

*Special Issue Reprint*

## **Advances in Wood Based Composites**

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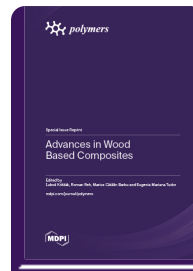
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The significance of wood-based composites has grown substantially in recent years due to their enhanced material efficiency, sustainability, and versatile applications. These composites are engineered by integrating lignocellulosic wood elements such as fibers, particles, or veneers with polymeric adhesives through manufacturing processes such as hot pressing, extrusion, or injection molding. Recent advancements in wood-based composites have focused on facets such as processing techniques, product innovations, surface and color treatments, and the examination of key properties. To optimize performance characteristics, specific additives such as hardeners, coupling agents, plasticizers, and fillers are incorporated into the composite formulation. These additives play a critical role in improving interfacial adhesion, mechanical strength, dimensional stability, and resistance to environmental degradation, thereby enhancing overall durability and functionality. Energy efficiency is also critical; therefore, improved manufacturing effectiveness and sustainability are targeted. Finally, significant insights into the acoustic properties of wood were gained through the analysis of sound propagation velocity combined with impactful design choices. The evaluation of cellulose macromolecular properties after chemical treatment helps us understand the changes that affect the performance of wood composites, indicating a comprehensive approach to enhancing wood-based materials.

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