

Investigation of the Cooling and Uniformity Effectiveness in a Sinter Packed Bed

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Abstract : When sinters are filled into the cooler from the sintering machine, and the non-uniform distribution of the sinters leads to uneven cooling. This causes the temperature difference of the sinters leaving the cooler to be so large that it results in the conveyors being deformed by the heat. The present work applies CFD method to investigate the thermo flowfield phenomena in a sinter cooler by the Porous Media Model. Using the obtained experimental data to simulate porosity (ϵ), permeability (κ), inertial coefficient (F), specific heat (C_p) and effective thermal conductivity (k_{eff}) of the sinter packed beds. The physical model is a similar geometry whose Darcy numbers (Da) are similar to the sinter cooler. Using the Cooling Index (CI) and Uniformity Index (UI) to analyze the thermo flowfield in the sinter packed bed obtains the cooling performance of the sinter cooler.

Keywords : porous media, sinter, cooling index (CI), uniformity index (UI), CFD

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