
Evaluating fiber-thermoplastic matrix adhesive bond strength using “loop” method

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The fiber-matrix adhesion bond strength is an important feature in the development of high-strength reinforced plastics. Evaluation of the adhesion of the reinforcing fibers, such as aramid ones, to thermoplastic matrix using existing techniques involve high complexity sample preparation, and in addition, require additional tools for testing. The article discusses the method of determining the fiber-matrix adhesive bond strength based on using an adhesion cell in the form of a node of the loop on microplastic obtained by impregnating multifilament thread or bungle of threads with thermoplastic melt. In the process of preparing samples the possibility of pressure adjustment in the area of adhesive contact between fiber surface and matrix melt is realized. Tests are carried out on a standard tensile testing machine without additional equipment, which is important for use in laboratories and educational institutions. The extreme dependence of fiber-thermoplastic matrix adhesive bond strength on the contact time and the temperature of the melt are shown by the example of Kevlar aramid thread and polysulfone.

Keywords: thermoplastics, reinforced plastics, adhesion, aramid fibers.

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