

# Physical Modelling of Controlled Rolling and Cooling of HSLA Steel of the C-Mn-V-B Type

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*Influence of finish rolling conditions and parameters of final cooling on structural properties of bars made of the microalloyed structural steel with chemical composition 0.17 C – 1.26 Mn – 0.31 Si – 0.10 V – 0.0009 B – 0.017 N (in wt.%) was investigated by two modes of physical modelling. Simulation experiments were performed on the laboratory rolling mill TANDEM and on the hot deformation simulator HDS-20 with main components of the plastometer Gleeble 3800. It was confirmed that insufficient magnitude of deformation at the last reduction (with strain 0.9 or 0.21) cannot ensure the desired phenomenon of temperature controlled finish rolling. Influence of the cooling rate of the final rolled product appeared to be much more important than influence of the finish rolling temperature, which was chosen between 800 – 980 °C. The collateral target consisted in metallographic verification of agreement of the samples' microstructures obtained by simulations of the same modes of thermo-mechanical treatment on the laboratory rolling mill and on the advanced compression plastometer, the first and only of its kind in the Czech Republic.*

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