

# Researchers invent invisible coating that makes wood “fireproof”

BY ASHWINI SAKHARKAR AUGUST 20, 2022 18:23 IST INVENTION



Researchers invent invisible coating that makes wood “fireproof”. Credit: NTU Singapore

Scientists at Nanyang Technological University, Singapore (NTU Singapore) have invented an invisible coating that can “fireproof” wood and still allows for the natural beauty of timber to shine.

With the popularity of mass engineered timber growing in the construction industry due to lower costs and faster construction, one of the biggest challenges for wood is its flammability. When untreated, wood or timber can burn and combust easily. Current practices to protect the interior of wooden buildings from fires require the use of fire-retardant panels or paint-like [coatings](#) that conceal the natural wood grains of timber.

In comparison, the new invisible coating allows for the natural beauty of timber to shine and yet can still provide a flame barrier when “activated” by fire. It is low-cost, easy to apply, effective in curbing the spread of fire, and generates very little smoke when burnt.

This fireproof coating is just 0.075 millimeters thick and is highly transparent, making it invisible to the naked eye. When heated up by a hot flame, a series of complex chemical reactions happen, which causes the coating to become a char that expands to more than 30 times its original thickness. It is this char that protects the fire from combusting the wood underneath.

*"In our coating, we used technology to lock certain compounds and interact with the resin," said Assoc Prof Dasari, an expert in fire-retardant materials. "They will actively participate in the chemical reactions in a systematic manner when exposed to high heat, thus leading to the formation of char. This char was engineered to be extremely heat-resistant, insulating the wood underneath from the high heat."*

In the industry-standard tests, the made-in-NTU coating generated very little smoke and was able to prevent the flames from spreading. When the char is scraped off, the wood underneath is still intact, proving the efficiency of the coating to protect the wood. This is important as, in a case of a fire, construction materials need to be fire retardant and relatively smoke-free to allow for the safe evacuation of occupants in a building.



The researchers expect this new coating to be in high demand by the construction industry, as timber buildings need to meet specific fire codes for buildings set by regulators.

Now, the researchers are planning to work with industry partners to test the effectiveness and longevity of the coating.