

The Influence of Fiber Fillers on the Bonding Safety of Wood-Adhesive Interfaces: A Fracture Energetic Approach

Authors : M. H. Brandtner-Hafner

Abstract : Adhesives have established themselves as an innovative joining technology in the wood industry. The strengths of adhesive bonding lie in the realization of lightweight designs, the avoidance of material weakening, and the joining of different types of materials. There is now a number of ways to positively influence the properties of bonded joints. One way is to add fiber fillers. This leads to an improvement in adhesion, structural integrity, and fracture toughness. In this study, the effectiveness of fiber-modified adhesives for bonding wooden joints is reviewed. A series of experimental tests were performed using the fracture analytical GF-principle to study the adhesive bonding safety and performance of the wood-adhesive interface. Two different construction adhesives based on epoxy and PUR were modified with different fiber materials and applied to bond wooden joints. The results show that bonding efficiency by adding fibrous materials to the bonding matrix leads to significant improvements in structural material properties.

Keywords : fiber-modified adhesives, bonding safety, wood-adhesive interfaces, fracture analysis

Conference Title : ICWACT 2022 : International Conference on Wood Adhesives, Chemistry and Technology

Conference Location : Venice, Italy

Conference Dates : August 16-17, 2022