

### Boilers and Heaters (External Combustion)

Industry Category	SCC Description	SCC Code	Emissions Factors					Emissions Factor Unit
			PM / PM10 / PM2.5 <sup>1</sup>	CO	NOx	SOx	VOC	
Utility:	Residual Oil #6 Normal Firing	10100401	9.2(S) + 3.2	5	47	163(S)	0.76	lb/1000 gallons
Utility:	Residual Oil #6 Tangential Firing	10100404	9.2(S) + 3.2	5	32	163(S)	0.76	lb/1000 gallons
Utility:	Distillate Oil Normal Firing	10100501	2.3	5	24	143.6(S)	0.2	lb/1000 gallons
Utility:	Natural Gas Normal Firing > 100 MM Btu/Hr	10100601	7.6	84	190	0.6	5.5	lb/MM cu ft
Utility:	Natural Gas Normal Firing < 100 MMBtu/Hr	10100602	7.6	84	100	0.6	5.5	lb/MM cu ft
Utility:	Natural Gas Tangential Firing	10100604	7.6	24	170	0.6	5.5	lb/MM cu ft
Industrial	Residual Oil #6 10-100 MMBtu/Hr	10200402	8.03(S) + 2.65	5	55	159(S)	0.28	lb/1000 gallons
Industrial	Residual Oil #6 < 10 MMBtu/Hr	10200403	8.03(S) + 2.65	5	55	159(S)	0.28	lb/1000 gallons
Industrial	Residual Oil #5 > 10 MMBtu/Hr	10200404	10.1	5	47	162.7(S)	0.28	lb/1000 gallons
Industrial	Distillate Oil #1 or #2 > 10 MMBtu/Hr	10200501	2.3	5	24	147.7(S)	0.2	lb/1000 gallons
Industrial	Distillate Oil 10-100 MMBtu/Hr	10200502	2.3	5	20	144(S)	0.2	lb/1000 gallons
Industrial	Distillate Oil < 10 MMBtu/Hr	10200503	2.3	5	20	144(S)	0.2	lb/1000 gallons
Industrial	Distillate Oil #4 > 100 MM Btu/Hr	10200504	7.5	5	47	155.7(S)	0.2	lb/1000 gallons
Industrial	Distillate Oil Cogeneration Boiler	10200505	2.3	5	20	143.6(S)	0.2	lb/1000 gallons
Industrial	Natural Gas Over 100 MMBtu/Hr	10200601	7.6	84	280	0.6	5.5	lb/MM cu ft
Industrial	Natural Gas 10-100 MMBtu/Hr	10200602	7.6	84	100	0.6	5.5	lb/MM cu ft
Industrial	Natural Gas < 10 MMBtu/Hr	10200603	7.6	84	100	0.6	5.5	lb/MM cu ft
Industrial	Natural Gas Cogeneration Boiler	10200604	7.6	24	170	0.6	5.5	lb/MM cu ft
Industrial	LPG: Butane	10201001	0.6	3.6	21	0.09(S)	0.6	lb/1000 gallons
Industrial	LPG: Propane	10201002	0.6	3.2	19	0.02	0.6	lb/1000 gallons
Commercial/Institutional	Distillate Oil Grade 1 & 2 Oil	10300501	1.08	5	24	142(S)	0.34	lb/1000 gallons
Commercial/Institutional	Distillate Oil 10-100MMBtu/Hr	10300502	1.08	5	20	144(S)	0.34	lb/1000 gallons
Commercial/Institutional	Distillate Oil < 10 MMBtu/Hr	10300503	1.08	5	20	144(S)	0.34	lb/1000 gallons
Commercial/Institutional	Natural Gas Over 100 MMBtu/Hr	10300601	7.6	84	190	0.6	5.5	lb/MM cu ft
Commercial/Institutional	Natural Gas 10-100MMBtu/Hr	10300602	7.6	84	100	0.6	5.5	lb/MM cu ft
Commercial/Institutional	Natural Gas < 10 MMBtu/Hr	10300603	7.6	84	100	0.6	5.5	lb/MM cu ft
Commercial/Institutional	LPG: Propane	10301002	0.4	1.9	14	0.02	0.5	lb/1000 gallons
Commercial/Institutional	Waste Oil	10301302	3.8	5	19	147(S)	1	lb/1000 gallons
Industrial	LPG: Space Heater	10500110	0.6	3.4	20	0.02	0.55	lb/1000 gallons

<sup>1</sup> Use the same emission factor for PM primary, PM<sub>10</sub> primary, and PM<sub>2.5</sub> primary when reporting emissions from external combustion equipment.

