

On the Stability and Combustion Intensity of Pulverized  
Anthracite Flames

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ABSTRACT

Recent experiments on pulverized anthracite flames carried out by the International Flame Research Foundation at IJmuiden (Holland) are discussed. It is shown that ignition is considerably aided by the entrainment of hot combustion products into the fuel rich primary jet. This indicates that it is advantageous if the mixing between the primary jet and the rest of the combustion air is preceded by the mixing of the primary jet with the hot combustion products.

Experimental evidence to prove this point is presented. Flame stability improves also with finer grinding. Flame speeds in this case increase partly due to the increased radiation from the flame front owing to the burning of the fine particles and also due to the higher absorption of such a dust cloud. It is shown from the comparison of the values of "mixedness" and "reactedness" along the flames that the combustion of the solid residue follows mixing more closely in flames with finer ground pulverized anthracite. The rates of combustion of the anthracite calculated from measurements on jet flames are of the same order of magnitude as those determined in a laboratory "plug flow" type flame.