Simpson®
Door Company

July 18, 2022

Aaron Manley
Engineer II
Olympic Clean Air Agency
2940 Limited Lane
Olympia, WA 98502

Subject: Air Operating Permit Renewal Application
Simpson Door Company, McCleary, Washington
Air Operating Permit No. 22AOP1559

Dear Mr. Manley:

Simpson Door Company (Simpson) is submitting the attached Air Operating Permit Renewal Application to the Olympic Region Clean Air Agency (ORCAA) for the door manufacturing facility located in McCleary, Washington. This facility currently operates under Air Operating Permit (AOP) No. 16AOP1172, which will expire on July 20, 2023. Consistent with Condition P7 of the current AOP, we are submitting this renewal application at least 12 months prior to the expiration date.

Consistent with your discussions with our consultant, there have been no substantive changes to equipment or operations at the McCleary Door Plant since the current AOP was issued in July 2018, and we are not proposing any operational changes or changes to the terms of the current permit. The attached renewal application is patterned after the renewal application we submitted in 2018, with minor changes listed below.

- In the previous application, the emergency engines were listed as insignificant emission units (IEU) based on their Potential to Emit (PTE) being less than the threshold provided in WAC 173-401-530(1)(a). However, emergency engines are now precluded from being considered as IEUs per WAC 173-401-530(2)(a) because they are subject to a federally enforceable applicable requirement, in this case, 40 CFR Part 63, Subpart ZZZZ. In this renewal application, these engines are included as emission units EU6 and EU7.
- Emission calculation methodologies for EU2, EU3, EU4, and EU8 have been revised and updated as appropriate.

The following attachments are also included in the application.

- Attachment A – detailed emissions calculations tables (a printed version of the spreadsheet that will be provided to ORCAA electronically)
- Attachment B – summary of changes between the current 2018 AOP (No. 16AOP1172) and draft permit provided by ORCAA on June 8, 2022 (marked-up versions of the draft AOP and Technical Support Document will be provided to ORCAA electronically)

This application includes my certification that the statements and information presented in the attached renewal application are true, accurate, and complete; thus, I certify that the Simpson McCleary Door Plant is in compliance with all existing air quality regulations and permit requirements.

Simpson®
Door Company

Sincerely,

400 SIMPSON AVENUE • McCLEARY, WA 98557
800 SIMPSON • SIMPSONDOOR.COM

INSPIRATION
AT YOUR DOOR

OLYMPIC REGION CLEAN AIR AGENCY
2940 Limited Lane NW - Olympia, Washington 98502 - 360-539-7610 – Fax 360-491-6308

AIR OPERATING PERMIT (AOP)
RENEWAL APPLICATION
Form A: General Information

Company Name: Simpson Door Company			**For ORCAA use only**
Plant Name: McCleary Door Plant			File No: 1114 County No: 27 Source No: 6 Application No: 22AOP1559
Physical Address: 400 Simpson Avenue, McCleary, Washington 98557			Date Received: Received JUL 22 2022 ORCAA
Mailing Address (if different from above):			
Current AOP Number: 16AOP1172			
Issuance Date: July 20, 2018		Expiration Date: July 20, 2023	
Owner's name and agent: Simpson Door Company			
Plant site manager/contact: Kert Brown			
Title: Safety & Environmental Manager	Phone: (360) 495 2075	Email: kert.brown@simpson.com	

RESPONSIBLE OFFICIAL CERTIFICATION
I certify that I am the responsible official, as defined in WAC 173-401-200(27) for this facility. I further certify as required by WAC 173-401-520, that, based on information and belief formed after reasonable inquiry, the statements and information in this application are true, accurate, and complete.

Responsible Official: Phil Steklenski		
Title: President	Phone: (360) 495 3291	Email: phil.steklenski@simpson.com
Address: 400 Simpson Avenue, McCleary, Washington 98557		
Signature: [signature]	Date: July 18, 2022	

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AIR OPERATING PERMIT (AOP) RENEWAL APPLICATION
Form B: Emissions Units

Emissions Unit Number	Emissions Unit Name & Description	Air Pollution Control Equipment	Fuel(s) Used	Significant or Insignificant WAC 173-401-530 through -533	
				(S or I)	Basis
EU1	Hog Fuel Boiler (Decommissioned)	N/A	N/A	■ S ❑ I	N/A
EU2	Wood Residuals Transport System	Baghouses/Cyclones	N/A	■ S ❑ I	
EU3	Package Boiler	Low NOx burner	Natural Gas, Propane	■ S ❑ I	
EU4	Lumber Dry Kilns	None	N/A	■ S ❑ I	
EU5	Surface Coating Line	Paint arrestor filters	N/A	■ S ❑ I	
EU6	Emergency Engine	None	Diesel	■ S ❑ I	WAC 173-401-530(2)(a)
EU7	Emergency Engine	None	Diesel	■ S ❑ I	WAC 173-401-530(2)(a)
EU8	Adhesives Coating Line	None	N/A	■ S ❑ I	
–	Veneer Dryer	None	N/A	❑ S ■ I	WAC 173-401-530(4)
–	MDO Press	None	N/A	❑ S ■ I	WAC 173-401-530(4)
–	Product Off-Gassing	None	N/A	❑ S ■ I	WAC 173-401-530(d)
–	Grinding Room Baghouse	None	N/A	❑ S ■ I	WAC 173-401-530(4)(e) or -532(55)
–	Shop Table Saw Cyclone	None	N/A	❑ S ■ I	WAC 173-401-532(46)
–	Storage Tank (6,000 gallon)	None	N/A	❑ S ■ I	WAC 173-401-532(2)(a)
–	Storage Tank (500 gallon)	None	N/A	❑ S ■ I	WAC 173-401-532(2)(a)
–	Storage Tank (1,000 gallon)	None	N/A	❑ S ■ I	WAC 173-401-532(2)(a)
–	Storage Tank (1,000 gallon)	None	N/A	❑ S ■ I	WAC 173-401-532(2)(a)
–	Welding	None	N/A	❑ S ■ I	WAC 173-401-532(2)(i) or -532(55)
–	Fuel and Propane Storage Tank (10,000 gallon)	None	N/A	❑ S ■ I	WAC 173-401-533(2)(c) & (d)
–	Fuel and Propane Storage Tank (5,000 gallon)	None	Natural Gas, Propane	❑ S ■ I	WAC 173-401-533(2)(c) & (d)
–	Fuel and Propane Storage Tank (500 gallon)	None	Natural Gas, Propane	❑ S ■ I	WAC 173-401-533(2)(c) & (d)
–	Fuel and Propane Storage Tank (300 gallon)	None	Natural Gas, Propane	❑ S ■ I	WAC 173-401-533(2)(c) & (d)
–	Fuel and Propane Storage Tank (300 gallon)	None	Natural Gas, Propane	❑ S ■ I	WAC 173-401-533(2)(c) & (d)
–	Fuel and Propane Storage Tank (1,000 gallon)	None	Natural Gas, Propane	❑ S ■ I	WAC 173-401-533(2)(c) & (d)
				❑ S ❑ I	

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AIR OPERATING PERMIT (AOP) RENEWAL APPLICATION
Form C: Emissions

Emissions Unit Number (from Form B)	Pollutants (all regulated pollutants including greenhouse gases)	Emissions			CAM Applicability	
		Annual Potential Emissions (for each regulated air pollutants)	Have Potential Emissions Changed Since Submittal of Most Recent AOP Application?	Actual Emissions for Calendar Year 2021	Annual Potential Emissions without regard to Control Device	CAM needed? If yes, submit a CAM Plan
EU2	PM	113.4 tpy	■ Yes ❑ No	59	523.2 tpy (a)	❑ Yes ■ No
EU2	PM10	97.0 tpy	■ Yes ❑ No	51	520.5 tpy (a)	❑ Yes ■ No
EU2	PM2.5	58.7 tpy	■ Yes ❑ No	30	517.9 tpy (a)	❑ Yes ■ No
EU3 (NG)	PM	0.48 tpy	■ Yes ❑ No	0		❑ Yes ■ No
EU3 (NG)	PM10	0.48 tpy	■ Yes ❑ No	0		❑ Yes ■ No
EU3 (NG)	PM2.5	0.48 tpy	■ Yes ❑ No	0		❑ Yes ■ No
EU3 (NG)	SO2	0.04 tpy	❑ Yes ■ No	0		❑ Yes ■ No
EU3 (NG)	NOx	3.16 tpy	■ Yes ❑ No	0		❑ Yes ■ No
EU3 (NG)	CO	5.30 tpy	■ Yes ❑ No	0		❑ Yes ■ No
EU3 (NG)	VOC	0.35 tpy	■ Yes ❑ No	0		❑ Yes ■ No
EU3 (NG)	CO2e	6,840 tpy	■ Yes ❑ No	0		❑ Yes ■ No
EU3 (Propane)	PM	0.03 tpy	■ Yes ❑ No	0.002		❑ Yes ■ No
EU3 (Propane)	PM10	0.03 tpy	■ Yes ❑ No	0.002		❑ Yes ■ No
EU3 (Propane)	PM2.5	0.03 tpy	■ Yes ❑ No	0.002		❑ Yes ■ No
EU3 (Propane)	SO2	1.05 tpy	■ Yes ❑ No	0.07		❑ Yes ■ No
EU3 (Propane)	NOx	9.10 tpy	■ Yes ❑ No	0.6		❑ Yes ■ No
EU3 (Propane)	CO	5.25 tpy	■ Yes ❑ No	0.3		❑ Yes ■ No
EU3 (Propane)	VOC	0.70 tpy	■ Yes ❑ No	0.05		❑ Yes ■ No
EU3 (Propane)	CO2e	8,129 MT	■ Yes ❑ No	184		❑ Yes ■ No
			❑ Yes ❑ No			❑ Yes ❑ No

Notes:
(a) Total emissions for several emission units aggregated, no single unit has uncontrolled emissions greater than 100 tpy. See attached documents for emissions data.

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		Annual Potential Emissions (for each regulated air pollutants)	Have Potential Emissions Changed Since Submittal of Most Recent AOP Application?	Actual Emissions for Calendar Year 2021	Annual Potential Emissions without regard to Control Device	CAM needed? If yes, submit a CAM Plan
EU4 (Douglas Fir)	PM	0.3 tpy	☐ Yes ■ No	0		☐ Yes ■ No
EU4 (Douglas Fir)	PM10	0.3 tpy	☐ Yes ■ No	0		☐ Yes ■ No
EU4 (Douglas Fir)	PM2.5	0.3 tpy	☐ Yes ■ No	0		☐ Yes ■ No
EU4 (Douglas Fir)	VOC	2.9 tpy	■ Yes ☐ No	0		☐ Yes ■ No
EU4 (Douglas Fir)	Total HAPs	0.3 tpy	☐ Yes ■ No	0		☐ Yes ■ No
EU4 (Hemlock)	PM	0.1 tpy	☐ Yes ■ No	0		☐ Yes ■ No
EU4 (Hemlock)	PM10	0.1 tpy	☐ Yes ■ No	0		☐ Yes ■ No
EU4 (Hemlock)	PM2.5	0.1 tpy	☐ Yes ■ No	0		☐ Yes ■ No
EU4 (Hemlock)	VOC	0.9 tpy	■ Yes ☐ No	0		☐ Yes ■ No
EU4 (Hemlock)	Total HAPs	0.7 tpy	☐ Yes ■ No	0		☐ Yes ■ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No

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		Annual Potential Emissions (for each regulated air pollutants)	Have Potential Emissions Changed Since Submittal of Most Recent AOP Application?	Actual Emissions for Calendar Year 2021	Annual Potential Emissions without regard to Control Device	CAM needed? If yes, submit a CAM Plan
EU5	PM	0.18 tpy	☐ Yes ☒ No	0		☐ Yes ☒ No
EU5	PM10	0.18 tpy	☐ Yes ☒ No	0		☐ Yes ☒ No
EU5	PM2.5	0.18 tpy	☐ Yes ☒ No	0		☐ Yes ☒ No
EU5	VOC	1.33 tpy	☐ Yes ☒ No	0		☐ Yes ☒ No
EU5	Total HAPs	0.675 tpy	☐ Yes ☒ No	0		☐ Yes ☒ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No

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		Annual Potential Emissions (for each regulated air pollutants)	Have Potential Emissions Changed Since Submittal of Most Recent AOP Application?	Actual Emissions for Calendar Year 2021	Annual Potential Emissions without regard to Control Device	CAM needed? If yes, submit a CAM Plan
EU6	PM	0.014 tpy	☐ Yes ☒ No	0.004		☐ Yes ☒ No
EU6	PM10	0.014 tpy	☐ Yes ☒ No	0.004		☐ Yes ☒ No
EU6	PM2.5	0.014 tpy	☐ Yes ☒ No	0.004		☐ Yes ☒ No
EU6	NOx	0.23 tpy	☐ Yes ☒ No	0.07		☐ Yes ☒ No
EU6	CO	0.29 tpy	☐ Yes ☒ No	0.09		☐ Yes ☒ No
EU6	VOC	0.033 tpy	☐ Yes ☒ No	0.010		☐ Yes ☒ No
EU6	SOx	0.0001 tpy	☐ Yes ☒ No	0		☐ Yes ☒ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No

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Form C: Emissions

Emissions Unit Number (from Form B)	Pollutants (all regulated pollutants including greenhouse gases)	Emissions			CAM Applicability	
		Annual Potential Emissions (for each regulated air pollutants)	Have Potential Emissions Changed Since Submittal of Most Recent AOP Application?	Actual Emissions for Calendar Year 2021	Annual Potential Emissions without regard to Control Device	CAM needed? If yes, submit a CAM Plan
EU7	PM	0.024 tpy	☐ Yes ■ No	0.007		☐ Yes ■ No
EU7	PM10	0.024 tpy	☐ Yes ■ No	0.007		☐ Yes ■ No
EU7	PM2.5	0.024 tpy	☐ Yes ■ No	0.007		☐ Yes ■ No
EU7	NOx	0.41 tpy	☐ Yes ■ No	0.12		☐ Yes ■ No
EU7	CO	0.51 tpy	☐ Yes ■ No	0.15		☐ Yes ■ No
EU7	VOC	0.058 tpy	☐ Yes ■ No	0.017		☐ Yes ■ No
EU7	SOx	0.0002 tpy	☐ Yes ■ No	0.0001		☐ Yes ■ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
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			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No

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Form C: Emissions

Emissions Unit Number (from Form B)	Pollutants (all regulated pollutants including greenhouse gases)	Emissions			CAM Applicability	
		Annual Potential Emissions (for each regulated air pollutants)	Have Potential Emissions Changed Since Submittal of Most Recent AOP Application?	Actual Emissions for Calendar Year 2021	Annual Potential Emissions without regard to Control Device	CAM needed? If yes, submit a CAM Plan
EU8	PM	0.00106 tpy	■ Yes ☐ No	0		☐ Yes ■ No
EU8	VOC	2.72 tpy	■ Yes ☐ No	1.91		☐ Yes ■ No
EU8	Total HAPs	2.72 tpy	■ Yes ☐ No	1.91		☐ Yes ■ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No
			☐ Yes ☐ No			☐ Yes ☐ No

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AIR OPERATING PERMIT (AOP) RENEWAL APPLICATION
Form D: Applicability Determinations

Facility Changes

Are/were there any...		If yes...
Notice of Construction Approval Orders that have been issued but not incorporated into the Air Operating Permit?	☐ Yes ■ No	Complete Form E for each Approval Order
Off-permit changes according to WAC 173-401-724?	☐ Yes ■ No	Complete Form F
Section 502(b)(10) changes according to WAC 173-401-722(2)?	☐ Yes ■ No	Complete Form F
New sources or modifications that did not require a Notice of Construction?	☐ Yes ■ No	Complete Form G

New Applicable Requirements

		If yes...
Are there any new applicable requirements?	☐ Yes ■ No	Complete Form H
Are there any inapplicable requirements for which the source would like to request to extend the permit shield?	☐ Yes ■ No	
Does the accidental release prevention regulation apply to the facility? (40 CFR Part 68)	☐ Yes ■ No	Attach a list of the regulated substances present in processes at the facility and identify the applicable program

Current Compliance

		If no...
Is the source in compliance with all of the conditions of the current permit?	■ Yes ☐ No	Attach a compliance plan.

