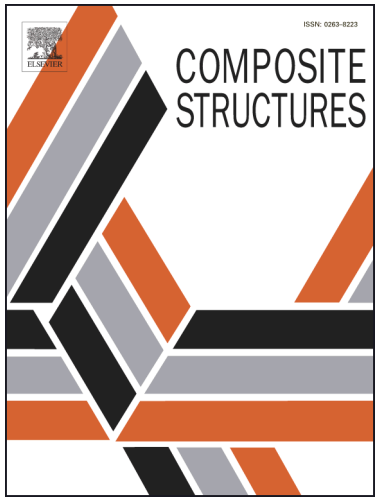

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Enhanced delamination resistance of thick-section glass-epoxy composite laminates using compliant thermoplastic polyurethane interlayers

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Keywords: Low-velocity, multiple impact behavior; thick-section laminated composites; interlaminar enhancement; thermoplastic polyurethane (TPU) interlayers; durability; delamination resistance

Abstract

In this work, we present a novel approach for improving the delamination resistance and durability of structural composite laminates using compliant thermoplastic polyurethane (TPU) interlayers that allow decoupling of the structural plies within the laminate thus preventing catastrophic delamination. Laminates with different compliant interlayer thicknesses are fabricated and characterized under multiple low velocity impacts (LVI) to demonstrate the significant improvement in delamination resistance that can be achieved. Finite element analysis and experimental data on samples of the interlayer laminates subjected to three-point bending is presented to provide additional insight into the unique decoupling phenomena enabling significant improvements in delamination resistance of structural composite laminates.

Introduction

1.1 Background