

Development of a Dual Fuel Burner for the Combustion of COG and LNG

조길원*, 조한창, 홍정구
포항산업과학연구원
(kwcho@rist.re.kr*)

This study has been carried out to develop a reheating furnace burner capable of firing COG (coke oven gas) and LNG (Liquefied Natural Gas) simultaneously. Full-scale co-firing tests have been performed for various burners using appropriate experimental apparatus. The major target of this study was to develop an auxiliary fuel nozzle for maximum injection of LNG while co-firing COG. The injection of LNG into the center pipe of the burner with controlling the COG supply showed acceptable combustion performance except the flame structure. The flame dimension was expanded markedly with the increase of LNG injection and the flame changed into unstable with LNG injection. A swirling fuel nozzle, having swirling vanes inside a round pipe, showed remarkable improvement in flame stability. It was shown that a burner equipped with a swirling fuel nozzle could keep the flame dimension similar to COG firing. Optimization tests were carried out to determine the degree of swirl vanes as 60° and the minimum requirement of COG co-firing as 100Nm³/h. To maximize the LNG injection, the supply pressure of LNG at burner inlet should be maintained over 1,300mmAq. It was concluded that LNG can be co-fired with COG up to 60~70% of burner capacity by installing a swirling fuel nozzle.