ModTech International Conference - New face of TMCR
Modern Technologies, Quality and Innovation - New face of TMCR
21-23rd May 2009   643

AVERAGING METHODS IN THE MICROMECHANICS OF PRE-IMPREGNATED COMPOSITE MATERIALS

Horatiu Teodorescu-Draghicescu[1], Sorin Vlase[1], Anghel Chiru[2], Ramona Purcarea[1] & Ionatan Popa[1]

[1]"Transilvania" University of Brasov-Romania, Department of Mechanics
[2]"Transilvania" University of Brasov-Romania, Department of Automotive and Engines

Corresponding author: Horatiu Teodorescu-Draghicescu, draghicescu.teodorescu@unitbv.ro

Abstract: The paper presents some averaging methods that authors have been used in the micromechanics of pre-impregnated composite materials like Sheet and Bulk Molding Compounds, in order to predict their basic elastic properties. Arithmetic, harmonic and geometric averaging methods are applied to compute the Young modulus of various Sheet Molding Compounds (SMCs) with different fibres volume fractions. The Young and shear moduli of the isotropic SMC compounds and the upper and lower limits of the homogenized elastic coefficients computed for a 27% fibres volume fraction SMC material are also presented. The estimation of the material's coefficients depends both on the basic elasticity properties of the isotropic compounds and the volume fraction of each compound. A comparison between theoretical approach and experimental data is shown.
Key words: Prepregs, SMCs, Averaging, Homogenization, Heterogeneity.