STUDY OF ELECTRICAL CONDUCTIVITY IN THE ALLOY OF ALUMINIUM AA5052 DURING THE HOMOGENIZATION

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Abstract

In this paper was conducted an investigation to study the changes in electrical conductivity that presents the commercial AA5052 aluminum alloy. The test samples in order to study were drawn from a slab in State of casting and prepared through the application of heat treatment of homogenization, driving time and maintaining the temperature, it can get changes in the conductivity on the initial conductivity. Later performs a follow-up of the microstructural evolution of the test samples in casting status and those treated thermally, by optical microscopy (OM) and hardness testing. AA5052 aluminium alloy was chemically characterized by flame atomic absorption spectroscopy technique and methodology for the measurement of electric conductivity consisted in the implementation of non-destructive testing such as: the method of induced currents and four stingers method. A calibration curve was also obtained for the equipment of eddy currents, by comparison of the changes in conductivity with temperature, for a material's conductivity and temperature coefficient known. Monitoring microstructural by optical microscopy revealed the presence of pores for exposure times between 8 and 16 hours, which were corroborated by a drop in electrical conductivity for these exposure times in both methods. The results were corrected through the application of uncertainty calculations developed by statistical methods, specifically the standard deviation. Finally concludes, that it is possible to determine the variations of electrical conductivity in the aluminum alloy AA5052, through the use of non-destructive testing, which can be correlated with changes in the strength and other properties.

Key words: Aluminum AA5052, electrical conductivity,, method of eddy currents.