



#### **MmeCa14-001**

##### **Influence of microstructure on the corrosion resistance of low carbon UNS S41003 stainless steel**

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The UNS S41003 is a lean stainless steel with 11%Cr. The relative low cost and better corrosion resistance make this material candidate to replace carbon steels in many applications. Depending on the processing route the UNS S41003 may present ferritic, martensitic or ferritic-martensitic microstructures. In this work the corrosion resistance was evaluated in specimens processed by three different ways: hot rolling (HR), batch annealing (ANN), and water quenching from 1000°C(Q). The microstructure of the HR condition was composed of 76.6% of martensite and 23.4% of delta ferrite. The ANN specimen was ferritic with intergranular Cr carbides, and the quenched specimen was completely martensitic. Polarization curves and electrochemical impedance spectroscopy tests were carried out in HCl solutions with low pH (<5.0). DL-EPR tests were also performed to evaluate and compare the intergranular corrosion susceptibility of the different steel specimens. It was observed that the martensitic microstructures give the highest corrosion resistance to the UNS S41003 steel.