Appendix D

Process Description/Process Flow Diagrams

Process Description

The Mountain Home TVFP facility will primarily receive rough cut lumber consisting of pine and douglas fir for processing into dimensional lumber. Green debarked logs may also be periodically transported to the Mountain Home facility by truck from the Boise Yamhill facility when there is a large order to dry logs for log home construction. The facility contains two lumber drying kilns. Lumber Kiln No. 1 consists of a 1,500 square foot building heated to 130°F with natural gas fired heaters and, if necessary, a 70 horsepower natural gas fired steam boiler. Lumber Kiln No. 2 is used to primarily dry rough cut lumber. This structure consists of one 2,700 square foot building divided into a west kiln and east kiln, each of which is heated to 130 to 145°F by way of a 250 horsepower natural gas fired steam boiler. After drying, rough cut lumber is removed from the kiln, and moved to the Planer Mill. The lumber is planed to the desired smoothness and dimensions. The wood shavings are routed from the Planer Mill to the Pellet Mill for processing wood pellets.

Lumber Kiln No. 1

Rough cut lumber as well as green debarked logs may be dried at any one time in a 1,500 square foot kiln building heated to 130°F with natural gas heaters and a natural gas boiler. The lumber kiln may process up to 40,000 board feet per day (bd-ft/day) and 10,400,000 bd-ft/yr.

Large fans circulate air inside the kiln. The lumber kiln roof is fitted with eight vents. At anytime, four of the vents are functioning as air supply vents and four are operating as exhaust vents. The size of each vent is approximately 20 x 20 square inches. The vent configuration is changed periodically in order to change the direction of air flow inside the kiln and facilitate drying. Emissions from the kiln include PM_{10}, volatile organic compounds (VOCs), and hazardous air pollutants (HAPs).

Lumber Kiln No. 1 Natural Gas Boiler

A 70 HP Cleaver-Brooks boiler is used to generate steam used in radiators to heat the log drying kiln to supplement the log kiln natural gas heater in times where additional heating is needed. The rated heat input capacity of the Cleaver-Brooks boiler is 2.343 MMBtu/hr and is fueled exclusively by natural gas.

Lumber Kiln No. 1 Natural Gas Heaters

Two small natural gas fired room heaters each with a rated input capacity of 145,000 Btu/hr are used inconjunction with a 70 Hp steam boiler to dry the rough cut lumber or green debarked logs in Lumber Kiln No. 1. Both heaters were installed inside the roof ceiling in Kiln No. 1 sometime in 2005. The emissions from these two natural gas heaters are included in the facility-wide emissions summary but are insignificant

compared to the facility-wide aggregate. In addition, these heaters are not included in the facility-wide model because they satisfy the exempted source criteria for fuel burning equipment per IDAPA 58.01.01.222.02.c.

Lumber Kiln No. 2

Rough cut lumber is dried in a 2,700 square foot kiln building divided into two rooms (east and west kilns) and heated to 130 to 145°F with steam radiators. Large fans circulate air inside the kiln. The kiln has a capacity to process green lumber at a rate of 50,000 bd-ft/day and 13,000,000 bd-ft/year.

The lumber kiln roof is fitted with ten vents. At anytime, five of the vents are functioning as air supply vents and five are operating as exhaust vents. The size of each vent is approximately 20 x 20 square inches. The vent configuration is changed periodically in order to change the direction of air flow inside the kiln and facilitate drying. Emissions from the kiln include PM_{10}, volatile organic compounds (VOCs), and hazardous air pollutants (HAPs).

Lumber Kiln No.2 Natural Gas Boiler

A 250 Hp Kewanee boiler generates steam used in radiators to dry green lumber in Kiln No. 2. The rated heat input capacity of the Kewanne boiler is 8.369 MMBtu/hr and is fueled exclusively by natural gas.

Planer Mill

The Planer Mill receives rough cut lumber after kiln drying is complete. The planer is used to finish rough-cut lumber into dimensional lumber. Planer shaving activities are conducted inside the Planer Mill building. Shavings and other wood residues produced in the planer are temporarily drawn into a chip bin. Wood shavings are conveyed from the chip bin into a chipper outside the building. Wood chips from the chipper are conveyed to a screen and drawn into a cyclone. The screened wood chips are drawn through the cyclone and conveyed back inside the building to the Pellet Mill operations for processing wood pellets. The wood waste fines are exhausted from a cyclone directly into a baghouse for collection. The Planer Mill wood chipper, screen and baghouse are emission points for collecting the planer mill wood waste fines.

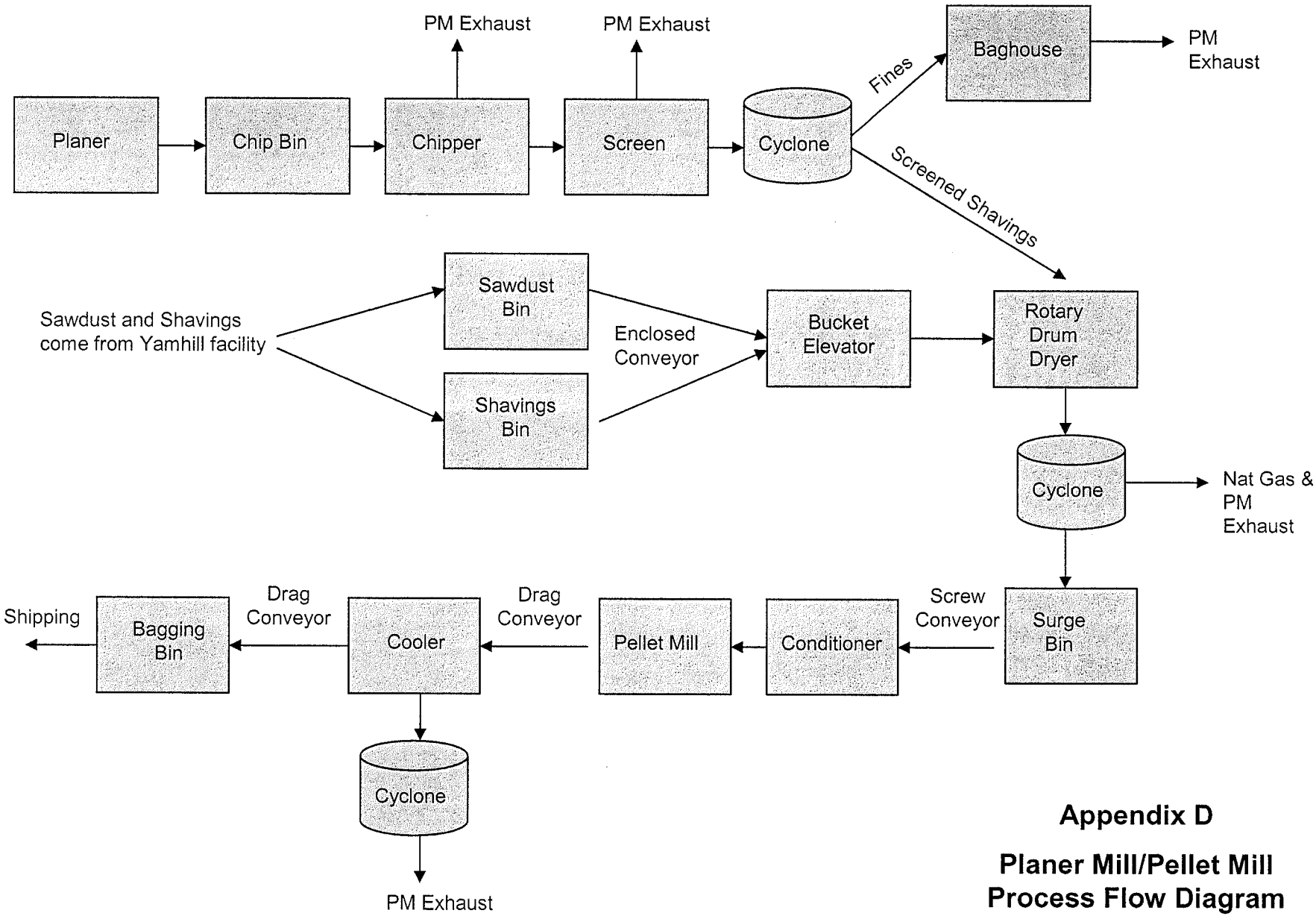
TVFP estimates the maximum planer throughput at 7,000 bd-ft/hr or 13,000,000 bd-ft of lumber per year.

Pellet Mill

The Pellet Mill receives two source streams of wood shavings. One source of wood shavings is from the Planer Mill. Screened wood chips are conveyed from the Planer Mill to the Pellet Mill hammermill..

The second source consists of either wood shavings or sawdust loaded into a hopper from 3-sided storage bins. The loaded material is transferred by enclosed conveyor from a hopper to an open bucket elevator. The bucket elevator transfers the material into a hammermill. The hammermill grounds the wood shavings into fine sawdust. The sawdust material is temporarily stored in an undried material bin. The undried material is transferred outside the building by way of enclosed conveyor to a Rotary Drum Dryer based on a drying cycle frequency. The Rotary Drum Dryer dries the sawdust material and transfers the dried material into an affixed cyclone at the end of the dryer. The exhaust stream and fine particulate matter is exhausted to the atmosphere. The bulk of the dried material is transferred back into the building by enclosed conveyor to a dry material bin. From the dry material bin, the material is conveyed through a cooling system and into a cyclone. The cyclone will exhaust fine particulate matter to the atmosphere and the bulk of the cooled material will be conveyed to a pelletizer. After the material is formed into wood pellets, the pellets are bagged and packaged.

