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Thermal simulation method of solidification process in heavy ingot

Jing Zhao; Zhishuai Xu; Renxing Li; Qijie Zhai, Tangshan University

ABSTRACT

This paper presents a method of thermally simulating the solidification process in heavy ingot and introduces a device which was developed for thermal simulation. The cooling curve of heavy steel ingot in the solidification process was calculated through numerical simulation software and adopted as control conditions for thermal simulation unit. The thermal simulation recurrence the solidification structure of hundreds of tons ingot in a small ingot of 20 kg.This simulation method makes up the disadvantages of only using numerical simulation or ingot dissection and provides a research measure of researching the solidification structure of heavy ingots under slow cooling conditions. The solidification process of 230 tons low pressure rotor steel ingot was simulated by the device. The solidification structure of the ingot is coarse dendrite, which is almost consistent with the ingot dissection results. It is showed that this method can achieve the goal of simulating the solidification structure under slow cooling conditions.

KEYWORDS: heavy ingot, numerical simulation, thermal simulation, solidification structure