

**E09 - ENGINE, DIGESTER GAS FIRED**

**CALCULATION METHODS**

$E_a = U_a \times EF \text{ (lbs/mmft}^3\text{)}$

$E_h = U_h \text{ (scfm)} \times (60/1000000) \times EF \text{ (lbs/mmft}^3\text{)}$

**NOTES:**

- Control efficiencies must be included in emission factors since the calculation procedure will not refer to this data.
- No particulate speciation table exists for digester gas combustion. The HCl factor has been estimated using chlorine content of raw gas.
- Emission factors for NOx, CO, and TOG are based on uncontrolled 2 cycle lean burn engine (AP-42) adjusted for the BTU content of digester gas as per AP-42 instructions (600 / 1000).
- The ROG factor is based on the speciation table which assumes the TOG content in the exhaust gas is composed of 52% CH4.
- Individual pollutant factors are estimated using the Pt Loma raw gas speciation (1996) and an assumed 98% destruction efficiency.

POLLUTANT	District Emission Factor	EPA REFERENCE	EPA	(UNITS)	COMMENTS
	(lbs/million ft3 fuel burned)	DOCUMENT	FACTOR		
NOX	1620.00	AP-42, Sect.3.2,10/96, Table 3.2-1	2.7	lbs/million BTU	
CO	228.00	AP-42, Sect.3.2,10/96, Table 3.2-1	0.38	lbs/million BTU	
SOX	2.00	AP-42, Section 3.1, 10/96, Table 3.1-1, e			Based on Pt Loma raw gas sulfur content and a 98% conversion to SOx.
TOG	162.00	AP-42, Sect.3.2,10/96, Table 3.2-1	0.27	lbs/million BTU	
ROG	77.76		48.00%	lbs/lb TOC	No ROG data in AP-42. Sect. 1.4, Table 1.4-3 for this size boiler.
TSP	27.60	AP-42, Sect.3.2,10/96, Table 3.2-2	0.046	lbs/million BTU	
PM10	27.60	AP-42, Sect.3.2,10/96, Table 3.2-2	100.00%	lbs/lb TSP	Assumes PM10 = TSP per EPA instructions.
ACETONE	0.0007				Based on Pt Loma raw gas content with a 98% DRE.
AMMONIA	0.0048				Based on Pt Loma raw gas content with a 98% DRE.
BENZENE	0.1782	EPA VOC Speciation Profile # 1001 1/90	0.11%	lbs/lb TOC	
1,3-BUTADIENE					
CARBON TETRACHLORIDE					
CHLORINE					
CHLOROBENZENE	0.0002				Based on Pt Loma raw gas content with a 98% DRE.
CHLOROFORM					
CHLOROFLUOROCARBONS					
DICHLOROBENZENE	0.0018				Based on Pt Loma raw gas content with a 98% DRE.
ETHYL BENZENE	0.0010				Based on Pt Loma raw gas content with a 98% DRE.
ETHYLENE DIBROMIDE					
ETHYLENE DICHLORIDE	0.0014				Based on Pt Loma raw gas content with a 98% DRE.
FORMALDEHYDE	1.3122	EPA VOC Speciation Profile # 1001 1/90	0.81%	lbs/lb TOC	
HEXANE	0.0648	EPA VOC Speciation Profile # 1001 1/90	0.04%	lbs/lb TOC	
HYDROGEN CHLORIDE	0.6455				Based on Pt Loma raw gas content with a 98% DRE.
HYDROGEN SULFIDE	0.0215				Based on Pt Loma raw gas content with a 98% DRE.
ISOPROPANOL					

METHANOL					
METHYLENE CHLORIDE	0.0001				Based on Pt Loma raw gas content with a 98% DRE.
METHYL ISOBUTYL KETONE					
METHYL ETHYL KETONE	0.0001				Based on Pt Loma raw gas content with a 98% DRE.
PERCHLOROETHYLENE	0.0005				Based on Pt Loma raw gas content with a 98% DRE.
PROPYLENE					
TOLUENE	0.0648	EPA VOC Speciation Profile # 1001 1/90	0.04%	lbs/lb TOC	
1,1,1-TRICHLOROETHANE	0.0001				Based on Pt Loma raw gas content with a 98% DRE.
TRICHLOROETHYLENE	0.0003				Based on Pt Loma raw gas content with a 98% DRE.
VINYL CHLORIDE					
VINYLDENE CHLORIDE					
XYLENES	0.0045				Based on Pt Loma raw gas content with a 98% DRE.

Last Updated on 8/23/99  
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