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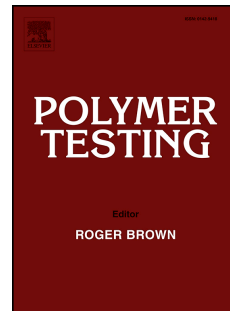
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Considering damages to open-holed composite laminates modified by nanofibers under the three-point bending test

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Abstract:

Nowadays, many components are made of composite laminates assembly by bolted or riveted joints. Thus, the drilling of laminates is a usual machining operation in many industries. Due to the stress concentration around the hole, different damage modes can occur during the service. In this study, the effect of interleaving Nylon 66 nanofibers between glass/epoxy laminate on decreasing damage under the three-point bending test is considered. The results showed that applying nanofibers caused a 57% decrease in the delaminated area. On the other hand, the Acoustic Emission (AE) technique was used to consider the effect of Nylon 66 nanofiber on other damage modes, matrix cracking, fiber/matrix debonding, and fiber breakage. AE signals were analyzed with three different methods, the outcomes showing that these damages significantly decreased.

Keywords: Composite laminates; Drilling; Three-point bending; Nanofibers; Acoustic emission.

1. Introduction:

The drilling process is a key step in the manufacturing process of components made by composite laminates. The produced hole is a source of severe stress concentration, which can simply be the reason for various damage modes such as: matrix cracking, delamination, fiber breakage, and fiber/matrix debonding. On the other hand, throughout the lifetime of drilled

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