### Internal Combustion Engines (Stationary)

These emission factors can be used by facilities that track the amount of fuel combusted in their stationary engines. Facilities that do not track fuel usage should use the lb/hp-hr emission factors that are prepopulated in the AQD Online Portal.

Industry Category	SCC Description	SCC Code	Emissions Factors					Emissions Factor Unit
			PM / PM10 / PM2.5 <sup>2</sup>	CO	NOx	SOx	VOC	
Utility	Diesel Turbine	20100101	1.68	0.458	122	140(S)	0.057	lb/1000 gal
Utility	Diesel Reciprocating Engine > 600 hp	20100102	42.5	130	604	39.7	49.3	lb/1000 gal
Utility	Natural Gas Turbine	20100201	6.73	83.64	326.4	0.6	2.14	lb/MM cu ft
Industrial	Diesel Turbine	20200101	1.67	0.46	122.32	140(S)	0.057	lb/1000 gal
Industrial	Diesel Reciprocating Engine < 600 hp	20200102	42.5	130	604	39.7	49.3	lb/1000 gal
Industrial	Natural Gas Turbine	20200201	6.73	83.64	326.4	0.6	11.2	lb/MM cu ft
Industrial	Natural Gas Reciprocating Engine	20200202	10	399	2840	0.6	116	lb/MM cu ft
Industrial	Natural Gas Turbine: Cogeneration	20200203	6.73	83.64	326.4	0.6	2.14	lb/MM cu ft
Industrial	Natural Gas Reciprocating : Cogeneration	20200204	10	399	2840	0.6	116	lb/MM cu ft
Industrial	Natural Gas 4 Cycle Reciprocating Rich Burn	20200253	9.69	3794	2254	0.6	30.2	lb/MM cu ft
Industrial	Natural Gas 4 Cycle Reciprocating Lean Burn	20200254	0.079	323	4161	0.6	120	lb/MM cu ft
Industrial	Gasoline Reciprocating Engine	20201702	12.6	128.7	205	10.6	382	lb/1000 gal
Commercial/Institutional	Diesel Large Bore Engine	20200401	7.85	116	438	138(S)	11.2	lb/1000 gal
Commercial/Institutional	Diesel Reciprocating Engine	20300101	42.5	130	604	39.7	49.3	lb/1000 gal
Commercial/Institutional	Diesel Turbine	20300102	1.67	0.46	122.3	140(S)	0.057	lb/1000 gal
Commercial/Institutional	Natural Gas Reciprocating Engine	20300201	10	399	2840	0.6	116	lb/MM cu ft
Commercial/Institutional	Natural Gas Turbine	20300202	6.73	83.64	326.4	0.6	2.14	lb/MM cu ft
Commercial/Institutional	Natural Gas Reciprocating: Cogeneration	20300204	10	399	2840	0.6	116	lb/MM cu ft
Testing	Turbojet Aircraft	20400101	11.3	32.7	14.6	13	46	lb/1000 gal
Testing	Natural Gas Turbine	20400301	14	120	300	0.6	6.9	lb/MM cu ft
Testing	Diesel/Kerosene Turbine	20400302	1.67	6.72	97.7	140(S)	2.38	lb/1000 gal
Testing	Gasoline Reciprocating Engine	20400401	6.2	3940	102	5.31	148	lb/1000 gal
Testing	Diesel/Kerosene Reciprocating Engine	20400402	42.5	130	604	39.7	49.3	lb/1000 gal

<sup>2</sup> Use the same emission factor for PM primary, PM<sub>10</sub> primary, and PM<sub>2.5</sub> primary when reporting emissions from internal combustion engines.