Form D: Applicability Determinations, Page 2

Requested Changes

Are there any requested changes to...		If yes...
Testing conditions?	❑ Yes ■ No	Complete Form I
Monitoring conditions (other than those being replaced by CAM)?	❑ Yes ■ No	
Recordkeeping conditions?	❑ Yes ■ No	
Reporting conditions?	❑ Yes ■ No	
Non-applicable conditions?	❑ Yes ■ No	
Any conditions?	❑ Yes ■ No	

Other Changes/Corrections

Are there any...		If yes...
Changes to the Process Descriptions in the current Technical Support Document?	❑ Yes ■ No	Please attach details or marked up copy of current permit.
Changes to the Emission Unit Summary in the current Technical Support Document?	❑ Yes ■ No	
Changes to the Regulatory Determinations in the current Technical Support Document?	❑ Yes ■ No	
Changes to the Insignificant Emission Units listed in the current Technical Support Document?	❑ Yes ■ No	
Changes to the current Statement of Basis in the current Technical Support Document?	❑ Yes ■ No	

ATTACHMENT A

Detailed Emission Tables

027-0006 SIMPSON DOOR COMPANY
EU2 **Wood Residuals Transport System**
Potential To Emit

Emission Factors*

	Sanderdust	Other Cyclones
Pollutant	(gr/scf)	(gr/scf)
PM	0.055	0.030
Fraction of PM	Baghouse	Medium Efficiency Cyclone
PM_{10}	0.995	0.850
$PM_{2.5}$	0.990	0.500

Oregon DEQ AQ-EF03 particulate fractions for wood products. https://www.oregon.gov/deq/FilterPermitsDocs/AQ-EF03.pdf
gr/scf = grains per standard cubic foot

Emissions

						Uncontrolled Emissions				Controlled Emissions					
Cyclone ID#	Max Hrs/day	Max Days/yr	Max Hr/yr	CFM	Material	PM (TPY)	PM10 (TPY)	PM2.5 (TPY)	% Control Baghouse	PM (TPY)	PM10 (TPY)	PM2.5 (TPY)	Comments	Baghouse	
CD10(1A)	24	365	8,760	45,000	Sanderdust	93	92	92	99	0.93	0.92	0.92	Door plant/finishing	8 (aka 1A)	
CD11(1B)	24	365	8,760	45,000	Sawdust	51	50	50	99	0.51	0.50	0.50	Door plant/finishing	7 (aka 1B)	
CD12(2A)	24	365	8,760	45,000	Sawdust	51	50	50	99	0.51	0.50	0.50	Door plant	3 (aka 2A)	
CD13(2B)	24	365	8,760	45,000	Sawdust	51	50	50	99	0.51	0.50	0.50	Door plant	4 (aka 2B)	
CD2	24	365	8,760	42,000	Planer Shavings	47	47	47	0	47	40	24	Material drops to CD6		
CD3	24	365	8,760	15,000	Sawdust	17	17	17	0	17	14	8.4	Material drops to CD6		
CD4	24	365	8,760	10,000	Sawdust	11	11	11	0	11	9.6	5.6	Material drops to CD6		
CD5	24	365	8,760	12,000	Sawdust	14	13	13	0	14	11	6.8	Material drops to CD6		
CD6	24	365	8,760	30,000	Sawdust	34	34	33	99	0.34	0.34	0.33	Material drops to Dust Silo	2 (aka C2)	
CD7	24	365	8,760	36,000	Sanderdust	74	74	74	99	0.74	0.74	0.74	AM Sander	1 (aka C1)	
CD8	24	365	8,760	12,000	Sawdust	14	13	13	0	14	11	6.8	Material drops to CD6		
CD9	24	365	8,760	0	Sawdust	0	0	0	0	0.0	0.0	0.0	Material drops to CD3		
CD14	24	365	8,760	12,000	Sawdust	14	13	13	99	0.14	0.13	0.13	Material drops to Atlas Bin vented to Baghouse 6	6	
CD15	24	365	8,760	30,000	Sawdust	34	34	33	99	0.34	0.34	0.33	2 cyclones, material drops to Atlas Storage Bin vented to Baghouse 6	6	"Carothers"
Truck loadout	24	365	8,760	12,000	Sawdust	14	13	13	99	0.14	0.13	0.13	Truck loadout vented to Baghouse 5	5	
					TOTAL:	516.4	513.8	511.2	TOTAL:	106.6	91.2	55.3			
		TOTAL ACFM		391,000											

Notes:

1 e. g. Cal. Cyclone **with baghouse**, PM=(0.03 gr/ft^3)(14218 ft^3/min)(1 lb/7000 gr)(60 min/hr)(1T/2000 lb) (100%-99% baghouse /100%)(6120 hr operate) = 0.1 T PM
2 Sawdust, shavings, chips, PM: FIRE 6.23 October 2000, SCC 30700804, 30700805, also in Table 10.4.1 AP-42, p. 10.4-2 (2/80)
3 Sawdust, shaviings, chips, PM-10 FIRE 6.23 October 2000, SCC 30700804, 30700805, assumes PM-10 and PM2.5 fraction from Oregon DEQ AQ-EF03 emission factor document
4 Sanderdust PM: FIRE October 2000, SCC30700806 also in Table 10.4.1 AP-42, p. 10.4-2 (2/80)
5 Sanderdust PM-10: FIRE October 2000, SCC30700806, assumes PM-10 and PM2.5 fraction from Oregon DEQ AQ-EF03 emission factor document

027-0006 SIMPSON DOOR COMPANY
EU3 Package Boiler - Propane, Natural gas
Potential To Emit

Maximum Heating Rate	14.7	MMBtu/hr
Hours of Operation	8,760	hr/yr
Heating Value (natural gas)	1,020	Btu/scf
Heating Value (propane)	92	MMBtu/ 1,000 gal
Sulfur Content (propane)	15	gr/ 100 scf

Greenhouse Gas Emissions

	CO2	CH4	N2O
GWP	1.0	25.0	298

EMISSION FACTORS	PM	PM10-PRI	PM10-FIL	PM2.5-PRI	PM2.5-FIL	PM-CON	SO2	NOX	VOC	CO
lb/MMscf natural gas	7.6	7.6		7.6			0.6	50	5.5	84
lb/ 1,000 gal propane	0.049	0.049	0.019	0.041	0.010	0.030	1.5	13	1.0	8

GHG Factors	CO2	CH4	N2O	CO2e
kg/MMBtu	53	0.001	0.0001	53
kg/MMBtu	63	0.003	0.0006	63

EMISSIONS Ton/Yr	PM	PM10-PRI	PM10-FIL	PM2.5-PRI	PM2.5-FIL	PM-CON	SO2	NOX	VOC	CO
Natural gas	0.480	0.480		0.48			0.04	3.16	0.35	5.30
Propane	0.03	0.03	0.01	0.03	0.01	0.02	1.05	9.10	0.70	5.25

Emissions (t/yr)	CO2	CH4	N2O	CO2e
Natural gas	6,833	0.129	0.013	6,840
Propane	3,096	0	0	8,129

Notes:

1 Boiler equipped with low-NOx burners (11NOC869)
2 Natural Gas - NOX, CO: EPA AP42 (7/98) Table 1.4-1 for controlled small boilers with low NOX burner
3 Natural Gas - PM: EPA AP42 (7/98) Table 1.4-2
4 Propane - 1 scf vapor = 0.0278 gallons liquid
5 PM-10, PM 2.5 assume = PM.
6 PM-10, PM 2.5 factors from EPA's natgas_procgas_lpg_pm_efs_not_ap42_032012_revisions.xls (Ron Huntley, EPA, 3/30/12) (SCC 10201002)
7 Organic and trace element emissions not calculated as they are not significant for this unit.
8 GHG factors from 40 CFR 98 - Mandatory Greenhouse Gas Reporting, Table A-1, C-1 and C-2

027-0006 SIMPSON DOOR COMPANY
EU04 **Lumber Dry Kilns**
Potential To Emit

Total MBF/Yr processed	6,787
Drying Temperature (°F)	180

Temperature is the maximum cycle temperature.

EMISSION FACTORS:	**lb Pollutant / MBF for Lumber Dry Kilns**									
Pollutant	PM	PM 10	PM 2.5	WPP1 VOC	Total HAP	Methanol	Formaldehyde	Acetaldehyde	Propionaldehyde	Acrolein
Douglas Fir	0.0890	0.0890	0.0890	0.8567	0.0924	0.0443	0.0012	0.0275	0.0003	0.0005
Western Hemlock	0.0320	0.0320	0.0320	0.2722	0.2048	0.0507	0.0007	0.0677	0.0004	0.0012

EMISSIONS	**Emission T/Yr**					**Emissions Lb/Yr**				
Species	PM	PM 10	PM 2.5	WPP1 VOC	Total HAP	Methanol	Formaldehyde	Acetaldehyde	Propionaldehyde	Acrolein
Douglas Fir	0.3	0.3	0.3	2.9	0.3	301	8	187	2	3
Western Hemlock	0.1	0.1	0.1	0.9	0.7	344	4	459	3	8
TOTAL EMISSIONS	**0.4**	**0.4**	**0.4**	**3.8**	**1.0**	**645**	**13**	**646**	**5**	**11**
>25,>10 T/Yr "Y"/"N"					N	N	N	N	N	N

Emission Factor References (see next sheet)

Notes
ORCAA Emission factor for PM and total HAP (T < 200F)
EPA Emission factor for VOC, methanol, formaldehyde, acetaldehyde, propionaldehyde and acrolein.

ORCAA Compilation of Dry Kiln Emission Factors
Created January 2015

Species	Max Kiln Temp (°F)	Emission Factors (lb/mbf) WPP1 VOC ≤ 200	WPP1 VOC > 200	Total HAP ≤ 200	Total HAP > 200	Methanol ≤ 200	Methanol > 200	Formaldehyde ≤ 200	Formaldehyde > 200	Acetaldehyde ≤ 200	Acetaldehyde > 200	Propionaldehyde ≤ 200	Propionaldehyde > 200	Acrolein ≤ 200	Acrolein > 200	PM/PM10/PM2.5 ≤ 200	PM/PM10/PM2.5 > 200
Non-Resinous Softwood Species																	
Western Hemlock	ODEQ	0.380	0.526	0.205	0.276	0.081	0.184	0.0013	0.004	0.120	0.084	0.0012	0.0014	0.0015	0.0023	0.032	0.032
Western Red Cedar	ODEQ	0.306	1.000	0.246	0.523	(4)	(4)	(1)	(4)	(1)	(1)	(1)	(1)	(1)	(1)	0.032	0.032
Resinous Softwood Species (Non-Pine Family)																	
Douglas Fir	ODEQ	0.768	1.618	0.092	0.163	0.039	0.117	0.0013	0.0043	0.051	0.040	0.0005	0.0008	0.0007	0.0012	0.089	0.089
White Spruce	ODEQ	0.177	0.212	0.063	0.115	0.025	0.078	0.0013	0.0044	0.036	0.031	0.0003	0.0007	0.0005	0.0010	0.089	0.089
Larch	ODEQ	0.768	1.618	0.092	0.163	(3)	(3)	(3)	(2)	(3)	(3)	(3)	(3)	(3)	(3)		
Resinous Softwood Species (Pine Family)																	
Lodgepole Pine	ODEQ	1.380	1.392	0.093	0.100	0.073	0.060	(5)	0.0040	0.012	(6)	(6)	(6)	(6)	(6)		
Ponderosa Pine	ODEQ	1.965	3.797	0.103	0.189	0.055	0.144	0.0028	0.0092	0.042	0.028	0.0019	0.0032	0.0017	0.0045		
Western White Pine	ODEQ	2.835	3.797	0.103	0.189	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)		
Slash Pine	ODEQ				0.215		0.164		0.004		0.045		0.001		0.002		
Hardwood Species																	
Alder	SWCAA	0.943	1.192	0.211	0.553	0.119	0.416	0.0007	0.0048	0.089	0.129	0.0012	0.0016	0.0009	0.0018	0.089	0.089
Maple	SWCAA	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(7)		

(1) suggest using western hemlock data
(2) suggest using white spruce data
(3) suggest using douglas fir data
(4) suggest using white fir data
(5) suggest using high-temperature data for this species
(6) suggest using ponderosa pine data 0
(7) suggest using alder (SWCAA Feb 2012 spreadsheet)

Softwood Species - WPP1 VOC, HAP, and individual HAP data from ODEQ 2014 Compilation of VOC and HAP Emission Factors for Lumber Drying Kilns.
Hardwood Species - WPP1 VOC, HAP, and individual HAP data calculated using same method as softwood using data from SWCAA and OSU (see sheets).

PM

1 PM Factors Ref.: Weyhaeuser Office of the Environment, e-mail Johnson 3/9/99; Weyerhaeuser Raymond Sawmill
An emission factor for PM from drying southern yellow pine was derived form an an average of Weyerhaeuser test data and data in the NCASI wood products database
The average total particulate (filterable plus condensable) was 0.097 lb PM/MBF of southern yellow pine (SYP) dried.
The emission factor for hemlock and douglas fir was developed with the assumption that the particulate emissions are mostly vaporized wood extractives, and that the amount emitted is proportional to the wood extractive content.
DF = 0.097 lb PM / MBF * (4.4% Extractive Content DF / 4.8% Extractive Content SYP) = 0.089 lb PM / MBF.
A "safety factor" of 25% was applied for a conservative emission factor: 0.089 lb x 1.25 = 0.11 lb PM/MBF. Note: the "safety factor" is not used in the table above, so DF = 0.089 lb PM / MBF. The same method was applied to Hemlock (Wood Extractive Content of 1.6%)
Hemlock = 0.097 lb PM / MBF * (1.6 % Extractive Content WH / 4.8% Extractive Content SYP) =0.032 lb PM/MBF
2 PM: Alder, Spruce, Cedar - PM: - used Douglas Fir PM factor for Spurce and Alder; used Hemlock factor for Cedar
3 PM 10 and PM 2.5: Probably all of the PM is condensable. Assumption: PM = PM-10 = PM 2.5

EPA Region 10 HAP and VOC Emission Factors for Lumber Drying, January 2021

This spreadsheet calculates and compiles hazardous air pollutant (HAP) and volatile organic compound (VOC) emission factors (EF) in units of pounds of pollutant per thousand board feet of lumber dried (lb/mbf) that are preferred by EPA Region 10 for estimating emissions from indirect steam-heated batch lumber drying kilns. The EFs are based on actual lab-scale emission test data when available. When no suitable HAP or VOC test data is available for a species of wood (e.g., western red cedar, engelmann spruce, larch and western white pine), EFs for similar species are substituted. When there are more than one similar species, the highest of the EF for the similar species is substituted. When test data is available for some individual HAP but not others (e.g., western true firs and lodgepole pine), data from the species and another similar to it are used to conservatively estimate HAP EF. The calculation of VOC EF follows the methodology presented in EPA's OTM-26 (Interim VOC Measurement Protocol for the Wood Products Industry - July 2007, commonly referred to as "WPP1 VOC"), except that adjustments to the RM25A measurement have been performed beyond formaldehyde and methanol to include as many as five other compounds (acetaldehyde, propionaldehyde, acrolein, acetic acid and ethanol). With the VOC EF calculation factoring in the contribution of individual compounds, no data substitution or estimation of the constituents is performed. To maintain the intergrity of the calculation, only measured (not estimated) values for the constituents are used.

