



OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY STANDARD AIR CONTAMINATION DISCHARGE PERMIT

Western Region
4026 Fairview Industrial Drive SE
Salem, Oregon 97302

Issued in accordance with provisions of ORS 468A.040
and based on land use compatibility findings included in the permit record.

ISSUED TO:

Hollingsworth & Vose Fiber Company
P.O Box E
Corvallis, OR 97339-0598

INFORMATION RELIED UPON:

Application Number: 27213 R-0; 28511 R-03
Received: 3/1/2013
Amended: 1/29/2016 & 11/2/2018

PLANT SITE LOCATION:

Plant 1: 1551 SE Crystal Lake Drive
Plant 2: 1120 SE Crystal Lake Drive
Corvallis, OR 97333

LAND USE COMPATIBILITY STATEMENT:

Issued by: City of Corvallis
Dated: Plant 1: 03/08/1988 &
Amended 05/08/1996
Amended 6/4/2021
Plant 2: 01/03/1996 &
Amended 05/08/1996
Amended: 6/4/2021

ISSUED BY THE DEPARTMENT OF ENVIRONMENTAL QUALITY

Michael West, Western Region Air Quality Manager

November 23, 2022

Date

<u>Nature of Business</u>	<u>SIC</u>	<u>NAICS</u>
Glass fiber manufacturing and glass fiber products manufacturing	3296	327993

RESPONSIBLE OFFICIAL

Title: Site Manager

FACILITY CONTACT PERSON

Name: Anita Ragan
Title: EH&S Manager
Phone: 541-738-5382

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LIST OF ABBREVIATIONS THAT MAY BE USED IN THIS PERMIT

ACDP	Air Contaminant Discharge Permit	NSR	New Source Review
ASTM	American Society for Testing and Materials	O ₂	oxygen
AQMA	Air Quality Maintenance Area	OAR	Oregon Administrative Rules
calendar year	The 12-month period beginning January 1st and ending December 31 st	ORS	Oregon Revised Statutes
CAO	Cleaner Air Oregon	O&M	operation and maintenance
CFR	Code of Federal Regulations	Pb	lead
CO	carbon monoxide	PCD	pollution control device
CO _{2e}	carbon dioxide equivalent	PM	particulate matter
CPMS	continuous parameter monitoring system	PM ₁₀	particulate matter less than 10 microns in size
DEQ	Oregon Department of Environmental Quality	PM _{2.5}	particulate matter less than 2.5 microns in size
dscf	dry standard cubic foot	ppm	part per million
EF	emission factor	PSD	Prevention of Significant Deterioration
EPA	US Environmental Protection Agency	PSEL	Plant Site Emission Limit
FCAA	Federal Clean Air Act	PTE	Potential to Emit
Gal	gallon(s)	RACT	Reasonably Available Control Technology
GDF	gasoline dispensing facility	scf	standard cubic foot
GHG	greenhouse gas	SER	Significant Emission Rate
gr/dscf	grains per dry standard cubic foot	SERP	source emission reduction plan
HAP	Hazardous Air Pollutant as defined by OAR 340-244-0040	SIC	Standard Industrial Code
HCFC	halogenated chloro-fluoro-carbon	SIP	State Implementation Plan
ID	identification number	SO ₂	sulfur dioxide
I&M	inspection and maintenance	Special Control Area	as defined in OAR 340-204-0070
lb	pound(s)	ST	Source test
MMBtu	million British thermal units	TACT	Typically Achievable Control Technology
NA	not applicable	VE	visible emissions
NESHAP	National Emissions Standards for Hazardous Air Pollutants	VOC	volatile organic compound
NO _x	nitrogen oxides	year	A period consisting of any 12-consecutive calendar months
NSPS	New Source Performance Standard		

PERMITTED ACTIVITIES

1. Within 180 days of this permit being issued the permittee must apply for an Oregon Title V operating permit. [MAO Condition 17.d]
2. Until such time as this permit expires or is modified or revoked, the permittee is allowed to discharge air contaminants from those processes and activities directly related to or associated with air contaminant source(s) in accordance with the requirements, limitations, and conditions of this permit. [OAR 340-216-0010]

EMISSIONS UNIT (EU) AND POLLUTION CONTROL DEVICE (PCD) IDENTIFICATION

3. The emissions units regulated by this permit are the following:

Emission Unit Description	Device ID	Emission Unit ID	Pollution Control Device Description	PCD ID
Line 1 Rotary 1	L1R1	GF	Ceramic Filtration Unit	CFU-105 or 102
Line 1 Rotary 2	L1R2		Ceramic Filtration Unit	CFU-105 or 102
Line 1 Rotary 3	L1R3		Ceramic Filtration Unit	CFU-103
Line 1 Rotary 4	L1R4		Ceramic Filtration Unit	CFU-103
Line 1 Rotary 5	L1R5		Ceramic Filtration Unit	CFU-108 or 112
Line 1 Rotary 6	L1R6		Ceramic Filtration Unit	CFU-108 or 112
Line 1 Rotary 7	L1R7		Ceramic Filtration Unit	CFU-104
Line 1 Rotary 8	L1R8		Ceramic Filtration Unit	CFU-104
Line 1 Rotary 9	L1R9		Ceramic Filtration Unit	CFU-106
Line 1 Rotary 10	L1R10		Ceramic Filtration Unit	CFU-106
Line 1 Rotary 11	L1R11		Ceramic Filtration Unit	CFU-107
Line 1 Rotary 12	L1R12		Ceramic Filtration Unit	CFU-107
Line 2 Rotary 2	L2R2		Ceramic Filtration Unit	CFU-110
Line 2 Rotary 3	L2R3		Ceramic Filtration Unit	CFU-110 or 112
Line 2 Rotary 4	L2R4		Ceramic Filtration Unit	CFU-112 or 102
Line 2 Rotary 9	L2R9		Ceramic Filtration Unit	CFU-112 or 102
Line 2 Rotary 5	L2R5		Ceramic Filtration Unit	CFU-111 or 112
Line 2 Rotary 6	L2R6		Ceramic Filtration Unit	CFU-111 or 112
Line 2 Rotary 7	L2R7		Ceramic Filtration Unit	CFU-109 and 112
Line 2 Rotary 8	L2R8		Ceramic Filtration Unit	CFU-109 and 112
Line 3 Rotary 3	L3R3		Ceramic Filtration Unit	CFU-101
Line 3 Rotary 4	L3R4		Ceramic Filtration Unit	CFU-101
Line 3 Rotary 5	L3R5		Ceramic Filtration Unit	CFU-102
Line 3 Rotary 6	L3R6		Ceramic Filtration Unit	CFU-102
Line 4 Flameblown 1	L4F1	Ceramic Filtration Unit	CFU-114	
Line 4 Flameblown 2	L4F2	Ceramic Filtration Unit	CFU-114	
Line 4 Flameblown 3	L4F3	Ceramic Filtration Unit	CFU-115	
Line 4 Flameblown 4	L4F4	Ceramic Filtration Unit	CFU-115	
Line 4 Rotary 5	L4R5	Ceramic Filtration Unit	CFU-116	
Line 4 Rotary 10	L4R10	Ceramic Filtration Unit	CFU-116	
Line 4 Rotary 6	L4R6	Ceramic Filtration Unit	CFU-117	

Emission Unit Description	Device ID	Emission Unit ID	Pollution Control Device Description	PCD ID
Line 4 Rotary 7	L4R7		Ceramic Filtration Unit	CFU-117
Line 4 Rotary 8	L4R8		Ceramic Filtration Unit	CFU-118
Line 4 Rotary 9	L4R9		Ceramic Filtration Unit	CFU-118
Line 1 Forehearth	Line 1 Forehearth	FF	Ceramic Filtration Unit	CFU-113
Line 2 Forehearth	Line 2 Forehearth		Ceramic Filtration Unit	CFU-113
Glass Melter 1	Line 1 Furnace		Ceramic Filtration Unit	CFU-113
Glass Melter 2	Line 2 Furnace		Ceramic Filtration Unit	CFU-113
Unpaved Roads	NA	UPR	NA	NA

Aggregate Insignificant Emission Units

Emission Unit Description	Device ID	Emission Unit ID	Pollution Control Device Description	PCD ID	Pollutant
Bulking Agent Storage Silo 1	ST01	SS	Cartridge Filtration	CF1	PM
Bulking Agent Storage Silo 2	ST02		Cartridge Filtration	CF2	PM
Raw Material Transport/Mix	Raw Material Transport/Mix	RM	Baghouse	BBBH	PM
Line 1 Furnace Bin	L1 Furnace Bin		Baghouse	L1BH	PM
Line 2 Furnace Bin	L2 Furnace Bin		Baghouse	L2BH	PM
Raw Material Bin 1	Raw Material Bin 1		Baghouse	B1BH	PM
Raw Material Bin 2	Raw Material Bin 2		Baghouse	B2BH	PM
Raw Material Bin 3	Raw Material Bin 3		Baghouse	B3BH	PM
Raw Material Bin 4	Raw Material Bin 4		Baghouse	B4BH	PM
Raw Material Bin 5	Raw Material Bin 5		Baghouse	B5BH	PM
Raw Material Bin 6	Raw Material Bin 6		Baghouse	B6BH	PM
Raw Material Bin 7	Raw Material Bin 7		Baghouse	B7BH	PM
Raw Material Bin 8	Raw Material Bin 8	Baghouse	B8BH	PM	
Off Specification Bin	Off Spec Bin	Baghouse	BHBH	PM	

EMISSION LIMITS AND STANDARDS, TESTING, MONITORING, AND RECORDKEEPING REQUIREMENTS

The following tables and conditions contain the applicable requirements along with testing, monitoring, and recordkeeping requirements for the emissions units to which those requirements apply.