TVFP estimates the maximum throughput of material at 12 bone dry tons per hour or 24,960 bone dry tons per year.



Appendix D

Planer Mill/Pellet Mill Process Flow Diagram

Treasure Valley Forest Products
Mountain Home, Idaho

Appendix E

Emission Estimates/Reference Information

Treasure Valley Forest Products - Mountain Home
Facility Summary Sheet

			Emission Rate (ton/year)								Emission Rate (lb/hr)						
Unit No.	Source Description	Emission Factor Source	PM	PM-10	NOx	SO2	CO	VOC	Lead	HAPs	PM	PM-10	NOx	SO2	CO	VOC	Lead
	Point Sources																
250HP	**250 Hp Nat Gas Boiler**	AP-42	0.27	0.27	3.49	0.02	2.93	0.19	1.75E-05	0.16	0.06	0.06	0.80	0.005	0.67	0.04	3.99E-06
70HP	**70 Hp Nat Gas Boiler**	AP-42	0.07	0.07	0.98	0.01	0.82	0.1	4.9E-06	0.04	0.02	0.02	0.22	0.001	0.19	0.01	1.12E-06
RD	**Rotary Drum Dryer**	NCASI, AP-42	0.67	0.67	2.12	0.02	3.24	12.0		0.003	0.65	0.65	2.04	0.02	3.12	11.52	
LK1	**Lumber Kiln No. 1**	NCASI, AP-42	0.047	0.027				17.16		0.35	0.05	0.03				16.50	
LK2	**Lumber Kiln No. 2**	NCASI, AP-42	0.06	0.03				21.45		0.44	0.06	0.03				20.63	
PMB	**Planer Mill Baghouse**	IDEQ	0.05	0.05							0.05	0.05					
PMC	**Pellet Mill Cyclone**	IDEQ	1.58	1.15							1.52	1.11					
	Fugitive Sources																
	Pellet Mill Hopper	AP-42	0.016	0.008							0.016	0.008					
	Wood Chipper	IDEQ	0.03	0.01							0.03	0.01					
	Chipper Screen	AP-42	0.002	0.001							0.002	0.001					
	Not Included in Modeling																
HEATLK1	**Lumber Kiln Heaters (No.1)**	AP-42	0.01	0.01	0.12	0.001	0.10	0.01	6.05E-07	0.005	0.002	0.002	0.03	0.0002	0.02	0.002	1.38E-07
	Shavings Bin	AP-42	0.008	0.004							0.008	0.004					
	Sawdust Bin	AP-42	0.008	0.004							0.008	0.004					
	Facility Total		2.8	2.3	6.7	0.05	7.1	50.8	2.3E-05	1.0	2.5	2.0	3.1	0.03	4.0	48.7	5.2E-06
	Significant Emission Rates (10%)		**2.5**	**1.5**	**4.0**	**4.0**	**10.0**	**4.0**	**0.6**								
	Modeling Threshold		na	1.0	1.0	1.0	na	na			na	0.2	na	0.2	14.0	na	
	Modeling Required			**Yes**	**Yes**	**No**						**Yes**		**No**	**No**		

Treasure Valley Forest Products - Mountain Home
250 Hp Boiler

Assumptions:

Hours of operation	8760 hrs/yr maximum operation
Rate heat input	8.369 MMBtu/hr
Fuel:	
Natural Gas[a]	1050 Btu/scf

Potential to Emit Calculations

Criteria Pollutants[b]:

Pollutant	EF ($lb/10^6$ SCF)	Emissions (lb/hr)	Emissions (tpy)
NOx	100	0.80	3.49
CO	84	0.67	2.93
SO2	0.6	0.00	0.02
VOC	5.5	0.04	0.19
PM10	7.6	0.06	0.27
PM	7.6	0.06	0.27
Lead	0.0005	3.99E-06	1.75E-05

Idaho Toxic Air Pollutants:

Organics[c]

Pollutant	CAS No.	Natural Gas EF ($lb/10^6$ scf)	Emissions (lb/hr)	Emissions (tpy)	IDAPA 58.01.01.58 5/586 (lb/hr)	Comparison
3-Methylchloranthrene	56-49-5	1.80E-06	1.43E-08	6.28E-08	2.50E-06	Below
Benzene	71-43-2	2.10E-03	1.67E-05	7.33E-05	8.00E-04	Below
Benzo(a)pyrene	50-32-8	1.20E-06	9.56E-09	4.19E-08	2.00E-06	Below
Formaldehyde	50-00-0	7.50E-02	5.98E-04	2.62E-03	5.10E-04	**Exceeds**
Hexane	110-54-3	1.80E+00	1.43E-02	6.28E-02	1.20E+01	Below
Naphthalene	91-20-3	6.10E-04	4.86E-06	2.13E-05	3.33E+00	Below
Pentane	109-66-0	2.60E+00	2.07E-02	9.08E-02	1.18E+02	Below
Toluene	108-88-3	3.40E-03	2.71E-05	1.19E-04	2.50E+01	Below
Benzo(a)anthracene		1.80E-06	1.43E-08	6.28E-08		
Benzo(a)pyrene		1.20E-06	9.56E-09	4.19E-08		
Benzo(b)fluoroanthene		1.80E-06	1.43E-08	6.28E-08		
Benzo(k)fluoroanthene		1.80E-06	1.43E-08	6.28E-08		
Chrysene		1.80E-06	1.43E-08	6.28E-08		
Dibenzo(a,h)anthracene		1.20E-06	9.56E-09	4.19E-08		
Indeno(1,2,3-cd)pyrene		1.80E-06	1.43E-08	6.28E-08		
Total IDAPA POM			9.09E-08		2.00E-06	Below
Subtotal HAPs (tpy)				1.56E-01		

Metals[d]

Pollutant	CAS No.	Natural Gas EF ($lb/10^6$ scf)	Emissions (lb/hr)	Emissions (tpy)	IDAPA 58.01.01.58 5/586 (lb/hr)	Comparison
Arsenic	7440-38-2	2.00E-04	1.59E-06	6.98E-06	1.50E-06	**Exceeds**
Barium	7440-39-3	4.40E-03	3.51E-05	1.54E-04	3.30E-02	Below
Beryllium	7440-41-7	1.20E-05	9.56E-08	4.19E-07	2.80E-05	Below
Cadmium	7440-43-9	1.10E-03	8.77E-06	3.84E-05	3.70E-06	**Exceeds**
Chromium	7440-47-3	1.40E-03	1.12E-05	4.89E-05	3.30E-02	Below
Cobalt	7440-48-4	8.40E-05	6.70E-07	2.93E-06	3.30E-03	Below
Copper	7440-50-8	8.50E-04	6.77E-06	2.97E-05	1.30E-02	Below
Manganese	7439-96-5	3.80E-04	3.03E-06	1.33E-05	6.70E-02	Below
Mercury	7439-97-6	2.60E-04	2.07E-06	9.08E-06	1.00E-03	Below
Molybdenum	7439-98-7	1.10E-03	8.77E-06	3.84E-05	3.33E-01	Below
Nickel	7440-02-0	2.10E-03	1.67E-05	7.33E-05	2.75E-05	Below
Selenium	7782-49-2	2.40E-05	1.91E-07	8.38E-07	1.30E-02	Below
Vanadium	1314-62-1	2.30E-03	1.83E-05	8.03E-05	3.00E-03	Below
Zinc	7440-66-6	2.90E-02	2.31E-04	1.01E-03	3.33E-01	Below
Subtotal HAPs				1.51E-03		
Total HAPS (tpy)				0.16		

Notes:

[a] *Fuel heat values from EPA AP-42, Appendix A (EPA website June 2007)*

[b] *Criteria Pollutants EPA AP-42, Section 1.4, Tables 1.4-1 and 1.4-2*

[c] *OrganicToxic Air Pollutants EPA AP-42, Section 1.4, Table 1.4-3*

[d] *Metals from EPA AP-42, Section 1.4, Table 1.4-4*

Treasure Valley Forest Products - Mountain Home
70 Hp Boiler

Assumptions:

Hours of operation	8760	hrs/yr maximum operation
Rate heat input	2.343	MMBtu/hr
Fuel:		
Natural Gas[a]	1050	Btu/scf

Potential to Emit Calculations

Criteria Pollutants[b]:

Pollutant	EF ($lb/10^6$ SCF)	Emissions (lb/hr)	Emissions (tpy)
NOx	100	0.22	0.98
CO	84	0.19	0.82
SO2	0.6	0.001	0.01
VOC	5.5	0.01	0.05
PM10	7.6	0.02	0.07
PM	7.6	0.02	0.07
Lead	0.0005	1.12E-06	4.89E-06

Idaho Toxic Air Pollutants:

Organics[c]

Pollutant	CAS No.	Natural Gas EF ($lb/10^6$ scf)	Emissions (lb/hr)	Emissions (tpy)	IDAPA 58.01.01.58 5/586 (lb/hr)	Comparison
3-Methylchloranthrene	56-49-5	1.80E-06	4.02E-09	1.76E-08	2.50E-06	Below
Benzene	71-43-2	2.10E-03	4.69E-06	2.05E-05	8.00E-04	Below
Benzo(a)pyrene	50-32-8	1.20E-06	2.68E-09	1.17E-08	2.00E-06	Below
Formaldehyde	50-00-0	7.50E-02	1.67E-04	7.33E-04	5.10E-04	Below
Hexane	110-54-3	1.80E+00	4.02E-03	1.76E-02	1.20E+01	Below
Naphthalene	91-20-3	6.10E-04	1.36E-06	5.96E-06	3.33E+00	Below
Pentane	109-66-0	2.60E+00	5.80E-03	2.54E-02	1.18E+02	Below
Toluene	108-88-3	3.40E-03	7.59E-06	3.32E-05	2.50E+01	Below
Benzo(a)anthracene		1.80E-06	4.02E-09	1.76E-08		
Benzo(a)pyrene		1.20E-06	2.68E-09	1.17E-08	2.00E-06	Below
Benzo(b)fluoroanthene		1.80E-06	4.02E-09	1.76E-08		
Benzo(k)fluoroanthene		1.80E-06	4.02E-09	1.76E-08		
Chrysene		1.80E-06	4.02E-09	1.76E-08		
Dibenzo(a,h)anthracene		1.20E-06	2.68E-09	1.17E-08		
Indeno(1,2,3-cd)pyrene		1.80E-06	4.02E-09	1.76E-08		
Total IDAPA POM			2.54E-08		2.00E-06	Below
Subtotal HAPs (tpy)				4.38E-02		

