

Paneling

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cross-laminated timber that failed at Peavy Hall, but damage to one product in the fledgling industry could hurt everyone.

“It’s certainly in the best interest of our industry in general for that to be a success,” Freres said.

Construction on Peavy Hall halted for months. Engineers eventually attributed the collapse to a glue failure due to it being applied under improper temperatures.

Freres' Mass Plywood Paneling has become a significant component in the delayed completion of Peavy Hall and the construction of the Advanced Wood Products Laboratory at Oregon State.

Experts say what happened at Peavy was an isolated incident due to a production malfunction, but it also brought a lot of negative attention to a portion of the wood products industry touted as a key component in Oregon's future.

Reviving a shrinking forestry industry

At its peak in the 1980s, over 50,000 people in Oregon worked in the manufacturing of wood products.

By 2011, that number dropped below 20,000.

Cross-laminated timber has been produced in Europe for about 25 years, according to Geoff Huntington, Director of Strategic Initiatives at Oregon State’s College of Forestry.

But it wasn’t until the past few years the first facility in the United States – specifically at DR Johnson in Riddle – opened.

A report by Grand View Research says the cross-laminated timber market is expected to be worth \$2 billion worldwide by 2025.

And with about 4 billion board feet of timber harvested a year in Oregon, it still marks a large segment of the state's economy.

"People are rediscovering that wood is such a fantastic building material," Freres Lumber vice president Tyler Freres said. "Concrete and steel really did build up our country over the last century, but we have an opportunity to switch to a much more ecologically beneficial material going forward."

"Wood is 100 percent solar powered, 100 percent renewable, 100 percent recyclable and it breathes in the carbon dioxide and it breaths out oxygen. Can you come up with a better material on the face of the earth?"

The Oregon Building Codes Structures Board in August adopted code that will allow wood-framed buildings to be built as high as 18 stories, significantly taller than the previous limit of six stories.

There had been concerns about potential failures of wood in case of fires at multi-story buildings, but Huntington said extensive testing showed engineered wood performed better in fires than steel.

Oregon State associate professor of renewable materials Arijit Sinha said buildings from 5 to 12 stories are where the Mass Plywood Panels will have their greatest advantage over steel and concrete or traditional wood-frame construction.

“The moment you go to multi-family dwellings, four- and five-story apartment complexes, that is the niche market for the mass plywood panels,” Sinha said.

Entering potentially large market

Freres Lumber is a family-owned company based in Lyons that has been a major player in Oregon's wood products industry since 1922.

While at a conference in Europe in 2015, Tyler and Kyle Freres toured cross-laminated timber facilities with a group



Seasoned Freres employees, from left, Ed Setzer, Zach Holman and Randy Carson. Experienced help has been crucial to getting a new plant up and running. Freres Lumber Company achieved an ambitious timeline in getting its Mass Plywood Panel plant operational by Christmas. JUSTIN MUCH/STAYTON MAIL

of professors from Oregon State.

It sparked an idea. Freres mostly produces wood veneer, most destined for plywood.

But if it could use the same cross-laminated timber technology for plywood, could they make structural boards in the same manner?

After returning to Oregon, they started to test a master product made of veneer and sent early samples to Oregon State's College of Forestry for proof of concept testing.

Freres’ Mass Plywood Panel differs from traditional plywood as it is made from wood veneers glued and pressed together in differing orientations and densities to make stronger panels for structural applications.

Cross-laminated timber is typically made up of thicker lumber laminated in a similar cross-hatch pattern, but needs to be significantly thicker than Mass Plywood Paneling to have equivalent strength.

MPP can be made in larger panels and cut to size from the factory to make assembly on construction sites quicker and easier.

Sinha said tests of mass plywood paneling showed the product is significantly stronger than cross-laminated timber of equal thickness.

“You’re saving wood in the long run,” Sinha said.

To make Mass Plywood Paneling a viable product, Freres Lumber built an all-new 182,000-square-foot, temperature-controlled manufacturing facility in Lyons down the road from its veneer processing facility.

Peavy Hall collapse

It was a 1,000-lb. section of the third floor of Peavy Hall that collapsed and crashed onto the floor below.

Engineers determined the failure was due to delamination of cross-laminated timber manufactured by DR Johnson Lumber Company of Riddle.

Temperature variations during manufacturing caused the glue to not set correctly.

Construction of the building was initially projected to cost \$46 million. Recent estimates put the cost at \$79.5 million, and it is expected to be completed in September 2019.

“I think at the end of the day, it was one issue with a block of panels,” Tyler Freres said.

"It's significant, it's considerable and it should be a little bit of a black eye, but

at the same time there’s a whole lot of concrete bridges that fall down on an annual basis and a whole lot of steel that fails, too. And they’re still used as building products.”

Freres gets involved in Peavy solution

Freres MPP product wasn’t used in the initial construction of Peavy Hall. But

contractor Anderson Construction chose to incorporate it into Peavy – mostly in sub roofing – as well as the structural walls and sub roofing in the adjacent Advanced Wood Products Laboratory.

Freres Lumber has a product it believes could be a player in a larger market.

But to make use of it, engineers and architects must design buildings with the intention of using it.

For engineers to recognize it is a via-

ble option, they must see it in action, which they soon will at Oregon State.

Freres Lumber has shipped five or six trucks full of mass plywood paneling, what is needed for the Advanced Wood Products Laboratory. It has shipped about the same amount for Peavy, with about a truckload for that building remaining.

The company has history with Oregon State.

Late company president Ted Freres – uncle of current president Rob Freres and father of vice presidents Tyler and Kyle Freres – and his wife, Diane, attended Oregon State, and the company and college have been involved for decades.

And Oregon State's College of Forestry will give Freres' MPP its desired showcase.

“We want it to be a successful project,” Tyler Freres said.

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