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薄壁白铜管坯电磁连铸

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摘 要：为获得高质量的薄壁白铜管坯，提出了在水平连铸过程中施加旋转电磁场的管坯连铸新方法，并采用BFe10-1-1合金进行实验，考察了电磁场对白铜管坯表面质量、凝固组织和力学性能的影响。结果表明：在连铸过程中施加旋转电磁场能够提高金属液的流动性和充型能力，消除表面裂纹缺陷，从而制备出表面光滑的薄壁白铜管坯；在电磁力的作用下管坯凝固组织显著细化，富镍相由针状转化为团块状，同时铸造应力由未施加电磁场时的7.2 MPa下降至0.32 MPa；随着凝固组织的改善，施加磁场的管坯抗拉强度和伸长率与未施加磁场管坯的相比分别提高5%和36%。

关键字： 白铜合金；管坯；连铸；旋转电磁场

Thin-walled tube billets of cupronickel alloy by electromagnetic continuous casting

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Abstract:A new method was proposed by imposing a rotating electromagnetic field during horizontal continuous casting of thin-walled cupronickel tube billets. The effects of electromagnetic field on the surface quality, solidification structure and mechanical properties were investigated experimentally by use of BFe10-1-1 alloy. The results show that, when the electromagnetic field was applicated, the flowability and filling capacity of cupronickel alloy are increased, the surface cracks are eliminated, and the thin-walled cupronickel tube billets with smooth surface can be obtained due to the increase of flowability and filling capacity of cupronickel alloy. The solidification structure of the tube billets is evidently refined, the shape of Ni-rich phase changes from needle-like to bulk and the casting stress declines from 7.2 to 0.32 MPa. With the structure improving, the tensile strength and elongation increase by 5% and 36%, respectively, than those of ordinary continuously cast tube billets.

Key words: cupronickel alloy; tube billets; continuous casting; electromagnetic field