Foss Manufacturing - Hampton, NH

INDUSTRIAL BOILERS <100 MMBtu/hr **Fuel:** Natural Gas

SCC: 1-03-006-03 **Fuel heating value:** 1,020 **Btu/scf** **Sulfur:** 5 grains/100 scf

	Max. Rate MMBtu/hr	**Max. Rate** scf/ unit time	**TSP** 0.0019	**PM_{10}** 0.0019	**SO_2** [3] 0.0015	**NOx** 0.10	**CO** 0.084	**NEVOC** 0.0055	**Units** lb/Mscf
EU09 - *CB-350*									
SN *1-56928 (1973)*			0.55						lb/MMBtu
Nameplate	14.7	14,412	8.1	0.027	0.022	1.4	1.2	0.079	lb/hr
Pot. Annual (unlimited)	128,772	126,247,059	35	0.12	0.095	6.3	5.3	0.35	TPY
EU10 - *CB95*									
SN *C14076-M4 (1982)*			0.60						lb/MMBtu
Nameplate	4.0	3,922	2.4	0.0075	0.0059	0.39	0.33	0.022	lb/hr
Pot. Annual (unlimited)	35,040	34,352,941	11	0.033	0.026	1.7	1.4	0.094	TPY
EU11 - *CB-700-350LE*									
SN *GL097207 (1998)*			0.30						lb/MMBtu
Nameplate	14.7	14,412	4.4	0.027	0.022	1.4	1.2	0.079	lb/hr
Pot. Annual (unlimited)	128,772	126,247,059	19	0.12	0.095	6.3	5.3	0.35	TPY
EU12 - *Primary Hot Oil*									
SN *NA (1985)*			0.30						lb/MMBtu
Nameplate	16.3	15,980	4.9	0.030	0.024	1.6	1.3	0.088	lb/hr
Pot. Annual (unlimited)	142,788	139,988,235	21	0.13	0.10	7.0	5.9	0.38	TPY
EU13 - *Back-up HOB*									
SN *NA (1985)*			0.30						lb/MMBtu
Nameplate	2.5	2,451	0.75	0.0047	0.0037	0.25	0.21	0.013	lb/hr
Pot. Annual (unlimited)	21,900	21,470,588	3.3	0.020	0.016	1.1	0.90	0.059	TPY

Notes:

1) Emission factors from AP-42 (5th Ed., Vol. 1, Supplement E) Section 1.4, *Natrual Gas Combustion.*

2) TSP and NOx emission rates are based on the limits (lb/MMBtu) specified in the Title V operating permit

3) SO_2 emission factor is equal to 0.6 lb/MMscf * (ratio of 5 grains/100cf to 2 grains/100cf)

Foss Manufacturing - Hampton, NH

IC INDUSTRIAL ENGINES **Fuel heating value:** 140,000 **Btu/gal** **Fuel:** No 2 oil **Sulfur:** 0.20%

