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FIRE PROTECTION OF OLD TIMBER ROOFS.

WOOD SCIENCE RESEARCH NEEDS

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ABSTRACT

This paper focuses the fire performance of timber and timber structures and discusses possible approaches to mitigate the fire risk in timber buildings, with special relevance to the case of timber roofs.

Furthermore, it highlights a number of issues concerning the implications for timber durability and mechanical properties resulting from the exposure to fire itself and high temperatures, active fire protection equipment and firefighting tactics, namely those involving the use of water, and passive fire protection measures, namely fire retardant treatments. These issues need be considered by those involved in the assessment and safeguard of ancient timber buildings.

INTRODUCTION

Timber combustibility is often mistaken with low fire resistance of timber structures. This often restrains the choice of timber as a structural material in new constructions or in interventions in existing ones, despite its many technical, architectural and environmental advantages.

Fire risk considerations may also be a strong draw-back to the safeguarding of old, common or historical, timber structures, even when they meet structural safety requirements, due to the fact that most practitioners and building owners don't have sufficient knowledge on this subject.

Real life has often shown that timber structures may present very good fire endurance, especially in the case of massive timber constructions, composed by large elements, with low cross section perimeter/area ratios.

However, not only old timber structures are not always made of large cross sections, but also specific joint detailing, timber surface conditions, building geometry and occupancy, presence of special equipment or stored products may increase the risk of fire to levels where the employment of specific protection measures is required.

The adoption of some fire protection measures is not consensual, especially in the case of buildings of historical interest or with valuable content. Besides, the long-term durability