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Table 1
Input Assumptions and Parameters
Hollingsworth & Vose Fiber Company—Corvallis, OR

Parameter	Throughput											
	2021				PTE							
	Daily		Annual		Daily		Annual					
FACILITY WIDE OPERATION												
Hours of Operation	24.0	(hrs/day)	⁽¹⁾	8,760	(hrs/yr)	⁽¹⁾	24.0	(hrs/day)	⁽²⁾	8,760	(hrs/yr)	⁽²⁾
NATURAL GAS USAGE												
Glass Plant Natural Gas Usage	2.48	(MMscf/day)	^(a)	391	(MMscf/yr)	⁽¹⁾	2.79	(MMscf/day)	⁽²⁾	1,020	(MMscf/yr)	⁽²⁾
Forehearth Natural Gas Usage	0.11	(MMscf/day)	⁽⁴⁾	15.3	(MMscf/yr)	^(b)	0.11	(MMscf/day)	^(c)	38.4	(MMscf/yr)	⁽²⁾
Glass Plant Natural Gas Usage - Excluding Forehearth	2.37	(MMscf/day)	^(d)	376	(MMscf/yr)	^(d)	2.68	(MMscf/day)	^(d)	982	(MMscf/yr)	^(d)
Non-Production Natural Gas Usage	0.062	(MMscf/day)	^(e)	9.77	(MMscf/yr)	⁽¹⁾	0.070	(MMscf/day)	^(e)	25.5	(MMscf/yr)	^(e)
GLASS PLANT PRODUCTION												
Rotary Fine Fiber Production	5.70	(tons/day)	^(a)	1,199	(tons/yr)	⁽¹⁾	8.55	(tons/day)	⁽²⁾	3,122	(tons/yr)	⁽²⁾
Rotary Coarse and Ultra Rotary Coarse Fiber Production	47.7	(tons/day)	⁽⁴⁾	6,006	(tons/yr)	⁽¹⁾	47.7	(tons/day)	⁽²⁾	17,424	(tons/yr)	⁽²⁾
Flameblown Production	2.16	(tons/day)	⁽⁴⁾	594	(tons/yr)	⁽¹⁾	2.16	(tons/day)	⁽²⁾	788	(tons/yr)	⁽²⁾
Glass Melt Throughput	64.8	(tons/day)	⁽⁴⁾	8,078	(tons/yr)	⁽¹⁾	64.8	(tons/day)	⁽²⁾	23,652	(tons/yr)	⁽²⁾
BULKING AGENT STORAGE SILOS												
Glass Plant 1 Silo Filling Hours of Operation	1.50	(hrs/day)	⁽¹⁾	52.0	(hrs/yr)	⁽⁵⁾	1.50	(hrs/day)	⁽²⁾	200	(hrs/yr)	⁽²⁾
Glass Plant 2 Silo Filling Hours of Operation	1.50	(hrs/day)	⁽¹⁾	65.0	(hrs/yr)	⁽⁵⁾	1.50	(hrs/day)	⁽²⁾	200	(hrs/yr)	⁽²⁾
CFU WASTE COLLECTION												
CFU Waste Generation	12.0	(tons/day)	⁽⁶⁾	3,111	(tons/yr)	⁽¹⁾	29.6	(tons/day)	⁽⁸⁾	5,000	(tons/yr)	⁽¹⁾
RAW MATERIAL HANDLING												
Off Specification Throughput	1.00	(tons/day)	⁽¹⁾	12.0	(tons/yr)	⁽⁷⁾	1.00	(tons/day)	⁽¹⁾	12.0	(tons/yr)	⁽¹⁾
Barium Carbonate Usage	0.84	(tons/day)	^(f)	257	(tons/yr)	⁽¹⁾	4.80	(tons/day)	^(f)	1,459	(tons/yr)	⁽¹⁰⁾
Zinc Oxide Usage	0.53	(tons/day)	^(f)	162	(tons/yr)	⁽¹⁾	3.02	(tons/day)	^(f)	919	(tons/yr)	⁽¹⁰⁾
Fluorspar Usage												
Sand Usage												
Dolomite Usage												
Limestone Usage												
Nepheline Syenite Usage												
SHIPPING AND RECEIVING PAINT USAGE												
Spray Paint Usage	1.00	(lb/day)	⁽¹⁾	342	(lb/yr)	⁽¹⁾	3.00	(lb/day)	⁽¹¹⁾	936	(lb/yr)	⁽¹¹⁾
EMERGENCY GENERATORS												
<i>Emergency Generator 1</i>												
Hours of Operation	2.00	(hrs/day)	⁽¹⁾	7.00	(hrs/yr)	⁽¹⁾	2.00	(hrs/day)	⁽²⁾	100	(hrs/yr)	⁽¹²⁾
Diesel Usage	46.8	(gal/day)	⁽⁹⁾	164	(gal/yr)	⁽⁹⁾	46.8	(gal/day)	⁽⁹⁾	2,340	(gal/yr)	⁽⁹⁾
<i>Emergency Generator 2</i>												
Hours of Operation	2.00	(hrs/day)	⁽¹⁾	8.00	(hrs/yr)	⁽¹⁾	2.00	(hrs/day)	⁽²⁾	100	(hrs/yr)	⁽¹²⁾
Diesel Usage	33.0	(gal/day)	⁽⁹⁾	132	(gal/yr)	⁽⁹⁾	33.0	(gal/day)	⁽⁹⁾	1,650	(gal/yr)	⁽⁹⁾
COOLING TOWERS												
Hours of Operation	24.0	(hrs/day)	⁽¹⁾	8,760	(hrs/yr)	⁽¹⁾	24.0	(hrs/day)	⁽¹⁾	8,760	(hrs/yr)	⁽¹⁾
Shock Biocide Usage	17.0	(lb/day)	⁽¹⁴⁾	310	(lb/yr)	⁽¹⁾	--		⁽¹⁵⁾	--		⁽¹⁵⁾

NOTES:

CFU = ceramic filtration unit.

MMBtu = million British thermal units.

MMscf = million standard cubic feet.

PTE = potential to emit.

(a) 2021 daily parameter ('unit'/day) = (PTE daily parameter ['unit'/day]) - (Line 3 PTE daily parameter ['unit'/day]); see Reference (3).

$$\text{Line 3 PTE natural gas usage (MMscf/day)} = 0.31 \quad (2)$$

$$\text{Line 3 PTE rotary fine fiber production (tons/day)} = 2.85 \quad (2)$$

(b) 2021 annual forehearth natural gas usage (MMscf/yr) = (2021 annual glass plant natural gas usage [MMscf/yr]) x (PTE annual forehearth natural gas usage [MMscf/yr]) / (PTE annual glass plant natural gas usage - excluding forehearth [MMscf/yr])

(c) Daily natural gas usage (MMscf/day) = (annual natural gas usage [MMscf/yr]) x (daily hours of operation [hrs/day]) / (annual hours of operation [hrs/yr])

(d) Glass plant natural gas usage - excluding forehearth (MMscf/"period") = (glass plant natural gas usage [MMscf/"period"]) - (forehearth natural gas usage [MMscf/"period"])

(e) Non-production natural gas usage (MMscf/"period") = (glass plant natural gas usage [MMscf/"period"]) x (2021 annual non-production natural gas usage [MMscf/yr]) / (2021 annual glass plant natural gas usage [MMscf/yr])

(f) Daily parameter ('unit'/day) = (annual parameter ['unit'/yr]) x (daily hours of operation [hrs/day]) / (annual hours of operation [hrs/yr]) x (short-term variability factor)

$$\text{Short-term variability factor} = 1.20 \quad (9)$$

(g) Diesel fuel usage (gal/"unit") = (diesel fuel usage [gal/hr]) x (hours of operation [hrs/"unit"])

$$\text{Emergency generator 1 diesel fuel usage (gal/hr)} = 23.4 \quad (13)$$

$$\text{Emergency generator 2 diesel fuel usage (gal/hr)} = 16.5 \quad (13)$$

REFERENCES:

(1) Information provided by Hollingsworth & Vose Fiber Company.

(2) See Oregon Department of Environmental Quality Standard Air Contamination Discharge Permit No. 02-2173-ST-01 issued November 23, 2022.

(3) Conservatively assumes PTE input excluding Line 3 production for maximum daily as 2021 actual daily parameter is unavailable. Contribution of Glass Plant 1, Production Line 3 is subtracted as Line 3 was not operated in 2021.

(4) Conservatively assumes PTE input for maximum daily as actual daily parameter is unavailable.

(5) Estimate based on 2021 bulking agent purchase records.

(6) Information provided by Hollingsworth & Vose Fiber Company. Daily estimate based on maximum average daily value from monthly data.

(7) Estimate based on typical production activities.

(8) Information provided by Hollingsworth & Vose Fiber Company. Daily estimate incorporates short-term variability.

(9) Factor of 1.2 applied to average daily parameters to account for short-term variability in production.

(10) Information provided by Hollingsworth & Vose Fiber Company. PTE estimate represents maximum annual usage across multiple production scenarios. Maximum usage of every raw material would not occur under same production scenario. Total annual raw material usage is limited by production capacity and was presented in PSD permit.

(11) PTE estimate based on 2021 usage and scaled based on total production.

(12) 40 CFR §63.6640(f)(2), any operation for non-emergency situations are limited to 100 hours per year.

(13) Information provided by vendor.

(14) Product used once monthly for system "shock". Only one cooling tower is dosed per day and product usage varies between cooling towers. Represents maximum usage cooling tower.

(15) Current products used Hollingsworth & Vose Fiber Company do not contain any regulated toxic air contaminants.

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Table 2
Input Assumptions and Parameters - Cooling Towers
Hollingsworth & Vose Fiber Company—Corvallis, OR

Parameter	(Units)	Value
Annual Days of Operation ⁽¹⁾	--	365
Drift Loss of Circulating Water ⁽²⁾	(%)	0.005
Density of Water	(lb/gal)	8.34
COOLING TOWER CHEMICALS		
Phosphoric Acid Concentration ^(a)	(ppm)	7.20
Sulfuric Acid Concentration ^(a)	(ppm)	7.20
PRODUCTION LINE 1 AND 2		
Number of Cells ⁽¹⁾	--	1
Total Water Circulation Rate ⁽¹⁾	(gpm)	900
PRODUCTION LINE 3		
Number of Cells ⁽¹⁾	--	1
Total Water Circulation Rate ⁽¹⁾	(gpm)	1,000
PRODUCTION LINE 4		
Number of Cells ⁽¹⁾	--	1
Total Water Circulation Rate ⁽¹⁾	(gpm)	800

NOTES:

gpm = gallons per minute.

ppm = parts per million.

TAC = toxic air contaminant.

(a) TAC concentration (ppm) = (corrosion inhibitor dosage [ppm]) x (weight percentage of TAC [%]) / 100

Corrosion inhibitor dosage (ppm) = 240 (3)

Weight percentage of phosphoric acid (%) = 3.00 (4)

Weight percentage of sulfuric acid (%) = 3.00 (4)

REFERENCES:

(1) Information provided by Hollingsworth & Vose Fiber Company.

(2) Information provided by manufacturer.

(3) Information provided by vendor. Average of dosage range.

(4) Composition information from vendor SDS.

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Table 3
Emission Factor Summary for Toxic Air Contaminants
Hollingsworth & Vose Fiber Company—Corvallis, OR

TAC	CAS/ODEQ Sequence Number	CFU Outlet						
		Emission Factor (lb/ton)						
		Rotary Fine	Rotary Coarse and Ultra Rotary Coarse			Flameblown	Glass Melt	
Rotary Coarse	Ultra Rotary Coarse		Maximum ⁽¹⁾					
METALS								
Antimony	7440-36-0	ND 0 ⁽²⁾	ND 0 ⁽²⁾	5.39E-05 ⁽³⁾	5.39E-05	3.24E-04 ⁽³⁾	3.55E-06 ⁽³⁾	
Arsenic	7440-38-2	ND 0 ⁽²⁾	ND 0 ⁽²⁾	ND 0 ⁽²⁾	0	ND 0 ⁽²⁾	ND 0 ⁽²⁾	
Barium	7440-39-3	5.21E-05 ⁽³⁾	3.32E-05 ⁽³⁾	2.27E-05 ⁽³⁾	3.32E-05	2.16E-04 ⁽³⁾	2.47E-06 ⁽³⁾	
Beryllium	7440-41-7	ND 0 ⁽²⁾	ND 0 ⁽²⁾	ND 0 ⁽²⁾	0	ND 0 ⁽²⁾	ND 0 ⁽²⁾	
Cadmium	7440-43-9	ND 0 ⁽²⁾	3.44E-05 ⁽³⁾	2.12E-06 ⁽³⁾	3.44E-05	5.98E-05 ⁽³⁾	2.96E-06 ⁽³⁾	
Chromium (total)	7440-47-3	1.82E-05 ⁽³⁾	3.20E-05 ⁽³⁾	1.34E-05 ⁽³⁾	3.20E-05	6.95E-05 ⁽³⁾	1.27E-06 ⁽³⁾	
Chromium VI	18540-29-9	1.82E-05 ⁽⁴⁾	3.20E-05 ⁽⁴⁾	1.34E-05 ⁽⁴⁾	3.20E-05	6.95E-05 ⁽⁴⁾	1.27E-06 ⁽⁴⁾	
Cobalt	7440-48-4	ND 0 ⁽²⁾	ND 0 ⁽²⁾	1.40E-06 ⁽³⁾	1.40E-06	ND 0 ⁽²⁾	5.35E-07 ⁽³⁾	
Copper	7440-50-8	4.39E-04 ⁽³⁾	1.90E-04 ⁽³⁾	1.83E-04 ⁽³⁾	1.90E-04	9.90E-04 ⁽³⁾	1.93E-05 ⁽³⁾	
Lead	7439-92-1	ND 0 ⁽²⁾	3.03E-04 ⁽³⁾	ND 0 ⁽²⁾	3.03E-04	ND 0 ⁽²⁾	2.64E-05 ⁽³⁾	
Manganese	7439-96-5	8.69E-05 ⁽³⁾	2.91E-05 ⁽³⁾	4.81E-05 ⁽³⁾	4.81E-05	2.26E-04 ⁽³⁾	7.05E-07 ⁽³⁾	
Mercury	7439-97-6	4.52E-06 ⁽³⁾	1.91E-06 ⁽³⁾	3.66E-06 ⁽³⁾	3.66E-06	1.13E-05 ⁽³⁾	3.59E-04 ⁽³⁾	
Nickel	7440-02-0	3.87E-05 ⁽³⁾	7.27E-05 ⁽³⁾	ND 0 ⁽²⁾	7.27E-05	3.74E-04 ⁽³⁾	ND 0 ⁽²⁾	
Phosphorus	504	7.25E-04 ⁽³⁾	8.61E-04 ⁽³⁾	6.48E-05 ⁽³⁾	8.61E-04	1.85E-03 ⁽³⁾	7.69E-05 ⁽³⁾	
Selenium	7782-49-2	ND 0 ⁽²⁾	ND 0 ⁽²⁾	ND 0 ⁽²⁾	0	ND 0 ⁽²⁾	ND 0 ⁽²⁾	
Zinc	7440-66-6	1.08E-03 ⁽³⁾	5.39E-04 ⁽³⁾	3.41E-04 ⁽³⁾	5.39E-04	5.96E-03 ⁽³⁾	4.05E-05 ⁽³⁾	
INORGANIC COMPOUNDS								
Carbon disulfide	75-15-0	--	--	--	--	--	3.82E-05 ⁽¹⁰⁾	
Total Fluoride	--	0.0225 ⁽⁵⁾	0.0069 ⁽⁵⁾	0.0027 ⁽⁵⁾	0.0069	0.052 ⁽⁵⁾	0.000158 ⁽⁵⁾	
Hydrogen fluoride	7664-39-3	0.03275 ⁽⁵⁾	0.000717 ⁽⁵⁾	0.0002285 ⁽⁵⁾	0.000717	0.0484 ⁽⁵⁾	0.0000201 ⁽⁵⁾	
Fluorides	239	0 ^(a)	6.2E-03 ^(a)	2.5E-03 ^(a)	6.2E-03	3.6E-03 ^(a)	1.4E-04 ^(a)	
Glasswool fibers	352	5.10E-03 ^(b)	1.80E-03 ^(b)	6.00E-04 ^(b)	1.8E-03	1.04E-02 ^(b)	--	
ORGANIC COMPOUNDS								
Acetone	67-64-1	0.0497 ⁽¹⁰⁾	0.0124 ⁽¹⁰⁾	0.0192 ⁽¹⁰⁾	0.0192	0.431 ⁽¹⁰⁾	5.48E-03 ⁽¹⁰⁾	
Benzene	71-43-2	9.88E-03 ⁽¹⁰⁾	1.10E-03 ⁽¹⁰⁾	4.24E-03 ⁽¹⁰⁾	4.24E-03	0.108 ⁽¹⁰⁾	1.31E-03 ⁽¹⁰⁾	
1,3-Butadiene	106-99-0	--	--	2.21E-04 ⁽¹⁰⁾	2.21E-04	--	5.79E-04 ⁽¹⁰⁾	
Cyclohexane	110-82-7	--	--	--	--	6.65E-03 ⁽¹⁰⁾	--	
Ethyl benzene	100-41-4	--	8.85E-04 ⁽¹⁰⁾	4.63E-04 ⁽¹⁰⁾	8.85E-04	5.66E-03 ⁽¹⁰⁾	--	
Chloroethane	75-00-3	--	--	--	--	3.05E-03 ⁽¹⁰⁾	--	
Formaldehyde	50-00-0	0.780 ⁽³⁾	6.50E-02 ⁽³⁾	2.55E-02 ⁽³⁾	6.50E-02	0.465 ⁽³⁾	2.90E-03 ⁽³⁾	
Hexane	110-54-3	0.0486 ⁽¹⁰⁾	2.00E-03 ⁽¹⁰⁾	0.0164 ⁽¹⁰⁾	0.0164	0.625 ⁽¹⁰⁾	7.89E-04 ⁽¹⁰⁾	
Chloromethane	74-87-3	3.84E-03 ⁽¹⁰⁾	--	--	--	0.0408 ⁽¹⁰⁾	--	
2-Butanone	78-93-3	1.88E-03 ⁽¹⁰⁾	5.71E-04 ⁽¹⁰⁾	7.83E-04 ⁽¹⁰⁾	7.83E-04	0.0137 ⁽¹⁰⁾	7.24E-05 ⁽¹⁰⁾	
Methyl isobutyl ketone	108-10-1	--	--	--	--	4.99E-03 ⁽¹⁰⁾	--	
Toluene	108-88-3	2.34E-02 ⁽¹⁰⁾	5.14E-03 ⁽¹⁰⁾	1.26E-02 ⁽¹⁰⁾	1.26E-02	0.109 ⁽¹⁰⁾	3.28E-04 ⁽¹⁰⁾	
m,p-Xylene	1330-20-7	--	2.10E-03 ⁽¹⁰⁾	--	2.10E-03	0.0117 ⁽¹⁰⁾	--	
o-Xylene	95-47-6	--	9.96E-04 ⁽¹⁰⁾	--	9.96E-04	--	--	

NOTES:

- CFU = ceramic filtration unit.
- HAP = hazardous air pollutant
- ND = non-detect.
- RBC = risk based concentration.
- TAC = toxic air contaminant.

(a) Fluorides emission factor (lb/ton) = (total fluoride emission factor [lb/ton]) - (hydrogen fluoride emission factor [lb/ton]); see Reference (6).

(b) Glasswool emission factor (lb/ton) = (CFU filterable PM emission factor [lb/ton]) x (glasswool fiber percent of filterable PM [%])/100

- Rotary fine CFU filterable PM emission factor (lb/ton) = 0.51 (8)
- Rotary coarse CFU filterable PM emission factor (lb/ton) = 0.18 (8)
- Ultra rotary coarse CFU filterable PM emission factor (lb/ton) = 0.060 (8)
- Flameblown CFU filterable PM emission factor (lb/ton) = 1.04 (8)
- Glasswool fiber percent of filterable PM (%) = 1.00 (9)

REFERENCES:

- (1) The maximum of emission factor of either rotary coarse and ultra rotary coarse will be used for emissions estimates.
- (2) Results of all source tests runs were below the minimum detection limit. The pollutant assumed not to be present in a measurable quantity.
- (3) Controlled production-based emission factors represent the average emission factor derived from multiple source tests conducted at the CFU outlet.
- (4) Conservatively assumes 100 percent of chromium emissions are hexavalent chromium.
- (5) Summary of 2018 source tests provided by DEQ with draft PSD permit (June 2020). Controlled production-based emission factors represent the average emission factor derived from multiple source tests conducted at the CFU outlet.
- (6) Represents emission factor for total fluorides minus hydrogen fluoride. If difference is less than zero, shown as zero.
- (7) Emission Factor from 2016 PSD application submitted by Hollingsworth & Vose Fiber Company.
- (8) Summary of 2018 source test results. Controlled production-based emission factors represent the average emission factor derived from multiple source tests conducted at the CFU outlet.
- (9) Results of 2022 microscopy analysis indicate that total glass content of CFU emissions is less than 1 percent. Conservatively assume 1 percent of filterable particulate matter as glasswool fiber.
- (10) Emission Factor from 2022 source test conducted by Bison Engineering.