Metals[d]

Pollutant	CAS No.	Natural Gas EF ($lb/10^6$ scf)	Emissions (lb/hr)	Emissions (tpy)	IDAPA 58.01.01.58 5/586 (lb/hr)	Comparison
Arsenic	7440-38-2	2.00E-04	4.46E-07	1.95E-06	1.50E-06	Below
Barium	7440-39-3	4.40E-03	9.82E-06	4.30E-05	3.30E-02	Below
Beryllium	7440-41-7	1.20E-05	2.68E-08	1.17E-07	2.80E-05	Below
Cadmium	7440-43-9	1.10E-03	2.45E-06	1.08E-05	3.70E-06	Below
Chromium	7440-47-3	1.40E-03	3.12E-06	1.37E-05	3.30E-02	Below
Cobalt	7440-48-4	8.40E-05	1.87E-07	8.21E-07	3.30E-03	Below
Copper	7440-50-8	8.50E-04	1.90E-06	8.31E-06	1.30E-02	Below
Manganese	7439-96-5	3.80E-04	8.48E-07	3.71E-06	6.70E-02	Below
Mercury	7439-97-6	2.60E-04	5.80E-07	2.54E-06	1.00E-03	Below
Molybdenum	7439-98-7	1.10E-03	2.45E-06	1.08E-05	3.33E-01	Below
Nickel	7440-02-0	2.10E-03	4.69E-06	2.05E-05	2.75E-05	Below
Selenium	7782-49-2	2.40E-05	5.36E-08	2.35E-07	1.30E-02	Below
Vanadium	1314-62-1	2.30E-03	5.13E-06	2.25E-05	3.00E-03	Below
Zinc	7440-66-6	2.90E-02	6.47E-05	2.83E-04	3.33E-01	Below
Subtotal HAPs				4.22E-04		
Total HAPS (tpy)				0.04		

Notes:

[a] *Fuel heat values from EPA AP-42, Appendix A (EPA website June 2007)*

[b] *Criteria Pollutants EPA AP-42, Section 1.4, Tables 1.4-1 and 1.4-2*

[c] *OrganicToxic Air Pollutants EPA AP-42, Section 1.4, Table 1.4-3*

[d] *Metals from EPA AP-42, Section 1.4, Table 1.4-4*

Treasure Valley Forest Products - Mountain Home

Rotary Drum Dryer

Single chamber drum dryer with single burner. Direct fired, softwood.
High efficiency cyclone attached to the end of the drum dryer. Natural gas exhaust stream is vented through cyclone by fan system.
Drum dryer information provided by MEC -attached with reference information.

Assumptions:

Hours of operation	2080	hrs/yr maximum operation
Rate heat input	35	MMBtu/hr
Throughput	12	Oven dried tons per hour
Flow rate	12,000	cfm
Cyclone efficiency	90	%
Natural Gas[a]	1050	Btu/scf

Potential to Emit Calculations
Criteria Pollutants[b]:

Pollutant	EF	EF	Emissions	
	(lb/ODT)	(lb/10[6] scf)	(lb/hr)	(tpy)
NO_x	0.17		2.04	2.12
CO	0.26		3.12	3.24
SO_2[c]		0.6	0.02	0.02
VOC	0.96		11.52	11.98
PM_{10}[d]	0.54		0.65	0.67

Idaho Toxic Air Pollutants:
Organics[e]

Pollutant	CAS No.	Natural Gas EF	Emissions		IDAPA 58.01.01.585/586	Comparison
		(lb/ODT)	(lb/hr)	(tpy)	(lb/hr)	
Formaldehyde	50-00-0	8.60E-03	2.87E-04	2.98E-04	5.10E-04	**Below**
Methanol	67-56-1	7.30E-02	2.43E-03	2.53E-03	1.73E+01	**Below**
Total HAPS (tpy)				0.003		

Notes:
[a] *Fuel heat values from EPA AP-42, Appendix A (EPA website June 2007)*
[b] *Criteria Pollutants, 2004 NCASI, Chapter 3 - Wood Drying, Tables 3.3.1.1-1, 3.3.1.1-2, and 3.3.1.1-3.*
[c] *Criteria Pollutants EPA AP-42, Section 1.4 - Natural Gas Combustion, Table 1.4-1*
[d] *Criteria Pollutants EPA AP-42, Section 10.6.2- Particleboard Manuf., Tables10.6.2-1. Assume PM is equal to PM10. Emission factor includes condesibles.*
[e] *OrganicToxic Air Pollutants EPA AP-42, Section 10.6.2-Particleboard Manuf., Table 10.6.2-3*

Treasure Valley Forest Products - Lodge Logs

Pellet Mill Hopper

Unloading residual wood products into hopper based on the predictive emissions equation, AP-42, Section 13.2.4.3.
Throughput limt of 10 ton/hr.

Maximum hourly production rate: 10 $\frac{\text{ton bone-dry wood}}{\text{hr}}$

Maximum annual production rate: 20,800 $\frac{\text{ton bone-dry wood}}{\text{yr}}$

AP-42 Section 13.2.4 (Aggregate Handling and Storage Piles)

Wind Speed	5.0	mph
Material moisture content	35.0	%
PM Particle size multiplier	0.74	
PM =	0.002	lb/ton bone-dry wood
PM10 Particle size multiplier	0.35	
PM10 =	0.001	lb/ton bone-dry wood

Potential Emissions

Pellet Mill Hopper	lb/hr	tpy
PM	**0.016**	**0.016**
PM10	**0.008**	**0.008**

Potential Emissions Calculations:

Maximum Hourly PM emissions:

$$10 \text{ ton bone-dry wood} \times \frac{0.002 \text{ lb PM}}{\text{ton bone-dry wood}} = 0.016 \text{ lb/hr PM}$$

Maximum Annual PM emissions:

$$20{,}800 \text{ ton bone-dry wood} \times \frac{0.002 \text{ lb PM}}{\text{ton bone-dry wood}} \times \frac{1 \text{ ton}}{2000 \text{ lb}} = 0.016 \text{ tpy PM}$$

Maximum Hourly PM10 emissions:

$$10 \text{ ton bone-dry wood} \times \frac{0.001 \text{ lb PM10}}{\text{ton bone-dry wood}} = 0.008 \text{ lb/hr PM10}$$

Maximum Annual PM10 emissions:

$$20{,}800 \text{ ton bone-dry wood} \times \frac{0.001 \text{ lb PM10}}{\text{ton bone-dry wood}} \times \frac{1 \text{ ton}}{2000 \text{ lb}} = 0.008 \text{ tpy PM10}$$

Treasure Valley Forest Products - Lodge Logs

Pellet Mill Cyclone

Wood shavings and other wood residues are drawn through a cyclone and sent to the pelletizer.
One-8 hr shift, 5 days/wk, 52 weeks/yr

Maximum hourly production rate: 12 $\frac{\text{ton bone-dry wood}}{\text{hr}}$

Maximum annual production rate: 24,960 $\frac{\text{ton bone-dry wood}}{\text{yr}}$

Assumptions:

Idaho DEQ Emission Factor Guide for Wood Industry (1/1997), High eff. cyclone mill mix

PM = 0.015 grains/scf air

PM10 = 0.011 grains/scf air

Potential Emissions

Pellet Mill Cyclone	lb/hr	tpy
PM	**1.52**	**1.58**
PM10	**1.11**	**1.15**

Potential Emissions Calculations:

Maximum Hourly PM emissions:

$$\frac{(11812\ \text{scf/min})\ (0.015\ \text{grains/scf})\ (60\ \text{min/hr})}{7{,}000\ \text{grains/lb}} = 1.52\ \text{lb/hr PM}$$

Maximum Annual PM emissions:

$$\frac{(1.52\ \text{lb/hr})\ (2080\ \text{hr/yr})}{2000\ \text{lb/ton}} = 1.58\ \text{tpy PM}$$

Maximum Hourly PM_{10} emissions:

$$\frac{(11812\ \text{scf/min})\ (0.011\ \text{grains/scf})\ (60\ \text{min/hr})}{7{,}000\ \text{grains/lb}} = 1.11\ \text{lb/hr } PM_{10}$$

Maximum Annual PM_{10} emissions:

$$\frac{(1.11\ \text{lb/hr})\ (2080\ \text{hr/yr})}{2000\ \text{lb/ton}} = 1.15\ \text{tpy } PM_{10}$$

Treasure Valley Forest Products - Lodge Logs

Wood Chipper

Planer wood shavings transferred into wood chipper.