Summary of facility wide emission limits and standards

Applicable Requirement	Condition Number	Pollutant/Parameter	Limit/Standard	Monitoring Requirement	Monitoring Condition
340-208-0210	4	Fugitive emissions	Minimize	Quarterly VE Survey	5
340-208-0300	6	Air contaminants	Not cause a nuisance	Complaint investigation	8
340-208-0450	7	PM >250 μ	No observable deposition off site	Complaint investigation	8
340-228-0110(1)	9.a	ASTM Grade 1 distillate fuel oil	$\leq 0.3\%$ Sulfur by weight	Vendor certificate or periodic laboratory analysis of composite samples	10
340-228-0110(2)	9.b	ASTM Grade 2 distillate fuel oil and used oil	$\leq 0.5\%$ Sulfur by weight	Vendor certificate or periodic laboratory analysis of composite samples	10
340-228-0100	9.c	Residual oil	$\leq 1.75\%$ Sulfur by weight	Vendor certificate or periodic laboratory analysis of composite samples	10

4. Applicable Requirement: The permittee must not allow or permit any materials to be handled, transported, or stored; or a building, its appurtenances, or a road to be used, constructed, altered, repaired or demolished; or any equipment to be operated, without taking reasonable precautions to prevent particulate matter from becoming airborne. [OAR 340-208-0210]
 - 4.a. Such reasonable precautions must include, but not be limited to the following: [OAR 340-208-0210(1)]
 - 4.a.i. Use, where possible, of water or chemicals for control of dust in the demolition of existing buildings or structures, construction operations, the grading of roads or the clearing of land;
 - 4.a.ii. Application of water, or other suitable chemicals on unpaved roads, materials stockpiles, and other surfaces which can create airborne dusts;
 - 4.a.iii. Full or partial enclosure of materials stockpiles in cases where application of water or chemicals are not sufficient to prevent particulate matter from becoming airborne;
 - 4.a.iv. Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials;
 - 4.a.v. Adequate containment during sandblasting or other similar operations;
 - 4.a.vi. Covering, at all times when in motion, open bodied trucks transporting materials likely to become airborne; and
 - 4.a.vii. Prompt removal from paved streets of earth or other material that does or may become airborne.

- 4.b. Upon request by DEQ, the permittee must develop a fugitive emission control plan for approval by DEQ if the above precautions are not adequate, and implement the plan whenever fugitive emissions leave the property for more than 18 seconds in a six-minute period.
5. **Monitoring Requirement:** At least once each quarter for a minimum period of 30 minutes, the permittee must visually survey the plant for any sources of excess fugitive emissions. For the purpose of this survey, excess fugitive emissions are considered to be any visible emissions that leave the plant site boundaries for more than 18 seconds in a six-minute period. The person conducting the observation must follow the procedures of EPA Method 22. If sources of visible emissions are identified, the permittee must:
 - 5.a. Immediately take corrective action to minimize the fugitive emissions, including but not limited to those actions identified in Condition 4; or
 - 5.b. Develop a DEQ approved fugitive emission control plan upon request by DEQ and implement the plan whenever fugitive emissions leave the property for more than 18 seconds in a six-minute period.
 - 5.c. Recordkeeping: The permittee must maintain records of the fugitive emissions surveys, corrective actions (if necessary), and/or the results of any EPA Method 22 tests.

Nuisance Conditions

6. **Applicable Requirement:** The permittee must not cause or allow air contaminants from any source to cause a nuisance. Nuisance conditions will be verified by DEQ personnel. [OAR 340-208-0300]
7. **Applicable Requirement:** The permittee must not cause or permit the deposition of any particulate matter larger than 250 microns in size at sufficient duration or quantity, as to create an observable deposition upon the real property of another person. [OAR 340-208-0450]
8. **Monitoring Requirement:** The permittee must maintain a log of each air emission related nuisance complaint received by the permittee during the operation of the facility. Documentation must include date of contact, time of observed nuisance condition, description of nuisance condition, location of receptor, status of plant operation during the observed period, and time of response to complainant. A plant representative must immediately investigate the condition following the receipt of the nuisance complaint and a plant representative must provide a response to the complainant within 24 hours, if possible.

Fuels

9. **Applicable Requirement:** If the permittee burns any of the fuels listed below, the sulfur content cannot exceed:
 - 9.a. 0.3% sulfur by weight for ASTM Grade 1 distillate oil; [OAR 340-228-0110(1)]
 - 9.b. 0.5% sulfur by weight for ASTM Grade 2 distillate oil; [OAR 340-228-0110(2)]
 - 9.c. 1.75% sulfur by weight for residual oil; [OAR 340-228-0100]
10. **Monitoring Requirement:** The permittee must monitor the sulfur content of each shipment of fuel received by:
 - 10.a. Obtaining a sulfur content certificate from each vendor for each shipment of fuel received; or
 - 10.b. Analyzing or having analyzed by a contract laboratory a representative sample taken by the permittee from each shipment of fuel received.

Emission Unit Glass Fiberizer (GF) and Forehearth/Glass Melt (FF) Requirements

Applicable Requirement	Condition Number	Pollutant/Parameter	Limit/Standard	Monitoring Requirement	Monitoring Condition
340-208-0110(4)	11	Visible emissions	20% opacity, 6-minute block average	VE periodic monitoring; Inspection and maintenance; Testing	12
340-226-0210(2)(b)(B)	13	PM	0.14 gr/dscf, avg. of 3 test runs	ST periodic monitoring; Inspection and maintenance; Testing	15, 16 & 17
340-226-0310	14	PM	See Table in OAR 340-226-8010, avg. of 3 test runs	ST periodic monitoring; Inspection and maintenance; Testing	15, 16 & 17

Visible Emission Standard

11. The permittee must comply with the following visible emission limits for emission units GF and FF: [OAR 340-208-0110(4)]
- 11.a. Any visible emissions may not equal or exceed an average of 20 percent opacity; and
 - 11.b. The visible emissions standards in this condition are based on the average of 24 consecutive observations recorded at 15-second intervals, or more frequently as allowed under Condition 11.b.ii, which comprise a six-minute block. Six-minute blocks need not be consecutive in time and in no case may two blocks overlap. For each set of 24 observations, the six-minute block average is calculated by summing the opacity of the 24 observations and dividing the sum by 24. Six-minute block averages are measured by:
 - 11.b.i. EPA Method 9; or
 - 11.b.ii. A continuous opacity monitoring system (COMS) installed and operated in accordance with the DEQ Continuous Monitoring Manual or 40 CFR part 60; or
 - 11.b.iii. An alternative monitoring method approved by DEQ that is equivalent to EPA Method 9.

Visible Emission Monitoring

12. The permittee must monitor visible emissions from the stacks of emission units GF and FF by conducting an EPA Method 22 test.
- 12.a. EPA Method 22 must be conducted at least once per calendar quarter on each glass fiberizer and glass melter exhaust for a period of six minutes. The visible emission survey must be performed by employees or contractors of the permittee who have been trained in the general procedures for determining the presence of visible emissions, but they do not have to be EPA Method 9 certified.
 - 12.b. If visible emissions are identified for more than 5% of the EPA Method 22 survey time (18 seconds), EPA Method 9 must be used to determine the % opacity within 24 hours. EPA Method 9 observations period must be for a minimum of six minutes.
 - 12.c. If any one reading during the EPA Method 9 observation period is greater than or equal to 20% opacity, the observation period must be for a minimum of 60 minutes.
 - 12.d. All EPA Method 22 and EPA Method 9 tests must be performed during periods that the emission units to which the opacity standards apply are in operation.

Particulate Matter Emission Standard

13. The permittee may not emit particulate matter emissions from emission units GF and FF in excess of 0.14 grains per dry standard cubic foot. Compliance with the emission standards in this condition is determined using DEQ Method 7 or an alternative method approved by DEQ: [OAR 340-226-0210(2)(b)(B)]
14. The permittee must not cause or allow the emission of non-fugitive particulate matter emissions from any process in EU GF or EU FF to exceed the amount shown in the table located in OAR 340-226-8010 for the process weight allocated to such a process. [OAR 340-226-0310]

Particulate Matter Monitoring

15. The permittee must operate and maintain a pressure monitoring device on each CFU in accordance in accordance with the manufacturer's instructions and DEQ's continuous monitoring manual.
 - 15.a. The permittee must continuously monitor pressure drop readings for each CFU during any time that an associated fiberizer or glass melter is in operation.
 - 15.b. The permittee must take corrective action if the daily average (calendar day) pressure drop is below the normal operating minimum pressure drop range of 2.0 inches of water column on a CFU while the associated fiberizer or glass melter is in operation.
 - 15.c. If the pressure drop stays below 2.0 inches of water column longer than 72 hours, the permittee must conduct daily visible emissions tests using EPA Method 9, and must notify the DEQ within 48 hours of the cause and corrective actions taken and proposed.
 - 15.d. An excursion below the minimum average pressure drop of 2.0 inches of water column is not necessarily a violation of the particulate matter emission standard.
 - 15.e. Recordkeeping: The permittee must maintain records of pressure drop readings, any excursion periods, and corrective actions taken.

Inspection and Maintenance Monitoring

16. At least once per calendar quarter, the permittee must conduct external inspections of each CFU and associated ductwork for structural integrity, corrosion and air leaks and must take corrective action as needed to maintain the system in proper operating condition. At least once per calendar year, the permittee must conduct an internal inspection of the CFUs for leaks using a dye test or other DEQ approved method for detecting leaks and take corrective action as needed to maintain the system in proper operating condition.
 - 16.a. Recordkeeping: The permittee must maintain records of the inspections including date, findings, and corrective actions taken.

17. Testing Requirement(s):

The permittee must conduct the following at the frequency specified. All testing must be conducted in accordance with the DEQ Source Sampling Manual.

