator	___ Flare	___ Other (describe) _____
___ Wet Plate Electrostatic Precipitator		___ Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutant	Capture Efficiency	Control Efficiency
Particulate Matter	99%	99%

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.). Control device utilizes 623 square feet of filter cloth media with an air to cloth ratio of 4.6 for an acfm of 2,917.

Is this device subject to the CAM requirements of 40 C.F.R. 64? ___ Yes _**X**_ No

If Yes, **Complete ATTACHMENT H**

If No**, Provide justification.** The control device is a fugitive emission point and does not discharge to the atmosphere as the unit is enclosed.

Describe the parameters monitored and/or methods used to indicate performance of this control device.

NA

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number: CD22B (Duty Cycled With CD22Bb)	**List all emission units associated with this control device.** ES22C (Melter Hood for 2nd Line)	
Manufacturer: MAC Equipment Co.	**Model number:** MactFlo 4MTF96	**Installation date:** 2004

Type of Air Pollution Control Device:

_X_ Baghouse/Fabric Filter	___ Venturi Scrubber	___ Multiclone
___ Carbon Bed Adsorber	___ Packed Tower Scrubber	___ Single Cyclone
___ Carbon Drum(s)	___ Other Wet Scrubber	___ Cyclone Bank
___ Catalytic Incinerator	___ Condenser	___ Settling Chamber
___ Thermal Incinerator	___ Flare	___ Other (describe) _____
___ Wet Plate Electrostatic Precipitator		___ Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutant	Capture Efficiency	Control Efficiency
Particulate Matter (TSP)	99%	99%
Chromium	99%	99%

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.).

1. 15,000 acfm
2. Closed Pressure Configuration
3. 96 Polyester Cartridge Filters
4. 10,560 ft^2 of filter area
5. Cartridges Cleaned By Pulse Air

Is this device subject to the CAM requirements of 40 C.F.R. 64? ___ Yes _**X**_ No

If Yes, **Complete ATTACHMENT H**

If No**, Provide justification.**

1. Facility is subject to MACT under the NESHAP 40CFR Parts 61 & 63 CAM APPLICABILITY DETERMINATION (1.b. bullet 1)

2. Emission Limitations or Standards for which a WVDEP Division of Air Quality Title V permit specifies a continuous compliance determination method, as defined in 40 CFR Section 64.1 CAM APPLICABILITY DETERMINATION (1.b. bullet 4)

Describe the parameters monitored and/or methods used to indicate performance of this control device.
Differential Pressure, Incoming air temperature and Discharge Air pico Amps are all monitored. A bag leak detection system is installed and monitored accordingly.

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number: CD22Bb (Duty Cycled With CD22B)	**List all emission units associated with this control device.** ES22C (Melter Hood For 2nd Line)	
Manufacturer: MAC Equipment Co.	**Model number:** MactFlo 4MTF96	**Installation date:** 2004

Type of Air Pollution Control Device:

_X_ Baghouse/Fabric Filter	___ Venturi Scrubber	___ Multiclone
___ Carbon Bed Adsorber	___ Packed Tower Scrubber	___ Single Cyclone
___ Carbon Drum(s)	___ Other Wet Scrubber	___ Cyclone Bank
___ Catalytic Incinerator	___ Condenser	___ Settling Chamber
___ Thermal Incinerator	___ Flare	___ Other (describe) _____
___ Wet Plate Electrostatic Precipitator		___ Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutant	Capture Efficiency	Control Efficiency
Particulate Matter (TSP)	99%	99%
Chromium	99%	99%

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.).

1. 15,000 acfm
2. Closed Pressure Configuration
3. 96 Polyester Cartridge Filters
4. 10,560 ft^2 of filter area
5. Cartridges Cleaned By Pulse Air

Is this device subject to the CAM requirements of 40 C.F.R. 64? ___ Yes _**X**_ No

If Yes, **Complete ATTACHMENT H**

If No**, Provide justification.**

1. Facility is subject to MACT under the NESHAP 40CFR Parts 61 & 63 CAM APPLICABILITY DETERMINATION (1.b. bullet 1)

2. Emission Limitations or Standards for which a WVDEP Division of Air Quality Title V permit specifies a continuous compliance determination method, as defined in 40 CFR Section 64.1 CAM APPLICABILITY DETERMINATION (1.b. bullet 4)

Describe the parameters monitored and/or methods used to indicate performance of this control device.
Differential Pressure, Incoming air temperature and Discharge Air pico Amps are all monitored. A bag leak detection system is installed and monitored accordingly.

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number: CD22C	**List all emission units associated with this control device.** ES22B (Mixed Batch Storage Day Bin For 2nd Line [1 Hour]); ES22Bb (Mixed Batch Storage Backup Day Bin for 2nd Line [8 hour])	
Manufacturer: IAC	**Model number:** Bin Vent Model 96TB-FRIP	**Installation date:** 2004

Type of Air Pollution Control Device:

_X_ Baghouse/Fabric Filter	___ Venturi Scrubber	___ Multiclone
___ Carbon Bed Adsorber	___ Packed Tower Scrubber	___ Single Cyclone
___ Carbon Drum(s)	___ Other Wet Scrubber	___ Cyclone Bank
___ Catalytic Incinerator	___ Condenser	___ Settling Chamber
___ Thermal Incinerator	___ Flare	___ Other (describe) _____
___ Wet Plate Electrostatic Precipitator		___ Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutant	Capture Efficiency	Control Efficiency
Particulate Matter	99%	99%

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.). Control device utilizes 623 square feet of filter cloth media with an air to cloth ratio of 4.6 for an acfm of 2,917.

Is this device subject to the CAM requirements of 40 C.F.R. 64? ___ Yes _**X**_ No

If Yes, **Complete ATTACHMENT H**

If No**, Provide justification.** The control device is a fugitive emission point and does not discharge to the atmosphere as the unit is enclosed.

Describe the parameters monitored and/or methods used to indicate performance of this control device.

NA

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number: CD23A (East Side)	**List all emission units associated with this control device.** ES22E (Forehearth For 2nd Line); ES23A (Fiber Forming Units); ES23B (Vacuum Chamber) & ES23C (Collection Plenum)	
Manufacturer: Fisher-Klosterman, Inc.	**Model number:** MS-850H	**Installation date:** 2004

Type of Air Pollution Control Device:

__ _ Baghouse/Fabric Filter	_X_ Venturi Scrubber	___ Multiclone
___ Carbon Bed Adsorber	___ Packed Tower Scrubber	___ Single Cyclone
___ Carbon Drum(s)	___ Other Wet Scrubber	___ Cyclone Bank
___ Catalytic Incinerator	___ Condenser	___ Settling Chamber
___ Thermal Incinerator	___ Flare	___ Other (describe) _____
___ Wet Plate Electrostatic Precipitator		___ Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutant	Capture Efficiency	Control Efficiency
Particulate Matter	99%	58%

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.). 40,000 acfm of air is directed from the plenums to the scrubber by a 350 hp fan. The liquid pressure is 30-70 psig and the pressure drop is 5-15 in H_2O. The liquid flow rate has a design maximum of 600 gal/min, however the average expected flow rate is 175-600 gal/min.

Is this device subject to the CAM requirements of 40 C.F.R. 64? ___ Yes _**X**_ No

If Yes, **Complete ATTACHMENT H**

If No**, Provide justification.**

1. Facility is subject to MACT under the NESHAP 40CFR Parts 61 & 63 CAM APPLICABILITY DETERMINATION (1.b. bullet 1)

2. Emission Limitations or Standards for which a WVDEP Division of Air Quality Title V permit specifies a continuous compliance determination method, as defined in 40 CFR Section 64.1 CAM APPLICABILITY DETERMINATION (1.b. bullet 4)

Describe the parameters monitored and/or methods used to indicate performance of this control device. The differential pressure in inches H_2O and the liquid flow rate in GPM are recorded to indicate performance.

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number: CD23B (West Side)	**List all emission units associated with this control device.** ES22E (Forehearth For 2nd Line); ES23A (Fiber Forming Units); ES23B (Vacuum Chamber) & ES23C (Collection Plenum)	
Manufacturer: Fisher-Klosterman, Inc.	**Model number:** MS-850H	**Installation date:** 2004

Type of Air Pollution Control Device:

__ _ Baghouse/Fabric Filter	_X_ Venturi Scrubber	___ Multiclone
___ Carbon Bed Adsorber	___ Packed Tower Scrubber	___ Single Cyclone
___ Carbon Drum(s)	___ Other Wet Scrubber	___ Cyclone Bank
___ Catalytic Incinerator	___ Condenser	___ Settling Chamber
___ Thermal Incinerator	___ Flare	___ Other (describe) _____
___ Wet Plate Electrostatic Precipitator		___ Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutant	Capture Efficiency	Control Efficiency
Particulate Matter	99%	58%

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.). 40,000 acfm of air is directed from the plenums to the scrubber by a 350 hp fan. The liquid pressure is 30-70 psig and the pressure drop is 5-15 in H_2O. The liquid flow rate has a design maximum of 600 gal/min, however the average expected flow rate range is 175-600 gal/min.

Is this device subject to the CAM requirements of 40 C.F.R. 64? ___ Yes _**X**_ No

If Yes, **Complete ATTACHMENT H**

If No**, Provide justification.**

1. Facility is subject to MACT under the NESHAP 40CFR Parts 61 & 63 CAM APPLICABILITY DETERMINATION (1.b. bullet 1)

2. Emission Limitations or Standards for which a WVDEP Division of Air Quality Title V permit specifies a continuous compliance determination method, as defined in 40 CFR Section 64.1 CAM APPLICABILITY DETERMINATION (1.b. bullet 4)

Describe the parameters monitored and/or methods used to indicate performance of this control device. The differential pressure in inches H_2O and the liquid flow rate in GPM are recorded to indicate performance.

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number: CD23C (Non-resinated)	**List all emission units associated with this control device.** ES22E (Forehearth For 2nd Line); ES23A (Fiber Forming Units); ES23B (Vacuum Chamber) & ES23C (Collection Plenum)	
Manufacturer: Fisher-Klosterman, Inc.	**Model number:** MS-650H	**Installation date:** 2004

Type of Air Pollution Control Device:

__ _ Baghouse/Fabric Filter	_X_ Venturi Scrubber	___ Multiclone
___ Carbon Bed Adsorber	___ Packed Tower Scrubber	___ Single Cyclone
___ Carbon Drum(s)	___ Other Wet Scrubber	___ Cyclone Bank
___ Catalytic Incinerator	___ Condenser	___ Settling Chamber
___ Thermal Incinerator	___ Flare	___ Other (describe) _____
___ Wet Plate Electrostatic Precipitator		___ Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutant	Capture Efficiency	Control Efficiency
Particulate Matter	99%	58%

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.). 40,000 acfm of air is directed from the plenums to the scrubber by a 350 hp fan. The liquid pressure is 30-70 psig and the pressure drop is 4-15 in H_2O. The liquid flow rate has a design maximum of 300 gal/min, however the expected flow rate range is 70-300 gal/min.

Is this device subject to the CAM requirements of 40 C.F.R. 64? ___ Yes _**X**_ No

If Yes, **Complete ATTACHMENT H**

If No**, Provide justification.**

1. Facility is subject to MACT under the NESHAP 40CFR Parts 61 & 63 CAM APPLICABILITY DETERMINATION (1.b. bullet 1)

2. Emission Limitations or Standards for which a WVDEP Division of Air Quality Title V permit specifies a continuous compliance determination method, as defined in 40 CFR Section 64.1 CAM APPLICABILITY DETERMINATION (1.b. bullet 4)

Describe the parameters monitored and/or methods used to indicate performance of this control device. The differential pressure in inches H_2O and the liquid flow rate in GPM are recorded to indicate performance.

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number: CD24A	**List all emission units associated with this control device.** ES24A (3 Zone Curing Oven For 2nd Line)	
Manufacturer: McGill AirClean	**Model number:** MCT 30.0	**Installation date:** 2004

Type of Air Pollution Control Device:

__ Baghouse/Fabric Filter	___ Venturi Scrubber	___ Multiclone
___ Carbon Bed Adsorber	___ Packed Tower Scrubber	___ Single Cyclone
___ Carbon Drum(s)	___ Other Wet Scrubber	___ Cyclone Bank
___ Catalytic Incinerator	___ Condenser	___ Settling Chamber
_X_ Thermal Incinerator	___ Flare	___ Other (describe) _____
___ Wet Plate Electrostatic Precipitator		___ Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutant	Capture Efficiency	Control Efficiency
VOC	99%	95%
Carbon Monoxide	99%	53%
Formaldehyde	99%	94%
Methanol	99%	94%
Phenol	99%	94%

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.).
1.785 $MMft^3/hr$ @ 250.0°F. There are 4 poppet type dampers and 1 Maxon Kinedizer burner that is PLC controlled with temperature indicator. The RTO has an auto-shutoff feature for flow, flame loss or over temperature.

