Qualitative Evaluations of the AlSi7Mg0.3 Microstructure by the X-Ray Diffractometry

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Nowadays it's very important to minimalize the costs of casted parts, what obviously conclude to reduction in time that is necessary for the heat treatment. Despite this fact it's necessary to keep or moreover increase mechanical properties like a strength, ductility, toughness and dimensional stability. Better mechanical properties lead to the better material utilisation, this parameter is represented by the following formula: $Q = R_m + k.logA_5$, known as a Quality index and increase of this parameter conclude to weight reduction of casted part. For obtaining good quality of the casted part it's very important to watch the cast´s internal composition, hence the microstructure of the casted part. For the facts mentioned above, this paper deals with evaluation of the microstructure of aluminium alloy AlSi7Mg0.3 by an X-ray diffractometry using the Debye-Scherrer method with configuration for rebound reflection and comparison of the results with metallographic observations using the light microscopy. Work is showing the opportunities of the X-ray diffraction for the nondestructive material testing of the casted aluminium parts, because in this field there are not enough knowledge about the comparison and evaluation between the microstructure and diffraction. Great advantage of the X-ray diffraction is that the testing surface doesn't needs to be specially treaded. This technology is non-destructive for the surface analyses so for the testing of the internal material composition it´s necessary etching.

Keywords: AlSi7Mg0.3, X-ray, diffractometry, microstructure, evaluation

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