Maximum hourly production rate: 2,577 $\frac{lb}{hr}$ See Planer Mill Baghouse assumptions

Maximum annual production rate: 2,393 $\frac{ton}{yr}$ See Planer Mill Baghouse assumptions

Assumptions:

Idaho DEQ Emission Factor Guide for Wood Industry (1/1997), Log Debarking

PM = 0.024 lb/ton

PM10 = 0.011 lb/ton

Potential Emissions

Wood Chipper	lb/hr	tpy
PM	0.03	0.03
PM10	0.01	0.01

Potential Emissions Calculations:

Maximum Hourly PM emissions:

$$2{,}577 \frac{\text{lb bone-dry wood}}{\text{hr}} \times 0.024 \frac{\text{lb PM}}{\text{ton bone-dry wood}} \times \frac{1\text{ ton}}{2000\text{ lb}} = 0.03 \text{ lb/hr PM}$$

Maximum Annual PM emissions:

$$2{,}393 \frac{\text{ton bone-dry wood}}{\text{yr}} \times 0.024 \frac{\text{lb PM}}{\text{ton bone-dry wood}} \times \frac{1\text{ ton}}{2000\text{ lb}} = 0.03 \text{ tpy PM}$$

Maximum Hourly PM10 emissions:

$$2{,}577 \frac{\text{lb bone-dry wood}}{\text{hr}} \times 0.011 \frac{\text{lb PM10}}{\text{ton bone-dry wood}} \times \frac{1\text{ ton}}{2000\text{ lb}} = 0.01 \text{ lb/hr PM10}$$

Maximum Annual PM10 emissions:

$$2{,}393 \frac{\text{ton bone-dry wood}}{\text{yr}} \times 0.011 \frac{\text{lb PM10}}{\text{ton bone-dry wood}} \times \frac{1\text{ ton}}{2000\text{ lb}} = 0.01 \text{ tpy PM10}$$

Treasure Valley Forest Products - Lodge Logs

Chipper Screen

Planer wood shavings from chipper are filtered through a chipper screen.

Maximum hourly production rate:	2,577	lb/hr	See Planer Mill Baghouse assumptions
Maximum annual production rate:	2,393	ton/yr	See Planer Mill Baghouse assumptions

Assumptions:

Transfer point emissions based on material transfer factor, AP-42 Section 13.2.4

AP-42 Section 13.2.4 (Aggregate Handling and Storage Piles)

Wind Speed	5.0	mph
Material moisture content	35.0	%
PM Particle size multiplier	0.74	
PM =	0.002	lb/ton bone-dry wood
PM10 Particle size multiplier	0.35	
PM10 =	0.001	lb/ton bone-dry wood

Potential Emissions

Chipper Screen	lb/hr	tpy
PM	0.002	0.002
PM10	0.001	0.001

Potential Emissions Calculations:

Maximum Hourly PM emissions:

$$2{,}577 \frac{\text{lb bone-dry wood}}{\text{hr}} \times 0.002 \frac{\text{lb PM}}{\text{ton bone-dry wood}} \times \frac{1 \text{ ton}}{2000 \text{ lb}} = 0.002 \text{ lb/hr PM}$$

Maximum Annual PM emissions:

$$2{,}393 \frac{\text{ton bone-dry wood}}{\text{yr}} \times 0.002 \frac{\text{lb PM}}{\text{ton bone-dry wood}} \times \frac{1 \text{ ton}}{2000 \text{ lb}} = 0.002 \text{ tpy PM}$$

Maximum Hourly PM10 emissions:

$$2{,}577 \frac{\text{lb bone-dry wood}}{\text{hr}} \times 0.001 \frac{\text{lb PM10}}{\text{ton bone-dry wood}} \times \frac{1 \text{ ton}}{2000 \text{ lb}} = 0.001 \text{ lb/hr PM10}$$

Maximum Annual PM10 emissions:

$$2{,}393 \frac{\text{ton bone-dry wood}}{\text{yr}} \times 0.001 \frac{\text{lb PM10}}{\text{ton bone-dry wood}} \times \frac{1 \text{ ton}}{2000 \text{ lb}} = 0.001 \text{ tpy PM10}$$

Treasure Valley Forest Products - Mountain Home
Planer Mill Baghouse

Planer Mill wood shavings are conveyed inside building and into a wood chipper outside of building. Wood chipper-->screen-->cyclone-->baghouse. Wood shavings screened through the cyclone are conveyed to Pellet Mill pelletizer inside building. Fines are collected in Planer Mill Baghouse and exhaust to atmosphere. Assume 1-8hr shifts per day, 5 days per week, 52 weeks per year. Request permit limit of 50,000 Bd-ft per day.

Maximum hourly production rate: 7,000 $\frac{BF}{hr}$

Maximum annual production rate: 13,000,000 $\frac{BF}{yr}$

Assumptions:
Idaho DEQ Emission Factor Guide for Wood Industry (1/1997), Sanderdust (w/baghouse)

PM =	0.04	lb/ton dry wood
PM10 =	0.04	lb/ton dry wood

Emission Calculations:

Assume volume per board 5.3 BF

Surface area of each planed side			
Top	96 in x 3.5 in	336 in^2	
Bottom	96 in x 3.5 in	336 in^2	
Right	96 in x 1.5 in	144 in^2	
Left	96 in x 1.5 in	144 in^2	
Total		960 in^2	per board
Total		181.1 in^2	per board foot

Approximately 1/8 inch is planed off of four sides. The total volume of shavings generated per BF is:
Typically 1/32 inch is planed off however to be more conservative, 1/8 inch was used.

Vol per board = 120 in^3/board

Vol per BF = 22.64 in^3/BF = 0.0131 ft^3/BF

Assume the density of the lumber shavings is 28.1 lb/ft^3. The mass of the shavings per board foot is:

0.013 ft3/BF(28.1 lb/ft^3) 0.37 lb shaving/BF

Mass of shavings routed to the wood chipper-->screen-->cylcone-->baghouse:

$$0.37 \frac{lb}{BF} \times 7{,}000 \frac{BF}{hr} \times = 2{,}577.3 \frac{lb}{hr}$$

$$0.37 \frac{lb}{BF} \times 13{,}000{,}000 \frac{BF}{yr} \times \frac{1\ ton}{2000\ lb} = 2{,}393.2 \frac{ton}{yr}$$

Potential Emissions

Planer Mill Baghouse	lb/hr	tpy
PM	0.05	0.05
PM10	0.05	0.05

Process Weight Calculations - Based on the amount of boards going into the planer:

Assume the typical product planed on planer is 5.3 board feet. The volume of a product can be found by multiplying the length by the cross sectional area. Therefore, the volume of the boards being sent to the planer:

96 inches x 3.5 inches x 1.5 x [1ft^3/1728 $inches^3$] = 0.29 $\frac{ft^3}{board}$ 0.055 $\frac{ft^3}{BF}$

Dry weight for doug fir should be 2 #s per bf

0.055 ft3/BF(27 lb/ft^3) 1.32 lb/BF

Mass of wood entering the planar:

$$1.32 \frac{lb}{BF} \times 7{,}000 \frac{BF}{hr} \times = 9{,}245 \frac{lb}{hr}$$

$$1.32 \frac{lb}{BF} \times 13{,}000{,}000 \frac{BF}{yr} \times \frac{1\ ton}{2000\ lb} = 8{,}585 \frac{tons}{yr}$$

Treasure Valley Forest Products - Mountain Home

Lumber Kiln Heaters No. 1

Supply heat to Lumber Kiln No. 1

Assumptions:

Hours of operation	8760 hrs/yr maximum operation	
Rate heat input	0.29 MMBtu/hr	(2 room heaters each rated at 0.145 MMBtu/hr)
Fuel:		
Natural Gas[a]	1050 Btu/scf	

Potential to Emit Calculations

Criteria Pollutants[b]:

Pollutant	EF ($lb/10^6$ SCF)	Emissions (lb/hr)	Emissions (tpy)
NOx	100	0.03	0.12
CO	84	0.02	0.10
SO2	0.6	0.0002	0.001
VOC	5.5	0.002	0.01
PM10	7.6	0.002	0.01
PM	7.6	0.002	0.01
Lead	0.0005	1.38E-07	6.05E-07

Idaho Toxic Air Pollutants:

Organics[c]

Pollutant	CAS No.	Natural Gas EF ($lb/10^6$ scf)	Emissions (lb/hr)	Emissions (tpy)	IDAPA 58.01.01.585/586 (lb/hr)	Comparison
3-Methylchloranthrene	56-49-5	1.80E-06	4.97E-10	2.18E-09	2.50E-06	Below
Benzene	71-43-2	2.10E-03	5.80E-07	2.54E-06	8.00E-04	Below
Benzo(a)pyrene	50-32-8	1.20E-06	3.31E-10	1.45E-09	2.00E-06	Below
Formaldehyde	50-00-0	7.50E-02	2.07E-05	9.07E-05	5.10E-04	Below
Hexane	110-54-3	1.80E+00	4.97E-04	2.18E-03	1.20E+01	Below
Naphthalene	91-20-3	6.10E-04	1.68E-07	7.38E-07	3.33E+00	Below
Pentane	109-66-0	2.60E+00	7.18E-04	3.15E-03	1.18E+02	Below
Toluene	108-88-3	3.40E-03	9.39E-07	4.11E-06	2.50E+01	Below
Benzo(a)anthracene		1.80E-06	4.97E-10	2.18E-09		
Benzo(a)pyrene		1.20E-06	3.31E-10	1.45E-09	2.00E-06	Below
Benzo(b)fluoroanthene		1.80E-06	4.97E-10	2.18E-09		
Benzo(k)fluoroanthene		1.80E-06	4.97E-10	2.18E-09		
Chrysene		1.80E-06	4.97E-10	2.18E-09		
Dibenzo(a,h)anthracene		1.20E-06	3.31E-10	1.45E-09		
Indeno(1,2,3-cd)pyrene		1.80E-06	4.97E-10	2.18E-09		
Total IDAPA POM			3.15E-09		2.00E-06	Below
Subtotal HAPs (tpy)				5.42E-03		

