Combustion Characteristics of a Fuel/Air Double-Staged Regenerative Burner

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This study has been performed to develop a high performance regenerative burner to enhance temperature uniformity and to reduce NOx emission. Combustion tests have been done using an experimental furnace for various burner models adopting air and fuel staging principle. It was found that a sufficient mixing of air and fuel jets is required to increase combustion completeness. NOx emission was decreased with increasing air/fuel velocity. The wetted perimeter of the air nozzle was found to be an important design parameter for air/fuel mixing. Under proper conditions, the temperature distribution in the furnace showed flat curve to maintain the NOx emission of under 50 ppm.