Strategy for efficient utilisation of low grade iron ores in sintering

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ABSTRACT

Magnetite concentrate is typically high in Fe grade and releases heat when oxidised. Hence it is an ideal sweetener to maintain sinter grade and quality when high proportions of low grade ores are used in the blends. However often magnetite concentrate is very fine and more costly. It is therefore important to develop strategies for its effective utilisation to improve the sinter quality while lowering the raw material cost. Three possible blended ores consisting of two low grade ores and one high grade magnetite concentrate were first proposed based on the fundamental characteristics and cost of the individual ores. Pilot scale sinter pot tests were further conducted at 20% of the proposed blended ores in a typical JSM blend. All the blends containing 20% of the proposed blended ores achieved the acceptable quality required for pot grate sinter. Compared with the base blend (a typical JSM blend), the blends containing 20% of the proposed blended ores achieved considerably better productivity despite they were fired at slightly high fuel rates. Overall the sinter from the blends containing the proposed blended ores is only slightly weaker as evidenced by TI and mean sinter size.