Is this device subject to the CAM requirements of 40 C.F.R. 64? ___ Yes _**X**_ No

If Yes, **Complete ATTACHMENT H**

If No**, Provide justification.**

1. Facility is subject to MACT under the NESHAP 40CFR Parts 61 & 63 CAM APPLICABILITY DETERMINATION (1.b. bullet 1)

2. Emission Limitations or Standards for which a WVDEP Division of Air Quality Title V permit specifies a continuous compliance determination method, as defined in 40 CFR Section 64.1 CAM APPLICABILITY DETERMINATION (1.b. bullet 4)

Describe the parameters monitored and/or methods used to indicate performance of this control device.
A 3 Hour Average Combustion Chamber Temperature is recorded.

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number: CD24B	**List all emission units associated with this control device.** ES24B (Cooling Table For 2nd Line)	
Manufacturer: Fisher-Klosterman, Inc.	**Model number:** MS-650H	**Installation date:** 2004

Type of Air Pollution Control Device:

___ Baghouse/Fabric Filter	_X_ Venturi Scrubber	___ Multiclone
___ Carbon Bed Adsorber	___ Packed Tower Scrubber	___ Single Cyclone
___ Carbon Drum(s)	___ Other Wet Scrubber	___ Cyclone Bank
___ Catalytic Incinerator	___ Condenser	___ Settling Chamber
___ Thermal Incinerator	___ Flare	___ Other (describe) _____
___ Wet Plate Electrostatic Precipitator		___ Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutant	Capture Efficiency	Control Efficiency
Particulate Matter	99%	77%

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.).
20,000 cfm airflow from the plenums to the drop out box, the liquid pressure to drop out box is 30-70 psig and the pressure drop is 4-15 in H_2O. The liquid flow rate has a design maximum of 300 gal/min, however the expected flow rate range is 70-300 gal/min.

Is this device subject to the CAM requirements of 40 C.F.R. 64? ___ Yes _**X**_ No

If Yes, **Complete ATTACHMENT H**

If No**, Provide justification.**

1. Facility is subject to MACT under the NESHAP 40CFR Parts 61 & 63 CAM APPLICABILITY DETERMINATION (1.b. bullet 1)

2. Emission Limitations or Standards for which a WVDEP Division of Air Quality Title V permit specifies a continuous compliance determination method, as defined in 40 CFR Section 64.1 CAM APPLICABILITY DETERMINATION (1.b. bullet 4)

Describe the parameters monitored and/or methods used to indicate performance of this control device.
The liquid pressure and differential pressure are monitored to indicate performance.

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number: CD25A	**List all emission units associated with this control device.** ES25B (Slitter Saw; ES25C (Edge Trimmer & Dicers); ES25D (Choppers); ES25F (Batt Folder);ES25G (Batt Packers); ES25H (Dicers or Cubers); ES25I (Blowing Wool Bagger) & ES25J (Dicers	
Manufacturer: Fisher-Klosterman, Inc.	**Model number:** MS-650H	**Installation date:** 2004

Type of Air Pollution Control Device:

___ Baghouse/Fabric Filter	_X_ Venturi Scrubber	___ Multiclone
___ Carbon Bed Adsorber	___ Packed Tower Scrubber	___ Single Cyclone
___ Carbon Drum(s)	___ Other Wet Scrubber	___ Cyclone Bank
___ Catalytic Incinerator	___ Condenser	___ Settling Chamber
___ Thermal Incinerator	___ Flare	___ Other (describe) _____
___ Wet Plate Electrostatic Precipitator		___ Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutant	Capture Efficiency	Control Efficiency
Particulate Matter	99%	58%

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.).
20,000 cfm air flow from the plenums to the drop out box and the liquid pressure to drop out box is 30-70 psig and the pressure drop is 4-15 inches water. The liquid flow rate has a design maximum of 300 gal/min, however the expected flow rate range is 70-300 gal/min.

Is this device subject to the CAM requirements of 40 C.F.R. 64? ___ Yes _**X**_ No

If Yes, **Complete ATTACHMENT H**

If No**, Provide justification** The control device is a fugitive emission point and does not discharge to the atmosphere as the unit discharges to the ambient plant air.

Describe the parameters monitored and/or methods used to indicate performance of this control device.

NA

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number: CD25C	**List all emission units associated with this control device.** ES25H (Dicers) & ES25I (Blowing Wool Bagger)	
Manufacturer: Van Dommele	**Model number:**	**Installation date:** 2004

Type of Air Pollution Control Device:

___ Baghouse/Fabric Filter	___ Venturi Scrubber	___ Multiclone
___ Carbon Bed Adsorber	___ Packed Tower Scrubber	__X_ Single Cyclone
___ Carbon Drum(s)	___ Other Wet Scrubber	___ Cyclone Bank
___ Catalytic Incinerator	_X__ Condenser	___ Settling Chamber
___ Thermal Incinerator	___ Flare	_ _ Other (describe)
___ Wet Plate Electrostatic Precipitator		___ Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutant	Capture Efficiency	Control Efficiency
Particulate Matter	80%	90%

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.).

The unit separates out any airborne fiberglass particles and send the collected material to the screen room.

Is this device subject to the CAM requirements of 40 C.F.R. 64? ____ Yes _**X**_ No

If Yes, **Complete ATTACHMENT H**

If No**, Provide justification.** The control device is a fugitive emission point and does not discharge to the atmosphere as the unit is enclosed.

Describe the parameters monitored and/or methods used to indicate performance of this control device.

NA

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number: CD25D	**List all emission units associated with this control device.** ES25H (Dicers) & ES25I (Blowing Wool Bagger)	
Manufacturer: Guardian Fiberglass	**Model number:** NA	**Installation date:** 2007/2012

Type of Air Pollution Control Device:

___ Baghouse/Fabric Filter	___ Venturi Scrubber	___ Multiclone
___ Carbon Bed Adsorber	___ Packed Tower Scrubber	___ Single Cyclone
___ Carbon Drum(s)	___ Other Wet Scrubber	___ Cyclone Bank
___ Catalytic Incinerator	___ Condenser	___ Settling Chamber
___ Thermal Incinerator	___ Flare	_**X**_ Other (describe) _ Screen Room
___ Wet Plate Electrostatic Precipitator		___ Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutant	Capture Efficiency	Control Efficiency
Particulate Matter	95%	90%

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.).

The screen room is a woven polyester capture device.

Is this device subject to the CAM requirements of 40 C.F.R. 64? ____ Yes _**X**_ No

If Yes, **Complete ATTACHMENT H**

If No**, Provide justification.** The control device is a fugitive emission point and does not discharge to the atmosphere as the unit is enclosed.

Describe the parameters monitored and/or methods used to indicate performance of this control device.

NA

APPENDIX H: COMPLIANCE ASSURANCE MONITORING PLAN

This section is not applicable

APPENDIX I: SITE-WIDE EMISSION CALCULATIONS

Emission Unit Summary

Line 1
Emissions Summary by Source
Operating As Resinated Line

ID No. of Emission. Point	Pollutant Name	Resinated Emissions lb/hr	Resinated Emissions TpY
FP11 Raw Materials Handling	PM	0.17	0.77
	PM_{10}	0.17	0.77
	$PM_{2.5}$	0.17	0.77
FP11 Raw Material Storage	Formaldehyde	0.00	0.00
	Phenol	0.00	0.00
	Methanol	0.00	0.00
	VOC	0.00	0.01
FP12 Binder Mix	Formaldehyde	0.00	0.01
	Phenol	0.00	0.00
	Methanol	0.06	0.26
	VOC	0.72	3.17
EP12 Melting & Refining Baghouse Stack	PM	0.54	2.38
	PM_{10}	0.54	2.38
	$PM_{2.5}$	0.54	2.38
	Lead	0.00	0.00
	Chrome	0.00	0.00
	SO_2	0.00	0.00
	NO_X	0.12	0.53
	CO	2.92	12.79
	VOC	0.88	3.85
EP13 Forming & Collection Drop out Boxes & Water Spray	PM	14.84	65.00
	PM_{10}	14.84	65.00
	$PM_{2.5}$	14.84	65.00
	Lead	0.00	0.00
	Chrome	0.00	0.01
	SO_2	0.00	0.02
	NO_X	1.28	5.61
	CO	21.12	92.51
	VOC	10.48	45.90
	Formic Acid	1.39	6.10
	Phenol	5.00	21.90
	Formaldehyde	2.52	11.04
	Methanol	9.12	39.95
	Ammonia	15.08	66.05
EP14 Curing & Cooling Stack RTO	PM	2.16	9.46
	PM_{10}	2.16	9.46
	$PM_{2.5}$	2.16	9.46
	SO_2	0.00	0.00
	Lead	0.00	0.00
	NO_X	15.00	65.70
	CO	4.52	19.80
	VOC	0.96	4.20
	Formic Acid	0.16	0.70
	Phenol	1.20	5.26
	Formaldehyde	0.68	2.98
	Methanol	0.23	1.03
	Ammonia	3.48	15.24
FP13 Facing Paper	PM	0.02	0.09
	PM_{10}	0.02	0.09
	$PM_{2.5}$	0.02	0.09
	VOC	0.23	1.02
FP14 Ink Printing	VOC	0.62	2.73
FP15 Adhesive VOC's	VOC	0.36	1.59
FP16 Particulate Dust Control	PM	0.09	0.40
	PM_{10}	0.09	0.40
	$PM_{2.5}$	0.09	0.40

Line 2
Emissions Summary by Source
Operating As A Resinated Line

ID No. of Emission. Point	Pollutant Name	Resinated Emissions lb/hr	Resinated Emissions TpY
FP11 Raw Materials Handling	PM	0.17	0.77
	PM_{10}	0.17	0.77
	$PM_{2.5}$	0.17	0.77
FP11 Raw Material Storage	Formaldehyde	0.00	0.00
	Phenol	0.00	0.00
	Methanol	0.00	0.00
	VOC	0.00	0.01
FP12 Binder Mix	Formaldehyde	0.00	0.01
	Phenol	0.00	0.00
	Methanol	0.06	0.26
	VOC	0.72	3.17
EP22 Melting & Refining Baghouse Stack	PM	0.54	2.38
	PM_{10}	0.54	2.38
	$PM_{2.5}$	0.54	2.38
	Lead	0.00	0.00
	Chrome	0.00	0.00
	SO_2	0.00	0.00
	NO_X	0.12	0.53
	CO	2.92	12.79
	VOC	0.88	3.85
EP23 Forming & Collection Scrubber(s)	PM	13.96	61.14
	PM_{10}	13.96	61.14
	$PM_{2.5}$	13.96	61.14
	Lead	0.00	0.00
	Chrome	0.00	0.01
	SO_2	0.00	0.02
	NO_X	1.28	5.61
	CO	21.12	92.51
	VOC	10.48	45.90
	Formic Acid	1.39	6.10
	Phenol	5.00	21.90
	Formaldehyde	2.52	11.04
	Methanol	9.12	39.95
	Ammonia	15.08	66.05
EP24 Curing & Cooling Stack RTO	PM	4.04	17.70
	PM_{10}	4.04	17.70
	$PM_{2.5}$	4.04	17.70
	SO_2	0.00	0.00
	Lead	0.00	0.00
	NO_X	15.00	65.70
	CO	5.24	22.95
	VOC	0.96	4.20
	Formic Acid	0.16	0.70
	Phenol	1.20	5.26
	Formaldehyde	0.68	2.98
	Methanol	0.23	1.03
	Ammonia	3.48	15.24
FP13 Facing Paper	PM	0.02	0.09
	PM_{10}	0.02	0.09
	$PM_{2.5}$	0.02	0.09
	VOC	0.23	1.02
FP14 Ink Printing	VOC	0.62	2.73
FP15 Adhesive VOC's	VOC	0.36	1.59
FP16 Particulate Dust Control	PM	0.09	0.40
	PM_{10}	0.09	0.40
	$PM_{2.5}$	0.09	0.40

