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Influence of drilling on mode II delamination of E-glass/epoxy laminated composites

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Abstract

The influence of drilling on mode II critical strain energy release rate (CSERR) of E-glass/epoxy laminated composites was studied in this research. End Notch Flexural (ENF) test configuration was used for mode II characterization. Six different drilling conditions (holes with diameter of 2, 4 or 6 mm drilled at the distance of 10 or 15 mm from the delamination front) were considered to assess its effect on the mode II delamination. It was observed that CSERR is drastically affected by drilling parameters. Compared to the virgin specimen, 61.25% enhancement in the mode II CSERR was obtained for the sample having a hole with diameter of 2 mm drilled at distance of 15 mm from the pre-crack front. A finite element analysis was also conducted to display the distribution of CSERR along the delamination front of each sample. It was concluded that drilling has a significant role in the CSERR distribution.

Keywords: *Drilling*; *Experimental study*; *Finite element analysis*; *laminated composite*; *mode II delamination*