

# Review

This new design guide is a must read for structural engineers seeking to create innovative timber buildings responsibly, writes **Judith Schulz**.

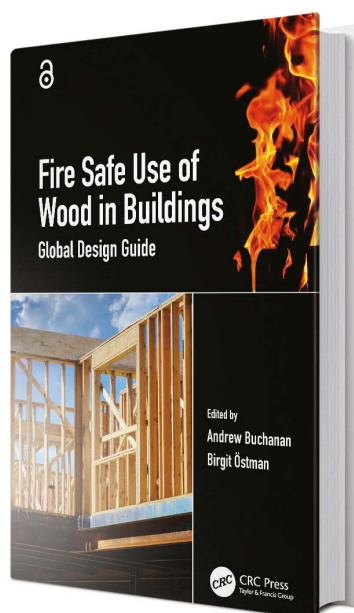
## Fire safe use of wood in buildings: Global design guide

**Editors:** Andrew Buchanan and Birgit Östman

**Publisher:** CRC Press

**Price:** £145.00 (available as Open Access)

**ISBN:** 978-1-032-04039-4



### I MADE THIS BOOK AN EARLY CHRISTMAS

present to myself and bought a copy as soon as it became available late last year, despite it being freely available online. This may have been in part because of fond memories going back many moons to when I was a student at Canterbury University in New Zealand, working through early editions of one of the editors' timber and fire safety guides; and reminiscing about that bright yellow soft copy, which over time earned its dog-ears, tabs and mug stains speaking of caffeine-fuelled late nights in the library pre-exams.

The guide is written by 32 authors from 13 countries brought together by Professors Andy Buchanan and Birgit Östman as editors.

The book is structured in 14 chapters, covering such topics as fire safety in timber buildings, fire safety requirements, loadbearing timber structures, performance-based design, robustness in fire, building execution and more.

Each of the 14 chapters closes with a section on 'research needs' on unresolved issues that would benefit from further investigations to aid designers and code writers in making informed decisions when designing with timber.

There are extensive references, for more in-depth investigations and further study, and where necessary, stern words and special boxes flagging limitations of applications of calculation methods, raising issues that are still under active research where caution is needed in the structural design of exposed mass timber. This alone makes it a must read for structural engineers seeking to create innovative timber buildings responsibly.

For those starting out in their design with timber, the guide offers a useful introduction to different wood products and how they come together to form timber structures, supplemented by images (in colour in the PDF, sadly only black and white in the hard copy).

The chapter on fire safety in timber buildings explains different stages of fires that will be familiar to fire engineers but worth a read for structural engineers too when designing with a combustible material, as it explains hazards associated with fall-off of protective layers and glue-line integrity failure, and different protection concepts, like partial and full encapsulation. What is notable is the choice of terminology, opting for 'burnout' to mark the end of the decay phase of a fire, while strongly discouraging the terms 'self-extinguishment' and 'auto-extinction' as 'full extinguishment of smouldering combustion with the application of water by firefighters very late in the fire'. It also notes that designers have the choice to design out the hazard of glue-line failure, by insisting on heat-

resistant adhesives.

Of particular interest for structural engineers will be chapters 7 and 8, covering loadbearing timber structures and connection design. It covers analysis methods from prEN 1995-1-2 (EC5) (due to be published in 2025) expanding the fire resistance from 60 minutes currently to 120 minutes, and is firm where testing remains necessary (loadbearing cross-laminated timber floor panel-to-panel connections). Deemed-to-satisfy tabulated design data also gets a mention as a third route to evidence fire resistance, which is common in other jurisdictions, though these 'deemed to satisfy' tables are not currently included in the UK national annex of EC5 as a route to compliance.

Chapters 7 and 8 give a good overview of how the thermomechanical properties of steel, for example, differ from timber and why that matters when developing connection designs – essential reading for every structural engineer who designs timber structures that are expected to resist fire for a period of time.

Others who have worked with the guide for some months now find the illustrations and international comparisons to be valuable too; though those hoping to find answers to all questions being asked when seeking timber to be the answer to the climate crisis will be disappointed.

The guide is honest in flagging issues that need further work when using timber at scale and is to be applauded for that honesty; it is a step in the right direction to rebuild trust in the responsible use of combustible materials in the built environment.

The hard copy of the guide is always within reach on my desk, and bears a few tabs already, with the soft copy also only a few clicks away.

If you are designing with timber, or want to get started, I'd suggest you make sure it's only a few clicks away from you too.

### Judith Schulz CEng, MSt

Judith is a fire safety engineer and director at Arup. She holds degrees in Civil Engineering from TU Karlsruhe, Germany, in Fire Engineering from Canterbury, New Zealand, and an MSt in Interdisciplinary Design in the Built Environment from Cambridge, UK. She is a member of the UK government's Building Regulations Advisory Committee (BRAC) as fire safety engineer, and contributes to several BRAC and industry working groups.