

Effect of soaking temperature on the microstructure and mechanical properties of heat treated Al-Si-Nb TRIP steel

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Abstract:

Two-step heat treatment with bainitic hold at 425 °C was applied to low alloyed high strength steel with partial substitution of silicon by aluminium. The steel was further micro-alloyed by niobium. Various soaking temperatures in the range of 750-1250 °C were used to analyse the effect of soaking hold on mechanical properties and microstructure of the steel. According to calculations in JMatPro, the temperatures below 900 °C should lie in an intercritical (two phase) region, while the temperature of 900 °C should be the first one to ensure full austenitization of this steel. To dissolve different portion of niobium into solid solution, higher soaking temperatures were also used. Tensile strengths of 780-1069 MPa and total elongation of 22-46 %.

Key words:

Heat treatment, TRIP steel, retained austenite