A summary of the EFs for each species of wood is included on this sheet. The sheets that follow present the original test data as well as the calculations for creating each EF. There are two sheets per lumber species: one for HAPs and one for VOCs. The methanol, formaldehyde and VOC EF are temperature dependent best-fit linear equations. The temperature variable reflects the maximum temperature of the heated air entering the lumber. Because acetaldehyde, propionaldehyde and acrolein emissions across different species are not consistently dependent upon maximum drying temperature, EF are calculated by averaging test results. Whereas HAP EF are derived in the HAP sheets, EF for individual VOC ethanol and acetic acid are derived in the VOC sheets for douglas fir and ponderosa pine (only wood species undergoing testing for these two VOC compounds).

Species	WPP1 VOC[1,2] (lb/mbf)	Methanol[2] (lb/mbf)	Formaldehyde[2] (lb/mbf)	Acetaldehyde (lb/mbf)	Propionaldehyde (lb/mbf)	Acrolein (lb/mbf)
Non-Resinous Softwood Species						
Western True Firs[3]	0.00817x - 1.02133	0.00465x - 0.73360	0.00016x - 0.02764	0.0550	0.0003	0.0009
Western Hemlock	0.00369x - 0.39197	0.00249x - 0.39750	0.000046x - 0.007622	0.0677	0.0004	0.0012
Western Red Cedar	0.00817x - 1.02133	0.00465x - 0.73360	0.00016x - 0.02764	0.0677	0.0004	0.0012
Resinous Softwood Species (Non-Pine Family)						
Douglas Fir	0.01460x - 1.77130	0.00114x - 0.16090	0.000028x - 0.003800	0.0275	0.0003	0.0005
Engelmann Spruce	0.1769	0.00088x - 0.13526	0.000042x - 0.006529	0.0201	0.0002	0.0005
Larch	0.01460x - 1.77130	0.00114x - 0.16090	0.000028x - 0.003800	0.0275	0.0003	0.0005
Resinous Softwood Species (Pine Family)						
Lodgepole Pine	1.1352	0.0550	0.0030	0.0104	0.0003	0.0008
Ponderosa Pine	0.02083x - 1.30029	0.00137x - 0.18979	0.000074x - 0.010457	0.0340	0.0010	0.0026
Western White Pine	0.02083x - 1.30029	0.00137x - 0.18979	0.000074x - 0.010457	0.0340	0.0010	0.0026

[1] VOC emissions approximated consistent with OTM-26 underestimate emissions when the mass-to-carbon ratio of unidentified VOC exceeds that of propane. Ethanol and acetic acid are examples of compounds that contribute to lumber drying VOC emissions (for some species more than others), and both have mass-to-carbon ratios exceeding that of propane. Contribution of ethanol and acetic acid to VOC emissions has been quantified here when emissions testing data is available.

[2] Because WPP1 VOC, methanol and formaldehyde emissions are dependent upon maximum drying temperature, a best-fit linear equation with dependent variable maximum temperature of heated air entering the lumber has been generated to model emissions, with a couple of exceptions. For engelmann spruce and lodgepole pine, a single VOC EF (based upon high-temperature drying) has been generated due to lack of sufficient test data to build a best-fit linear equation.

[3] Western true firs consist of the following seven species classified in the same Abies genus: bristlecone fir, California red fir, grand fir, noble fir, pacific silver fir, subalpine fir and white fir.

027-0090
EU90

SIMPSON DOOR COMPANY
Emergency Engine - 170 hp Fire Pump
Potential To Emit

This emergency engine calculation sheet characterizes emissions from an uncontrolled Tier I diesel compression-ignition engine.

Legend

Assumed
Calculated
Per NOC Application
Parameter/Constant

170 hp | 1 gal/137,000 btu | 2,544 btu/hp-hr | 0.018578832 gal/hp-hr
2 hr/day | hr/yr

Btu/hp conversion (mechanical horsepower to Btu) from https://www.inchcalculator.com/convert/horsepower-to-btu-per-hour/

Engine Emission Calculation Parameters

Operating Parameter		
Design BHP	170 BHP	
Fuel use @ 100% load[1]	3.2 gal/hr	
Fuel use calculated @ 100% load per manufacturer	3.2 gal/hr	
Fuel energy content[2]	137,000 btu/gal	
BHP to kW conversion	0.7457 kw/BHP	
BHP @ maximum load	170 BHP	
Power (in kW) @ max BHP	127 kW	
Heat Rate @ 100% load	0.44 MMBtu/hr	
Schedule - hrs/day for readiness testing	1 hrs/day	
Schedule - days/wk	1 days/wk	
Schedule - wks/yr	50 wks/yr	
Max. hours per year (per Subpart IIII 40 CFR 60.4211(f)(3)(i))	100 hours/year	
Stack height	ft	
"F" Factor diesel	8190 dscf/MMBtu	
O2 Correction Factor	2.27 dimensionless	
Exhaust temp (K)	K	
Exhaust temp (°F)	°F	
Ambient temp (K)	298 K	
Ambient temp (F)	86 °F	
% moisture by volume	7.1 %	
Stack exhaust rate (dscfm)	cfm	
Stack exhaust rate (acfm)	acfm	
Fuel sulfur content	0.0015 wt%	
Average use factor	100.0% percent	
Average load factor[3]	100.00% percent	
Stack diameter	inches	
Ambient Temp	K	
NO2 to NOx ratio[4]	5%	

[1]Provided in Form 1B of NOC application
[2]Heat content of diesel
[3]NO2 to NOx ratio based on information from Diesel Net Guidance regarding NOx emissions from diesel combustion

1 g/hp-hr
1.34 g/kW-hr

CO2e GW potential

CO2	73.96 kg/mmbtu	32.4 lbs/hr	3242 lbs/yr	1.6 TPY	1.6 CO2e TPY
CH4	0.003 kg/mmbtu	0.00143	0.132	0.000066	0.00144 CO2e TPY
N2O	0.0006 kg/mmbtu	0.00026	0.024	1.2E-05	3.9E-05 CO2e TPY

https://www.epa.gov/sites/default/files/2015-07/documents/emission-factors_2014.pdf — 1.63 CO2e TPY TOTAL

Pollutant	CAS #	Emission Factor[1] (gm/hp-hr)	EF Units	Emission Rate[2] (lb/hr)	Emission Rate[3] (lb/day)	Emission Rate[4] (lb/yr)	Emission Rate (ton/yr)	SER (ton/yr)	SQER	SQER Units	Modeled	TAP	HAP
PM	N/A	0.728	gm/hp-hr	0.27	0.54	27	0.014	2.50	N/A	N/A	No	Yes	No
PM_{10}[5]	N/A	0.728	gm/hp-hr	0.27	0.54	27	0.014	1.50	N/A	N/A	No	Yes	No
$PM_{2.5}$[6]	N/A	0.728	gm/hp-hr	0.27	0.54	27	0.014	1.50	N/A	N/A	Yes	Yes	No
NOx	N/A	22.30	gm/hp-hr	8.6	9.2	461	0.23	4.0	N/A	N/A	No	No	No
CO	630080	11.30	gm/hp-hr	5.73	11.47	573	0.28	100.00	N/A	N/A	No	Yes	No
HC	N/A	1.74	gm/hp-hr	0.65	1.30	65	0.033	N/A	N/A	N/A	No	No	No
SOx	7446095	1.2.E-03	lbs/hp-hr	0.0021	0.0041	0.21	0.0001	4.00	N/A	N/A	No	No	No
Toxic Air Pollutants													
Benzene	71432	9.33E-04	lb/MMBtu	4.09E-04	8.14E-04	4.09E-02	2.05E-05	N/A	2.20E+02	lb/yr	No	Yes	Yes
Toluene	108883	4.09E-04	lb/MMBtu	1.79E-04	3.56E-04	1.79E-02	8.97E-06	N/A	2.20E+02	lb/day	No	Yes	Yes
Xylenes	1330207	2.85E-04	lb/MMBtu	1.25E-04	2.20E-04	1.15E-02	8.25E-06	N/A	1.80E+02	lb/day	No	Yes	Yes
Propylene	115071	2.58E-03	lb/MMBtu	1.13E-03	2.25E-03	1.13E-01	5.64E-05	N/A	2.70E+02	lb/day	No	Yes	No
Formaldehyde	50000	1.18E-03	lb/MMBtu	5.17E-04	1.03E-03	5.17E-02	2.59E-05	N/A	2.70E+01	lb/yr	No	Yes	Yes
Acetaldehyde	75070	7.67E-04	lb/MMBtu	3.36E-04	6.73E-04	3.36E-02	1.68E-05	N/A	6.80E+01	lb/yr	No	Yes	Yes
Acrolein	107028	9.25E-05	lb/MMBtu	4.06E-05	8.13E-05	4.06E-03	2.03E-06	N/A	7.80E-02	lb/day	No	Yes	Yes
Naphthalene	91203	8.48E-05	lb/MMBtu	3.72E-05	7.44E-05	3.72E-03	1.86E-06	N/A	4.40E+00	lb/yr	No	Yes	Yes
Acenaphthylene	208968	5.06E-06	lb/MMBtu	2.22E-06	4.44E-06	2.22E-04	1.11E-07	N/A	none	n/a	No	No	Yes (HAP)
Acenaphthene	83329	1.42E-06	lb/MMBtu	6.23E-07	1.25E-06	6.23E-05	3.11E-08	N/A	none	N/A	No	No	Yes (HAP)
Fluorene (Se)	7782416	1.92E-05	lb/MMBtu	1.28E-05	2.56E-05	1.28E-03	6.40E-07	N/A	3.70E+00	lb/day	No	Yes	Yes (HAP)
Phenanthrene	85018	2.94E-05	lb/MMBtu	1.29E-05	2.58E-05	1.29E-03	6.44E-07	N/A	none	N/A	No	No	Yes (HAP)
Anthracene	120127	1.87E-06	lb/MMBtu	8.20E-07	1.64E-06	8.20E-05	4.10E-08	N/A	none	N/A	No	No	Yes (HAP)
Fluoranthene	206440	7.61E-06	lb/MMBtu	3.34E-06	6.67E-06	3.34E-04	1.67E-07	N/A	none	n/a	No	No	Yes (HAP)
Pyrene	129000	4.78E-06	lb/MMBtu	2.10E-06	4.19E-06	2.10E-04	1.05E-07	N/A	none	N/A	No	No	Yes (HAP)
Benz(a)anthracene	56553	1.68E-06	lb/MMBtu	7.37E-07	1.47E-06	7.37E-05	3.68E-08	N/A	8.80E-01	lb/yr	No	Yes	Yes (HAP)
Chrysene	218019	3.91E-07	lb/MMBtu	1.55E-07	3.10E-07	1.55E-05	7.74E-09	N/A	8.80E+00	lb/yr	No	Yes	Yes (HAP)
Benzo(b)fluoranthene	205992	9.91E-08	lb/MMBtu	4.34E-08	8.69E-08	4.34E-06	2.17E-09	N/A	8.80E-02	lb/yr	No	Yes	Yes (HAP)
Benzo(k)fluoranthene	207089	1.55E-07	lb/MMBtu	6.80E-08	1.36E-07	6.80E-06	3.40E-09	N/A	8.80E-01	lb/yr	No	Yes	Yes (HAP)
Benzo(a)pyrene	50328	1.84E-07	lb/MMBtu	8.24E-08	1.65E-07	8.24E-06	4.12E-09	N/A	1.60E-02	lb/yr	No	Yes	Yes (HAP)
Indeno(1,2,3-cd)pyrene	193395	3.71E-07	lb/MMBtu	1.64E-07	3.29E-07	1.64E-05	8.22E-09	N/A	8.80E-01	lb/yr	No	Yes	Yes (HAP)
Dibenz(a,h)anthracene	53703	5.83E-07	lb/MMBtu	2.56E-07	5.11E-07	2.56E-05	1.28E-08	N/A	8.25E-02	lb/yr	No	Yes	Yes (HAP)
Benzo(g,h,i)perylene	191242	8.89E-07	lb/MMBtu	3.14E-07	6.28E-07	3.14E-05	1.57E-08	N/A	none	n/a	No	Yes	Yes (HAP)
DEEP	N/A	0.7240	gm/hp-hr	2.73E-01	5.47E-01	2.73E+01	1.36E-02	N/A	8.80E-01	lb/yr	YES	Yes	No
Total PAH	N/A	1.68E-04	lb/MMBtu	7.37E-05	1.47E-04	7.37E-03	3.68E-06	N/A	8.80E-01	lb/yr	No	Yes	No
Sum				2.74E-01	5.48E-01	2.74E+01	1.37E-02					1,3-Butadiene	3.91E-05
Sum HAP				1.68E-03	3.36E-03	1.68E-01	8.41E-05						

Factors for engines <600 hp are below AP-42 Section 3.3, Table 3.3-1)

Benzene	8.59E-04
Toluene	4.09E-04
Xylenes	2.85E-04
Propylene	2.58E-03
Formaldehyde	1.18E-03
Acetaldehyde	7.67E-04
Acrolein	9.25E-05
Naphthalene	8.48E-05
Acenaphthylene	5.06E-06
Acenaphthene	1.42E-06
Fluorene (Se)	2.92E-05
Phenanthrene	2.94E-05
Anthracene	1.87E-06
Fluoranthene	7.61E-06
Pyrene	4.78E-06
Benz(a)anthracene	1.68E-06
Chrysene	3.91E-07
Benzo(b)fluoranthene	1.55E-07
Benzo(k)fluoranthene	9.91E-08
Benzo(a)pyrene	1.84E-07
Indeno(1,2,3-cd)pyrene	3.71E-07
Dibenz(a,h)anthracene	5.83E-07
Benzo(g,h,i)perylene	8.89E-07
DEEP	7.24E-01
Total PAH	3.68E-04
1,3-Butadiene	3.91E-05

[1]NOx, PM, CO and HC emissions factors from Tier I ratings.
NOx emission factor reflects controlled emissions through ignition timing retard. PM, CO and HC emissions uncontrolled.
[2]SO2 factor from EPA AP-42, section 3.4, Table 3.4-1 (10/96) using 0.0015% sulfur by weight for ULSD.
[3]Emission Rate (lb/hr) = (Emission Factor)(max horse power rating)/453.59 g/lb)
[4]Emission Rate (lb/yr) = (Emission Rate (lb/hr))(load factor (%))(use factor(%))(Maximum hrs/yr)
[5]Emission Rate (lb/day) = (Emission Rate (lb/hr))(load factor (%))(use factor(%))(Maximum hrs/day)
[6]PM_{10} emission factor assumed same as PM factor.
[7]$PM_{2.5}$ emissions factor assumed the same as PM factor.
[8]Toxic Air Pollutant emission factors from EPA AP-42, Section 3.4, Table 3.4-3 and Table 3.4-4 (10/96)

