

Coiling simulations of medium-Mn sheet steels using dilatometry

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Abstract:

The work presents the results of coiling simulations of two medium manganese steels containing 3 and 5% Mn. The steels were subjected to the heat treatment including an austenitization at 1000°C for 300s and next isothermal holding at temperatures of 750, 700, 650 and 500°C for duration of 5 hours. The results of dilatometric analysis showed that in case of the 3Mn steel the ferritic transformation occurred during the isothermal holding at 750 and 700°C. The amount of ferrite created during this step at 750°C was smaller compared to 700°C. Lowering the temperature to 650°C led to a transformation lack during the holding time. At 500°C a bainitic transformation occurred. Increasing the manganese content resulted in prolonging the incubation time before any transformations. For the 5Mn steel for all isothermal holding temperatures no transformation occurred within 5 hours. The conclusion was that manganese shifted significantly the ferritic and bainitic regions to longer times.

Key words:

Medium-Mn steels, dilatometric analysis, phase transformation kinetic, AHSS