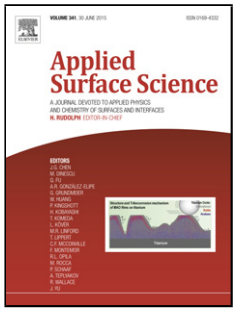

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Weathering performance of surface of thermally modified wood finished with nanoparticles-modified waterborne polyacrylate coatings

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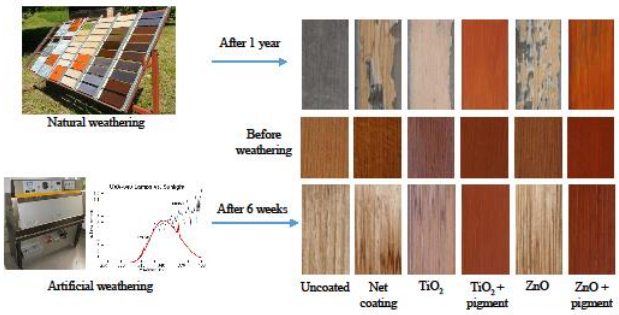
Graphical abstract



Highlights

- TiO_2 efficiently improves the surface durability of coated thermally modified wood.
- The addition of ZnO leads to poor adhesion strength, cracking and peeling of coating.
- The addition of TiO_2 helps to maintain sufficiently good adhesive of coating on TMT.
- Discoloration of TMT out of doors cannot be eliminated, but can be reduced by addition of TiO_2.

Abstract

In this research the samples of thermally modified (TMT) beech wood samples, finished with waterborne polyacrylate clear coatings modified with nano-sized ZnO and TiO_2-rutil were naturally and artificially exposed to weathering conditions. To extend the lifetime of wood and maintain its natural look, the research and development of clear coatings with minimal use of harmful chemicals has become very important. Therefore nano-sized inorganic UV absorbers are