Metals[d]

Pollutant	CAS No.	Natural Gas EF ($lb/10^6$ scf)	Emissions (lb/hr)	Emissions (tpy)	IDAPA 58.01.01.585/586 (lb/hr)	Comparison
Arsenic	7440-38-2	2.00E-04	5.52E-08	2.42E-07	1.50E-06	Below
Barium	7440-39-3	4.40E-03	1.22E-06	5.32E-06	3.30E-02	Below
Beryllium	7440-41-7	1.20E-05	3.31E-09	1.45E-08	2.80E-05	Below
Cadmium	7440-43-9	1.10E-03	3.04E-07	1.33E-06	3.70E-06	Below
Chromium	7440-47-3	1.40E-03	3.87E-07	1.69E-06	3.30E-02	Below
Cobalt	7440-48-4	8.40E-05	2.32E-08	1.02E-07	3.30E-03	Below
Copper	7440-50-8	8.50E-04	2.35E-07	1.03E-06	1.30E-02	Below
Manganese	7439-96-5	3.80E-04	1.05E-07	4.60E-07	6.70E-02	Below
Mercury	7439-97-6	2.60E-04	7.18E-08	3.15E-07	1.00E-03	Below
Molybdenum	7439-98-7	1.10E-03	3.04E-07	1.33E-06	3.33E-01	Below
Nickel	7440-02-0	2.10E-03	5.80E-07	2.54E-06	2.75E-05	Below
Selenium	7782-49-2	2.40E-05	6.63E-09	2.90E-08	1.30E-02	Below
Vanadium	1314-62-1	2.30E-03	6.35E-07	2.78E-06	3.00E-03	Below
Zinc	7440-66-6	2.90E-02	8.01E-06	3.51E-05	3.33E-01	Below
Subtotal HAPs				5.23E-05		
Total HAPS (tpy)				0.005		

Notes:

[a] *Fuel heat values from EPA AP-42, Appendix A (EPA website June 2007)*

[b] *Criteria Pollutants EPA AP-42, Section 1.4, Tables 1.4-1 and 1.4-2*

[c] *OrganicToxic Air Pollutants EPA AP-42, Section 1.4, Table 1.4-3*

[d] *Metals from EPA AP-42, Section 1.4, Table 1.4-4*

Treasure Valley Forest Products - Lodge Logs

Shavings Bin

Unloading from three-sided bin with capacity of 200 cubic yards. The bin will be filled approximately once per week of operation (not continuously).
Wood chip density is approximately 35%.
Bulk density of wood is equal to the density of dry wood (2.056 lb/bd-ft) divided by the moisture content of the wood.

Bulk density: 38 lb/cf

Maximum hourly production rate: $\frac{80}{8}$ $\frac{\text{ton bone-dry wood}}{\text{hr}}$

Maximum annual production rate: 20,800 $\frac{\text{ton bone-dry wood}}{\text{yr}}$

AP-42 Section 13.2.4 (Aggregate Handling and Storage Piles)

Wind Speed	5.0	mph
Material moisture content	35.0	%
PM Particle size multiplier	0.74	
PM =	0.002	lb/ton bone-dry wood
PM10 Particle size multiplier	0.35	
PM10 =	0.001	lb/ton bone-dry wood

Division of Environmental Protection, Office of Air Quality for West Virginia, Reference Document for General Permit Number G10-B, for the construction, modification, relocation, operation, and prevention and control of air pollution from the operation of coal preparation plants and coal handling operations

Control Factor = 50% Based on partial enclosure

Potential Emissions

Shavings Bin	lb/hr	tpy
PM	0.008	0.008
PM10	0.004	0.004

Potential Emissions Calculations:

Maximum Hourly PM emissions:

$$\frac{80}{8}\ \frac{\text{ton bone-dry wood}}{\text{hr}} \times \frac{0.002\ \text{lb PM}}{\text{ton bone-dry wood}} \times 50\% = 0.0079\ \text{lb/hr PM}$$

Maximum Annual PM emissions:

$$20{,}800\ \frac{\text{ton bone-dry wood}}{\text{yr}} \times \frac{0.002\ \text{lb PM}}{\text{ton bone-dry wood}} \times \frac{1\ \text{ton}}{2000\ \text{lb}} \times 50\% = 0.0082\ \text{tpy PM}$$

Maximum Hourly PM10 emissions:

$$\frac{80}{8}\ \frac{\text{ton bone-dry wood}}{\text{hr}} \times \frac{0.001\ \text{lb PM10}}{\text{ton bone-dry wood}} \times 50\% = 0.0038\ \text{lb/hr PM10}$$

Maximum Annual PM10 emissions:

$$20{,}800\ \frac{\text{ton bone-dry wood}}{\text{yr}} \times \frac{0.001\ \text{lb PM10}}{\text{ton bone-dry wood}} \times \frac{1\ \text{ton}}{2000\ \text{lb}} \times 50\% = 0.0039\ \text{tpy PM10}$$

Treasure Valley Forest Products - Lodge Logs

Sawdust Bin

Unloading from three-sided bin with capacity of 200 cubic yards. The bin will be filled approximately once per week of operation (not continuo

Wood chip density is approximately 35%.

Bulk density of wood is equal to the density of dry wood (2.056 lb/bd-ft) divided by the moisture content of the wood.

Bulk density: 38 lb/cf

Maximum hourly production rate: $\frac{80}{8}$ $\frac{\text{ton bone-dry wood}}{\text{hr}}$

Maximum annual production rate: 20,800 $\frac{\text{ton bone-dry wood}}{\text{yr}}$

AP-42 Section 13.2.4 (Aggregate Handling and Storage Piles)

Wind Speed	5.0	mph
Material moisture content	35.0	%
PM Particle size multiplier	0.74	
PM =	0.002	lb/ton bone-dry wood
PM10 Particle size multiplie	0.35	
PM10 =	0.001	lb/ton bone-dry wood

Division of Environmental Protection, Office of Air Quality for West Virginia, Reference Document for General Permit Number G10-B, for the construction, modification, relocation, operation, and prevention and control of air pollution from the operation of coal preparation plants and coal handling operations

Control Factor = 50% Based on partial enclosure

Potential Emissions

Sawdust Bin	lb/hr	tpy
PM	**0.008**	**0.008**
PM10	**0.004**	**0.004**

Potential Emissions Calculations:

Maximum Hourly PM emissions:

$$\frac{80}{8}\ \frac{\text{ton bone-dry wood}}{\text{hr}} \times \frac{0.002\ \text{lb PM}}{\text{ton bone-dry wood}} \times 50\% = 0.008\ \text{lb/hr PM}$$

Maximum Annual PM emissions:

$$20{,}800\ \frac{\text{ton bone-dry wood}}{\text{yr}} \times \frac{0.002\ \text{lb PM}}{\text{ton bone-dry wood}} \times \frac{1\ \text{ton}}{2000\ \text{lb}} \times 50\% = 0.008\ \text{tpy PM}$$

Maximum Hourly PM10 emissions:

$$\frac{80}{8}\ \frac{\text{ton bone-dry wood}}{\text{hr}} \times \frac{0.001\ \text{lb PM10}}{\text{ton bone-dry wood}} \times 50\% = 0.004\ \text{lb/hr PM10}$$

Maximum Annual PM10 emissions:

$$20{,}800\ \frac{\text{ton bone-dry wood}}{\text{yr}} \times \frac{0.001\ \text{lb PM10}}{\text{ton bone-dry wood}} \times \frac{1\ \text{ton}}{2000\ \text{lb}} \times 50\% = 0.004\ \text{tpy PM10}$$

Treasure Valley Forest Products - Mountain Home

Compliance with IDAPA Rule 701 PM Standard for Process Weight			
Unit	Planer Mill Baghouse	Pellet Mill Cyclone	Pellet Mill Hopper
Process Weight (lb/hr)	9,245	24,000	20,000
PM Emission Rate (lb/hr)	0.05	1.52	0.016
Compliance with Allowable Emission Calculation			
Calculated Allowable Emissions (E) (lb/hr) [1]	10.78	13.69	13.08
Compliance w/ PM Loading Standard	**Yes**	**Yes**	**Yes**

General Restrictions - New Equipment:

If PW is less than 9,250 pounds per hour
$E = 0.045(PW)^{0.6}$

If PW is greater than 9,250 pounds per hour
$E = 1.10(PW)^{0.25}$

Treasure Valley Forest Products - Mountain Home
PM Standard Calculations

Compliance with IDAPA Rule 676 PM Standard for Fuel Burning Equipment

Unit	Rotary Drum Dryer
Fuel	Natural Gas
Rated Heat Input (MM Btu/hr)	35
PM Emission Rate (lb/hr)	0.65
Exit/Flue Gas Flowrate Calculation	
F_d (Table 19-2, EPA Method 19) (dscf/MM Btu) [1,2]	8,710
Exit flowrate @ 0% O_2: (dscfm)	5,081
Exit flow rate corrected: = ACFM(Std T{°R}/Stack T{°R})(Stack P {inHg}/Std P{inHg})	
Exit flowrate corrected: (dscfm)[4]	5,464
Exit flowrate corrected to 3% O_2	6,379
Calculated Grain Loading (gr/dscf @ 3% O_2) [4]	0.012
PM Loading Standard (IDAPA 58.01.01.676) (gr/dscf @ 3% 02)	0.015
Compliance w/ PM Loading Standard	**Yes**

[1] Appendix A-7 to 40 CFR part 60, Method 19—Determination of sulfur dioxide removal efficiency and particulate, sulfur dioxide and nitrogen oxides emission rates, Table 19-2 (F Factors for Various Fuels)

[2] F_d, Volumes of combustion components per unit of heat content (scf/million Btu). F_d for natural gas is 8,710 scf/million Btu.

