

Experimental study of evaluation of mechanical parameters of heterogeneous porous structure

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Abstract

© Published under licence by IOP Publishing Ltd. The paper deals with the problem of determining the mechanical macroparameters of the porous material in case of knowing the information about its structure. Fabric tensor and porosity was used to describe structure of the material. Experimental study presented. In research two-component liquid polyurethane plastics of cold curing Lasilcast (Lc-12) was used. Then samples was scanned on computer tomography. Resulting data was analyzed. Regular subvolume was cut out after analyses. Then mechanical tests was performed. As a result we get information about fabric tensor, porosity, Young's modulus and Poisson ratio of the sample. In the abstract presented results for some samples. Taking into account the law of porosity variation, we considered the problem of evaluating the mechanical macro parameters depending on the nature of the porous structure. To evaluate the macroparameters, we built the dependence of the Young's modules and Poisson ratio of the material on the rotation angle α and the pore ellipticity parameter λ . The sensitivity of the deformations to the elastic constants was also estimated.

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