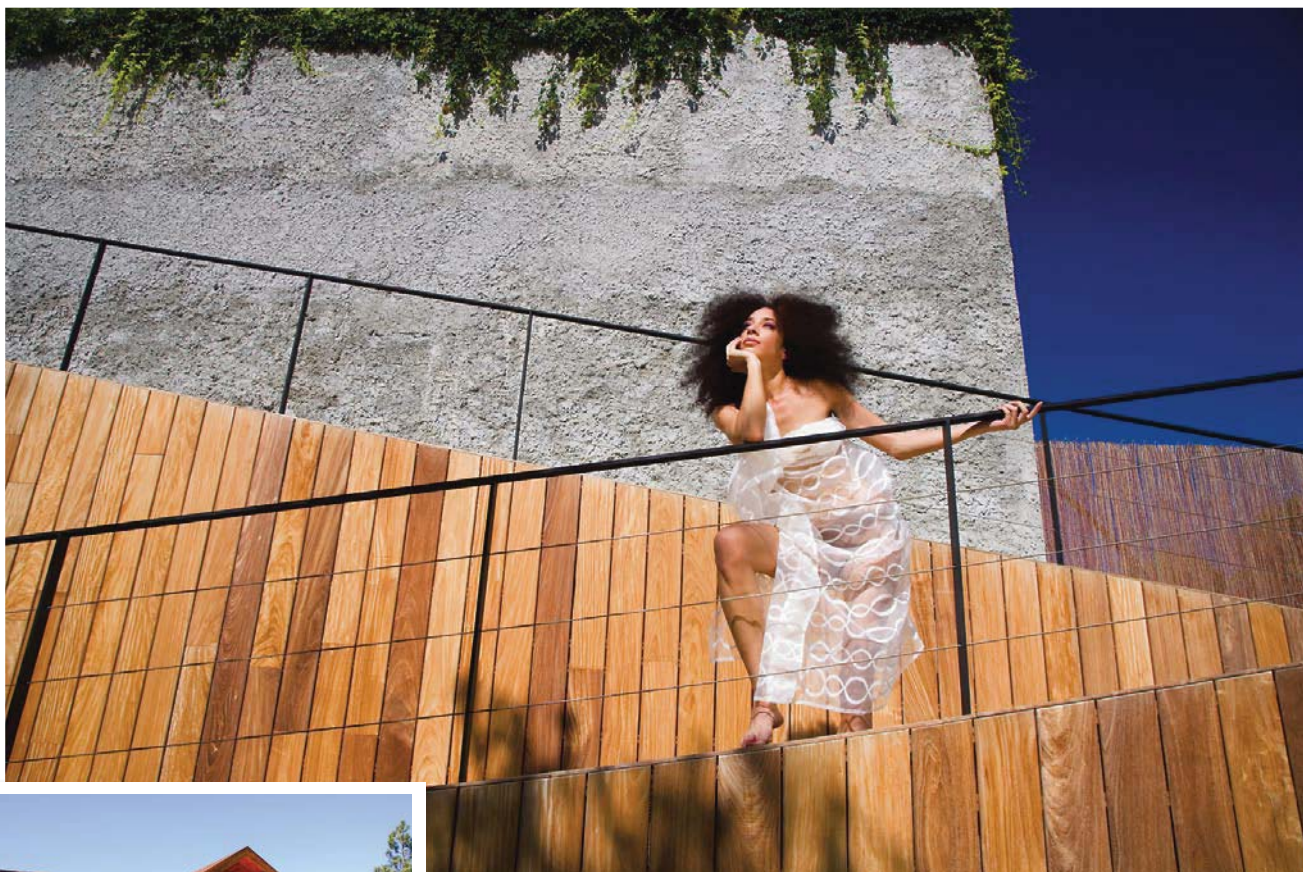


Nano Coatings: Small in a **BIG** WAY

Little things can make a huge difference in finding the balance between aesthetics and durability. By Harry Stulajter , Director, Nanovations



Red cedar home endures a lifetime of UV rays

Wood represents a class of substrates of its own, with highly special challenges for clear finishes. Long-term outdoor performance, light stability, high transparency with ideal accentuation of the wood grain, as

well as good mechanical and chemical resistances are the major issue that govern this field. UV protection is one of the hot topics in wood products development today, and a main factor for clear exterior wood coatings to fall below expectations.

Nanotechnology opens a new world of opportunities and solutions in different areas. An example is copying of the water and dirt-repelling effect of Lotus leaves, and applying it on applications like self-cleaning windows and paints. But how

can these tiny elements make a difference in clear wood finishes?

A Clear Choice

Until now, one of the best protection from the sun's ultraviolet radiation is obtained from pigmented products. These however, tend to hide the wood's natural grain and texture, creating challenges in balancing aesthetics with protection.

The use of nano-sized UV absorbers makes it possible to add the absorbers in much higher concentration without altering

the transparency and the appearance of the coating. The primary crystallite size of approximately 10 nm is significantly smaller than other absorbers. This uniform particle size enables clear impregnating wood protection with unseen performance, while maintaining great aesthetics.

Blending combinations with light stabilisers and hydrophobic nanoscale components add to the performance: covering a wider spectrum of UV radiation, along with excellent moist regulating and water repellent properties.

Weathering The Elements

One of the first coatings utilising these technologies, has been released by Nanovations in Sydney, Australia. These target wood exposed to harsh environments, like the marine teak market for yachts and boats, and external wood decking and structures. The clear impregnating solutions have shown successful results against the age old dilemma of wood discolouration due to UV related oxidation.

Lignol Teak Guard Marine is placed in an environment where not only UV radiation is high. Salt spray and abrasive salt crystals, moist and water, but also a lot of foot traffic on a relative small area,

makes it one of the hardest-to-treat wood substrates on the market.

Its effectiveness has been demonstrated with accelerated weathering tests and 'real life' experiments. Furthermore, the products are trialed in an exposed weathering lab in Townsville, tropical north-eastern Australia – a global reference location for natural and accelerated exposure with 310 days of sun, and one of the highest UV radiation levels in the world.

This technology applies to multiple wood species and heat-treated wood. The coatings also perform well on timber treated with boric acid, oxides or salts. Being water based, the coatings are solvent and volatile organic compound (VOC) free.

Clear, transparent and thin finishes that protect wood without hiding its natural beauty, nor compromising on resistance from water vapor, are the target of many coating manufacturers. It is also at the top of architects' and designers' wish lists, due to a higher demand of wood in sustainable building designs. By exploiting their optical transparency and protective properties, the tiny nano-particles look prepared to continue playing a big role in wood treatment.



Coatings provide protection from light, water and foot traffic

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