Other Common Emission Processes

Industry Category	SCC Description	SCC Code	Emissions Factors							Emissions Factor Unit
			PM	PM10	PM2.5	CO	NOx	SOx	VOC	
Asphaltic Concrete	(Batch) Natural Gas Dryer Hot Screens & Mixer w/baghouse	30500245	0.042	0.027	0.0083	0.4	0.025	0.0046	0.0082	lb/ton asphalt concrete
Asphaltic Concrete	(Batch) #2 Oil-Fired Dryer Hot Screens & Mixer w/baghouse	30500246	0.042	0.027	0.0083	0.4	0.12	0.088	0.0082	lb/ton produced
Asphaltic Concrete	(Batch) #6 Waste Oil Dryer Hot Screens & Mixer w/baghouse	30500247	0.042	0.027	0.0083	0.4	0.12	0.088	0.036	lb/ton asphalt concrete
Asphaltic Concrete	Dryer / Mixer: Continuous Feed Plant Natural Gas w/baghouse	30500255	0.033	0.023	0.0029	0.13	0.026	0.0034	0.032	lb/ton produced
Asphaltic Concrete	Dryer / Mixer: Continuous Feed Plant Oil Fired w/baghouse	30500258	0.033	0.023	0.0029	0.13	0.055	0.011	0.032	lb/ton produced
Industrial Heat	Asphalt Heater: Natural Gas	10200603	7.6	7.6	7.6	84	100	0.6	5.5	lb/MM cu ft burned
Industrial Heat	Asphalt Heater: #2 Fuel Oil	10200503	2	2	2	5	20	144(S)	0.2	lb/1000 gal burned
Brick Manufacture	Raw Material Drying	30500301	41	41						lb/ton raw material
Brick Manufacture	Raw Material Grinding : Wet Process	30500302	0.0023	0.0023						lb/ton raw material
Brick Manufacture	Storage of Raw Materials	30500303	12	12						lb/ton raw material
Brick Manufacture	Screening	30500308	1.4	1.4						lb/ton raw material
Brick Manufacture	Curing & Firing: Gas Fired Tunnel Kilns	30500311	0.96	0.87		1.2	0.35	0.78	0.024	lb/ton produced
Brick Manufacture	Curing & Firing: Gas Fired Periodic Kilns	30500314	0.034	0.034		0.15	0.5		0.01	lb/ton produced
Brick Manufacture	Extrusion Line w/ fabric filter	30500342	0.0036	0.0036						lb/ton produced
Brick Manufacture	Dryer with Waste Heat and Supplement Gas	30500351	0.187	0.187		0.31	0.098	0	0.03	lb/ton produced
Gypsum Manufacturing	Continuous Kettle: Calciner	30501511	41	26	7					lb/ton product
Gypsum Manufacturing	Flash Calciner	30501512	37	14	4					lb/ton product
Gypsum Manufacturing	Impact Mill w/ fabric filter	30501513	0.02	0.02						lb/ton product
Gypsum Manufacturing	End Sawing (1/2 in x 4 ft x 8 ft) <sup>3</sup>	30501521	0.80	0.80						lb/100 sq ft board sawed
Gypsum Manufacturing	End Sawing (1/2 in x 4 ft x 12 ft) <sup>3</sup>	30501522	0.50	0.50						lb/100 sq ft board sawed
Stone Quarrying/Processing	Open Storage	30502007	0.25	0.12	0.02					lb/ton-yr product stored
Stone Quarrying/Processing	Drying	30502012	5	5						lb/ton stone dried
Electrical Equipment	Electrical Windings Reclamation Single Chamber Incinerator/Oven	31307001	4.7	4.7	4.7	10	3	2.5	3	lb/ton charged
Electrical Equipment	Electrical Windings Reclamation Multiple Chamber Incinerator/Oven	31307002	4.7	4.7	4.7	10	3	2.5	3	lb/ton charged
Transportation Equipment	Brake Shoe Debonding Single Chamber Incinerator	31401001	4.7	4.7	4.7	10	3	2.5	3	lb/ton charged
Transportation Equipment	Brake Shoe Debonding Multiple Chamber Incinerator	31401002	4.7	4.7	4.7	10	3	2.5	3	lb/ton charged
Government Solid Waste Disposal	Incineration: Sludge Multiple Hearth	50100515	8.2	8.2	8.2	31	5	20	1.7	lb/ton dried sludge burned
Commercial/Institutional Solid Waste Disposal	Incineration: General Multiple Chamber Incinerator	50200101	4.7	4.7	4.7	10	3	2.5	3	lb/ton waste burned
Commercial/Institutional Solid Waste Disposal	Incineration: Special Purpose Pathological & Cremation	50200505	5.92	5.92	5.92	0.6	11	1.4	0.2	lb/ton medical waste burned
Industrial Solid Waste Disposal	Incineration: General Multiple Chamber Incinerator	50300101	4.7	4.7	4.7	10	3	2.5	3	lb/ton charged
Feed and Grain Terminal Elevators	Shipping/Receiving	30200501	1	1						lb/ton grain processed