Line 2
Emissions Summary by Source
Operating As A Non-Resinated

ID No. of Emission. Point	Pollutant Name	Non-resinated Emissions lb/hr	Non-resinated Emissions TpY
FP11 Raw Materials Handling	PM	0.17	0.77
	PM_{10}	0.17	0.77
	$PM_{2.5}$	0.17	0.77
EP22 Melting & Refining Baghouse Stack	PM	0.54	2.38
	PM_{10}	0.54	2.38
	$PM_{2.5}$	0.54	2.38
	Lead	0.00	0.00
	Chrome	0.00	0.00
	SO_2	0.00	0.00
	NO_X	0.12	0.53
	CO	2.92	12.79
	VOC	0.88	3.85
EP23 Forming & Collection Scrubber(s)	PM	13.96	61.14
	PM_{10}	13.96	61.14
	$PM_{2.5}$	13.96	61.14
	Lead	0.00	0.00
	Chrome	0.00	0.01
	SO_2	0.00	0.02
	NO_X	1.28	5.61
	CO	21.12	92.51
	VOC	10.48	45.90
FP17 Dedust/ Silicone	VOC	1.19	5.22
FP18 Ink Printing	VOC	0.06	0.26
FP19 Particulate Dust Control	PM	0.11	0.49
	PM_{10}	0.11	0.49
	$PM_{2.5}$	0.11	0.49

Line 1 & 2 Emisions Total
Emissions Summary by Source
Operating As Resinated Lines

ID No. of Emission. Point	Pollutant Name	Resinated Emissions lb/hr	Resinated Emissions TpY
FP11 Raw Materials Handling	PM	0.35	1.53
	PM_{10}	0.35	1.53
	$PM_{2.5}$	0.35	1.53
FP11 Raw Material Storage	Formaldehyde	0.00	0.01
	Phenol	0.00	0.00
	Methanol	0.00	0.01
	VOC	0.00	0.02
FP11 Binder Mix	Formaldehyde	0.00	0.02
	Phenol	0.00	0.00
	Methanol	0.12	0.52
	VOC	1.45	6.34
EP12 & EP22 Melting & Refining Baghouse Stack	PM	1.09	4.77
	PM_{10}	1.09	4.77
	$PM_{2.5}$	1.09	4.77
	Lead	0.00	0.00
	Chrome	0.00	0.00
	SO_2	0.00	0.00
	NO_X	0.24	1.05
	CO	5.84	25.58
	VOC	1.76	7.71
EP13 & EP-23 Forming & Collection	PM	28.80	126.14
	PM_{10}	28.80	126.14
	$PM_{2.5}$	28.80	126.14
	Lead	0.00	0.00
	Chrome	0.01	0.03
	SO_2	0.01	0.04
	NO_X	2.56	11.21
	CO	42.24	185.01
	VOC	20.96	91.80
	Formic Acid	2.78	12.19
	Phenol	10.00	43.80
	Formaldehyde	5.04	22.08
	Methanol	18.24	79.89
	Ammonia	30.16	132.10
EP14 & EP-24 Curing & Cooling Stack RTO	PM	6.20	27.16
	PM_{10}	6.20	27.16
	$PM_{2.5}$	6.20	27.16
	SO_2	0.00	0.00
	Lead	0.00	0.00
	NO_X	30.00	131.40
	CO	9.76	42.75
	VOC	1.92	8.41
	Formic Acid	0.32	1.40
	Phenol	2.40	10.51
	Formaldehyde	1.36	5.96
	Methanol	0.47	2.05
	Ammonia	6.96	30.48
FP13 Facing Paper	PM	0.04	0.18
	PM_{10}	0.04	0.18
	$PM_{2.5}$	0.04	0.18
	VOC	0.47	2.04
FP14 Ink Printing	VOC	1.24	5.45
FP15 Adhesive VOC's	VOC	0.73	3.19
FP16 Particulate Dust Control	PM	0.18	0.79
	PM_{10}	0.18	0.79
	$PM_{2.5}$	0.18	0.79
EP16, 17 & 18 Internal Combustion Engines[a]	PM	1.27	0.32
	PM_{10}	1.27	0.32
	$PM_{2.5}$	1.27	0.32
	SO_2	0.95	0.24
	NO_X	28.55	7.14
	CO	6.60	1.65
	VOC	0.90	0.23
EP19,20, & 22 Heaters	PM	0.05	0.22
	PM_{10}	0.05	0.22
	$PM_{2.5}$	0.05	0.22
	SO_2	0.01	0.04
	NO_X	1.68	7.35
	CO	0.34	1.47
	VOC	0.09	0.40
	NH_3	0.30	1.32
Roads	PM	0.84	3.66
	PM_{10}	0.17	0.73
	$PM_{2.5}$	0.04	0.18
Cooling Towers	PM	0.10	0.42
	PM_{10}	0.10	0.42
	$PM_{2.5}$	0.10	0.42

Total emissions from Internal Combustion Engines (ICEs), Roads, and Cooling Towers are calculated facility-wide.

GHG Emission Factors - Natural Gas Combustion

Greenhouse Gas	Global Warming Potential[1]	Natural Gas Emission Factor [2] (lb/MMBtu)	Diesel Emission Factor [2] (lb CO2/gal)
CO_2	1	116.89	22.23
CH_4	21	2.2E-03	6.6E-03
N_2O	310	2.2E-04	1.3E-03

[1] Per 40 CFR Part 98 dated July 12, 2010, Table A-1 of Subpart A - *Global Warming Potentials (100-year time horizon)* ; used to convert emissions of each GHG to a CO_2 equivalent basis.

[2] Per 40 CFR Part 98 dated December 17, 2010, Table C-1 of Subpart C - *Default CO_2 Emission Factors and High Heat Values for Various Types of Fuel* and Table C-2 of Subpart C - *Default CH_4 and N_2O Emission Factors for Various Types of Fuel* .

GHG Emission Rates from Combustion

Source Name	Source ID	Heat Input		Maximum Annual Operation (hr/yr)	CO_2 Emissions[1] (lb/hr)	CO_2 Emissions[1] (tpy)	CH_4 Emissions[1] (lb/hr)	CH_4 Emissions[1] (tpy)	N_2O Emissions[1] (lb/hr)	N_2O Emissions[1] (tpy)	Total CO_2e Emissions (lbs/hr)	Total CO_2e Emissions (tpy)
Emer Gen	EP16	29.2	(Gal/hr)	500	649	162	0.193	0.05	0.039	0.01	665	166
Emer Gen	EP17	27.6	(Gal/hr)	500	614	153	0.183	0.05	0.037	0.01	629	157
Fire Pump	EP18	14	(Gal/hr)	500	311	78	0.093	0.02	0.019	0.00	319	80
Forehearth	EP12	6	(MMBtu/hr)	8,760	701	3,072	0.019	0.08	0.002	0.01	702	3,076
Forehearth	EP22	6	(MMBtu/hr)	8,760	701	3,072	0.019	0.08	0.002	0.01	702	3,076
Forming and Collecting	EP13	8.4	(MMBtu/hr)	8,760	982	4,301	0.019	0.08	0.002	0.01	983	4,305
Forming and Collecting	EP23	9.6	(MMBtu/hr)	8,760	1122	4,915	0.021	0.09	0.002	0.01	1,123	4,920
Curing and Cooling RTO	EP14	18	(MMBtu/hr)	8,760	2104	9,215	0.040	0.17	0.004	0.02	2,106	9,224
Curing and Cooling RTO	EP24	18	(MMBtu/hr)	8,761	2104	9,216	0.040	0.17	0.004	0.02	2,106	9,226
Makeup Air Units	EP21	8.525	(MMBtu/hr)	8,760	996	4,365	0.019	0.08	0.002	0.01	997	4,369
Makeup Air Units	EP22	7.875	(MMBtu/hr)	8,760	920	4,032	0.017	0.08	0.002	0.01	921	4,036
Binder water heaters	EP20	0.375	(MMBtu/hr)	8,760	44	192	0.001	0.00	0.000	0.00	44	192
									Total Sitewide Annual CO_2e (tpy)			**67,643**

GHG Emission Rates from Raw Material Processing

Raw Material Inputs		
Throughput	18,400	lbs/hr
	80,592	tpy
Limestone	5	lbs CO_2/ton melted[1]
	0.260	Fraction of total throughput that is limestone[2]
Soda Ash	830	lbs CO_2/ton melted[1]
	0.740	Fraction of total throughput that is soda ash[2]

[1] Emission factors supplied by raw materials supplier to Guardian as per 40 CFR 98 Subpart N.

[2] Fraction based on September 2008 EI data.

GHG PTE Melting Raw Materials	Raw Material (tons)	Potential CO_2 Emissions (lbs/yr)	Potential CO_2 Emissions (tpy)
Limestone	20,919	104,596	52.3
Soda Ash	59,673	49,528,429	24,764.2

Estimation of Emissions from Cooling Towers

	Recirc. Rate (gpm)	Recirc. Rate (gph)	Drift Loss[1]	TDS (ppm)	Calculated EF (lb/Mgal)	PM Emission Rate[2] (lb/hr)	PM Emission Rate[2] (tpy)	PM_{10} Emission Rate[2] (lb/hr)	PM_{10} Emission Rate[2] (tpy)	$PM_{2.5}$ Emission Rate[3] (lb/hr)	$PM_{2.5}$ Emission Rate[3] (tpy)
Cooling Tower #1	2,532	151,920	0.0050%	750	0.0003	0.048	0.208	0.048	0.208	0.048	0.208
Cooling Tower #2	2,532	151,920	0.0050%	750	0.0003	0.048	0.208	0.048	0.208	0.048	0.208

[1]http://www.surplus-used-equipment.com/media/4491/3000-iii_prodcat_ca1997.pdf

[2]Conservatively assumes that all dissolved solids lost from the cooling water (all PM) are emitted as PM_{10}, following AP-42 Chapter 13.4.1.

[3]Conservatively assumes that all dissolved solids lost from the cooling water (all PM) are emitted as $PM_{2.5}$.

Estimation of Emissions from Paved Roads

AP-42 13.2.1.3
E= [k(sL)^0.91 x (W)^1.02] x (1-P/4N)

			Reference
k (PM)	0.011	lb/VMT	Table 13.2-1.1
k (PM10)	0.0022	lb/VMT	Table 13.2-1.1
k (PM2.5)	0.00054	lb/VMT	Table 13.2-1.1
P	140	days	Figure 13.2.1-2
sL	7.4	g/m2	Table 13.2-1.3 Municipal Solid Waste Landfill
W	80,000	lbs	legal weight for an 18 wheeler (http://www.thetruckersreport.com/truck_facts.shtml)
W	40.00	tons	
N	365	days/yr	
E (PM)	2.65	lb/VMT	
E (PM10)	0.53	lb/VMT	
E (PM2.5)	0.13	lb/VMT	
VMT	2,000	ft/trip	
	20	trucks/day	
	2,765	miles/yr	

PM10		PM10		PM2.5	
lb/yr	tpy	lb/yr	tpy	lb/yr	tpy
7318.7	3.659	1463.7	0.732	359.3	0.180

Estimation of Emissions from Support Facility Operations

Diesel-fired Internal Combustion Engines for Emergency Electricity and Emergency Fire Water

Emissions occur from the combustion of diesel fuel in two internal combustion engines used for emergency electricity and one internal combustion engine used for emergency fire water. The emergency generators are Caterpillar, model #3406 & 3456 diesel engines with the following rated speed "Not to exceed emission data" in lbs/hr and estimated fuel usage:

	Model 3406 Electrical Generator EP16				Model 3456 Electrical Generator EP17			
% Load	CO	NOx	PM	HC	CO	NOx	PM	HC
100%	4.16	9.13	0.58	0.1	0.62	10.96	0.09	0.11
10%	0.53	1.5	0.09	0.1	0.64	2.76	0.05	0.14

	Fuel Usage (gal/hr)	
Model #:	3406	3456
100%load:	29.2	27.6
10% load:	5	5.2

For emission calculations, the load is estimated to be 10% when the generators are tested weekly and estimated load during emergency use is 100%.
The fuel usage is calculated estimated on the amount of time and load on each generator. Generator usage hours are estimated as follows for 2010:

Model 3406: Total hours usage: 500 Hours at 100% load: 500 Hours at 10% load: 0

Model 3456: Total hours usage: 500.000 Hours at 100% load: 500 Hours at 10% load: 0

This gives an estimated fuel usage of: 14600 gal/yr for Model 3406 and an average hourly fuel usage of: 29.20 gal/hr

13800 gal/yr for Model 3456 and an average hourly fuel usage of: 27.60 gal/hr

Determination of SO2 emissions for the emergency generators were estimated using Table 3.4-1 of AP-42, where S EQUALS 0.05%w sulfur content.
Sulfur dioxide emissions for the each generator are calculated as follows:

F = (Average fuel usage in gal/hr) x (0.137 MMBtu/gal) x 1.01S

F = 29.20 gal/hr for Model 3406 x (0.137 MMBtu/gal) x 1.01S = 0.20 lbs SO2/hr for 3406 engine, or 0.05 TPY for EP16

F = 27.60 gal/hr for Model 3456 x (0.137 MMBtu/gal) x 1.01S = 0.19 lbs SO2/hr for 3456 engine, or 0.05 TPY for EP17

The emergency fire water pump engine is a Cummins diesel Model NT-855-F1 with an estimated engine rating of 255 hp and consumes a maximum of 14 gals/hr of diesel fuel. Using the EPA's FIRE database, SCC Code No. 2-03-001-01 for reciprocating internal combustion engines in industrial use presents an emission factor of 130 lbs of CO, 49.3 lbs of VOCs, 604 lbs of NOx, 39.7 lbs of SO2 and 42.5 lbs of PM10 per 1000 gallons of diesel fuel burned. The exhaust from the engines is discharged horizontally through the side of the building, as emission points EP16, EP17 & EP18. These engines only run in emergency situations and during maintenance.
For permitting purposes 500 hr/yr was used.

