

Note: This is a reference cited in AP 42, *Compilation of Air Pollutant Emission Factors, Volume I Stationary Point and Area Sources*. AP42 is located on the EPA web site at www.epa.gov/ttn/chief/ap42/

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Natural Gas
Combustion

AP-42 Section 1.4
Reference Number
16

Reference 12

**EMISSIONS ASSESSMENT OF CONVENTIONAL STATIONARY
COMBUSTION SYSTEMS: VOLUME III. EXTERNAL COMBUSTION SOURCES
FOR ELECTRICITY GENERATION**

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by:

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TABLE 125. SUMMARY OF EMISSION FACTOR DATA FOR FLUE GAS EMISSIONS OF PARTICULATES, CO, AND HYDROCARBONS FROM GAS-FIRED UTILITY BOILERS TESTED

Combustion Source Type	Site No.	Emission Factor, ng/J		
		Particulates	CO	Total Organics
Tangentially-fired	113	0.080	<3.5	0.50 - 1.10
	114	0.044	107	0.24 - 1.43
	115	0.014	220	0.94 - 2.52
Wall-fired	106	1.40	<190*	No Data
	106	0.013	<240*	No Data
	116	0.164	18	8.79 - 10.02
	117	0.001	12	0.13 - 1.24
	Mean $\bar{x}$	0.245	72	2.12 - 3.26
	s($\bar{x}$)	0.194	41	1.71
	ts($\bar{x}$)/ $\bar{x}$	1.93	1.60	1.45

*These CO data showed large "less than" values and were not used in the computation of the mean emission factor for CO.

TABLE 128. COMPARISON OF CRITERIA POLLUTANT EMISSION FACTORS
FOR RESIDUAL OIL- AND GAS-FIRED UTILITY BOILERS

Combustion Source Type	Data Source	NO _x	Emission Factor, ng/J			
			Hydrocarbons	CO	Particulates	SO ₂
Residual Oil-fired	Current Study	No Data	4.64	28	19.3	448**
	Existing Data	114*, 190†	No Data†	67.4	31.6	448**
	Combined Existing Data & Current Study	114*, 190†	4.64	56	29.5	448**
	EPA	147*, 309†	2.9	15	39.2	476
Gas-fired	Current Study	No Data	2.43	72	0.245	No Data
	Existing Data	124*, 233†	No Data†	14.6	No Data†	No Data
	Combined Existing Data & Current Study	124*, 233†	2.43	32.6	0.245	No Data
	EPA	126*, 294†	0.42	17	2-6	0.25

* For tangentially-fired boilers.

† For wall-fired boilers.

‡ EPA AP-42 emission factors were the only source of existing data.

** SO₂ emission factors for both current study and existing data were computed by assuming conversion of 95.22 percent of fuel sulfur to SO₂. The average sulfur content for the 11 residual oil-fired boilers tested was 1.03 percent, identical to the national average residual oil sulfur content.

TABLE 129. BEST ESTIMATES OF AVERAGE EMISSION FACTORS FOR CRITERIA POLLUTANTS

Combustion Source Type	Emission Factor, ng/J				SO ₂ (Uncontrolled)
	NO _x	Hydrocarbons	CO	Particulates**	
Bituminous Coal					
Pulverized Dry Bottom	259*, 379†	4.5	16.8	251	1407
Pulverized Wet Bottom	380	4.5	86.3	213	1407
Cyclone	678	9.5	82	57	1407
All Stokers	241	10.7	157	603	1407
Lignite					
Pulverized Dry Bottom	260	8.97	32.6†	62†	628
Cyclone	333	4.72	32.6†	132†	628
All Stokers	195	4.37	65.1†	615†	628
Residual Oil					
Tangentially-fired	114	4.64	56	29.5	448
Wall-fired	190	4.64	56	29.5	448
Natural Gas					
Tangentially-fired	124	2.43	32.6	0.245	0.25
Wall-fired	233	2.43	32.6	0.245	0.25

* For tangentially-fired boilers.

† For wall-fired boilers.

* Based on EPA AP-42 emission factors.

** Controlled for bituminous coal-fired and lignite-fired sources, uncontrolled for residual oil-fired and gas-fired sources.