

High-temperature tempering process and susceptibility to embrittlement by electrochemical evaluations of a martensitic stainless steel

Content

The purpose of this project is to analyze the susceptibility to embrittlement in martensitic stainless steels during the annealing process. To this end, Charpy V impact tests will be applied and a detailed study of fracture surfaces will be conducted, linking the results to the microstructural transformations that occur at different austenitizing temperatures.

This type of steel can experience toughness loss due to annealing, resulting in a decrease in impact resistance within the range of 450 to 600°C. This phenomenon is mainly associated with the segregation of impurities, such as phosphorus (P), at the grain boundaries of the original austenite, which also increases the possibility of corrosion due to differences in electrochemical potential.

Heat treatment of martensitic stainless steels is crucial to achieving mechanical and corrosion-resistant properties that meet the required technical specifications. This is especially important since these steels are widely used in sectors such as naval and energy. Therefore, it is essential to properly perform both quenching and tempering to achieve an optimal microstructure. Likewise, the precise selection of tempering temperature and time is key to ensuring the material achieves the mechanical and corrosion resistance properties required for its specific application.

Tipo de presentación

None

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