An inventive method to prevent hot-formed steel from oxide spalling

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Abstract The "dual carbon" objective strongly promotes energy conservation and emission reduction. Each 10% reduction in an automobile's weight correlates with an 8% decrease in carbon emissions, therefore making automobile lightweighting becoming a predominant trend in industrial advancement. Hot-formed steel has excellent plasticity and toughness, significantly reducing the weight of the vehicle body and facilitating lightweight construction while ensuring safety performance. Nonetheless, a significant issue with hot-formed steel is the substantial formation of oxide scale on its surface during heating. The binding force between the oxide scale and the matrix is inadequate. Consequently, it is imperative to suggest a solution to mitigate the aforementioned deficiencies. Our study has created an innovative, cost-effective anti-oxidation technology for hot-formed steel, tailored to the specifications of current production lines, to address the issue of oxide scale detachment, facilitate independent research and development, thereby expediting the strategic advancement of lightweight automobiles.

Keywords High temperature corrosion; Oxidation scale; Electrochemical impedance spectroscopy; Hot-formed steels

Reference

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