

How 3D printing uses timber waste products to produce an advanced construction material

FWPA launches WoodChat season two

3D printing technology can combine timber waste products and recycled plastics to transform them into a high-performance construction element, as results from research conducted at the University of Sydney show.

The Forest and Wood Products Australia (FWPA)-supported research is the focus of the latest episode of WoodChat, and is being conducted by a team led by Professor Sandra Löschke, Director of the Architecture Design Research Group at the University of Sydney.

In the season two launch episode of FWPA's podcast series, Professor Löschke explained that she and her team set out to explore what 3D printing can offer both the construction and forestry industries that conventional technologies do not.

The process of 3D printing involves a composite material being placed through a nozzle, and being applied layer by layer to a surface, before it hardens. Its use in the construction industry is growing rapidly, especially for the creation of concrete elements. However, these elements still largely rely on traditional construction processes, for example the use of steel reinforcement bars. This project looks at what 3D printing can offer the construction industry that traditional methods cannot.

"The aim has been to produce an element that is strong and aesthetically pleasing by varying the material composition during the printing process. We want it to be as close as possible to natural timber, both in terms of the percentage of timber used, and also in its look and feel," Professor Löschke said.

"We have developed a printing process that can gradually modify the material to allow for a wood-like pattern and texture that give the feel of timber. This is crucial for boosting the product's marketability.

"The ultimate dream is to be able to build entire buildings and even cities using this technology. And when you consider that two-storey houses are already being 3D-printed in concrete, it is easy to imagine that we may be able to do the same thing, better and more sustainably, with a recycled timber composite," Professor Löschke said.

The interdisciplinary research team includes Professor Gwenaëlle Proust and Higher Degree Research students John Mai, Yerong Huang and Jordan Girdis.

This episode of WoodChat is the first in the new series, and follows topics from last year including the increasing use of Unmanned Aerial Vehicles (UAVs) in forestry, environmental benefits associated with using timber in construction, and a genetic DNA testing system that can predict key commercial attributes of trees during the earliest stages of their lives.

This episode will be followed throughout the year with topics such as how RFID tracking systems are being used in prefabricated timber construction, and some of the initiatives that are currently engaging and securing future industry leaders.

The WoodChat series represents FWPA's commitment to communicating industry news and innovations. Each episode in the series includes in-depth conversations with experts on recent discoveries, innovations and initiatives.

You can listen to WoodChat on [SoundCloud](#) and [iTunes](#).

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