

The behaviour to failure of fibre mat reinforced composites was modelled after performing experiments on samples of two kinds: plates and tubular samples. A tensile loading/unloading test was conducted on the plates to determine the characteristics of the material up to failure, whereas torsion and combined loading tests were conducted on the tubular samples. The behaviour of the material was then modelled, based on the "laminated analogy": the material is replaced by a quasi-isotropic laminate $[0/\pm 45/90]$ consisting of "virtual unidirectional plies". The failure envelope of the experiments was compared with those of failure criteria such as those based on the maximum stress, maximum strain and ply scale continuum damage model. The results obtained show that in the case of combined static traction/shear loading, a brittle criterion suffices to describe the failure of the material.