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Professional Development Program

# Fundamentals of the response of timber buildings to fire- from theory to application

**Date:** Friday 20 August 2021

**Venue:** International Convention Centre, Sydney

**Time:** 9.30am – 5.00pm

**Cost:** \$250 per person ex GST

To register please visit [www.afaconference.com.au/register](http://www.afaconference.com.au/register)

## Event overview:

Mass timber construction is becoming increasingly prevalent in the building industry due to the numerous benefits of engineered timber structures.

However due to their combustible nature, exposed mass timber structures can affect the dynamics of the fire within the compartment and the external plume, and burn continuously under specific conditions until structural collapse. Large surfaces of exposed engineered timber such as cross-laminated timber, used as floors and walls in building compartments, challenge the primary objectives of any fire safety strategy (i.e. egress, compartmentation and structural stability).

Self-extinction corresponds to the ceasing of flaming combustion, a condition necessary to enable the concept of burnout required for the design principles of compartmentation and structural stability. Failure to achieve self-extinction in compartments may be caused by several factors, which include an excessive ratio of exposed timber surfaces, encapsulation failure, or the fall-off of charred timber lamellae.

This CPD aims to provide an overview of the fundamentals of the response of timber buildings to fire- from theory to application. There will also be discussion around the critical research questions that need to be addressed for enabling a safe design for timber buildings.

## Who should attend?

- Structural Engineers
- Fire Safety Engineers
- Fire Safety Professionals
- Regulators.

## Presenters from the University of Queensland:

- Dr Juan P. Hidalgo
- Dr David Lange
- Dr Felix Wiesner
- Dr Cristian Maluk



*See over for event agenda*



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# Agenda

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9.30 am	Welcome and introduction to the CPD: <ul style="list-style-type: none"><li>• background (wood and engineered timber)</li><li>• fire hazards of timber construction</li><li>• fire safety strategy</li><li>• explicit quantification of performance explicit performance,</li><li>• objectives of the CPD</li><li>• structure of the CPD (agenda).</li></ul>
10.00 am	Flammability of wood/timber: <ul style="list-style-type: none"><li>• wood composition</li><li>• wood thermal decomposition</li><li>• ignition, burning, flame spread</li><li>• wood pyrolysis/heat transfer modelling</li><li>• complexity vs accuracy.</li></ul>
10.30 am	Structural properties of wood/timber in fire: <ul style="list-style-type: none"><li>• mechanical properties of wood</li><li>• effect of temperatures on mechanical properties.</li></ul>
11.00 am	Technical discussion (or panel discussion)
11.30 am	The role of mass timber structures in quasi-cubic compartment fire dynamics: <ul style="list-style-type: none"><li>• review of theory of fire dynamics in quasi-cubic compartments</li><li>• effect of mass timber.</li></ul>
12.00 pm	The role of mass timber structures in open-plan compartment fire dynamics: <ul style="list-style-type: none"><li>• review of theory of fire dynamics in open-plan compartments</li><li>• effect of mass timber.</li></ul>
12.30 pm	Technical discussion (or panel discussion)
1.00 pm	Lunch
2.00 pm	Structural behaviour of mass timber structures in fire
2.45 pm	Self-extinction of mass timber structures: <ul style="list-style-type: none"><li>• structures review of self-extinction on condensed fuels</li><li>• scaling up self-extinction in compartments</li><li>• framework for self-extinction</li><li>• time-scale condition</li><li>• thermal feedback conditions.</li></ul>
3.30 pm	Tea and coffee break
3.45 pm	Technical discussion (or panel discussion)
4.15 pm	Improving the performance of wood/timber in fire
4.45 pm	Summary of technical discussions / opportunities for R&D collaboration
5.00 pm	Close of event

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