The following is a summary of the calculated emissions emitted by the diesel engines:

	M3406 Electrical Generator EP16		M3456 Electrical Generator EP17		Fire Water Pump EP18	
Pollutant	Emissions (lb/hr)	Emissions (TpY)	Emissions (lb/hr)	Emissions (TpY)	Emissions (lb/hr)	Emissions (TpY)
Carbon Monoxide (CO)	4.16	1.04000	0.62	0.15500	1.82	0.4550
Nitrous Oxide (NOx)	9.13	2.28250	10.96	2.74000	8.46	2.1140
Particulate (PM)	0.58	0.14500	0.09	0.02250	0.60	0.1488
Hydrocarbons (HC)	0.10	0.02500	0.11	0.02750	0.69	0.1726
Sulfur Oxide (SO2)	0.20	0.05051	0.19	0.04774	0.56	0.1390

	Emission Factor[1]	Electrical Generator EP16		Electrical Generator EP17		Fire Water Pump EP18	
	lb/Mmbtu	lb/hr	TpY	lb/hr	TpY	lb/hr	TpY
Benzene	9.33E-04	3.76E-03	9.40E-04	3.55E-03	8.88E-04	1.80E-03	4.51E-04
Toluene	4.09E-04	1.65E-03	4.12E-04	1.56E-03	3.89E-04	7.90E-04	1.98E-04
Xylene	2.85E-04	1.15E-03	2.87E-04	1.09E-03	2.71E-04	5.51E-04	1.38E-04
Propylene	2.58E-03	1.04E-02	2.60E-03	9.83E-03	2.46E-03	4.98E-03	1.25E-03
1,3 Butadiene	3.91E-05	1.58E-04	3.94E-05	1.49E-04	3.72E-05	7.55E-05	1.89E-05
Formaldehyde	1.18E-03	4.75E-03	1.19E-03	4.49E-03	1.12E-03	2.28E-03	5.70E-04
Acetaldehyde	7.67E-04	3.09E-03	7.73E-04	2.92E-03	7.30E-04	1.48E-03	3.70E-04
Acrolein	9.25E-05	3.73E-04	9.32E-05	3.52E-04	8.81E-05	1.79E-04	4.47E-05
Benzo(a)pyrene	1.88E-07	7.58E-07	1.89E-07	7.16E-07	1.79E-07	3.63E-07	9.08E-08
PAH	1.68E-04	6.77E-04	1.69E-04	6.40E-04	1.60E-04	3.25E-04	8.11E-05

1. Unless otherwise noted, emission factors taken from AP-42, Fifth Edition, Section 3.3, Gasoline & Diesel Industrial Engines (10/96), Tables 3.3-1 and 3.3-2.

Diesel fuel heat content assumed to be 138000 Btu/gal

Make-up Air Space Heaters, EP-19 & EP -22

Seasonal emissions occur from the combustion of natural gas in space heaters which include 8.525 MMBtu/hr and 7.875 MMBtu/hr makeup air handling units. Using the EPA's FIRE database, SCC Code No. 1-05-002-06 for space heaters in commercial/industrial use presents an emission factor of 20 lbs of CO, 5.3 lbs of VOCs, 100 lbs of NOx, 0.6 lbs SO2 18 lbs NH_3, and 3.0 lbs of PM10 per million cubic feet (MMCF) of natural gas burned. Therefore, the regulated air pollutant emissions are estimated, as follows:

8.525 MMBTU/hr Make-up Air Handling Unit, EP-19

F = (20 lbs CO/MMCF) x (8.525 Mbtu/hr) x (1 CF/MBtu) x (1 MMCF/10^6 CF)
F = 0.17 lbs CO/hr, or
0.75 TpY based 8,760 hrs/yr

F = (5.3 lbs VOC/MMCF) x (8.525 Mbtu/hr) x (1 CF/MBtu) x (1 MMCF/10^6 CF)
F = 0.05 lbs VOC/hr, or
0.20 TpY based 8,760 hrs/yr

F = (3.0 lbs PM10/MMCF) x (8.525 Mbtu/hr) x (1 CF/MBtu) x (1 MMCF/10^6 CF)
F = 0.03 lbs PM/hr, or
0.11 TpY based 8,760 hrs/yr

F = (100.0 lbs NOX/MMCF) x (8.525 Mbtu/hr) x (1 CF/MBtu) x (1 MMCF/10^6 CF)
F = 0.85 lbs NOX/hr, or
3.73 TpY based 8,760 hrs/yr

F = (0.60 lbs SO_2/MMCF) x (8.525 Mbtu/hr) x (1 CF/MBtu) x (1 MMCF/10^6 CF)
F = 0.005 lbs SO_2/hr, or
0.02 TpY based 8,760 hrs/yr

F = (18 lbs NH_3/MMCF) x (8.525 Mbtu/hr) x (1 CF/MBtu) x (1 MMCF/10^6 CF)
F = 0.153 lbs NH_3/hr, or
0.67 TpY based 8,760 hrs/yr

7.875 MMBTU/hr Make-up Air Handling Unit, EP-22

F = (20 lbs CO/MMCF) x (7.875 Mbtu/hr) x (1 CF/MBtu) x (1 MMCF/10^6 CF)
F = 0.16 lbs CO/hr, or
0.69 TpY based 8,760 hrs/yr

F = (5.3 lbs VOC/MMCF) x (7.875 Mbtu/hr) x (1 CF/MBtu) x (1 MMCF/10^6 CF)
F = 0.05 lbs VOC/hr, or
0.20 TpY based 8,760 hrs/yr

F = (3.0 lbs PM10/MMCF) x (7.875 Mbtu/hr) x (1 CF/MBtu) x (1 MMCF/10^6 CF)
F = 0.02 lbs PM/hr, or
0.10 TpY based 8,760 hrs/yr

F = (100.0 lbs NOX/MMCF) x (7.875 Mbtu/hr) x (1 CF/MBtu) x (1 MMCF/10^6 CF)
F = 0.79 lbs NOX/hr, or
3.45 TpY based 8,760 hrs/yr

F = (0.60 lbs SO_2/MMCF) x (7.875 Mbtu/hr) x (1 CF/MBtu) x (1 MMCF/10^6 CF)
F = 0.005 lbs SO_2/hr, or
0.02 TpY based 8,760 hrs/yr

F = (18 lbs NH_3/MMCF) x (7.875 Mbtu/hr) x (1 CF/MBtu) x (1 MMCF/10^6 CF)
F = 0.142 lbs NH_3/hr, or
0.62 TpY based 8,760 hrs/yr

Grand Total Emissions, EP-19, & EP -22

F = (20 lbs CO/MMCF) x (16.4 Mbtu/hr) x (1 CF/MBtu) x (1 MMCF/10^6 CF)
F = 0.33 lbs CO/hr, or
1.44 TpY based 8,760 hrs/yr

F = (5.3 lbs VOC/MMCF) x (16.4 Mbtu/hr) x (1 CF/MBtu) x (1 MMCF/10^6 CF)
F = 0.09 lbs VOC/hr, or
0.40 TpY based 8,760 hrs/yr

F = (3.0 lbs PM10/MMCF) x (16.4 Mbtu/hr) x (1 CF/MBtu) x (1 MMCF/10^6 CF)
F = 0.05 lbs PM/hr, or
0.22 TpY based 8,760 hrs/yr

F = (100.0 lbs NOX/MMCF) x (16.4 Mbtu/hr) x (1 CF/MBtu) x (1 MMCF/10^6 CF)
F = 1.64 lbs NOX/hr, or
7.18 TpY based 8,760 hrs/yr

F = (0.60 lbs SO_2/MMCF) x (16.4 Mbtu/hr) x (1 CF/MBtu) x (1 MMCF/10^6 CF)
F = 0.01 lbs SO_2/hr, or
0.04 TpY based 8,760 hrs/yr

F = (18 lbs NH_3/MMCF) x (16.4 Mbtu/hr) x (1 CF/MBtu) x (1 MMCF/10^6 CF)
F = 0.295 lbs NH_3/hr, or
1.29 TpY based 8,760 hrs/yr

Binder Water Heaters, EP-20

Emissions occur from the combustion of natural gas in five water heaters used in the binder room. 5 units are rated 75 Mbtu/hr for a total maximum rated heat input of 0.375 MMBtu/hr.

Using the EPA's FIRE database, SCC Code No. 1-05-002-06 for external boilers in commercial/industrial use presents an emission factor of 20 lbs of CO, 5.3 lbs of VOCs, 100 lbs of NOx, 0.6 lbs SO2 and 3.0 lbs of PM10 per million cubic feet (MMCF) of natural gas burned. Therefore, the fugitive regulated air pollutant emissions are estimated, as follows:

F = (20 lbs CO/MMCF) x (375 Mbtu/hr) x (1 CF/MBtu) x (1 MMCF/10^6 CF)
F = 0.008 lbs CO/hr, or
0.033 TpY based 8,760 hrs/yr

F = (5.3 lbs VOC/MMCF) x (375 Mbtu/hr) x (1 CF/MBtu) x (1 MMCF/10^6 CF)
F = 0.002 lbs VOC/hr, or
0.0087 TpY based 8,760 hrs/yr

F = (3.0 lbs PM10/MMCF) x (375 Mbtu/hr) x (1 CF/MBtu) x (1 MMCF/10^6 CF)
F = 0.001 lbs PM/hr, or
0.005 TpY based 8,760 hrs/yr

F = (100.0 lbs NOX/MMCF) x (375 Mbtu/hr) x (1 CF/MBtu) x (1 MMCF/10^6 CF)
F = 0.04 lbs NOX/hr, or
0.16 TpY based 8,760 hrs/yr

F = (0.60 lbs SO_2/MMCF) x (375 Mbtu/hr) x (1 CF/MBtu) x (1 MMCF/10^6 CF)
F = 0.0002 lbs SO_2/hr, or
0.0010 TpY based 8,760 hrs/yr

F = (18 lbs NH_3/MMCF) x (375 Mbtu/hr) x (1 CF/MBtu) x (1 MMCF/10^6 CF)
F = 0.007 lbs NH_3/hr, or
0.03 TpY based 8,760 hrs/yr

Raw Materials Handling Emission Calculations, FP-11

Particulate matter emissions from raw materials handling were characterized by the USEPA in Section 11.13 Glass Fiber Manufacturing of AP-42 for unloading and conveying, storage bins, and mixing and weighing operations. Potential particulate matter emissions from these operations at Guardian Fiberglass are controlled with bag filter dust collectors and vented to the in-plant environment. Table 11.13-2 of AP-42 presents the particulate matter emission factors for glass fiber manufacturing. Summarized in following table are the AP-42 emission factors that were used to determine potential uncontrolled particulate matter emissions for the raw material handling operations.

Source	PM Emission Factor (lbs/ton of material processed)
Unloading and conveying (SCC 3-05-012-21)	3.0
Storage bins (SCC 3-05-012-22)	0.2
Mixing and weighing (SCC 3-05-012-24)	0.6

The tons of raw material processed is equivalent to 115% of the maximum production capacity specified for Guardian Fiberglass facility. The maximum production capacity is 16,000 lbs per hour or, **70,080** tons per year (TpY) based on 8,760 operational hours per year. Therefore, the maximum raw material processed is equivalent to **18,400** lbs per hour or, **80,592** tons per year (TpY) based on 8,760 operational hours per year.

