

**W1.32**

**Theoretical Oxygen and Air for  
Combustion and Products of Combustion**

Sr No	Substance	Reaction of Combustion	Unit	Theoretical		Gas Produced	
			kg/nm <sup>3</sup>	O <sub>2</sub> nm <sup>3</sup>	Air nm <sup>3</sup>	dry nm <sup>3</sup>	wet nm <sup>3</sup>
1	C	C to CO	kg	0.94	4.45	5.38	5.38
2	C	C to CO <sub>2</sub>	kg	1.87	8.89	8.89	8.89
3	H <sub>2</sub>	H <sub>2</sub> to H <sub>2</sub> O	nm <sup>3</sup>	0.5	2.38	1.88	2.88
4	S	S to SO <sub>2</sub>	kg	0.7	3.33	3.33	3.33
5	CO	CO to CO <sub>2</sub>	nm <sup>3</sup>	0.5	2.38	2.38	2.38
6	CH <sub>4</sub>	CH <sub>4</sub> to CO <sub>2</sub> + H <sub>2</sub> O	nm <sup>3</sup>	2	9.52	8.52	10.52

air/O<sub>2</sub> = 4.76

source : Onoda Manual

**basic data on air, gases and products of combustion**

<b>gas</b>	<b>formula</b>	<b>sp. Wt kg/nm<sup>3</sup></b>	<b>sp. Vol nm<sup>3</sup>/kg</b>
air		1.29	0.775
carbon monoxide	CO	1.25	0.800
carbon dioxide	CO <sub>2</sub>	1.98	0.505
nitrogen	N <sub>2</sub>	1.25	0.800
oxygen	O <sub>2</sub>	1.43	0.699
sulphur dioxide	SO <sub>2</sub>	2.93	0.341
water vapor	H <sub>2</sub> O	0.804	1.244

source : compiled