Index Boiler
Index Efficiency
Primer
Operations
Efficiency
Steam System
Emissions
Auto.& Controls
Resource Links
Home

Flue Gas Analysis Table

Introduction

See Flue Gas Analysis

Operation

Using a Flue Gas Analyzer or any meter designed to measure oxygen or carbon-monoxide, and taking the flue gas temperature and the temperature of the combustion air, the following Table can be used to determine combustion efficiency when operating on natural gas. The Temperature Column is the NET Difference between Flue Gas and Combustion Air Temperatures.

(Flue Gas Temp -minus- Combustion Air Temp)

Note that each fuel has its own characteristics. Therefore, these numbers are valid ONLY for natural gas.

Read Combustion Efficiency in the Column under the NET Temperature Difference, in the row for the measured O2% or CO2%.

Excess Air %	Excess O2 %	Excess CO2 %	Combustion Efficiency at Net Temperature Difference								
			170F	220F	270F	330F	380F	430F	480F	530F	580F
0.0	0.0	11.8	86.3	85.3	84.2	83.0	81.9	80.8	79.7	78.6	77.5
4.5	1.0	11.2	86.2	85.1	84.0	82.7	81.6	80.5	79.3	78.2	77.0
9.5	2.0	10.7	86.1	84.9	83.8	82.4	81.2	80.1	78.9	77.7	76.5
15.0	3.0	10.1	85.9	84.7	83.5	82.1	80.9	79.7	78.4	77.2	75.9
21.1	4.0	9.6	85.7	84.5	83.2	81.7	80.5	79.2	77.9	76.6	75.3
28.1	5.0	9.0	85.5	84.2	82.9	81.3	80.0	78.6	77.3	75.9	74.5

35.9	6.0	8.4	85.3	83.9	82.5	80.9	79.5	78.0	76.6	75.2	73.7
44.9	7.0	7.9	85.0	83.5	82.1	80.3	78.8	77.3	75.8	74.3	72.8
55.3	8.0	7.3	84.7	83.1	81.6	79.7	78.1	76.6	74.9	73.3	71.7
67.3	9.0	6.7	84.3	82.7	81.0	79.0	77.3	75.6	73.9	72.2	70.4
81.6	10.0	6.2	83.9	82.1	80.3	78.2	76.4	74.5	72.7	70.8	68.9
98.7	11.0	5.6	83.4	81.5	79.5	77.2	75.2	73.2	71.2	69.2	67.1
119.7	12.0	5.1	82.7	80.6	78.5	75.9	73.8	71.6	69.4	67.2	64.9
145.8	13.0	4.5	82.0	79.6	77.3	74.4	72.0	69.6	67.1	64.7	62.2
179.5	14.0	3.9	81.0	78.3	75.7	72.4	69.7	67.0	64.2	61.5	58.7
224.3	15.0	3.4	79.6	76.6	73.5	69.8	66.7	63.5	60.4	57.2	54.0

Source: Table extracted from: Boiler Efficiency Institute, "Boiler Efficiency Improvement" by David F. Dyer and Glennon Maples, Copyright 1991.

More Information

- Flue Gas Analysis
- Oxygen Control
- Combustion Air Control
- Air Infiltration
- Exhaust Draft Control
- Flue Gas Condensers

Source: Table extracted from: Boiler Efficiency Institute, "Boiler Efficiency Improvement" by David F. Dyer and Glennon Maples, Copyright 1991.