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Table 4
Glass Plant TAC Emission Estimates - PTE
Hollingsworth & Vose Fiber Company—Corvallis, OR

Process Type	Rotary Fine	Rotary Coarse/Ultra Rotary Coarse	Flameblown	Glass Melt
Daily Throughput (tons/day) ⁽¹⁾	8.55	47.7	2.16	64.8
Annual Throughput (tons/yr) ⁽¹⁾	3,122	17,424	788	23,652

TAC	CAS/ODEQ Sequence Number	Regulatory Category (Yes/No)			Process Emission Factor ⁽²⁾ (lb/ton)				Emission Estimates								Total Facility Emission Estimates	
					Rotary Fine	Rotary Coarse/Ultra Rotary Coarse	Flameblown	Glass Melt	Rotary Fine		Rotary Coarse/Ultra Rotary Coarse		Flameblown		Glass Melt			
		TAC	HAP	RBC					Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily (lb/day)	Annual (lb/yr)
METALS																		
Antimony	7440-36-0	Yes	Yes	Yes	0	5.4E-05	3.2E-04	3.6E-06	--	--	2.6E-03	0.94	7.0E-04	0.26	2.3E-04	0.084	3.5E-03	1.28
Arsenic	7440-38-2	Yes	Yes	Yes	0	0	0	0	--	--	--	--	--	--	--	--	--	--
Barium	7440-39-3	Yes	No	No	5.2E-05	3.3E-05	2.2E-04	2.5E-06	4.5E-04	0.16	1.6E-03	0.58	4.7E-04	0.17	1.6E-04	0.058	2.7E-03	0.97
Beryllium	7440-41-7	Yes	Yes	Yes	0	0	0	0	--	--	--	--	--	--	--	--	--	--
Cadmium	7440-43-9	Yes	Yes	Yes	0	3.4E-05	6.0E-05	3.0E-06	--	--	1.6E-03	0.60	1.3E-04	0.047	1.9E-04	0.070	2.0E-03	0.72
Chromium (total)	7440-47-3	No	Yes	No	1.8E-05	3.2E-05	7.0E-05	1.3E-06	1.6E-04	0.057	1.5E-03	0.56	1.5E-04	0.055	8.2E-05	0.030	1.9E-03	0.70
Chromium VI	18540-29-9	Yes	Yes	Yes	1.8E-05	3.2E-05	7.0E-05	1.3E-06	1.6E-04	0.057	1.5E-03	0.56	1.5E-04	0.055	8.2E-05	0.030	1.9E-03	0.70
Cobalt	7440-48-4	Yes	Yes	Yes	0	1.4E-06	0	5.4E-07	--	--	6.7E-05	0.024	--	--	3.5E-05	0.013	1.0E-04	0.037
Copper	7440-50-8	Yes	No	Yes	4.4E-04	1.9E-04	9.9E-04	1.9E-05	3.8E-03	1.37	9.1E-03	3.31	2.1E-03	0.78	1.3E-03	0.46	0.016	5.92
Lead	7439-92-1	Yes	Yes	Yes	0	3.0E-04	0	2.6E-05	--	--	0.014	5.28	--	--	1.7E-03	0.62	0.016	5.90
Manganese	7439-96-5	Yes	Yes	Yes	8.7E-05	4.8E-05	2.3E-04	7.1E-07	7.4E-04	0.27	2.3E-03	0.84	4.9E-04	0.18	4.6E-05	0.017	3.6E-03	1.30
Mercury	7439-97-6	Yes	Yes	Yes	4.5E-06	3.7E-06	1.1E-05	3.6E-04	3.9E-05	0.014	1.7E-04	0.064	2.4E-05	8.9E-03	0.023	8.49	0.024	8.58
Nickel	7440-02-0	Yes	Yes	Yes	3.9E-05	7.3E-05	3.7E-04	0	3.3E-04	0.12	3.5E-03	1.27	8.1E-04	0.29	--	--	4.6E-03	1.68
Phosphorus	504	Yes	Yes	No	7.3E-04	8.6E-04	1.9E-03	7.7E-05	6.2E-03	2.26	0.041	15.0	4.0E-03	1.46	5.0E-03	1.82	0.056	20.5
Selenium	7782-49-2	Yes	Yes	Yes	0	0	0	0	--	--	--	--	--	--	--	--	--	--
Zinc	7440-66-6	Yes	No	No	1.1E-03	5.4E-04	6.0E-03	4.1E-05	9.2E-03	3.37	0.026	9.39	0.013	4.70	2.6E-03	0.96	0.050	18.4
INORGANIC COMPOUNDS																		
Carbon disulfide	75-15-0	Yes	Yes	Yes	--	--	--	3.82E-05	--	--	--	--	--	--	2.48E-03	0.90	2.48E-03	0.90
Fluorides	239	Yes	No	Yes	0	6.2E-03	3.6E-03	1.4E-04	--	--	0.29	108	7.8E-03	2.84	8.9E-03	3.26	0.31	114
Hydrogen fluoride	7664-39-3	Yes	Yes	Yes	0.033	7.2E-04	0.048	2.0E-05	0.28	102	0.034	12.5	0.10	38.1	1.3E-03	0.48	0.42	153
Glasswool fibers	352	Yes	No	No	5.1E-03	1.8E-03	0.010	--	0.044	15.9	0.086	31.4	0.022	8.20	--	--	0.15	55.5
ORGANIC COMPOUNDS																		
Acetone	67-64-1	Yes	No	Yes	0.0497	0.0192	0.431	5.48E-03	0.42	155	0.92	335	0.93	340	0.36	130	2.63	959
Benzene	71-43-2	Yes	Yes	Yes	9.88E-03	4.24E-03	0.108	1.31E-03	0.084	30.8	0.20	73.9	0.23	85.1	0.085	31.0	0.60	221
1,3-Butadiene	106-99-0	Yes	Yes	Yes	--	2.21E-04	--	5.79E-04	--	--	0.011	3.85	--	--	0.038	13.7	0.048	17.5
Cyclohexane	110-82-7	Yes	No	Yes	--	--	6.65E-03	--	--	--	--	--	0.014	5.24	--	--	0.014	5.24
Ethyl benzene	100-41-4	Yes	Yes	Yes	--	8.85E-04	5.66E-03	--	--	--	0.042	15.4	0.012	4.46	--	--	0.054	19.9
Chloroethane	75-00-3	Yes	Yes	Yes	--	--	3.05E-03	--	--	--	--	--	6.6E-03	2.40	--	--	6.6E-03	2.40
Formaldehyde	50-00-0	Yes	Yes	Yes	0.78	0.065	0.47	2.9E-03	6.67	2,435	3.10	1,133	1.00	366	0.19	68.6	11.0	4,003

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Table 4
Glass Plant TAC Emission Estimates - PTE
Hollingsworth & Vose Fiber Company—Corvallis, OR

Process Type	Rotary Fine	Rotary Coarse/Ultra Rotary Coarse	Flameblown	Glass Melt
Daily Throughput (tons/day)	⁽¹⁾ 8.55	47.7	2.16	64.8
Annual Throughput (tons/yr)	⁽¹⁾ 3,122	17,424	788	23,652

TAC	CAS/ODEQ Sequence Number	Regulatory Category (Yes/No)			Process Emission Factor ⁽²⁾ (lb/ton)				Emission Estimates								Total Facility Emission Estimates	
					Rotary Fine	Rotary Coarse/Ultra Rotary Coarse	Flameblown	Glass Melt	Rotary Fine		Rotary Coarse/Ultra Rotary Coarse		Flameblown		Glass Melt			
		TAC	HAP	RBC					Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily (lb/day)	Annual (lb/yr)
Hexane	110-54-3	Yes	Yes	Yes	0.0486	0.0164	0.625	7.89E-04	0.42	152	0.78	286	1.35	493	0.051	18.7	2.60	949
Chloromethane	74-87-3	Yes	Yes	Yes	3.84E-03	--	0.0408	--	0.033	12.0	--	--	0.088	32.2	--	--	0.12	44.1
2-Butanone	78-93-3	Yes	No	Yes	1.88E-03	7.83E-04	0.0137	7.24E-05	0.016	5.87	0.037	13.6	0.030	10.8	4.7E-03	1.71	0.088	32.0
Methyl isobutyl ketone	108-10-1	Yes	Yes	Yes	--	--	4.99E-03	--	--	--	--	--	0.011	3.93	--	--	0.011	3.93
Toluene	108-88-3	Yes	Yes	Yes	0.0234	0.0126	0.109	3.28E-04	0.20	73.1	0.60	220	0.24	85.9	0.021	7.76	1.06	386
m,p-Xylene	1330-20-7	Yes	Yes	Yes	--	2.10E-03	0.0117	--	--	--	0.10	36.6	0.025	9.22	--	--	0.13	45.8
o-Xylene	95-47-6	Yes	Yes	Yes	--	9.96E-04	--	--	--	--	0.048	17.4	--	--	--	--	0.048	17.4

NOTES:

HAP = hazardous air pollutant

RBC = risk based concentration.

TAC = toxic air contaminant.

(a) Daily emissions estimate (lb/day) = (process emission factor [lb/ton]) x (daily throughput [tons/day])

(b) Annual emissions estimate (lb/yr) = (process emission factor [lb/ton]) x (annual throughput [tons/yr])

REFERENCES:

(1) See Table 1, Input Assumptions and Parameters.

(2) See Table 3, Emission Factor Summary for Toxic Air Contaminants.

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Table 5
CFU TAC Emission Estimates - PTE
Hollingsworth & Vose Fiber Company—Corvallis, OR

Process Type	Rotary Fine	Rotary Coarse/Ultra Rotary Coarse	Flameblown	Glass Melt
Daily Production (tons/day) ⁽¹⁾	8.55	47.7	2.16	64.8
Annual Production (tons/yr) ⁽¹⁾	3,122	17,424	788	23,652

TAC	CAS	Regulatory Category (Yes/No)			CFU Emission Factor (lb/ton waste)				Emission Estimates								Total Facility Emission Estimates	
					Rotary Fine	Rotary Coarse/Ultra Rotary Coarse	Flameblown	Glass Melt	Rotary Fine		Rotary Coarse/Ultra Rotary Coarse		Flameblown		Glass Melt			
		TAC	HAP	RBC					Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily (lb/day)	Annual (lb/yr)
Silica, crystalline	7631-86-9	Yes	No	Yes	5.05E-03 ^(c)	1.78E-03 ^(c)	0.0103 ^(c)	3.47E-05 ^(c)	0.043	15.8	0.085	31.0	0.022	8.11	2.2E-03	0.82	0.15	55.7

NOTES:

CFU = ceramic filtration unit.

HAP = hazardous air pollutant

RBC = risk based concentration.

TAC = toxic air contaminant.

(a) Daily emissions estimate (lb/day) = (process emission factor [lb/ton]) x (daily throughput [tons/day])

(b) Annual emissions estimate (lb/yr) = (process emission factor [lb/ton]) x (annual throughput [tons/yr])

(c) Silica emission factor (lb/ton) = (CFU filterable PM emission factor [lb/ton]) x (bulking agent percent of filterable PM [%])/100 x (bulking agent silica content [%])/100

Rotary fine CFU filterable PM emission factor (lb/ton) = 0.51 (2)

Rotary coarse/ultra rotary coarse CFU filterable PM emission factor (lb/ton) = 0.18 (2)

Flameblown CFU filterable PM emission factor (lb/ton) = 1.04 (2)

Glass melt CFU filterable PM emission factor (lb/ton) = 3.5E-03 (2)

Bulking agent percent of filterable PM (%) = 99.0 (3)

Bulking agent silica content (%) = 1.00 (4)

REFERENCES:

(1) See Table 1, Input Assumptions and Parameters.

(2) Summary of 2018 source test results. Controlled production-based emission factors represent the average emission factor derived from multiple source tests conducted at the CFU outlet.

(3) Conservatively assumes 99 percent of filterable PM is bulking agent.

(4) Composition information from vendor SDS. Average of range.

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Table 6
CFU Super Sack Filling TAC Emission Estimates - PTE
Hollingsworth & Vose Fiber Company—Corvallis, OR

TAC	CAS/ODEQ Sequence Number	Glass Plant CFU Exhaust TAC Emission Factor ⁽¹⁾ (lb/ton)				CFU Super Sack Filter TAC Emission Factor (lb/ton)				CFU Super Sack Filter Emission Estimates								Total CFU Super Sack Filter Emission Estimates	
		Rotary Fine	Rotary Coarse/Ultra Rotary Coarse	Flameblown	Glass Melt	Rotary Fine	Rotary Coarse/Ultra Rotary Coarse	Flameblown	Glass Melt	Rotary Fine		Rotary Coarse/Ultra Rotary Coarse		Flameblown		Glass Melt		Daily (lb/day)	Annual (lb/yr)
										Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)		
Antimony	7440-36-0	0	5.4E-05	3.2E-04	3.6E-06	-- ^(c)	1.2E-06 ^(c)	3.8E-07 ^(c)	9.6E-07 ^(c)	--	--	3.6E-05	6.2E-03	1.1E-05	1.9E-03	2.8E-05	4.8E-03	7.6E-05	0.013
Arsenic	7440-38-2	0	0	0	0	-- ^(c)	-- ^(c)	-- ^(c)	-- ^(c)	--	--	--	--	--	--	--	--	--	--
Barium	7440-39-3	5.2E-05	3.3E-05	2.2E-04	2.5E-06	1.2E-07 ^(c)	7.6E-07 ^(c)	2.5E-07 ^(c)	6.7E-07 ^(c)	3.5E-06	5.8E-04	2.2E-05	3.8E-03	7.5E-06	1.3E-03	2.0E-05	3.3E-03	5.3E-05	9.0E-03
Beryllium	7440-41-7	0	0	0	0	-- ^(c)	-- ^(c)	-- ^(c)	-- ^(c)	--	--	--	--	--	--	--	--	--	--
Cadmium	7440-43-9	0	3.4E-05	6.0E-05	3.0E-06	-- ^(c)	7.9E-07 ^(c)	7.0E-08 ^(c)	8.0E-07 ^(c)	--	--	2.3E-05	3.9E-03	2.1E-06	3.5E-04	2.4E-05	4.0E-03	4.9E-05	8.3E-03
Chromium (total)	7440-47-3	1.8E-05	3.2E-05	7.0E-05	1.3E-06	4.1E-08 ^(c)	7.3E-07 ^(c)	8.1E-08 ^(c)	3.4E-07 ^(c)	1.2E-06	2.0E-04	2.2E-05	3.7E-03	2.4E-06	4.1E-04	1.0E-05	1.7E-03	3.5E-05	6.0E-03
Chromium VI	18540-29-9	1.8E-05	3.2E-05	7.0E-05	1.3E-06	4.1E-08 ^(c)	7.3E-07 ^(c)	8.1E-08 ^(c)	3.4E-07 ^(c)	1.2E-06	2.0E-04	2.2E-05	3.7E-03	2.4E-06	4.1E-04	1.0E-05	1.7E-03	3.5E-05	6.0E-03
Cobalt	7440-48-4	0	1.4E-06	0	5.4E-07	-- ^(c)	3.2E-08 ^(c)	-- ^(c)	1.5E-07 ^(c)	--	--	9.5E-07	1.6E-04	--	--	4.3E-06	7.3E-04	5.2E-06	8.9E-04
Copper	7440-50-8	4.4E-04	1.9E-04	9.9E-04	1.9E-05	9.8E-07 ^(c)	4.3E-06 ^(c)	1.2E-06 ^(c)	5.2E-06 ^(c)	2.9E-05	4.9E-03	1.3E-04	0.022	3.4E-05	5.8E-03	1.5E-04	0.026	3.5E-04	0.059
Lead	7439-92-1	0	3.0E-04	0	2.6E-05	-- ^(c)	6.9E-06 ^(c)	-- ^(c)	7.2E-06 ^(c)	--	--	2.1E-04	0.035	--	--	2.1E-04	0.036	4.2E-04	0.070
Manganese	7439-96-5	8.7E-05	4.8E-05	2.3E-04	7.1E-07	1.9E-07 ^(c)	1.1E-06 ^(c)	2.6E-07 ^(c)	1.9E-07 ^(c)	5.8E-06	9.7E-04	3.3E-05	5.5E-03	7.8E-06	1.3E-03	5.7E-06	9.6E-04	5.2E-05	8.7E-03
Mercury	7439-97-6	4.5E-06	3.7E-06	1.1E-05	3.6E-04	1.0E-08 ^(c)	8.4E-08 ^(c)	1.3E-08 ^(c)	9.7E-05 ^(c)	3.0E-07	5.1E-05	2.5E-06	4.2E-04	3.9E-07	6.6E-05	2.9E-03	0.49	2.9E-03	0.49
Nickel	7440-02-0	3.9E-05	7.3E-05	3.7E-04	0	8.7E-08 ^(c)	1.7E-06 ^(c)	4.4E-07 ^(c)	-- ^(c)	2.6E-06	4.3E-04	4.9E-05	8.3E-03	1.3E-05	2.2E-03	--	--	6.5E-05	0.011
Phosphorus	504	7.3E-04	8.6E-04	1.9E-03	7.7E-05	1.6E-06 ^(c)	2.0E-05 ^(c)	2.2E-06 ^(c)	2.1E-05 ^(c)	4.8E-05	8.1E-03	5.8E-04	0.098	6.4E-05	0.011	6.2E-04	0.10	1.3E-03	0.22
Selenium	7782-49-2	0	0	0	0	-- ^(c)	-- ^(c)	-- ^(c)	-- ^(c)	--	--	--	--	--	--	--	--	--	--
Zinc	7440-66-6	1.1E-03	5.4E-04	6.0E-03	4.1E-05	2.4E-06 ^(c)	1.2E-05 ^(c)	7.0E-06 ^(c)	1.1E-05 ^(c)	7.2E-05	0.012	3.6E-04	0.062	2.1E-04	0.035	3.3E-04	0.055	9.7E-04	0.16
Fluorides	239	0	6.2E-03	3.6E-03	1.4E-04	-- ^(c)	1.4E-04 ^(c)	4.2E-06 ^(c)	3.7E-05 ^(c)	--	--	4.2E-03	0.71	1.2E-04	0.021	1.1E-03	0.19	5.4E-03	0.91
Silica, crystalline	7631-86-9	--	--	--	--	3.2E-05 ^(d)	3.2E-05 ^(d)	3.2E-05 ^(d)	3.2E-05 ^(d)	9.5E-04	0.16	9.5E-04	0.16	9.5E-04	0.16	9.5E-04	0.16	3.8E-03	0.64

NOTES:

CFU = ceramic filtration unit.

TAC = toxic air contaminant.

(a) Daily CFU super sack filter emission estimate (lb/day) = (super sack filter TAC emission factor [lb/ton]) x (daily waste generation [tons/day])

$$\text{Daily waste generation (tons/day)} = 29.6 \quad (2)$$

(b) Annual CFU super sack filter emission estimate (lb/yr) = (CFU super sack filter TAC emission factor [lb/ton]) x (annual waste generation [tons/yr])

$$\text{Annual waste generation (tons/yr)} = 5,000 \quad (2)$$

(c) CFU super sack filter TAC emission factor (lb/ton) = (Glass Plant CFU exhaust TAC emission factor [lb/ton]) / (Glass Plant PM emission factor [lb/ton]) x (CFU super sack filter PM emission factor [lb/ton])

$$\text{CFU super sack filter PM emission factor (lb/ton)} = 3.2E-03 \quad (3)$$

$$\text{Rotary fine PM emission factor (lb/ton)} = 1.43 \quad (4)$$

$$\text{Rotary coarse/ultra rotary coarse PM emission factor (lb/ton)} = 0.14 \quad (5)$$

$$\text{Flameblown PM emission factor (lb/ton)} = 2.73 \quad (4)$$

$$\text{Glass melt PM emission factor (lb/ton)} = 0.012 \quad (4)$$

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Table 6
CFU Super Sack Filling TAC Emission Estimates - PTE
Hollingsworth & Vose Fiber Company—Corvallis, OR

(d) Emission factor (lb/ton) = (CFU super sack filter PM emission factor [lb/ton]) x (bulking agent silica content [%]) / 100

CFU super sack filter PM emission factor (lb/ton) = 3.2E-03 (3)

Bulking agent silica content (%) = 1.00 (6)

REFERENCES:

- (1) See Table 3, Emission Factor Summary for Toxic Air Contaminants.
- (2) See Table 1, Input Assumptions and Parameters. Conservatively assign full waste collection to each fiber type.
- (3) AP-42 Chapter 11.26 (November 1995), Table 11.26-1 "Emission Factors for Talc Processing." Emission factor for ground talc storage bin loading, with fabric filter. Emission factor used as representative of CFU super sack loading with fabric filter control. Emission factor converted from 0.0016 lb/Mlb to 0.0032 lb/ton.
- (4) Summary of 2018 source test results. Controlled production-based emission factors represent the average emission factor derived from multiple source tests conducted at the CFU outlet.
- (5) Conservatively used the lower of the rotary coarse and ultra rotary coarse results. Value represents the average emission factor for Ultra Rotary Coarse source tests dated September 12 and 15, 2018.
- (6) Composition information from vendor SDS. Average of range.

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Table 7
Glass Plant Bailing Emission Estimates - PTE
Hollingsworth & Vose Fiber Company—Corvallis, OR

TAC	ODEQ Sequence Number	Regulatory Category (Yes/No)			Emission Factor ^(a) (lb/ton)	Emission Estimates	
		TAC	HAP	RBC		Daily ^(b) (lb/day)	Annual ^(c) (lb/yr)
Glasswool Fibers	352	Yes	No	No	0.040	2.34	853

NOTES:

HAP = hazardous air pollutant

RBC = risk based concentration.

TAC = toxic air contaminant.

(a) Emission factor (lb/ton) = (percentage of fiber airborne) / 100 x (percentage of airborne fiber as fugitive) / 100 x (2,000 lb/ton)

Percentage of fiber airborne (%) = 0.01 (1)

Percentage of airborne fiber as fugitive (%) = 20 (2)

(b) Daily emissions estimate (lb/day) = (emission factor [lb/ton]) x (daily fiber production [tons/day])

Daily fiber production (tons/day) = 58.41 (3)

(c) Annual emissions estimate (lb/yr) = (emission factor [lb/ton]) x (annual fiber production [tons/yr])

Annual fiber production (tons/yr) = 21,334 (3)

REFERENCES:

(1) Assume less than 0.01% of all fiber produced becomes airborne.

(2) Assume 20% of airborne fiber leaves the production building.

(3) See Table 1, Input Assumptions and Parameters. Sum of rotary fine, ultra rotary coarse/rotary coarse, and flameblown fiber production.

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Table 8
Bulking Agent Storage Silos TAC Emission Estimates - PTE
Hollingsworth & Vose Fiber Company—Corvallis, OR

Parameter		Glass Plant 1 Silo	Glass Plant 2 Silo
Daily Hours of Operation (hrs/day)	(1)	1.50	1.50
Annual Hours of Operation (hrs/yr)	(1)	200	200
PM ₁₀ Emission Factor (lb/hr)	(2)	0.0051	0.0051

TAC	CAS	Regulatory Category (Yes/No)			Emissions Estimates				Total Silo Emissions Estimate	
					Glass Plant 1 Silo		Glass Plant 2 Silo			
		TAC	HAP	RBC	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily (lb/day)	Annual (lb/yr)
Silica, crystalline	7631-86-9 ⁽⁴⁾	Yes	No	Yes	7.7E-05	0.010	7.7E-05	0.010	1.5E-04	0.020

NOTES:

HAP = hazardous air pollutant

RBC = risk based concentration.

TAC = toxic air contaminant.

(a) Daily emissions estimate (lb/day) = (PM₁₀ emission factor [lb/hr]) x (daily hours of operation [hrs/day]) x (weight percent [%])/100

Weight percent crystalline silica (%) = 1.00 (3)

(b) Annual emissions estimate (lb/yr) = (PM₁₀ emission factor [lb/hr]) x (annual hours of operation [hrs/yr]) x (weight percent [%])/100

Weight percent crystalline silica (%) = 1.00 (3)

REFERENCES:

(1) See Table 1, Input Assumptions and Parameters.

(2) From Draft PSD permit provided by the DEQ in June 2020. Assumes PM₁₀ emissions as representative of respirable portion of particulate emissions.

(3) Composition information from vendor SDS. Average of range.

(4) Assigned CAS for Silica, crystalline. Not all crystalline silica in product is of respirable size.

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**Table 9
Raw Material Handling TAC Emission Estimates - PTE
Hollingsworth & Vose Fiber Company—Corvallis, OR**

Product	TAC	CAS/ODEQ Sequence Number	ODEQ Sequence Number	Regulatory Category (Yes/No)			Product Usage ⁽¹⁾		Weight Percent (%)	Emissions Estimate	
				TAC	HAP	RBC	Daily (tons/day)	Annual (tons/yr)		Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)
Barium Carbonate	Barium	7440-39-3 ⁽³⁾	45	Yes	No	No	4.80	1,459	97.0 ⁽⁴⁾	0.18	53.8
Zinc Oxide	Zinc Oxide	1314-13-2	633	Yes	No	No	3.02	919	97.5 ⁽⁵⁾	0.11	34.0
	Lead	7439-92-1 ⁽⁶⁾	305	Yes	Yes	Yes			0.10 ⁽⁷⁾	1.1E-04	0.035
	Cadmium	7440-43-9 ⁽⁸⁾	83	Yes	Yes	Yes			0.010 ⁽⁷⁾	1.1E-05	3.5E-03
Fluorspar	Fluorides	239 ⁽⁹⁾	239	Yes	No	Yes	[REDACTED]	[REDACTED]	[REDACTED]	0.049	14.8
	Silica, crystalline	7631-86-9	579	Yes	No	Yes				7.4E-04	0.22
Sand	Silica, crystalline	7631-86-9 ⁽¹¹⁾	579	Yes	No	Yes				1.71	520
	Aluminum	7429-90-5 ⁽¹²⁾	13	Yes	No	Yes				5.7E-03	1.73
Dolomite	Silica, crystalline	7631-86-9 ⁽¹¹⁾	579	Yes	No	Yes				6.8E-03	2.05
Limestone	Silica, crystalline	7631-86-9 ⁽¹¹⁾	579	Yes	No	Yes				1.1E-04	0.033
Nepheline Syenite	Aluminum	7429-90-5 ⁽¹²⁾	13	Yes	No	Yes				0.68	205

NOTES:

HAP = hazardous air pollutant

RBC = risk based concentration.

TAC = toxic air contaminant.

(a) Daily emissions estimate (lb/day) = (PM emission factor [lb/ton]) x (daily product throughput [tons/day]) x (weight percent [%])/100

PM emission factor (lb/ton) = 0.038 (2)

(b) Annual emissions estimate (lb/yr) = (PM emission factor [lb/ton]) x (annual product throughput [tons/yr]) x (weight percent [%])/100

PM emission factor (lb/ton) = 0.038 (2)

REFERENCES:

(1) See Table 1, Input Assumptions and Parameters.

