

Micromechanics of Stress Transfer across the Interface Fiber-Matrix Bonding

Authors : Fatiha Teklal, Bachir Kacimi, Arezki Djebbar

Abstract : The study and application of composite materials are a truly interdisciplinary endeavor that has been enriched by contributions from chemistry, physics, materials science, mechanics and manufacturing engineering. The understanding of the interface (or interphase) in composites is the central point of this interdisciplinary effort. From the early development of composite materials of various nature, the optimization of the interface has been of major importance. Even more important, the ideas linking the properties of composites to the interface structure are still emerging. In our study, we need a direct characterization of the interface; the micromechanical tests we are addressing seem to meet this objective and we chose to use two complementary tests simultaneously. The microindentation test that can be applied to real composites and the drop test, preferred to the pull-out because of the theoretical possibility of studying systems with high adhesion (which is a priori the case with our systems). These two tests are complementary because of the principle of the model specimen used for both the first "compression indentation" and the second whose fiber is subjected to tensile stress called the drop test. Comparing the results obtained by the two methods can therefore be rewarding.

Keywords : Fiber, Interface, Matrix, Micromechanics, Pull-out

Conference Title : ICMSET 2019 : International Conference on Material Science and Engineering Technology

Conference Location : Paris, France

Conference Dates : December 30-31, 2019