

研究论文

热轧工艺对Cr12钢表面起皱的影响机制

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摘要: 研究了热轧工艺对Cr12钢表面起皱相关的组织和织构演变的影响, 重点关注其对变形组织不均匀和晶粒簇形成的改变。结果表明: 随着热轧终轧温度由960降低到850°C, 在变形组织中带状晶粒减薄, 剪切变形比重增大, 含有剪切带的晶粒增多, 由表层向中心层逼近, 中心层附近光滑带状晶粒减少; 在退火组织中由含有剪切带晶粒形成的高r值晶粒簇增多, 由光滑带状晶粒形成的低r值晶粒簇减少, 而且带状晶粒的减薄使具有 $\epsilon 23$ 正负差异的不同对称取向晶粒簇消退, 因此基体中 $\epsilon 33$ 和 $\epsilon 23$ 的差异均减小, 表面起皱减弱。

关键词: 金属材料 铁素体不锈钢 起皱 热轧 显微组织 织构

Effect of Hot Rolling Process on Surface Ridging of Cr12 Ferritic Stainless Steel

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Abstract: The effect of hot rolling process on microstructural and textural evolutions associated with surface ridging of Cr12 ferritic stainless steel sheet was investigated. Special attention was paid to changes in the heterogeneity of deformed microstructure and the formation of grain colonies during annealing. The results show that: when finishing temperature of hot rolling decreases from 960 to 850°C band-like grains decrease in thickness, meanwhile shear deformation and grains containing shear bands increase and extend from surface to mid-thickness with the decrease of smooth grains in the deformed microstructure. In the annealed microstructure, high r - value grain colonies derived from the grains with shear bands increase and low r - value ones derived from smooth grains decrease. Moreover the decreasing thickness of band-like grains suppresses the formation of grain colonies of different symmetric orientations with positive or negative $\epsilon 23$. So both differences of $\epsilon 33$ and $\epsilon 23$ in the matrix decrease and surface ridging declines.

Keywords: metallic material ferritic stainless steel ridging hot rolling microstructure texture

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