(2) Information provided by Hollingsworth & Vose Fiber Company. See Title V permit application. Represents total PM emissions across raw material locations. Sum of PM emission factors for unloading & conveying, storage, weighing & mixing, and batch mix storage.

(3) Assigned CAS for barium and compounds.

(4) Composition information from vendor SDS.

(5) Composition information from vendor SDS. Average of range.

(6) Assigned CAS for lead and compounds.

(7) Composition information from vendor SDS. Compound present in trace quantities.

(8) Assigned CAS for cadmium and compounds.

(9) Assigned ODEQ ID for fluorides.

(11) Assigned CAS for Silica, crystalline. Not all crystalline silica in the product is of a respirable size. Conservatively assumes all crystalline silica emitted from baghouse is of respirable size.

(12) Assigned CAS for aluminum and compounds.

Table 10
Raw Material Handling - Off Specification TAC Emission Estimates - PTE
Hollingsworth & Vose Fiber Company—Corvallis, OR

Product	TAC	CAS/ODEQ Sequence Number	Regulatory Category (Yes/No)			Percent of Off Specification Makeup ⁽¹⁾ (%)	Off Specification Throughput		Weight Percent (%)	Emissions Estimate					
			TAC	HAP	RBC		Daily ^(a) (tons/day)	Annual ^(b) (tons/yr)		Daily (lb/day)	Annual (lb/yr)				
Barium Carbonate	Barium	7440-39-3 ⁽³⁾	Yes	No	No	61.4	0.61	7.37	97.0 ⁽⁴⁾	1.2E-03 ^(c)	0.014 ^(d)				
Zinc Oxide	Zinc Oxide	1314-13-2	Yes	No	No	38.6	0.39	4.63	97.5 ⁽⁶⁾	7.5E-04 ^(c)	9.0E-03 ^(d)				
	Lead	7439-92-1 ⁽⁷⁾	Yes	Yes	Yes				0.10 ⁽⁸⁾	7.7E-07 ^(c)	9.3E-06 ^(d)				
	Cadmium	7440-43-9 ⁽⁹⁾	Yes	Yes	Yes				0.010 ⁽⁸⁾	7.7E-08 ^(c)	9.3E-07 ^(d)				
Fluorspar	Fluorides	239 ⁽¹⁰⁾	Yes	No	Yes	--	--	--	--	3.3E-05 ^(c)	3.9E-04 ^(d)				
	Silica, crystalline	7631-86-9	Yes	No	Yes					4.9E-07 ^(c)	5.9E-06 ^(d)				
Sand	Silica, crystalline	7631-86-9 ⁽¹²⁾	Yes	No	Yes					1.1E-03 ^(c)	0.014 ^(d)				
	Aluminum	7429-90-5 ⁽¹³⁾	Yes	No	Yes					3.8E-06 ^(c)	4.5E-05 ^(d)				
Dolomite	Silica, crystalline	7631-86-9 ⁽¹²⁾	Yes	No	Yes					4.5E-06 ^(c)	5.4E-05 ^(d)				
Limestone	Silica, crystalline	7631-86-9 ⁽¹²⁾	Yes	No	Yes					7.2E-08 ^(c)	8.6E-07 ^(d)				
Nepheline Syenite	Aluminum	7429-90-5 ⁽¹³⁾	Yes	No	Yes					4.5E-04 ^(c)	5.4E-03 ^(d)				
TAC Total															
	Barium	7440-39-3	Yes	No	No					--	--	--	--	1.2E-03	0.014
	Zinc Oxide	1314-13-2	Yes	No	No					--	--	--	--	7.5E-04	9.0E-03
	Lead	7439-92-1	Yes	Yes	Yes	--	--	--	--	7.7E-07	9.3E-06				
	Cadmium	7440-43-9	Yes	Yes	Yes	--	--	--	--	7.7E-08	9.3E-07				
	Fluorides	239	Yes	No	Yes	--	--	--	--	3.3E-05	3.9E-04				
	Silica, crystalline	7631-86-9	Yes	No	Yes	--	--	--	--	1.1E-03	0.014				
	Aluminum	7429-90-5	Yes	No	Yes	--	--	--	--	4.6E-04	5.5E-03				

NOTES:

HAP = hazardous air pollutant

RBC = risk based concentration.

TAC = toxic air contaminant.

(a) Daily product throughput (tons/day) = (percent of Off Specification makeup [%]) / 100 x (Off Specification daily throughput [tons/day])

Off Specification daily throughput (tons/day) = 1.00 (2)

(b) Annual product throughput (tons/yr) = (percent of Off Specification makeup [%]) / 100 x (Off Specification annual throughput [tons/yr])

Off Specification annual throughput (tons/yr) = 12.0 (2)

(c) Daily emissions estimate (lb/day) = (PM emission factor [lb/ton]) x (daily product throughput [tons/day]) x (weight percent [%])/100

PM emission factor (lb/ton) = 0.002 (5)

(d) Annual emissions estimate (lb/yr) = (PM emission factor [lb/ton]) x (annual product throughput [tons/yr]) x (weight percent [%])/100

PM emission factor (lb/ton) = 0.002 (5)

REFERENCES:

(1) Assumes same ratio of raw material usage as presented in Table 1, Input Assumptions and Parameters. Actual batch makeup varies by glass type.

(2) See Table 1, Input Assumptions and Parameters.

(3) Assigned CAS for barium and compounds.

(4) Composition information from vendor SDS.

(5) Information provided by Hollingsworth & Vose Fiber Company. See Oregon Department of Environmental Quality Standard Air Contamination Discharge Permit No. 02-2173-ST-01 issued November 23, 2022.

(6) Composition information from vendor SDS. Average of range.

(7) Assigned CAS for lead and compounds.

(8) Composition information from vendor SDS. Compound present in trace quantities.

(9) Assigned CAS for cadmium and compounds.

(10) Assigned ODEQ ID for fluorides.

(12) Assigned CAS for Silica, crystalline. Not all crystalline silica in the product is of a respirable size. Conservatively assumes all crystalline silica emitted from baghouse is of respirable size.

(13) Assigned CAS for aluminum and compounds.

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**Table 11
Cooling Tower - Circulation Drift - TAC Emission Estimates - PTE
Hollingsworth & Vose Fiber Company—Corvallis, OR**

Parameter	Production Line 1 and 2	Production Line 3	Production Line 4
Total Water Circulation Rate (gpm) ⁽¹⁾	900	1,000	800

Pollutant	CAS	Regulatory Category (Yes/No)			Concentration ⁽¹⁾ (ppm)	Emission Estimates						Total Facility Emission Estimates	
		TAC	HAP	RBC		Production Line 1 and 2		Production Line 3		Production Line 4		Daily (lb/day)	Annual (lb/yr)
						Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)		
Drift Loss	--	--	--	--	--	540 ^(a)	197,258 ^(b)	600 ^(a)	219,175 ^(b)	480 ^(a)	175,340 ^(b)	--	--
Phosphoric Acid	7664-38-2	Yes	No	Yes	7.20	3.9E-03 ^(c)	1.42 ^(d)	4.3E-03 ^(c)	1.58 ^(d)	3.5E-03 ^(c)	1.26 ^(d)	0.012	4.26
Sulfuric Acid	7664-93-9	Yes	No	Yes	7.20	3.9E-03 ^(c)	1.42 ^(d)	4.3E-03 ^(c)	1.58 ^(d)	3.5E-03 ^(c)	1.26 ^(d)	0.012	4.26

NOTES:

gpm = gallons per minute.

HAP = hazardous air pollutant

ppm = parts per million.

RBC = risk based concentration.

TAC = toxic air contaminant.

(a) Daily drift loss (lb/day) = (total water circulation rate [gpm]) x (density of water [lb/gal]) x (drift loss percent of circulating water [%] / 100) x (60 min/hr) x (daily hours of operation [hrs/day])

Density of water (lb/gal) = 8.34 (1)

Daily hours of operation (hrs/day) = 24.0 (2)

Drift loss percent of circulating water (%) = 5.0E-03 (1)

(b) Annual drift loss (lb/yr) = (daily drift loss [lb/day]) x (annual days of operation [days/yr])

Annual days of operation (days/yr) = 365 (1)

(c) Daily emissions estimate (lb/day) = (daily drift loss [lb/day]) x (concentration [ppm] / 1,000,000); see Reference (3).

(d) Annual emissions estimate (lb/yr) = (annual drift loss [lb/yr]) x (concentration [ppm] / 1,000,000); see Reference (3).

REFERENCES:

(1) See Table 2, Input Assumptions and Parameters - Cooling Towers.

(2) See Table 1, Input Assumptions and Parameters.

(3) Assumes the composition of the drift loss is same as the cooling tower makeup water.

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Table 12
Spray Paint Usage TAC Emission Estimates - PTE
Hollingsworth & Vose Fiber Company—Corvallis, OR

Product	TAC	CAS	Regulatory Category (Yes/No)			Weight Percent (%)		Emission Factor (lb/lb)		Usage ⁽³⁾		Emissions Estimates	
			TAC	HAP	RBC	Maximum ⁽¹⁾	Average ⁽²⁾	Daily	Annual	Daily (lb/day)	Annual (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)
Total	Acetone	67-64-1	Yes	No	Yes	36.0	26.2	0.36 ^(c)	0.26 ^(d)	3.00	936	1.08	245
	Barium	7440-39-3	Yes	No	No	3.10	2.10	0.023 ^(e)	0.016 ^(f)			0.070	14.7
	Cobalt	7440-48-4	Yes	Yes	Yes	0.10	0.10	7.5E-04 ^(e)	7.5E-04 ^(f)			2.3E-03	0.70
	Ethylbenzene	100-41-4	Yes	Yes	Yes	1.75	1.10	0.018 ^(c)	0.011 ^(d)			0.053	10.3
	1,2,4-Trimethylbenzene	95-63-6	Yes	No	Yes	1.40	1.40	0.014 ^(c)	0.014 ^(d)			0.042	13.1
	Xylenes	1330-20-7	Yes	Yes	Yes	6.25	4.50	0.063 ^(c)	0.045 ^(d)			0.19	42.1

Product	TAC	CAS	Regulatory Category (Yes/No)			Weight Percent (%)
			TAC	HAP	RBC	
Black Paint	Acetone	67-64-1	Yes	No	Yes	25.0 ⁽⁵⁾
	Xylenes	1330-20-7	Yes	Yes	Yes	4.40 ⁽⁵⁾
	Ethylbenzene	100-41-4	Yes	Yes	Yes	1.00 ⁽⁵⁾
	Cobalt 2-Ethylhexanoate	7440-48-4 ⁽⁶⁾	Yes	Yes	Yes	0.10 ⁽⁵⁾
Gray Paint	Acetone	67-64-1	Yes	No	Yes	17.5 ⁽⁷⁾
	Xylenes	1330-20-7	Yes	Yes	Yes	6.25 ⁽⁷⁾
	Ethylbenzene	100-41-4	Yes	Yes	Yes	1.75 ⁽⁷⁾
Purple Paint	Acetone	67-64-1	Yes	No	Yes	26.0 ⁽⁵⁾
	Xylenes	1330-20-7	Yes	Yes	Yes	5.00 ⁽⁵⁾
	Barium Sulfate	7440-39-3 ⁽⁸⁾	Yes	No	No	1.80 ⁽⁵⁾
	Ethylbenzene	100-41-4	Yes	Yes	Yes	1.20 ⁽⁵⁾
Blue Paint	Acetone	67-64-1	Yes	No	Yes	27.0 ⁽⁵⁾
	Xylenes	1330-20-7	Yes	Yes	Yes	3.50 ⁽⁵⁾
	Ethylbenzene	100-41-4	Yes	Yes	Yes	0.90 ⁽⁵⁾
	Cobalt 2-Ethylhexanoate	7440-48-4 ⁽⁶⁾	Yes	Yes	Yes	0.10 ⁽⁵⁾
Green Paint	Acetone	67-64-1	Yes	No	Yes	25.0 ⁽⁵⁾
	Xylenes	1330-20-7	Yes	Yes	Yes	5.10 ⁽⁵⁾
	Barium Sulfate	7440-39-3 ⁽⁸⁾	Yes	No	No	1.60 ⁽⁵⁾
	Ethylbenzene	100-41-4	Yes	Yes	Yes	1.20 ⁽⁵⁾
Orange Paint	Acetone	67-64-1	Yes	No	Yes	27.0 ⁽⁵⁾
	Xylenes	1330-20-7	Yes	Yes	Yes	4.20 ⁽⁵⁾
	Barium Sulfate	7440-39-3 ⁽⁸⁾	Yes	No	No	3.10 ⁽⁵⁾
	Ethylbenzene	100-41-4	Yes	Yes	Yes	1.00 ⁽⁵⁾
Red Paint	Acetone	67-64-1	Yes	No	Yes	36.0 ⁽⁵⁾
	Xylenes	1330-20-7	Yes	Yes	Yes	2.70 ⁽⁵⁾
	Barium Sulfate	7440-39-3 ⁽⁸⁾	Yes	No	No	1.70 ⁽⁵⁾
	1,2,4-Trimethylbenzene	95-63-6	Yes	No	Yes	1.40 ⁽⁵⁾
	Ethylbenzene	100-41-4	Yes	Yes	Yes	0.60 ⁽⁵⁾

NOTES:

HAP = hazardous air pollutant.

RBC = risk based concentration.

TAC = toxic air contaminant.

(a) Daily emissions estimate (lb/day) = (daily product usage [lb/day]) x (emission factor [lb/lb])

(b) Annual emissions estimate (lb/yr) = (annual product usage [lb/yr]) x (emission factor [lb/lb])

(c) Daily emission factor (lb/lb) = (maximum weight percent [%]) / 100

(d) Annual emission factor (lb/lb) = (average weight percent [%]) / 100

(e) Daily emission factor (lb/lb) = (maximum weight percent [%]) / 100 x (1 - [transfer efficiency {%}]/100)

Transfer efficiency (%) = 25.0 (4)

(f) Annual emission factor (lb/lb) = (average weight percent [%]) / 100 x (1 - [transfer efficiency {%}]/100)

Transfer efficiency (%) = 25.0 (4)

REFERENCES:

(1) Maximum TAC of content of paints used the facility.

(2) Average of content of paints used the facility.

(3) See Table 1, Input Assumptions and Parameters.

(4) AP-42 Chapter 4.2.2.12 (May 1983) Table 4.2.2.12-1 "Coating Method Transfer Efficiencies." Assume transfer efficiency for air atomized spray.

(5) Composition information from vendor SDS.

(6) Assigned CAS for Cobalt and compounds.

(7) Composition information from vendor SDS. Represents average of range.

(8) Assigned CAS for Barium and compounds.

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Table 13
Emergency Generator TAC Emission Estimates - PTE
Hollingsworth & Vose Fiber Company—Corvallis, OR

Parameter	Emergency Generator 1	Emergency Generator 2
Daily Fuel Consumption (gal/day) ⁽¹⁾	46.8	33.0
Annual Fuel Consumption (gal/yr) ⁽¹⁾	2,340	1,650

TAC	CAS/ODEQ Sequence Number	Regulatory Category (Yes/No)			Emission Factor (lb/Mgal)	Emissions Estimates				Total Facility Emissions Estimates	
		TAC	HAP	RBC		Emergency Generator 1		Emergency Generator 2		Daily (lb/day)	Annual (lb/yr)
						Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)		
METALS											
Arsenic	7440-38-2	Yes	Yes	Yes	1.6E-03 ⁽²⁾	7.5E-05	3.7E-03	5.3E-05	2.6E-03	1.3E-04	6.4E-03
Cadmium	7440-43-9	Yes	Yes	Yes	1.5E-03 ⁽²⁾	7.0E-05	3.5E-03	5.0E-05	2.5E-03	1.2E-04	6.0E-03
Chromium VI	18540-29-9	Yes	Yes	Yes	1.0E-04 ⁽²⁾	4.7E-06	2.3E-04	3.3E-06	1.7E-04	8.0E-06	4.0E-04
Copper	7440-50-8	Yes	No	Yes	4.1E-03 ⁽²⁾	1.9E-04	9.6E-03	1.4E-04	6.8E-03	3.3E-04	0.016
Lead	7439-92-1	Yes	Yes	Yes	8.3E-03 ⁽²⁾	3.9E-04	0.019	2.7E-04	0.014	6.6E-04	0.033
Manganese	7439-96-5	Yes	Yes	Yes	3.1E-03 ⁽²⁾	1.5E-04	7.3E-03	1.0E-04	5.1E-03	2.5E-04	0.012
Mercury	7439-97-6	Yes	Yes	Yes	2.0E-03 ⁽²⁾	9.4E-05	4.7E-03	6.6E-05	3.3E-03	1.6E-04	8.0E-03
Nickel	7440-02-0	Yes	Yes	Yes	3.9E-03 ⁽²⁾	1.8E-04	9.1E-03	1.3E-04	6.4E-03	3.1E-04	0.016
Selenium	7782-49-2	Yes	Yes	Yes	2.2E-03 ⁽²⁾	1.0E-04	5.1E-03	7.3E-05	3.6E-03	1.8E-04	8.8E-03
ORGANIC COMPOUNDS											
Acetaldehyde	75-07-0	Yes	Yes	Yes	0.78 ⁽²⁾	0.037	1.83	0.026	1.29	0.063	3.13
Acrolein	107-02-8	Yes	Yes	Yes	0.034 ⁽²⁾	1.6E-03	0.079	1.1E-03	0.056	2.7E-03	0.14
Benzene	71-43-2	Yes	Yes	Yes	0.19 ⁽²⁾	8.7E-03	0.44	6.1E-03	0.31	0.015	0.74
1,3-Butadiene	106-99-0	Yes	Yes	Yes	0.22 ⁽²⁾	0.010	0.51	7.2E-03	0.36	0.017	0.87
Ethylbenzene	100-41-4	Yes	Yes	Yes	0.011 ⁽²⁾	5.1E-04	0.026	3.6E-04	0.018	8.7E-04	0.043
Formaldehyde	50-00-0	Yes	Yes	Yes	1.73 ⁽²⁾	0.081	4.04	0.057	2.85	0.14	6.89
Hexane	110-54-3	Yes	Yes	Yes	0.027 ⁽²⁾	1.3E-03	0.063	8.9E-04	0.044	2.1E-03	0.11
Toluene	108-88-3	Yes	Yes	Yes	0.11 ⁽²⁾	4.9E-03	0.25	3.5E-03	0.17	8.4E-03	0.42
Xylenes (mixed isomers)	1330-20-7	Yes	Yes	Yes	0.042 ⁽²⁾	2.0E-03	0.099	1.4E-03	0.070	3.4E-03	0.17
INORGANIC COMPOUNDS											
Ammonia	7664-41-7	Yes	No	Yes	0.80 ⁽³⁾	0.037	1.87	0.026	1.32	0.064	3.19
Hydrochloric Acid	7647-01-0	Yes	Yes	Yes	0.19 ⁽²⁾	8.7E-03	0.44	6.1E-03	0.31	0.015	0.74
POLYCYCLIC AROMATIC HYDROCARBONS (PAH)											
PAHs	401	Yes	Yes	Yes	0.036 ⁽²⁾	1.7E-03	0.085	1.2E-03	0.060	2.9E-03	0.14
Benzo[a]pyrene	50-32-8	Yes	Yes	Yes	3.6E-05 ⁽²⁾	1.7E-06	8.4E-05	1.2E-06	5.9E-05	2.8E-06	1.4E-04
Naphthalene	91-20-3	Yes	Yes	Yes	0.020 ⁽²⁾	9.2E-04	0.046	6.5E-04	0.033	1.6E-03	0.079
DIESEL PARTICULATE MATTER (DPM)											
DPM	200	Yes	No	Yes	33.5 ⁽²⁾	1.57	78.4	1.11	55.3	2.67	134

NOTES:

HAP = hazardous air pollutant

Mgal = thousand gallons.

RBC = risk based concentration.

TAC = toxic air contaminant.

(a) Daily emissions estimate (lb/day) = (emission factor [lb/Mgal]) x (Mgal/1,000 gal) x (daily fuel consumption [gal/day])

(b) Annual emissions estimate (lb/yr) = (emission factor [lb/Mgal]) x (Mgal/1,000 gal) x (annual fuel consumption [gal/yr])

REFERENCES:

(1) See Table 1, Input Assumptions and Parameters.

(2) DEQ approved diesel combustion emission factors for stationary and portable internal combustion engines.

(3) Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory published by the South Coast Air Quality Management District (SCAQMD) in December 2016. See Appendix B, Table B-2 "Default EF for Diesel/Distillate Oil Fuel Combustion (lb/1000 gal)" for stationary and portable internal combustion engines (ICE). Assumes no control.

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Table 14
Facility Natural Gas Usage TAC Emission Estimates - PTE
Hollingsworth & Vose Fiber Company—Corvallis, OR

Parameter	Glass Plant - Excluding Forehearth	Forehearth	Non-Production
Daily Fuel Usage (MMscf/day) ⁽¹⁾	2.68	0.11	0.070
Annual Fuel Usage (MMscf/yr) ⁽¹⁾	982	38.4	25.5

TAC	CAS/ODEQ Sequence Number	Regulatory Category (Yes/No)			Emission Factor (lb/MMscf)	Emissions Estimates						Total Facility Emissions Estimates	
		TAC	HAP	RBC		Glass Plant - Excluding Forehearth		Forehearth		Non-Production		Daily (lb/day)	Annual (lb/yr)
						Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)		
METALS													
Arsenic	7440-38-2	Yes	Yes	Yes	2.0E-04 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	-- ⁽³⁾	-- ⁽³⁾	1.4E-05	5.1E-03	1.4E-05	5.1E-03
Barium	7440-39-3	Yes	No	No	4.4E-03 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	-- ⁽³⁾	-- ⁽³⁾	3.1E-04	0.11	3.1E-04	0.11
Beryllium	7440-41-7	Yes	Yes	Yes	1.2E-05 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	-- ⁽³⁾	-- ⁽³⁾	8.4E-07	3.1E-04	8.4E-07	3.1E-04
Cadmium	7440-43-9	Yes	Yes	Yes	1.1E-03 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	-- ⁽³⁾	-- ⁽³⁾	7.7E-05	0.028	7.7E-05	0.028
Chromium (total)	7440-47-3	No	Yes	No	1.4E-03 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	-- ⁽³⁾	-- ⁽³⁾	9.8E-05	0.036	9.8E-05	0.036
Chromium VI	18540-29-9	Yes	Yes	Yes	5.6E-05 ^(c)	-- ⁽²⁾	-- ⁽²⁾	-- ⁽³⁾	-- ⁽³⁾	3.9E-06	1.4E-03	3.9E-06	1.4E-03
Cobalt	7440-48-4	Yes	Yes	Yes	8.4E-05 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	-- ⁽³⁾	-- ⁽³⁾	5.9E-06	2.1E-03	5.9E-06	2.1E-03
Copper	7440-50-8	Yes	No	Yes	8.5E-04 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	-- ⁽³⁾	-- ⁽³⁾	5.9E-05	0.022	5.9E-05	0.022
Lead	7439-92-1	Yes	Yes	Yes	5.0E-04 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	-- ⁽³⁾	-- ⁽³⁾	3.5E-05	0.013	3.5E-05	0.013
Manganese	7439-96-5	Yes	Yes	Yes	3.8E-04 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	-- ⁽³⁾	-- ⁽³⁾	2.6E-05	9.7E-03	2.6E-05	9.7E-03
Mercury	7439-97-6	Yes	Yes	Yes	2.6E-04 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	-- ⁽³⁾	-- ⁽³⁾	1.8E-05	6.6E-03	1.8E-05	6.6E-03
Molybdenum trioxide	1313-27-5	Yes	No	No	1.7E-03 ⁽⁴⁾	4.4E-03 ^(a)	1.62 ^(b)	1.7E-04 ^(a)	0.063 ^(b)	1.2E-04	0.042	4.7E-03	1.73
Nickel	7440-02-0	Yes	Yes	Yes	2.1E-03 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	-- ⁽³⁾	-- ⁽³⁾	1.5E-04	0.054	1.5E-04	0.054
Selenium	7782-49-2	Yes	Yes	Yes	2.4E-05 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	-- ⁽³⁾	-- ⁽³⁾	1.7E-06	6.1E-04	1.7E-06	6.1E-04
Vanadium	7440-62-2	Yes	No	Yes	2.3E-03 ⁽⁴⁾	6.2E-03 ^(a)	2.26 ^(b)	2.4E-04 ^(a)	0.088 ^(b)	1.6E-04	0.059	6.6E-03	2.40
Zinc	7440-66-6	Yes	No	No	0.029 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	-- ⁽³⁾	-- ⁽³⁾	2.0E-03	0.74	2.0E-03	0.74
INORGANIC COMPOUNDS													
Ammonia	7664-41-7	Yes	No	Yes	3.20 ⁽⁶⁾	8.59 ^(a)	3,141 ^(b)	0.34 ^(a)	123 ^(b)	0.22	81.6	9.15	3,346
ORGANIC COMPOUNDS													
Acetaldehyde	75-07-0	Yes	Yes	Yes	4.3E-03 ⁽⁴⁾	0.012 ^(a)	4.22 ^(b)	4.5E-04 ^(a)	0.17 ^(b)	3.0E-04	0.11	0.012	4.50
Acrolein	107-02-8	Yes	Yes	Yes	2.7E-03 ⁽⁴⁾	7.2E-03 ^(a)	2.65 ^(b)	2.8E-04 ^(a)	0.10 ^(b)	1.9E-04	0.069	7.7E-03	2.82
Benzene	71-43-2	Yes	Yes	Yes	8.0E-03 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	8.4E-04 ^(a)	0.31 ^(b)	5.6E-04	0.20	1.4E-03	0.51
Ethylbenzene	100-41-4	Yes	Yes	Yes	9.5E-03 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	1.0E-03 ^(a)	0.36 ^(b)	6.6E-04	0.24	1.7E-03	0.61
Formaldehyde	50-00-0	Yes	Yes	Yes	0.017 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	-- ⁽³⁾	-- ⁽³⁾	1.2E-03	0.43	1.2E-03	0.43
Hexane	110-54-3	Yes	Yes	Yes	6.3E-03 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	6.6E-04 ^(a)	0.24 ^(b)	4.4E-04	0.16	1.1E-03	0.40
Toluene	108-88-3	Yes	Yes	Yes	0.037 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	3.9E-03 ^(a)	1.41 ^(b)	2.6E-03	0.93	6.4E-03	2.34
Xylenes	1330-20-7	Yes	Yes	Yes	0.027 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	2.9E-03 ^(a)	1.04 ^(b)	1.9E-03	0.69	4.8E-03	1.74
POLYCYCLIC AROMATIC HYDROCARBONS (PAHs)													
PAHs	401	Yes	Yes	Yes	1.0E-04 ⁽⁴⁾	2.7E-04 ^(a)	0.098 ^(b)	1.1E-05 ^(a)	3.8E-03 ^(b)	7.0E-06	2.5E-03	2.9E-04	0.10
Benzo[a]pyrene	50-32-8	Yes	Yes	Yes	1.2E-06 ⁽⁴⁾	3.2E-06 ^(a)	1.2E-03 ^(b)	1.3E-07 ^(a)	4.6E-05 ^(b)	8.4E-08	3.1E-05	3.4E-06	1.3E-03
Naphthalene	91-20-3	Yes	Yes	Yes	3.0E-04 ⁽⁴⁾	8.1E-04 ^(a)	0.29 ^(b)	3.2E-05 ^(a)	0.012 ^(b)	2.1E-05	7.6E-03	8.6E-04	0.31

NOTES:

HAP = hazardous air pollutant

MMscf = million standard cubic feet.