Glass Fiberization Size Category	Pollutant - units to report	Test type	Frequency	Test Method ^a	Operating condition	Operating parameters to monitor and record during testing
Flame Blown	NO _x – ppm _{dv} , lb/hr, lb/ton of glass produced CO – ppm _{dv} , lb/hr, lb/ton of glass produced PM – gr/dscf, lb/hr, lb/ton of glass produced Opacity - %	NO _x , CO, PM Emission Factor Verification PM & Opacity Compliance	At least once within 180 days of the issuance of this permit.	NO _x -EPA Method 7E CO – EPA Method 10 PM – ODEQ Method 7 Opacity – EPA Method 9	≥ normal load for emission factor verification > 90% of capacity or as allowed by Condition 22.c for compliance testing	<ul style="list-style-type: none"> Tons of glass fiber produced/hr Pressure drop across the CFU
Rotary Fine	NO _x – ppm _{dv} , lb/hr, lb/ton of glass produced CO – ppm _{dv} , lb/hr, lb/ton of glass produced PM – gr/dscf, lb/hr, lb/ton of glass produced Opacity - %	NO _x , CO, PM Emission Factor Verification PM & Opacity Compliance	At least once within 180 days of the issuance of this permit.	NO _x -EPA Method 7E CO – EPA Method 10 PM – ODEQ Method 7 Opacity – EPA Method 9	≥ normal load for emission factor verification > 90% of capacity or as allowed by Condition 22.c for compliance testing	<ul style="list-style-type: none"> Tons of glass fiber produced/hr Pressure drop across the CFU
Rotary Coarse	NO _x – ppm _{dv} , lb/hr, lb/ton of glass produced CO – ppm _{dv} , lb/hr, lb/ton of glass produced PM – gr/dscf, lb/hr, lb/ton of glass produced Opacity - %	NO _x , CO, PM Emission Factor Verification PM & Opacity Compliance	At least once within 180 days of the issuance of this permit.	NO _x -EPA Method 7E CO – EPA Method 10 PM – ODEQ Method 7 Opacity – EPA Method 9	≥ normal load for emission factor verification > 90% of capacity or as allowed by Condition 22.c for compliance testing	<ul style="list-style-type: none"> Tons of glass fiber produced/hr Pressure drop across the CFU
Ultra Rotary Coarse	NO _x – ppm _{dv} , lb/hr, lb/ton of glass produced CO – ppm _{dv} , lb/hr, lb/ton of glass produced PM – gr/dscf, lb/hr, lb/ton of glass produced Opacity - %	NO _x , CO, PM Emission Factor Verification PM & Opacity Compliance	At least once within 180 days of the issuance of this permit.	NO _x -EPA Method 7E CO – EPA Method 10 PM – ODEQ Method 7 Opacity – EPA Method 9	≥ normal load for emission factor verification > 90% of capacity or as allowed by Condition 22.c for compliance testing	<ul style="list-style-type: none"> Tons of glass fiber produced/hr Pressure drop across the CFU

^a The test method listed must be used unless an alternative method is approved by DEQ.

Insignificant Activities Requirements

18. DEQ acknowledges that insignificant emissions units (IEUs) identified by rule as either categorically insignificant activities or aggregate insignificant emissions as defined in OAR 340-200-0020 exist at facilities required to obtain an Oregon Title V Operating Permit. IEUs must comply with all applicable requirements. In general, the requirements that could apply to IEUs are incorporated as follows:
- 18.a. OAR 340-208-0110 (20% opacity)
 - 18.b. OAR 340-228-0210 (gr/dscf corrected to 12% CO₂ or 50% excess air for fuel burning equipment)
 - 18.c. OAR 340-226-0210 (gr/dscf for non-fugitive, non-fuel burning equipment)
 - 18.d. OAR 340-226-0310 (process weight limit for non-fugitive, non-fuel burning process equipment)
 - 18.e. Emergency stationary reciprocating internal combustion engines (RICE) are subject to the following requirements: [40 CFR 63.6640(f)]
 - 18.e.i. For each emergency stationary RICE, the permittee must:
 - 18.e.i.A. Change oil and filter every 500 hours of operation or annually, whichever comes first; [40 CFR 63.6603(a), table 2d(4)(a)]
 - 18.e.i.B. Inspect air cleaner every 1,000 hours of operation or annually, whichever comes first; [40 CFR 63.6603(a), table 2d(4)(b)]
 - 18.e.i.C. inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary; [40 CFR 63.6603(a), table 2d(4)(c)]
 - 18.e.i.D. During periods of startup, minimize the engine's time spent at idle and minimize the engine's startup time at startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations apply; and [40 CFR 63.6603(a), table 2d]
 - 18.e.ii. The permittee must install a non-resettable hour meter on each emergency stationary RICE, if one is not already installed. [40 CFR 63.6625(f)]
 - 18.e.iii. The permittee must operate and maintain the stationary RICE according to the manufacturer's emission related operation and maintenance instructions [40 CFR 63.6640(a), Table 6(9)]
 - 18.e.iv. Operating conditions: [40 CFR 63.6640(f)(2)]
 - 18.e.iv.A. There is no time limit on the use of emergency stationary RICE in emergency situations.
 - 18.e.iv.B. Emergency stationary RICE may be operated for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by the manufacturer, the vendor, or the insurance company associated with the engine. Required testing of such units should be minimized, but there is no time limit on the use of emergency stationary RICE in emergency situations and for routine testing and maintenance.
 - 18.e.iv.C. Emergency stationary RICE may be operated for an additional 50 hours per year in non-emergency situations. The 50 hours per year for non-emergency situations cannot be used for peak shaving or to generate income for a facility to supply power to an electric grid or otherwise supply power as part of a financial arrangement with another utility.
 - 18.e.v. The permittee must keep records of the hours of operation of each emergency stationary RICE that is recorded through the non-resettable hour meter. The permittee must document how many hours are spent for emergency operation, including what classified the operation as emergency and how many hours are spent for non-emergency operation. If the engines are used for demand response operation, the permittee must keep records of the notification of the emergency situation, and the time the engine was operated as part of demand response. [40 CFR 63.6655(f)]

Unless otherwise specified in this permit or an applicable requirement, DEQ is not requiring any testing, monitoring, recordkeeping, or reporting for the applicable emissions limits and standards that apply to IEUs. However, if testing were performed for compliance purposes, the permittee would be required to use the test methods identified in and perform the testing in accordance with DEQ's Source Sampling Manual.

PLANT SITE EMISSION LIMITS

19. The permittee must not cause or allow plant site emissions to exceed the following limits for any 12 consecutive calendar month period: [OAR 340-222-0035 through OAR 340-222-0041]

Pollutant	Plant Site Emission Limit (tons/yr)	Unassigned Emissions (tons/yr)
PM	24	52
PM ₁₀	14	40
PM _{2.5}	14	35
SO ₂	39	0
NO _x	40	58
CO	986	0
VOC	39	0
Fluoride	na	0
GHG (CO ₂ e)	74,000	0

- 19.a. The permittee may only use Unassigned Emissions after any necessary construction (OAR 340-214-0190) and permit revision applications have been approved by DEQ.

20. Monitoring Requirement:
 The permittee must conduct the following monitoring activities for use in calculating emission rates in Condition 21.

- 20.a The permittee must maintain records of the following process parameters:

Emissions Units/Process	Process Parameter	Units	Frequency
Flame Blown	Glass fiber produced	Tons	Monthly and Annually
Rotary Fine	Glass fiber produced	Tons	Monthly and Annually
Rotary Coarse	Glass fiber produced	Tons	Monthly and Annually
Ultra Rotary Coarse	Glass fiber produced	Tons	Monthly and Annually
Line 1 & 2 Glass Melter/ Forehearths	Glass melted	Tons	Monthly and Annually
Facility wide	Natural gas	MMscf	Monthly and Annually

21. The permittee must determine compliance with the Plant Site Emission Limits established in Condition 19 of this permit by conducting monitoring and calculations for each rolling 12-month period in accordance with the following procedures, test methods, and frequencies except for GHGs:

- 21.a. The permittee must calculate emissions using the following formula, process parameters, and emission factors:

$$E = \sum P_{eu} \times EF_{eu} \times K + AI$$

where:

- E = Pollutant emissions in lbs/month and tons/yr;
- P_{eu} = Process parameter amount identified in Condition 20.a;
- EF_{eu} = Emission factor identified for each emissions unit and pollutant in Condition 21.b;
- K = Conversion constant: 1 lb/lb for monthly emissions calculations; 1 ton/2,000 lbs for annual emissions calculations; and
- AI = 0.083 tons/month or 1 ton/yr for PM, PM₁₀, PM_{2.5}.

21.b. The emission factors for calculating pollutant emissions are as follows:

Emission Source Description	Throughput Type [Units]	Emission Factors (lb/throughput unit)				
		PM/PM ₁₀ /PM _{2.5}	SO ₂	NO _x	CO	VOC
Flame Blown	Ton of flame blown glass fiber produced	4.83	na	25.6	511	2.41
Rotary Fine	Ton of rotary fine glass fiber produced	2.61	na	7.46	184	3.05
Rotary Coarse	Ton of rotary coarse glass fiber produced	0.69	na	2.08	56.9	0.315
Ultra Rotary Coarse	Ton of ultra rotary coarse glass fiber produced	0.415	na	0.265	10.9	0.34
Line 1 & 2 Glass Melter/Forehearths	Ton of glass melted	0.0355	0.04	0.0345	0.135	0.0755
Facility wide	MMSCF of Natural gas	na	1.7	na	na	na
Vehicle miles	Tons of glass melted	0.0829/0.0237/ 0.00254	na	na	na	na

21.c. The emissions factors listed in Condition 21.b are not enforceable limits unless otherwise specified in this permit. Compliance with PSELS must only be determined by the calculations contained in this Condition 21 and Condition 32.

GENERAL TESTING REQUIREMENTS

22. Unless otherwise specified in this permit, the permittee must conduct all testing in accordance with DEQ's Source Sampling Manual. [OAR 340-212-0120]
- 22.a. Unless otherwise specified by a state or federal regulation, the permittee must submit a source test plan to DEQ at least 30 days prior to the date of the test. The test plan must be prepared in accordance with the Source Sampling Manual and address any planned variations or alternatives to prescribed test methods. Permittee should be aware, if significant variations are requested, it may require more than 30 days for DEQ to grant approval and may require EPA approval in addition to approval by DEQ.
 - 22.b. Only regular operating staff may adjust the processes or emission control device parameters during a compliance source test and within two (2) hours prior to the tests. Any operating adjustments made during a compliance source test, which are a result of consultation during the tests with source testing personnel, equipment vendors, or consultants, may render the source test invalid.
 - 22.c. Unless otherwise specified by permit condition or DEQ approved source test plan, all compliance source tests must be performed as follows:
 - 22.c.i. At least 90% of the design capacity for new or modified equipment;
 - 22.c.ii. At least 90% of the maximum operating rate for existing equipment; or

- 22.c.iii. At 90 to 110% of the normal maximum operating rate for existing equipment. For purposes of this permit, the normal maximum operating rate is defined as the 90th percentile of the average hourly operating rates during a 12 month period immediately preceding the source test. Data supporting the normal maximum operating rate must be included with the source test report.
- 22.d. Each source test must consist of at least three (3) test runs and the emissions results must be reported as the arithmetic average of all valid test runs. If for reasons beyond the control of the permittee a test run is invalid, DEQ may accept two (2) test runs for demonstrating compliance with the emission limit or standard.
- 22.e. Source test reports prepared in accordance with DEQ's Source Sampling Manual must be submitted to DEQ within 60 days of completing any required source test, unless a different time period is approved in the source test plan submitted prior to the source test.

