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Effect of double circuits electroslag remelting process on the ingot quality and corrosion resistance of S136 steel

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This paper investigates the effect of different electroslag remelting processes on the solidification quality and corrosion resistance of S136 steel. The results show that the double circuits process can reduce the mass fraction of oxygen in the ingot and effectively improve the cleanliness of the ingot. Analyzing the solidification quality of ingots, it can be seen that the secondary dendrite spacing in the ingot heart position obtained by the double circuits process can be reduced by 46.04 μm compared with the traditional electroslag remelting process, and the segregation of C and Cr elements in the ingot can be effectively reduced. The average diameter of inclusions in the ingots obtained by the double circuits process was reduced by 0.18 μm (0.5 R), the number of inclusions was reduced by 38.63 % (0.25 R), and the integral number of inclusions was reduced by 41.83 % (0 R) compared to the traditional process. Electrochemical experiments on experimental steel in the tempered state, the experimental steel pitting pits obtained from the double circuits process are smaller in size and more diffuse in distribution, the depth of the pits is reduced, and the corrosion resistance is improved.

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