

**Thesis Abstract cohort 2012-2014**  
**The International Master of Science in Fire Safety Engineering**

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**Evaluation of the burning behaviour of wood products in the context of structural fire design**

The possibility of 40+ storey buildings made mostly out of timber is being studied by many structural engineering firms as a sustainable form of tall building construction. However building codes and laws require tall buildings to be made out of non-combustible materials which inevitably force all timber members to be covered by non-combustible materials, mainly plaster boards. This approach takes away the environmental benefit of timber buildings. A framework is introduced in order to demonstrate how an improved understanding of the fire behaviour of timber might lead to an adequate structural design of fire exposed members. A literature review is given in order to demonstrate the discrepancy between common design practice and the state-of-the art. This review beckons the question what happens with structural timber elements near extinction of the contents of a fire. Do the structural elements really sustain burning beyond the combustion of the building contents, as is commonly assumed for structural design? To provide an answer, bench-scale tests are conducted on novel timber products. It is found that for structural applications wood products usually self-extinguish. However specifically for CLT elements ply delamination implies a potential for significant fire contribution and structural failure well before self-extinguishment becomes relevant.

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