RBC = risk based concentration.

TAC = toxic air contaminant.

(a) Daily emission estimates (lb/day) = (emission factor [lb/MMscf]) x (daily fuel usage [MMscf/day])

(b) Annual emission estimates (lb/yr) = (emission factor [lb/MMscf]) x (annual fuel usage [MMscf/yr])

(c) Chromium VI emission factor (lb/MMscf) = (chromium emission factor [lb/MMscf]) x (chromium VI percentage of total chromium [%]) / 100

Chromium VI percentage of total chromium (%) = 4.00 (5)

REFERENCES:

(1) See Table 1, Input Assumptions and Parameters.

(2) Source-specific emissions calculated in Table 4, Glass Plant TAC Emission Estimates - PTE. Emissions of this pollutant are included with the emission estimates for the production-based TEU emission factors.

(3) Source-specific emissions calculated in Table 4, Glass Plant TAC Emission Estimates - PTE. Emissions of this pollutant are included with the emission estimates for the glass melt TEU emission factors.

(4) Emission factors provided by Oregon Department of Environmental Quality for Natural Gas External Combustion Sources. Emission factors for sources <10 MMBtu/hr were used.

(5) Based on assumptions used by the EPA as outlined in the 2011 National Emissions Inventory. EPA assumes that 4% of chromium emitted during natural gas combustion is in the form of hexavalent chromium.

(6) EPA Webfire Clearinghouse for Inventories and Emission Factors. Assumes uncontrolled natural gas combustion.

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Table 15
TAC Emissions Estimate Summary - PTE
Hollingsworth & Vose Fiber Company—Corvallis, OR

Toxic Air Contaminant	CAS/ODEQ Sequence Number	Regulatory Category (Yes/No)			Emissions Estimate								
					Rotary Fine		Rotary Coarse/Ultra Rotary Coarse		Flameblown		Glass Melt Operations		
		TAC	HAP	RBC	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	
METALS													
Aluminum	7429-90-5	Yes	No	Yes	--	--	--	--	--	--	--	--	--
Antimony	7440-36-0	Yes	Yes	Yes	--	--	2.6E-03	0.94	7.0E-04	0.26	2.3E-04	0.084	
Arsenic	7440-38-2	Yes	Yes	Yes	--	--	--	--	--	--	--	--	
Barium	7440-39-3	Yes	No	No	4.5E-04	0.16	1.6E-03	0.58	4.7E-04	0.17	1.6E-04	0.058	
Beryllium	7440-41-7	Yes	Yes	Yes	--	--	--	--	--	--	--	--	
Cadmium	7440-43-9	Yes	Yes	Yes	--	--	1.6E-03	0.60	1.3E-04	0.047	1.9E-04	0.070	
Chromium (total)	7440-47-3	No	Yes	No	1.6E-04	0.057	1.5E-03	0.56	1.5E-04	0.055	8.2E-05	0.030	
Chromium VI	18540-29-9	Yes	Yes	Yes	1.6E-04	0.057	1.5E-03	0.56	1.5E-04	0.055	8.2E-05	0.030	
Cobalt	7440-48-4	Yes	Yes	Yes	--	--	6.7E-05	0.024	--	--	3.5E-05	0.013	
Copper	7440-50-8	Yes	No	Yes	3.8E-03	1.37	9.1E-03	3.31	2.1E-03	0.78	1.3E-03	0.46	
Lead	7439-92-1	Yes	Yes	Yes	--	--	0.014	5.28	--	--	1.7E-03	0.62	
Manganese	7439-96-5	Yes	Yes	Yes	7.4E-04	0.27	2.3E-03	0.84	4.9E-04	0.18	4.6E-05	0.017	
Mercury	7439-97-6	Yes	Yes	Yes	3.9E-05	0.014	1.7E-04	0.064	2.4E-05	8.9E-03	0.023	8.49	
Molybdenum trioxide	1313-27-5	Yes	No	No	--	--	--	--	--	--	--	--	
Nickel	7440-02-0	Yes	Yes	Yes	3.3E-04	0.12	3.5E-03	1.27	8.1E-04	0.29	--	--	
Phosphorus	504	Yes	Yes	No	6.2E-03	2.26	0.041	15.0	4.0E-03	1.46	5.0E-03	1.82	
Selenium	7782-49-2	Yes	Yes	Yes	--	--	--	--	--	--	--	--	
Vanadium	7440-62-2	Yes	No	Yes	--	--	--	--	--	--	--	--	
Zinc	7440-66-6	Yes	No	No	9.2E-03	3.37	0.026	9.39	0.013	4.70	2.6E-03	0.96	
Zinc Oxide	1314-13-2	Yes	No	No	--	--	--	--	--	--	--	--	
INORGANIC COMPOUNDS													
Ammonia	7664-41-7	Yes	No	Yes	--	--	--	--	--	--	--	--	
Carbon disulfide	75-15-0	Yes	Yes	Yes	--	--	--	--	--	--	2.5E-03	0.90	
Fluorides	239	Yes	No	Yes	--	--	0.29	108	7.8E-03	2.84	8.9E-03	3.26	
Hydrogen Fluoride	7664-39-3	Yes	Yes	Yes	0.28	102	0.034	12.5	0.10	38.1	1.3E-03	0.48	
Hydrochloric Acid	7647-01-0	Yes	Yes	Yes	--	--	--	--	--	--	--	--	
Phosphoric Acid	7664-38-2	Yes	No	Yes	--	--	--	--	--	--	--	--	
Glasswool Fibers	352	Yes	No	No	0.044	15.9	0.086	31.4	0.022	8.20	--	--	
Silica, Crystalline	7631-86-9	Yes	No	Yes	--	--	--	--	--	--	--	--	
Sulfuric Acid	7664-93-9	Yes	No	Yes	--	--	--	--	--	--	--	--	
ORGANIC COMPOUNDS													
Acetaldehyde	75-07-0	Yes	Yes	Yes	--	--	--	--	--	--	--	--	
Acetone	67-64-1	Yes	No	Yes	0.42	155	0.92	335	0.93	340	0.36	130	
Acrolein	107-02-8	Yes	Yes	Yes	--	--	--	--	--	--	--	--	
Benzene	71-43-2	Yes	Yes	Yes	0.084	30.8	0.20	73.9	0.23	85.1	0.085	31.0	
1,3-Butadiene	106-99-0	Yes	Yes	Yes	--	--	0.011	3.85	--	--	0.038	13.7	
Cyclohexane	110-82-7	Yes	No	Yes	--	--	--	--	0.014	5.24	--	--	
Ethylbenzene	100-41-4	Yes	Yes	Yes	--	--	0.042	15.4	0.012	4.46	--	--	
Chloroethane	75-00-3	Yes	Yes	Yes	--	--	--	--	6.6E-03	2.40	--	--	
Formaldehyde	50-00-0	Yes	Yes	Yes	6.67	2,435	3.10	1,133	1.00	366	0.19	68.6	
Hexane	110-54-3	Yes	Yes	Yes	0.42	152	0.78	286	1.35	493	0.051	18.7	
Chloromethane	74-87-3	Yes	Yes	Yes	0.033	12.0	--	--	0.088	32.2	--	--	
2-Butanone	78-93-3	Yes	No	Yes	0.016	5.87	0.037	13.6	0.030	10.8	4.7E-03	1.71	
Methyl isobutyl ketone	108-10-1	Yes	Yes	Yes	--	--	--	--	0.011	3.93	--	--	
1,2,4-Trimethylbenzene	95-63-6	Yes	No	Yes	--	--	--	--	--	--	--	--	
Toluene	108-88-3	Yes	Yes	Yes	0.20	73.1	0.60	220	0.24	85.9	0.021	7.76	
Xylenes (mixed isomers)	1330-20-7	Yes	Yes	Yes	--	--	0.10	36.6	0.025	9.22	--	--	
o-Xylene	95-47-6	Yes	Yes	Yes	--	--	0.048	17.4	--	--	--	--	
POLYCYCLIC AROMATIC HYDROCARBONS (PAH)													
PAHs	401	Yes	Yes	Yes	--	--	--	--	--	--	--	--	
Benzo[a]pyrene	50-32-8	Yes	Yes	Yes	--	--	--	--	--	--	--	--	
Naphthalene	91-20-3	Yes	Yes	Yes	--	--	--	--	--	--	--	--	
Diesel Particulate Matter (DPM)													
DPM	200	Yes	No	Yes	--	--	--	--	--	--	--	--	
Total TACs					8.19	2,990	6.36	2,323	4.10	1,495	0.79	288	
Total HAPs					7.69	2,808	4.99	1,823	3.08	1,123	0.42	152	

REFERENCES:

- (1) Emissions of this TAC are included with the emission estimates for the production-based TEU emission factors.

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Table 15
TAC Emissions Estimate Summary - PTE
Hollingsworth & Vose Fiber Company—Corvallis, OR

Toxic Air Contaminant	CAS/ODEQ Sequence Number	Regulatory Category (Yes/No)			Emissions Estimate										
					CFUs		CFU Super Sack Filling		Bailing Fugitives		Bulking Agent Silos		Raw Material Handling		
		TAC	HAP	RBC	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	
METALS															
Aluminum	7429-90-5	Yes	No	Yes	--	--	--	--	--	--	--	--	--	0.68	207
Antimony	7440-36-0	Yes	Yes	Yes	--	--	7.6E-05	0.013	--	--	--	--	--	--	--
Arsenic	7440-38-2	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Barium	7440-39-3	Yes	No	No	--	--	5.3E-05	9.0E-03	--	--	--	--	--	0.18	53.8
Beryllium	7440-41-7	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Cadmium	7440-43-9	Yes	Yes	Yes	--	--	4.9E-05	8.3E-03	--	--	--	--	--	1.1E-05	3.5E-03
Chromium (total)	7440-47-3	No	Yes	No	--	--	3.5E-05	6.0E-03	--	--	--	--	--	--	--
Chromium VI	18540-29-9	Yes	Yes	Yes	--	--	3.5E-05	6.0E-03	--	--	--	--	--	--	--
Cobalt	7440-48-4	Yes	Yes	Yes	--	--	5.2E-06	8.9E-04	--	--	--	--	--	--	--
Copper	7440-50-8	Yes	No	Yes	--	--	3.5E-04	0.059	--	--	--	--	--	--	--
Lead	7439-92-1	Yes	Yes	Yes	--	--	4.2E-04	0.070	--	--	--	--	--	1.1E-04	0.035
Manganese	7439-96-5	Yes	Yes	Yes	--	--	5.2E-05	8.7E-03	--	--	--	--	--	--	--
Mercury	7439-97-6	Yes	Yes	Yes	--	--	2.9E-03	0.49	--	--	--	--	--	--	--
Molybdenum trioxide	1313-27-5	Yes	No	No	--	--	--	--	--	--	--	--	--	--	--
Nickel	7440-02-0	Yes	Yes	Yes	--	--	6.5E-05	0.011	--	--	--	--	--	--	--
Phosphorus	504	Yes	Yes	No	--	--	1.3E-03	0.22	--	--	--	--	--	--	--
Selenium	7782-49-2	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Vanadium	7440-62-2	Yes	No	Yes	--	--	--	--	--	--	--	--	--	--	--
Zinc	7440-66-6	Yes	No	No	--	--	9.7E-04	0.16	--	--	--	--	--	--	--
Zinc Oxide	1314-13-2	Yes	No	No	--	--	--	--	--	--	--	--	--	0.11	34.0
INORGANIC COMPOUNDS															
Ammonia	7664-41-7	Yes	No	Yes	--	--	--	--	--	--	--	--	--	--	--
Carbon disulfide	75-15-0	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Fluorides	239	Yes	No	Yes	--	--	5.4E-03	0.91	--	--	--	--	--	0.049	14.8
Hydrogen Fluoride	7664-39-3	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Hydrochloric Acid	7647-01-0	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Phosphoric Acid	7664-38-2	Yes	No	Yes	--	--	--	--	--	--	--	--	--	--	--
Glasswool Fibers	352	Yes	No	No	--	--	--	--	2.34	853	--	--	--	--	--
Silica, Crystalline	7631-86-9	Yes	No	Yes	0.15	55.7	3.8E-03	0.64	--	--	1.5E-04	0.020	1.72	523	
Sulfuric Acid	7664-93-9	Yes	No	Yes	--	--	--	--	--	--	--	--	--	--	--
ORGANIC COMPOUNDS															
Acetaldehyde	75-07-0	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Acetone	67-64-1	Yes	No	Yes	--	--	--	--	--	--	--	--	--	--	--
Acrolein	107-02-8	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Benzene	71-43-2	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
1,3-Butadiene	106-99-0	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Cyclohexane	110-82-7	Yes	No	Yes	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	100-41-4	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Chloroethane	75-00-3	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Formaldehyde	50-00-0	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Hexane	110-54-3	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Chloromethane	74-87-3	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
2-Butanone	78-93-3	Yes	No	Yes	--	--	--	--	--	--	--	--	--	--	--
Methyl isobutyl ketone	108-10-1	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trimethylbenzene	95-63-6	Yes	No	Yes	--	--	--	--	--	--	--	--	--	--	--
Toluene	108-88-3	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Xylenes (mixed isomers)	1330-20-7	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
o-Xylene	95-47-6	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
POLYCYCLIC AROMATIC HYDROCARBONS (PAH)															
PAHs	401	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Benzo[a]pyrene	50-32-8	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	91-20-3	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Diesel Particulate Matter (DPM)															
DPM	200	Yes	No	Yes	--	--	--	--	--	--	--	--	--	--	--
Total TACs					0.15	55.7	0.016	2.62	2.34	853	1.5E-04	0.020	2.74	833	
Total HAPs					0	0	4.9E-03	0.83	0	0	0	0	1.3E-04	0.038	

REFERENCES:

- (1) Emissions of this TAC are included with the emission estimates for the production-based TEU emission factors.

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Table 15
TAC Emissions Estimate Summary - PTE
Hollingsworth & Vose Fiber Company—Corvallis, OR

Toxic Air Contaminant	CAS/ODEQ Sequence Number	Regulatory Category (Yes/No)			Emissions Estimate										
					Raw Material Handling - Off Specification		Cooling Towers		Shipping and Receiving - Paint Usage		Emergency Generators				
		TAC	HAP	RBC	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Line 1	Line 2	
METALS															
Aluminum	7429-90-5	Yes	No	Yes	4.6E-04	5.5E-03	--	--	--	--	--	--	--	--	--
Antimony	7440-36-0	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Arsenic	7440-38-2	Yes	Yes	Yes	--	--	--	--	--	--	7.5E-05	3.7E-03	5.3E-05	2.6E-03	
Barium	7440-39-3	Yes	No	No	1.2E-03	0.014	--	--	0.070	14.7	--	--	--	--	
Beryllium	7440-41-7	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	
Cadmium	7440-43-9	Yes	Yes	Yes	7.7E-08	9.3E-07	--	--	--	--	7.0E-05	3.5E-03	5.0E-05	2.5E-03	
Chromium (total)	7440-47-3	No	Yes	No	--	--	--	--	--	--	--	--	--	--	
Chromium VI	18540-29-9	Yes	Yes	Yes	--	--	--	--	--	--	4.7E-06	2.3E-04	3.3E-06	1.7E-04	
Cobalt	7440-48-4	Yes	Yes	Yes	--	--	--	--	2.3E-03	0.70	--	--	--	--	
Copper	7440-50-8	Yes	No	Yes	--	--	--	--	--	--	1.9E-04	9.6E-03	1.4E-04	6.8E-03	
Lead	7439-92-1	Yes	Yes	Yes	7.7E-07	9.3E-06	--	--	--	--	3.9E-04	0.019	2.7E-04	0.014	
Manganese	7439-96-5	Yes	Yes	Yes	--	--	--	--	--	--	1.5E-04	7.3E-03	1.0E-04	5.1E-03	
Mercury	7439-97-6	Yes	Yes	Yes	--	--	--	--	--	--	9.4E-05	4.7E-03	6.6E-05	3.3E-03	
Molybdenum trioxide	1313-27-5	Yes	No	No	--	--	--	--	--	--	--	--	--	--	
Nickel	7440-02-0	Yes	Yes	Yes	--	--	--	--	--	--	1.8E-04	9.1E-03	1.3E-04	6.4E-03	
Phosphorus	504	Yes	Yes	No	--	--	--	--	--	--	--	--	--	--	
Selenium	7782-49-2	Yes	Yes	Yes	--	--	--	--	--	--	1.0E-04	5.1E-03	7.3E-05	3.6E-03	
Vanadium	7440-62-2	Yes	No	Yes	--	--	--	--	--	--	--	--	--	--	
Zinc	7440-66-6	Yes	No	No	--	--	--	--	--	--	--	--	--	--	
Zinc Oxide	1314-13-2	Yes	No	No	7.5E-04	9.0E-03	--	--	--	--	--	--	--	--	
INORGANIC COMPOUNDS															
Ammonia	7664-41-7	Yes	No	Yes	--	--	--	--	--	--	0.037	1.87	0.026	1.32	
Carbon disulfide	75-15-0	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	
Fluorides	239	Yes	No	Yes	3.3E-05	3.9E-04	--	--	--	--	--	--	--	--	
Hydrogen Fluoride	7664-39-3	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	
Hydrochloric Acid	7647-01-0	Yes	Yes	Yes	--	--	--	--	--	--	8.7E-03	0.44	6.1E-03	0.31	
Phosphoric Acid	7664-38-2	Yes	No	Yes	--	--	0.012	4.26	--	--	--	--	--	--	
Glasswool Fibers	352	Yes	No	No	--	--	--	--	--	--	--	--	--	--	
Silica, Crystalline	7631-86-9	Yes	No	Yes	1.1E-03	0.014	--	--	--	--	--	--	--	--	
Sulfuric Acid	7664-93-9	Yes	No	Yes	--	--	0.012	4.26	--	--	--	--	--	--	
ORGANIC COMPOUNDS															
Acetaldehyde	75-07-0	Yes	Yes	Yes	--	--	--	--	--	--	0.037	1.83	0.026	1.29	
Acetone	67-64-1	Yes	No	Yes	--	--	--	--	1.08	245	--	--	--	--	
Acrolein	107-02-8	Yes	Yes	Yes	--	--	--	--	--	--	1.6E-03	0.079	1.1E-03	0.056	
Benzene	71-43-2	Yes	Yes	Yes	--	--	--	--	--	--	8.7E-03	0.44	6.1E-03	0.31	
1,3-Butadiene	106-99-0	Yes	Yes	Yes	--	--	--	--	--	--	0.010	0.51	7.2E-03	0.36	
Cyclohexane	110-82-7	Yes	No	Yes	--	--	--	--	--	--	--	--	--	--	
Ethylbenzene	100-41-4	Yes	Yes	Yes	--	--	--	--	0.053	10.3	5.1E-04	0.026	3.6E-04	0.018	
Chloroethane	75-00-3	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	
Formaldehyde	50-00-0	Yes	Yes	Yes	--	--	--	--	--	--	0.081	4.04	0.057	2.85	
Hexane	110-54-3	Yes	Yes	Yes	--	--	--	--	--	--	1.3E-03	0.063	8.9E-04	0.044	
Chloromethane	74-87-3	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	
2-Butanone	78-93-3	Yes	No	Yes	--	--	--	--	--	--	--	--	--	--	
Methyl isobutyl ketone	108-10-1	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	
1,2,4-Trimethylbenzene	95-63-6	Yes	No	Yes	--	--	--	--	0.042	13.1	--	--	--	--	
Toluene	108-88-3	Yes	Yes	Yes	--	--	--	--	--	--	4.9E-03	0.25	3.5E-03	0.17	
Xylenes (mixed isomers)	1330-20-7	Yes	Yes	Yes	--	--	--	--	0.19	42.1	2.0E-03	0.099	1.4E-03	0.070	
o-Xylene	95-47-6	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	
POLYCYCLIC AROMATIC HYDROCARBONS (PAH)															
PAHs	401	Yes	Yes	Yes	--	--	--	--	--	--	1.7E-03	0.085	1.2E-03	0.060	
Benzo[a]pyrene	50-32-8	Yes	Yes	Yes	--	--	--	--	--	--	1.7E-06	8.4E-05	1.2E-06	5.9E-05	
Naphthalene	91-20-3	Yes	Yes	Yes	--	--	--	--	--	--	9.2E-04	0.046	6.5E-04	0.033	
Diesel Particulate Matter (DPM)															
DPM	200	Yes	No	Yes	--	--	--	--	--	--	1.57	78.4	1.11	55.3	
Total TACs					3.6E-03	0.043	0.023	8.52	1.43	326	1.76	88.2	1.24	62.2	
Total HAPs					8.5E-07	1.0E-05	0	0	0.24	53.1	0.16	7.95	0.11	5.61	

REFERENCES:

- (1) Emissions of this TAC are included with the emission estimates for the production-based TEU emission factors.

