

# The influence of the microstructure upon corrosion resistance of an Al-10wt% Si-5wt%Cu alloy

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The need of the industries achieves better specific properties of materials, make to develop studies to meet this demand. For the automotive industry the most interesting properties are low specific weight, low coefficient of thermal expansion, wear resistance at high temperatures and high corrosion resistance. In this context, new materials have been considered, in particular AlSiCu alloys. [1, 2]. In general, the corrosion behavior strongly depends on the structural morphology and chemical composition [3]. In this work, an Al-10wt%Si-5wt%Cu alloy was solidified under upward unsteady state heat flow conditions. Heat was directionally extracted only through a water-cooled bottom made of steel (SAE 1020). The aim of the present work is to investigate the influence of the microstructure of this alloy upon corrosion resistance. Experimental results include primary dendrite arm spacing ( $l_1$ ) and capacitances values ( $Z_{CPE}$ ). The corrosion behavior was analysed by electrochemical impedance spectroscopy technique conducted in a 3% NaCl solution at room temperature. Coarser dendritic structures tend to improve the corrosion resistance of an Al-10wt%Si-5wt%Cu alloy.

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