The Efficiency of Different Types of Inoculation of Pure Al and AlSi2 Alloy

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In paper problem concerning inoculation of primary structure of aluminum with purity of 99,5% and 99,8% and AlSi2 alloy, which is realized mainly by intensification of liquid metal movement in mould is presented. In aim of realization of forced movement during the crystallization of liquid metal was used rotating electromagnetic field produced by the induction coil supplied by current with elevated frequency. The degree of structure refinement was represented by equiaxed crystals zone content on transverse section of ingot and average area of macro-grain in this zone. Effect of structure refinement obtained by influence of electromagnetic field was compared with refinement obtained by use of traditional inoculation, which consists in introducing of additives i.e. titanium, boron, carbon and strontium to metal bath. The results of studies and their analysis show possibility of effective refinement of pure Al and Al-Si alloy primary structure, only with use of rotating electromagnetic field and without necessity of application of inoculants such a Ti, B and C. This method of inoculation is important, because inoculants decrease the degree of purity and electrical conductivity of pure Al. Moreover inoculants are reason of point cracks formation during rolling of ingots.

Keywords: Aluminum, Al-Si alloy, Primary structure, Inoculation, Electromagnetic field

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