



The process used to create the transparent wood was published in the January 2021 issue of the journal *Science Advances* | Photo source [Science Advances](#)

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TRANSPARENT WOOD CREATES A HAZY, PATTERNED WINDOW

 ARCHITECTURE & DESIGN

Researchers have developed a method to make wood mostly transparent, creating a naturally hazy window with insulating properties

Spotted: A team of materials scientists at the University of Maryland have developed an improved method for turning wood transparent. The result is a material that is tough and beautiful, and which is around 90 per cent transparent – allowing light to fill a room, but hazy enough to prevent others from seeing inside.

Previous processes for making wood transparent involved soaking the wood in sodium chlorite to remove the lignin. However, this method produced a chemical waste that was tough to recycle and could weaken the wood. The new process, developed by a team led by Lianbing Hu, modifies the lignin instead of removing it. The result is a tougher product which has better insulating properties than glass and a natural wood-grain pattern.

The team treated a small block of Douglas fir with hydrogen peroxide and left it under a UV lamp designed to simulate natural sunlight. The pores are then filled with clear epoxy. The method removes some, but not all of the lignin (which gives wood its colour), leaving behind the other cell structures in the wood, which provide a natural pattern. The wood is then cut against the grain so that the remaining cell structures bounce the light around to give a hazy effect. No matter what angle the sun strikes, the light travels perpendicularly to fall on the same diffuse area all day.

The result of this work is a material which can not only provide light insulation, but can also be used in a wide variety of ways. According to Hu, “In this patented research, we demonstrate the first aesthetic wood with patterns following the density variation in natural wood. Such patterned, transparent wood can also block UV and heat, is mechanically strong, which could find many applications in buildings where sustainability and energy efficiency are desired.”

A number of researchers are working on developments involving wood. For example, Swiss researchers have recently developed a way to make wood emit **luminescent light**, while in Germany, researchers have created a recyclable product from **cellulose** that could replace the use of unsustainable Styrofoam packaging.

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Takeaway:

Inventwood, a University of Maryland spinoff company, is working to commercialise the transparent wood technology. Hu's group had previously created a battery made of wood, a super-strong wood that could replace steel, a bio-compatible battery made of grass and a cooling wood, among other concepts. The group's work illustrates that there are a huge number of ways that natural products can be adapted to deliver sustainable innovations in areas that have not yet been explored.