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Editorial

Special Issue on Timber in Fire

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Timber is amongst the oldest building materials used by humankind. We have been building with timber for millennia, and in its various forms timber has consistently remained a key structural and building material in most cultures throughout human history (along with masonry and, more recently, concrete and steel). However, various conflagrations in largely timber-built towns and cities around the world throughout the history of civilization – typically called the “Great Fires” (e.g. of Rome, Constantinople, Hangzhou, Utrecht, Amsterdam, London, Baltimore, Tokyo, etc.) – led to the use of timber structural and cladding materials being reduced or explicitly restricted within dense conurbations, with a preference for non-combustible structural framing, cladding, and roofing materials – particularly for multistorey and high-rise construction.

In most places, timber has remained a critically important and widely used building material in a range of applications, however during recent centuries the structural use of timber (either as heavy timber elements or light timber framing) has typically been limited to low-rise construction of smaller volume buildings with fewer than four-to-five storeys; the use of timber cladding has also been widely restricted or avoided.

However, spurred on by the sustainability and constructability credentials of timber as compared with concrete, masonry, or steel – and by the development of novel engineered timber materials and prefabricated systems incorporating engineered timber joists and trusses, glued-laminated timber (glulam) and cross-laminated timber (CLT) – timber has experienced an accelerating resurgence/emergence as a primary material in multi-storey buildings [1].

A range of publications during the past five years has highlighted the opportunities to build large, multi-storey buildings in engineered timber [2, 3, 4]. Timber buildings of up to nine or ten storeys are increasingly being proposed internationally, and numerous proposals have been made for predominantly timber – or hybrid timber-steel or timber-concrete – buildings of 30 storeys or more [2]. Timber is also increasingly

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being proposed by architects and engineers for innovative, sustainable, and attractive building facades and cladding systems.

Despite its advantages and sustainability credentials, timber is combustible and presents special fire safety challenges as compared with concrete and steel – neither of which is without its own challenges. The fire safety community must work together to collectively ensure that the relevant fire safety challenges for timber buildings are knowingly and appropriately addressed during design, application, and use; so as to avoid the problems of the past and ensure that timber can be safely used to support the global push for sustainable urbanism and increased urban density.

The papers compiled within this special issue of *Fire Technology* address a range of key fire safety issues and applications of timber in modern buildings, including: the *structural fire resistance* for both *solid timber* [5] and *engineered timber* elements in *glulam* [6] or *CLT* [7], and *light frame* engineered timber flooring systems [8] as well as *connections in timber* [9, 10]; the specific *fire dynamics* in building compartments made from massive or light frame timber elements [11]; the *fire protection* capabilities of timber materials [12]; and the fire-safe use of *timber cladding* materials for multi-storey buildings [13].

The breadth of coverage of key considerations in this special issue is, from our perspective, surprisingly (and serendipitously) complete. While it is clear that considerable additional research is needed in support of essentially all of the research areas presented, it is also evident that – with sufficient fire safety knowledge, education, skill, additional research, and care during design and application – fire safety considerations need not prevent the use of timber in multi-storey buildings.

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