Table 2 in Emergency ICE Final Determination

Pollutant	CAS #	Emission Rate[1] (lb/hr)	Emission Rate[2] (lb/day)	Emission Rate[3] (lb/yr)
Criteria Air Pollutants				
PM	N/A	0.27	0.54	27.3346
PM_{10}[4]	N/A	0.27	0.54	27.3346
$PM_{2.5}$[5]	N/A	0.27	0.54	27.3346
Lead	N/A	0.00	0.00	0.0000
NOx	N/A	8.6	9.2	460.8810
CO	630080	5.73	11.47	573.4253
HC	N/A	0.65	1.30	65.2131
SOx	7446095	0.00	0.00	0.0063
Toxic Air Pollutants				
Benzene	71432	4.09E-04	8.18E-04	8.09E-02
Toluene	108883	1.79E-04	3.58E-04	1.79E-02
Xylenes	1330207	1.25E-04	2.50E-04	1.25E-02
Propylene	115071	1.13E-03	2.26E-03	1.13E-01
Formaldehyde	50000	5.17E-04	1.03E-03	5.17E-02
Acetaldehyde	75070	3.36E-04	6.73E-04	3.36E-02
Acrolein	107028	4.06E-05	8.13E-05	4.06E-03
Naphthalene	91203	8.72E-05	7.44E-05	3.72E-03
Acenaphthylene	208968	5.22E-06	8.44E-06	2.22E-04
Acenaphthene	83329	6.23E-07	1.25E-06	6.23E-05
Fluorene	7782416	1.28E-05	2.56E-05	1.28E-03
Phenanthrene	85018	1.29E-05	2.58E-05	1.29E-03
Anthracene	120127	8.20E-07	1.64E-06	8.20E-05
Fluoranthene	206440	3.34E-06	6.67E-06	3.34E-04
Pyrene	129000	2.10E-06	4.19E-06	2.10E-04
Benz(a)anthracene	56553	7.37E-07	1.47E-06	7.37E-05
Chrysene	218019	1.55E-07	3.10E-07	1.55E-05
Benzo(b)fluoranthene	205992	4.34E-08	8.69E-08	4.34E-06
Benzo(k)fluoranthene	207089	6.80E-08	1.36E-07	6.80E-06
Benz(a)pyrene	50328	8.24E-08	1.65E-07	8.24E-06
Indeno(1,2,3-cd)pyrene	193395	1.64E-07	3.29E-07	1.64E-05
Dibenz(a,h)anthracene	53703	2.56E-07	5.11E-07	2.56E-05
Benzo(g,h,i)perylene	191242	3.14E-07	4.29E-07	2.14E-05
DEEP	N/A	2.73E-01	5.47E-01	2.73E+01
Total PAH	N/A	7.37E-05	1.47E-04	7.37E-03
Sum TAP		2.74E-01	5.48E-01	2.74E+01
Sum HAP		1.68E-03	3.36E-03	1.68E-01

027-0006 SIMPSON DOOR COMPANY
EU01 Emergency Engine - 225 kW Powerhouse
Potential To Emit

This emergency engine calculation sheet characterizes emissions from an uncontrolled Tier I diesel compression-ignition engine.

Legend

Assumed
Calculated
Per NOC Application
Parameter/Constant

225 kw 1 bhp 301.7239182 bhp
0.7457 kw hr

302 hp 1 gal 2,546 btu 5.60794182 gal
137,000 btu 1 hp hr

Engine Emission Calculation Parameters

Operating Parameter		
Design BHP	302	BHP
Fuel use @ 100% load[1]	5.6	gal/hr
Fuel use calculated @ 100% load per gen	5.6	gal/hr
Fuel energy content[2]	137,000	Btu/gal
BHP to kW conversion	0.7457	kW/BHP
BHP @ maximum load	302	bhp
Power (in kW) @ max BHP	225	kw
Heat Rate @ 100% load	0.77	MMBtu/hr
Schedule - hrs/day for readiness testing	2	hrs/day
Schedule - days/wk	3	days/wk
Schedule - wks/yr	52	wks/yr
Max. hours per year (per Subpart III of 4	100	hours/year
Stack height	0	ft
"F" Factor diesel	9190	dscf/MMBtu
O2 Correction Factor	2.07	dimensionless
Exhaust temp (K)	0	K
Exhaust temp (F)	0	F
Ambient temp (K)	293	K
Ambient temp (F)	68	F
% moisture by volume	7.1	%
Stack exhaust rate (dscfm)	0	dscfm
Stack exhaust rate (acfm)	0	acfm
Fuel sulfur content	0.0015	%
Average use factor	100.0%	percent
Average Load Factor[3]	100.00%	percent
Stack diameter	0	inches
Ambient Temp	0	F
NO2 to NOx ratio	5%	

[1]Calculated
[2]Heat content of diesel
[3]NO2 to NOx ratio based on information from Diesel Net Guidance regarding NOx emissions from diesel combustion

1 g/kw-hr
1.64 g/hp-hr

CO2e GW potential

CO2	73.96 kg/mmbtu	56.7 kg/hr	5674 kg/yr	2.8 TPY	2.8 CO2e TPY
CH4	0.003 kg/mmbtu	0.00230	0.230	0.000115	0.00268 CO2e TPY
N2O	0.0006 kg/mmbtu	0.00046	0.046	2.3E-05	6.9E-03 CO2e TPY

https://www.epa.gov/sites/default/files/2015-07/documents/emission-factors_2014.pdf 2.85 CO2e TPY 101AL

Pollutant	CAS #	Emission Factor[4,5] (gm/hp-hr)	EF Units	Emission Rate[6] (lb/hr)	Emission Rate[6] (lb/day)	Emission Rate[7] (lb/yr)	Emission Rate (ton/yr)	SER (ton/yr)	SQER	SQER Units	Model?	TAP	HAP	
PM	N/A	0.724	gm/hp-hr	0.48	0.96	48	0.024	2.50	N/A	N/A	No	No	No	
PM_{10}	N/A	0.724	gm/hp-hr	0.48	0.96	48	0.024	2.50	N/A	N/A	No	No	No	
$PM_{2.5}$[8]	N/A	0.724	gm/hp-hr	0.48	0.96	48	0.024	2.50	N/A	N/A	No	No	No	
NOx	N/A	13.30	gm/hp-hr	8.2	16	819	0.41	40	N/A	N/A	No	No	No	
CO	630080	15.30	gm/hp-hr	10	20	1,019	0.51	100	N/A	N/A	No	No	No	
HC	N/A	1.74	gm/hp-hr	1.2	2.32	116	0.058	N/A	N/A	N/A	No	No	No	
SOx	7446095	1.21E-03	lbs/hp-hr	0.00	0.01	0.37	0.0002	4.00	N/A	N/A	No	No	No	
Toxic Air Pollutants														Factors for engines <600 hp are below (AP-42 Section 3.3, Table 3.3-2)
Benzene	71432	9.33E-04	lb/MMBtu	7.16E-04	1.43E-03	7.16E-02	3.58E-05	N/A	1.10E+01	lb/yr	No	Yes	Yes	9.33E-04
Toluene	108883	4.09E-04	lb/MMBtu	3.14E-04	6.28E-04	3.14E-02	1.57E-05	N/A	1.72E+02	lb/day	No	Yes	Yes	4.09E-04
Xylenes	1330207	2.85E-04	lb/MMBtu	2.19E-04	4.37E-04	2.19E-02	1.09E-05	N/A	1.82E+01	lb/day	No	Yes	Yes	2.85E-04
Propylene	115071	2.58E-03	lb/MMBtu	1.98E-03	3.96E-03	1.98E-01	9.90E-05	N/A	2.60E+01	lb/day	No	Yes	No	2.58E-03
Formaldehyde	50000	1.18E-03	lb/MMBtu	9.05E-04	1.81E-03	9.05E-02	4.53E-05	N/A	2.70E+01	lb/yr	No	Yes	Yes	1.18E-03
Acetaldehyde	75070	7.67E-04	lb/MMBtu	5.88E-04	1.18E-03	5.88E-02	2.94E-05	N/A	4.00E+01	lb/yr	No	Yes	Yes	7.67E-04
Acrolein	107028	9.25E-05	lb/MMBtu	7.10E-05	1.42E-04	7.10E-03	3.55E-06	N/A	3.60E+02	lb/day	No	Yes	Yes	9.25E-05
Naphthalene	91203	8.48E-05	lb/MMBtu	6.51E-05	1.30E-04	6.51E-03	3.25E-06	N/A	4.80E+00	lb/yr	No	Yes	Yes	8.48E-05
Acenaphthylene	208968	5.06E-06	lb/MMBtu	3.88E-06	7.76E-06	3.88E-04	1.94E-07	N/A	none	N/A	No	No	Yes (PAH)	5.06E-06
Acenaphthene	83329	1.42E-06	lb/MMBtu	1.09E-06	2.18E-06	1.09E-04	5.45E-08	N/A	none	N/A	No	Yes	Yes (PAH)	1.42E-06
Fluorene (Da	7782414	2.92E-05	lb/MMBtu	2.24E-05	4.48E-05	2.24E-03	1.12E-06	N/A	1.20E-05	lb/day	No	Yes	Yes (PAH)	2.92E-05
Phenanthrene	85018	2.94E-05	lb/MMBtu	2.26E-05	4.51E-05	2.26E-03	1.13E-06	N/A	none	N/A	No	Yes	Yes (PAH)	2.94E-05
Anthracene	120127	1.87E-06	lb/MMBtu	1.43E-06	2.87E-06	1.43E-04	7.17E-08	N/A	none	N/A	No	Yes	Yes (PAH)	1.87E-06
Fluoranthene	206440	7.61E-06	lb/MMBtu	5.84E-06	1.17E-05	5.84E-04	2.92E-07	N/A	none	N/A	No	Yes	Yes (PAH)	7.61E-06
Pyrene	129000	4.78E-06	lb/MMBtu	3.67E-06	7.33E-06	3.67E-04	1.83E-07	N/A	none	N/A	No	Yes	Yes (PAH)	4.78E-06
Benz(a)anthracene	56553	1.61E-06	lb/MMBtu	1.24E-06	2.48E-06	1.24E-04	6.21E-08	N/A	9.80E-01	lb/yr	No	Yes	Yes (PAH)	1.61E-06
Chrysene	218019	1.53E-06	lb/MMBtu	1.17E-06	2.34E-06	1.17E-04	5.86E-08	N/A	9.80E+02	lb/yr	No	Yes	Yes (PAH)	1.53E-06
Benzo(b)fluoranthene	205992	9.91E-08	lb/MMBtu	7.60E-08	1.52E-07	7.60E-06	3.80E-09	N/A	9.80E-01	lb/yr	No	Yes	Yes (PAH)	9.91E-08
Benzo(k)fluoranthene	207089	1.55E-07	lb/MMBtu	1.19E-07	2.38E-07	1.19E-05	5.95E-09	N/A	9.80E-01	lb/yr	No	Yes	Yes (PAH)	1.55E-07
Benzo(g,h,i)perylene	50328	1.88E-07	lb/MMBtu	1.44E-07	2.88E-07	1.44E-05	7.21E-09	N/A	2.60E-01	lb/yr	No	Yes	Yes (PAH)	1.88E-07
Indeno(1,2,3-cd)pyrene	193395	3.75E-07	lb/MMBtu	2.88E-07	5.75E-07	2.88E-05	1.44E-08	N/A	9.80E-01	lb/yr	No	Yes	Yes (PAH)	3.75E-07
Dibenz(a,h)anthracene	53703	5.83E-07	lb/MMBtu	4.47E-07	8.95E-07	4.47E-05	2.24E-08	N/A	8.10E-02	lb/yr	No	Yes	Yes (PAH)	5.83E-07
Benzo(g,h,i)perylene	191242	4.89E-07	lb/MMBtu	3.75E-07	7.50E-07	3.75E-05	1.88E-08	N/A	none	N/A	No	Yes	Yes (PAH)	4.89E-07
DEEP	N/A	0.7240	gm/hp-hr	4.82E-01	9.64E-01	4.82E+01	2.41E-02	N/A	3.40E-01	ft/yr	Yes	No		0.7240
Total HAP	N/A	1.88E-04	lb/MMBtu	1.29E-04	2.58E-04	1.29E-02	6.44E-06	N/A	8.90E-01	lb/yr	No	Yes	No	1.88E-04
Sum:				**4.87E-01**	**9.74E-01**	**4.87E+01**	**2.44E-02**							1,3-Butadiene: 1.91E-01
Sum HAP:				**2.94E-03**	**5.88E-03**	**2.94E-01**	**1.47E-04**							

[4] NOx, PM, CO and HC emissions factors from Tier I ratings
NOx emission factor reflects controlled emissions through ignition timing retard. PM, CO and HC emissions uncontrolled.
[5]SO2 factor from EPA AP-42, section 3.4. Table 3.4-1 (10/96) using 0.0015% sulfur by weight for ULSD
[6]Emission Rate (lb/hr) = (Emission Factor)*(max horse power rating)/(453.59 g/lb)
[7]Emission Rate (lb/yr) = (Emission Rate (lb/hr))*(use factor%)*(Maximum hrs/yr)
[8]Emission Rate (lb/day) = (Emission Rate (lb/hr))*(load factor (%))*(use factor(%))*(Maximum hrs/day);
[9]PM_{10} emission factor assumed same as PM factor
[10]$PM_{2.5}$ emissions factor assumed the same as PM factor
[11]Toxic Air Pollutant emission factors from EPA AP-42, Section 3.4, Table 3.4-3 and Table 3.4-4 (10/96).