GENERAL MONITORING AND RECORDKEEPING REQUIREMENTS

General Monitoring Requirements:

- 23. The permittee must not knowingly render inaccurate any required monitoring device or method.
- 24. The permittee must comply with the monitoring requirements on the date of permit issuance unless otherwise specified in the permit or an applicable requirement.

General Recordkeeping Requirements

- 25. The permittee must maintain the following general records of testing and monitoring required by this permit:
 - 25.a. The date, place as defined in the permit, and time of sampling or measurements;
 - 25.b. The date(s) analyses were performed;
 - 25.c. The company or entity that performed the analyses;
 - 25.d. The analytical techniques or methods used;
 - 25.e. The results of such analyses;
 - 25.f. The operating conditions as existing at the time of sampling or measurement; and
 - 25.g. The records of quality assurance for continuous monitoring systems (including but not limited to quality control activities, audits, calibration drift checks).
- 26. Unless otherwise specified by permit condition, the permittee must make every effort to maintain 100 percent of the records required by the permit. If information is not obtained or recorded for legitimate reasons (e.g., the monitor or data acquisition system malfunctions due to a power outage), the missing record(s) will not be considered a permit deviation provided the amount of data lost does not exceed 10% of the averaging periods in a reporting period or 10% of the total operating hours in a reporting period, if no averaging time is specified. Upon discovering a required record is missing, the permittee must document the reason for the missing record. In addition, any missing record that can be recovered from other available information will not be considered a missing record. [OAR 340-214-0110 and 340-214-0114]
- 27. The permittee must comply with the recordkeeping requirements on the date of permit issuance unless otherwise specified in the permit or an applicable requirement.
- 28. Unless otherwise specified, the permittee must retain records of all required monitoring data and support information for a period of at least five (5) years from the date of the monitoring sample, measurement, report, or application. Support information includes all calibration and maintenance records and all original strip-chart recordings (or other original data) for continuous monitoring instrumentation, and copies of all reports required by the permit. All existing records required by the previous Air Contaminant Discharge Permit or Oregon Title V Operating Permit must also be retained for five (5) years from the date of the monitoring sample, measurement, report, or application.

REPORTING REQUIREMENTS

General Reporting Requirements

29. Excess Emissions Reporting: The permittee must report all excess emissions as follows:
[OAR 340-214-0300 through 340-214-0360]
- 29.a. Immediately (within 24 hours of the event or by 9am the next business day) notify DEQ of an excess emission event by phone, email, or facsimile; and
 - 29.b. Within 15 days of the excess emissions event, submit a written report that contains the following information: [OAR 340-214-0340(1)]
 - 29.b.i. The date and time of the beginning of the excess emissions event and the duration or best estimate of the time until return to normal operation;
 - 29.b.ii. The date and time the permittee notified DEQ of the event;
 - 29.b.iii. The equipment involved;
 - 29.b.iv. Whether the event occurred during planned startup, planned shutdown, scheduled maintenance, or as a result of a breakdown, malfunction, or emergency;
 - 29.b.v. Steps taken to mitigate emissions and corrective action taken, including whether the approved procedures for a planned startup, shutdown, or maintenance activity were followed;
 - 29.b.vi. The magnitude and duration of each occurrence of excess emissions during the course of an event and the increase over normal rates or concentrations as determined by continuous monitoring or best estimate (supported by operating data and calculations);
 - 29.b.vii. The final resolution of the cause of the excess emissions; and
 - 29.b.viii. Where applicable, evidence supporting any claim that emissions in excess of technology-based limits were due to any emergency pursuant to OAR 340-214-0360.
 - 29.c. In the event of any excess emissions which are of a nature that could endanger public health and occur during non-business hours, weekends, or holidays, the permittee must immediately notify DEQ by calling the Oregon Accident Response System (OARs). The current number is 1-800-452-0311.
 - 29.d. If startups, shutdowns, or scheduled maintenance may result in excess emissions, the permittee must submit startup, shutdown, or scheduled maintenance procedures used to minimize excess emissions to DEQ for prior authorization, as required in OAR 340-214-0310 and 340-214-0320. New or modified procedures must be received by DEQ in writing at least 72 hours prior to the first occurrence of the excess emission event. The permittee must abide by the approved procedures and have a copy available at all times.
 - 29.e. The permittee must continue to maintain a log of all excess emissions in accordance with OAR 340-214-0340(3). However, the permittee is not required to submit the detailed log with the semi-annual and annual monitoring reports. The permittee is only required to submit a brief summary listing the date, time, and the affected emissions units for each excess emission that occurred during the reporting period.
30. Reporting requirements must commence on the date of permit issuance unless otherwise specified in the permit.

Addresses of regulatory agencies are the following, unless otherwise instructed:

Submit all Notices and applications that do not include payment to the Western Region's Permit Coordinator.

Submit all reports (annual reports, source test plans and reports, etc.) to DEQ's Western Region. If you know the name

Submit payments for invoices, applications to modify the permit, and any other payments to DEQ's Business Office:
DEQ – Air Quality Division
700 NE Multnomah St., Suite 600
Portland, OR 97232
503-229-5359

Submit all reports for EPA requirements to:
Air Operating Permits
US Environmental Protection Agency
Mail Stop OAQ-108
1200 Sixth Avenue
Seattle, WA 98101

of the Air Quality staff member responsible for your permit, please include it.

Western Region
4026 Fairview Industrial Drive
SE
Salem, OR 97302
(503) 378-8240

Annual Report

31. For each year this permit is in effect, the permittee must submit to the DEQ western region office by March 15 two (2) paper copies and one (1) electronic copy of the following information for the previous calendar year:
 - 31.a. Operating parameters:
 - 31.a.i. Tons of glass melted;
 - 31.a.ii. Tons of Flame Blown fiber produced;
 - 31.a.iii. Tons of Rotary Fine fiber produced;
 - 31.a.iv. Tons of Rotary Coarse fiber produced;
 - 31.a.v. Tons of Ultra Rotary Coarse fiber produced;
 - 31.a.vi. MMscf of natural gas used;
 - 31.a.vii. The following records for each emergency stationary RICE identified: [40 CFR 63.6655(f)]
 - 31.a.vii.A Hours of operation of each emergency stationary RICE that is recorded through the non-resettable hour meter;
 - 31.a.vii.B Hours of emergency operation; including what classified the operation as emergency; and
 - 31.a.vii.C Hours of non-emergency operation used for maintenance checks and readiness testing.
 - 31.a.viii. Calculation of annual pollutant emissions determined each month in accordance with Condition 21;
 - 31.a.ix. A summary listing the date, time, and affected device/process for each excess emission that occurred during the reporting period;
 - 31.a.x. A summary of complaints relating to air quality received by the permittee during the reporting period;
 - 31.a.xi. List permanent changes made in facility process, production levels, and pollution control equipment which affected air contaminant emissions; and
 - 31.a.xii. List major maintenance performed on pollution control equipment.
 - 31.a.x.iii. State whether the average diameter of the glass fibers produced at the facility is more or less than 1 micron.
32. Greenhouse Gas Registration and Reporting: If the calendar year emission rate of greenhouse gases (CO₂e) is greater than or equal to 2,756 tons (2,500 metric tons), the permittee must register and report its greenhouse gas emissions with DEQ in accordance with OAR 340-215.

GENERAL CONDITIONS

G1. General Provision

Terms not otherwise defined in this permit have the meaning assigned to such terms in the referenced regulation.

G2. Reference materials

Where referenced in this permit, the versions of the following materials are effective as of the dates noted unless otherwise specified in this permit:

- a. Source Sampling Manual; November 15, 2018.
- b. Continuous Monitoring Manual; April 16, 2015 - State Implementation Plan Volume 3, Appendix A6; and
- c. All state and federal regulations as in effect on the date of issuance of this permit.

G3. Masking Emissions:

The permittee must not install or use any device or other means designed to mask the emission of an air contaminant that causes or is likely to cause detriment to health, safety, or welfare of any person or otherwise violate any other regulation or requirement. [OAR 340-208-0400] This condition is enforceable only by the State.

G4. Credible Evidence:

Notwithstanding any other provisions contained in any applicable requirement, any credible evidence may be used for the purpose of establishing whether a person has violated or is in violation of any such applicable requirements. [OAR 340-214-0120]

G5. Open Burning [OAR Chapter 340, Division 264]

The permittee is prohibited from conducting open burning, except as may be allowed by OAR 340-264-0020 through 340-264-0200.

G6. Asbestos [40 CFR Part 61, Subpart M (federally enforceable), OAR Chapter 340-248-0005 through 340-248-0180 (state-only enforceable) and 340-248-0205 through 340-248-0280]

The permittee must comply with OAR Chapter 340, Division 248, and 40 CFR Part 61, Subpart M when conducting any renovation or demolition activities at the facility.

G7. Stratospheric Ozone and Climate Protection [40 CFR 82 Subpart F, OAR 340-260-0040]

The permittee must comply with the standards for recycling and emissions reduction pursuant to 40 CFR Part 82, Subpart F, Recycling and Emissions Reduction.

G8. Construction/Operation Modification

The permittee must obtain approval from DEQ prior to construction or modification of any stationary source or air pollution control equipment in accordance with OAR 340-210-0205 through OAR 340-210-0250.

G9. New Source Review Modification [OAR 340-224-0010]

The permittee may not begin construction of a major source or a major modification of any stationary source without having received an Air Contaminant Discharge Permit (ACDP) from DEQ and having satisfied the requirements of OAR 340, Division 224.

G10. Duty to Provide Information [OAR 340-214-0110]

The permittee must furnish to DEQ, within a reasonable time, any information that DEQ may request in writing to determine whether cause exists for modifying, revoking and reissuing, or terminating the permit, or to determine compliance with the permit. Upon request, the permittee must also furnish to DEQ copies of records required to be retained by the permit or, for information claimed to be confidential, the permittee may furnish such records to DEQ along with a claim of confidentiality.

