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Determining the Mode II Intra Ply Energy Release Rate of Composites Made of Prepreg

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Abstract : The distinction between interlaminar and intralaminar fracture toughness has already been investigated by several authors. For loading mode I, the double cantilever beam specimens were often used for the interlaminar fracture toughness and the compact tension specimen for the intralaminar fracture toughness. In order to minimize the influence of the different specimen geometries, a method was developed which allows the determination of both the interlaminar and the intralaminar fracture toughness on an almost identical specimen geometry. However, as this method is not applicable to prepreg semi-finished products, a further modification was developed, which is also suitable for prepreg laminates. After the successful application for the investigation of mode I with this method, the application of the method for loading mode II is presented in this paper. In addition to manufacturing differences, due to an additional fiber ply in which the controlled crack growth takes place, the adapted test procedure is also explained. By comparing the test results of standardized end-notched flexure (ENF) specimens with those of the modified ENF specimen, the difference between the interlaminar and intralaminar fracture toughness of the material Hexply 8552/IM7 is shown.

Keywords : ENF, fracture toughness, interlaminar, mode II
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