

Improvement of Sinter Strength and Reducibility through Promotion of Magnetite Ore Oxidation by Use of Separate Granulating Method

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In general, Fe content in iron ore is gradually decreasing. This fact affects worse performance of BF operation, for example, increase of RAR and Slag ratio. Depletion of high grade iron ore deposits is moving us to use concentrates in sintering process.

Through magnetite concentration deteriorates reducibility because of high FeO content in sinter product. Such situation makes it to promote oxidation of magnetite iron ore during sintering process for improving sinter reducibility. In addition, promoting oxidation of magnetite possibly increases sinter strength with using oxidation heat.

Sinter research group in Japan consisting of both universities and Iron and Steel making companies for utilization of magnetite concentration suggests that restricting melt formation is critical for promoting oxidation of magnetite concentration.

In this paper, It is confirmed that “Separate Granulation” has been examined to apply their suggestion by sinter pot test.

The main results obtained are described as follows:

When divided granulation by the above blending is adopted, FeO in the iron ore decreases, and both sintering reducibility and cold strength were improved.

- (1) From sinter structure, pore integration suppression, pore low circularity, mineral refinement was confirmed. These observation results are matched with melt suppression during sintering.
- (2) Magnetite reduction and hematite rise in the sintered mineral were confirmed. This result corresponds to the FeO decrease in (1) above.
- (3) From the above (1) to (3), it is thought that this separate granulation method promotes oxidation of magnetite ore by suppression of melting reaction, resulting in improvement in sintering reducibility and sinter strength.

Keywords : sinter; magnetite; separate granulation; reducibility; sinter strength; iron ore.