

SOME ADVANCED SYMMETRIC COMPOSITE LAMINATES SUBJECTED TO OFF-AXIS LOADING SYSTEMS. A STIFFNESS EVALUATION

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Abstract: The paper presents the stiffness evaluation of three advanced composite laminates based on epoxy resin reinforced alternatively with HM carbon, HS carbon and Kevlar49 fibres. The laminates have following plies sequences: $[0/90/0/90]_s$, $[0/45/-45/90]_s$, $[45/-45/45/-45]_s$ and are subjected to off-axis loading systems. The elastic constants as well as the tensile-shear interaction have been determined. In order to obtain equal stiffness in all off-axis loading systems, a composite laminate have to present balanced angle plies. Tensile-shear interaction in a fibre-reinforced composite laminate occurs only if the off-axis loading system does not coincide with the main axes of a single lamina or if the laminate is not balanced.

Key words: Stiffness, Elastic properties, Carbon fibres, Kevlar49, Laminates, Off-axis loading system.