

Effect of the austenite hot deformation on the transformation microstructural mechanics parameters of a microalloyed steel

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Abstract: This study was established to optimize the heat treatments - mechanical and improve the mechanical properties of microalloyed steel with Nb-Ti-V for the production of hot rolled strip. A database of the main parameters of deformation of this steel was developed by dilatometer-plastometer tests. The cooling experiments were used to simulate sequences of the industrial process. The results of these investigations used to analyze the effect of deformation parameters on the evolution of the ferritic structure and mechanical properties of steel. The conditions of rolling deformation bands must be simulated by experimental investigations in order to find a favorable microstructure while choosing the appropriate technological parameters. The microstructural evolution during hot rolling is a dominant factor for achieving the optimal properties. The chemical composition can predict the limits of the desired properties, but these limits depend significantly thermomechanical conditions imposed. A good adaptation of these conditions with the performance of the material allows for a high quality finished product. These investigations will be the basis for determining in advance of the microstructure, mechanical properties for subsequent monitoring of the industrial process.

Keywords : Microalloyed steel, Austenite, hot deformation, mechanical properties, structure