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Reducing the risk of blowholes in heavy steel plates: causes to consider

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The comprehensive metallographic analysis and statistical big-data analysis of blowhole appearance in heavy plate manufacturing gave no exact cause of defect formation but indicated differences in the chemical composition of defective and clean heavy plates and, above all, high content of residual elements. The rare BHs were found in the largest width ingot and on thinner plates that can be connected with open of blowholes after a thick layer of scale is removed after reheating. Non-metal inclusions in areola around blowholes have a higher content of silicon and manganese, possibly forming by casting mixture particles entrapping and dissolved by liquid steel at pouring. The copper-enriched phases were found in the formed scale and on the interface between metal and scale making them characteristic of hot-shortness defects which difficult to differentiate from blowholes. The ways to eliminate the risk of blowhole formation and ensure the highest quality and efficiency of cast ingots are proposed.

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