PART DEFORMABILITY PREDICTION DURING THE MILLING OF AlMgSi1 (6082) MATERIAL

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Abstract

The hypothesis that the part is homogeneous and isotropic simplifies the processing planning process. However, assumptions also have a negative impact on the processing result. Residual stresses within the material, which can affect the deformability of the part during and after the machining process, are directly reflected in the final dimensions and the desired geometry of the part. Experimental research was conducted on the material AlMgSi1 (6082), in order to establish a model for predicting the intensity of deformability of the work. The experiments were conducted on two different parts, obtained from the preparation of the same geometry and dimensions. In the first case, the part in the shape of a vessel was processed, from solid material, while in the second case, the bottom was removed. It turns out that when machining parts of greater height, without a bottom, from solid material, there is a significant probability that the work will twist. In the case when the bottom is retained, the intensity of deformations is also present, but in a much smaller percentage. Such knowledge is extremely important in proper production planning. In this way, significant savings in production time and cost can be achieved by adequately defining offsets for rough and fine machining, while obtaining a part that meets the defined accuracy according to the technical documentation.

Keywords

Machining, Milling, Deformability, Cost Reduction

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