

Damage modelling in thermoplastic composites reinforced with natural fibres under compressive loading

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Abstract: In this work, the compression failure of thermoplastic composites made of jute/polypropylene is investigated by experimental and numerical studies. Two laminate specimen's lengths with different fibre orientations have been considered to analyse this composite type response to a compressive solicitation. The applied numerical model permits to understand the mechanisms of damage and evolution in the laminate. The interlayer damage (delamination) and the intra-layer damage (matrix cracking) have been modelled by the combined use of the Cohesive Zones model (CZM) and the Matzenmiller, Lubliner and Taylor (MLT) mechanical model. It was found that the loading conditions of laminates and the fibres orientation affect the compression failure load of the thermoplastic composites.

Keywords : Jute/polypropylene, mechanical behaviour, damage, laminates, modelling