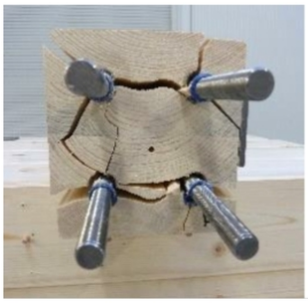
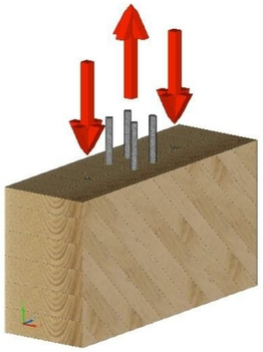
Axially stressed threaded rods glued into the wood

2015, 2017





Glued-in threaded rods are used in construction to replace conventional fasteners. The load-bearing capacity of various standard connections was investigated. Characteristic values were determined from the test results.

The project

Basic principles and research procedure

The load-bearing behavior was determined at different wood strengths, bond lengths and fiber-load angles. Furthermore, the influence of reinforcements of the transversely stressed areas with double-threaded screws was investigated. Tensile tests, with threaded rods glued into the transverse layers of cross-laminated timber, were carried out. Glulam (spruce GL24h) was used for the standard connections and the reinforced test series. For the preliminary tests with cross laminated timber, a 5-ply panel (spruce C24) was used. Bonding was carried out with the 2-component polyurethane casting resin LOCTITE® CR 421 PURBOND from Henkel & Cie. AG.

The construction method

Results and conclusion

It was shown that the wood strength has no influence on the load-bearing behavior, although considerable differences were observed in the fiber-load angle. When comparing the mean fracture values with the standard used today, it was shown that the characteristic pull-out values according to the current design standard are about 30% lower than the mean fracture values of the tests. The double-threaded bolts prevented splitting of the test specimens in the transversely stressed area. In the series with two threaded rods, an increase in load-bearing capacity of 38% to above the yield strength of the steel was observed for the same bond length. Type of work: Thesis at BFH AHB Authors: Markus Ryffel (2017), Michael Hollenstein (2015)