Influence of the Bending Momentum Loading of Testing Samples from the Alloy AlSi7Mg0.3 on the Surface Stress State Detected by X-ray Diffraction

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These days are more and more posing claims for the highest quality of castings from the aluminium alloys and for the lowest weight of these castings. Thus for complex material (in this case alloy) utilization it is very important to monitor its behavior both during production (chemical composition, metallographic evaluation of the structure, observance of thermal treatments temperatures, refining and degassing of melt and so on) and also during its loading. This papers deals with the monitoring changes of stress on the testing samples surface arising from the force loading. As a loading there was a bending momentum at the testing samples (rods) from the alloy AlSi7Mg0,3 which was poured into the metal mould after the different thermal treatment methods. Bending momentum increased up to the expressive deformation of the tested sample. Results were also completed by the depth profile of the residual stresses which were measured by means of the X-ray diffraction (X-ray tensiometry analysis) namely for all thermal treatment methods. Moreover in the depth profile there was also performed the qualitative evaluation of the structure by the back-reflection Debye-Scherrer method.

Keywords: alloy AlSi7Mg0.3, residual stresses, Debye-Scherrer method

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