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Table 15
TAC Emissions Estimate Summary - PTE
Hollingsworth & Vose Fiber Company—Corvallis, OR

Toxic Air Contaminant	CAS/ODEQ Sequence Number	Regulatory Category (Yes/No)			Emissions Estimate						Total Facility Emissions Estimate		
					Natural Gas Combustion								
					Glass Plant - Excluding Forehearth		Forehearth		Non-Production		Daily (lb/day)	Annual (lb/yr)	
		TAC	HAP	RBC	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)			
METALS													
Aluminum	7429-90-5	Yes	No	Yes	--	--	--	--	--	--	0.68	207	
Antimony	7440-36-0	Yes	Yes	Yes	(1)	(1)	(1)	(1)	--	--	3.6E-03	1.29	
Arsenic	7440-38-2	Yes	Yes	Yes	(1)	(1)	(1)	(1)	1.4E-05	5.1E-03	1.4E-04	0.011	
Barium	7440-39-3	Yes	No	No	(1)	(1)	(1)	(1)	3.1E-04	0.11	0.25	69.6	
Beryllium	7440-41-7	Yes	Yes	Yes	(1)	(1)	(1)	(1)	8.4E-07	3.1E-04	8.4E-07	3.1E-04	
Cadmium	7440-43-9	Yes	Yes	Yes	(1)	(1)	(1)	(1)	7.7E-05	0.028	2.2E-03	0.76	
Chromium (total)	7440-47-3	No	Yes	No	(1)	(1)	(1)	(1)	9.8E-05	0.036	2.0E-03	0.74	
Chromium VI	18540-29-9	Yes	Yes	Yes	(1)	(1)	(1)	(1)	3.9E-06	1.4E-03	2.0E-03	0.71	
Cobalt	7440-48-4	Yes	Yes	Yes	(1)	(1)	(1)	(1)	5.9E-06	2.1E-03	2.4E-03	0.74	
Copper	7440-50-8	Yes	No	Yes	(1)	(1)	(1)	(1)	5.9E-05	0.022	0.017	6.01	
Lead	7439-92-1	Yes	Yes	Yes	(1)	(1)	(1)	(1)	3.5E-05	0.013	0.017	6.06	
Manganese	7439-96-5	Yes	Yes	Yes	(1)	(1)	(1)	(1)	2.6E-05	9.7E-03	3.9E-03	1.33	
Mercury	7439-97-6	Yes	Yes	Yes	(1)	(1)	(1)	(1)	1.8E-05	6.6E-03	0.027	9.08	
Molybdenum trioxide	1313-27-5	Yes	No	No	4.4E-03	1.62	1.7E-04	0.063	1.2E-04	0.042	4.7E-03	1.73	
Nickel	7440-02-0	Yes	Yes	Yes	(1)	(1)	(1)	(1)	1.5E-04	0.054	5.1E-03	1.76	
Phosphorus	504	Yes	Yes	No	--	--	--	--	--	--	0.058	20.8	
Selenium	7782-49-2	Yes	Yes	Yes	(1)	(1)	(1)	(1)	1.7E-06	6.1E-04	1.8E-04	9.4E-03	
Vanadium	7440-62-2	Yes	No	Yes	6.2E-03	2.26	2.4E-04	0.088	1.6E-04	0.059	6.6E-03	2.40	
Zinc	7440-66-6	Yes	No	No	(1)	(1)	(1)	(1)	2.0E-03	0.74	0.053	19.3	
Zinc Oxide	1314-13-2	Yes	No	No	--	--	--	--	--	--	0.11	34.1	
INORGANIC COMPOUNDS													
Ammonia	7664-41-7	Yes	No	Yes	8.59	3,141	0.34	123	0.22	81.6	9.21	3,349	
Carbon disulfide	75-15-0	Yes	Yes	Yes	--	--	--	--	--	--	2.5E-03	0.90	
Fluorides	239	Yes	No	Yes	--	--	--	--	--	--	0.37	130	
Hydrogen Fluoride	7664-39-3	Yes	Yes	Yes	--	--	--	--	--	--	0.42	153	
Hydrochloric Acid	7647-01-0	Yes	Yes	Yes	--	--	--	--	--	--	0.015	0.74	
Phosphoric Acid	7664-38-2	Yes	No	Yes	--	--	--	--	--	--	0.012	4.26	
Glasswool Fibers	352	Yes	No	No	--	--	--	--	--	--	2.49	909	
Silica, Crystalline	7631-86-9	Yes	No	Yes	--	--	--	--	--	--	1.88	579	
Sulfuric Acid	7664-93-9	Yes	No	Yes	--	--	--	--	--	--	0.012	4.26	
ORGANIC COMPOUNDS													
Acetaldehyde	75-07-0	Yes	Yes	Yes	0.012	4.22	4.5E-04	0.17	3.0E-04	0.11	0.075	7.62	
Acetone	67-64-1	Yes	No	Yes	--	--	--	--	--	--	3.71	1,204	
Acrolein	107-02-8	Yes	Yes	Yes	7.2E-03	2.65	2.8E-04	0.10	1.9E-04	0.069	0.010	2.96	
Benzene	71-43-2	Yes	Yes	Yes	(1)	(1)	8.4E-04	0.31	5.6E-04	0.20	0.62	222	
1,3-Butadiene	106-99-0	Yes	Yes	Yes	--	--	--	--	--	--	0.065	18.4	
Cyclohexane	110-82-7	Yes	No	Yes	--	--	--	--	--	--	0.014	5.24	
Ethylbenzene	100-41-4	Yes	Yes	Yes	--	--	1.0E-03	0.36	6.6E-04	0.24	0.11	30.8	
Chloroethane	75-00-3	Yes	Yes	Yes	(1)	(1)	(1)	(1)	--	--	6.6E-03	2.40	
Formaldehyde	50-00-0	Yes	Yes	Yes	(1)	(1)	(1)	(1)	1.2E-03	0.43	11.1	4,010	
Hexane	110-54-3	Yes	Yes	Yes	(1)	(1)	6.6E-04	0.24	4.4E-04	0.16	2.60	949	
Chloromethane	74-87-3	Yes	Yes	Yes	--	--	--	--	--	--	0.12	44.1	
2-Butanone	78-93-3	Yes	No	Yes	--	--	--	--	--	--	0.088	32.0	
Methyl isobutyl ketone	108-10-1	Yes	Yes	Yes	--	--	--	--	--	--	0.011	3.93	
1,2,4-Trimethylbenzene	95-63-6	Yes	No	Yes	--	--	--	--	--	--	0.042	13.1	
Toluene	108-88-3	Yes	Yes	Yes	(1)	(1)	3.9E-03	1.41	2.6E-03	0.93	1.07	389	
Xylenes (mixed isomers)	1330-20-7	Yes	Yes	Yes	--	--	2.9E-03	1.04	1.9E-03	0.69	0.32	89.8	
o-Xylene	95-47-6	Yes	Yes	Yes	--	--	--	--	--	--	0.048	17.4	
POLYCYCLIC AROMATIC HYDROCARBONS (PAH)													
PAHs	401	Yes	Yes	Yes	2.7E-04	0.098	1.1E-05	3.8E-03	7.0E-06	2.5E-03	3.2E-03	0.25	
Benzo[a]pyrene	50-32-8	Yes	Yes	Yes	3.2E-06	1.2E-03	1.3E-07	4.6E-05	8.4E-08	3.1E-05	6.3E-06	1.4E-03	
Naphthalene	91-20-3	Yes	Yes	Yes	8.1E-04	0.29	3.2E-05	0.012	2.1E-05	7.6E-03	2.4E-03	0.39	
Diesel Particulate Matter (DPM)													
DPM	200	Yes	No	Yes	--	--	--	--	--	--	2.67	134	
Total TACs					8.62	3,152	0.35	127	0.23	85.5	38.3	12,690	
Total HAPs					0.020	7.27	1.0E-02	3.65	8.2E-03	3.01	16.7	5,987	

REFERENCES:

(1) Emissions of this TAC are included with the emission estimates for the production-based TEU emission factors.

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Table 16
Glass Plant TAC Emission Estimates - 2021
Hollingsworth & Vose Fiber Company—Corvallis, OR

Process Type	Rotary Fine	Rotary Coarse/Ultra Rotary Coarse	Flameblown	Glass Melt
Daily Throughput (tons/day) ⁽¹⁾	5.70	47.7	2.16	64.8
Annual Throughput (tons/yr) ⁽¹⁾	1,199	6,006	594	8,078

TAC	CAS/ODEQ Sequence Number	Regulatory Category (Yes/No)			Process Emission Factor ⁽²⁾ (lb/ton)				Emissions Estimate								Total Facility Emissions Estimates	
					Rotary Fine	Rotary Coarse/Ultra Rotary Coarse	Flameblown	Glass Melt	Rotary Fine		Rotary Coarse/Ultra Rotary Coarse		Flameblown		Glass Melt			
		TAC	HAP	RBC					Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily (lb/day)	Annual (lb/yr)
Metals																		
Antimony	7440-36-0	Yes	Yes	Yes	0	5.4E-05	3.2E-04	3.6E-06	--	--	2.6E-03	0.32	7.0E-04	0.19	2.3E-04	0.029	3.5E-03	0.54
Arsenic	7440-38-2	Yes	Yes	Yes	0	0	0	0	--	--	--	--	--	--	--	--	--	--
Barium	7440-39-3	Yes	No	No	5.2E-05	3.3E-05	2.2E-04	2.5E-06	3.0E-04	0.062	1.6E-03	0.20	4.7E-04	0.13	1.6E-04	0.020	2.5E-03	0.41
Beryllium	7440-41-7	Yes	Yes	Yes	0	0	0	0	--	--	--	--	--	--	--	--	--	--
Cadmium	7440-43-9	Yes	Yes	Yes	0	3.4E-05	6.0E-05	3.0E-06	--	--	1.6E-03	0.21	1.3E-04	0.036	1.9E-04	0.024	2.0E-03	0.27
Chromium (total)	7440-47-3	No	Yes	No	1.8E-05	3.2E-05	7.0E-05	1.3E-06	1.0E-04	0.022	1.5E-03	0.19	1.5E-04	0.041	8.2E-05	0.010	1.9E-03	0.27
Chromium VI	18540-29-9	Yes	Yes	Yes	1.8E-05	3.2E-05	7.0E-05	1.3E-06	1.0E-04	0.022	1.5E-03	0.19	1.5E-04	0.041	8.2E-05	0.010	1.9E-03	0.27
Cobalt	7440-48-4	Yes	Yes	Yes	0	1.4E-06	0	5.4E-07	--	--	6.7E-05	8.4E-03	--	--	3.5E-05	4.3E-03	1.0E-04	0.013
Copper	7440-50-8	Yes	No	Yes	4.4E-04	1.9E-04	9.9E-04	1.9E-05	2.5E-03	0.53	9.1E-03	1.14	2.1E-03	0.59	1.3E-03	0.16	0.015	2.41
Lead	7439-92-1	Yes	Yes	Yes	0	3.0E-04	0	2.6E-05	--	--	0.014	1.82	--	--	1.7E-03	0.21	0.016	2.03
Manganese	7439-96-5	Yes	Yes	Yes	8.7E-05	4.8E-05	2.3E-04	7.1E-07	5.0E-04	0.10	2.3E-03	0.29	4.9E-04	0.13	4.6E-05	5.7E-03	3.3E-03	0.53
Mercury	7439-97-6	Yes	Yes	Yes	4.5E-06	3.7E-06	1.1E-05	3.6E-04	2.6E-05	5.4E-03	1.7E-04	0.022	2.4E-05	6.7E-03	0.023	2.90	0.023	2.93
Nickel	7440-02-0	Yes	Yes	Yes	3.9E-05	7.3E-05	3.7E-04	0	2.2E-04	0.046	3.5E-03	0.44	8.1E-04	0.22	--	--	4.5E-03	0.71
Phosphorus	504	Yes	Yes	No	7.3E-04	8.6E-04	1.9E-03	7.7E-05	4.1E-03	0.87	0.041	5.17	4.0E-03	1.10	5.0E-03	0.62	0.054	7.76
Selenium	7782-49-2	Yes	Yes	Yes	0	0	0	0	--	--	--	--	--	--	--	--	--	--
Zinc	7440-66-6	Yes	No	No	1.1E-03	5.4E-04	6.0E-03	4.1E-05	6.2E-03	1.29	0.026	3.24	0.013	3.54	2.6E-03	0.33	0.047	8.40
Inorganic Compounds																		
Carbon disulfide	75-15-0	Yes	Yes	Yes	--	--	--	3.8E-05	--	--	--	--	--	--	2.5E-03	0.31	2.5E-03	0.31
Fluorides	239	Yes	No	Yes	0	6.2E-03	3.6E-03	1.4E-04	--	--	0.29	37.1	7.8E-03	2.14	8.9E-03	1.11	0.31	40.4
Hydrogen fluoride	7664-39-3	Yes	Yes	Yes	0.033	7.2E-04	0.048	2.0E-05	0.19	39.3	0.034	4.31	0.10	28.7	1.3E-03	0.16	0.33	72.5
Glasswool fibers	352	Yes	No	No	5.1E-03	1.8E-03	0.010	--	0.029	6.11	0.086	10.8	0.022	6.18	--	--	0.14	23.1
Organic Compounds																		
Acetone	67-64-1	Yes	No	Yes	0.050	0.019	0.43	5.5E-03	0.28	59.6	0.92	115	0.93	256	0.36	44.3	2.49	475
Benzene	71-43-2	Yes	Yes	Yes	9.9E-03	4.2E-03	0.11	1.3E-03	0.056	11.8	0.20	25.5	0.23	64.2	0.085	10.6	0.58	112
1,3-Butadiene	106-99-0	Yes	Yes	Yes	--	2.2E-04	--	5.8E-04	--	--	0.011	1.33	--	--	0.038	4.68	0.048	6.00
Cyclohexane	110-82-7	Yes	No	Yes	--	--	6.7E-03	--	--	--	--	--	0.014	3.95	--	--	0.014	3.95
Ethyl benzene	100-41-4	Yes	Yes	Yes	--	8.9E-04	5.7E-03	--	--	--	0.042	5.32	0.012	3.36	--	--	0.054	8.68
Chloroethane	75-00-3	Yes	Yes	Yes	--	--	3.1E-03	--	--	--	--	--	6.6E-03	1.81	--	--	6.6E-03	1.81
Formaldehyde	50-00-0	Yes	Yes	Yes	0.78	0.065	0.47	2.9E-03	4.45	935	3.10	390	1.00	276	0.19	23.4	8.74	1,625

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Table 16
Glass Plant TAC Emission Estimates - 2021
Hollingsworth & Vose Fiber Company—Corvallis, OR

Process Type	Rotary Fine	Rotary Coarse/Ultra Rotary Coarse	Flameblown	Glass Melt
Daily Throughput (tons/day) ⁽¹⁾	5.70	47.7	2.16	64.8
Annual Throughput (tons/yr) ⁽¹⁾	1,199	6,006	594	8,078

TAC	CAS/ODEQ Sequence Number	Regulatory Category (Yes/No)			Process Emission Factor ⁽²⁾ (lb/ton)				Emissions Estimate								Total Facility Emissions Estimates	
					Rotary Fine	Rotary Coarse/Ultra Rotary Coarse	Flameblown	Glass Melt	Rotary Fine		Rotary Coarse/Ultra Rotary Coarse		Flameblown		Glass Melt			
		TAC	HAP	RBC					Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily (lb/day)	Annual (lb/yr)
Hexane	110-54-3	Yes	Yes	Yes	0.049	0.016	0.63	7.9E-04	0.28	58.3	0.78	98.5	1.35	371	0.051	6.37	2.46	534
Chloromethane	74-87-3	Yes	Yes	Yes	3.8E-03	--	0.041	--	0.022	4.60	--	--	0.088	24.2	--	--	0.11	28.8
2-Butanone	78-93-3	Yes	No	Yes	1.9E-03	7.8E-04	0.014	7.2E-05	0.011	2.25	0.037	4.70	0.030	8.14	4.7E-03	0.58	0.082	15.7
Methyl isobutyl ketone	108-10-1	Yes	Yes	Yes	--	--	5.0E-03	--	--	--	--	--	0.011	2.96	--	--	0.011	2.96
Toluene	108-88-3	Yes	Yes	Yes	0.023	0.013	0.11	3.3E-04	0.13	28.1	0.60	75.7	0.24	64.7	0.021	2.65	0.99	171
m,p-Xylene	1330-20-7	Yes	Yes	Yes	--	2.1E-03	0.012	--	--	--	0.10	12.6	0.025	6.95	--	--	0.13	19.6
o-Xylene	95-47-6	Yes	Yes	Yes	--	1.0E-03	--	--	--	--	0.048	5.98	--	--	--	--	0.048	5.98

NOTES:

HAP = hazardous air pollutant

RBC = risk based concentration.

TAC = toxic air contaminant.

(a) Daily emissions estimate (lb/day) = (process emission factor [lb/ton]) x (daily throughput [tons/day])

(b) Annual emissions estimate (lb/yr) = (process emission factor [lb/ton]) x (annual throughput [tons/yr])

REFERENCES:

(1) See Table 1, Input Assumptions and Parameters.

(2) See Table 3, Emission Factor Summary for Toxic Air Contaminants.

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Table 17
CFU TAC Emission Estimates - 2021
Hollingsworth & Vose Fiber Company—Corvallis, OR

Process Type	Rotary Fine	Rotary Coarse/Ultra Rotary Coarse	Flameblown	Glass Melt
Daily Production (tons/day) ⁽¹⁾	5.70	47.7	2.16	64.8
Annual Production (tons/yr) ⁽¹⁾	1,199	6,006	594	8,078

TAC	CAS	Regulatory Category (Yes/No)			CFU Emission Factor (lb/ton)				Emission Estimates								Total Facility Emission Estimates	
					Rotary Fine	Rotary Coarse/Ultra Rotary Coarse	Flameblown	Glass Melt	Rotary Fine		Rotary Coarse/Ultra Rotary Coarse		Flameblown		Glass Melt			
		TAC	HAP	RBC					Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily (lb/day)	Annual (lb/yr)
Silica, crystalline	7631-86-9	Yes	No	Yes	5.0E-03 ^(c)	1.8E-03 ^(c)	0.010 ^(c)	3.5E-05 ^(c)	0.029	6.05	0.085	10.7	0.022	6.12	2.2E-03	0.28	0.14	23.2

NOTES:

CFU = ceramic filtration unit.

HAP = hazardous air pollutant

RBC = risk based concentration.

TAC = toxic air contaminant.

(a) Daily emissions estimate (lb/day) = (process emission factor [lb/ton]) x (daily throughput [tons/day])

(b) Annual emissions estimate (lb/yr) = (process emission factor [lb/ton]) x (annual throughput [tons/yr])

(c) Silica emission factor (lb/ton) = (CFU filterable PM emission factor [lb/ton]) x (bulking agent percent of filterable PM [%])/100 x (bulking agent silica content [%])/100

Rotary fine CFU filterable PM emission factor (lb/ton) = 0.51 (2)

Rotary coarse/ultra rotary coarse CFU filterable PM emission factor (lb/ton) = 0.18 (2)

Flameblown CFU filterable PM emission factor (lb/ton) = 1.04 (2)

Glass melt CFU filterable PM emission factor (lb/ton) = 3.5E-03 (2)

Bulking agent percent of filterable PM (%) = 99.0 (3)

Bulking agent silica content (%) = 1.00 (4)

REFERENCES:

(1) See Table 1, Input Assumptions and Parameters.

(2) Summary of 2018 source test results. Controlled production-based emission factors represent the average emission factor derived from multiple source tests conducted at the CFU outlet.

(3) Conservatively assume remainder of filterable PM is bulking agent.

(4) Composition information from vendor SDS. Average of range.

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Table 18
CFU Super Sack Filling TAC Emission Estimates - 2021
Hollingsworth & Vose Fiber Company—Corvallis, OR

TAC	CAS/ODEQ Sequence Number	Glass Plant CFU Exhaust TAC Emission Factor ⁽¹⁾ (lb/ton)				CFU Super Sack Filter TAC Emission Factor (lb/ton)				CFU Super Sack Filter Emission Estimates								Total CFU Super Sack Filter Emission Estimates	
		Rotary Fine	Rotary Coarse/Ultra Rotary Coarse	Flameblown	Glass Melt	Rotary Fine	Rotary Coarse/Ultra Rotary Coarse	Flameblown	Glass Melt	Rotary Fine		Rotary Coarse/Ultra Rotary Coarse		Flameblown		Glass Melt		Daily (lb/day)	Annual (lb/yr)
										Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)		
Antimony	7440-36-0	0	5.4E-05	3.2E-04	3.6E-06	-- (c)	1.2E-06 (c)	3.8E-07 (c)	9.6E-07 (c)	--	--	1.5E-05	3.8E-03	4.6E-06	1.2E-03	1.2E-05	3.0E-03	3.1E-05	8.0E-03
Arsenic	7440-38-2	0	0	0	0	-- (c)	-- (c)	-- (c)	-- (c)	--	--	--	--	--	--	--	--	--	--
Barium	7440-39-3	5.2E-05	3.3E-05	2.2E-04	2.5E-06	1.2E-07 (c)	7.6E-07 (c)	2.5E-07 (c)	6.7E-07 (c)	1.4E-06	3.6E-04	9.1E-06	2.4E-03	3.0E-06	7.9E-04	8.0E-06	2.1E-03	2.2E-05	5.6E-03
Beryllium	7440-41-7	0	0	0	0	-- (c)	-- (c)	-- (c)	-- (c)	--	--	--	--	--	--	--	--	--	--
Cadmium	7440-43-9	0	3.4E-05	6.0E-05	3.0E-06	-- (c)	7.9E-07 (c)	7.0E-08 (c)	8.0E-07 (c)	--	--	9.4E-06	2.4E-03	8.4E-07	2.2E-04	9.6E-06	2.5E-03	2.0E-05	5.2E-03
Chromium (total)	7440-47-3	1.8E-05	3.2E-05	7.0E-05	1.3E-06	4.1E-08 (c)	7.3E-07 (c)	8.1E-08 (c)	3.4E-07 (c)	4.9E-07	1.3E-04	8.8E-06	2.3E-03	9.8E-07	2.5E-04	4.1E-06	1.1E-03	1.4E-05	3.7E-03
Chromium VI	18540-29-9	1.8E-05	3.2E-05	7.0E-05	1.3E-06	4.1E-08 (c)	7.3E-07 (c)	8.1E-08 (c)	3.4E-07 (c)	4.9E-07	1.3E-04	8.8E-06	2.3E-03	9.8E-07	2.5E-04	4.1E-06	1.1E-03	1.4E-05	3.7E-03
Cobalt	7440-48-4	0	1.4E-06	0	5.4E-07	-- (c)	3.2E-08 (c)	-- (c)	1.5E-07 (c)	--	--	3.8E-07	1.0E-04	--	--	1.7E-06	4.5E-04	2.1E-06	5.5E-04
Copper	7440-50-8	4.4E-04	1.9E-04	9.9E-04	1.9E-05	9.8E-07 (c)	4.3E-06 (c)	1.2E-06 (c)	5.2E-06 (c)	1.2E-05	3.1E-03	5.2E-05	0.014	1.4E-05	3.6E-03	6.3E-05	0.016	1.4E-04	0.036
Lead	7439-92-1	0	3.0E-04	0	2.6E-05	-- (c)	6.9E-06 (c)	-- (c)	7.2E-06 (c)	--	--	8.3E-05	0.022	--	--	8.6E-05	0.022	1.7E-04	0.044
Manganese	7439-96-5	8.7E-05	4.8E-05	2.3E-04	7.1E-07	1.9E-07 (c)	1.1E-06 (c)	2.6E-07 (c)	1.9E-07 (c)	2.3E-06	6.0E-04	1.3E-05	3.4E-03	3.2E-06	8.2E-04	2.3E-06	5.9E-04	2.1E-05	5.4E-03
Mercury	7439-97-6	4.5E-06	3.7E-06	1.1E-05	3.6E-04	1.0E-08 (c)	8.4E-08 (c)	1.3E-08 (c)	9.7E-05 (c)	1.2E-07	3.1E-05	1.0E-06	2.6E-04	1.6E-07	4.1E-05	1.2E-03	0.30	1.2E-03	0.30
Nickel	7440-02-0	3.9E-05	7.3E-05	3.7E-04	0	8.7E-08 (c)	1.7E-06 (c)	4.4E-07 (c)	-- (c)	1.0E-06	2.7E-04	2.0E-05	5.2E-03	5.3E-06	1.4E-03	--	--	2.6E-05	6.8E-03
Phosphorus	504	7.3E-04	8.6E-04	1.9E-03	7.7E-05	1.6E-06 (c)	2.0E-05 (c)	2.2E-06 (c)	2.1E-05 (c)	1.9E-05	5.0E-03	2.4E-04	0.061	2.6E-05	6.7E-03	2.5E-04	0.065	5.3E-04	0.14
Selenium	7782-49-2	0	0	0	0	-- (c)	-- (c)	-- (c)	-- (c)	--	--	--	--	--	--	--	--	--	--
Zinc	7440-66-6	1.1E-03	5.4E-04	6.0E-03	4.1E-05	2.4E-06 (c)	1.2E-05 (c)	7.0E-06 (c)	1.1E-05 (c)	2.9E-05	7.5E-03	1.5E-04	0.038	8.4E-05	0.022	1.3E-04	0.034	3.9E-04	0.10
Fluorides	239	0	6.2E-03	3.6E-03	1.4E-04	-- (c)	1.4E-04 (c)	4.2E-06 (c)	3.7E-05 (c)	--	--	1.7E-03	0.44	5.1E-05	0.013	4.5E-04	0.12	2.2E-03	0.57
Silica, crystalline	7631-86-9	--	--	--	--	3.2E-05 (d)	3.2E-05 (d)	3.2E-05 (d)	3.2E-05 (d)	3.8E-04	0.100	3.8E-04	0.100	3.8E-04	0.100	3.8E-04	0.100	1.5E-03	0.40

NOTES:

CFU = ceramic filtration unit.

