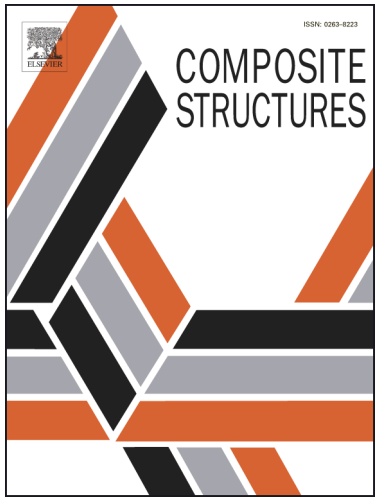

Influence of low and high temperature on mixed adhesive joints under quasi-static and impact conditions

J.J.M. Machado, E.A.S. Marques, Lucas F.M. da Silva

PII: S0263-8223(18)30454-9
DOI: https://doi.org/10.1016/j.compstruct.2018.03.093
Reference: COST 9540

To appear in: *Composite Structures*

Received Date: 30 January 2018
Revised Date: 19 March 2018
Accepted Date: 26 March 2018

Please cite this article as: Machado, J.J.M., Marques, E.A.S., da Silva, L.F.M., Influence of low and high temperature on mixed adhesive joints under quasi-static and impact conditions, *Composite Structures* (2018), doi: https://doi.org/10.1016/j.compstruct.2018.03.093

Influence of low and high temperature on mixed adhesive joints under quasi-static and impact conditions

J. J. M. Machado[1], E. A. S. Marques[1], Lucas F. M. da Silva[2*]

[1]Instituto de Ciência e Inovação em Engenharia Mecânica e Engenharia Industrial (INEGI), Rua Dr. Roberto Frias, 4200-465 Porto, Portugal

[2]Departamento de Engenharia Mecânica, Faculdade de Engenharia (FEUP), Universidade do Porto, Rua Dr. Roberto Frias, 4200-465 Porto, Portugal

Abstract

The increasing use of composite structures in the automotive industry is due to strict regulations regarding fuel efficiency and safety standards. The main advantage of the use of adhesives is the possibility of joining dissimilar materials, particularly composites. The technique studied was the mixed adhesive joints, as two or more adhesives can be used in a single lap joint combining the properties of those adhesives to attain mechanical performance superior to that obtained using those adhesives individually. The main goal was to assess if a previously validated combination of mixed adhesives in a composite joint, tested under quasi-static and impact conditions, offers the same advantage over the use of a single adhesive when subjected to low (-30 °C) and high (80 °C) temperatures. The influence of temperature on the behaviour of the composite joints was assessed in quasi-static and impact conditions allowing to infer the effect on each adhesive. Another important aspect of the use of this type of technique is to avoid the early delamination of the composite substrates. This method was found to improve the performance under quasi-static and impact conditions although its behaviour under the wide range of temperature tested was found to vary significantly.

[*]Corresponding author. Tel: +351225081706. Fax: +351225081445. Email: lucas@fe.up.pt