[3] (Flow $_{8\%}$) = (Flow $_{0\%}$)x (20.9/(20.9 - 3)), where 20.9 = Oxygen concentration in ambient air

[4] (Flow (dscfm) x (7,000 gr/lb) x (PM lb/hr) x (60 min/ hr) = gr/dscf

Reference Information

Table A2-1. Model CB Steam Boiler Ratings (15 - 100 hp)

BOILER HP	15[C]	20[C]	30[C]	40[C]	50	60	70	80	100
RATINGS - SEA LEVEL TO 3000 FT									
Rated Cap. (lbs steam/hr @212°F) Btu Output (1000 Btu/hr)	518 502	690 670	1035 1004	1380 1339	1725 1674	2070 2009	2415 2343	2760 2678	3450 3348
APPROXIMATE FUEL CONSUMPTION AT RATED CAPACITY									
Light Oil (gph)[A]	4.5	6.0	9.0	12.0	15.0	18.0	21.0	24.0	30.0
Heavy Oil (gph)[B]	-	-	-	-	14.0	16.5	19.5	22.5	28.0
Gas (cfh) 1000 Btu-Nat Gas (Therm/hr)	625 6.3	835 8.4	1255 12.6	1675 16.8	2095 21.0	2510 25.1	2930 29.3	3350 33.5	4185 41.9
POWER REQUIREMENTS - SEA LEVEL TO 3000 FT, 60 HZ									
Blower Motor hp (except gas)	1	1	1-1/2	2	2	2	2	2[D]	3
Gas Models (only)	1	1	1-1/2	2	2	2	2	2[D]	3
Oil Pump Motor, hp No. 2 Oil	Belt-Driven From Blower				1/3	1/3	1/3	1/3	1/3
Oil Pump Motor, hp No. 6 Oil	-	-	-	-	1/3	1/3	1/3	1/3	1/3
Oil Heater kW No. 6 Oil	-	-	-	-	5	5	5	5	5
Air Compressor Motor hp (Oil firing Only)	Air Compressor Belt-Driven from Blower Motor				2	2	2	2	2

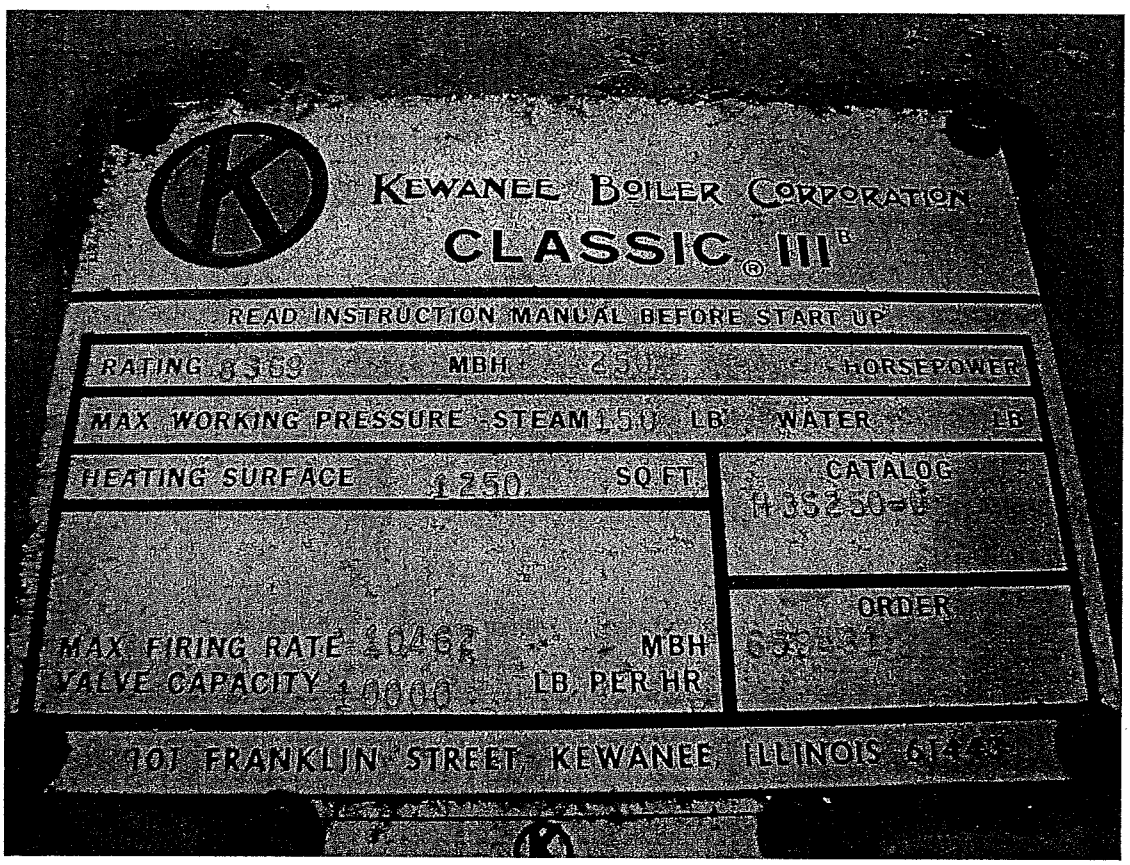
NOTES:
1. For altitudes above 3000 ft, contact your local Cleaver-Brooks authorized representative for verification of blower motor hp.
A. Based on 140,000 Btu/gal.
B. Based on 150,000 Btu/gal.
C. No. 6 Oil not available in 15-40 hp range.
D. 3 hp above 2000 ft.

Table A2-2. Model CB Steam Boiler Ratings (125 - 800 hp)

BOILER HP	125	150	200	250	300	350	400	500	600	700	750	800
RATINGS SEA LEVEL TO 3000 FT [J]												
Rated Cap. (lbs steam/hr @ 212°F) Btu Output (1000 Btu/hr)	4313 4184	5175 5021	6900 6695	8625 8369	10350 10043	12075 11716	13800 13390	17250 16738	20700 20085	24150 23432	25875 25106	27600 26779
APPROXIMATE FUEL CONSUMPTION AT RATED CAPACITY												
Light Oil (gph)[A]	37.5	45.0	60.0	74.5	89.5	104.5	119.5	149.5	179.5	209.0	224.2	239.3
Heavy Oil (gph)[B]	35.0	42.0	56.0	69.5	83.5	97.5	111.5	139.5	167.5	195.5	209.2	223.4
Gas (cfh) MBTU-nat Gas (Therm/hr)	5230 52.3	6280 62.8	8370 83.7	10460 104.6	12555 125.5	14650 146.5	16750 167.5	20925 209.3	25100 251.0	29300 293.0	31385 313.8	33480 334.8
POWER REQUIREMENTS - SEA LEVEL TO 3000 FT, 60 HZ												
Blower Motor hp (except gas)	5	7-1/2	15	7-1/2	10[C]	15[D]	10[C]	15[E]	20[F]	30[G]	40[L]	50[H]
Gas Models (only)	5	5	10	7-1/2	7-1/2[I]	15	10[C]	15[E]	20[F]	30[G]	40[L]	50[H]
Oil Pump Motor, hp No. 2 Oil	1/2	1/2	1/2	1/2	3/4	3/4	3/4	3/4	3/4	1	1	1
Oil Pump Motor, hp No. 6 Oil	1/2	1/2	1/2	1/2	1/2	3/4	3/4	3/4	3/4	3/4	3/4	3/4
Oil Heater kW No. 6 Oil	5	5	5	7-1/2	7-1/2	7-1/2	7-1/2	7-1/2[K]	7-1/2[K]	7-1/2[K]	7-1/2[K]	7-1/2[K]
Air Compressor Motor hp (Oil firing Only)	Air Compressor Belt-Driven From Blower Motor						7-1/2	7-1/2	7-1/2	7-1/2	7-1/2	7-1/2

NOTES:
1. For altitudes above 3000 ft, contact your local Cleaver-Brooks authorized representative for verification of blower motor hp.
A. Based on 140,000 Btu/gal.
B. Based on 150,000 Btu/gal.
C.15 hp above 2500 ft.
D. 20 hp above 2500 ft.
E. 20 hp above 2000 ft.
F. 30 hp above 2500 ft.
G. 40 hp above 2000 ft.
H. 60 hp above 3000 ft.
I. 10 hp above 2500 ft.
J. Sea level to 2,500 ft for 300 and 350 Hp sizes.
K. 10 kW on low pressure.
L. 50 hp above 2500 ft.

250 HP Kewanee Boiler Nameplate



Rick Brenneman

From: Dominic A. Piazza [dominic@machineryandequipment.com]
Sent: Tuesday, March 06, 2007 10:12 AM
To: rbrenneman@lodgelogs.com
Subject: Equipment Quote #S118679 ✓

March 6, 2007

Treasure Valley Forest Product
7789 S Federal Way
Boise, ID 83716

Attn: Rick Brenneman

FAX#: PHN#:(208) 336-2450
REF#:S118679
EMAIL:rbrenneman@lodgelogs.com

Dear Rick:

Thank you for your e-mail regarding equipment that we have available for sale. We are pleased to quote you the following:

D734185 TRIPLE PASS ROTARY DRUM DRYER, 10' DIA. X 40' LONG, DRIVEN BY 25 HP MOTOR, MANUFACTURED BY M.E.C., COMPLETE SYSTEM INCLUDES FEEDER ASSEMBLY, 35 MM BTU BURNER, 150 HP, 35,000 CFM FAN SYSTEM, CYCLONE & DUCTING. 24" X 30' SCREW CONVEYOR WITH DRIVE, BELT CONVEYOR 19" WIDE X 12' LONG WITH MOTOR & DRIVE, CHAIN CONVEYOR 23" WIDE X 13' LONG, SLIDE GATE ASSEMBLY. DRUM WAS COMPLETELY OVERHAULED. NEW IN 1995. REPORTED TO BE IN VERY GOOD CONDITION.

