



论文摘要

中南大学学报(自然科学版)

ZHONGNAN DAXUE XUEBAO(ZIRAN KEXUE BAN)

Vol.32 No.2 Apr.2001

[PDF全文下载] [全文在线阅读]

文章编号: 1005-9792(2001)02-0192-04

外冷在铝材铸轧过程中的作用机理

高志, 肖刚, 钟掘

(中南大学机电工程学院, 湖南长沙 410083)

摘要: 外冷技术是实现铝材超薄快速铸轧的关键技术之一, 它通过在铸轧过程中对铝板和辊套外表面进行强制冷却以达到提高系统的传热能力, 增加铸轧速度, 提高铝材质量的目的. 作者在研究了铸轧过程传热模型和辊-板系统温度场特点的基础上, 分析了外冷板面和辊面对辊套和铝板的温度场及铸轧速度的影响规律. 研究表明: 随着铸轧速度的提高, 外冷板面对提高铸轧速度的影响逐步减少, 而外冷辊面对提高铸轧速度的影响逐步增强. 造成这一现象的原因在于外冷板面和外冷辊面对提高铸轧速度的作用机理不同, 因此, 应将辊面外冷作为外冷技术的发展方向, 通过采用高效外冷介质, 合理设置外冷区间来满足超薄快速铸轧对外冷技术的要求. 本研究对确定铝材铸轧过程中的外冷技术方案, 具有重要的意义.

关键字: 铝材; 铸轧; 外冷

The mechanism research of external cooling in aluminum cast-rolling process

GAO Zhi, XIAO Gang, ZHONG Jue

(College of Mechanical and Electrical Engineering, Central South University, Changsha 410083, China)

Abstract: External cooling technology is one of the key technologies to realize fast-cast-rolling process of aluminum, i.e. using compulsive cooling on the outside surface of plate and rollers to attain the aim of improving the cooling ability of system, increasing cast-rolling speed, enhancing aluminum plate quality. This paper analyzed the influence of external cooling surfaces of the board and the roller on the temperature field of the roller and the board as well as cast-rolling speed, based on the researching heat transfer model of cast-rolling process and the characteristics of roll-plate system temperature field. It is shown that, with the increase of cast-rolling speed, the influence of cooling board surface on increasing cast-rolling speed is gradually decreasing, while the influence of cooling roller surface on increasing cast-rolling speed is gradually increasing. The reason for this phenomenon lies in the different mechanisms for improving cast-rolling speed of external cooling plate surface and roll surface. Therefore, external cooling of rollers surface should be regarded as the developing direction of external cooling technology; through applying high efficiency external cooling media and rationally setting up external cooling area, the requirement of fast-cast-rolling process for the external cooling technology might be satisfied. The research is very important in working out external cooling technology scheme.

Key words: aluminum; cast-rolling; external cold

有色金属在线 中国有色金属权威知识平台

版权所有：《中南大学学报(自然科学版、英文版)》编辑部

地 址：湖南省长沙市中南大学 邮编： 410083

电 话： 0731-88879765 传真： 0731-88877727

电子邮箱： zngdx@mail.csu.edu.cn 湘ICP备09001153号