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Abstract

In 2016 the world's first bio-based bridge was installed at the TU/e University Campus in Eindhoven, Netherlands over the river Dommel. The bridge has length of 14 m and uses hemp and flax fibres in a bio-based epoxy resin around a core of PLA bio foam. The main research question was whether and how these bio-based composite materials could be used in structural loadbearing (bridge and building) applications.

The focus of this presentation will be on a couple of major aspects. Apart from the description of the design and production process various materials tests were carried out and evaluated. The materials tests studied strength, stiffness, the influence of moisture as well as the creep behaviour. In addition a comparison of the FEM analysis with the 1:1 scale load test as well as the monitoring of the bridge after installation will be described.

It can be concluded that bio-based composite materials show a great potential for applications in the built environment, while also a long list of questions remains for researcher to be answered.