Table 2 In Emergency ICE Final Determination

Pollutant	CAS #	Emission Rate[1] (lb/hr)	Emission Rate[2] (lb/day)	Emission Rate (ton/yr)
Criteria Air Pollutants				
PM	N/A	8.48	0.96	48.2039
PM_{10}	N/A	0.48	0.96	48.2039
$PM_{2.5}$[3]	N/A	0.48	0.96	48.2039
Lead	N/A	0.00	0.00	0.0000
NOx	N/A	8.2	16.4	818.9334
CO	630080	10.19	20.37	1018.6733
HC	N/A	1.16	2.32	115.8491
SOx	7446095	0.00	0.01	0.3665
Toxic Air Pollutants				
Benzene	71432	7.16E-04	1.43E-03	7.16E-02
Toluene	108883	3.14E-04	6.28E-04	3.14E-02
Xylenes	1330207	2.19E-04	4.37E-04	2.19E-02
Propylene	115071	1.98E-03	3.96E-03	1.98E-01
Formaldehyde	50000	9.05E-04	1.81E-03	9.05E-02
Acetaldehyde	75070	5.88E-04	1.18E-03	5.88E-02
Acrolein	107028	7.10E-05	1.42E-04	7.10E-03
Naphthalene	91203	6.51E-05	1.30E-04	6.51E-03
Acenaphthylene	208968	3.88E-06	7.76E-06	3.88E-04
Acenaphthene	83329	1.09E-06	2.18E-06	1.09E-04
Fluorene	7782414	2.24E-05	4.48E-05	2.24E-03
Phenanthrene	85018	2.26E-05	4.51E-05	2.26E-03
Anthracene	120127	1.43E-06	2.87E-06	1.43E-04
Fluoranthene	206440	5.84E-06	1.17E-05	5.84E-04
Pyrene	129000	3.67E-06	7.33E-06	3.67E-04
Benz(a)anthracene	56553	1.29E-06	2.58E-06	1.29E-04
Chrysene	218019	1.21E-07	1.42E-07	1.21E-05
Benzo(b)fluoranthene	205992	2.60E-08	1.52E-07	7.60E-06
Benzo(k)fluoranthene	207089	1.19E-07	2.38E-07	1.19E-05
Benzo(g,h,i)perylene	50328	1.44E-07	2.88E-07	1.44E-05
Indeno(1,2,3-cd)pyrene	193395	2.88E-07	5.75E-07	2.84E-05
Dibenz(a,h)anthracene	53703	4.47E-07	8.95E-07	4.47E-05
Benzo(g,h,i)perylene	191242	3.75E-07	7.50E-07	3.75E-05
DEEP	N/A	4.82E-01	9.64E-01	4.82E+01
Total HAP	N/A	1.29E-04	2.58E-04	1.29E-02
Sum TAP		4.87E-01	9.74E-01	4.87E+01
Sum HAP		2.94E-03	5.88E-03	2.94E-01

027-0006 SIMPSON DOOI SIMPSON DOOR CO
EU8 Adhesive Coating Line
Potential To Emit

Density of H2O @ 20° C: 8.33 lb/gal

EPA list of Hazardous Air Pollutants: https://www.epa.gov/haps/initial-list-hazardous-air-pollutants-modifications
TAP means any toxic air pollutant regulated in Washington and listed in WAC 173-460-150

2021 SDS: \\olympia1\PROJECTS\1998\002.010\T\SDSs

Simpson Material Product ID	Manufacturer	Material Name	ENTER Usage GAL/YR	ENTER/ CALCULATE Usage LB/YR	Specific Gravity	CAS 50-00-0 Formaldehyde VOC, HAP, TAP wt %	CAS# 101-68-8 4,4-Diphenyl Methane Diisocyanate [MDI] VOC, HAP, TAP wt %	CAS 108-05-4 Vinyl Acetate VOC, HAP, TAP wt %	CAS 112-15-2 Diethylene Glycol Ethyl Ether Acetate VOC, HAP wt %	Comment
Annual Emissions Limit (2021 ORCAA 21NOC1538) (lb/year)						**328**	**2.12**	**5,110**		

Used maximum % list in SDS
Used maximum Density of Material listed in MSDS

Total VOC	2.72	**Tons**
Total HAP	2.72	**Tons**

027-0006 SIMPSON DOOR COMPANY
EU2 **Wood Residuals Transport System**
2021 Actual Emission

Enter Data Under "Yellow" Headers

*Emission Factors**

	Sanderdust	Other Cyclones
Pollutant	(gr/scf)	(gr/scf)
PM	0.055	0.030
Fraction of PM	Baghouse	Medium Efficiency Cyclone
PM_{10}	0.995	0.850
$PM_{2.5}$	0.990	0.500

Oregon DEQ AQ-EF03 particulate fractions for wood products. https://www.oregon.gov/deq/FilterPermitsDocs/AQ-EF03.pdf
gr/scf = grains per standard cubic foot

Emissions

Cyclone ID#	Average Hrs/day	Actual Days/yr	Hr/yr	CFM	Material	% Control Baghouse	PM (TPY)	PM10 (TPY)	PM2.5 (TPY)	Comments	Baghouse	
CD10(1A)	17.07	269	4,593	45,000	Sanderdust	99	0.49	0.48	0.48	Door plant/finishing	8 (aka 1A)	
CD11(1B)	17.07	269	4,593	45,000	Sawdust	99	0.27	0.26	0.26	Door plant/finishing	7 (aka 1B)	
CD12(2A)	17.07	269	4,593	45,000	Sawdust	99	0.27	0.26	0.26	Door plant	3 (aka 2A)	
CD13(2B)	17.07	269	4,593	45,000	Sawdust	99	0.27	0.26	0.26	Door plant	4 (aka 2B)	
CD2	17.07	269	4,593	42,000	Planer Shavings	0	25	21	12	Material drops to CD6		
CD3	17.07	269	4,593	15,000	Sawdust	0	9	8	4.4	Material drops to CD6		
CD4	17.07	269	4,593	10,000	Sawdust	0	6	5.0	3.0	Material drops to CD6		
CD5	17.07	269	4,593	12,000	Sawdust	0	7	6	3.5	Material drops to CD6		
CD6	17.07	269	4,593	30,000	Sawdust	99	0.18	0.18	0.18	Material drops to Dust Silo	2 (aka C2)	
CD7	17.07	269	4,593	36,000	Sanderdust	99	0.39	0.39	0.39	AM Sander	1 (aka C1)	
CD8	17.07	269	4,593	12,000	Sawdust	0	7	6	3.5	Material drops to CD6		
CD9	17.07	269	4,593	6,000	Sawdust	0	3.5	3.0	1.8	Material drops to CD3		
CD14	17.07	269	4,593	12,000	Sawdust	99	0.07	0.07	0.07	Material drops to Atlas Bin vented to Baghouse 6	6	
CD15	17.07	269	4,593	30,000	Sawdust	99	0.18	0.18	0.18	2 cyclones, material drops to Atlas Storage Bin vented to Baghouse 6	6	"Carothers"
Truck loadout	17.07	269	4,593	12,000	Sawdust	99	0.07	0.07	0.07	Truck loadout vented to Baghouse 5	5	
						TOTAL:	59	51	31			
		TOTAL ACFM			397,000							

Notes:

1 e. g. Cal. Cyclone **with baghouse**, PM=(0.03 gr/ft^3)(14218 ft^3/min)(1 lb/7000 gr)(60 min/hr)(1T/2000 lb) (100%-99% baghouse /100%)(6120 hr operate) = 0.1 T PM
2 Sawdust, shavings, chips, PM: FIRE 6.23 October 2000, SCC 30700804, 30700805, also in Table 10.4.1 AP-42, p. 10.4-2 (2/80)
3 Sawdust, shaviings, chips, PM-10 FIRE 6.23 October 2000, SCC 30700804, 30700805, assumes PM-10 and PM2.5 fraction from Oregon DEQ AQ-EF03 emission factor document
4 Sanderdust PM: FIRE October 2000, SCC30700806 also in Table 10.4.1 AP-42, p. 10.4-2 (2/80)
5 Sanderdust PM-10: FIRE October 2000. SCC30700806. assumes PM-10 and PM2.5 fraction from Oregon DEQ AQ-EF03 emission factor document

027-000 SIMPSON DOOR COMPANY
EU3 Package Boiler - Propane, Natural gas
2021 Actual Emission

Enter Data in "Yellow" Cells

EMISSIONS YEAR	2021

ENTER Propane	92,809	gal/yr
Natural gas	0	MMscf/yr
Sulfur Content (propane)	15.00	gr/ 100 scf

Greenhouse Gas Emissions

	CO2	CH4	N2O
GWP	1.0	25.0	298

Natural gas HHV	1.03E-03	MMBtu/scf
Propane	3.38	10^6 scf/yr

EMISSION FACTORS	PM	PM10-PRI	PM10-FIL	PM2.5-PRI	PM2.5-FIL	PM-CON	SO2	NOX	VOC	CO
lb/MMscf natural gas	7.6	7.6		7.6			0.6	50	5.5	84
lb/1000 gal propane	0.049	0.049	0.019	0.041	0.010	0.030	1.5	13	1.0	8

GHG Factors	CO2	CH4	N2O	CO2e
kg/MMbtu	53	0.001	0.0001	53
g/scf	54.5	0.001028	0.000103	55

EMISSIONS Ton/Yr	PM	PM10-PRI	PM10-FIL	PM2.5-PRI	PM2.5-FIL	PM-CON	SO2	NOX	VOC	CO
Natural gas	0	0		0			0	0	0	0
Propane	0.002	0.002	0.001	0.002	0.000	0.001	0.070	0.603	0.045	0.348

Emissions (t/yr)	CO2	CH4	N2O	CO2e
Natural gas	0	0.000	0.000	0
Propane	184	0.003	0.0003	184

Notes:

1 Boiler equipped with low-NOx burners (11NOC869)
2 Natural Gas - NOX, CO: EPA AP42 (7/98) Table 1.4-1 for controlled small boilers with low NOX burner
3 Natural Gas - PM: EPA AP42 (7/98) Table 1.4-2
4 Propane - 1 scf vapor = 0.0278 gallons liquid
5 PM-10, PM 2.5 assume = PM.
6 PM-10, PM 2.5 factors from EPA's natgas_procgas_lpg_pm_efs_not_ap42_032012_revisions.xls (Ron Huntley, EPA, 3/30/12) (SCC 10201002)
7 Organic and trace element emissions not calculated as they are not significant for this unit.
8 GHG from *Emission Factors for Greenhouse Gas Inventories*, Nov 7, 2011.
9 Natural gas GHG factors from 40 CFR 98 - Mandatory Greenhouse Gas Reporting, Table A-1, C-1 and C-2.
9 GHG reported in metric tons (t/yr) rather than short tons (T/yr). 1.1023 T/t

027-0006 SIMPSON DOOR COMPANY
EU04 **Lumber Dry Kilns**
2021 Actual Emission

Total MBF/Yr processed	0	***per Kert via email 1/21/22 "dry kilns are still not in operation"***
Drying Temperature (°F)	180	***Temperature is the maximum cycle temperature.***

EMISSION FACTORS:	**lb Pollutant / MBF for Lumber Dry Kilns**									
Pollutant	PM	PM 10	PM 2.5	WPP1 VOC	Total HAP	Methanol	Formaldehyde	Acetaldehyde	Propionaldehyde	Acrolein
Douglas Fir	0.0890	0.0890	0.0890	0.8567	0.0924	0.0443	0.0012	0.0275	0.0003	0.0005
Western Hemlock	0.0320	0.0320	0.0320	0.2722	0.2048	0.0507	0.0007	0.0677	0.0004	0.0012

EMISSIONS	**Emission T/Yr**					**Emissions Lb/Yr**				
Species	PM	PM 10	PM 2.5	WPP1 VOC	Total HAP	Methanol	Formaldehyde	Acetaldehyde	Propionaldehyde	Acrolein
Douglas Fir	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0
Western Hemlock	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0
TOTAL EMISSIONS	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0**	**0**	**0**	**0**	**0**
>25,>10 T/Yr "Y"/"N"					N	N	N	N	N	N

Emission Factor References (see next sheet)

Notes
ORCAA Emission factor for PM and total HAP (T < 200F)
EPA Emission factor for VOC, methanol, formaldehyde, acetaldehyde, propionaldehyde and acrolein.

ORCAA Compilation of Dry Kiln Emission Factors
Created January 2015

Emission Factors (lb/mbf)

Species	Max Kiln Temp (°F)	WPP1 VOC ≤ 200	WPP1 VOC > 200	Total HAP ≤ 200	Total HAP > 200	Methanol ≤ 200	Methanol > 200	Formaldehyde ≤ 200	Formaldehyde > 200	Acetaldehyde ≤ 200	Acetaldehyde > 200	Propionaldehyde ≤ 200	Propionaldehyde > 200	Acrolein ≤ 200	Acrolein > 200	PM/PM10/PM2.5 ≤ 200	PM/PM10/PM2.5 > 200
Non-Resinous Softwood Species																	
White Fir	ODEQ	0.587	0.993	0.182	0.494	0.122	0.420	0.0028	0.016	(5)	0.055	(1)	(1)	(1)	(1)	0.089	0.089
Western Hemlock	ODEQ	0.380	0.526	0.205	0.276	0.081	0.184	0.0013	0.004	0.120	0.084	0.0012	0.0014	0.0015	0.0023	0.032	0.032
Western Red Cedar	ODEQ	0.306	1.000	0.246	0.523	(4)	(4)	(1)	(4)	(1)	(1)	(1)	(1)	(1)	(1)	0.032	0.032
Resinous Softwood Species (Non-Pine Family)																	
Douglas Fir	ODEQ	0.768	1.618	0.092	0.163	0.039	0.117	0.0013	0.0043	0.051	0.040	0.0005	0.0008	0.0007	0.0012	0.089	0.089
White Spruce	ODEQ	0.177	0.212	0.063	0.115	0.025	0.078	0.0013	0.0044	0.036	0.031	0.0003	0.0007	0.0005	0.0010	0.089	0.089
Larch	ODEQ	0.768	1.618	0.092	0.163	(3)	(3)	(3)	(2)	(3)	(3)	(3)	(3)	(3)	(3)		
Resinous Softwood Species (Pine Family)																	
Lodgepole Pine	ODEQ	1.380	1.392	0.093	0.100	0.073	0.060	(5)	0.0040	0.012	(6)	(6)	(6)	(6)	(6)		
Ponderosa Pine	ODEQ	1.965	3.797	0.103	0.189	0.055	0.144	0.0028	0.0092	0.042	0.028	0.0019	0.0032	0.0017	0.0045		
Western White Pine	ODEQ	2.835	3.797	0.103	0.189	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)		
Slash Pine	ODEQ				0.215		0.164		0.004		0.045		0.001		0.002		
Hardwood Species																	
Alder	SWCAA	0.943	1.192	0.211	0.553	0.119	0.416	0.0007	0.0048	0.089	0.129	0.0012	0.0016	0.0009	0.0018	0.089	0.089
Maple	SWCAA	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(7)		

(1) suggest using western hemlock data
(2) suggest using white spruce data
(3) suggest using douglas fir data
(4) suggest using white fir data
(5) suggest using high-temperature data for this species
(6) suggest using ponderosa pine data
(7) suggest using alder (SWCAA Feb 2012 spreadsheet)

Softwood Species - WPP1 VOC, HAP, and individual HAP data from ODEQ 2014 Compilation of VOC and HAP Emission Factors for Lumber Drying Kilns.
Hardwood Species - WPP1 VOC, HAP, and individual HAP data calculated using same method as softwood using data from SWCAA and OSU (see sheets).