G11. Reopening for Cause [OAR 340-216-0082]

- a. The permit may be modified, revoked, reopened and reissued, or terminated for cause as determined by DEQ.
- b. Proceedings to reopen and reissue a permit must follow the same procedures as apply to initial permit issuance and affect only those parts of the permit for which cause to reopen exists.

G12. Property Rights [OAR 340-200-0020]

The permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations.

G13. Notice of Change of Ownership or company Name

The permittee must notify DEQ in writing using a DEQ "Transfer Application Form" within 60 days after the following:

- a. Legal change of the name of the company as registered with the Corporations Division of the State of Oregon; or
- b. Sale or exchange of the activity or facility.

G14. Construction or Modification Notices

The permittee must notify DEQ in writing using a DEQ "Notice of Intent to Construct Form," or other permit application form and obtain approval in accordance with OAR 340-210-0205 through 340-210-0250 before:

- a. Constructing, installing, or establishing a new stationary source that will cause an increase in any regulated pollutant emissions;
- b. Making any physical change or change in operation of an existing stationary source that will cause an increase, on an hourly basis at full production, in any regulated pollutant emissions; or
- c. Constructing or modifying any air pollution control equipment.

G15. Air Toxics Emission Inventory [OAR 340-245-0040]

The permittee must submit an air toxics emission inventory every three years. DEQ will notify the

permittee in writing and provide a reporting form.

G16. Permit Modifications

Application for a modification of this permit must be submitted within 60 days prior to the source modification. When preparing an application, the applicant should also consider submitting the application 180 days prior to allow DEQ adequate time to process the application and issue a permit before it is needed. A special activity fee must be submitted with an application for the permit modification. The fees and two (2) copies of the application must be submitted to the DEQ Business Office.

G17. Annual Compliance Fee [OAR-340-216-8020]

The permittee must pay the annual fees specified in OAR 340-216-8020, Table 2, Part 2 and 3 for a Standard ACDP on December 1 of each year this permit is in effect. An invoice indicating the amount, as determined by DEQ regulations will be mailed prior to the above date. Late fees in accordance with Part 5 of the table will be assessed as appropriate.

G18. Change of Ownership or Company Name Fee [OAR-340-216-8020]

The permittee must pay the non-technical permit modification fee specified in OAR 340-216-8020, Table 2, Part 4 with an application for changing the ownership or the name of the company.

G19. Special Activity Fees [OAR 340-216-8020]

The permittee must pay the special activity fees specified in OAR 340-216-8020, Table 2, Part 4 with an application to modify the permit.

G20. Payment submittal

The permittee must submit payments for invoices, applications to modify the permit, and any other payments to DEQ's Business Office:

Oregon Dept. of Environmental Quality
Financial Services -- Revenue Section
700 NE Multnomah St., Suite 600

G21. Report, notice, and application submittal to Permit Coordinator

The permittee must submit all notices, reports (annual reports, source test plans and reports, etc.), and applications that do not include payment to the Permit Coordinator.

Oregon Dept. of Environmental Quality
Western Region
Air Quality Permit Coordinator
4026 Fairview Industrial Drive SE
Salem, OR 97302-1142

G.22. Permitted Activities

- a. Until this permit expires or is modified or revoked, the permittee is allowed to discharge air contaminants from the following:
 - i. Processes and activities directly related to or associated with the devices/processes listed in this permit;
 - ii. Any categorically insignificant activities, as defined in OAR 340-200-0020, at the source; and

- iii. Construction or modification changes that are Type 1 or Type 2 changes under OAR 340-210-0225 that are approved by DEQ in accordance with OAR 340-210-0215 through 0250, if the permittee complies with all of the conditions of DEQ's approval to construct and all of the conditions of this permit.
- b. Discharge of air contaminants from any other equipment or activity not identified herein is not authorized by this permit.

G.23. Other Regulations

In addition to the specific requirements listed in this permit, the permittee must comply with all other applicable legal requirements enforceable by DEQ.

G.24. DEQ Access

The permittee must allow DEQ's representatives access to the plant site and pertinent records at all reasonable times for the purposes of performing inspections, surveys, collecting samples, obtaining data, reviewing and copying air contaminant emissions discharge records and conducting all necessary functions related to this permit in accordance with ORS 468.095.

G.25. Permit Expiration [OAR 340-216-0082]

- a. A source may not be operated after the expiration date of the permit, unless any of the following occur prior to the expiration date of the permit: [OAR 340-216-0082]
 - a.i. A timely and complete application for renewal of this permit or for a different ACDP has been submitted; or
- b. A timely and complete application for renewal or for an Oregon Title V Operating Permit has been submitted, or
- c. Another type of permit (ACDP or Oregon Title V Operating Permit) has been issued authorizing operation of the source.
- d. For a source operating under an ACDP or Oregon Title V Operating Permit, a requirement established in an earlier ACDP remains in effect notwithstanding expiration of the ACDP, unless the provision expires by its terms or unless the provision is modified or terminated according to the procedures used to establish the requirement initially.

G.26. Permit Termination, Revocation, or Modification [OAR 340-216-0082]

DEQ may terminate, revoke, or modify this permit pursuant to OAR chapter 340 division 216.

All inquiries should be directed to:
Western Region
4026 Fairview Industrial Drive SE
Salem, OR 97302
(503) 378-8240

Attachment 1
Source Test Results

SOURCE TEST RESULTS

The test results in the table below are all after the wet scrubbers were removed and replaced with ceramic filtration units. The addition of these controls and associated variable speed fans and ducting probably had some effect on emissions rates listed below. Therefore, test results prior to these changes are not included in the averages.

Flame Blown (CFU 114)																										
Date	PM			VOC				NOx				CO				Formaldehyde			Total Fluoride			Hydrogen Fluoride				
	gr/dscf	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass	
4/26/2018 4/27/2018	Run 1	<0.00089	<0.15	<5.00	0.56	0.077	2.52	0.0145	5.6	0.8	23.33	0.151	126.3	10.97	359.8	2.068	0.14	0.013	0.44	0.0025	0.047	0.0029	0.094	0.042	0.0027	0.087
	Run 2	<0.00088	<0.15	<5.00	0.49	0.068	2.24	0.0129	5.6	0.81	26.57	0.153	125.5	11.06	362.7	2.085	0.11	0.01	0.33	0.00192	<0.029	<0.0017	<0.057	0.042	0.0027	0.088
	Run 3	<0.00088	<0.15	<5.02	0.62	0.087	2.284	0.0163	5.5	0.8	26.11	0.15	129.2	11.42	374.3	2.149	0.13	0.012	0.4	0.0023	<0.029	<0.0018	<0.058	0.042	0.0028	0.09
	Avg	<0.00088	<0.15	<5.00	0.56	0.077	2.53	0.0146	5.6	0.8	26.34	0.151	127	11.15	365.6	2.101	0.12	0.12	0.39	0.00224	<0.070	<0.0021	<0.070	0.043	0.0027	0.089
Flame Blown (CFU 114)																										
Date	PM			VOC				NOx				CO				Formaldehyde			Total Fluoride			Hydrogen Fluoride				
	gr/dscf	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass	
6/5/2018 - 6/6/2018	Run 1	na	na	na	<0.51	<0.069	<2.26	<0.0117	5.3	0.75	24.71	0.0128	135.5	11.65	381.8	1.982	0.12	0.011	0.38	0.00195	0.022	0.0014	0.045	0.0035	0.00023	0.0074
	Run 2	<0.00083	<0.14	<4.68	<0.51	<0.070	<2.3	<0.0118	5.3	0.76	24.94	0.0128	137.2	11.95	391.9	2.009	0.28	0.026	0.87	0.00445	<0.014	<0.0009	<0.028	0.0038	0.00025	0.0081
	Run 3	<0.00083	<0.14	<4.65	<0.51	<0.070	<2.31	<0.0118	5.3	0.77	25.1	0.0128	136.1	11.92	390.8	1.997	0.13	0.012	0.39	0.002	<0.014	<0.0009	<0.028	0.0038	0.00024	0.0079
	Avg	<0.00083	<0.14	<4.66	<0.51	<0.070	<2.29	<0.0118	5.3	0.76	24.92	0.0128	136.3	11.84	388.2	1.996	0.18	0.017	0.54	0.0028	<0.017	<0.0010	<0.034	0.0037	0.00024	0.0078
Flame Blown Average Test Result																										
Average test results	PM			VOC				NOx				CO				Formaldehyde			Total Fluoride			Hydrogen Fluoride				
	gr/dscf	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass	
			4.83			2.41				25.63				376.9				0.465						0.052		0.0484

Rotary Fine (CFU 117)																										
Date	PM			VOC				NOx				CO				Formaldehyde				Total Fluoride			Hydrogen Fluoride			
	gr/dscf	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass	
4/29/2018	Run 1	<0.001	<0.15	<2.72	2.3	0.28	4.86	0.0522	3.6	0.46	7.88	0.0846	159.7	12.27	211.7	2.274	0.49	0.042	0.73	0.00782	<0.031	<0.0017	<0.031	0.063	0.0037	0.066
	Run 2	<0.00097	<0.15	<2.77	2	0.25	4.52	0.0455	3.6	0.47	8.64	0.87	164.6	13.1	239.2	2.41	0.5	0.043	0.79	0.00797	<0.032	<0.0017	<0.031	0.051	0.003	0.053
	Run 3	<0.00097	<0.15	<2.76	1.4	0.17	3.12	0.031	3.4	0.45	8.15	0.81	165.5	13.17	240.5	2.39	0.52	0.044	0.81	0.00801	<0.032	<0.0017	<0.031	0.058	0.0033	0.06
	5/1/2018	Avg	<0.00098	<0.15	<2.72	1.9	0.23	4.16	0.0429	3.6	0.46	8.22	0.842	163.3	12.84	230.5	2.358	0.5	0.043	0.78	0.00794	<0.031	<0.0017	<0.031	0.057	0.0033

