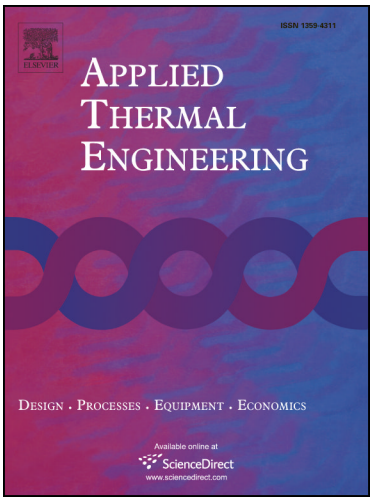

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Theoretical study on the cooling procedure for vertical flow sinters

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Abstract: Sinter cooling is an important process in the sinter production process. This article analyses the sinter cooling procedure in a new vertical cooling device. The analysis model is established to study the pressure drop and the heat transfer and is used to analyse several conditions. The results show that the analysis model is reliable for predicting the operational parameters and achieving the preliminary projected dimension. The parameters such as the cooling air temperature and the cooling air superficial velocity non-uniformly vary along the cooling device. When the cooling device diameter is set as an independent variable, the normal volumetric flow rate is not related to the cooling device diameter. The cooling time increases with the increase in cooling device diameter, whereas the sinter layer height is negatively correlated to the cooling device diameter. When the sinter flow rate is set as an independent variable instead of the cooling device diameter, the cooling time decreases, whereas the sinter layer height increases with the increasing sinter flow rate. Both cooling time and sinter layer height decrease with the increase in hot sinter temperature. Importantly, the pressure drop is minimal with variation of the hot sinter