Engines > 600HP	Max. Rate MMBtu/hr	Max. Rate gal/unit time	TSP	PM_{10}	SO_2	NOx	CO	NEVOC	Units
			0.0087	0.0087	0.02828	0.448	0.12	0.011	lb/gal
Caterpillar 910 hp									
EU01 - Engine #1									
SN: *unknown (1978)*			0.60			2.44			lb/MMBtu
Reported Capacity	6.54	46.7	3.9	0.41	1.3	16	5.6	0.54	lb/hr
Max. Annual (Permit)	500 hr	*23,350*	0.98	0.10	0.33	4.0	1.4	0.13	TPY
Caterpillar 910 hp									
EU02 - Engine #2									
SN: *unknown (1978)*			0.60			2.44			lb/MMBtu
Reported Capacity	6.54	46.7	3.9	0.41	1.3	16	5.6	0.54	lb/hr
Max. Annual (Permit)	500 hr	*23,350*	0.98	0.10	0.33	4.0	1.4	0.13	TPY
Caterpillar 1,250 hp									
EU03 - Engine #3									
SN: *unknown (1978)*			0.60			2.44			lb/MMBtu
Reported Capacity	8.68	62.0	5.2	0.54	1.8	21	7.4	0.71	lb/hr
Max. Annual (Permit)	500 hr	*31,000*	1.30	0.13	0.44	5.3	1.8	0.18	TPY
Caterpillar 1,250 hp									
EU04 - Engine #4									
SN: *unknown (1979)*			0.60			2.44			lb/MMBtu
Reported Capacity	8.68	62.0	5.2	0.54	1.8	21.2	7.4	0.71	lb/hr
Max. Annual (Permit)	500 hr	*31,000*	1.30	0.13	0.44	5.29	1.8	0.18	TPY
Caterpillar 1,250 hp									
EU05 - Engine #5									
SN: *unknown (1980)*			0.60			2.44			lb/MMBtu
Reported Capacity	8.68	62.0	5.2	0.54	1.8	21	7.4	0.71	lb/hr
Max. Annual (Permit)	500 hr	*31,000*	1.30	0.13	0.44	5.3	1.8	0.18	TPY
Caterpillar 1,250 hp									
EU06 - *Engine #6*									
SN: *unknown (1990)*			0.30			2.44			lb/MMBtu
Reported Capacity	8.68	62.0	2.6	0.54	1.8	21	7.4	0.71	lb/hr
Max. Annual (Permit)	500 hr	*31,000*	0.65	0.13	0.44	5.3	1.8	0.18	TPY
Engines < 600HP			**TSP**	**PM_{10}**	**SO_2**	**NOx**	**CO**	**NEVOC**	**Units**
			0.043	0.043	0.041	0.50	0.13	0.045	lb/gal
Caterpillar - **129** hp									
EU16 - *Fire pump #1*									
SN: *10560643 (1976)*			0.55						lb/MMBtu
Reported Capacity	1.37	9.8	0.75	0.43	0.40	4.9	1.3	0.44	lb/hr
Max. Annual (Permit)	500 hr	*4,900*	0.19	0.11	0.099	1.2	0.33	0.11	TPY
Caterpillar -**170** hp									
EU17 - *Fire pump #2*									
SN: *25142637 (1985)*			0.30						lb/MMBtu
Reported Capacity	1.41	10.1	0.42	0.44	0.41	5.0	1.3	0.45	lb/hr
Max. Annual (Permit)	500 hr	*5,050*	0.11	0.11	0.10	1.3	0.34	0.11	TPY

1) Emission factors from AP-42 Section 1.3 *Gasoline and Diesel Industrial Engines* unless otherwise noted

2) Fire Pump 1 and 2 were not in the previous permit since they were below the applicability threshold of 200 hp (SIP approved Env-A 603.02(d)) The Fire Pumps will be put into the renewed Title V permit since the actual emissions are > 1,000 lb/yr.

3) NOx & TSP potential emissions are based on emission limits (lb/MMBtu) specified in the title V permit

Fuel heating value: 1,020 **Btu/scf** **Sulfur:** 5 grains/100 scf **Fuel:** Natural Gas

Turbine Engine	Max. Rate MMBtu/ unit time	Max. Rate kscf/ unit time	TSP	PM_{10}	SO_2	NOx	CO	NEVOC	Units
			0.00	0.0019	0.0034	0.092	0.082	0.0021	lb/MMBtu
EU08 - *Solar Turbine*									
SN: *TO249 (2007)*									
5 MW @ 6,700 hp									lb/MMBtu
Reported Capacity	60.24	59.1	0.11	0.11	0.20	5.5	4.9	0.13	lb/hr
Pot. Annual (unlimited)	8760 hr	*517,355*	0.50	0.50	0.88	24	22	0.55	TPY

1) Emission factors from AP-42 Section 3.1 *Stationary Gas Turbines.*

2) NOx & TSP potential emissions are based on emission limits (lb/MMBtu) specified in the title V permit

