



Swansea University
Prifysgol Abertawe

Speaker 10

Blistering formation in high strength steels (HSS) during hot rolling



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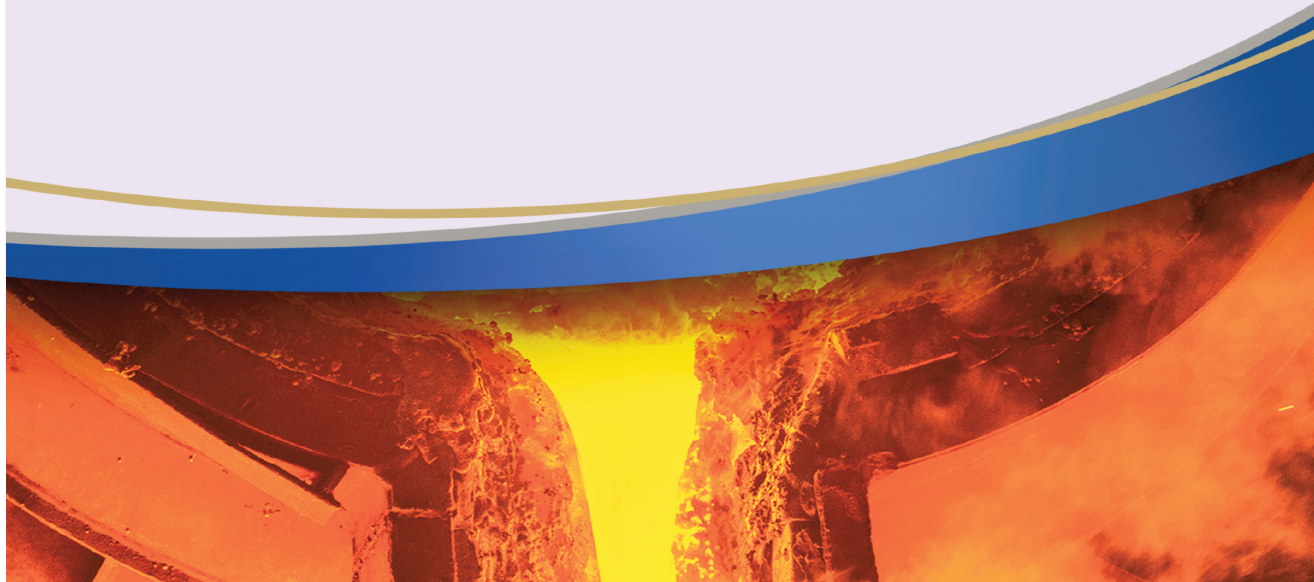
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ABSTRACT:

Blistering is the detachment of scale at high temperature, producing bubble-like features in high strength steels (HSS) which cause surface defects in rolled product. A high Si GOES (grain oriented electrical steel), and a high Mn steel was examined to discern the influence of chemical composition on the formation mechanism.

Samples were oxidised in a thermo-gravimetric analyser (TGA,) with an air velocity of 10litres $[\text{min}]^{-1}$, over a temperature range of 750-1200°C and held at temperature in an argon atmosphere for 10minutes, then oxidised in air for 600s, 60s, 30s, 15s and 4s respectively. The conditions were selected to simulate hot rolling with the approximate formation of secondary and tertiary scales in the finishing mills. Blisters were characterised using EBSD, EDX, Raman Spectroscopy, nanoindentation, FIB and FEG-SEM imaging. The thermodynamics and kinetics of these reactions were shown to differ greatly between the two steel grades, producing blistering regimes unique to each grade.



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