Optimisation of thermomechanical treatments to improve the geometry and the mechanical properties of high strength steel heavy products - Final report

Funded under: ECSC-STEEL C

Abstract


The main objective of this project was to reduce the costs and delays in rolling and heat treating carbon and low-alloyed steels through improved monitoring. Particular attention was paid to the suppression of rejects due to defects, to increasing service properties of the final products, and to reducing the distortion of thick plates, providing savings in metal, energy, time and costs. The report outlines the development of numerical models for predicting microstructure, residual stresses and distortions during heat treatment and taking into account phase transformations and carbon content heterogeneities. After modelling the mechanical behaviour of 40 CrMnMo 8 steel during the hot rolling and in the interstand, the influence of carbon segregation on flow curves was investigated. A model for calculating phase transformation kinetics in steels has been developed, and the effects of phase transformations on the thermomechanical behaviour of the material have been taken into account.

Additional information

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Last updated on 2002-04-19
Retrieved on 2020-01-15


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