Rotary Fine (CFU 117)																										
Date	PM			VOC				NOx				CO				Formaldehyde				Total Fluoride			Hydrogen Fluoride			
	gr/dscf	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass	
6/9/2018	Run 1	<0.00091	<0.15	<2.49	0.95	0.12	2.07	0.023	2.9	0.38	6.51	0.0725	164.4	13.38	227.8	2.538	0.52	0.046	0.79	0.00877	<0.014	<0.00079	<0.014	0.0063	0.00037	0.0063
	Run 2	<0.00088	<0.15	<2.50	0.83	0.11	1.9	0.0212	2.9	0.4	6.86	0.0764	160.7	13.64	232.2	2.588	0.5	0.044	0.75	0.00831	<0.014	<0.00079	<0.014	0.005	0.0003	0.0051
	Run 3	<0.00091	<0.15	<2.50	0.85	0.11	1.85	0.0206	2.9	0.4	6.73	0.747	165.1	13.48	229.4	2.549	0.53	0.047	0.79	0.0088	0.016	0.0009	0.016	0.005	0.00029	0.51
	Avg	<0.0009	<0.15	<2.50	0.88	0.11	1.94	0.0216	2.9	0.39	6.7	0.0745	163.4	13.5	229.8	2.558	0.52	0.046	0.78	0.00863	<0.015	<0.00083	<0.014	0.0054	0.00032	0.0055

Rotary Fine Average Test Result																											
Date	PM			VOC				NOx				CO				Formaldehyde				Total Fluoride			Hydrogen Fluoride				
	gr/dscf	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass		
	Average test results			2.61			3.05				7.46				230.15				0.78						0.0225		0.03275

Rotary Coarse (CFU 107)																										
Date	PM			VOC				NOx				CO				Formaldehyde				Total Fluoride			Hydrogen Fluoride			
	gr/dscf	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass	
6/13/2018	Run 1	<0.00081	<0.11	<0.59	<0.51	<0.054	<0.30	<0.0111	3.6	0.4	2.17	0.081	124.2	8.38	46	1.717	0.11	0.0078	0.043	0.0016	0.036	0.0016	0.0085	0.0058	0.000277	0.00148
	Run 2	<0.00080	<0.11	<0.59	<0.51	<0.055	<0.30	<0.0109	3.8	0.43	2.37	0.084	125.9	8.63	47.6	1.718	0.12	0.0084	0.046	0.00168	0.036	0.0016	0.0085	0.0037	0.000177	0.000956
	Run 3	<0.00080	<0.11	<0.60	<0.51	<0.055	<0.30	<0.0108	3.7	0.42	2.32	0.083	127.4	8.73	48.3	1.728	0.12	0.0081	0.045	0.0016	0.4	0.0018	0.0098	0.0022	0.000106	0.000578
6/14/2018	Avg	<0.0008	<0.11	<0.59	<0.51	<0.055	<0.30	<0.0109	3.7	0.42	2.29	0.083	125.8	8.58	47.3	1.721	0.11	0.0081	0.045	0.00163	0.37	0.0017	0.0089	0.029	0.000187	0.00101

Rotary Coarse (CFU 104)																										
Date	PM			VOC				NOx				CO				Formaldehyde				Total Fluoride			Hydrogen Fluoride			
	gr/dscf	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass	
9/28/2018	Run 1	<0.00098	<0.15	<0.79	0.53	0.064	0.34	0.0122	3.2	0.4	2.15	0.077	145.3	11.11	59.4	2.127	0.17	0.014	0.074	0.00263	<0.018	<0.0009	<0.0049	<0.0015	<0.000821	<0.000447
	Run 2	<0.00097	<0.15	<0.80	<0.51	<0.061	<0.34	<0.0116	3.2	0.4	2.2	0.076	145.5	11.11	61	2.107	0.18	0.014	0.078	0.0027	<0.018	<0.0009	<0.0049	<0.0014	<0.000745	<0.00041
	Run 3	<0.00098	<0.15	<0.79	<0.51	<0.060	<0.33	<0.0114	2.8	0.35	1.88	0.066	149.7	11.23	60.9	2.128	0.2	0.016	0.085	0.00296	<0.018	<0.0009	<0.0048	<0.0014	<0.000775	<0.000415
	Avg	<0.00098	<0.15	<0.79	<0.52	<0.062	<0.33	<0.0117	3.1	0.38	2.08	0.073	146.8	11.15	60.4	2.121	0.18	0.015	0.079	0.00276	<0.018	<0.0009	<0.0049	<0.0014	<0.000781	<0.000424

Rotary Coarse Average Test Result																											
Date	PM			VOC				NOx				CO				Formaldehyde				Total Fluoride			Hydrogen Fluoride				
	gr/dscf	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass		
	Average test results			0.69			0.315				2.085				54.1				0.065						0.0069		0.000717

Ultra Rotary Coarse (CFU 112)																												
Date	PM				VOC				NOx				CO				Formaldehyde			Total Fluoride			Hydrogen Fluoride					
9/11/2018	gr/dscf	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass
9/12/2018	Avg	<0.00101	<0.15	<0.41	1.04	0.12	0.34	0.0297	0.54	0.066	0.19	0.0161	24.2	1.78	5.04	0.436	0.16	0.013	0.036	0.0031	<0.018	<0.000921	<0.0027	<0.0015	<0.000079	<0.00023		
Ultra Rotary Coarse (CFU 112)																												
Date	PM				VOC				NOx				CO				Formaldehyde			Total Fluoride			Hydrogen Fluoride					
9/15/2018	gr/dscf	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass
9/16/2018	Avg	<0.00098	<0.15	<0.42	1.01	0.12	0.34	0.0289	0.95	0.12	0.34	0.0282	27	2.03	5.83	0.49	0.07	0.0052	0.015	0.00125	<0.018	<0.000931	<0.0027	<0.0014	<0.0000783	<0.000227		
Ultra rotary Coarse Average Test Result																												
	gr/dscf	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass
Average test results			0.415			0.34				0.26500				5.435				0.0255				0.0027					0.0002285	

Glass Melt/Forehearth (CFU 113)																												
Date	PM				VOC				NOx				CO				Formaldehyde			Total Fluoride			Hydrogen Fluoride					
9/18/2018	gr/dscf	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass
9/19/2018	Avg	<0.00138	<0.065	<0.035	2.5	0.093	0.051	0.0212	1.4	0.057	0.031	0.0128	7.5	0.18	0.1	0.0407	0.18	0.0049	0.0027	0.00112	<0.017	<0.000289	<0.000157	<0.0020	<0.0000347	<0.0000189		
Glass Melt/Forehearth (CFU 113)																												
Date	PM				VOC				NOx				CO				Formaldehyde			Total Fluoride			Hydrogen Fluoride					
9/25/2018	gr/dscf	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass
9/26/2018	Avg	<0.00092	<0.066	<0.036	3.2	0.18	0.1	0.0413	1.2	0.069	0.038	0.0156	8.7	0.32	0.17	0.072	0.15	0.0057	0.0031	0.00129	<0.012	<0.000291	<0.000159	<0.0015	<0.0000389	<0.0000213		
Glass Melt/Forehearth Average Test Result																												
	gr/dscf	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	lb/mscf NG	PPM	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass	PPM	lb/hr	lb/ton glass
Average test results			0.0355			0.0755				0.03450				0.135				0.0029				0.000158					0.0000201	

*For these sources PM is equal to PM₁₀ and PM_{2.5}.

Table 1
CO CEMS Summary and Emission Factors
Hollingsworth Vose Fiber Company - Corvallis, OR

Fiber Type]	Total Operating Time (hrs/quarter)	CO CEMS Emissions (lb-CO/quarter)	Total fiber Production ⁽¹⁾ (ton-fiber/quarter)	CO Emission Factor ^(a) (lb-CO/ton-fiber)
Fourth Quarter of 2018 ⁽²⁾				
Rotary Fine	17,661	101,251	497	204
Rotary Coarse	33,709	173,471	2,994	57.9
Ultra Rotary Coarse	6,086	4,800	670	7.17
Flameblown	8,192	83,617	143	583
First Quarter of 2019 ⁽³⁾				
Rotary Fine	16,012	85,027	472	180
Rotary Coarse	28,184	136,154	2,581	52.757
Ultra Rotary Coarse	8,074	14,464	710	20.4
Flameblown	7,807	69,424	142	489
Second Quarter of 2019 ⁽⁴⁾				
Rotary Fine	18,274	91,180	532	171
Rotary Coarse	14,156	70,581	1,335	52.9
Ultra Rotary Coarse	9,585	6,661	766	8.70
Flameblown	8,127	70,277	148	476
Third Quarter of 2019 ⁽⁵⁾				
Rotary Fine	10,493	53,919	298	181
Rotary Coarse	18,971	110,438	1,727	64.0
Ultra Rotary Coarse	10,162	6,694	929	7.20
Flameblown	8,232	72,789	147	495
Average CO Emission Factor (lb-CO/ton-fiber)				
Rotary Fine				184
Rotary Coarse				56.9
Ultra Rotary Coarse				10.9
Flameblown				511

CEMS = Continuous emissions monitoring system.

CO = Carbon monoxide.

Notes:

^(a) CO emission factor (lb-CO/ton-fiber) = (CO CEMS emissions (lb-CO/quarter)) / (total fiber production (ton-fiber/quarter))

References:

⁽¹⁾ Fiber production based on measured pull quantity for each fiber product type.

⁽²⁾ The fourth quarter of 2018 represents the accounting calendar quarter from October 1, 2018 to December 31, 2018.

⁽³⁾ The first quarter of 2019 represents the accounting calendar quarter from January 1, 2019 to March 29, 2019.

⁽⁴⁾ The second quarter of 2019 represents the accounting calendar quarter from March 30, 2019 to June 28, 2019.

⁽⁵⁾ The third quarter of 2019 represents the accounting calendar quarter from June 29, 2019 to September 27, 2019.