PM

1 PM Factors Ref.: Weyhaeuser Office of the Environment, e-mail Johnson 3/9/99; Weyerhaeuser Raymond Sawmill
An emission factor for PM from drying southern yellow pine was derived form an an average of Weyerhaeuser test data and data in the NCASI wood products database
The average total particulate (filterable plus condensable) was 0.097 lb PM/MBF of southern yellow pine (SYP) dried.
The emission factor for hemlock and douglas fir was developed with the assumption that the particulate emissions are mostly vaporized wood extractives, and that the amount emitted is proportional to the wood extractive content.
DF = 0.097 lb PM / MBF * (4.4% Extractive Content DF / 4.8% Extractive Content SYP) = 0.089 lb PM / MBF.
A "safety factor" of 25% was applied for a conservative emission factor: 0.089 lb x 1.25 = 0.11 lb PM/MBF. Note: the "safety factor" is not used in the table above, so DF = 0.089 lb PM / MBF. The same method was applied to Hemlock (Wood Extractive Content of 1.6%)
Hemlock = 0.097 lb PM / MBF * (1.6 % Extractive Content WH / 4.8% Extractive Content SYP) =0.032 lb PM/MBF
2 PM: Alder, Spruce, Cedar - PM: - used Douglas Fir PM factor for Spurce and Alder; used Hemlock factor for Cedar
3 PM 10 and PM 2.5: Probably all of the PM is condensable. Assumption: PM = PM-10 = PM 2.5

EPA Region 10 HAP and VOC Emission Factors for Lumber Drying, January 2021

This spreadsheet calculates and compiles hazardous air pollutant (HAP) and volatile organic compound (VOC) emission factors (EF) in units of pounds of pollutant per thousand board feet of lumber dried (lb/mbf) that are preferred by EPA Region 10 for estimating emissions from indirect steam-heated batch lumber drying kilns. The EFs are based on actual lab-scale emission test data when available. When no suitable HAP or VOC test data is available for a species of wood (e.g., western red cedar, engelmann spruce, larch and western white pine), EFs for similar species are substituted. When there are more than one similar species, the highest of the EF for the similar species is substituted. When test data is available for some individual HAP but not others (e.g., western true firs and lodgepole pine), data from the species and another similar to it are used to conservatively estimate HAP EF. The calculation of VOC EF follows the methodology presented in EPA's OTM-26 (Interim VOC Measurement Protocol for the Wood Products Industry - July 2007, commonly referred to as "WPP1 VOC"), except that adjustments to the RM25A measurement have been performed beyond formaldehyde and methanol to include as many as five other compounds (acetaldehyde, propionaldehyde, acrolein, acetic acid and ethanol). With the VOC EF calculation factoring in the contribution of individual compounds, no data substitution or estimation of the constituents is performed. To maintain the intergrity of the calculation, only measured (not estimated) values for the constituents are used.

A summary of the EFs for each species of wood is included on this sheet. The sheets that follow present the original test data as well as the calculations for creating each EF. There are two sheets per lumber species: one for HAPs and one for VOCs. The methanol, formaldehyde and VOC EF are temperature dependent best-fit linear equations. The temperature variable reflects the maximum temperature of the heated air entering the lumber. Because acetaldehyde, propionaldehyde and acrolein emissions across different species are not consistently dependent upon maximum drying temperature, EF are calculated by averaging test results. Whereas HAP EF are derived in the HAP sheets, EF for individual VOC ethanol and acetic acid are derived in the VOC sheets for douglas fir and ponderosa pine (only wood species undergoing testing for these two VOC compounds).

Species	WPP1 VOC[1,2] (lb/mbf)	Methanol[2] (lb/mbf)	Formaldehyde[2] (lb/mbf)	Acetaldehyde (lb/mbf)	Propionaldehyde (lb/mbf)	Acrolein (lb/mbf)
Non-Resinous Softwood Species						
Western True Firs[3]	0.00817x - 1.02133	0.00465x - 0.73360	0.00016x - 0.02764	0.0550	0.0003	0.0009
Western Hemlock	0.00369x - 0.39197	0.00249x - 0.39750	0.000046x - 0.007622	0.0677	0.0004	0.0012
Western Red Cedar	0.00817x - 1.02133	0.00465x - 0.73360	0.00016x - 0.02764	0.0677	0.0004	0.0012
Resinous Softwood Species (Non-Pine Family)						
Douglas Fir	0.01460x - 1.77130	0.00114x - 0.16090	0.000028x - 0.003800	0.0275	0.0003	0.0005
Engelmann Spruce	0.1769	0.00088x - 0.13526	0.000042x - 0.006529	0.0201	0.0002	0.0005
Larch	0.01460x - 1.77130	0.00114x - 0.16090	0.000028x - 0.003800	0.0275	0.0003	0.0005
Resinous Softwood Species (Pine Family)						
Lodgepole Pine	1.1352	0.0550	0.0030	0.0104	0.0003	0.0008
Ponderosa Pine	0.02083x - 1.30029	0.00137x - 0.18979	0.000074x - 0.010457	0.0340	0.0010	0.0026
Western White Pine	0.02083x - 1.30029	0.00137x - 0.18979	0.000074x - 0.010457	0.0340	0.0010	0.0026

[1] VOC emissions approximated consistent with OTM-26 underestimate emissions when the mass-to-carbon ratio of unidentified VOC exceeds that of propane. Ethanol and acetic acid are examples of compounds that contribute to lumber drying VOC emissions (for some species more than others), and both have mass-to-carbon ratios exceeding that of propane. Contribution of ethanol and acetic acid to VOC emissions has been quantified here when emissions testing data is available.

[2] Because WPP1 VOC, methanol and formaldehyde emissions are dependent upon maximum drying temperature, a best-fit linear equation with dependent variable maximum temperature of heated air entering the lumber has been generated to model emissions, with a couple of exceptions. For engelmann spruce and lodgepole pine, a single VOC EF (based upon high-temperature drying) has been generated due to lack of sufficient test data to build a best-fit linear equation.

[3] Western true firs consist of the following seven species classified in the same Abies genus: bristlecone fir, California red fir, grand fir, noble fir, pacific silver fir, subalpine fir and white fir.

027-0008
EU06

SIMPSON DOOR COMPANY
Emergency Engine - 170 hp Fire Pump
2021 Actual Emission

This emergency engine calculation sheet characterizes emissions from an uncontrolled Tier I diesel compression ignition engine.

Enter Data in "Yellow" Cells

Legend

Assumed
Calculated
Per NOC Application
Parameter/Constant

170 hp | 1 gal | 2,544 btu | 8.15678832 gal
133,000 btu | 1 hr | hr

Btu/hr conversion mechanical horsepower to btu from https://www.inchcalculator.com/convert/horsepower-to-btu-per-hour/

Engine Emission Calculation Parameters

Operating Parameter		
Design BHP	170	BHP
Fuel use @ 100% load[a]	8.2	gal/hr
Fuel use calculated @ 100% load per BHP	8.2	gal/hr
Fuel energy content[b]	137,000	Btu/gal
BHP to kW conversion	0.7457	kW/HP
BHP @ maximum load	170	BHP
Power @n kW) @ max BHP	127	kW
Heat Rate @ 100% load	0.44	MMBtu/hr
Schedule - hrs/day for preventative maint	0.5	hrs/day
Schedule - days/wk	1	days/wk
Schedule - wks/yr	52	wks/yr
Operating hours	30	hours/year
Stack height	ft	
"F" Factor diesel	9190	dscf/MMBtu
O2 Correction Factor	3.07	dimensionless
Exhaust temp (K)	K	
Exhaust temp (F)	F	
Ambient temp (K)	293	K
Ambient temp (F)	68	F
% moisture by volume	7.1	%
Stack exhaust rate (dscfm)		dscfm
Stack exhaust rate (acfm)	0	acfm
Fuel sulfur content	0.0015	wt%
Average use factor	100.0%	percent
Average load Factor[a]	100.00%	percent
Stack diameter		inches
Ambient Temp	K	
%O2 to NOx ratio[c]	5%	

[a]Provided in Form 18 of NOC application
[b]Heat content of diesel
[c]NO2 to NOx ratio based on information from Diesel Net Guidance regarding NOx emissions from diesel combustion

1 g/kw hr
1.34 g/hp hr

CO2e GW potential

CO2	73.96 kg/mmbtu	32.4 kg/hr	3242 kg/yr	1.6 TPY	1.6 CO2e TPY
CH4	0.003 kg/mmbtu	0.00132	0.132	0.000066	0.00166 CO2e TPY
N2O	0.0006 kg/mmbtu	0.00026	0.026	1.3E-05	3.9E-05 CO2e TPY

https://www.epa.gov/sites/default/files/2015-07/documents/emission-factors_2014.pdf — 1.63 CO2e TPY TOTAL

Pollutant	CAS #	Emission Factor[a,b] (g/mhp-hr)	EF Units	Emission Rate[c] (lb/hr)	Emission Rate[d] (lb/day)	Emission Rate[e] (lb/yr)	Emission Rate (ton/yr)	SER (ton/yr)	SQER	SQER Units	Model?	TAP	HAP	
PM	N/A	0.724	gm/hp-hr	0.27	0.14	8	0.004	1.50	N/A	N/A	No	No	No	
PM_{10}[f]	N/A	0.724	gm/hp-hr	0.27	0.14	8	0.004	1.50	N/A	N/A	No	No	No	
$PM_{2.5}$[g]	N/A	0.724	gm/hp-hr	0.27	0.14	8	0.004	1.50	N/A	N/A	No	No	No	
NOx	N/A	11.30	gm/hp-hr	4.6	2.3	138	0.07	4.0	N/A	N/A	No	No	No	
CO	630080	15.30	gm/hp-hr	5.73	2.87	172	0.09	100.00	N/A	N/A	No	No	No	
HC	N/A	1.74	gm/hp-hr	0.65	0.33	20	0.010	N/A	N/A	N/A	No	No	No	
SOx	7446095	1.21E-05	lbs/hp-hr	0.0021	0.0010	0.06	0.0000	4.00	N/A	N/A	No	No	No	
Toxic Air Pollutants														Factors for engines <600 hp are below (AP-42 Section 3.3, Table 3.3-2)
Benzene	71432	9.33E-04	lb/MMBtu	4.09E-04	2.05E-04	1.23E-02	6.14E-06	N/A	2.50E+02	lb/yr	No	Yes	Yes	9.33E-04
Toluene	108883	4.09E-04	lb/MMBtu	1.79E-04	8.97E-05	5.38E-03	2.69E-06	N/A	3.79E+02	lb/day	No	Yes	Yes	4.09E-04
Xylenes	1330207	2.85E-04	lb/MMBtu	1.25E-04	6.25E-05	3.75E-03	1.87E-06	N/A	1.62E+01	lb/day	No	Yes	Yes	2.85E-04
Propylene	115071	2.58E-03	lb/MMBtu	1.13E-03	5.66E-04	3.39E-02	1.70E-05	N/A	1.20E+01	lb/day	No	Yes	No	2.58E-03
Formaldehyde	50000	1.18E-03	lb/MMBtu	5.17E-04	2.59E-04	1.55E-02	7.76E-06	N/A	4.75E+01	lb/yr	No	Yes	Yes	1.18E-03
Acetaldehyde	75070	7.67E-04	lb/MMBtu	3.36E-04	1.68E-04	1.01E-02	5.04E-06	N/A	6.05E+01	lb/yr	No	Yes	Yes	7.67E-04
Acrolein	107028	9.25E-05	lb/MMBtu	4.06E-05	2.03E-05	1.22E-03	6.08E-07	N/A	2.50E-01	lb/day	No	Yes	Yes	9.25E-05
Naphthalene	91203	8.48E-05	lb/MMBtu	3.72E-05	1.86E-05	1.11E-03	5.58E-07	N/A	4.80E+00	lb/yr	No	Yes	Yes	8.48E-05
Acenaphthylene	208968	1.06E-06	lb/MMBtu	4.65E-07	2.32E-07	1.39E-05	6.97E-10	N/A	none	N/A	No	No	Yes (PAH)	1.06E-06
Acenaphthene	83329	1.41E-06	lb/MMBtu	6.21E-07	3.11E-07	1.87E-05	9.34E-10	N/A	none	N/A	No	Yes	Yes (PAH)	1.42E-06
Fluorene Gas	7782414	2.92E-05	lb/MMBtu	1.28E-05	6.40E-06	3.84E-04	1.92E-07	N/A	3.20E+00	lb/day	No	Yes	Yes (PAH)	2.92E-05
Phenanthrene	85018	2.94E-05	lb/MMBtu	1.29E-05	6.44E-06	3.87E-04	1.93E-07	N/A	none	N/A	No	Yes	Yes (PAH)	2.94E-05
Anthracene	120127	1.87E-06	lb/MMBtu	8.20E-07	4.10E-07	2.46E-05	1.23E-08	N/A	none	N/A	No	Yes	Yes (PAH)	1.87E-06
Fluoranthene	206440	7.61E-06	lb/MMBtu	3.34E-06	1.67E-06	1.00E-04	5.00E-08	N/A	none	N/A	No	Yes	Yes (PAH)	7.61E-06
Pyrene	129000	4.75E-06	lb/MMBtu	2.10E-06	1.05E-06	6.29E-05	3.14E-08	N/A	none	N/A	No	Yes	Yes (PAH)	4.29E-06
Benzo(a)anthracene	56553	1.68E-06	lb/MMBtu	7.37E-07	3.68E-07	2.21E-05	1.10E-08	N/A	8.90E-01	lb/yr	No	Yes	Yes (PAH)	1.68E-06
Chrysene	218019	3.53E-07	lb/MMBtu	1.55E-07	7.74E-08	4.64E-06	2.32E-09	N/A	8.90E+00	lb/yr	No	Yes	Yes (PAH)	3.53E-07
Benzo(b)fluoranthene	205992	9.91E-08	lb/MMBtu	4.34E-08	2.17E-08	1.30E-06	6.52E-10	N/A	8.90E-01	lb/yr	No	Yes	Yes (PAH)	9.91E-08
Benzo(k)fluoranthene	207089	3.56E-07	lb/MMBtu	1.56E-07	7.80E-08	4.68E-06	2.34E-09	N/A	8.90E-01	lb/yr	No	Yes	Yes (PAH)	3.56E-07
Benzo(e)pyrene	50328	1.88E-07	lb/MMBtu	8.24E-08	4.12E-08	2.47E-06	1.24E-09	N/A	1.60E-01	lb/yr	No	Yes	Yes (PAH)	1.88E-07
Indeno(1,2,3-cd)pyrene	193395	3.75E-07	lb/MMBtu	1.64E-07	8.22E-08	4.93E-06	2.47E-09	N/A	8.90E-01	lb/yr	No	Yes	Yes (PAH)	3.75E-07
Dibenz(a,h)anthracene	53703	1.83E-07	lb/MMBtu	2.56E-07	1.28E-07	7.67E-06	3.83E-09	N/A	8.20E-01	lb/yr	No	Yes	Yes (PAH)	1.83E-07
Benzo(g,h,i)perylene	191242	4.89E-07	lb/MMBtu	2.14E-07	1.07E-07	6.43E-06	3.21E-09	N/A	none	N/A	No	Yes	Yes (PAH)	4.89E-07
DEEP	N/A	0.7240	gm/hp-hr	2.71E-01	1.36E-01	8.14E+00	4.07E-03	N/A	5.42E-01	lb/yr	YES	Yes	No	0.0000
Total PAH	N/A	1.68E-04	lb/MMBtu	7.37E-05	3.68E-05	2.21E-03	1.10E-06	N/A	8.90E-01	lb/yr	No	Yes	No	1.68E-04
Sum				**2.74E-01**	**1.37E-01**	**8.21E+00**	**4.11E-03**						1,3-Butadiene:	3.91E-05
Sum HAP				**1.68E-03**	**8.41E-04**	**5.04E-02**	**2.52E-05**							

