

Industrial validation of microstructure evolution prediction tool

RSProSim (Rolling Schedule Process Simulator)

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The aim of the study was the industrial validation of a tool to predict microstructure evolution during hot rolling. The simulations of the microstructure development were carried out with the developed software RSProSim. The input parameters for predicting the microstructure during hot rolling (strain, strain rate, temperature) resulted from finite element modelling (FEM) using industrial rolling parameters. The evaluation was carried out for the stainless steel grade 1.4404 (AISI 316L) using two industrially rolled plates with thicknesses of 12 mm and 50 mm. The microstructure was predicted for five different positions in the plate cross-section (S1, Q1, M, Q2, S2) and compared with the microstructure of industrially rolled plates. The grain size distribution was compared between the predicted results and samples from hot rolled plates. The influence of thermomechanical parameters on the simulated and measured grain size distribution was evaluated.

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