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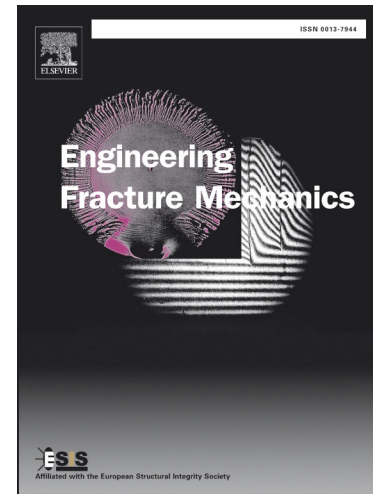
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# Experimental and numerical investigation of adhesively bonded $\pm 55^\circ$ filament wound tubular specimens under internal pressure

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## Abstract

This work aims to study experimentally and numerically the pressure behaviour of filament wound adhesively bonded interlocked tube under internal pressure tests. To this end, a series of hydraulic pressure tests were carried-out on E glass reinforced Vinylester 411 adhesively bonded tubes.

The experimental results have revealed that a leakage was witnessed on the bonding area. Furthermore, the post-mortem X-ray tomography tests on specimens, subjected to internal pressure loading, provided a better understanding of the failure mechanisms resulting from the applied pressure.

Based on these results, a finite element model was developed taking into account the nonlinearity behaviour of the adhesive layer. In fact, the aforementioned model intend a compliant prediction of the pressure behaviour of the joined tube as well as the damage propagation in the bonding zone. A perfect correlation of the experimental and the numerical outcomes has been obtained.

## Keywords

Filament-wound tube/ Adhesive bonding/ Internal pressure/ X-ray tomography/ damage mechanism/ Finite element analysis

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