

Combustion characteristics of fiber mat catalytic burners

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Fiber mat catalytic burners have been known to effective heat source in industrial drying processes using low temperature heat since combustion heat can be transferred to absorptive body by far-infrared radiation. In order to extend the application of fiber mat catalytic burner, novel fiber mat catalytic burners were manufactured and combustion characteristics of them was investigated. For diffusive catalytic burners, combustion efficiency was significantly affected by the installation method and the temperature around of catalytic bed effects the combustion efficiency due to diffusion velocity of oxygen. For premixed catalytic combustion, tubular heat exchangers were installed into the catalytic mat and fuel gas was preheated by passing them. It is seen that unburned hydrocarbons in exhaust gas were decreased with pre-heating of fuel gas in premixed catalytic combustion. Also, we made an attempt to control of catalytic mat temperature by regulating radiant heat. As a result, temperature difference between front and behind the catalytic mat was significantly decreased and the combustion efficiency of fiber mat catalytic burner was increased.