TAC = toxic air contaminant.

(a) Daily CFU super sack filter emission estimate (lb/day) = (super sack filter TAC emission factor [lb/ton]) x (daily waste generation [tons/day])

$$\text{Daily waste generation (tons/day)} = 12.0 \quad (2)$$

(b) Annual CFU super sack filter emission estimate (lb/yr) = (CFU super sack filter TAC emission factor [lb/ton]) x (annual waste generation [tons/yr])

$$\text{Annual waste generation (tons/yr)} = 3,111 \quad (2)$$

(c) CFU super sack filter TAC emission factor (lb/ton) = (Glass Plant CFU exhaust TAC emission factor [lb/ton]) / (Glass Plant PM emission factor [lb/ton]) x (CFU super sack filter PM emission factor [lb/ton])

$$\text{CFU super sack filter PM emission factor (lb/ton)} = 3.2E-03 \quad (3)$$

$$\text{Rotary fine PM emission factor (lb/ton)} = 1.43 \quad (4)$$

$$\text{Rotary coarse/ultra rotary coarse PM emission factor (lb/ton)} = 0.14 \quad (5)$$

$$\text{Flameblown PM emission factor (lb/ton)} = 2.73 \quad (4)$$

$$\text{Glass melt PM emission factor (lb/ton)} = 0.012 \quad (4)$$

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Table 18
CFU Super Sack Filling TAC Emission Estimates - 2021
Hollingsworth & Vose Fiber Company—Corvallis, OR

(d) Emission factor (lb/ton) = (CFU super sack filter PM emission factor [lb/ton]) x (bulking agent silica content [%]) / 100

CFU super sack filter PM emission factor (lb/ton) = 3.2E-03 (3)

Bulking agent silica content (%) = 1.00 (6)

REFERENCES:

- (1) See Table 3, Emission Factor Summary for Toxic Air Contaminants.
- (2) See Table 1, Input Assumptions and Parameters. Conservatively assign full waste collection to each fiber type.
- (3) AP-42 Chapter 11.26 (November 1995), Table 11.26-1 "Emission Factors for Talc Processing." Emission factor for ground talc storage bin loading, with fabric filter. Emission factor used as representative of CFU super sack loading with fabric filter control. Emission factor converted from 0.0016 lb/Mlb to 0.0032 lb/ton.
- (4) Summary of 2018 source test results. Controlled production-based emission factors represent the average emission factor derived from multiple source tests conducted at the CFU outlet.
- (5) Conservatively used the lower of the rotary coarse and ultra rotary coarse results. Value represents the average emission factor for Ultra Rotary Coarse source tests dated September 12 and 15, 2018.
- (6) Composition information from vendor SDS. Average of range.

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Table 19
Glass Plant Bailing Emission Estimates - 2021
Hollingsworth & Vose Fiber Company—Corvallis, OR

TAC	ODEQ Sequence Number	Regulatory Category (Yes/No)			Emission Factor ^(a) (lb/ton)	Emission Estimates	
		TAC	HAP	RBC		Daily ^(b) (lb/day)	Annual ^(c) (lb/yr)
Glasswool fibers	352	Yes	No	No	0.040	2.22	312

NOTES:

HAP = hazardous air pollutant

RBC = risk based concentration.

TAC = toxic air contaminant.

(a) Emission factor (lb/ton) = (percentage of fiber airborne) / 100% x (percentage of airborne fiber as fugitive) / 100% x (2,000 lb/ton)

Percentage of fiber airborne = 0.01 (1)

Percentage of airborne fiber as fugitive = 20 (2)

(b) Daily emissions estimate (lb/day) = (emission factor [lb/ton]) x (daily fiber production [tons/day])

Daily fiber production (tons/day) = 55.56 (3)

(c) Annual emissions estimate (lb/yr) = (emission factor [lb/ton]) x (annual fiber production [tons/yr])

Annual fiber production (tons/yr) = 7,799 (3)

REFERENCES:

(1) Assume less than 0.01% of all fiber produced becomes airborne.

(2) Assume 20% of airborne fiber leaves the production building.

(3) See Table 1, Input Assumptions and Parameters. Sum of rotary fine, ultra rotary coarse/rotary coarse, and flameblown fiber production.

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Table 20
Bulking Agent Storage Silos TAC Emission Estimates - 2021
Hollingsworth & Vose Fiber Company—Corvallis, OR

Parameter		Glass Plant 1 Silo	Glass Plant 2 Silo
Daily Hours of Operation (hrs/day)	(1)	1.50	1.50
Annual Hours of Operation (hrs/yr)	(1)	52.0	65.0
PM ₁₀ Emission Factor (lb/hr)	(2)	0.0051	0.0051

TAC	CAS	Regulatory Category (Yes/No)			Emissions Estimates				Total Silo Emissions Estimate	
					Glass Plant 1 Silo		Glass Plant 2 Silo			
		TAC	HAP	RBC	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily (lb/day)	Annual (lb/yr)
Silica, crystalline	7631-86-9 ⁽⁴⁾	Yes	No	Yes	7.7E-05	2.7E-03	7.7E-05	3.3E-03	1.5E-04	6.0E-03

NOTES:

HAP = hazardous air pollutant

RBC = risk based concentration.

TAC = toxic air contaminant.

(a) Daily emissions estimate (lb/day) = (PM₁₀ emission factor [lb/hr]) x (daily hours of operation [hrs/day]) x (weight percent [%])/100

Weight percent crystalline silica (%) = 1.00 (3)

(b) Annual emissions estimate (lb/yr) = (PM₁₀ emission factor [lb/hr]) x (annual hours of operation [hrs/yr]) x (weight percent [%])/100

Weight percent crystalline silica (%) = 1.00 (3)

REFERENCES:

(1) See Table 1, Input Assumptions and Parameters.

(2) From Draft PSD permit provided by the DEQ in June 2020. Assumes PM₁₀ emissions as representative of respirable portion of particulate emissions.

(3) Composition information from vendor SDS. Average of range.

(4) Assigned CAS for Silica, crystalline. Not all crystalline silica in product is of respirable size.

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Table 21
Raw Material Handling TAC Emission Estimates - 2021
Hollingsworth & Vose Fiber Company—Corvallis, OR

Product	TAC	CAS/ODEQ Sequence Number	Regulatory Category (Yes/No)			Product Usage ⁽¹⁾		Weight Percent (%)	Emissions Estimate	
			TAC	HAP	RBC	Daily (tons/day)	Annual (tons/yr)		Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)
Barium Carbonate	Barium	7440-39-3 ⁽³⁾	Yes	No	No	0.84	257	97.0 ⁽⁴⁾	0.031	9.47
Zinc Oxide	Zinc Oxide	1314-13-2	Yes	No	No	0.53	162	97.5 ⁽⁵⁾	0.020	6.00
	Lead	7439-92-1 ⁽⁶⁾	Yes	Yes	Yes			0.10 ⁽⁷⁾	2.0E-05	6.2E-03
	Cadmium	7440-43-9 ⁽⁸⁾	Yes	Yes	Yes			0.010 ⁽⁷⁾	2.0E-06	6.2E-04
Fluorspar	Fluorides	239 ⁽⁹⁾	Yes	No	Yes	[REDACTED]			0.015	4.51
	Silica, crystalline	7631-86-9	Yes	No	Yes				2.2E-04	0.068
Sand	Silica, crystalline	7631-86-9 ⁽¹¹⁾	Yes	No	Yes				0.51	154
	Aluminum	7429-90-5 ⁽¹²⁾	Yes	No	Yes				1.7E-03	0.51
Dolomite	Silica, crystalline	7631-86-9 ⁽¹¹⁾	Yes	No	Yes				1.4E-03	0.42
Limestone	Silica, crystalline	7631-86-9 ⁽¹¹⁾	Yes	No	Yes				1.9E-05	5.8E-03
Nepheline Syenite	Aluminum	7429-90-5 ⁽¹²⁾	Yes	No	Yes				0.20	59.5

NOTES:

HAP = hazardous air pollutant
RBC = risk based concentration.
TAC = toxic air contaminant.

(a) Daily emissions estimate (lb/day) = (PM emission factor [lb/ton]) x (daily product throughput [tons/day]) x (weight percent [%])/100

PM emission factor (lb/ton) = 0.038 (2)

(b) Annual emissions estimate (lb/yr) = (PM emission factor [lb/ton]) x (annual product throughput [tons/yr]) x (weight percent [%])/100

PM emission factor (lb/ton) = 0.038 (2)

REFERENCES:

- (1) See Table 1, Input Assumptions and Parameters.
- (2) Information provided by Hollingsworth & Vose Fiber Company. See Title V permit application. Represents total PM emissions across raw material locations. Sum of PM emission factors for unloading & conveying, storage, weighing & mixing, and batch mix storage.
- (3) Assigned CAS for barium and compounds.
- (4) Composition information from vendor SDS.
- (5) Composition information from vendor SDS. Average of range.
- (6) Assigned CAS for lead and compounds.
- (7) Composition information from vendor SDS. Compound present in trace quantities.
- (8) Assigned CAS for cadmium and compounds.
- (9) Assigned ODEQ ID for fluorides.

(11) Assigned CAS for Silica, crystalline. Not all crystalline silica in product is of a respirable size. Conservatively assumes all crystalline silica emitted from baghouse is of respirable size.

(12) Assigned CAS for aluminum and compounds.

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Table 22
Raw Material Handling - Off Specification TAC Emission Estimates - 2021
Hollingsworth & Vose Fiber Company—Corvallis, OR

Product	TAC	CAS/ODEQ Sequence Number	Regulatory Category (Yes/No)			Percent of Off Specification Makeup ⁽¹⁾ (%)	Off Specification Throughput		Weight Percent (%)	Emissions Estimate					
			TAC	HAP	RBC		Daily ^(a) (tons/day)	Annual ^(b) (tons/yr)		Daily (lb/day)	Annual (lb/yr)				
Barium Carbonate	Barium	7440-39-3 ⁽³⁾	Yes	No	No	61.3	0.61	7.36	97.0 ⁽⁴⁾	1.2E-03 ^(c)	0.014 ^(d)				
Zinc Oxide	Zinc Oxide	1314-13-2	Yes	No	No	38.7	0.39	4.64	97.5 ⁽⁶⁾	7.5E-04 ^(c)	9.1E-03 ^(d)				
	Lead	7439-92-1 ⁽⁷⁾	Yes	Yes	Yes				0.10 ⁽⁸⁾	7.7E-07 ^(c)	9.3E-06 ^(d)				
	Cadmium	7440-43-9 ⁽⁹⁾	Yes	Yes	Yes				0.010 ⁽⁸⁾	7.7E-08 ^(c)	9.3E-07 ^(d)				
Fluorspar	Fluorides	239 ⁽¹⁰⁾	Yes	No	Yes	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	3.6E-05 ^(c)	4.4E-04 ^(d)				
	Silica, crystalline	7631-86-9	Yes	No	Yes					5.5E-07 ^(c)	6.6E-06 ^(d)				
Sand	Silica, crystalline	7631-86-9 ⁽¹²⁾	Yes	No	Yes					1.2E-03 ^(c)	0.015 ^(d)				
	Aluminum	7429-90-5 ⁽¹³⁾	Yes	No	Yes					4.1E-06 ^(c)	4.9E-05 ^(d)				
Dolomite	Silica, crystalline	7631-86-9 ⁽¹²⁾	Yes	No	Yes					3.4E-06 ^(c)	4.0E-05 ^(d)				
Limestone	Silica, crystalline	7631-86-9 ⁽¹²⁾	Yes	No	Yes					4.8E-08 ^(c)	5.8E-07 ^(d)				
Nepheline Syenite	Aluminum	7429-90-5 ⁽¹³⁾	Yes	No	Yes					4.7E-04 ^(c)	5.7E-03 ^(d)				
TAC Total															
	Barium	7440-39-3	Yes	No	No					--	--	--	--	1.2E-03	0.014
	Zinc Oxide	1314-13-2	Yes	No	No					--	--	--	--	7.5E-04	9.1E-03
	Lead	7439-92-1	Yes	Yes	Yes	--	--	--	--	7.7E-07	9.3E-06				
	Cadmium	7440-43-9	Yes	Yes	Yes	--	--	--	--	7.7E-08	9.3E-07				
	Fluorides	239	Yes	No	Yes	--	--	--	--	3.6E-05	4.4E-04				
	Silica, crystalline	7631-86-9	Yes	No	Yes	--	--	--	--	1.2E-03	0.015				
	Aluminum	7429-90-5	Yes	No	Yes	--	--	--	--	4.8E-04	5.7E-03				

NOTES:

HAP = hazardous air pollutant

RBC = risk based concentration.

TAC = toxic air contaminant.

(a) Daily product throughput (tons/day) = (percent of Off Specification makeup [%]) / 100 x (Off Specification daily throughput [tons/day])

Off Specification daily throughput (tons/day) = 1.00 (2)

(b) Annual product throughput (tons/yr) = (percent of Off Specification makeup [%]) / 100 x (Off Specification annual throughput [tons/yr])

Off Specification annual throughput (tons/yr) = 12.0 (2)

(c) Daily emissions estimate (lb/day) = (PM emission factor [lb/ton]) x (daily product throughput [tons/day]) x (weight percent [%])/100

PM emission factor (lb/ton) = 0.002 (5)

(d) Annual emissions estimate (lb/yr) = (PM emission factor [lb/ton]) x (annual product throughput [tons/yr]) x (weight percent [%])/100

PM emission factor (lb/ton) = 0.002 (5)

REFERENCES:

(1) Assumes same ratio of raw material usage as presented in Table 1, Input Assumptions and Parameters. Actual batch makeup varies by glass type.

(2) See Table 1, Input Assumptions and Parameters.

(3) Assigned CAS for barium and compounds.

(4) Composition information from vendor SDS.

(5) Information provided by Hollingsworth & Vose Fiber Company. See Oregon Department of Environmental Quality Standard Air Contamination Discharge Permit No. 02-2173-ST-01 issued November 23, 2022.

(6) Composition information from vendor SDS. Average of range.

(7) Assigned CAS for lead and compounds.

(8) Composition information from vendor SDS. Compound present in trace quantities.

(9) Assigned CAS for cadmium and compounds.

(10) Assigned ODEQ ID for fluorides.

(12) Assigned CAS for Silica, crystalline. Not all crystalline silica in the product is of a respirable size. Conservatively assumes all crystalline silica emitted from baghouse is of respirable size.

(13) Assigned CAS for aluminum and compounds.

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Table 23
Cooling Tower - Circulation Drift - TAC Emission Estimates - 2021
Hollingsworth & Vose Fiber Company—Corvallis, OR

Parameter	Production Line 1 and 2	Production Line 3	Production Line 4
Total Water Circulation Rate (gpm) ⁽¹⁾	900	1,000	800

Pollutant	CAS	Regulatory Category (Yes/No)			Concentration ⁽¹⁾ (ppm)	Emissions Estimates						Total Facility Emissions Estimates	
		TAC	HAP	RBC		Production Line 1 and 2		Production Line 3		Production Line 4		Daily (lb/day)	Annual
						Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)		
PM	--	--	--	--	--	540 ^(a)	197,258 ^(b)	600 ^(a)	219,175 ^(b)	480 ^(a)	175,340 ^(b)	1,621	591,773
Phosphoric Acid	7664-38-2	Yes	No	Yes	7.20	3.9E-03 ^(c)	1.42 ^(d)	4.3E-03 ^(c)	1.58 ^(d)	3.5E-03 ^(c)	1.26 ^(d)	0.012	4.26
Sulfuric Acid	7664-93-9	Yes	No	Yes	7.20	3.9E-03 ^(c)	1.42 ^(d)	4.3E-03 ^(c)	1.58 ^(d)	3.5E-03 ^(c)	1.26 ^(d)	0.012	4.26

NOTES:

gpm = gallons per minute.

HAP = hazardous air pollutant

ppm = parts per million.

RBC = risk based concentration.

TAC = toxic air contaminant.

(a) Daily drift loss (lb/day) = (total water circulation rate [gpm]) x (density of water [lb/gal]) x (drift loss percent of circulating water [%] / 100) x (60 min/hr) x (daily hours of operation [hrs/day])

Density of water (lb/gal) = 8.34 (1)

Daily hours of operation (hr/day) = 24.0 (2)

Drift loss percent of circulating water (%) = 5.0E-03 (1)

(b) Annual emissions estimate (lb/yr) = (daily emissions estimate [lb/day]) x (annual days of operation [days/yr])

Annual days of operation (days/yr) = 365 (1)

(c) Daily emissions estimate (lb/day) = (daily PM emissions estimate [lb/day]) x (concentration [ppm] / 1,000,000); see Reference (3).

(d) Annual emissions estimate (lb/yr) = (annual PM emissions estimate [lb/yr]) x (concentration [ppm] / 1,000,000); see Reference (3).

REFERENCES:

(1) See Table 2, Input Assumptions and Parameters - Cooling Towers.

(2) See Table 1, Input Assumptions and Parameters.

(3) Assumes the composition of the drift loss is same as the cooling tower makeup water.

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Table 24
Cooling Tower - Material Balance - TAC Emission Estimates - 2021
Hollingsworth & Vose Fiber Company—Corvallis, OR

Pollutant	CAS	Regulatory Category (Yes/No)			Weight Percent ⁽¹⁾ (%)	Emissions Estimates	
		TAC	HAP	RBC		Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)
Glutaraldehyde	111-30-8	Yes	No	Yes	45.0	7.65	140
Methanol	67-56-1	Yes	Yes	Yes	0.50	0.085	1.55

NOTES:

HAP = hazardous air pollutant.

RBC = risk based concentration.

TAC = toxic air contaminant.

(a) Daily emissions estimate (lb/day) = (daily product usage [lb/day]) x (weight percent [%] / 100)

Daily product usage (lb/day) = 17.0 (2)

(b) Annual emissions estimate (lb/yr) = (annual product usage [lb/yr]) x (weight percent [%] / 100)

Annual product usage (lb/yr) = 310 (2)

REFERENCES:

(1) Composition information from vendor SDS.

(2) See Table 2, Input Assumptions and Parameters - Cooling Towers.

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Table 25
Spray Paint Usage TAC Emission Estimates - 2021
Hollingsworth & Vose Fiber Company—Corvallis, OR

Product	TAC	CAS	Regulatory Category (Yes/No)			Weight Percent (%)		Emission Factor (lb/lb)		Usage ⁽³⁾		Emissions Estimates	
			TAC	HAP	RBC	Maximum ⁽¹⁾	Average ⁽²⁾	Daily	Annual	Daily (lb/day)	Annual (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)
Total	Acetone	67-64-1	Yes	No	Yes	36.0	26.2	0.36 ^(c)	0.26 ^(d)	1.00	342	0.36	89.6
	Barium	7440-39-3	Yes	No	No	3.10	2.10	0.023 ^(e)	0.016 ^(f)			0.023	5.39
	Cobalt	7440-48-4	Yes	Yes	Yes	0.10	0.10	7.5E-04 ^(e)	7.5E-04 ^(f)			7.5E-04	0.26
	Ethylbenzene	100-41-4	Yes	Yes	Yes	1.75	1.10	0.018 ^(c)	0.011 ^(d)			0.018	3.76
	1,2,4-Trimethylbenzene	95-63-6	Yes	No	Yes	1.40	1.40	0.014 ^(c)	0.014 ^(d)			0.014	4.79
	Xylenes	1330-20-7	Yes	Yes	Yes	6.25	4.50	0.063 ^(c)	0.045 ^(d)			0.063	15.4

Product	TAC	CAS	Regulatory Category (Yes/No)			Weight Percent (%)
			TAC	HAP	RBC	
Black Paint	Acetone	67-64-1	Yes	No	Yes	25.0 ⁽⁵⁾
	Xylenes	1330-20-7	Yes	Yes	Yes	4.40 ⁽⁵⁾
	Ethylbenzene	100-41-4	Yes	Yes	Yes	1.00 ⁽⁵⁾
	Cobalt 2-Ethylhexanoate	7440-48-4 ⁽⁶⁾	Yes	Yes	Yes	0.10 ⁽⁵⁾
Gray Paint	Acetone	67-64-1	Yes	No	Yes	17.5 ⁽⁷⁾
	Xylenes	1330-20-7	Yes	Yes	Yes	6.25 ⁽⁷⁾
	Ethylbenzene	100-41-4	Yes	Yes	Yes	1.75 ⁽⁷⁾
Purple Paint	Acetone	67-64-1	Yes	No	Yes	26.0 ⁽⁵⁾
	Xylenes	1330-20-7	Yes	Yes	Yes	5.00 ⁽⁵⁾
	Barium Sulfate	7440-39-3 ⁽⁸⁾	Yes	No	No	1.80 ⁽⁵⁾
	Ethylbenzene	100-41-4	Yes	Yes	Yes	1.20 ⁽⁵⁾
	Cobalt 2-Ethylhexanoate	7440-48-4 ⁽⁶⁾	Yes	Yes	Yes	0.10 ⁽⁵⁾
Blue Paint	Acetone	67-64-1	Yes	No	Yes	27.0 ⁽⁵⁾
	Xylenes	1330-20-7	Yes	Yes	Yes	3.50 ⁽⁵⁾
	Ethylbenzene	100-41-4	Yes	Yes	Yes	0.90 ⁽⁵⁾
Green Paint	Acetone	67-64-1	Yes	No	Yes	25.0 ⁽⁵⁾
	Xylenes	1330-20-7	Yes	Yes	Yes	5.10 ⁽⁵⁾
	Barium Sulfate	7440-39-3 ⁽⁸⁾	Yes	No	No	1.60 ⁽⁵⁾
	Ethylbenzene	100-41-4	Yes	Yes	Yes	1.20 ⁽⁵⁾
	Cobalt 2-Ethylhexanoate	7440-48-4 ⁽⁶⁾	Yes	Yes	Yes	0.10 ⁽⁵⁾
Orange Paint	Acetone	67-64-1	Yes	No	Yes	27.0 ⁽⁵⁾
	Xylenes	1330-20-7	Yes	Yes	Yes	4.20 ⁽⁵⁾
	Barium Sulfate	7440-39-3 ⁽⁸⁾	Yes	No	No	3.10 ⁽⁵⁾
	Ethylbenzene	100-41-4	Yes	Yes	Yes	1.00 ⁽⁵⁾
	Cobalt 2-Ethylhexanoate	7440-48-4 ⁽⁶⁾	Yes	Yes	Yes	0.10 ⁽⁵⁾
Red Paint	Acetone	67-64-1	Yes	No	Yes	36.0 ⁽⁵⁾
	Xylenes	1330-20-7	Yes	Yes	Yes	2.70 ⁽⁵⁾
	Barium Sulfate	7440-39-3 ⁽⁸⁾	Yes	No	No	1.70 ⁽⁵⁾
	1,2,4-Trimethylbenzene	95-63-6	Yes	No	Yes	1.40 ⁽⁵⁾
	Ethylbenzene	100-41-4	Yes	Yes	Yes	0.60 ⁽⁵⁾

NOTES:

HAP = hazardous air pollutant.