The particulate matter emissions from raw material handling are controlled with bag filter dust collectors, as well as process enclosures. The use of process enclosures and bag filter dust collectors were detemined to have a minimum overall control device efficiency of 99%. Therefore, the maximum hourly and annual controlled PM emissions released to the in-plant environment from raw material handling operations may be estimated with the following relationship:

$$E_{PM} = \text{(Production Rate, tons per unit time)} \times \text{(PM Emission Factor)} \times (1 - 0.99)$$

Presented in the following table are the estimated maximum hourly and annual controlled PM emission rates for raw material handling operations at the proposed Guardian Fiberglass facility.

CONTROLLED EMISSIONS	PM Emissions		PM10 Emissions[1]		PM2.5 Emissions[1]	
Source	lbs/hr	TpY	lbs/hr	TpY	lbs/hr	TpY
Unloading and conveying (SCC 3-05-012-21)	0.28	1.21	0.28	1.21	0.28	1.21
Storage bins (SCC 3-05-012-22)	0.02	0.08	0.02	0.08	0.02	0.08
Mixing and weighing (SCC 3-05-012-24)	0.06	0.24	0.06	0.24	0.06	0.24
Total	0.35	1.53	0.35	1.53	0.35	1.53

1. Assumes all PM is PM2.5

Historical Resin/Binder/De-dusting oil/Production Data, FP-12

Historical usage data from GF Inwood, WV wool fiberglass production facility.

	De-dusting oil Use (gal/yr)	Resin/Binder Ratio (%w)	Resin/glass pulled (lbs/ton)	Binder/glass pulled (lbs/ton)	Wax/glass pulled (gal/ton)
Usage[A]	51,497	22.5%	180	829	31.0

A - Maximum of last three calendar years or previous Title V renewal application

Actual Resin, Binder & De-dusting oil Use Determinations

The maximum resinated production rate of each production line is 8,000 lbs/hr or 4.0 TpH of glass pulled, or an annual production rate of 35,040 TpY. The historical usage of resin of 180 lb/ton is assumed for Line 2 (batt line) to produce products at normal LOI's (5.0%) and a resin usage of 304 lb/ton is assumed for Line 1 (roll line) to produce products at high LOI's (8.4%). The resin usage rate of 304 lb/ton was determined during the 2006 compliance tests. Therefore, the maximum annual usage of resin and mixed binder is estimated, as follows:

Binder Rate to Achieve 8.4% LOI

Binder Rate	6.6	gal/min
Pull Rate	3.4	tons/hr
Binder Rate	116	gal/ton
Binder Rate	1,052	lbs/ton
Resin/TGP	303.4	lbs/ton

Line 1 (Roll Line)

U_1 = 35,040 TpY x 304 lbs resin/ton glass pulled

U_1 = 10,630,407 lbs resin/yr, or resin density = 10.01 lbs/gal

U_1 = 1,062,191 gals resin/yr

Line 2 Batt Line)

U_2 = 35,040 TpY x 180 lbs resin/ton glass pulled

U_2 = 6,307,200 lbs resin/yr, or resin density = 10.01 lbs/gal

U_2 = 630,216 gals resin/yr

Grand Total Line 1 plus Line 2 (Roll Line) Resin Usage

U = $U_1 + U_2$

U = 16,937,607 lbs resin/yr, or

U = 1,692,407 gals resin/yr total

Grand Total Binder Usage

Assume Line 1 uses 22% solids formula and Line 2 uses 14% solids formula.

U = 1,062,191 gal/yr of resin x 1lb binder / 0.2883 lb resin + 630,659 gal/yr of resin x 1lb binder / 0.1835 lb resin

U = 71,254,412 lbs binder/yr, or mixed binder density = 9.04 lbs/gal

U = 7,886,190 gals binder/yr

U = 900 gals binder/hr

Resin Tank Throughput

There are 4 - 4,500 gallon above ground storage tanks in use for resin storage. Therefore, annual throughput of resin per tank is estimated to be 423,101.69 gals resin/yr

Dedusting Oil Tank Throughput

U = 70,080 TpY x 2.4 gals de-dusting oil/ton glass pulled

U = 193,421 gals de-dusting oil/yr, or de-dusting oil density = 7.51 lbs/gal

U = 1,451,817 lbs de-dusting oil/yr

U = 166 lbs de-dusting oil/hr

VOC Resin and Oil Storage Emissions

Estimation of fugitive VOC emissions from Storage Tanks (Old Method)

Breathing Loss from fixed roof tanks

$$L_B = 2.26 \times 10^{-2} M_V (P/(PA-P))^{0.68} D^{1.73} H^{0.51} \Delta T^{0.50} F_P CK_C$$

Working Loss from fixed roof tanks

$$L_W = 2.40 \times 10^{-5} M_V PVNK_NK_C$$

Tank No.	Product	Q gal/yr	MW lb/lbmole	P_A psia	P psia	D ft	H ft
T3	Resin[1]	423,102	30.03	14.7	1.8	7.4	14
T4	Resin	423,102	30.03	14.7	1.8	7.4	14
T5	Resin	423,102	30.03	14.7	1.8	7.4	14
T6	Resin	423,102	30.03	14.7	1.8	7.4	14
T7A	De-dust Oil[2]	96,710	190	14.7	0.0002	9	8
T7B	De-dust Oil[2]	96,710	190	14.7	0.0002	9	8

Tank No.	V gal	N	K_N	ΔT °F	Fp	C	K_C
T3	4500	94.02	1	19.9	1	0.55	1
T4	4500	94.02	1	19.9	1	0.55	1
T5	4500	94.02	1	19.9	1	0.55	1
T6	4500	94.02	1	19.9	1	0.55	1
T6	9000	47.01	1	19.9	1	0.55	1
T7A	9000	10.75	1	19.9	1	0.55	1
T7B	9000	10.75	1	19.9	1	0.55	1

Tank No.	L_B	Lw	Total Emission Loss (lbs/yr)
T3	53.47	549	602
T4	53.47	549	602
T5	53.47	549	602
T6	53.47	549	602
T7A	0.67	0.09	0.76
T7B	0.67	0.09	0.76
Total Storage Tank Losses			**2,410**
			1.21

lbs/yr **0.28** **lbs/hr**

TpY

Notes:

[1] Assumed vapor pressure and MW equivalent to 37%w aqueous solution of formaldehyde.

[1] Assumed vapor pressure and MW equivalent to Residual Oil No. 6

Estimation of fugitive VOC emissions from Storage Tanks (New Method)

	Usage	Density lb/gal	Throughput lbs	gal
Resin	242 lb/ton glass	10.01	16,937,607	1,692,407
Oil	2.4 gal/ton glass	7.51	1,451,817	193,421
Binder	1017 lb/ton glass	9.04	71,254,412	7,886,190

There are 4 - 4500 gallon above ground storage tanks in use for resin storage. Therefore,
throughput of resin per tank is estimated to be 423,102 gals resin.

Estimation of fugitive VOC emissions from Storage Tanks

Calculated in accordance with U.S EPA equations (U.S. EPA, "Compilation of Air Pollutant Emission Factors" (AP-42), February, 1996, section 7.1.3.1)

Tank No.	Volume gal	Product	Throughput (Q) gal	Diameter ft	Height ft
T3	4,500	Resin	423,102	7.4	14
T4	4,500	Resin	423,102	7.4	14
T5	4,500	Resin	423,102	7.4	14
T6	4,500	Resin	423,102	7.4	14
T7A	4,500	Oil	96,710	9	8
T7B	4,500	Oil	96,710	9	8

Ambient Parameters	
Ambient Pressure (psia) [1]	14.66
Minimum Ambient Temperature (^{o}F) [2]	58
Maximum Ambient Temperature (^{o}F) [3]	77

[1] Ambient pressure determined by assuming that proposed construction site is at sea level.
[2] Minimum ambient temperature representative of refrigerated enclosure provided by Grover Thomas, Guardian.
[3] Maximum ambient temperature assumes a maximum daily temperature fluctuation of 19^{o}F, as recommended by Grover Thomas, Guardian.

Resin Specifications					
Component	Molecular Weight (lb/lbmol)	Vapor Pressure at 58^{o}F (mm Hg) [1]	Vapor Pressure at 58^{o}F (psia)	Vapor Pressure at 77^{o}F (mm Hg) [1]	Vapor Pressure at 77^{o}F (psia)
Formaldehyde	30.0262	0.36	0.00696	0.83	0.01605
Methanol	32.042	0.28	0.00541	0.49	0.00948
Phenol [2]	94.1128	0.00	0.00000	0.00	0.00000
Water	18.0152	10.41	0.20130	20.12	0.38906
Total Liquid	--	11.05	0.21367	21.44	0.41458

[1] Partial vapor pressures provided by Kim Tutin, Technology Manager of Insulation Resins at Georgia-Pacific Resins, Inc, in 1/26/2006 email to Grover Thomas, Guardian, and in 2/2/2006 email to
[2] Due to the low vapor pressure of phenol, it's contribution to total VOCs is negligible.

De-dust Oil Specifications [1]			
Component	Vapor Molecular Weight (lb/lbmol)	Vapor Pressure at 58^{o}F (psia) [2]	Vapor Pressure at 77^{o}F (psia) [3]
VOC	190	0.00004	0.00009

[1] Assumed vapor phase molecular weight and vapor pressures equivalent to Residual Oil No. 6; parameters from AP-42 Table 7.1-2
[2] For conservatism, vapor pressure from AP-42 Table 7.1-2 at 60^{o}F
[3] For conservatism, vapor pressure from AP-42 Table 7.1-2 at 80^{o}F

Tank No.	L_B (lbs)	Lw (lbs)	**Total Emission Loss (lbs)**
T3	0.48	7.32	**7.81**
T4	0.48	7.32	**7.81**
T5	0.48	7.32	**7.81**
T6	0.48	7.32	**7.81**
T7A	0.01	0.04	**0.05**
T7B	0.01	0.04	**0.05**

Storage Tank VOC & HAP Emissions

	Resin Tank		Oil Tank	
	lb/yr	tpy	lb/yr	tpy
VOC losses	**31.22**	**0.01561**	**0.101**	**0.00005**

Pollutant	Content in Resin (wt%)	Emissions lb/hr	Emissions lb/yr	Emissions tpy
Formaldehyde	9.00%	0.00210	18	0.009
Phenol	0.65%	0.00000	0	0.000
Methanol	0.25%	0.00146	13	0.006
Total Haps	**9.90%**	**0.00356**	**31**	**0.016**

De-dust Oil		**0.000012**	**0.10128**	**0.0000506**

Total VOC Losses = VOC from Resin Tanks + VOC from Oil Tanks

Total VOC Losses = 31.33 lb/yr 0.0036 lb/hr

Total VOC Losses = 0.02 tpy

Mixed Binder Batch Formulation (22% Solids.)

Material	Qty. (lbs)	Vol. (gal)	Batch (wt %)	VOC (wt%)	VOC (lbs)	Comments
Urea	488.37	40.10	6.5%			Water soluble solid
Resin	2162.15	216.0	28.8%	3.0%	65.7	<2.14% formaldehyde; <0.65% phenol. , 0.25% methanol
Aqua Ammonia	25	3.4	0.3%			
Sulf-N-45	123.75	6.9	1.7%			Water soluble solid
Silane	2.5	0.3	0.03%	41%	1.0	Ethanol
Hot water	1292.82	155	17.2%			
Cold water	3405.41	408	45.4%			
Total	7500	830	100%		66.8	

Time elapsed (Minutes)	%FF Reduction
0	9.00
80	2.81
140	1.27
200	0.80
260	0.47
410	0.33
470	0.28
Average	2.14

Mixed Binder Est. Physical & Chemical Properties

Mixed Binder Density	9.04	lbs/gal
VOC Content	0.080	lbs VOC/gal Mixed Binder
VOC Mass fraction	0.89%	lbs VOC/lb Mixed Binder
Binder Throughput	71,254,412	lbs Binder

Estimation of fugitive VOC emissions from Pre-Act Mixing Tanks

Fugitive VOC emissions occur from the batch mixing of binder resin in the Pre-react mix tanks. There is 1-1200 & 1-1700 gallon Pre-React Mix tanks, with fixed covers, an acess hatch w/cover, and an opening for the mixing impellor shaft. The primary ingredients that contain VOCs are fed directly from resin storage tanks, while other ingredients are added by hand from small containers.

The batch mixing process for the Pre-React tanks is similar to the batch mixing processes that occur in the paint manufacturing industry. Under Section 6.4 Paint and Varnish of AP-42, it is estimated that 1 to 2% of the solvents (or VOCs) are lost from paint mixing operations. The solvents used in paint manufacturing are typically high vapor pressure solvents that are designed to flash off during the application of the paint. The VOCs (e.g. formaldehyde, phenol) found in Pre-Act Mixing Tanks have a strong affinity towards water which results in a lower mixed vapor pressure than those of common paint solvents. Therefore, it is estimated that only 2% of the available mass of VOCs in the ingredients used in the Pre-React Mixing Tanks are lost to the indoor air as fugitive emissions.

