

Accepted Manuscript

Toughness of a brittle epoxy resin reinforced with micro cork particles: Effect of size, amount and surface treatment

A.Q. Barbosa, L.F.M. da Silva, J. Abenojar, M. Figueiredo, A. Öchsner



PII: S1359-8368(16)31242-2

DOI: [10.1016/j.compositesb.2016.10.072](https://doi.org/10.1016/j.compositesb.2016.10.072)

Reference: JCOMB 4671

To appear in: *Composites Part B*

Received Date: 7 July 2016

Revised Date: 12 October 2016

Accepted Date: 27 October 2016

Please cite this article as: Barbosa AQ, da Silva LFM, Abenojar J, Figueiredo M, Öchsner A, Toughness of a brittle epoxy resin reinforced with micro cork particles: Effect of size, amount and surface treatment, *Composites Part B* (2016), doi: 10.1016/j.compositesb.2016.10.072.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Toughness of a brittle epoxy resin reinforced with micro cork particles: effect of size, amount and surface treatment

A.Q. Barbosa^{1*}, L.F.M. da Silva², J. Abenojar³, M. Figueiredo², A. Öchsner⁴

¹INEGI, Rua Dr. Roberto Frias, 400 4200-465, Porto, Portugal

²Department of Mechanical Engineering, Faculty of Engineering, University of Porto,
Rua Dr. Roberto Frias, 4200-465, Porto, Portugal

³Materials Performance Group, Materials Science and Engineering Department,
Universidad Carlos III de Madrid, Leganés, Spain

⁴Griffith School of Engineering, Griffith University (Gold Coast Campus), Building
G39 Room 2.22, Parklands Drive, Southport Queensland 4214, Australia

ABSTRACT

Structural adhesives are increasingly being used for new applications, replacing conventional bonding methods. Epoxy resins are the most common structural adhesives used due to their suitable mechanical, thermal and chemical properties, as well for their low ductility and low toughness. Several researchers, have in the past decades, found it necessary to reverse these properties and find new ways to increase the toughness of these adhesives. There are many processes depicted in the literature on how to increase the toughness of brittle adhesives, the use of rubber particles being one of the most common. The inclusion of particles (nano or micro) is a successful method to improve toughness of structural adhesives. In the present study, natural micro particles of cork are used with the objective of increasing the toughness of a brittle epoxy adhesive. The concept is for the cork particles to act like as a crack stopper leading to more energy absorption. The influence of the cork particle size, amount and the presence of a surface treatment were studied. Cork particles ranging from 38-53 and 125-250 μm were mixed into adhesive Araldite 2020. The amount

*Corresponding author: email: aqueiros@inegi.up.pt

Download English Version:

<https://daneshyari.com/en/article/5021397>

Download Persian Version:

<https://daneshyari.com/article/5021397>

[Daneshyari.com](https://daneshyari.com)