

High Temperature Characteristics of Different Types of Blast Furnace Ferrous Materials

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ABSTRACT

The blast furnace cohesive zone has a profound impact on hot metal productivity and quality, fuel consumption, operational stability and the lining life of the blast furnace. The high temperature properties of ferrous burden materials determine the configuration and location of the cohesive zone and have therefore attracted particular attention. While numerous standard testing methods are in use to assess the quality of ferrous burden materials for the blast furnace, these simple tests are generally conducted under fixed conditions, which often represent the extreme situations encountered by the burden materials in the blast furnace. Furthermore, none of these simple tests provides information on the high temperature properties of the burden materials, such as their softening and melting properties. CSIRO is equipped with a fully computerised testing facility to characterise the high temperature properties of ferrous burden materials under realistic conditions similar to those encountered in the blast furnace. This paper will first review the CSIRO softening and melting test method and then discuss the softening and melting properties of a variety of blast furnace burden materials, including sinter, pellets and lump ore, and their implications for blast furnace operation.