F = (0.080 lbs VOC/gal Mixed Binder) x (7,888,866 gal Binder/yr) x 2%
F = 12,684 lbs VOC/yr, or **6.34 TpY of VOCs** **1.45 lb/hr VOC**

Formaldehyde and Phenol emissions are calculated from emission factors determined from a December 2001 source test on the Inwood, WV facility binder mix room. A variability factor of 2 is included to account for process variability, the limited source test data available, and possible changes in the resin manufacturer. An hour-long source test was conducted in Inwood, WV in October 2001 during preparation of binder in the Binder Mix Room. The source tests determined that lb/hr of formaldehyde and lb/hr of phenol are lost to the indoor air as fugitive emissions from the Pre-React Mixing Tanks. The annual emission rates presented in the source test summary table below are determined assuming continous operation.

Pre-React Mixing Tank Source Test Summary

	Variability Factor	Source Test Emission	Source Test Emission Factor (tpy)	Adjusted Emission	Adjusted Emission Factor
Formaldehyde	2.0	0.002	0.01	0.004	0.02
Phenol	2.0	0.0002	0.001	0.0004	0.002

Assuming Methanol is present in the binder pre-act as shown in the Mixed Binder Batch Formulation above, emissions are calculated as follows:

Method 1 - using 2001 Emission Results

	Content in Binder (wt%)	Content in VOC (wt%)	Emissions lb/yr	Emissions tpy	g/hr	lb/hr
Formaldehyde [a]	0.616%	-	35.0	0.018	1.81	0.00
Phenol [a]	0.187%	-	3.50	0.0018	0.18	0.00
Methanol [b]	0.072%	8.23%	1,044	0.522	54.06	0.12
Total	0.876%					

[a] Formaldehyde and phenol emissions based on October 2001 source tests on binder mix room at Inwood, WV facility.

[b] Assumes that VOC is mostly comprised of formaldehyde, phenol, and methanol and ethanol is negligable.

Melting and Refining Emission Calculations, EP-12 & EP-22

Regulated air pollutant emissions from melting and refining were characterized by the USEPA in Section 11.13 Glass Fiber Manufacturing of AP-42 for wool fiberglass electric furnaces used for melting operations. Emissions from exhaust system serving the melting and refining processes, are exhausted for the first production line to stack No. EP12, and for the second production line to stack No. EP22, which are vertically discharged to the outside ambient air.

Regulated air pollutant emissions from the melting and refining operation were based on Potential to Emit established by the emission limits found in Guardian's Inwood Permit to Modify R14-015 or based source test data where no emission limits were established. For comparison, emission factors for all pollutants established in source testing have been noted if available.

Presented in the following table is the measured data used to develop emission factors for determining potential regulated air pollutant emissions for the proposed forming and collection operations.

Regulated Air Pollutants Melting and Refining	Emission Rate (lbs/hr)	Measured Process Rate (lbs material/hr)	Guardian's Emission Factor (lbs/ton of material processed)	Air Permit Emission Factor (lbs/ton)
Particulate matter	0.16	6,414	0.050	0.136
PM10				0.136
PM2.5				0.136
Lead	0.000049	6,287	0.00002	0.00002
Chrome	0.0006	16,814	0.00007	0.00007
Sulfur dioxides	0.00026	5,804	0.00009	0.0001344
Nitrogen oxides	0.047	6,060	0.016	0.030
Carbon monoxide	1.47	6,060	0.485	0.73
Volatile organic compounds	0.42	5,841	0.144	0.22

The tons of raw material processed is equivalent to the maximum production capacity specified for Guardian Fiberglass facility, which is 8,000 lbs per hour or, 35,040 tons per year (TpY) based 8,760 operational hours per year for the existing line, and new line is 8,000 lbs per hour or, 35,040 TpY.

Emissions of SO_x, NO_x, CO and VOC from the electric furnaces are uncontrolled by the bag filter dust collectors and will be released to the outside ambient air. Therefore, the maximum hourly and annual uncontrolled emissions of SO_x, NO_x, CO and VOC from the melting operations may be estimated with the following relationship:

E_i = (Production Rate, tons per unit time) x (Emission Factor) x 1.0

A 1.0 variability factor is applied in order to compensate for emissions due to normal process variations.

For PM, the emission rate reflects negotiated State allowable limits. Assumes all PM is PM2.5

Condensable PM emissions from source testing conducted in February 2012 is added to the permit limits.

E_{PM} = (Production Rate, tons per unit time) x (Emission Factor) x 1.0

Presented in the following table are the estimated maximum hourly and annual controlled emissions of PM, and uncontrolled emissions of Chrome, SO_x, NO_x, CO and VOC from the melting operations for 8,000 roll line, EP-12.

Regulated Air Pollutants from Electric glass furnace - wool (SCC 3-05-012-03)	Maximum Allowable Emission Rates	
	lbs/hr	TpY
Particulate matter (PM)	0.544	2.383
PM10	0.544	2.383
PM2.5	0.544	2.383
Lead	0.00006	0.00028
Chrome	0.00029	0.00125
Sulfur oxides (SO_x)	0.0005	0.002
Nitrogen oxides (NO_x)	0.120	0.526
Carbon monoxide (CO)	2.920	12.790
Volatile organic compounds (VOC)	0.880	3.854

Melting and Refining Emission Calculations (cont.)

Presented in the following table are the estimated maximum hourly and annual controlled emissions of PM, and uncontrolled emissions of SO_x, NO_x, CO and VOC from the melting operations for 8,000 batt line, EP-22

Regulated Air Pollutants from	Maximum Allowable Emission Rates	
Electric glass furnace - wool (SCC 3-05-012-03)	lbs/hr	TpY
Particulate matter (PM)	0.544	2.383
PM10	0.544	2.383
PM2.5	0.544	2.383
Lead	0.00006	0.00028
Chrome	0.00029	0.00125
Sulfur oxides (SO_x)	0.0005	0.002
Nitrogen oxides (NO_x)	0.120	0.526
Carbon monoxide (CO)	2.920	12.790
Volatile organic compounds (VOC)	0.880	3.854

Forming and Collection Emission Calculations, EP-13 & EP-23

Molten glass from the electric furnaces is drawn off to the forehearth or refining unit, which maintains the molten glass at a uniform temperature with a natural gas fired process heater. Emissions occurring from the combustion of natural gas in the forehearth process heater are released to the exhaust serving the forming and collection system.

Guardian Fiberglass uses a rotary spin process which consists of fiberizers, natural gas heat, and compressed air for fiber forming. Natural gas heated air is provided by the blowers. Subsequent to forming, the wool fibers enter a vacuum chamber (or collection) process. Emissions occurring from the forming and collection processes are exhausted via a common stack to the outside ambient air. The combustion of natural gas in the forming process heaters produce regulated air pollutants of SO_2, NO_x, and CO.

Regulated air pollutant emissions from the melting and refining operation were based on Potential to Emit established by the emission limits found in Guardian's Inwood Permit to Modify R14-015 or based source test data where no emission limits were established. For comparison, emission factors for all pollutants established in source testing have been noted if available.

Presented infollowing table is the measured data used to develop emission factors for determining potential regulated air pollutant emissions for the proposed forming and collection operations.

Regulated Air Pollutants Forming and collection	Emission Rate (lbs/hr)	Measured Process Rate (lbs material/hr)	Guardian's Emission Factor (lbs/ton of material processed)	Air Permit Emission Factor (lbs/ton)	Air Permit Emission Factor (lbs/ton) Line #2
Particulate matter	9.66	6,310	3.06	3.71	3.49
PM10				3.71	3.49
PM2.5				3.71	3.49
Lead	0.0002	6,287	0.0001	0.0001	
Chrome	0.0029	6,825	0.0008	0.0008	
Sulfur dioxides	0.0024	5,960	0.0008	0.001007	
Nitrogen oxides	0.493	6,060	0.16	0.32	
Carbon monoxide[a]			5.28	5.28	
Volatile organic compounds	4.80	5,640	1.70	2.62	
Formic Acid[a]	-	-	0.35	0.35	
Phenol[a]	0.180	6,231	0.06	1.25	
Formaldehyde	0.88	6,101	0.29	0.630	
Methanol			2.28	2.280	
Ammonia	7.38	6,099	2.42	3.77	

[a] Emission factors developed by Guardian based on expected improvements in product quality or potential emissions as a result of the Cannizzaro reaction.

The tons of raw material processed is equivalent to the maximum production capacity specified for Guardian Fiberglass facility, which is 8,000 lbs per hour or, 35,040 tons per year (TpY) based 8,760 operational hours per year for the existing line, and new line is 8,000 lbs per hour or, 35,040 TpY for resinated wool fiberglass, and 8,000 lbs per hour or, 35,040 TpY for resinated and non-resinated wool fiberglass. Therefore, the maximum hourly and annual emissions of combustion gases, phenol, formaldehyde, and ammonia from the forming and collection operations may be estimated with the following relationship:

E = (Production Rate, tons per unit time) x (Emission Factor) x 1.0

For PM, the emission rate reflects negotiated State allowable limits. Condensable emissions from the December 2012 stack test are added to the permit limit. Assumes all PM is PM2.5.

Presented in the following table are the estimated maximum hourly and annual controlled emissions of PM, and and uncontrolle emissions of Chrome, SO_2, NO_x, CO, VOC, formic acid, phenol, formaldehyde, methanol, and ammonia from the forming and collection operations for existing 8,000 roll line, EP-13.

Regulated Air Pollutants from	Maximum Allowable Emission Rates	
Forming and collection operations	lbs/hr	TpY
Particulate matter	14.840	64.999
PM10	14.840	64.999
PM2.5	14.840	64.999
Lead	0.00022	0.00095
Chrome	0.003	0.015
Sulfur dioxides	0.004	0.018
Nitrogen oxides	1.280	5.606
Carbon monoxide	21.120	92.506
Volatile organic compounds	10.480	45.902
Formic Acid [a]	1.392	6.096
Phenol	5.000	21.900
Formaldehyde	2.520	11.038
Methanol	9.120	39.946
Ammonia	15.080	66.050

Presented in the following table are the estimated maximum hourly and annual controlled emissions of PM, and and uncontrolle emissions of Chrome, SO_2, NO_x, CO, VOC, formic acid, phenol, formaldehyde, methanol, and ammonia from the forming and collection operations for existing 8,000 roll line, EP-23.

Regulated Air Pollutants from	Maximum Allowable Emission Rates	
Forming and collection operations	lbs/hr	TpY
Particulate matter	13.960	61.145
PM10	13.960	61.145
PM2.5	13.960	61.145
Lead	0.00022	0.00095
Chrome	0.003	0.015
Sulfur dioxides	0.004	0.018
Nitrogen oxides	1.280	5.606
Carbon monoxide	21.120	92.506
Volatile organic compounds	10.480	45.902
Formic Acid [a]	1.392	6.096
Phenol	5.000	21.900
Formaldehyde	2.520	11.038
Methanol	9.120	39.946
Ammonia	15.080	66.050

Curing and Cooling Emission Calculations, EP-14 & EP-24

A continuous blanket of wool fiberglass from the forming and collection operations is conveyed through a natural gas fired curing oven. Emissions occurring from the curing and cooling of wool fiberglass are are exhausted via a common stack to the outside ambient air. The combustion of natural gas in the curing oven will produce regulated air pollutants of SO_2, NO_x, and CO.

Regulated air pollutant emissions from the melting and refining operation were based on Potential to Emit established by the emission limits found in Guardian's Inwood Permit to Modify R14-015 or based source test data where no emission limits were established. For comparison, emission factors for all pollutants established in source testing have been noted if available.

Regulated Air Pollutants Forming and collection	Emission Rate (lbs/hr)	Measured Process Rate (lbs material/hr)	Guardian's Emission Factor (lbs/ton of material processed)	Air Permit Emission Factor (lbs/ton)	Air Permit Emission Factor (lbs/ton) Line #2
Particulate matter	0.74	6,414	0.23	0.54	1.01
PM10				0.54	1.01
PM2.5				0.54	1.01
Sulfur dioxides	0.00023	5,960	0.00008	0.00008	
Lead	0.00002	6,287	0.00001	0.00001	
Nitrogen oxides	6.70	5,559	2.41	3.75	
Carbon monoxide	2.50	5,559	0.90	1.13	1.31
Volatile organic compounds	0.17	5,559	0.06	0.24	
Formic Acid [a]	-	-	0.04	0.04	
Phenol [a]	-	-	0.30	0.300	
Formaldehyde	0.06	6,101	0.02	0.170	
Methanol	0.20	6,822	0.059	0.059	
Ammonia	0.37	5,757	0.13	0.87	

[a] Emission factors developed by Guardian based on expected improvements in product quality or potential emissions as a result of the Cannizzaro reaction.

