



## 论文摘要

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### 双辊铸轧中辊套传热的集肤效应 及最大铸轧速度

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**摘要:** 基于热平衡原理,用大型通用有限元分析软件ANSYS建立了双辊连续铸轧中辊套二维稳态传热计算模型;分析在不同转速、材料和内冷等工况下旋转辊套的传热规律,揭示了辊套传热的“集肤效应”和铸轧不同板坯厚度时能够达到的最大铸轧速度.仿真研究表明:随着铸轧速度的提高,“集肤效应”越明显;改变内冷条件,如与内部冷却水的换热系数从 $5\ 000\ \text{W}/(\text{m}^2\cdot\text{K})$ 增至 $25\ 000\ \text{W}/(\text{m}^2\cdot\text{K})$ ,铸轧速度提高不明显;而应用导热性能好的铜辊套,由于其热穿透能力提高,铸轧速度大大提高.

**关键字:** 双辊连续铸轧;集肤效应;温度;热流;辊套

### Analysis for skin effect of heat transfer in the roller and the maximal casting velocity during two-roll casting

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**Abstract:** According to the theory of thermal balance, the two-dimension steady model for heat transfer in the roller was constructed during two-roll casting by using the FEM analysis software of ANSYS, the rule of heat transfer was analyzed under various conditions, such as velocity, material and inner cool condition. Then, the effect of skin was revealed and the maximal velocity was worked out in casting strips of various thickness. The results show that the effect of skin was more obvious with the increase of the velocity, while increasing the water flux could not result in the increase of the velocity, for example, the convection heat transfer with the cooling water increased from  $5\ 000\ \text{W}/(\text{m}^2\cdot\text{K})$  to  $25\ 000\ \text{W}/(\text{m}^2\cdot\text{K})$ , the velocity increased slightly, but with the bronze roller, the velocity increased greatly.

**Key words:** two-roll casting; skin effect; temperature; heat flux; roller

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