<sup>3</sup> For other thicknesses, multiply emission factor by 2 times board thickness (in inches).

Industry Category	SCC Description	SCC Code	Emissions Factors							Emissions Factor Unit
			PM	PM10	PM2.5	CO	NOx	SOx	VOC	
Feed and Grain Terminal Elevators	Transfer/Convey	30200502	2	2						lb/ton grain processed
Feed and Grain Terminal Elevators	Cleaning	30200503	0.034	0.034						lb/ton grain processed
Feed and Grain Terminal Elevators	Drying	30200504	0.22	0.22						lb/ton grain processed
Feed and Grain Terminal Elevators	Unloading (Receiving)	30200505	0.294	0.294						lb/ton grain processed
Feed and Grain Terminal Elevators	Loading (Shipping)	30200506	0.029	0.029						lb/ton grain processed
Feed and Grain Terminal Elevators	Removal from Bins (Tunnel Belt)	30200507	1.4	1.4						lb/ton grain processed
Feed and Grain Terminal Elevators	Elevator Legs(Headhouse)	30200508	1.5	1.5						lb/ton grain processed
Feed and Grain Terminal Elevators	Tripper (Gallery Belt)	30200509	1	1						lb/ton grain processed
Feed and Grain Terminal Elevators	Terminal Elevators: General	30200512	10.2	1.65						lb/ton of grain shipped or received
Feed Manufacture	Grain Receiving	30200802	0.017	0.0025						lb/ton grain received
Feed Manufacture	Shipping	30200803	0.0033	0.0008						lb/ton grain received
Feed Manufacture	Handling	30200804	5.5	1.95						lb/ton grain received
Feed Manufacture	Grinding	30200805	0.06	0.06						lb/ton grain received
Feed Manufacture	Pellet Cooler	30200806	0.1	0.1						lb/ton grain received
Feed Manufacture	Pellet Cooler (w/ Single Cyclone)	30200816	0.36	0.18						lb/ton grain processed
Secondary Aluminum Production	Sweating Furnace	30400101	14.5	13.3				0.02		lb/ton produced
Secondary Aluminum Production	Smelting Furnace/ Crucible	30400102	1.9	1.7						lb/ton metal produced
Secondary Aluminum Production	Smelting Furnace/ Reverb	30400103	4.3	2.3	0.85				0.2	lb/ton metal produced
Secondary Aluminum Production	Fluxing: Chlorination	30400104	1000	532	198					lb/ton chlorine used
Secondary Aluminum Production	Burning/Drying	30400109					0.9	2.9		lb/ton metal produced
Secondary Aluminum Production	Pouring/Casting	30400114					0.01	0.02	0.14	lb/ton metal charged
Secondary Copper Production	Copper Wire Burning: Incinerator	30400208	253	253				12.8	0.6	lb/ton of charge
Secondary Copper Production	Reverberatory Furnace Charge w/ Brass & Bronze	30400215	36	21.2					0.2	lb/ton of charge
Secondary Copper Production	Crucible & Pot Furnace Charge w/ Brass & Bronze	30400219	21	12.4				0.5		lb/ton of charge
Secondary Copper Production	Electric Induction Charge w/ Copper	30400223	7	7						lb/ton of charge
Secondary Copper Production	Electric Induction Charge w/ Brass & Bronze	30400224	20	20						lb/ton of charge
Secondary Copper Production	Fugitive Emissions Crucible Furnace	30400237	0.29	0.29						lb/ton of charge
Secondary Copper Production	Fugitive Emissions Electric Induction Furnace	30400238	0.04	0.04						lb/ton of charge
Secondary Copper Production	Fugitive Emissions Casting Operations	30400239	0.015	0.015						lb/ton castings produced
Secondary Metal Production	Gray Iron Foundries Electric Induction Furnace	30400303	0.9	0.86						lb/ton metal charged
Secondary Metal Production	Gray Iron Foundries Inoculation	30400310	4	4					0.005	lb/ton metal inoculated
Secondary Metal Production	Gray Iron Foundries Charge Handling	30400315	0.6	0.36						lb/ton metal charged
Secondary Metal Production	Gray Iron Foundries Pouring/Casting	30400320	4.2	2.06			0.096	0.02	0.14	lb/ton metal charged
Secondary Metal Production	Gray Iron Foundries Casting Cooling	30400325	1.4	1.4						lb/ton metal charged
Secondary Metal Production	Gray Iron Foundries Casting Knock Out	30400332							1.2	lb/ton sand handled
Secondary Metal Production	Gray Iron Foundries Grinding/Cleaning	30400340	1.7	1.7						lb/ton metal charged
Secondary Metal Production	Gray Iron Foundries Sand Grinding / Handling	30400350	3.6	0.54						lb/ton sand handled
Secondary Metal Production	Gray Iron Foundries Core Ovens	30400351	2.22	2.22			0.5	0.038		lb/ton sand handled
Secondary Metal Production	Gray Iron Foundries Castings Finishing	30400360	.032	0.0045						lb/ton metal charged
Secondary Metal Production	Gray Iron Foundries Shell Core Machine	30400370					0.5	0.32		lb/ton of cores produced
Secondary Metal Production	Steel Foundries Electric Arc Furnace	30400701	13	13			0.2	0.24	0.35	lb/ton metal processed
Secondary Metal Production	Steel Foundries Heat Treating Furnace	30400704					80.7	277	0.6	lb/ton metal processed
Secondary Metal Production	Steel Foundries Electric Induction Furnace	30400705	0.09	0.09						lb/ton metal processed
Secondary Metal Production	Steel Foundries Sand Grinding / Handling	30400706	0.54	0.54						lb/ton sand processed

