

Investigation on the Effect of Amount of Titanium on the Mechanical Properties of API X70 Steel after Controlled Rolling

Amin Asiaban, Reza Abdideh, Mohammad Reza Pakbaz, Nabi Allah Razani, Mohammad Hizombor - Khuzestan Oxin Steel Co., Ahvaz, Iran

ABSTRACT

Considering the wide range of applications of microalloyed steels in industrial structures, optimization of their properties are in attention. Controlling microalloy elements and also grain size, in this type of steels have great importance. According to the primary chemical composition and also in controlled rolling process by controlled rolling parameters and its temperature, the final properties of microalloyed steels are determined.

In this paper, the effect of changing in the amount of titanium on the microstructure and Mechanical Properties of a grade of microalloyed steels are investigated. To do this, many type of API X70 steels with different percentages of titanium (0.010, 0.015, 0.020, 0.025 and 0.030 wt %) are selected and have been applied to the similar controlled rolling processes. Tensile and impact tests show that increasing titanium percent causes increasing yield and tensile strength and also improves the toughness. On the other side, microstructure observations show that titanium element also causes refinement of the Ferrite grains.

KEYWORDS

API X70 steel, Controlled Rolling, Titanium, Mechanical Properties, Microstructure