EXHAUST 12,000 CFM
SCALE SYSTEM.
11-20 TONS PER HOUR
SASKATCHEWAN. CAN.
- SASKATOON -

Price:$165,000 AS IS, WHERE IS CANADA

If you would like additional information or would like to make arrangements for a personal inspection, please let us know. Photos can be accessed by stock number on our website: www.machineryandequipment.com

Sincerely

Dominic A. Piazza
Sales Engineer

DAP/kjs

MAC

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High Point, NC 27263
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SECTION 7

DATA SHEET
H.E. COLLECTORS
Effective 12-16-91
Supersedes 3-20-91

H.E. COLLECTOR

MAC MODEL HE COLLECTORS
STANDARD SPECIFICATIONS

Materials of Construction

C.S. Construction
Full welded exterior
Skip welded interior, ground smooth
Critical interior welds continuous
Main body, cone, expansion chamber and inlet:
#21 thru #47: 10 ga. construction
14 ga. inner cylinder
Outlet plenums:
1H21 thru 1H30: 10 ga. top & bottom sheets, 12 ga. scroll
1H33 thru 1H47: 7 ga. top & bottom sheets, 10 ga. scroll
All multiple units 10 ga. with ¼ x 1½ flat bar reinforcement
Inlet plenum reinforcement
2H ¼ x 1¼
3H ¼ x 2
4H 2 x 2 x ¼ angle with leg down
Main body to cone flanges
H27 and smaller 5/16 x 2
H30 and larger ¼ x 2

Major Components

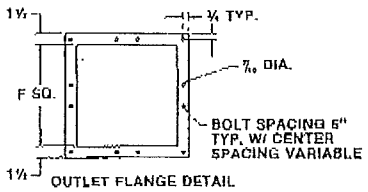
Flanges are drilled and matched marked
Flat bar flanges on air inlet, outlet and product discharge
Expansion chamber with 8" inspection port
Mounting pads (4 ea.) are located on cylinder side wall
Outlet scroll complete with mount clips allowing 360° rotation
CW inlet rotation is standard
On 2H, 3H, & 4H models 9" gathering auger is included, auger slave driven from airlock
Side inlet, opposite side exhaust standard for 2H models
End inlet, end exhaust standard for 3H and 4H models

Paint

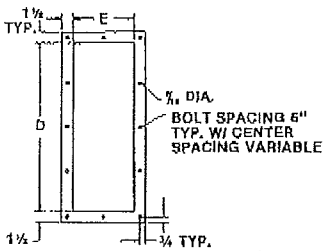
Standard cleaning and metal preparation
Exterior primed with one coat of gray primer
Exterior to have one finish coat
Color to be specified
Standard color is MAC Blue
Alternate standard color is MAC White

NOTES:

1. All dimensions are in inches
2. Support frame optional

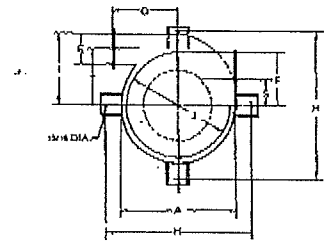


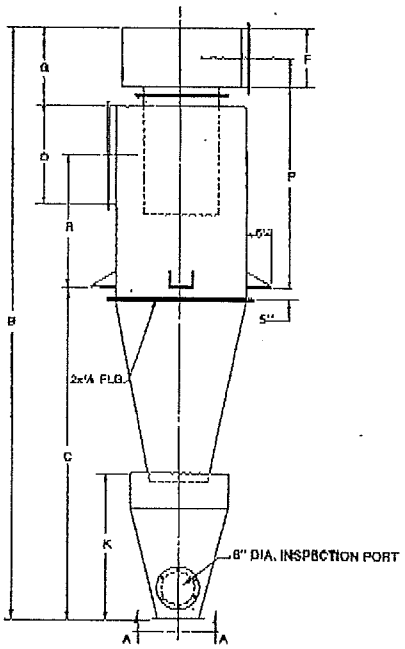
OUTLET FLANGE DETAIL

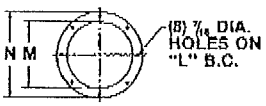


INLET FLANGE DETAIL

CW ORIENTATION SHOWN
CCW ORIENTATION OPPOSITE HAND

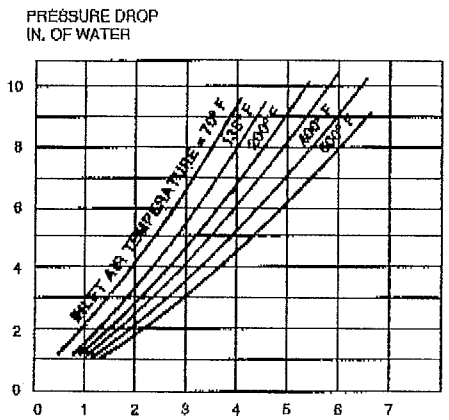




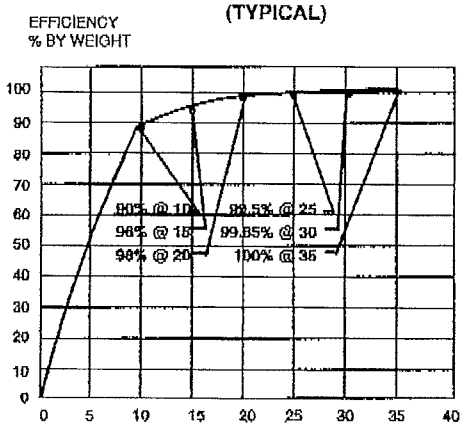


VIEW A-A

PRESSURE DROP CHART



EFFICIENCY CHART (TYPICAL)



SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	R	S	T	WT. IN LBS.	VOLUME MIN	VOLUME OPT	VOLUME MAX
21	21	94 11/16	55 3/16	15	6	9½	14¼	30	13½	19	25¾	9½	8	11	12½	34¾	17½	4¾	10½	330	2188	2344	2500
24	24	108 9/16	61 13/16	18	6½	10¾	15¾	33	15⅛	21⅛	25¾	9½	8	11	14	41⅜	22	5⅜	12⅛	415	2844	3047	3250
27	27	120½	68½	20	7¼	12	17	36	17⅛	24	37⅝	11¾	10	13	15½	46	25	6	13½	540	3524	3776	4028
30	30	132⅜	75⅛	22	8	13¼	18¼	39	19	26½	37⅜	11¾	10	13	17	50⅝	28	6⅝	15	630	4278	4583	4889
33	33	144 11/16	81 11/16	24	9¼	15	20	42	20⅝	30	37⅝	11¾	10	13	18½	55½	31	7½	16	745	5390	5775	6160
36	36	153⅝	86⅛	25½	10¾	16½	21½	45	23⅜	33	37⅜	11¾	10	13	20	59¼	33¼	8¼	18	840	6650	7125	7600
39	39	174 3/16	102 7/16	27	11¾	17¾	22¾	48	25⅝	35½	49 7/16	11¾	10	13	21½	62⅞	35⅛	8⅞	19½	1020	7700	8250	8800
43	43	188¾	109	30	13	19¾	24¾	52	27¾	39⅛	49 7/16	11⅝	10	13	23½	69⅞	40	9⅞	21¼	1200	9450	10125	10800
47	47	202 13/16	115¼	33	13¾	21¼	26¼	56	30⅝	42½	49 7/16	11¾	10	13	25⅛	76⅝	44½	10⅝	23½	1390	11025	11812	12600

For more information see Print #C00228, Rev. D.
Information on this page subject to change without notice.

SEP SERIES HEATERS

Kiln Heaters

TECHNICAL DATA

MODEL NUMBER: SEP-		60 (A,S)	90 (A,S)	115 (A,S)	145 (A,S)	175 (A,S)	200 (A,S)	230 (A,S)	290 (A,S)	345 (A,S)	400 (A,S)
TOTAL INPUT, BTUH*		60,000	90,000	115,000	145,000	172,500	195,000	230,000	287,500	345,000	390,000
TOTAL OUTPUT, BTUH		48,000	72,000	92,000	116,000	138,000	156,000	184,000	230,000	276,000	312,000
AIR VOLUME, CFM		1250	1250	1900	1900	2200	2200	4400	4400	4400	4400
AIR THROW AT 8 FT. MTNG. HEIGHT, FEET		47	47	60	60	65	65	80	80	80	80
RECOMMENDED MAXIMUM MOUNTING HEIGHT, FEET		12	12	16	20	20	20	30	30	30	30
FAN DIAMETER, INCHES/ NUMBER OF FANS		14/1	14/1	16/1	16/1	16/1	16/1	16/2	16/2	16/2	16/2
SHIP WEIGHT, POUNDS		100	115	140	150	165	165	270	285	310	310
NET WEIGHT, POUNDS		85	85	125	130	145	145	225	270	285	285
FAN MOTOR DATA	HORSEPOWER	1/8	1/8	1/8	1/8	1/8	1/8	1/8 (2)	1/8 (2)	1/8 (2)	1/8 (2)
	AMPS @ 115V/1PH/80Hz	2.1	2.1	2.1	2.1	2.1	2.1	4.2	4.2	4.2	4.2
	RPM	1075	1075	1075	1075	1075	1075	1075	1075	1075	1075
	MOTOR TYPE	PSC	PSC	PSC	PSC	PSC	PSC	PSC	PSC	PSC	PSC
TOTAL UNIT AMPS		4.5	4.5	6.0	6.0	6.0	6.0	9.0	9.0	9.0	9.0
FLUE CONNECTION SIZE, INCHES**		3	4	4	4	5	5	5	5	6	6
GAS CONNECTION, INCHES		1/2	1/2	1/2	1/2	1/2	1/2	3/4	3/4	3/4	3/4