The tons of raw material processed is equivalent to the maximum production capacity specified for Guardian Fiberglass facility, which is 8,000 lbs per hour or, 35,040 tons per year (TpY) based 8,760 operational hours per year for the existing line, and new line is 8,000 lbs per hour or, 35,040 TpY. Therefore, the maximum hourly and annual emissions of SO_2, NO_x, CO, VOC, phenol, formaldehyde, and ammonia from the curing and cooling operations may be estimated with the following relationship:

E = (Production Rate, tons per unit time) x (Emission Factor) x 1.0

For PM, the emission rate reflects negotiated State allowable limits. Condensable emissions from the December 2012 stack test are added to the permit limit. Assumes all PM is PM2.5.

Presented in the following table are the estimated maximum hourly and annual controlled emissions of PM, and and uncontrolle emissions of SO_2, NO_x, CO, VOC, formic acid, phenol, formaldehyde, methanol, and ammonia from the forming and collection operations for existing 8,000 roll line, EP-14.

Regulated Air Pollutants from Curing and cooling operations	Maximum Allowable Emission Rates	
	lbs/hr	TpY
Particulate matter	2.160	9.461
PM10	2.160	9.461
PM2.5	2.160	9.461
Sulfur dioxides	0.0003	0.001
Lead	0.00003	0.0001
Nitrogen oxides	15.000	65.700
Carbon monoxide	4.520	19.798
Volatile organic compounds	0.960	4.205
Formic Acid [a]	0.160	0.701
Phenol	1.200	5.256
Formaldehyde	0.680	2.978
Methanol	0.235	1.027
Ammonia	3.480	15.242

Presented in the following table are the estimated maximum hourly and annual controlled emissions of PM, and and uncontrolle emissions of Chrome, SO_2, NO_x, CO, VOC, formic acid, phenol, formaldehyde, methanol, and ammonia from the forming and collection operations for existing 8,000 roll line, EP-24.

Regulated Air Pollutants from Curing and cooling operations	Maximum Allowable Emission Rates	
	lbs/hr	TpY
Particulate matter	4.040	17.695
PM10	4.040	17.695
PM2.5	4.040	17.695
Sulfur dioxides	0.0003	0.001
Lead	0.00003	0.0001
Nitrogen oxides	15.000	65.700
Carbon monoxide	5.240	22.951
Volatile organic compounds	0.960	4.205
Formic Acid [a]	0.160	0.701
Phenol	1.200	5.256
Formaldehyde	0.680	2.978
Methanol	0.235	1.027
Ammonia	3.480	15.242

Facing, Sizing and Packaging Emission Calculations, Resinated

Facing Paper Application, FP13

Potential particulate matter (PM) and volatile organic compound (VOC) emissions from the application of facing material to the wool fiberglass material were not characterized in AP-42. A PM emission factor of 0.05 lbs PM per ton of wool processed is presented on page C-65 of "Wool Fiberglass Insulation Manufacturing - Background Information for Proposed Standards" USEPA-450-3-83-002A. A representative (or conservative) VOC emission factor of 1.86 lbs VOC per ton of asphalt blowing coating produced, which is used by the asphalt manufacturing industry, was obtained from the USEPA FIRE database. Summarized in the following are the emission factors that were used to determine potential regulated air pollutant emissions from the facing application.

Regulated Air Pollutants from Facing application (SCC 3-05-012-99)	Emission Factors (lbs/ton of material processed)
Particulate Matter (PM)	0.05
Volatile organic compounds (VOC)	1.86

The tons of raw material processed is equivalent to the maximum production capacity specified for Guardian Fiberglass facility, which is 16,000 lbs per hour or, 70,080 tons per year (TpY) based 8,760 operational hours per year. The maximum application rate for asphalt based facing material is 1 lb of facing material per 32 lbs of wool fiberglass, or 2,190 TpY of facing material processed.

The emissions from the facing application are uncontrolled and released to the in-plant environment. Therefore, the maximum hourly and annual emissions released to the in-plant environment from the facing application may be estimated with the following relationship:

E = (Material Rate, tons per unit time) x (Emission Factor) x (1 - PM Control Efficiency,0.9)

Presented in the following table are the estimated maximum hourly and annual controlled PM emission rates for facing application operation at the proposed Guardian Fiberglass facility.

Regulated Air Pollutants from Facing application (SCC 3-05-012-99)	Maximum Allowable Emission Rates	
	lbs/hr	TpY
Particulate Matter (PM)	0.04	0.18
Volatile organic compounds (VOC)	0.47	2.04

Determination of fugitive VOC emissions from the Ink-jet Identification, FP-14

Guardian uses an ink printing system to print product codes on the finished product. The emissions from the ink printing system are uncontrolled and released, as fugitive emissions, to the in-plant environment. Emission rates are based on actual 2006 yearly ink usage in Inwood and actual 2001 solvent usage in Kingman. Therefore, the actual maximum annual VOC emission rate is estimated using a 1.70 variation factor based on actual data:

	Usage gal/yr	Density lbs/gal	Variability Factor	Two Lines	Usage lb/yr	VOC Content lb VOC/lb	VOC Emissions lb/hr	tpy
Ink	338	6.66	1.7	2	7,637	0.93	0.8090	3.54
Solvent	170	6.60	1.7	2	3,813	1.00	0.4353	1.91
Total							**1.2443**	**5.4501**

Ink Speciation

Constituent	Weight Percent lb/lb ink	Emissions lb/yr	tpy
Ethanol	80	6,110	3.05
Isopropyl alcohol	20	1,527	0.76
Propanol	5	382	0.19
Butoxy Diglycol	2	153	0.08
Methanol	31	2,367	1.18

Solvent Speciation

Constituent	Weight Percent lb/lb solvent	Emissions lb/yr	tpy
Ethanol	100	3,813	1.91
Isopropyl alcohol	20	763	0.38
Monohydroxymethane	5	191	0.10
2 Pentatone, 4 Methyl	2	76	0.04
Methanol	50	1,907	0.95

Guardian Fiberglass pressurized spray adhesive, FP-15

Determination of fugitive VOC emissions for spray adhesive based on a material balance is as follows:
Emission rates are calculated using the Inwood, WV 2005 adhesive usage of 595 gallons.
Total glass production rate was 50,614 tons or 0.0118 per TGP.
Therefore, the annual 2005 VOC emissions from adhesive application is calculated as follows:

Adhesive Usage

U = 0.01176 gal spray adhes/TGP x 70,080 tons of glass
U = 824 gals/yr x 9.90 lbs/gal Adhesive density = 9.90 lbs/gal
U = 8,159 lbs spray adhesive used/yr VOC = 7.740 lbs VOC/ gal adhesive

Estimated VOC Emission Rate

F = 824 gal adhesive used/yr x 7.7400 lbs VOC/gal adhesive
F = 6,379 lbs VOC/yr, or
3.19 TpY of VOCs
0.73 lbs VOC/hr

Particulate dust control, FP-16

Potential particulate matter (PM) emissions from the sizing and packaging area are collected and controlled by two Air Tumbler control devices. The sizing and packaging area consists of trimming and rolling, the K&S Roll Machine, the blowing wool bagger, and packaging machinery. The Air Tumblers use cyclonic flow and wet impingement control techniques for the removal of particulates from the exhaust gas stream. The particulate matter removal efficiency for the Air Tumbler and scrubber are assumed to be 50% or greater. The PM exhaust concentration is assumed to be less than 0.01 lbs PM per 1000 lbs of exhaust air.

Potential PM emissions for the sizing and packaging area are estimated by multiplying the PM exhaust outlet concentration by the control devices rated volumetric air flowrate and by the control efficiency of 90% for the building as a process enclosure, as follows:

E = (0.01 lbs PM per 1000 lbs Air) x (Total Air Flowrate of control devices, cfm) x (units of conversion) x (1 - 90%)

Facing, Sizing and Packaging Emission Calculations (cont.)

Sizing & Packaging PM Control Devices	Maximum Rate Air Flowrate, cfm
Air Tumbler No. 1	20,000
Cyclone/screen rooms	20,000
Total Air Flowrate	40,000

Presented in the following table are the estimated maximum hourly and annual uncontrolled emissions of PM from the facing, sizing and packaging operations at the proposed Guardian Fiberglass facility for both produciton lines.

Selected units of conversion are: 60 min/hr; 8760 hr/yr; 29 lbs/lbmole air; 1 lbmol /385.5 cf air; and 2000 lbs/ton.

Regulated Air Pollutants from	Maximum Allowable Emission Rates	
Sizing and packaging (SCC 3-05-012-99)	lbs/hr	TpY
Particulate Matter (PM)	**0.18**	**0.79**

Efficiency 50 %
Bldg Effici 90 %

Non-Resinated Emission Calculations, Line 2

Non-resinated De-dusting oil, Silcicone-Tower and Silicone-Dicer VOC Determinations, FP16

The estimated tons of non-resinated glass pulled is 8,000 lbs per hour or, 35,040 tons per year (TpY) based on 8,760 operational hours per year. Therefore, the annual VOC emissions from the application of de-dusting oil, anti-stat and silicone are estimated using the assumption that all VOC in the de-dusting oil, anti-stat and silicone used are released as fugitive emissions within the facility and a 1.50 variability factor.

The estimated amount of dedusting oil (Anneal 330) used at dicer	0.50	gal/TGP	(Engr Est - 10/12/07))
The estimated amount of silicone used at the dicer	0.25	gal/TGP	(Engr Est - 10/12/07))
The estimated amount of silicone used at the tower	0.35	gal/TGP	(Engr Est - 10/12/07))

	Usage gal/TGP	Production TGP/yr	Variability Factor	Density (lb/gal)	Usage gal/yr	Usage lb/yr	VOC Content	VOC Emissions tpy
Dedusting Oil	0.50	35,040	1.50	7.34	26,280	192,874	2.9%	2.80
Silicone - Dicer	0.25	35,040	1.50	8.34	13,140	109,588	3.00%	1.64
Silicone - Tower	0.35	35,040	1.50	8.46	18,396	155,575	1.00%	0.78

Non-resinated De-dusting oil, Silicone-Tower and Silicone-Dicer VOC Emission Summary

Therefore, presented in the following table are the estimated maximum hourly and annual emissions of VOC from the non-resinated packaging operations.

Material Applied	(lb/hr) lb/hr	(TpY) tpy
De-dusting Oil	0.64	2.80
Silicone - Dicer	0.38	1.64
Silicone - Tower	0.18	0.78
Total VOCs TpY	**1.19**	**5.22**

Speciation

Constituent	Weight Percent lb/lb material	Emissions lb/hr	tpy
Petroleum Hydrocarbon	100	0.64	2.80
Methylhydrogen siloxane	60	0.00	0.00
Octamethylcyclotetrasiloxane	30	0.00	0.00
N-Octyltriethoxysilane	7	0.00	0.00
Trimethylated silica	7	0.00	0.00
Ethylbenzene	1	0.00	0.00
Silicon Copolymer	20	0.00	0.00

Determination of fugitive VOC emissions from the Ink-jet Identification, FP-17

Guardian uses an ink printing system to print product codes on the finished product. The emissions from the ink printing system are uncontrolled and released, as fugitive emissions, to the in-plant environment. Emission rates are based on actual 2004 yearly ink usage in Albion and actual 2001 solvent usage in Kingman. Therefore, the actual maximum annual VOC emission rate is estimated using a 1.25 variation factor based on actual data.

	Usage gal/yr	Density lbs/gal	Variability Factor	Usage lb/yr	VOC Content lb VOC/lb	VOC Emissions lb/yr	lb/hr	tpy
Ink	2.1	7.51	1.25	20	0.70	14	0.0016	0.01
Solvent	57	7.09	1.25	503	1	503	0.0575	0.25
Total						**517**	**0.0590**	**0.26**

Ink Speciation

Constituent	Weight Percent lb/lb ink	Emissions lb/yr	tpy
Acetone	60	0.00	0
Dye (Chromium (III) - Azo Complex)	10	0.00	0

Solvent Speciation

Constituent	Weight Percent lb/lb solvent	Emissions lb/yr	tpy
Acetone	100	503.4	0.252

Particulate dust control, FP18

Potential particulate matter (PM) emissions from the non-resinated packaging area are collected and controlled by "tube sock filters" and subsequently exhausted, as fugitive emisions to the in-plant environment. The estimated allowable PM exhaust concentration will be less than 0.005 lbs PM per 1000 lbs of exhaust air.

