Influence of Heat Treatment Temperature on the structural and Mechanical Property of 00Cr13Ni5Mo2 Supermartensitic Stainless Steels

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Abstract: This Work focuses on the microstructure and mechanical & metallurgical properties of 13CrNi5Mo2 Super Martensitic Stainless Steels (SMSS). The main objective has been to review the effect of different heat treatments processes on microstructure and mechanical properties. The material had been taken from a new pipe. After a homogenization treatment, the samples were quenched at 1050 °C and air cooled then tempered from 550 to 750 °C for 1h. The structures obtained by optical microscopy are formed of martensite and amount of residual austenite. The steel displays the best comprehensive mechanical properties after quenching at 1050 °C and by tempering at 650°C. The best hardness of the steel is about of 34 HRC. also have a low proportion of residual austenite. These results are confirmed by the optical micrographs.

Keywords: residual austenite, Super Martensitic, mechanical properties, heat treatments