**ATTACHMENT 2
EMISSION DETAIL SHEETS**

PM						
Emission Unit	Pollution Control Device	Maximum Tons/yr* or vehicle miles travelled	Emission Factor	Emission Units	Emission Factor Reference	Emission Rate Ton/yr
Flame Blown	Ceramic Filtration Unit	788	4.83	lb/ton glass	2018 Source Test	1.90
Rotary Fine	Ceramic Filtration Unit	3122	2.61	lb/ton glass	2018 Source Test	4.07
Rotary Coarse	Ceramic Filtration Unit	15488*	0.69	lb/ton glass	2018 Source Test	5.34
Ultra Rotary Coarse	Ceramic Filtration Unit	3679*	0.415	lb/ton glass	2018 Source Test	0.76
Glass Melter 1/Line 1 Forehearth	Ceramic Filtration Unit	11826	0.0355	lb/ton glass	2018 Source Test	0.21
Glass Melter 2/Line 2 Forehearth	Ceramic Filtration Unit	11826	0.0355	lb/ton glass	2018 Source Test	0.21
Unpaved Roads	NA	553	3.55	lb/vehicle miles travelled	AP-42 13.2	0.98
Aggregate Insignificant						1
Total						14.49

*All lines that can make both rotary coarse and ultra rotary coarse are set to make ultra rotary coarse to maximize the potential to emit emissions

PM AI						
Emission Unit	Pollution Control Device	Maximum hrs/yr or Tons/yr	Emission Factor	Emission Units	Emission Factor Reference	Emission Rate Ton/yr
Bulking Agent Storage Silo 1	Cartridge filters	79.5	0.0051	lb/hr	Facility estimate	0.0002
Bulking Agent Storage Silo 2	Cartridge filters	79.5	0.0051	lb/hr	Facility estimate	0.0002
Raw Material Transport	Baghouse	26105	0.03	lb/ton raw material	AP-42, table 11.13-2 with 99% control efficiency	0.3916
Raw Material Mixing	Baghouse	26105	0.006	lb/ton raw material	AP-42, table 11.13-2 with 99% control efficiency	0.0783
Line 1 Furnace Bin	Baghouse	13052	0.002	lb/ton	AP-42, table 11.13-2 with 99% control efficiency	0.0131
Line 2 Furnace Bin	Baghouse	13052	0.002	lb/ton	AP-42, table 11.13-2 with 99% control efficiency	0.0131
Raw material controlled by baghouses and vented inside building	Baghouse	26105	0.001	lb/ton raw material	AP-42, table 11.13-2 with 99% control efficiency and 50% reduction for venting inside building	0.0131
Off Specification Bin	Baghouse	12	0.002	lb/tons	AP-42, table 11.13-2 with 99% control efficiency	0.000012
Total						0.51

PM 10						
Emission Unit	Pollution Control Device	Maximum tons/yr or vehicle miles travelled	Emission Factor	Emission Units	Emission Factor Reference	Emission Rate Ton/yr
Flame Blown	Ceramic Filtration Unit	788	4.83	lb/ton glass	2018 Source Test	1.90
Rotary Fine	Ceramic Filtration Unit	3122	2.61	lb/ton glass	2018 Source Test	4.07
Rotary Coarse	Ceramic Filtration Unit	15488*	0.69	lb/ton glass	2018 Source Test	5.34
Ultra Rotary Coarse	Ceramic Filtration Unit	3679*	0.415	lb/ton glass	2018 Source Test	0.76
Glass Melter 1/Line 1 Forehearth	Ceramic Filtration Unit	11826	0.0355	lb/ton glass	2018 Source Test	0.21
Glass Melter 2/Line 2 Forehearth	Ceramic Filtration Unit	11826	0.0355	lb/ton glass	2018 Source Test	0.21
Unpaved Roads	NA	553	1.01	lb/vehicle miles travelled	AP-42 13.2	0.28
Aggregate Insignificant						1
Total						13.78

*All lines that can make both rotary coarse and ultra rotary coarse are set to make ultra rotary coarse to maximize the potential to emit emissions

PM 10 AI						
Emission Unit	Pollution Control Device	Maximum hrs/yr or tons/yr	Emission Factor	Emission Units	Emission Factor Reference	Emission Rate ton/yr
Bulking Agent Storage Silo 1	Cartridge filters	79.5	0.0051	lb/hr	Facility estimate	0.0002
Bulking Agent Storage Silo 2	Cartridge filters	79.5	0.0051	lb/hr	Facility estimate	0.0002
Raw Material Transport	Baghouse	26105	0.03	lb/ton	AP-42, table 11.13-2 with 99% control efficiency	0.3916
Raw Material Mixing	Baghouse	26105	0.006	lb/ton	AP-42, table 11.13-2 with 99% control efficiency	0.0783
Line 1 Furnace Bin	Baghouse	13052	0.002	lb/ton	AP-42, table 11.13-2 with 99% control efficiency	0.0131
Line 2 Furnace Bin	Baghouse	13052	0.002	lb/ton	AP-42, table 11.13-2 with 99% control efficiency	0.0131
Raw material controlled by baghouses and vented inside building	Baghouse	26105	0.001	lb/ton raw material	AP-42, table 11.13-2 with 99% control efficiency and 50% reduction for venting inside building	0.0131
Off Specification Bin	Baghouse	12	0.002	lb/tons	AP-42, table 11.13-2 with 99% control efficiency	0.000012
Total						0.51

PM 2.5						
Emission Unit	Pollution Control Device	Maximum tons/yr or vehicle miles travelled	Emission Factor	Emission Units	Emission Factor Reference	Emission Rate Ton/yr
Flame Blown	Ceramic Filtration Unit	788	4.83	lb/ton glass	2018 Source Test	1.90
Rotary Fine	Ceramic Filtration Unit	3122	2.61	lb/ton glass	2018 Source Test	4.07
Rotary Coarse	Ceramic Filtration Unit	15488*	0.69	lb/ton glass	2018 Source Test	5.34
Ultra Rotary Coarse	Ceramic Filtration Unit	3679*	0.415	lb/ton glass	2018 Source Test	0.76
Glass Melter 1/Line 1 Forehearth	Ceramic Filtration Unit	11826	0.0355	lb/ton glass	2018 Source Test	0.21
Glass Melter 2/Line 2 Forehearth	Ceramic Filtration Unit	11826	0.0355	lb/ton glass	2018 Source Test	0.21
Unpaved Roads	NA	553	0.10	lb/vehicle mile travelled	AP-42 13.2	0.03
Aggregate Insignificant						1
Total						13.53

*All lines that can make both rotary coarse and ultra rotary coarse are set to make ultra rotary coarse to maximize the potential to emit emissions

PM 2.5 AI						
Emission Unit	Pollution Control Device	Tons/yr	Emission Factor	Emission Units	Emission Factor Reference	Emission Rate Ton/yr
Bulking Agent Storage Silo 1	Cartridge filters	79.5	0.0051	lb/hr	Facility estimate	0.0002
Bulking Agent Storage Silo 2	Cartridge filters	79.5	0.0051	lb/hr	Facility estimate	0.0002
Raw Material Transport	Baghouse	26105	0.03	lb/ton raw material	AP-42, table 11.13-2 with 99% control efficiency	0.3916
Raw Material Mixing	Baghouse	26105	0.006	lb/ton raw material	AP-42, table 11.13-2 with 99% control efficiency	0.0783
Line 1 Furnace Bin	Baghouse	13052	0.002	lb/ton	AP-42, table 11.13-2 with 99% control efficiency	0.0131
Line 2 Furnace Bin	Baghouse	13052	0.002	lb/ton	AP-42, table 11.13-2 with 99% control efficiency	0.0131
Raw material controlled by baghouses and vented inside building	Baghouse	26105	0.001	lb/ton raw material	AP-42, table 11.13-2 with 99% control efficiency and 50% reduction for venting inside building	0.0131
Off Specification Bin	Baghouse	12	0.002	lb/tons	AP-42, table 11.13-2 with 99% control efficiency	0.000012
Total						0.51

Fluoride						
Emission Unit	Pollution Control Device	Maximum Tons/yr*	Emission Factor	Emission Units	Emission Factor Reference	Emission Rate Ton/yr
Flame Blown	Ceramic Filtration Unit	788	0.0036	lb/ton glass	2018 Source Test	0.0014
Rotary Fine	Ceramic Filtration Unit	3122	not detected	lb/ton glass	2018 Source Test	0.0000
Rotary Coarse	Ceramic Filtration Unit	17424*	0.0062	lb/ton glass	2018 Source Test	0.0540
Ultra Rotary Coarse	Ceramic Filtration Unit	0*	0.0025	lb/ton glass	2018 Source Test	0.0000
Glass Melter 1/Line 1 Forehearth	Ceramic Filtration Unit	11826	0.00014	lb/ton glass	2018 Source Test	0.0008
Glass Melter 2/Line 2 Forehearth	Ceramic Filtration Unit	11826	0.00014	lb/ton glass	2018 Source Test	0.0008
Total						0.0571

*All lines that can make both rotary coarse and ultra rotary coarse are set to make rotary coarse to maximize the potential to emit emissions

CO					
Emission Unit	tons/yr*	Emission Factor	Emission Units	Emission Factor Reference	Emission Rate Ton/yr
Flame Blown	788	511	lb/ton glass	CEMS (Oct 1, 2018- Sept 30, 2019)	201.3
Rotary Fine	3122	184	lb/ton glass	CEMS (Oct 1, 2018- Sept 30, 2019)	287.2
Rotary Coarse	17424*	56.9	lb/ton glass	CEMS (Oct 1, 2018- Sept 30, 2019)	495.7
Ultra Rotary Coarse	0*	10.9	lb/ton glass	CEMS (Oct 1, 2018- Sept 30, 2019)	0.00
Line 1 Forehearth	11826	0.135	lb/ton glass	2018 Source Test	0.80
Line 2 Forehearth	11826	0.135	lb/ton glass	2018 Source Test	0.80
Total					985.9

*All lines that can make both rotary coarse and ultra rotary coarse are set to make rotary coarse to maximize the potential to emit emissions

NOx					
Emission Unit	tons/yr*	Emission Factor	Emission Units	Emission Factor Reference	Emission Rate Ton/yr
Flame Blown	788	25.63	lb/ton glass	2018 Source Test	10.10
Rotary Fine	3122	7.46	lb/ton glass	2018 Source Test	11.65
Rotary Coarse	17424*	2.085	lb/ton glass	2018 Source Test	18.16
Ultra Rotary Coarse	0*	0.265	lb/ton glass	2018 Source Test	0.00
Line 1 Forehearth	11826	0.0345	lb/ton glass	2018 Source Test	0.20
Line 2 Forehearth	11826	0.0345	lb/ton glass	2018 Source Test	0.20
Total					40.32

*All lines that can make both rotary coarse and ultra rotary coarse are set to make rotary coarse to maximize the potential to emit emissions

