

2012

TUNDISH POWDER ASSESSMENT FOR CONTINUOUS CASTING STEEL

A. BALASKA, A. HAMOUDA, T. CHOUCANE, H. MERADI, M.H. SAMAR

Abstract : A highly competitive steel market requires the steelmaker to be sensitive to customer demands in terms of product properties, quality, price and delivery. The continuous casting tundish serves as an interim reservoir when liquid steel is transferred from the ladle to the continuous casting mould. Several researches were devoted to study the thermal insulation properties of mold lubrication powders. In this work we have focused our attention to evaluate covering powders for continuous casting steel. The aim is utilization of Algerian diatomite as a covering powder in the tundish; we determined several chemical and thermo-physical properties of the diatomite. The SEM pictures showed that the diatomite has a high porosity and cylindrical form of particle. FTIR studies show the presence of quartz, and different mineral matters. The elemental analysis of diatomite shows that silica oxide is present in major quantity whereas XRD confirms the presence of all minerals in diatomite sample and shows the high amorphousness of silica. Heat insulating property of diatomite has been demonstrated by many thermal studies, the thermal conductivity of diatomite was increased over the range of 25 – 1100°C from 0.378 W.m-1K-1 to 1.438 W.m-1K-1. The DSC/TGA thermal analysis and the hot stage microscope were performed to follow the stage changes during this treatment. We have obtained two transformations: first, endothermic at 760°C with 12.5% loss of mass, the second exothermic at 897°C and fusion of powder was at 1470°C

Keywords : Tundish, heat insulation, diatomite, characterization, Thermal Properties