

ENVIRONMENTAL CHARACTERISTICS OF CYLINDRICAL RADIANT BURNERS

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Abstract: The environmental characteristics of burners with hollow cylindrical emitters operating in the internal combustion mode, when the fuel mixture completely reacts in the volume of emitter, have been experimentally investigated. The effect of porous structure of the intermetallic Ni–Al emitter, firing rate, and the methane–air ratio was discussed. It was found that control of the emitter structure and the mixture composition can provide the low NO_x and CO concentrations up to the best world standards. It was found that the main approach to control the concentrations of nitrogen oxides and carbon monoxide in the flue gases is to control the air–fuel ratio. At the ratio more than 1.35 for firing rate 160 kW/m², the concentrations were as follows: CO < 60 ppm and NO_x < 15 ppm; for firing rate 420 kW/m² — CO < 5 ppm, NO_x < 15 ppm. Reduction of the concentration of CO down to 40 ppm under firing rate of 160 kW/m² can be achieved by coarsening the porous structure of the emitter.

Keywords: radiant burner; infrared burner; porous burner; ecology; nitrogen oxides (NO_x); carbon monoxide (CO)

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