

Editorial

# Advanced Technologies for Increasing the Durability of Timber and Extending Its Service Life

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Wood is one of most used and appreciated material among humans, and is an irreplaceable choice for building furniture, utility poles, bridges, and more. Wood originates from sustainable resources, plays an important role for the carbon sequestration during its service life, and possesses a variety of unique features (such as insulation capacity, mechanical resistance, anti-seismic properties, and aesthetic appearance).

An additional advantage of this material is the end life that is strongly influenced by the treatments or chemical modifications applied to the timber to increase its service life.

One of the main disadvantages of the material is the organic composition of wood, which makes it susceptible to biotic (wood decay) and abiotic (weathering, fire) degradation.

The wood material can be maintained during its service life by applying various techniques—mechanical behavior (changes caused by abiotic factors), chemical–physical alterations (moisture content, lignin and cellulose modification due to UV radiation, pollution, fire), and biological degradation are the most important issues to be considered for increasing wood durability.

This Special Issue contains six contributions and considers innovative measures, such as the investigation on interaction of substances with wood polymers when applied as a biocide. The first [1] describes caffeine as potential substance for protecting wood against decay. In the second paper [2], innovative technology is used for grafting compounds with biocidal and fire resistance properties to the wood substrate. The application of this anchoring method for applying natural product to wood is a good solution in terms of efficacy, duration, and eco-sustainability.

Applying the performance concept to a Chinese traditional wooden building [3], e.g., by determining the mechanical characteristics of timber and evaluating biological degradation, is the first step used to improve the service life of a building. Knowledge of the initial status of conservation, a correct diagnosis, and the use of adequate protection methods can guarantee an increase in the service life.

The fourth paper [4] deals with the growth of micro-fungi as *A. alternata*, responsible for allergies of the inhabitants of environments where its spores are present. The study shows the effect of the wood species as a source of dust during the manufacturing process.

A mixture of fatty acids shows phase change materials impregnated in solid wood, and an evaluation of regulators for indoor thermal comfort and a possible reduction in fossil fuel when used in wooden structures was investigated in the fifth paper [5]. Biological resistance of the material against insects, termites, and mold fungi showed that these materials are suitable for in-door building elements.

Performance in the marine environment of acetylated wood and other wood-based products is discussed in the final paper [6].

The improved performance of wood, used for human commodities, has a great number of advantages to be considered, and this small Special Issue aims to explore this complicated and variable matter.



**Citation:** Palanti, S.; Terziev, N. Advanced Technologies for Increasing the Durability of Timber and Extending Its Service Life. *Forests* **2022**, *13*, 1015. <https://doi.org/10.3390/f13071015>

Received: 13 June 2022

Accepted: 27 June 2022

Published: 28 June 2022

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**Conflicts of Interest:** The authors declare no conflict of interest.

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