

Effect of Al₂O₃ and FeO Composition on RDI in Sintering process

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ABSTRACT (USE 'HEADING 1' STYLE)

RDI (Reduction Disintegration Index), one of the sinter quality factors, indicates the degree of disintegration by the reducing gas at about 550°C in the middle of the blast furnace shaft. This is related to the permeability and reduction reaction of gas in the blast furnace, so appropriate quality control is essential. RDI is influenced by micro structure, pore, and chemical composition in the sintered ore. Particularly, it is affected by chemical composition factors such as slag volume, basicity (CaO / SiO₂), MgO, Al₂O₃ and FeO. Of these, Al₂O₃ and FeO vary the most depending on the type of iron ore and the operating conditions. Therefore, it is necessary to quantitatively evaluate the effect of Al₂O₃ and FeO changes on RDI in HSC conditions. The decrease of FeO 0.1% in the sintered ores increased RDI by about 0.2%. Since FeO in the sintered ores is determined by the sintering reaction, it can be controlled by changing the operating conditions. When the content of Al₂O₃ was lower than 1.95%, the RDI increased by 0.1% when Al₂O₃ was increased by 0.1%. When Al₂O₃ content was higher than 1.95%, it was confirmed that RDI increased 0.5% when Al₂O₃ was increased by 0.1%. In other words, RDI control is very difficult if the alumina content is greater than 1.95%. When the quantitative evaluation of the effect of basicity and MgO on RDI is completed, RDI control is possible through blending of raw materials.