[a] NOx, PM, CO and HC emissions factors from Tier I ratings
NOx emission factor reflects controlled emissions through ignition timing retard, PM, CO and HC emissions uncontrolled.
[b]SO_2 factor from EPA AP-42, section 3.4, Table 3.4-1 (10/96) using 0.0015% sulfur by weight for ULSD
[c]Emission Rate (lb/hr) = (Emission Factor)*(max horse power rating)/(453.59 g/lb)
[d]Emission Rate (lb/yr) = (Emission Rate (lb/hr))*(load factor (%))*(use factor(%))*(Maximum hrs/yr)
[e]Emission Rate (lb/day) = (Emission Rate (lb/hr))*(load factor (%))*(use factor(%))*(Maximum hrs/day)
[f]PM_{10} emission factor assumed same as PM factor
[g]$PM_{2.5}$ emissions factor assumed the same as PM factor
[h]Toxic Air Pollutant emission factors from EPA AP-42, Section 3.4, Table 3.4-3 and Table 3.4-4 (10/96)

Table 2 In Emergency ICE Final Determination

Pollutant	CAS #	Emission Rate[c] (lb/hr)	Emission Rate[d] (lb/day)	Emission Rate (lb/yr)
Criteria Air Pollutants				
PM	N/A	0.27	0.14	8.1404
PM_{10}[f]	N/A	0.27	0.14	8.1404
$PM_{2.5}$[g]	N/A	0.27	0.14	8.1404
Lead	N/A	0.00	0.00	0.0000
NOx	N/A	4.6	2.3	138.7967
CO	630080	5.73	2.87	172.0276
HC	N/A	0.65	0.33	19.5439
SOx	7446095	0.00	0.00	0.0619
Toxic Air Pollutants				
Benzene	71432	4.09E-04	2.05E-04	1.23E-02
Toluene	108883	1.79E-04	8.97E-05	5.38E-03
Xylenes	1330207	1.25E-04	6.25E-05	3.75E-03
Propylene	115071	1.13E-03	5.66E-04	1.39E-02
Formaldehyde	50000	5.17E-04	2.59E-04	1.55E-02
Acetaldehyde	75070	3.36E-04	1.68E-04	1.01E-02
Acrolein	107028	4.06E-05	2.03E-05	1.22E-03
Naphthalene	91203	3.72E-05	1.86E-05	1.12E-03
Acenaphthylene	208968	2.21E-06	1.11E-06	6.65E-05
Acenaphthene	83329	6.21E-07	3.11E-07	1.87E-05
Fluorene	7782414	1.28E-05	6.40E-06	1.84E-04
Phenanthrene	85018	1.29E-05	6.44E-06	1.87E-04
Anthracene	120127	8.20E-07	4.10E-07	2.46E-05
Fluoranthene	206440	3.34E-06	1.67E-06	1.00E-04
Pyrene	129000	2.10E-06	1.05E-06	6.29E-05
Benzo(a)anthracene	56553	7.37E-07	3.68E-07	3.21E-05
Chrysene	218019	1.55E-07	7.74E-08	4.64E-06
Benzo(b)fluoranthene	205992	4.34E-08	2.17E-08	1.30E-06
Benzo(k)fluoranthene	207089	6.84E-08	3.40E-08	3.04E-06
Benzo(e)pyrene	50328	8.24E-08	4.12E-08	1.47E-06
Indeno(1,2,3-cd)pyrene	193395	1.64E-07	8.22E-08	4.93E-06
Dibenz(a,h)anthracene	53703	2.56E-07	1.28E-07	7.67E-06
Benzo(g,h,i)perylene	191242	2.14E-07	1.07E-07	6.43E-06
DEEP	N/A	2.71E-01	1.36E-01	8.14E+00
Total PAH	N/A	7.37E-05	3.68E-05	2.21E-03
Sum TAP		2.74E-01	1.37E-01	8.23E+00
Sum HAP		1.68E-03	8.41E-04	5.04E-02

027-0006 SIMPSON DOOR COMPANY
EG07 **Emergency Engine - 225 kW Powerhouse**
2021 Actual Emission

This emergency engine calculation sheet characterizes emissions from an uncontrolled Tier I diesel compression-ignition engine.

Enter Data in "Yellow" Cells

Legend

Assumed
Calculated
Per NOC Application
Parameter/Constant

225 kW 1 bhp 301.7298182 bhp
0.7457 kw hr

302 hp 1 gal 2,544 btu 5.60794161 gal
137,000 btu 1 hp hr

Engine Emission Calculation Parameters

Operating Parameter		
Design BHP	302	BHP
Fuel use @ 100% load[4]	5.6	gal/hr
Fuel use calculated @ 100% load per gen	5.6	gal/hr
Fuel energy content[4]	137,000	Btu/gal
BHP to kW conversion	0.7457	kw/BHP
BHP @ maximum load	302	BHP
Power (in kW) @ max BHP	225	kW
Heat Rate @ 100% load	0.77	MMBtu/hr
Schedule - hrs/day for preventative maint	0.5	hr/day
Schedule - days/wk	1	days/wk
Schedule - wks/yr	52	wks/yr
Operating hours	30	hours/year
Stack height		ft
"F" Factor diesel	8190	dscf/MMBtu
O2 Correction Factor	7.07	dimensionless
Exhaust temp (K)		K
Exhaust temp (F)		F
Ambient temp (K)	293	K
Ambient temp (F)	68	F
% moisture by volume	7.1	%
Stack exhaust rate (dscfm)		dscfm
Stack exhaust rate (acfm)	0	acfm
Fuel sulfur content	0.0015	%
Average use factor	100.0%	percent
Average Load Factor[4]	100.00%	percent
Stack diameter		inches
Ambient Temp		K
NO2 to NOx ratio[5]	5%	

[4]Calculated
[5]Heat content of diesel
[5]NO2 to NOx ratio based on information from Diesel Net Guidance regarding NOx emissions from diesel combustion.

1 g/kw hr
1.94 g/hp hr

CO2e GW potential

CO2	79.96 kg/mmbtu	56.7 kg/hr	5674 kg/yr	2.8 TPY	2.8 CO2e TPY
CH4	0.003 kg/mmbtu	0.00230	0.230	0.000115	0.00288 CO2e TPY
N2O	0.0006 kg/mmbtu	0.00046	0.046	2.3E-05	6.9E-03 CO2e TPY

https://www.epa.gov/sites/default/files/2015-07/documents/emission-factors_2014.pdf 2.85 CO2e TPY TOTAL

Pollutant	CAS #	Emission Factor[1,3] (gm/hp-hr)	EF Units	Emission Rate[2] (lb/hr)	Emission Rate[3] (lb/day)	Emission Rate[4] (lb/yr)	Emission Rate (ton/yr)	SER (ton/yr)	SQER	SQER Units	Model?	TAP	HAP	
PM	N/A	0.724	gm/hp-hr	0.48	0.24	14	0.007	2.50	N/A	N/A	No	No	No	
PM_{10}	N/A	0.724	gm/hp-hr	0.48	0.24	14	0.007	1.50	N/A	N/A	No	No	No	
$PM_{2.5}$[6]	N/A	0.724	gm/hp-hr	0.48	0.24	14	0.007	1.50	N/A	N/A	No	No	No	
NOx	N/A	12.30	gm/hp-hr	8.2	4	246	0.12	4.0	N/A	N/A	No	No	No	
CO	630080	15.30	gm/hp-hr	10	9	305	0.15	10.00	N/A	N/A	No	No	No	
HC	N/A	1.74	gm/hp-hr	1.2	0.58	35	0.017	N/A	N/A	N/A	No	No	No	
SOx	7446095	1.21E-05	lbs/hp-hr	0.00	0.00	0.11	0.0001	≥ 0.6	N/A	N/A	No	No	No	
Toxic Air Pollutants														Factors for engines <600 hp are below (AP-42 Section 3.3, Table 3.3-2)
Benzene	71432	9.33E-04	lb/MMBtu	7.16E-04	3.58E-04	2.15E-02	1.07E-05	N/A	2.10E+01	lb/yr	No	Yes	Yes	9.33E-04
Toluene	108883	4.09E-04	lb/MMBtu	3.14E-04	1.57E-04	9.41E-03	4.71E-06	N/A	3.73E+02	lb/day	No	Yes	Yes	4.09E-04
Xylenes	1330207	2.85E-04	lb/MMBtu	2.19E-04	1.09E-04	6.56E-03	3.28E-06	N/A	1.40E+01	lb/day	No	Yes	Yes	2.85E-04
Propylene	115071	2.58E-03	lb/MMBtu	1.98E-03	9.90E-04	5.94E-02	2.97E-05	N/A	1.29E+02	lb/day	No	Yes	No	2.58E-03
Formaldehyde	50000	1.18E-03	lb/MMBtu	9.05E-04	4.53E-04	2.71E-02	1.36E-05	N/A	2.70E+01	lb/yr	No	Yes	Yes	1.18E-03
Acetaldehyde	75070	7.67E-04	lb/MMBtu	5.89E-04	2.94E-04	1.77E-02	8.83E-06	N/A	6.03E+03	lb/yr	No	Yes	Yes	7.67E-04
Acrolein	107028	9.25E-05	lb/MMBtu	7.10E-05	3.55E-05	2.13E-03	1.06E-06	N/A	2.60E-02	lb/day	No	Yes	Yes	9.25E-05
Naphthalene	91203	8.48E-05	lb/MMBtu	6.51E-05	3.25E-05	1.95E-03	9.76E-07	N/A	6.80E+01	lb/yr	No	Yes	Yes	8.48E-05
Acenaphthylene	208968	5.06E-06	lb/MMBtu	3.88E-06	1.94E-06	1.16E-04	5.82E-08	N/A	none	N/A	No	No	Yes (PAH)	5.06E-06
Acenaphthene	83329	1.42E-06	lb/MMBtu	1.09E-06	5.45E-07	3.27E-05	1.63E-08	N/A	none	N/A	No	Yes	Yes (PAH)	1.42E-06
Fluorene Gas	7782414	2.92E-05	lb/MMBtu	2.24E-05	1.12E-05	6.72E-04	3.36E-07	N/A	3.20E+00	lb/day	No	Yes	Yes (PAH)	2.92E-05
Phenanthrene	85018	2.94E-05	lb/MMBtu	2.26E-05	1.13E-05	6.77E-04	3.38E-07	N/A	none	N/A	No	Yes	Yes (PAH)	2.94E-05
Anthracene	120127	1.87E-06	lb/MMBtu	1.43E-06	7.17E-07	4.30E-05	2.15E-08	N/A	none	N/A	No	Yes	Yes (PAH)	1.87E-06
Fluoranthene	206440	7.61E-06	lb/MMBtu	5.84E-06	2.92E-06	1.75E-04	8.76E-08	N/A	none	N/A	No	Yes	Yes (PAH)	7.61E-06
Pyrene	129000	4.78E-06	lb/MMBtu	3.67E-06	1.83E-06	1.10E-04	5.50E-08	N/A	none	N/A	No	Yes	Yes (PAH)	4.78E-06
Benzo(a)anthracene	56553	1.68E-06	lb/MMBtu	1.29E-06	6.44E-07	3.87E-05	1.93E-08	N/A	8.90E-01	lb/yr	No	Yes	Yes (PAH)	1.68E-06
Chrysene	218019	3.53E-07	lb/MMBtu	2.71E-07	1.35E-07	8.12E-06	4.06E-09	N/A	8.90E+01	lb/yr	No	Yes	Yes (PAH)	3.53E-07
Benzo(b)fluoranthene	205992	6.91E-08	lb/MMBtu	7.60E-08	3.80E-08	2.28E-06	1.14E-09	N/A	8.90E-01	lb/yr	No	Yes	Yes (PAH)	9.91E-08
Benzo(k)fluoranthene	207089	1.55E-07	lb/MMBtu	1.19E-07	5.95E-08	3.57E-06	1.78E-09	N/A	8.90E-01	lb/yr	No	Yes	Yes (PAH)	1.55E-07
Benzo(a)pyrene	50328	1.89E-07	lb/MMBtu	1.44E-07	7.21E-08	4.33E-06	2.16E-09	N/A	1.60E-01	lb/yr	No	Yes	Yes (PAH)	1.88E-07
Indeno(1,2,3-cd)pyrene	193395	3.75E-07	lb/MMBtu	2.88E-07	1.44E-07	8.63E-06	4.32E-09	N/A	8.90E-01	lb/yr	No	Yes	Yes (PAH)	3.75E-07
Dibenz[a,h]anthracene	53703	5.83E-07	lb/MMBtu	4.47E-07	2.24E-07	1.34E-05	6.71E-09	N/A	8.23E-02	lb/yr	No	Yes	Yes (PAH)	5.83E-07
Benz(g,h,i)perylene	191242	4.89E-07	lb/MMBtu	3.75E-07	1.88E-07	1.13E-05	5.63E-09	N/A	none	N/A	No	Yes	Yes (PAH)	4.89E-07
DEEP	N/A	0.7240	gm/hp-hr	4.82E-01	2.41E-01	1.45E+01	7.23E-03	N/A	5.40E-01	lb/yr	YES	Yes	No	0.0000
Total PAH	N/A	1.68E-04	lb/MMBtu	1.29E-04	6.44E-05	3.87E-03	1.93E-06	N/A	8.90E-01	lb/yr	No	Yes	No	1.68E-04
Sum				**4.87E-01**	**2.44E-01**	**1.46E+01**	**7.31E-03**							
Sum HAP				**2.94E-03**	**1.47E-03**	**8.83E-02**	**4.41E-05**							1,3-Butadiene 3.91E-05

[1] NOx, PM, CO and HC emissions factors from Tier I ratings
NOx emission factor reflects controlled emissions through ignition timing retard. PM, CO and HC emissions uncontrolled.
[2]SO, factor from EPA AP-42, section 3.4, Table 3.4-1 (10/96) using 0.0015% sulfur by weight for ULSD
[3]Emission Rate (lb/hr) = (Emission Factor)*(max horse power rating)/(453.59 g/lb)
[4]Emission Rate (lb/yr) = (Emission Rate (lb/hr))*(load factor (%))*(use factor(%))*(Maximum hrs/yr)
[4]Emission Rate (lb/day) = (Emission Rate (lb/hr))*(load factor (%))*(use factor(%))*(Maximum hrs/day)
[5]PM_{10} emission factor assumed same as PM factor.
[6]$PM_{2.5}$ emissions factor assumed the same as PM factor.
[7]Toxic Air Pollutant emission factors from EPA AP-42, Section 3.4, Table 3.4-3 and Table 3.4-4 (10/96).