Potential PM emissions for the sizing and packaging area are estimated by multiplying the PM exhaust outlet concentration by the control devices rated volumetric air flowrate and by the control efficiency provided by the enclosure, as follows:

E = (0.005 lbs PM per 1000 lbs Air) x (Total Air Flowrate of control devices, cfm) x (units of conversion) x (1 - 90 %)

Facing, Sizing and Packaging Emission Calculations (cont.)

Sizing & Packaging PM Control Devices	Maximum Rate Air Flowrate, cfm
Total Air Flowrate	50,000

Selected units of conversion are: 60 min/hr; 8760 hr/yr; 29 lbs/lb mole air; 1 lb mole /385.5 cf air; and 2000 lbs/ton.

Presented in the following table are the estimated maximum hourly and annual uncontrolled emissions of PM from the facing, sizing and packaging operations.

Regulated Air Pollutants from Sizing and packaging (SCC 3-05-012-99)	**Emission Rates**	
	lbs/hr	**TpY**
Particulate Matter (PM)	0.11	0.4937

Bldg Efficiency 90 %

Particulate dust control

Potential particulate matter (PM) emissions from the non-resinated packaging area are collected and controlled by "tube sock filters" and subsequently exhausted, as fugitive emisions to the in-plant environment. The estimated allowable PM exhaust concentration will be less than 0.01 lbs PM per 1000 lbs of exhaust air.

Potential PM emissions for the sizing and packaging area are estimated by multiplying the PM exhaust outlet concentration by the control devices rated volumetric air flowrate and by the control efficiency provided by the enclosure, as follows:

E = (0.01 lbs PM per 1000 lbs Air) x (Total Air Flowrate of control devices, cfm)
x (units of conversion) x (1 - 90 %)

Facing, Sizing and Packaging Emission Calculations (cont.)

Sizing & Packaging PM Control Devices	Maximum Rate Air Flowrate, cfm
Total Air Flowrate	50,000

Selected units of conversion are: 60 min/hr; 8760 hr/yr; 29 lbs/lb mole air; 1 lb mole /385.5 cf air; and 2000 lbs/ton.

Presented in the following table are the estimated maximum hourly and annual uncontrolled emissions of PM from the facing, sizing and packaging operations.

Regulated Air Pollutants from	**Emission Rates**	
Sizing and packaging (SCC 3-05-012-99)	**lbs/hr**	**TpY**
Particulate Matter (PM)	0.23	0.9875

Bldg Efficiency 90 %

Resin Tank Formaldehyde Emissions [1,2]

Tank Parameter	Value [3]
Tank Identification	Resin Tank 1 (T1)
Contents of Tank	Phenol-Formaldehyde Resin
Location	Inwood, WV
Tank Type (Vertical or Horizontal)	Vertical
Diameter, ft	14.0
Effective Diameter, ft	14.0
Shell Height or Length, ft	7.4
Nominal Capacity, gal	4,500
Geometric Capacity, gal	8,521
Throughput, gallons/yr	1,692,407
Average Liquid Height, ft (def. = Shell Height/2)	3.70
Maximum Liquid Height, ft	7.4
Roof Type (Cone or Dome)	Cone
Tank Roof Cone Slope, ft/ft (def. = 0.0625)	0.0625
Dome Tank Roof Radius, ft (def. = shell diameter)	N/A
Dome Tank Roof Height, ft	N/A
Roof Outage, ft	0.146
Vapor Space Outage, ft	3.85
Vapor Space Volume, ft^3	592
Average Daily Minimum Ambient Temperature, F	58.0
Average Daily Maximum Ambient Temperature, F	77.0
Daily Total Solar Insolation Factor, Btu/ft^2/day [4]	0
Daily Average Ambient Temperature, F	67.5
Tank Paint Solar Absorbance, dimensionless [4]	0.000
Daily Vapor Temperature Range, R	13.7
Daily Average Liquid Surf. Temperature, F	66.9
Daily Minimum Liquid Surf. Temperature, F	63.5
Daily Maximum Liquid Surf. Temperature, F	70.4
Liquid Bulk Temperature	66.5
Type of Substance (Organic or Petroleum)	Organic
Vapor Molecular Weight, lb/lbmol	30.0
Vapor Pressure at Daily Av. Liquid Surf. Temp., psia	0.0112
Vapor Pressure at Daily Min. Liquid Surf. Temp., psia	0.0096
Vapor Pressure at Daily Max. Liquid Surf. Temp., psia	0.0129
Vapor Density, lb/ft^3	0.0001
Daily Vapor Pressure range, psi	0.003
Breather Vent Pressure Setting, psig (def. = 0.03)	0.0300
Breather Vent Vacuum Setting, psig (def. = -0.03)	-0.0300
Breather Vent Pressure Setting Range, psi	0.0600
Ambient Pressure, psia (def. = 14.7)	14.66
Vapor Space Expansion Factor	0.0221
Vented Vapor Saturation Factor	0.998
Annual Turnovers	198.6
Turnover Factor	0.32
Working Loss Product Factor (Crude Oil = 0.75, Else=1)	1.00
Standing Storage Loss, lb/yr	**0.28**
Working Loss, lb/yr	**4.32**
Total Losses, lb/yr	**4.60**

[1] Calculated in accordance with U.S EPA equations (U.S. EPA, "Compilation of Air Pollutant Emission Factors" (AP-42), February, 1996, section 7.1.3.1)

[2] Because of identical tank parameters and throughputs, Tank No.'s T2, T3, and T4 are assumed to have equivalent emissions to Tank No. T1

[3] Red values are user inputs, blue values are recommended defaults, and black values are calculated in accordance with AP-42 equations.

[4] Tanks are indoors and not exposed to direct sunlight therefore 'Daily Total Solar Insolation Factor' and 'Tank Paint Solar Absorbance' are each set equal to 0.

Resin Tank Methanol Emissions [1,2]

Tank Parameter	Value [3]
Tank Identification	Resin Tank 1 (T1)
Contents of Tank	Phenol-Formaldehyde Resin
Location	Inwood, WV
Tank Type (Vertical or Horizontal)	Vertical
Diameter, ft	14.0
Effective Diameter, ft	14.0
Shell Height or Length, ft	7.4
Nominal Capacity, gal	4,500
Geometric Capacity, gal	8,521
Throughput, gallons/yr	1,692,407
Average Liquid Height, ft (def. = Shell Height/2)	3.70
Maximum Liquid Height, ft	7.4
Roof Type (Cone or Dome)	Cone
Tank Roof Cone Slope, ft/ft (def. = 0.0625)	0.0625
Dome Tank Roof Radius, ft (def. = shell diameter)	N/A
Dome Tank Roof Height, ft	N/A
Roof Outage, ft	0.146
Vapor Space Outage, ft	3.85
Vapor Space Volume, ft^3	592
Average Daily Minimum Ambient Temperature, F	58.0
Average Daily Maximum Ambient Temperature, F	77.0
Daily Total Solar Insolation Factor, Btu/ft^2/day [4]	0
Daily Average Ambient Temperature, F	67.5
Tank Paint Solar Absorbance, dimensionless [4]	0.000
Daily Vapor Temperature Range, R	13.7
Daily Average Liquid Surf. Temperature, F	66.9
Daily Minimum Liquid Surf. Temperature, F	63.5
Daily Maximum Liquid Surf. Temperature, F	70.4
Liquid Bulk Temperature	66.5
Type of Substance (Organic or Petroleum)	Organic
Vapor Molecular Weight, lb/lbmol	32.0
Vapor Pressure at Daily Av. Liquid Surf. Temp., psia	0.0073
Vapor Pressure at Daily Min. Liquid Surf. Temp., psia	0.0066
Vapor Pressure at Daily Max. Liquid Surf. Temp., psia	0.0081
Vapor Density, lb/ft^3	0.0000
Daily Vapor Pressure range, psi	0.001
Breather Vent Pressure Setting, psig (def. = 0.03)	0.0300
Breather Vent Vacuum Setting, psig (def. = -0.03)	-0.0300
Breather Vent Pressure Setting Range, psi	0.0600
Ambient Pressure, psia (def. = 14.7)	14.66
Vapor Space Expansion Factor	0.0220
Vented Vapor Saturation Factor	0.999
Annual Turnovers	198.6
Turnover Factor	0.32
Working Loss Product Factor (Crude Oil = 0.75, Else=1)	1.00
Standing Storage Loss, lb/yr	**0.20**
Working Loss, lb/yr	**3.00**
Total Losses, lb/yr	**3.20**

[1] Calculated in accordance with U.S EPA equations (U.S. EPA, "Compilation of Air Pollutant Emission Factors" (AP-42), February, 1996, section 7.1.3.1)

[2] Because of identical tank parameters and throughputs, Tank No.'s T2, T3, and T4 are assumed to have equivalent emissions to Tank No. T1

[3] Red values are user inputs, blue values are recommended defaults, and black values are calculated in accordance with AP-42 equations.

[4] Tanks are indoors and not exposed to direct sunlight therefore 'Daily Total Solar Insolation Factor' and 'Tank Paint Solar Absorbance' are each set equal to 0.

Wax/De-dust Oil Tank VOC Emissions [1,2]

Tank Parameter	Value [3]
Tank Identification	Wax/De-dust Oil Tanks 1 (T7A & T7B)
Contents of Tank	Wax/De-dust Oil
Location	Inwood, WV
Tank Type (Vertical or Horizontal)	Vertical
Diameter, ft	8.0
Effective Diameter, ft	8.0
Shell Height or Length, ft	9.0
Nominal Capacity, gal	6,000
Geometric Capacity, gal	3,384
Throughput, gallons/yr	193,421
Average Liquid Height, ft (def. = Shell Height/2)	4.50
Maximum Liquid Height, ft	9.0
Roof Type (Cone or Dome)	Cone
Tank Roof Cone Slope, ft/ft (def. = 0.0625)	0.0625
Dome Tank Roof Radius, ft (def. = shell diameter)	N/A
Dome Tank Roof Height, ft	N/A
Roof Outage, ft	0.146
Vapor Space Outage, ft	4.65
Vapor Space Volume, ft^3	715
Average Daily Minimum Ambient Temperature, F	58.0
Average Daily Maximum Ambient Temperature, F	77.0
Daily Total Solar Insolation Factor, Btu/ft^2/day[4]	0
Daily Average Ambient Temperature, F	67.5
Tank Paint Solar Absorbance, dimensionless [4]	0.000
Daily Vapor Temperature Range, R	13.7
Daily Average Liquid Surf. Temperature, F	66.9
Daily Minimum Liquid Surf. Temperature, F	63.5
Daily Maximum Liquid Surf. Temperature, F	70.4
Liquid Bulk Temperature	66.5
Type of Substance (Organic or Petroleum)	Petroleum
Vapor Molecular Weight, lb/lbmol	190.0
Vapor Pressure at Daily Av. Liquid Surf. Temp., psia	0.00006
Vapor Pressure at Daily Min. Liquid Surf. Temp., psia	0.00005
Vapor Pressure at Daily Max. Liquid Surf. Temp., psia	0.00007
Vapor Density, lb/ft^3	0.0000
Daily Vapor Pressure range, psi	0.000
Breather Vent Pressure Setting, psig (def. = 0.03)	0.0300
Breather Vent Vacuum Setting, psig (def. = -0.03)	-0.0300
Breather Vent Pressure Setting Range, psi	0.0600
Ambient Pressure, psia (def. = 14.7)	14.66
Vapor Space Expansion Factor	0.0219
Vented Vapor Saturation Factor	1.000
Annual Turnovers	57.2
Turnover Factor	0.69
Working Loss Product Factor (Crude Oil = 0.75, Else=1)	1.00
Standing Storage Loss, lb/yr	**0.01**
Working Loss, lb/yr	**0.04**
Total Losses, lb/yr	**0.05**

[1] Calculated in accordance with U.S EPA equations (U.S. EPA, "Compilation of Air Pollutant Emission Factors" (AP-42), February, 1996, section 7.1.3.1)

[2] Because of identical tank parameters and throughputs, Tank No.'s T2, T3, and T4 are assumed to have equivalent emissions to Tank No. T1

[3] Red values are user inputs, blue values are recommended defaults, and black values are calculated in accordance with AP-42 equations.

[4] Tanks are indoors and not exposed to direct sunlight therefore 'Daily Total Solar Insolation Factor' and 'Tank Paint Solar Absorbance' are each set equal to 0.