

Local Reinforcement of Wood Elements by Means of CFRP

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Abstract:

This experimental work presents a study on the intervention on existing wood elements under bending and/or shear loads by means of CFRP materials, in those cases where a complete replacement of the wood element cannot be carried out. Several wood prismatic specimens, locally reinforced by carbon fibre reinforced polymer materials, were tested. In particular, the effectiveness on recovering the continuity of two different kinds of junction was evaluated on specimens made of either spruce or oak wood, previously cut in two stamps. One junction was realized by means of four sheets of CFRP (carbon fibre reinforced polymer), embedded in epoxy resin and inserted in the wood astride the cut. The other kind of junction was obtained by means of four bars in CFRP with a diameter of 10 mm, inserted in the wood for 150 mm depth, again astride the cut. CFRP materials and wood were glued by means of epoxy resin as well as the contact surface of the two pieces of wood to be joined. These junctions were submitted to mechanical tests in order to evaluate their flexural and shear capacities. Encouraging results were obtained, in terms of flexural behaviour of CFRP sheet junctions and shear behaviour of CFRP bar junctions.

Keywords:

Bending, CFRP, Epoxy resin, Shear, Wood.