Industry Category	SCC Description	SCC Code	Emissions Factors								Emissions Factor Unit
			PM	PM10	PM2.5	CO	NOx	SOx	VOC		
Secondary Metal Production	Steel Foundries Pouring/Casting	30400708	2.8	2.8			0.01	0.02	0.14	lb/ton metal processed	
Secondary Metal Production	Steel Foundries Casting Shakeout	30400709	26.2	26.2					1.2	lb/ton metal processed	
Secondary Metal Production	Steel Foundries: Knock Out	30400710							1.2	lb/ton sand handled	
Secondary Metal Production	Steel Foundries: Cleaning	30400711	1.7	1.7						lb/ton metal processed	
Secondary Metal Production	Steel Foundries Charge Handling	30400712	0.36	0.36						lb/ton metal processed	
Secondary Metal Production	Steel Foundries Castings Cooling	30400713	1.4	1.4						lb/ton metal processed	
Secondary Metal Production	Steel Foundries Shakeout Machine	30400714							1.2	lb/ton sand handled	
Secondary Metal Production	Steel Foundries Finishing	30400715	0.0045	0.0045				47.7	1.1	lb/ton metal processed	
Secondary Metal Production	Steel Foundries Core Ovens	30400717	0.9	0.9			0.5			lb/ton metal processed	
Secondary Metal Production	Steel Foundries Shell Core Machine	30400730					0.5			lb/ton of cores produced	
Secondary Metal Production	Steel Foundries Core Machines/Other	30400731					0.5			lb/ton of cores produced	
Secondary Metal Production	Malleable Iron Annealing	30400901							0.1	lb/ton metal charged	
Secondary Metal Production	Metal Heat Treating Furnace: General	30402201							0.1	lb/ton processed	
Secondary Metal Production	Metal Heat Treating Quench Bath	30402210							280	lb/ton processed	