
Thermal Conductivity of a Unidirectional Fiber Composite

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The paper presents a mathematical model of heat transfer in a fiber composite, taking into account the presence of pores in the shape of elongated voids between fibers in a matrix. The calculation dependences of the effective matrix thermal conductivity after curing the adhesive and fiber composite with a matrix are obtained. The formulae for two-sided estimates and limits for possible error calculations are presented. Parametric analysis of these dependences and formulae has been carried out. The comparison of the calculation results with the experimental data revealed the need to clarify the mathematical model in the case of a large difference of thermal conductivity between the matrix and fibers.

Keywords: *unidirectional fiber composite, anisotropic fiber, effective thermal conductivity tensor.*

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