

Development of a New Method for T-Joint Specimens Testing under Shear Loading

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Abstract : Nonstandard tests are necessary for analyses and verification of new developed structural and technological solutions with application of composite materials. One of the most critical primary structural parts of a typical aerospace structure is T-joint. This structural element is loaded mainly in shear, bending, peel and tension. The paper is focused on the shear loading simulations. The aim of the work is to obtain a representative uniform distribution of shear loads along T-joint during the mechanical testing is. A new design of T-joint test procedure, numerical simulation and optimization of representative boundary conditions are presented. The different conditions and inaccuracies both in simulations and experiments are discussed. The influence of different parameters on stress and strain distributions is demonstrated on T-joint made of CFRP (carbon fiber reinforced plastic). A special test rig designed by VZLU (Aerospace Research and Test Establishment) for T-shear test procedure is presented.

Keywords : T-joint, shear, composite, mechanical testing, finite element analysis, methodology

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