Foss Manufacturing - Hampton

Device	Potential Annual Emissions (ton/yr)					
	TSP	PM_{10}	SO_2	NO_x	CO	NEVOCs
EU01 - Engine #1	0.98	0.10	0.33	4.0	1.4	0.13
EU02 - Engine #2	0.98	0.10	0.33	4.0	1.4	0.13
EU03 - Engine #3	1.3	0.13	0.44	5.3	1.8	0.18
EU04 - Engine #4	1.3	0.13	0.44	5.3	1.8	0.18
EU05 - Engine #5	1.3	0.13	0.44	5.3	1.8	0.18
EU06 - Engine #6	0.65	0.13	0.44	5.3	1.8	0.18
EU08 - Solar Turbine	0.50	0.50	0.88	24	22	0.55
EU09 - CB-350	35	0.12	0.095	6.3	5.3	0.35
EU10 - CB95	11	0.033	0.026	1.7	1.4	0.094
EU11 - CB-700-350LE	19	0.12	0.095	6.3	5.3	0.35
EU12 - Primary Hot Oil	21	0.13	0.10	7.0	5.9	0.38
EU13 - Back-up HOB	--	0.020	0.016	1.1	0.90	0.059
EU16 - Fire pump #1	0.19	0.11	0.099	1.2	0.33	0.11
EU17 - Fire pump #2	0.11	0.11	0.10	1.3	0.34	0.11
EG Total (tpy)	**6.8**	**0.96**	**2.6**	**32**	**11**	**1.2**
Facility Total (tpy)	**94**	**1.9**	**3.8**	**160.7**	**51**	**3.0**

NEVOCs - non-exempt VOCs

Facility total NOx emission is the Title V permit limit

Foss Manufacturing - Hampton

De minimis Method RTAP/HAP	CAS #	Uncontrolled lb/yr	Controlled lb/yr	De minimis lb/yr	Uncontrolled lb/day	Controlled lb/day	De minimis lb/day
Dioxane	123-91-1	0.25		1,119	0.00084		3.1
Acetaldehyde	75-07-0	0.24		147	0.00080		1.9
Acrylonitrile	107-13-1	0.010		33	0.000033		0.18
Styrene	100-42-5	214		4,336	0.71		12
Ethyl acrylate	140-88-5	0.19		308	0.00063		0.84
Ethylene oxide	75-21-8	11		28	0.036		0.076
Formaldehyde	50-00-0	***452***	***23***	5.6	***1.5***	***0.075***	0.015
Methanol	67-56-1	461		5,715	1.5		16
Methyl methacrylate	80-62-6	0.047		3,174	0.00016		8.7
Vinyl acetate	108-05-4	14		867	0.046		2.4
Propylene oxide	75-56-9	1.0		74	0.0033		0.20
Chlorobenzene	108-90-7	86		1,002	0.29		2.7
Vinyl chloride	75-01-4	0.70		40	0.0023		0.11
Acetone	67-64-1	408		18,400	1.4		50
Ethanol	64-17-5	2,105		29,115	7.0		80
Total HAP (tpy)		0.62					

Adj. In-Stack Method

Formaldehyde	lb/day	ug/sec	Adj ug/m^3	24-hr ug/m^3	Annual ug/m^3
Uncontrolled	1.5	946	***1.4***	1.3	0.88
Controlled	0.0753	47	0.068		

Stack flow 17,700 acfm
8.35 m^3/sec

HAP

RTAP Table 1450-1 adopted Feb. 2011 Assumed property boundary >40 ft from building

2011 emissions report indicted that EU12 was operated 300 days/yr (see appendix to permit application)

Conrol efficiency = 95%

Foss Manufacturing -Hampton

Fuel Burning Device	E.F. lb/kscf kscf/yr	TSP 0.0019	PM_{10} 0.0019	SO_2 0.0015	NOx 0.10	CO 0.084	NEVOC 0.0055
Natural gas devices	83,472	0.16	0.16	0.13	8.3	7.0	0.46

NOTES:

SO_2 emission factor is equal to 0.6 lb/MMscf * (ratio of 5 grains/100cf to 2 grains/100cf)