

Effect of Mn addition on serrated plastic flow behaviour in high-strength multiphase steels with retained austenite

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Abstract:

The effect of manganese addition (from 3 to 5%) on the serrated plastic flow behavior in medium manganese TRIP steels was investigated in static tensile tests performed in a temperature range of 20-200°C. The Portevin-Le Chatelier (PLC) effect was observed in a steel containing the higher Mn content. The effect of deformation temperature on the critical strain for the serrated flow was noted. The relationships between the manganese content, deformation temperature, mechanical properties and the appearance of serrated flow were characterized.

Key words:

Medium-Mn steel, Portevin–Le Chatelier phenomenon, influence of manganese content, advanced high-strength steel