



Charring Behavior of Cross Laminated Timber with Respect to the Fire Protection

<https://research.thinkwood.com/en/permalink/catalogue267>

Author: Tiso, Mattia
Organization: SP Technical Research Institute of Sweden
Year of Publication: 2014
Country of Publication: Sweden
Format: Report
Material: CLT (Cross-Laminated Timber)
Topic: Fire
Keywords: Small Scale
Cone Calorimeter
Heat Flux
Gypsum Type F
Plywood
Fire Resistance
Language: English
Research Status: Complete

Summary:

Timber buildings made with Cross-laminated Timber (CLT) panels are becoming wide spread in Europe. The fire resistance of CLT panels depends upon several parameters, including the number of layers and their thickness. At the present, EN 1995-1-2:2004 does not provide specific information on the fire design of CLT panels. Several fire resistance tests of CLT panels were performed in different scales by furnace testing using the standard fire curve according to ISO 834-1:1999, however the large number of possible combination of CLT products makes testing too complicated and expensive as a tool for the verification of the fire resistance of several combinations. In this report are presented nine small-scale tests carried-out at SP Wood Technology (Technical Research Institute of Sweden). The tests consisted in specimens of CLT and massive timber exposed at a two steps of constant heat flux in a cone calorimeter (50 and 75 kW/m²). Some specimens were exposed with two different types of fire protection (gypsum plasterboard type F and plywood) and some were tested unprotected. Later, thermal simulations with the same set-up of tests were implemented on the finite element software package in Safir 2007, with the time-temperature curve given by ISO 834 as input; also the analytical calculation of the charring depth following the Eurocode 5 part 1-2 was done. The target of this thesis is to compare performed CLT furnace tests with the smallscale cone calorimeter tests carried out, the numerical results of the thermal model and the analytical results obtained.

Online Access: Free

Resource Link

<http://www.diva-portal.org/smash/get/diva2:962826/FULLTEXT01.pdf>