Cause analysis of spot rust defects on the surface of special steel SCM415 pickling plate

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Abstract The formation reasons of corrosion defects on the surface of special steel SCM415 pickling plate were analyzed using scanning electron microscopy (SEM), energy dispersive spectroscopy (EDS), electron probe microanalysis (EPMA) and other methods. The results showed that the corrosion defects were in the form of nearly circular thin films with sizes ranging from 300-800 microns. The main components of the corrosion site were Mn and O elements, with almost no Cr element. The corrosion defects are closely related to the state of oxide scale on the surface of hot-rolled steel plates. During the hot rolling heating furnace and high-temperature rolling process, uneven Cr and Mn oxidation products are generated on the surface of the slab, and localized Cr depletion occurs, leading to preferential corrosion after acid washing. By adding an appropriate amount of Si element to the steel and using low-temperature tapping to increase the hot rolling process in the furnace, the uneven enrichment of Cr can be effectively reduced, and the spot defects after acid washing can be greatly reduced.

Keywords spot rust defects; pickling plate; oxidation scale;furnace time

Reference

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