

Development of High Performance Regenerative Burner System Adopting Fuel and Air Staging Technology

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This study has been performed to develop a low NO_x regenerative burner capable of suppressing the NO_x emission of lower than 50 ppm. A pilot scale experimental furnace enabling the combustion of LNG up to 200,000 kcal/h were prepared to conduct regenerative combustion. Various types of model burners were designed and fabricated to derive a low NO_x burner model. Combustion experiments were performed for model burners to check exhaust gas composition with increasing furnace temperature up to 1,200°C. By adopting the two-staged injection principle for both air and fuel, the NO_x emission could be maintained under 40 ppm under normal regenerative combustion condition. The so-called flameless combustion was accomplished at the furnace temperature of higher than 1,050°C by high speed injection of air and fuel..