

Penetration Behavior of Initial Sinter Melt into Natural Iron Ore Substrates

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ABSTRACT

Sinter quality depends heavily on the mineral phases, textures and physical structure of the sinter, which are formed upon solidification of the sinter melt. The interaction of sinter initial melt with its surrounding materials will impact the properties of the sinter melt and consequently the solidified structure and quality of resultant sinter. Spreading and penetration are two important phenomena dictating the interaction of the initial melt with its surrounding materials, such as nuclei particles and adhering fines. In the present study, the penetration behaviour of initial melt into various natural iron ore substrates during sintering was studied using laboratory scale penetration tests. The penetration depth and length was found to increase with temperature and vary with the type of natural iron ore substrates due to their unique pore structure, chemical compositions and mineral compositions.