Table 2 In Emergency ICE Final Determination

Pollutant	CAS #	Emission Rate[2] (lb/hr)	Emission Rate[3] (lb/day)	Emission Rate (lb/yr)
Criteria Air Pollutants				
PM	N/A	0.48	0.24	14.4612
PM_{10}[5]	N/A	0.48	0.24	14.4612
$PM_{2.5}$[6]	N/A	0.48	0.24	14.4612
Lead	N/A	0.00	0.00	0.0000
NOx	N/A	8.2	4.1	245.6800
CO	630080	10.19	5.09	305.6020
HC	N/A	1.16	0.58	34.7547
SOx	7446095	0.00	0.00	0.1099
Toxic Air Pollutants				
Benzene	71432	7.16E-04	3.58E-04	2.15E-02
Toluene	108883	3.14E-04	1.57E-04	9.41E-03
Xylenes	1330207	2.19E-04	1.09E-04	6.56E-03
Propylene	115071	1.98E-03	9.90E-04	5.94E-02
Formaldehyde	50000	9.05E-04	4.53E-04	2.71E-02
Acetaldehyde	75070	5.88E-04	2.94E-04	1.77E-02
Acrolein	107028	7.10E-05	3.55E-05	2.13E-03
Naphthalene	91203	6.51E-05	3.25E-05	1.95E-03
Acenaphthylene	208968	3.88E-06	1.94E-06	1.16E-04
Acenaphthene	83329	1.09E-06	5.45E-07	3.27E-05
Fluorene	7782414	2.24E-05	1.12E-05	6.72E-04
Phenanthrene	85018	2.26E-05	1.13E-05	6.77E-04
Anthracene	120127	1.43E-06	7.17E-07	4.30E-05
Fluoranthene	206440	5.84E-06	2.92E-06	1.75E-04
Pyrene	129000	3.67E-06	1.83E-06	1.10E-04
Benzo(a)anthracene	56553	1.29E-06	6.44E-07	3.87E-05
Chrysene	218019	2.71E-07	1.35E-07	8.12E-06
Benzo(b)fluoranthene	205992	7.60E-08	3.80E-08	2.28E-06
Benzo(k)fluoranthene	207089	1.19E-07	5.95E-08	3.57E-06
Benzo(a)pyrene	50328	1.44E-07	7.21E-08	4.33E-06
Indeno(1,2,3-cd)pyrene	193395	2.88E-07	1.44E-07	8.63E-06
Dibenz(a,h)anthracene	53703	4.47E-07	2.24E-07	1.34E-05
Benz(g,h,i)perylene	191242	3.75E-07	1.88E-07	1.13E-05
DEEP	N/A	4.82E-01	2.41E-01	1.45E+01
Total PAH	N/A	1.29E-04	6.44E-05	3.87E-03
Sum TAP		4.87E-01	2.44E-01	1.46E+01
Sum HAP		2.94E-03	1.47E-03	8.83E-02

027-0006 027-0006 SIMPSON DOOR COMPANY
EU8 EU08 **Adhesive Coating Line**
2021 Actual Emission
Enter Data in "Yellow" Cells

Density of H2O @ 20° C: 8.33 lb/gal

2021

EPA list of Hazardous Air Pollutants: https://www.epa.gov/haps/initial-list-hazardous-air-pollutants-modifications
TAP means any toxic air pollutant regulated in Washington and listed in WAC 173-460-150.

2021 SDS: \\olympia1\PROJECTS\1958\002.010\T\SDSs

Simpson Material Product ID	Manufacturer	Material Name	ENTER Usage GAL/YR	ENTER/ CALCULATE Usage LB/YR	Specific Gravity	CAS 50-00-0 Formaldehyde VOC, HAP, TAP wt %	CAS# 101-68-8 4,4-Diphenyl Methane Diisocyanate [MDI] VOC, HAP, TAP wt %	CAS 108-05-4 Vinyl Acetate VOC, HAP, TAP wt %	CAS 112-15-2 Diethylene Glycol Ethyl Ether Acetate VOC, HAP wt %	Comment
CR-5H	Momentive	Casco-Resin	37.5	465.0	1.3	5%				specific gravity and % formaldehyde from SDS, pale = 45 pounds per Simpon tracking spreadsheet
XB-9325 LFF	Heiton	Bulk PVA	12,358.5	115,300.0	1.1			0.3%	3%	diethylene glycol ethyl ether acetate (CAS 112-15-2) = 3%, Vinyl acetate (CAS 108-05-4) = 0.3%
FM-56A		Cascosel								Kaolinite (H4Al2Si2O9), 50%, 1318-74-7 and Wood Flour, 30% and Ammonium Chloride, 5%, 12125-02-9
IBS-32		Cascorez								
PC-603L		Protective Coat								
M318LV	Heiton	Wonderbond	288.8	2,940.0	1.2					Aluminum Chloride, Hexahydrate, 50%, 7784-13-6 2014, note: Possible small amt. HCL em
M188L		Wonderbond								tolune-4-sulphonic acid, 35%, 6192-52-5
PA370	Akfix	PUR Express Wood Glue	5.7	55.0	1.2		see other tab			4,4'-methylenediphenyl diisocyanate, diphenylmethane-4,4'-diisocyanate (CAS 101-68-8) = 4.5%, benzoyl chloride (CAS 98-88-4) = 0.1%
BC-1000	Heiton	Perkins	54.9	430.0	0.9					No hazardous substances
HL9555	H.B. Fuller	Benzofilex	31.6	300.0	9.5					No hazardous substances
UH5075	IFS Industries	DuraPro	2,270.0	20,800.0	1.1					Benzene, 1,1-methylenebis[isocyanato- (CAS 26447-40-5) = 5%. Although an isomer of MDI, this CAS# is not specifically listed as a TAP or HAP and has been excluded herein
HL-9682LT	H.B. Fuller	Rapidex	3,202.2	28,008.0	1.1		see other tab			4,4'-methylenediphenyl diisocyanate 101-68-8, 5%
132 858	BASF	Powdered glue Innovation 178	33.0	165.4	5.0					178 glue powder, has formaldehyde but doesn't list what percent
132 659	BASF	Powdered glue Innovation 106	33.0	165.4	5.0					106 glue powder, has formaldehyde but doesn't list what percent, 1% ammonium chloride 12125-02-9
		TOTAL lb/yr	**18,315.3**	**168,568.7**		20	0.89	345	3459	lb / Yr
Annual Emissions Limit (2021 ORCAA 21NOC1538) (lb/year)						328	2.12	5,110		

Used maximum % list in SDS — Total VOC 1.91 Tons
Used maximum Density of Material listed in — Total HAP 1.91 Tons

MDI Emissions Calculations for H.B. Fuller HL-9692-LT (Rapidex)

API MDI/Polymeric MDI Emissions Reporting Guidelines For the Polyurethane Industry (2004)

2021 Actual Emission

The evaporation rate (in grams/day) is determined from the following expression:

$W = 25.4 * VPMDI * (Mw / Tproc) * (u)^{0.78} * SA * tTF$

Where:

W = the evaporation losses from the open process in gr./day.
VPMDI = the vapor pressure of MDI in atmospheres @ process temperature.
Tproc = the process temperature in °K.
Mw = the molecular weight of MDI
u = the airflow speed in m/sec.
SA = the exposed surface area in M2.
tTF = the "tack-free" time in seconds.

Step I: Determine Vapor Pressure of MDI at Process Temperature

Process temperature	280	deg F	
	411	**deg K**	
VP(MDI)	0.2801	mmHg, at process temp	https://www.americanchemistry.com/industry-groups/diisocyanates-dii/resources/mdi-vapor-pressure-chart
	5.00%	concentration of MDI in adhesive per 10/23/18 SDS	
	760	mmHg/atm	
	1.843E-05	**atm**	

Step II: Determine Ventilation Rate in Meters/Second

Roller Surface Area	9	inches, diameter	
	19.5	inches, length	
	3.83	ft2	
Velocity @ STP	700	cfm	
	677	scfm	
Ventilation Rate	177	ft/min	Velocity/Surface Area
	0.90	**m/s**	

Step III: Determine Tack Time

Tack-free time	**13**	**sec**

Step IV: Determine the Exposed Surface Area

Rapidex adhesive purchased	28,008	lb/year
	12,704,205	g/year
Coat weights	10	g/ft2
Roller applicator coats	1,270,420	ft2/year
	118,026.04	m2/yr

Step V: Determine Evaporation Losses from the Open Process

$W = 25.4 * VPMDI * (Mw / Tproc) * (u)^{0.78} * SA * tTF$

VPMDI	1.843E-05	atm	VPMDI = the vapor pressure of MDI in atmospheres @ process temperature.
Mw	250.26		Mw = the molecular weight of MDI
Tproc	411	degK	Tproc = the process temperature in °K.
u	0.90	m/sec	u = the airflow speed in m/sec.
SA	118,026	m2/yr	SA = the exposed surface area in M2.
tTF	13	sec	tTF = the "tack-free" time in seconds.
W	402	grams/year	W = the evaporation losses from the open process in gr./day.
MDI Emissions	**0.8870**	**lb/year**	*based on glue coats weights and actual product usage*

MDI Emissions Calculations for Alfix PA370 PUR Express Wood Glue

API MDI/Polymeric MDI Emissions Reporting Guidelines For the Polyurethane Industry (2004)

2021 Actual Emission

PA370 is NOT applied via glue spreader rolls. PA370 comes in small 17.6 oz bottles and is used for incidental touch ups

Modeling MDI emissions as if they were from a spill

All emissions released because of the spill of MDI/PMDI can be calculated using EPA's proposed model:

$$Q_R = (0.003413) * (u)^{0.78} * A_{spill} * (VP_{MDI}/T_{spill}) * (MW)^{2/3} * K_{MDI}$$

Where:

Q_R = the evaporation rate in lb/min

u = the airflow speed in m/sec. This is the airflow in the vicinity of the process

A_{spill} = the area of the spilled material in ft^2.

VP_{MDI} = the vapor pressure of MDI in mm Hg, at the filling temperature

T_{spill} = the average evaporation temperature in °K.

MW = the molecular weight of MDI (250.26).

K_{MDI} = the adjustment factor to the vapor pressure that is a function of MDI concentration in the feedstock and the temperature.

4-12

QR = (0.003413) * (u)0.78 * Aspill * (VPMDI/Tspill) * (MW)^2/3 * KMDI

https://www.americanchemistry.com/industry-groups/diisocyanates-di/resources/mdi-vapor-pressure-chart

Tspill	70	deg F	assume room temp
Tspill	294	deg K	
VP(MDI)	6.10E-06	mmHg, at process temp	
KMDI	4.50%	concentration of MDI in adhesive per 12/17/15 SDS	
u	1	m/sec	indoor airflow in vicinity of process
Aspill	5	ft2	conservative touch up area assumption
Molecular Weight of MDI	250.26		
QR (evaporation rate)	4.93E-10	lb/min	

Lspill = QR * tspill

tspil	0.5	minutes	conservative assumption for amount of time MDI exposed to air during touchup process
Lspill	2.47E-10	lbs MDI emitted per each touchup	
Product used per touchup	2	oz/touchup	conservative assumption
	0.015625	gal/touchup	
Product used per year	5.74	gal	
Touch ups per year	367		
MDI emissions	9.06E-08	lbs/year	

ATTACHMENT B

Summary of Changes Between 2018 AOP (No. 16AOP1172) and June 2022 Draft Permit

Summary of changes (2018 AOP and June 2022 draft AOP)

- Addition of EU5-EU-8 to Table 1
- Section A12. Emergency Provision is different than the corresponding section in the 2018 permit (P17)
- Section A13 and A14 Unavoidable Excess Emissions (current SIP and post SIP Change) are updated
- New Sections added or expanded
    - G1 Operating permit fees described in permit, instead of referencing ORCAA regulations
    - G14 Prevention of significant deterioration added
    - G18 Reasonably Available Control Technology (RACT) added
    - G19 Outdoor Burning Added
    - G20 Wood Heating Added
    - G21 Burning Used Oil in Land Based Facilities added
    - G22 Gasoline Dispensing Facilities added
- Applicable Requirements Table Re-organized and renumbered, with additional requirements for new emission units. Table below shows the cross referenced ARs

2022 AR	Description	2018 Permit AR	Description
1.1	Opacity Standard (State)	AR#7	Opacity Standard
1.2	Opacity Standard (ORCAA)	AR#7	
1.3	Fugitive Emissions Control	AR#4	Fugitive Emissions Control
1.4	Fugitive Dust Control	AR#5	Fugitive Dust Control
1.5	Odor Control (state)	AR#2	Odor Control
1.6	Odor Control (ORCAA)	AR#2	
1.7	Sulfur Dioxide	AR#8	Sulfur Dioxide
1.8	Particulate Standards for Combustion units	AR#9	Particulate Standards for Combustion units
1.9	ORCAA Particulate Standards	New Requirement	--
1.10	Particulate Standards for Process Units	New Requirement	--
1.11	Maintenance and Repair of Process and Air Pollution control Equipment	AR#6	Maintenance and Repair of Process and Air Pollution control Equipment
2.1	Atlas Bin	AR#11	Atlas Bin
2.2	Atlas Bin Opacity Limit	AR#12	Atlas Bin Opacity Limit
2.3	Requirement to Maintain Air Pollution Control EU2	AR#13	Requirement to Maintain Air Pollution Control EU2
3.1	EU3 Fuel Standards	AR#14	EU3 Fuel Standards
3.2	EU3 Particulate Limit	AR#15	EU3 Particulate Limit
3.3	EU3 Opacity Limit	AR#16	EU3 Opacity Limit
3.4	EU3 NOx Limit	AR#17	EU3 NOx Limit

2022 AR	Description	2018 Permit AR	Description
3.5	EU3 CO Limit	AR#18	EU3 CO Limit
3.6	Requirement to Minimize Emissions from Boiler (EU3)	AR#19	Requirement to Minimize Emissions from Boiler (EU3)
3.7	ORCAA Requirement to Maintain Air Pollution Control	AR#20	ORCAA Requirement to Maintain Air Pollution Control
3.8	EU Operation and Maintenance Plan	AR#21	EU Operation and Maintenance Plan
4.1	Approved Primer	New requirement for new emission unit	--
4.2	Spray Booth Requirement	New requirement for new emission unit	--
4.3	Operating Requirements	New requirement for new emission unit	--
5.1	Emergency Engine Maintenance	New requirement for new emission unit	--
5.2	Emergency Engine Operation	New requirement for new emission unit	--
5.3	Emergency Hour Meter	New requirement for new emission unit	--
6.1	Adhesive Material Limits	New requirement for new emission unit	--

- New addition/changes to the Opacity Surveys:
    - The surveys must consist of visual observation of all emission units to identify point and fugitive emissions exhibiting opacity greater than zero percent (0%).
    - Surveys must be conducted from locations with a clear view of the target emission unit and where the sun is at the observer's back. Survey locations must be at least 15 feet but not more than 0.25 miles (1 mile in previous AOP) from the Facility.
- Addition of fugitive dust audit list (Table M1)
- New sulfur limit for diesel (0.0015% instead of 2%)
- Addition of paint filters (EU5) to the control equipment list and monitoring requirements
- New GHG monitoring requirement
- New Record Keeping Requirements
    - Operating pressure drop across each baghouse
    - EU5-EU8 Record Keeping requirements added
    - New recordkeeping requirements for Actions Taken to Maintain Air Pollution Control Equipment
- New section on emergencies in the Reporting Deviations from Permit Conditions requirement
- Annual Inventory Report section now has details on the dates
- New section about submitting reports via CEDRI
- Subpart ZZZZ Reporting for new engines

Summary of Changes to Technical Support Document (2018 TSD and June 2022 draft TSD)

1. Addition of Permit Administration Section – describes history of facility and the administrative information for the facility
2. New section describing the basis of Title V applicability
3. Changes to PTE in PM10, PM2.5, NOx, CO, VOCs, HAPs, GHGs due to addition/subtraction of emission units
4. Addition of EU5-EU8 to the permit (surface coating, emergency engines, glues and adhesives line)
5. Adhesives removed from IEUs
6. Addition of requirements from 20NOC1457 and 21NOC1538
7. 40 CFR Part 63 Subpart A added to include the Emergency Engines (EU6 and EU7)
8. 40 CFR Part 63 Subpart ZZZZ: NESHAP for Stationary Reciprocating Internal Combustion Engines (RICE) added
9. New section about control equipment monitoring – existing baghouse operating ranges from 2016 AOP