SO2					
Emission Units	mmscf NG/yr or tons/yr of material processed	Emission Factor	Emission Factor Units	Emission Factor Reference	Emission Rate Ton/yr
Flame Blown, Rotary Fine, Rotary Coarse, Ultra Rotary Coarse, Line 1 Forehearth, and Line 2 Forehearth	1625.5	1.7	lb/mmscf NG	DEQ Emission Factor	1.38
Glass Melting and Conditioning	26105	0.04	lb/ton of material processed	AP-42 table 11.13-4	0.52
Total					1.90

*All lines that can make both rotary coarse and ultra rotary coarse are set to make rotary coarse to maximize the potential to emit emissions

VOC					
Emission Unit	tons/yr	Emission Factor	Emission Units	Emission Factor Reference	Emission Rate Ton/yr
Flame Blown	788	2.41	lb/ton glass	2018 Source Test	0.95
Rotary Fine	3122	3.05	lb/ton glass	2018 Source Test	4.76
Rotary Coarse	15488*	0.315	lb/ton glass	2018 Source Test	2.44
Ultra Rotary Coarse	3679*	0.34	lb/ton glass	2018 Source Test	0.63
Line 1 Forehearth	11826	0.0755	lb/ton glass	2018 Source Test	0.45
Line 2 Forehearth	11826	0.0755	lb/ton glass	2018 Source Test	0.45
Total					9.67

*All lines that can make both rotary coarse and ultra rotary coarse are set to make ultra rotary coarse to maximize the potential emit emissions

GHG

Emission Unit	mmscf natural gas or Tons/yr	Emission Factor	Emission Units	Emission Factor Reference	Emission Rate Ton/yr
Natural gas usage	1018.7	120163	lb/mmscf of NG	40 CFR Part 98	61,205
Limestone	45.5	0.44	ton/ton of raw material	40 CFR Part 98	20
Dolomite	1528.4	0.48	ton/ton of raw material	40 CFR Part 98	734
Sodium carbonate	3126.6	0.42	ton/ton of raw material	40 CFR Part 98	1313
Barium carbonate	307.1	0.22	ton/ton of raw material	40 CFR Part 98	68
Potassium carbonate	376.7	0.32	ton/ton of raw material	40 CFR Part 98	121
Total					63,460

Baseline 1978

Source	Annual emission Estimates (tons/yr)				
	PM	PM ₁₀	NO _x	CO	SO ₂
1978 Lewisburg Baseline					
Unloading & Conveying	3.20	3.20	--	--	--
Storage Bins	0.21	0.21	--	--	--
Mixing and weighing	0.64	0.64	--	--	--
Furnace	0.53	0.53	0.29	0.053	0.043
Fiberizers	40.3 ^a	40.3 ^a	1.33	31.4	--
Total	44.9 ^a	44.9 ^a	1.62	31.5	0.043
1978 Corvallis Baseline					
Material Handling	0.095	0.095	0.66	0.12	--
Furnace	1.22	1.22	0.66	0.12	0.097
Fiberizers	3.50	3.50	3.01	71.1	--
Total	4.82	4.82	3.67	71.2	0.10
1978 combined Baseline					
Total	49.7 ^a	49.7 ^a	5.29	102.7	0.14

^a Differs from the letter sent from Stoel Rives on July 6, 2015 outlining baseline emission rates for Hollingsworth and Vose. To calculate this value AP-42 Table 11-13.1 R-11 emission factors were used in conjunction with the capacity of the furnaces in 1978. Then an additional 50% reduction in emissions was used for the emission control device, a spray chamber.

Baseline and Netting Basis GHG (Calendar Year 2001)

Process	Plant	Emission Points(s)	Process Rate		Emission Factor		Reference	Emissions (tons/yr)
Glass Melting and Conditioning and Glass Fiber Production (process rate = natural gas burned)	GP1	FSS, L1S, L2S, L3S1, L3S2	520.818	MMcf/yr	60.08	Ton/MMcf	40 CFR Part 98 Subpart C	31,292
Glass Fiber and Fiber Production (process rate = natural gas burned)	GP2	L4S1, L4S2, L4S3, L4S4, L5S1, L5S2, L5S3, L5S4, L6S1, L6S2	290.214	MMcf/yr	60.08	Ton/MMcf	40 CFR Part 98 Subpart C	17,436
Carbonate Usage	GP1	See 8/15/2013 Submittal					Company Estimate	1069
Total GHG								49,797

Initial PM2.5 Netting Basis (May 1, 2011)

Device/Process	PM10 Netting Basis (tons/year) 5/1/2011	PM2.5 Fraction	Reference	PM2.5 Netting Basis
Raw Material Processing	0.59	100%	DEQ AQ-EF08	0.59
Glass Melting and Conditioning	0.59	96%	DEQ AQ-EF08	0.57
Glass Plant 1 Fiber Production	18.32	90%	DEQ AQ-EF03	16.49
Glass Plant 2 Fiber Production	30.9	90%	DEQ AQ-EF03	27.81
Unassigned	4	90.3%	Weighted Average of Assigned Emissions	3.61
Total	50.4	--	--	49.1

Netting Basis from 1996 PSD Approval

Pollutant	Netting Basis
PM	76
PM ₁₀	54
NO _x	98



September 12, 2022

Mr. Mike Eisele
Western Region Air Quality
Department of Environmental Quality
4026 Fairview Industrial Dr.
Salem, OR 97302

Re: Response to Comments on Proposed Standard ACDP No. 02-2173-ST-01

Dear Mike:

Thank you for providing Hollingsworth & Vose Fiber Company (H&V Fiber) the comments submitted on our proposed PSD air permit. OAR 340-209-0080(3) provides a permittee 10 working days from receipt of the comments to provide a written response. As we received the last of the comments on August 29, 2022, this written response is timely.

First, H&V Fiber would like to thank you and the others at DEQ who have brought the PSD permit to this point. We recognize that a lot of work went into preparation of the draft permit, review report and attachments in addition to the immense amount of planning and forethought that went into the public meeting and public hearing. The fact that multiple comments were submitted on the permit is evidence of the successful work done to publicize the notice period and hearing. H&V further appreciates that an additional week was provided to ensure that everyone who wanted to comment about the permit was able to submit their opinions.

Many of the comments related to wanting DEQ to slow the process down so that LUBA could issue its decision on the two appeals of the Land Use Compatibility Statement (LUCS) issued by the City of Corvallis for our facility. The decisions in the two appeals were issued on August 2nd and so the concern about slowing issuance of the permit to enable LUBA to rule has been resolved. We see no basis for not proceeding to permit issuance.

Having reviewed the comments that you provided to us, we want to provide a written response to two themes raised in the comments. Both relate to emissions from our ceramic filtration units (CFUs). As you know, in August 2017, after public hearing, the City of Corvallis awarded Conditional Development Approval to H&V for the installation of the CFUs. These control devices were significant upgrades from the scrubbers that had previously been in use to control particulate and Fluoride emissions from the plant. The CFUs are so efficient that extensive testing by a third party testing company using extended length test runs was unable to detect any particulate in our emissions for any of the fiber production lines or either furnace.

This increase in control efficiency is why our PM₁₀ Plant Site Emission Limit went from 50 tons per year to 14 tons per year—the lowest limit the rules allow. Actual emissions are lower as we performed our calculations as if particulate emissions were continuously occurring at the In-Stack Detection Limit. Fluorides were similarly reduced from a Plant Site Emission Limit of 13 tons per year to 0.044 tons per year, i.e., below DEQ’s de minimis emission rate. In short, since 2017 the emissions from our facility have decreased substantially.

With that background, I wanted to share with you our response to two themes that we heard in the comments:

Theme 1: H&V has performed inadequate testing and DEQ does not know what our emissions are.

We appreciate the complexity of the draft permit and that it is not easy to navigate. However, we wish to point the commenters to the excellent tables provided as Attachment 1 to the proposed permit. Because of their location in the back of the permit package, tucked between the modeling report and the emission detail sheets, the tables are easy to miss. They chronicle the extensive testing that has been performed by H&V Fiber with detailed DEQ oversight. In addition, Condition 17 requires that another large testing campaign be completed within 180 days of permit issuance. Even before the next round of testing, we believe that the facility has been diligently evaluated and much more test data generated than is typical for a facility of this size. We expect the additional testing will validate the prior testing results in a manner that is open and public, just as the prior results are publicly available.

Theme 2: H&V has not adequately characterized its PM_{2.5} emissions.

We appreciate the questions posed about PM_{2.5} emissions and are concerned that there may be a misunderstanding about how H&V has characterized our PM_{2.5} emissions. Commenters are correct that H&V Fiber has not tested specifically for PM_{2.5}. However, we have extensively tested for total particulate (PM) using Oregon Method 5. As you well know, this test method is different from EPA Method 5 in that it requires collection and measurement of both particulate that is solid when exiting the stack and so caught on a filter (filterable particulate) and particulate that is in a gaseous form when exiting the stack but that condenses into solid particulate in the atmosphere (condensable particulate). Condensable particulate is not measured under the EPA method, which is used in many parts of the country, but is measured in the Oregon method. As a result of using Oregon Method 5 for measurement, the particulate measurement would include all particulate that is smaller than 2.5 microns aerodynamic diameter as well as all particulate greater than 2.5 microns aerodynamic diameter. This means that our particulate test value includes all PM_{2.5}, as well as any particulates larger than PM_{2.5}. That is why the method is referred to as measuring “total particulate.”

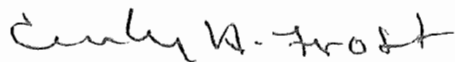
With DEQ’s agreement, H&V Fiber calculated its PM_{2.5} emissions for all of the fiberizers and both furnaces using the total particulate emission factor. As noted above, while every test run

was below the In-Stack Detection Limit, PM, and therefore PM_{2.5}, emissions are being calculated as if emissions were equal to the detection limit at all times. This means that H&V Fiber is, if anything, overcounting its PM_{2.5} emissions by using the methodology in the proposed permit.

H&V Fiber thanks the Department as well as all of the community members who participated in the public process. We appreciate the opportunity to provide these responses to select comments. We look forward to the issuance of the PSD permit.

Please do not hesitate to contact me at (541) 738-5382 if you have any questions or require additional information.

Sincerely,

A handwritten signature in black ink that reads "Cindy W. Frost". The signature is written in a cursive style with a clear, legible font.

Cindy Frost

cc: Anita Ragan (H&V)
Tom Wood (Stoel Rives)
Chad Darby (Maul Foster & Alongi)