MAKING IMPROVED COMPOUNDS FROM PRODUCTION SCRAPED MATERIAL AND AGGREGATES OF PLASTIC MATERIAL

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At the stage was made compounds in extrusion process by using twin screw extruder. For this process was used scraped material and aggregates of plastic material from injection production. There was used PA6 and PC/ABS blends. PA6 was process with black masterbatch and nucleation agent. Parameters of the process: barrel temperature 260÷270°C and screw speed550 rpm. Second bland PC/ABS was made with addition improving laser marking agent. Parameters of the process: barrel temperature 250÷260°C and screw speed 500 rpm.

First PA6 compound with nucleation agent on the base of sodium bicarbonate and derivatives of citric acid. There was tested in three different amounts: 0,5%, 0,75% and 1% weights. This type of additive decreases viscosity of material, increases crystallization speed and improves homogeneity of material what improves filling of mould cavity. Used additives had influence on the mechanical properties in comparison original material. There was observed increase of impact resistance and tensile strength. Taken into consideration aesthetic aspect and injection process parameters there was chosen optimal amount of additive. Positive aspect of trials was: decrease of cycle time by 8%, decrease of weight of final parts was 7%, decrease of process temperature 20 degree (saving of energy at the level 10%).

Second PC/ABS compound with addition improving laser marking agent on the base of mica, iron oxide or antimony oxide. There was produced blends with different amount of additives: 0,5%, 1%, 2%, 3% and 5% weight. There was chosen the most of optimal version when we take into consideration quality and price. Used additive had no influence of mechanical properties of material. Main aim of this additive was improve of quality of laser marking process. In the process of marking was used fiber optic laser marking device designed for marking polymer materials. During the process was set three main parameters: speed, frequency and power marking. By using this additive there was observed improvement of marking dark marking on the bright surfaces. By using this process we can eliminate second tamp printing process, there was decrease process time by 20%, there was eliminated solvent based paints from the process and we observed decrease scrab level by 10%, increase resistance of marking.

AN ANALYSIS THE NUMERICAL MODEL OF SLIDING BEARING

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Research results presented in the article constitute a set of numerical research of slide bearing model and comparison of selected characteristics of bearing static calculations carried out according to standard DIN. Slide bearings are one of the tribological systems, which have a significant effect on the correct operation of

machines [1]. There are no commercially available testers for testing slide bearings on which you can explore slide bearings. Therefore, most studies use computer simulations [2,3]. Therefore numerical simulations are confirmed by experimental research or calculations of basic static characteristics of the bearing in order to verify the correctness of the numerical model.

The tested bearing was modeled in ANSYS Design Modeler module. Oil film workspace was isolated from the model. Finite element mesh of slide bearing is shown in Fig. 1.

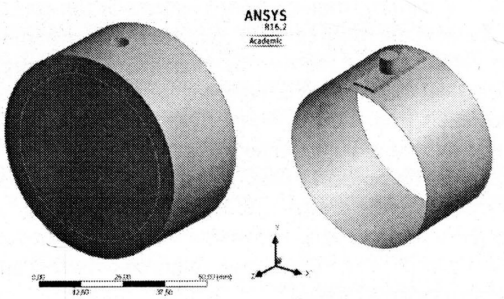

Fig. 1. Finite element mesh of slide bearing

Finite element mesh was prepared in the module ANSYS Mesh. In order to investigate the effect of mesh density of oil film components, there were calculations for various amounts of elements on thickness of the grid.

In order to validate the numerical calculations, calculations of basic parameters of a sliding bearing according to DIN 3165-2 [4] were made. Calculations were performed for a smooth slide bearing. Characteristics that were included in the verification are:

- maximum pressure in the oil film,
- the maximum temperature in the oil film,
- oil flow.

The calculations are made to verify the correctness of the adopted numerical boundary conditions.

References:

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