Analysis of Mechanical Properties of AlSi9Mg Alloy with Al, Ti and B Additions

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The initial structure of AlSi9Mg alloy is composed of granular and acicular β phase, with α phase as matrix. The hard, irregular, often pointed β phase is responsible for the poor mechanical properties of said alloy. This composition is responsible for the alloy's low strength parameters, and it limits the extent of practical applications. This study presents the results of modification of an AlSi9Mg alloy with aluminum, boron and titanium in different ranges produced as a melted modifier. The influence of the analyzed modifiers on the microstructure and mechanical properties of the silumin was presented in graphs. Thermal analysis has been used to characterize the thermal effects processes of AlSi9Mg alloy. The modification of a hypoeutectic AlSi9Mg alloy improved the alloy's properties. The results of the tests indicate that the mechanical properties of the modified alloy are determined by the sequence in which the components are introduced to the alloy.

Keywords: Al-Si alloy, Silumin, Modification, Mechanical properties

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Paper number: M2017138