RBC = risk based concentration.

TAC = toxic air contaminant.

(a) Daily emissions estimate (lb/day) = (daily product usage [lb/day]) x (emission factor [lb/lb])

(b) Annual emissions estimate (lb/yr) = (annual product usage [lb/yr]) x (emission factor [lb/lb])

(c) Daily emission factor (lb/lb) = (maximum weight percent [%]) / 100

(d) Annual emission factor (lb/lb) = (average weight percent [%]) / 100

(e) Daily emission factor (lb/lb) = (maximum weight percent [%]) / 100 x (1 - [transfer efficiency %]/100)

Transfer efficiency (%) = 25.0 (4)

(f) Annual emission factor (lb/lb) = (average weight percent [%]) / 100 x (1 - [transfer efficiency %]/100)

Transfer efficiency (%) = 25.0 (4)

REFERENCES:

(1) Maximum TAC of content of paints used the facility.

(2) Average of content of paints used the facility.

(3) See Table 1, Input Assumptions and Parameters.

(4) AP-42 Chapter 4.2.2.12 (May 1983) Table 4.2.2.12-1 "Coating Method Transfer Efficiencies." Assume transfer efficiency for air atomized spray.

(5) Composition information from vendor SDS.

(6) Assigned CAS for Cobalt and compounds.

(7) Composition information from vendor SDS. Represents average of range.

(8) Assigned CAS for Barium and compounds.

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Table 26
Emergency Generator TAC Emission Estimates - 2021
Hollingsworth & Vose Fiber Company—Corvallis, OR

Parameter	Emergency Generator 1	Emergency Generator 2
Daily Fuel Consumption (gal/day) ⁽¹⁾	46.8	33.0
Annual Fuel Consumption (gal/yr) ⁽¹⁾	164	132

TAC	CAS/ODEQ Sequence Number	Regulatory Category (Yes/No)			Emission Factor (lb/Mgal)	Emissions Estimates				Total Facility Emissions Estimates	
		TAC	HAP	RBC		Emergency Generator 1		Emergency Generator 2		Daily (lb/day)	Annual (lb/yr)
						Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)		
Metals											
Arsenic	7440-38-2	Yes	Yes	Yes	1.6E-03 ⁽²⁾	7.5E-05	2.6E-04	5.3E-05	2.1E-04	1.3E-04	4.7E-04
Cadmium	7440-43-9	Yes	Yes	Yes	1.5E-03 ⁽²⁾	7.0E-05	2.5E-04	5.0E-05	2.0E-04	1.2E-04	4.4E-04
Chromium VI	18540-29-9	Yes	Yes	Yes	1.0E-04 ⁽²⁾	4.7E-06	1.6E-05	3.3E-06	1.3E-05	8.0E-06	3.0E-05
Copper	7440-50-8	Yes	No	Yes	4.1E-03 ⁽²⁾	1.9E-04	6.7E-04	1.4E-04	5.4E-04	3.3E-04	1.2E-03
Lead	7439-92-1	Yes	Yes	Yes	8.3E-03 ⁽²⁾	3.9E-04	1.4E-03	2.7E-04	1.1E-03	6.6E-04	2.5E-03
Manganese	7439-96-5	Yes	Yes	Yes	3.1E-03 ⁽²⁾	1.5E-04	5.1E-04	1.0E-04	4.1E-04	2.5E-04	9.2E-04
Mercury	7439-97-6	Yes	Yes	Yes	2.0E-03 ⁽²⁾	9.4E-05	3.3E-04	6.6E-05	2.6E-04	1.6E-04	5.9E-04
Nickel	7440-02-0	Yes	Yes	Yes	3.9E-03 ⁽²⁾	1.8E-04	6.4E-04	1.3E-04	5.1E-04	3.1E-04	1.2E-03
Selenium	7782-49-2	Yes	Yes	Yes	2.2E-03 ⁽²⁾	1.0E-04	3.6E-04	7.3E-05	2.9E-04	1.8E-04	6.5E-04
Organic Compounds											
Acetaldehyde	75-07-0	Yes	Yes	Yes	0.78 ⁽²⁾	0.037	0.13	0.026	0.10	0.063	0.23
Acrolein	107-02-8	Yes	Yes	Yes	0.034 ⁽²⁾	1.6E-03	5.6E-03	1.1E-03	4.5E-03	2.7E-03	0.010
Benzene	71-43-2	Yes	Yes	Yes	0.19 ⁽²⁾	8.7E-03	0.031	6.1E-03	0.025	0.015	0.055
1,3-Butadiene	106-99-0	Yes	Yes	Yes	0.22 ⁽²⁾	0.010	0.036	7.2E-03	0.029	0.017	0.064
Ethylbenzene	100-41-4	Yes	Yes	Yes	0.011 ⁽²⁾	5.1E-04	1.8E-03	3.6E-04	1.4E-03	8.7E-04	3.2E-03
Formaldehyde	50-00-0	Yes	Yes	Yes	1.73 ⁽²⁾	0.081	0.28	0.057	0.23	0.14	0.51
Hexane	110-54-3	Yes	Yes	Yes	0.027 ⁽²⁾	1.3E-03	4.4E-03	8.9E-04	3.6E-03	2.1E-03	8.0E-03
Toluene	108-88-3	Yes	Yes	Yes	0.11 ⁽²⁾	4.9E-03	0.017	3.5E-03	0.014	8.4E-03	0.031
Xylenes (mixed isomers)	1330-20-7	Yes	Yes	Yes	0.042 ⁽²⁾	2.0E-03	6.9E-03	1.4E-03	5.6E-03	3.4E-03	0.013
Inorganic Compounds											
Ammonia	7664-41-7	Yes	No	Yes	0.80 ⁽³⁾	0.037	0.13	0.026	0.11	0.064	0.24
Hydrochloric Acid	7647-01-0	Yes	Yes	Yes	0.19 ⁽²⁾	8.7E-03	0.031	6.1E-03	0.025	0.015	0.055
Polycyclic Aromatic Hydrocarbons (PAH)											
PAHs	401	Yes	Yes	Yes	0.036 ⁽²⁾	1.7E-03	5.9E-03	1.2E-03	4.8E-03	2.9E-03	0.011
Benzo[a]pyrene	50-32-8	Yes	Yes	Yes	3.6E-05 ⁽²⁾	1.7E-06	5.8E-06	1.2E-06	4.7E-06	2.8E-06	1.1E-05
Naphthalene	91-20-3	Yes	Yes	Yes	0.020 ⁽²⁾	9.2E-04	3.2E-03	6.5E-04	2.6E-03	1.6E-03	5.8E-03
DIESEL PARTICULATE MATTER (DPM)											
DPM	200	Yes	No	Yes	33.5 ⁽²⁾	1.57	5.49	1.11	4.42	2.67	9.91

NOTES:

HAP = hazardous air pollutant

Mgal = thousand gallons.

RBC = risk based concentration.

TAC = toxic air contaminant.

(a) Daily emissions estimate (lb/day) = (emission factor [lb/Mgal]) x (Mgal/1,000 gal) x (daily fuel consumption [gal/day])

(b) Annual emissions estimate (lb/yr) = (emission factor [lb/Mgal]) x (Mgal/1,000 gal) x (annual fuel consumption [gal/yr])

REFERENCES:

(1) See Table 1, Input Assumptions and Parameters.

(2) DEQ approved diesel combustion emission factors for stationary and portable internal combustion engines.

(3) Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory published by the South Coast Air Quality Management District (SCAQMD) in December 2016. See Appendix B, Table B-2 "Default EF for Diesel/Distillate Oil Fuel Combustion (lb/1000 gal)" for stationary and portable internal combustion engines (ICE). Assumes no control.

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Table 27
Facility Natural Gas Usage TAC Emission Estimates - 2021
Hollingsworth & Vose Fiber Company—Corvallis, OR

Parameter	Glass Plant - Excluding Forehearth	Forehearth	Non-Production
Daily Fuel Usage (MMscf/day) ⁽¹⁾	2.37	0.11	0.062
Annual Fuel Usage (MMscf/yr) ⁽¹⁾	376	15.3	9.77

TAC	CAS/ODEQ Sequence Number	Regulatory Category (Yes/No)			Emission Factor (lb/MMscf)	Emissions Estimates						Total Facility Emissions Estimates	
		TAC	HAP	RBC		Glass Plant - Excluding Forehearth		Forehearth		Non-Production		Daily (lb/day)	Annual (lb/yr)
						Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)		
Metals													
Arsenic	7440-38-2	Yes	Yes	Yes	2.0E-04 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	-- ⁽³⁾	-- ⁽³⁾	1.2E-05	2.0E-03	1.2E-05	2.0E-03
Barium	7440-39-3	Yes	No	No	4.4E-03 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	-- ⁽³⁾	-- ⁽³⁾	2.7E-04	0.043	2.7E-04	0.043
Beryllium	7440-41-7	Yes	Yes	Yes	1.2E-05 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	-- ⁽³⁾	-- ⁽³⁾	7.4E-07	1.2E-04	7.4E-07	1.2E-04
Cadmium	7440-43-9	Yes	Yes	Yes	1.1E-03 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	-- ⁽³⁾	-- ⁽³⁾	6.8E-05	0.011	6.8E-05	0.011
Chromium (total)	7440-47-3	No	Yes	No	1.4E-03 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	-- ⁽³⁾	-- ⁽³⁾	8.7E-05	0.014	8.7E-05	0.014
Chromium VI	18540-29-9	Yes	Yes	Yes	5.6E-05 ^(c)	-- ⁽²⁾	-- ⁽²⁾	-- ⁽³⁾	-- ⁽³⁾	3.5E-06	5.5E-04	3.5E-06	5.5E-04
Cobalt	7440-48-4	Yes	Yes	Yes	8.4E-05 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	-- ⁽³⁾	-- ⁽³⁾	5.2E-06	8.2E-04	5.2E-06	8.2E-04
Copper	7440-50-8	Yes	No	Yes	8.5E-04 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	-- ⁽³⁾	-- ⁽³⁾	5.3E-05	8.3E-03	5.3E-05	8.3E-03
Lead	7439-92-1	Yes	Yes	Yes	5.0E-04 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	-- ⁽³⁾	-- ⁽³⁾	3.1E-05	4.9E-03	3.1E-05	4.9E-03
Manganese	7439-96-5	Yes	Yes	Yes	3.8E-04 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	-- ⁽³⁾	-- ⁽³⁾	2.4E-05	3.7E-03	2.4E-05	3.7E-03
Mercury	7439-97-6	Yes	Yes	Yes	2.6E-04 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	-- ⁽³⁾	-- ⁽³⁾	1.6E-05	2.5E-03	1.6E-05	2.5E-03
Molybdenum trioxide	1313-27-5	Yes	No	No	1.7E-03 ⁽⁴⁾	3.9E-03 ^(a)	0.62 ^(b)	1.7E-04 ^(a)	0.025 ^(b)	1.0E-04	0.016	4.2E-03	0.66
Nickel	7440-02-0	Yes	Yes	Yes	2.1E-03 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	-- ⁽³⁾	-- ⁽³⁾	1.3E-04	0.021	1.3E-04	0.021
Selenium	7782-49-2	Yes	Yes	Yes	2.4E-05 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	-- ⁽³⁾	-- ⁽³⁾	1.5E-06	2.3E-04	1.5E-06	2.3E-04
Vanadium	7440-62-2	Yes	No	Yes	2.3E-03 ⁽⁴⁾	5.5E-03 ^(a)	0.86 ^(b)	2.4E-04 ^(a)	0.035 ^(b)	1.4E-04	0.022	5.8E-03	0.92
Zinc	7440-66-6	Yes	No	No	0.029 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	-- ⁽³⁾	-- ⁽³⁾	1.8E-03	0.28	1.8E-03	0.28
Inorganic Compounds													
Ammonia	7664-41-7	Yes	No	Yes	3.20 ⁽⁶⁾	7.60 ^(a)	1,202 ^(b)	0.34 ^(a)	48.9 ^(b)	0.20	31.3	8.13	1,282
Organic Compounds													
Acetaldehyde	75-07-0	Yes	Yes	Yes	4.3E-03 ⁽⁴⁾	0.010 ^(a)	1.62 ^(b)	4.5E-04 ^(a)	0.066 ^(b)	2.7E-04	0.042	0.011	1.72
Acrolein	107-02-8	Yes	Yes	Yes	2.7E-03 ⁽⁴⁾	6.4E-03 ^(a)	1.01 ^(b)	2.8E-04 ^(a)	0.041 ^(b)	1.7E-04	0.026	6.9E-03	1.08
Benzene	71-43-2	Yes	Yes	Yes	8.0E-03 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	8.4E-04 ^(a)	0.12 ^(b)	5.0E-04	0.078	1.3E-03	0.20
Ethylbenzene	100-41-4	Yes	Yes	Yes	9.5E-03 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	1.0E-03 ^(a)	0.15 ^(b)	5.9E-04	0.093	1.6E-03	0.24
Formaldehyde	50-00-0	Yes	Yes	Yes	0.017 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	-- ⁽³⁾	-- ⁽³⁾	1.1E-03	0.17	1.1E-03	0.17
Hexane	110-54-3	Yes	Yes	Yes	6.3E-03 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	6.6E-04 ^(a)	0.096 ^(b)	3.9E-04	0.062	1.1E-03	0.16
Toluene	108-88-3	Yes	Yes	Yes	0.037 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	3.9E-03 ^(a)	0.56 ^(b)	2.3E-03	0.36	6.1E-03	0.92
Xylenes	1330-20-7	Yes	Yes	Yes	0.027 ⁽⁴⁾	-- ⁽²⁾	-- ⁽²⁾	2.9E-03 ^(a)	0.42 ^(b)	1.7E-03	0.27	4.5E-03	0.68
Polycyclic Aromatic Hydrocarbons (PAHs)													
PAHs	401	Yes	Yes	Yes	1.0E-04 ⁽⁴⁾	2.4E-04 ^(a)	0.038 ^(b)	1.1E-05 ^(a)	1.5E-03 ^(b)	6.2E-06	9.8E-04	2.5E-04	0.040
Benzo[a]pyrene	50-32-8	Yes	Yes	Yes	1.2E-06 ⁽⁴⁾	2.8E-06 ^(a)	4.5E-04 ^(b)	1.3E-07 ^(a)	1.8E-05 ^(b)	7.4E-08	1.2E-05	3.1E-06	4.8E-04
Naphthalene	91-20-3	Yes	Yes	Yes	3.0E-04 ⁽⁴⁾	7.1E-04 ^(a)	0.11 ^(b)	3.2E-05 ^(a)	4.6E-03 ^(b)	1.9E-05	2.9E-03	7.6E-04	0.12

NOTES:

HAP = hazardous air pollutant

MMscf = million standard cubic feet.

RBC = risk based concentration.

TAC = toxic air contaminant.

(a) Daily emission estimates (lb/day) = (emission factor [lb/MMscf]) x (daily fuel usage [MMscf/day])

(b) Annual emission estimates (lb/yr) = (emission factor [lb/MMscf]) x (annual fuel usage [MMscf/yr])

(c) Chromium VI emission factor (lb/MMscf) = (chromium emission factor [lb/MMscf]) x (chromium VI percentage of total chromium [%]) / 100

Chromium VI percentage of total chromium (%) = 4.00 ⁽⁵⁾

REFERENCES:

(1) See Table 1, Input Assumptions and Parameters.

(2) Source-specific emissions calculated in Table 16, Glass Plant TAC Emission Estimates - 2021. Emissions of this pollutant are included with the emission estimates for the production-based TEU emission factors.

(3) Source-specific emissions calculated in Table 16, Glass Plant TAC Emission Estimates - 2021. Emissions of this pollutant are included with the emission estimates for the glass melt TEU emission factors.

(4) Emission factors provided by Oregon Department of Environmental Quality for Natural Gas External Combustion Sources. Emission factors for sources <10 MMBtu/hr were used.

(5) Based on assumptions used by the EPA as outlined in the 2011 National Emissions Inventory. EPA assumes that 4% of chromium emitted during natural gas combustion is in the form of hexavalent chromium.

(6) EPA Webfire Clearinghouse for Inventories and Emission Factors. Assumes uncontrolled natural gas combustion.

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Table 28
TAC Emissions Estimate Summary - 2021
Hollingsworth & Vose Fiber Company—Corvallis, OR

Pollutant	CAS/ODEQ Sequence Number	Regulatory Category (Yes/No)			Emissions Estimate								
					Rotary Fine		Rotary Coarse/Ultra Rotary Coarse		Flameblown		Glass Melt Operations		
		TAC	HAP	RBC	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	
Metals													
Aluminum	7429-90-5	Yes	No	Yes	--	--	--	--	--	--	--	--	--
Antimony	7440-36-0	Yes	Yes	Yes	--	--	2.6E-03	0.32	7.0E-04	0.19	2.3E-04	0.029	
Arsenic	7440-38-2	Yes	Yes	Yes	--	--	--	--	--	--	--	--	
Barium	7440-39-3	Yes	No	No	3.0E-04	0.062	1.6E-03	0.20	4.7E-04	0.13	1.6E-04	0.020	
Beryllium	7440-41-7	Yes	Yes	Yes	--	--	--	--	--	--	--	--	
Cadmium	7440-43-9	Yes	Yes	Yes	--	--	1.6E-03	0.21	1.3E-04	0.036	1.9E-04	0.024	
Chromium (total)	7440-47-3	No	Yes	No	1.0E-04	0.022	1.5E-03	0.19	1.5E-04	0.041	8.2E-05	0.010	
Chromium VI	18540-29-9	Yes	Yes	Yes	1.0E-04	0.022	1.5E-03	0.19	1.5E-04	0.041	8.2E-05	0.010	
Cobalt	7440-48-4	Yes	Yes	Yes	--	--	6.7E-05	8.4E-03	--	--	3.5E-05	4.3E-03	
Copper	7440-50-8	Yes	No	Yes	2.5E-03	0.53	9.1E-03	1.14	2.1E-03	0.59	1.3E-03	0.16	
Lead	7439-92-1	Yes	Yes	Yes	--	--	0.014	1.82	--	--	1.7E-03	0.21	
Manganese	7439-96-5	Yes	Yes	Yes	5.0E-04	0.10	2.3E-03	0.29	4.9E-04	0.13	4.6E-05	5.7E-03	
Mercury	7439-97-6	Yes	Yes	Yes	2.6E-05	5.4E-03	1.7E-04	0.022	2.4E-05	6.7E-03	0.023	2.90	
Molybdenum trioxide	1313-27-5	Yes	No	No	--	--	--	--	--	--	--	--	
Nickel	7440-02-0	Yes	Yes	Yes	2.2E-04	0.046	3.5E-03	0.44	8.1E-04	0.22	--	--	
Phosphorus	504	Yes	Yes	No	4.1E-03	0.87	0.041	5.17	4.0E-03	1.10	5.0E-03	0.62	
Selenium	7782-49-2	Yes	Yes	Yes	--	--	--	--	--	--	--	--	
Vanadium	7440-62-2	Yes	No	Yes	--	--	--	--	--	--	--	--	
Zinc	7440-66-6	Yes	No	No	6.2E-03	1.29	0.026	3.24	0.013	3.54	2.6E-03	0.33	
Zinc Oxide	1314-13-2	Yes	No	No	--	--	--	--	--	--	--	--	
Inorganic Compounds													
Ammonia	7664-41-7	Yes	No	Yes	--	--	--	--	--	--	--	--	--
Carbon disulfide	75-15-0	Yes	Yes	Yes	--	--	--	--	--	--	2.5E-03	0.31	
Fluorides	239	Yes	No	Yes	--	--	0.29	37.1	7.8E-03	2.14	8.9E-03	1.11	
Hydrogen Fluoride	7664-39-3	Yes	Yes	Yes	0.19	39.3	0.034	4.31	0.10	28.7	1.3E-03	0.16	
Hydrochloric Acid	7647-01-0	Yes	Yes	Yes	--	--	--	--	--	--	--	--	
Glasswool Fibers	352	Yes	No	No	0.029	6.11	0.086	10.8	0.022	6.18	--	--	
Phosphoric Acid	7664-38-2	Yes	No	Yes	--	--	--	--	--	--	--	--	
Silica, crystalline	7631-86-9	Yes	No	Yes	--	--	--	--	--	--	--	--	
Sulfuric Acid	7664-93-9	Yes	No	Yes	--	--	--	--	--	--	--	--	
Organic Compounds													
Acetaldehyde	75-07-0	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--
Acetone	67-64-1	Yes	No	Yes	0.28	59.6	0.92	115	0.93	256	0.36	44.3	
Acrolein	107-02-8	Yes	Yes	Yes	--	--	--	--	--	--	--	--	
Benzene	71-43-2	Yes	Yes	Yes	0.056	11.8	0.20	25.5	0.23	64.2	0.085	10.6	
1,3-Butadiene	106-99-0	Yes	Yes	Yes	--	--	0.011	1.33	--	--	0.038	4.68	
Cyclohexane	110-82-7	Yes	No	Yes	--	--	--	--	0.014	3.95	--	--	
Ethylbenzene	100-41-4	Yes	Yes	Yes	--	--	0.042	5.32	0.012	3.36	--	--	
Chloroethane	75-00-3	Yes	Yes	Yes	--	--	--	--	6.6E-03	1.81	--	--	
Formaldehyde	50-00-0	Yes	Yes	Yes	4.45	935	3.10	390	1.00	276	0.19	23.4	
Glutaraldehyde	111-30-8	Yes	No	Yes	--	--	--	--	--	--	--	--	
Hexane	110-54-3	Yes	Yes	Yes	0.28	58.3	0.78	98.5	1.35	371	0.051	6.37	
Methanol	67-56-1	Yes	Yes	Yes	--	--	--	--	--	--	--	--	
Chloromethane	74-87-3	Yes	Yes	Yes	0.022	4.60	--	--	0.088	24.2	--	--	
2-Butanone	78-93-3	Yes	No	Yes	0.011	2.25	0.037	4.70	0.030	8.14	4.7E-03	0.58	
Methyl isobutyl ketone	108-10-1	Yes	Yes	Yes	--	--	--	--	0.011	2.96	--	--	
1,2,4-Trimethylbenzene	95-63-6	Yes	No	Yes	--	--	--	--	--	--	--	--	
Toluene	108-88-3	Yes	Yes	Yes	0.13	28.1	0.60	75.7	0.24	64.7	0.021	2.65	
Xylenes (mixed isomers)	1330-20-7	Yes	Yes	Yes	--	--	0.10	12.6	0.025	6.95	--	--	
o-Xylene	95-47-6	Yes	Yes	Yes	--	--	0.048	5.98	--	--	--	--	
Polycyclic Aromatic Hydrocarbons (PAH)													
PAHs	401	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--
Benzo[a]pyrene	50-32-8	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--
Naphthalene	91-20-3	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--
Diesel Particulate Matter (DPM)													
DPM	200	Yes	No	Yes	--	--	--	--	--	--	--	--	--
Total TACs					5.46	1,148	6.36	801	4.10	1,127	0.79	98.5	
Total HAPs					5.13	1,078	4.99	628	3.08	846	0.42	52.0	

REFERENCES:

- (1) Emissions of this TAC are included with the emission estimates for the production-based TEU emission factors.