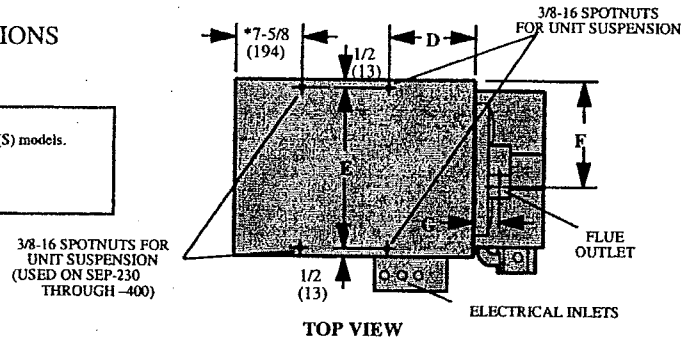
* Ratings shown are for elevations up to 2,000 feet. For elevations above 2,000 feet, ratings should be reduced at the rate of 4% for each 1,000 feet above sea level.

** Diameter of round pipe - adaptor furnished with heater.

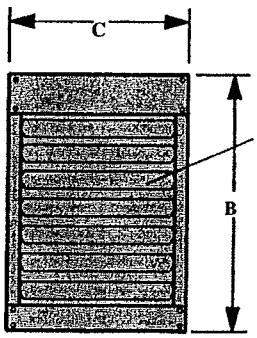
A,S - Aluminized or Stainless Steel heat exchangers

SEP UNIT DIMENSIONS

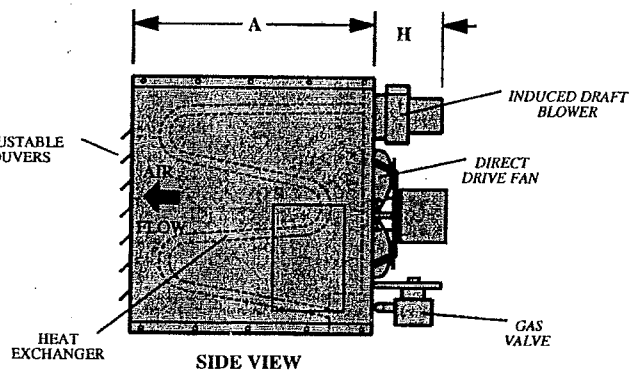
*NOTE - Two Spotnuts are furnished on SEP-60A, -90A, -115A, -145A, -175A, -200A(S) models.
- Four spotnuts are furnished on SEP-230A, 290A, 345A, 400A(S) models.



TOP VIEW



FRONT VIEW



SIDE VIEW

DIMENSIONAL DATA

MODEL NUMBER: SEP-	A	B	C	D	E	F	G	H	MINIMUM CLEARANCES			
									TOP	SIDES	REAR	FLUE
60, 90	26	28-1/4	19-1/2	8-1/2	18-1/2	11-11/16	2-13/16	7-7/8	6	6	18	6
115, 145	31-5/16	32-3/16	20-3/16	11-1/2	19-1/16	11-7/8	3-1/4	7-7/8	6	6	18	6
175, 200	31-5/16	32-3/16	23-1/8	11-1/2	22-1/16	13-1/4	3-1/4	7-7/8	6	6	18	6
230*	31-5/16	32-3/16	41-1/8	3-11/16	38-13/16	17-1/2	3-1/2	8-11/16	6	6	18	6
290*	31-5/16	32-3/16	41-1/8	3-11/16	38-13/16	17-1/2	3-1/2	8-11/16	6	6	18	6
345*	31-5/16	32-3/16	41-1/8	3-11/16	38-13/16	17-1/2	3-1/2	9-13/16	6	6	18	6
400*	31-5/16	32-3/16	41-1/8	3-11/16	38-13/16	22-1/8	3-1/2	9-13/16	6	6	18	6

NOTE: All dimensions are in inches. Provide 24-inch service clearance on electrical control box side and at rear of unit

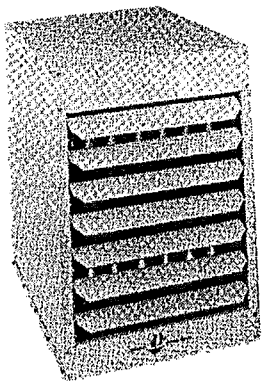
* Unit contains dual fans.

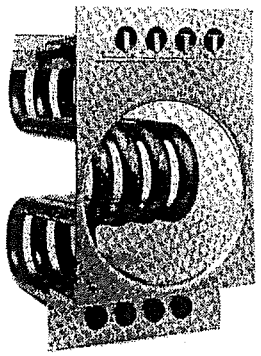
Advanced ADP Distributor Products®
Leading By Example

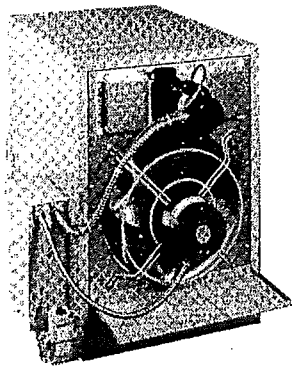
SEP 60-400
GAS FIRED PROPELLER UNIT HEATERS
(Now available in Stainless or Aluminized Steel)

PRODUCT INFORMATION
GAS UNIT HEATERS

FORM # UHSS-3
Rev 1/00







FEATURES/BENEFITS

EFFICIENCY - The SEP series gas-fired propeller unit heaters deliver 80% thermal efficiency and 78% seasonal efficiency using natural gas or LPG in all models. This excellent efficiency set a new standard for savings when using gas-fired unit heaters.

RELIABILITY - The design of this unit heater has proven itself to be superior during the fourteen years and hundreds of thousands of hours in the toughest winter climates of North America and under extreme conditions in laboratory life cycle testing. The SEP has been designed to provide long, trouble-free service life.

QUALITY - Every heater undergoes continuous quality checks at all stages of manufacturing. After assembly, each heater is test fired and functionally tested to provide final assurance that it is performing in accordance with ADP's rigorous quality standards.

APPROVALS – All ADP heaters are built in our ISO 9002 facility. The rating plate of each heater carries the mark signifying that the SEP heater is designed certified by CSA. In addition, the heater series is listed by the California Energy Code (CEC).

POWER EXHAUST – All heaters have a sealed flue collector and a power exhaust system that enables conventional vertical venting or horizontal venting up to 35 feet. Power exhaust, when used with horizontal venting, lowers operating cost because it reduces stack losses. It also allows the option of not penetrating the roof, or multiple floors. The versatile SEP series power exhaust reduces installation cost further by allowing the exhaust to be directed upward, left or right, just by rotating the exhaust assembly on certain models.

TUBULAR HEAT EXCHANGERS – Constructed of aluminized steel for superior resistance to corrosion and oxidation. Additional protection is available with an optional stainless steel heat exchanger. The curving design provides for complete exposure of the heating surface to the supply air stream. Rounded surfaces minimize air resistance and permit air to surround all heat transfer surfaces for excellent heat transfer. Tubular design means lighter weight and significantly longer service life due to lower thermal-induced stresses. Further, the tubular exchangers create less resistance to air flowing through the unit, therefore providing higher airflow and great throw distance of the heated air to the space.

INSHOT BURNERS - These lightweight aluminized steel burners are maintenance-free and never require adjustment. The burning venturi mixes air and gas in the correct proportion for efficient combustion. The entire burner assembly is removable as one piece for ease of service.

DIRECT SPARK IGNITION – In combination with the 24-volt main gas valve with 100% shutoff for safety, the direct spark ignition control provides positive, reliable and safe main burner ignition. This eliminates the need for a pilot light, improving system efficiency and reliability. A separate flame sensor proves main burner ignition. If loss of main burner flame should occur, the control will reinitiate ignition 3 times before locking out for one hour, thus reducing nuisance service calls. The unit will reinitiate ignition after the one hour lockout.

AIR DISTRIBUTION – All models are equipped with efficient, quiet, direct-drive propeller fans, which have been dynamically balanced for quiet, smooth operation. Heated air flows easily through the tubular heat exchangers and is effectively directed to the heated space by means of aerodynamically shaped outlet louvers.

CABINET – Constructed on 18- to 22-gauge cold rolled steel, each cabinet has a pre-painted finish for superior resistance to corrosive elements. Each cabinet has a two-point (3/8" X 16" spotnut) suspension system for easy installation. The two fan models have four-point suspensions. Generous use of inside cabinet insulation keeps the outer surface temperatures low. The wiring junction box is conveniently located on the side of the cabinet for easy access and adequate protection.

WARRANTY – All components have a limited warranty for two full years. The aluminized steel heat exchangers have a limited warranty for ten years. The stainless steel heat exchangers have a limited warranty for fifteen years. Consult the warranty certificate for details.

2175 West Park Place Blvd. * Stone Mountain, GA 30087 * (800) 848-2270 * Fax (770) 465-5599
www.heatcraft.com