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Table 28
TAC Emissions Estimate Summary - 2021
Hollingsworth & Vose Fiber Company—Corvallis, OR

Pollutant	CAS/ODEQ Sequence Number	Regulatory Category (Yes/No)			Emissions Estimate										
					CFUs		CFU Super Sack Filling		Bailing Fugitives		Bulking Agent Silos		Raw Material Handling		
		TAC	HAP	RBC	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	
Metals															
Aluminum	7429-90-5	Yes	No	Yes	--	--	--	--	--	--	--	--	--	0.20	60.0
Antimony	7440-36-0	Yes	Yes	Yes	--	--	3.1E-05	8.0E-03	--	--	--	--	--	--	--
Arsenic	7440-38-2	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Barium	7440-39-3	Yes	No	No	--	--	2.2E-05	5.6E-03	--	--	--	--	--	0.031	9.47
Beryllium	7440-41-7	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Cadmium	7440-43-9	Yes	Yes	Yes	--	--	2.0E-05	5.2E-03	--	--	--	--	--	2.0E-06	6.2E-04
Chromium (total)	7440-47-3	No	Yes	No	--	--	1.4E-05	3.7E-03	--	--	--	--	--	--	--
Chromium VI	18540-29-9	Yes	Yes	Yes	--	--	1.4E-05	3.7E-03	--	--	--	--	--	--	--
Cobalt	7440-48-4	Yes	Yes	Yes	--	--	2.1E-06	5.5E-04	--	--	--	--	--	--	--
Copper	7440-50-8	Yes	No	Yes	--	--	1.4E-04	0.036	--	--	--	--	--	--	--
Lead	7439-92-1	Yes	Yes	Yes	--	--	1.7E-04	0.044	--	--	--	--	--	2.0E-05	6.2E-03
Manganese	7439-96-5	Yes	Yes	Yes	--	--	2.1E-05	5.4E-03	--	--	--	--	--	--	--
Mercury	7439-97-6	Yes	Yes	Yes	--	--	1.2E-03	0.30	--	--	--	--	--	--	--
Molybdenum trioxide	1313-27-5	Yes	No	No	--	--	--	--	--	--	--	--	--	--	--
Nickel	7440-02-0	Yes	Yes	Yes	--	--	2.6E-05	6.8E-03	--	--	--	--	--	--	--
Phosphorus	504	Yes	Yes	No	--	--	5.3E-04	0.14	--	--	--	--	--	--	--
Selenium	7782-49-2	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Vanadium	7440-62-2	Yes	No	Yes	--	--	--	--	--	--	--	--	--	--	--
Zinc	7440-66-6	Yes	No	No	--	--	3.9E-04	0.10	--	--	--	--	--	--	--
Zinc Oxide	1314-13-2	Yes	No	No	--	--	--	--	--	--	--	--	--	0.020	6.00
Inorganic Compounds															
Ammonia	7664-41-7	Yes	No	Yes	--	--	--	--	--	--	--	--	--	--	--
Carbon disulfide	75-15-0	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Fluorides	239	Yes	No	Yes	--	--	2.2E-03	0.57	--	--	--	--	--	0.015	4.51
Hydrogen Fluoride	7664-39-3	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Hydrochloric Acid	7647-01-0	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Glasswool Fibers	352	Yes	No	No	--	--	--	--	2.22	312	--	--	--	--	--
Phosphoric Acid	7664-38-2	Yes	No	Yes	--	--	--	--	--	--	--	--	--	--	--
Silica, crystalline	7631-86-9	Yes	No	Yes	0.14	23.2	1.5E-03	0.40	--	--	1.5E-04	6.0E-03	0.51	155	
Sulfuric Acid	7664-93-9	Yes	No	Yes	--	--	--	--	--	--	--	--	--	--	--
Organic Compounds															
Acetaldehyde	75-07-0	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Acetone	67-64-1	Yes	No	Yes	--	--	--	--	--	--	--	--	--	--	--
Acrolein	107-02-8	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Benzene	71-43-2	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
1,3-Butadiene	106-99-0	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Cyclohexane	110-82-7	Yes	No	Yes	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	100-41-4	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Chloroethane	75-00-3	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Formaldehyde	50-00-0	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Glutaraldehyde	111-30-8	Yes	No	Yes	--	--	--	--	--	--	--	--	--	--	--
Hexane	110-54-3	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Methanol	67-56-1	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Chloromethane	74-87-3	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
2-Butanone	78-93-3	Yes	No	Yes	--	--	--	--	--	--	--	--	--	--	--
Methyl isobutyl ketone	108-10-1	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trimethylbenzene	95-63-6	Yes	No	Yes	--	--	--	--	--	--	--	--	--	--	--
Toluene	108-88-3	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Xylenes (mixed isomers)	1330-20-7	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
o-Xylene	95-47-6	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons (PAH)															
PAHs	401	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Benzo[a]pyrene	50-32-8	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	91-20-3	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--	--	--
Diesel Particulate Matter (DPM)															
DPM	200	Yes	No	Yes	--	--	--	--	--	--	--	--	--	--	--
Total TACs					0.14	23.2	6.3E-03	1.63	2.22	312	1.5E-04	6.0E-03	0.77	235	
Total HAPs					0	0	2.0E-03	0.52	0	0	0	0	2.2E-05	6.8E-03	

REFERENCES:

- (1) Emissions of this TAC are included with the emission estimates for the production-based TEU emission factors.

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Table 28
TAC Emissions Estimate Summary - 2021
Hollingsworth & Vose Fiber Company—Corvallis, OR

Pollutant	CAS/ODEQ Sequence Number	Regulatory Category (Yes/No)			Emissions Estimate								
					Raw Material Handling - Off Specification		Cooling Towers				Total		
		TAC	HAP	RBC			Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)			Daily (lb/day)
Metals													
Aluminum	7429-90-5	Yes	No	Yes	4.8E-04	5.7E-03	--	--	--	--	--	--	--
Antimony	7440-36-0	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--
Arsenic	7440-38-2	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--
Barium	7440-39-3	Yes	No	No	1.2E-03	0.014	--	--	--	--	--	--	--
Beryllium	7440-41-7	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--
Cadmium	7440-43-9	Yes	Yes	Yes	7.7E-08	9.3E-07	--	--	--	--	--	--	--
Chromium (total)	7440-47-3	No	Yes	No	--	--	--	--	--	--	--	--	--
Chromium VI	18540-29-9	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--
Cobalt	7440-48-4	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--
Copper	7440-50-8	Yes	No	Yes	--	--	--	--	--	--	--	--	--
Lead	7439-92-1	Yes	Yes	Yes	7.7E-07	9.3E-06	--	--	--	--	--	--	--
Manganese	7439-96-5	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--
Mercury	7439-97-6	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--
Molybdenum trioxide	1313-27-5	Yes	No	No	--	--	--	--	--	--	--	--	--
Nickel	7440-02-0	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--
Phosphorus	504	Yes	Yes	No	--	--	--	--	--	--	--	--	--
Selenium	7782-49-2	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--
Vanadium	7440-62-2	Yes	No	Yes	--	--	--	--	--	--	--	--	--
Zinc	7440-66-6	Yes	No	No	--	--	--	--	--	--	--	--	--
Zinc Oxide	1314-13-2	Yes	No	No	7.5E-04	9.1E-03	--	--	--	--	--	--	--
Inorganic Compounds													
Ammonia	7664-41-7	Yes	No	Yes	--	--	--	--	--	--	--	--	--
Carbon disulfide	75-15-0	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--
Fluorides	239	Yes	No	Yes	3.6E-05	4.4E-04	--	--	--	--	--	--	--
Hydrogen Fluoride	7664-39-3	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--
Hydrochloric Acid	7647-01-0	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--
Glasswool Fibers	352	Yes	No	No	--	--	--	--	--	--	--	--	--
Phosphoric Acid	7664-38-2	Yes	No	Yes	--	--	0.012	4.26	--	--	0.012	4.26	--
Silica, crystalline	7631-86-9	Yes	No	Yes	1.2E-03	0.015	--	--	--	--	--	--	--
Sulfuric Acid	7664-93-9	Yes	No	Yes	--	--	0.012	4.26	--	--	0.012	4.26	--
Organic Compounds													
Acetaldehyde	75-07-0	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--
Acetone	67-64-1	Yes	No	Yes	--	--	--	--	--	--	--	--	--
Acrolein	107-02-8	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--
Benzene	71-43-2	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--
1,3-Butadiene	106-99-0	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--
Cyclohexane	110-82-7	Yes	No	Yes	--	--	--	--	--	--	--	--	--
Ethylbenzene	100-41-4	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--
Chloroethane	75-00-3	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--
Formaldehyde	50-00-0	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--
Glutaraldehyde	111-30-8	Yes	No	Yes	--	--	--	--	7.65	140	7.65	140	--
Hexane	110-54-3	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--
Methanol	67-56-1	Yes	Yes	Yes	--	--	--	--	0.085	1.55	0.085	1.55	--
Chloromethane	74-87-3	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--
2-Butanone	78-93-3	Yes	No	Yes	--	--	--	--	--	--	--	--	--
Methyl isobutyl ketone	108-10-1	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--
1,2,4-Trimethylbenzene	95-63-6	Yes	No	Yes	--	--	--	--	--	--	--	--	--
Toluene	108-88-3	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--
Xylenes (mixed isomers)	1330-20-7	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--
o-Xylene	95-47-6	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons (PAH)													
PAHs	401	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--
Benzo[a]pyrene	50-32-8	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--
Naphthalene	91-20-3	Yes	Yes	Yes	--	--	--	--	--	--	--	--	--
Diesel Particulate Matter (DPM)													
DPM	200	Yes	No	Yes	--	--	--	--	--	--	--	--	--
Total TACs					3.7E-03	0.044	0.023	8.52	7.74	141	7.76	150	
Total HAPs					8.5E-07	1.0E-05	0	0	0.085	1.55	0.085	1.55	

REFERENCES:

- (1) Emissions of this TAC are included with the emission estimates for the production-based TEU emission factors.

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Table 28
TAC Emissions Estimate Summary - 2021
Hollingsworth & Vose Fiber Company—Corvallis, OR

Pollutant	CAS/ODEQ Sequence Number	Regulatory Category (Yes/No)			Emissions Estimate					
					Shipping and Receiving - Paint Usage		Emergency Generators			
		TAC	HAP	RBC			Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)
Metals										
Aluminum	7429-90-5	Yes	No	Yes	--	--	--	--	--	--
Antimony	7440-36-0	Yes	Yes	Yes	--	--	--	--	--	--
Arsenic	7440-38-2	Yes	Yes	Yes	--	--	7.5E-05	2.6E-04	5.3E-05	2.1E-04
Barium	7440-39-3	Yes	No	No	0.023	5.39	--	--	--	--
Beryllium	7440-41-7	Yes	Yes	Yes	--	--	--	--	--	--
Cadmium	7440-43-9	Yes	Yes	Yes	--	--	7.0E-05	2.5E-04	5.0E-05	2.0E-04
Chromium (total)	7440-47-3	No	Yes	No	--	--	--	--	--	--
Chromium VI	18540-29-9	Yes	Yes	Yes	--	--	4.7E-06	1.6E-05	3.3E-06	1.3E-05
Cobalt	7440-48-4	Yes	Yes	Yes	7.5E-04	0.26	--	--	--	--
Copper	7440-50-8	Yes	No	Yes	--	--	1.9E-04	6.7E-04	1.4E-04	5.4E-04
Lead	7439-92-1	Yes	Yes	Yes	--	--	3.9E-04	1.4E-03	2.7E-04	1.1E-03
Manganese	7439-96-5	Yes	Yes	Yes	--	--	1.5E-04	5.1E-04	1.0E-04	4.1E-04
Mercury	7439-97-6	Yes	Yes	Yes	--	--	9.4E-05	3.3E-04	6.6E-05	2.6E-04
Molybdenum trioxide	1313-27-5	Yes	No	No	--	--	--	--	--	--
Nickel	7440-02-0	Yes	Yes	Yes	--	--	1.8E-04	6.4E-04	1.3E-04	5.1E-04
Phosphorus	504	Yes	Yes	No	--	--	--	--	--	--
Selenium	7782-49-2	Yes	Yes	Yes	--	--	1.0E-04	3.6E-04	7.3E-05	2.9E-04
Vanadium	7440-62-2	Yes	No	Yes	--	--	--	--	--	--
Zinc	7440-66-6	Yes	No	No	--	--	--	--	--	--
Zinc Oxide	1314-13-2	Yes	No	No	--	--	--	--	--	--
Inorganic Compounds										
Ammonia	7664-41-7	Yes	No	Yes	--	--	0.037	0.13	0.026	0.11
Carbon disulfide	75-15-0	Yes	Yes	Yes	--	--	--	--	--	--
Fluorides	239	Yes	No	Yes	--	--	--	--	--	--
Hydrogen Fluoride	7664-39-3	Yes	Yes	Yes	--	--	--	--	--	--
Hydrochloric Acid	7647-01-0	Yes	Yes	Yes	--	--	8.7E-03	0.031	6.1E-03	0.025
Glasswool Fibers	352	Yes	No	No	--	--	--	--	--	--
Phosphoric Acid	7664-38-2	Yes	No	Yes	--	--	--	--	--	--
Silica, crystalline	7631-86-9	Yes	No	Yes	--	--	--	--	--	--
Sulfuric Acid	7664-93-9	Yes	No	Yes	--	--	--	--	--	--
Organic Compounds										
Acetaldehyde	75-07-0	Yes	Yes	Yes	--	--	0.037	0.13	0.026	0.10
Acetone	67-64-1	Yes	No	Yes	0.36	89.6	--	--	--	--
Acrolein	107-02-8	Yes	Yes	Yes	--	--	1.6E-03	5.6E-03	1.1E-03	4.5E-03
Benzene	71-43-2	Yes	Yes	Yes	--	--	8.7E-03	0.031	6.1E-03	0.025
1,3-Butadiene	106-99-0	Yes	Yes	Yes	--	--	0.010	0.036	7.2E-03	0.029
Cyclohexane	110-82-7	Yes	No	Yes	--	--	--	--	--	--
Ethylbenzene	100-41-4	Yes	Yes	Yes	0.018	3.76	5.1E-04	1.8E-03	3.6E-04	1.4E-03
Chloroethane	75-00-3	Yes	Yes	Yes	--	--	--	--	--	--
Formaldehyde	50-00-0	Yes	Yes	Yes	--	--	0.081	0.28	0.057	0.23
Glutaraldehyde	111-30-8	Yes	No	Yes	--	--	--	--	--	--
Hexane	110-54-3	Yes	Yes	Yes	--	--	1.3E-03	4.4E-03	8.9E-04	3.6E-03
Methanol	67-56-1	Yes	Yes	Yes	--	--	--	--	--	--
Chloromethane	74-87-3	Yes	Yes	Yes	--	--	--	--	--	--
2-Butanone	78-93-3	Yes	No	Yes	--	--	--	--	--	--
Methyl isobutyl ketone	108-10-1	Yes	Yes	Yes	--	--	--	--	--	--
1,2,4-Trimethylbenzene	95-63-6	Yes	No	Yes	0.014	4.79	--	--	--	--
Toluene	108-88-3	Yes	Yes	Yes	--	--	4.9E-03	0.017	3.5E-03	0.014
Xylenes (mixed isomers)	1330-20-7	Yes	Yes	Yes	0.063	15.4	2.0E-03	6.9E-03	1.4E-03	5.6E-03
o-Xylene	95-47-6	Yes	Yes	Yes	--	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons (PAH)										
PAHs	401	Yes	Yes	Yes	--	--	1.7E-03	5.9E-03	1.2E-03	4.8E-03
Benzo[a]pyrene	50-32-8	Yes	Yes	Yes	--	--	1.7E-06	5.8E-06	1.2E-06	4.7E-06
Naphthalene	91-20-3	Yes	Yes	Yes	--	--	9.2E-04	3.2E-03	6.5E-04	2.6E-03
Diesel Particulate Matter (DPM)										
DPM	200	Yes	No	Yes	--	--	1.57	5.49	1.11	4.42
Total TACs					0.48	119	1.76	6.18	1.24	4.98
Total HAPs					0.081	19.4	0.16	0.56	0.11	0.45

REFERENCES:

- (1) Emissions of this TAC are included with the emission estimates for the production-based TEU emission factors.

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Table 28
TAC Emissions Estimate Summary - 2021
Hollingsworth & Vose Fiber Company—Corvallis, OR

Pollutant	CAS/ODEQ Sequence Number	Regulatory Category (Yes/No)			Emissions Estimate						Total Facility Emissions Estimate	
					Natural Gas Combustion							
		TAC	HAP	RBC	Glass Plant - Excluding Forehearth		Forehearth		Non-Production		Daily (lb/day)	Annual (lb/yr)
					Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)	Daily (lb/day)	Annual (lb/yr)		
Metals												
Aluminum	7429-90-5	Yes	No	Yes	--	--	--	--	--	--	0.20	60.0
Antimony	7440-36-0	Yes	Yes	Yes	(1)	(1)	(1)	(1)	--	--	3.5E-03	0.55
Arsenic	7440-38-2	Yes	Yes	Yes	(1)	(1)	(1)	(1)	1.2E-05	2.0E-03	1.4E-04	2.4E-03
Barium	7440-39-3	Yes	No	No	(1)	(1)	(1)	(1)	2.7E-04	0.043	0.058	15.3
Beryllium	7440-41-7	Yes	Yes	Yes	(1)	(1)	(1)	(1)	7.4E-07	1.2E-04	7.4E-07	1.2E-04
Cadmium	7440-43-9	Yes	Yes	Yes	(1)	(1)	(1)	(1)	6.8E-05	0.011	2.2E-03	0.28
Chromium (total)	7440-47-3	No	Yes	No	(1)	(1)	(1)	(1)	8.7E-05	0.014	2.0E-03	0.28
Chromium VI	18540-29-9	Yes	Yes	Yes	(1)	(1)	(1)	(1)	3.5E-06	5.5E-04	1.9E-03	0.27
Cobalt	7440-48-4	Yes	Yes	Yes	(1)	(1)	(1)	(1)	5.2E-06	8.2E-04	8.6E-04	0.27
Copper	7440-50-8	Yes	No	Yes	(1)	(1)	(1)	(1)	5.3E-05	8.3E-03	0.015	2.46
Lead	7439-92-1	Yes	Yes	Yes	(1)	(1)	(1)	(1)	3.1E-05	4.9E-03	0.017	2.09
Manganese	7439-96-5	Yes	Yes	Yes	(1)	(1)	(1)	(1)	2.4E-05	3.7E-03	3.6E-03	0.54
Mercury	7439-97-6	Yes	Yes	Yes	(1)	(1)	(1)	(1)	1.6E-05	2.5E-03	0.025	3.24
Molybdenum trioxide	1313-27-5	Yes	No	No	3.9E-03	0.62	1.7E-04	0.025	1.0E-04	0.016	4.2E-03	0.66
Nickel	7440-02-0	Yes	Yes	Yes	(1)	(1)	(1)	(1)	1.3E-04	0.021	5.0E-03	0.73
Phosphorus	504	Yes	Yes	No	--	--	--	--	--	--	0.055	7.90
Selenium	7782-49-2	Yes	Yes	Yes	(1)	(1)	(1)	(1)	1.5E-06	2.3E-04	1.8E-04	8.9E-04
Vanadium	7440-62-2	Yes	No	Yes	5.5E-03	0.86	2.4E-04	0.035	1.4E-04	0.022	5.8E-03	0.92
Zinc	7440-66-6	Yes	No	No	(1)	(1)	(1)	(1)	1.8E-03	0.28	0.050	8.78
Zinc Oxide	1314-13-2	Yes	No	No	--	--	--	--	--	--	0.020	6.01
Inorganic Compounds												
Ammonia	7664-41-7	Yes	No	Yes	7.60	1,202	0.34	48.9	0.20	31.3	8.20	1,283
Carbon disulfide	75-15-0	Yes	Yes	Yes	--	--	--	--	--	--	2.5E-03	0.31
Fluorides	239	Yes	No	Yes	--	--	--	--	--	--	0.33	45.5
Hydrogen Fluoride	7664-39-3	Yes	Yes	Yes	--	--	--	--	--	--	0.33	72.5
Hydrochloric Acid	7647-01-0	Yes	Yes	Yes	--	--	--	--	--	--	0.015	0.055
Glasswool Fibers	352	Yes	No	No	--	--	--	--	--	--	2.36	335
Phosphoric Acid	7664-38-2	Yes	No	Yes	--	--	--	--	--	--	0.012	4.26
Silica, crystalline	7631-86-9	Yes	No	Yes	--	--	--	--	--	--	0.65	178
Sulfuric Acid	7664-93-9	Yes	No	Yes	--	--	--	--	--	--	0.012	4.26
Organic Compounds												
Acetaldehyde	75-07-0	Yes	Yes	Yes	0.010	1.62	4.5E-04	0.066	2.7E-04	0.042	0.073	1.96
Acetone	67-64-1	Yes	No	Yes	--	--	--	--	--	--	2.85	565
Acrolein	107-02-8	Yes	Yes	Yes	6.4E-03	1.01	2.8E-04	0.041	1.7E-04	0.026	9.6E-03	1.09
Benzene	71-43-2	Yes	Yes	Yes	(1)	(1)	8.4E-04	0.12	5.0E-04	0.078	0.59	112
1,3-Butadiene	106-99-0	Yes	Yes	Yes	--	--	--	--	--	--	0.065	6.07
Cyclohexane	110-82-7	Yes	No	Yes	--	--	--	--	--	--	0.014	3.95
Ethylbenzene	100-41-4	Yes	Yes	Yes	--	--	1.0E-03	0.15	5.9E-04	0.093	0.074	12.7
Chloroethane	75-00-3	Yes	Yes	Yes	(1)	(1)	(1)	(1)	--	--	6.6E-03	1.81
Formaldehyde	50-00-0	Yes	Yes	Yes	(1)	(1)	(1)	(1)	1.1E-03	0.17	8.88	1,626
Glutaraldehyde	111-30-8	Yes	No	Yes	--	--	--	--	--	--	7.65	140
Hexane	110-54-3	Yes	Yes	Yes	(1)	(1)	6.6E-04	0.096	3.9E-04	0.062	2.46	535
Methanol	67-56-1	Yes	Yes	Yes	--	--	--	--	--	--	0.085	1.55
Chloromethane	74-87-3	Yes	Yes	Yes	--	--	--	--	--	--	0.11	28.8
2-Butanone	78-93-3	Yes	No	Yes	--	--	--	--	--	--	0.082	15.7
Methyl isobutyl ketone	108-10-1	Yes	Yes	Yes	--	--	--	--	--	--	0.011	2.96
1,2,4-Trimethylbenzene	95-63-6	Yes	No	Yes	--	--	--	--	--	--	0.014	4.79
Toluene	108-88-3	Yes	Yes	Yes	(1)	(1)	3.9E-03	0.56	2.3E-03	0.36	1.01	172
Xylenes (mixed isomers)	1330-20-7	Yes	Yes	Yes	--	--	2.9E-03	0.42	1.7E-03	0.27	0.20	35.6
o-Xylene	95-47-6	Yes	Yes	Yes	--	--	--	--	--	--	0.048	5.98
Polycyclic Aromatic Hydrocarbons (PAH)												
PAHs	401	Yes	Yes	Yes	2.4E-04	0.038	1.1E-05	1.5E-03	6.2E-06	9.8E-04	3.1E-03	0.051
Benzo[a]pyrene	50-32-8	Yes	Yes	Yes	2.8E-06	4.5E-04	1.3E-07	1.8E-05	7.4E-08	1.2E-05	5.9E-06	4.9E-04
Naphthalene	91-20-3	Yes	Yes	Yes	7.1E-04	0.11	3.2E-05	4.6E-03	1.9E-05	2.9E-03	2.3E-03	0.13
Diesel Particulate Matter (DPM)												
DPM	200	Yes	No	Yes	--	--	--	--	--	--	2.67	9.91
Total TACs					7.63	1,207	0.35	50.5	0.21	32.8	39.3	5,316
Total HAPs					0.018	2.78	1.0E-02	1.45	7.3E-03	1.15	14.1	2,633

REFERENCES:

- (1) Emissions of this TAC are included with the emission estimates for the production-based TEU emission factors.