

Freres Lumber Co. Mass Plywood Panels (MPP) Frequently Asked Questions (FAQ)

1. What is MPP (Mass Plywood Panels)?

MPP is a patent-pending, veneer-based engineered wood product developed by Freres Lumber Co. MPP is a Mass Timber Panel assembled by combining extremely thin layers of Douglas Fir veneers, which are densely layered together, creating a large-format wood platform that may be engineered to exact specifications and cut with advanced CNC technologies. MPP is strong, fire-resistant, and lighter per volume than traditional building materials such as concrete or steel.

2. Are 4X8 sheets of plywood used to make MPP? In what thickness?

Although its name may suggest otherwise, the Mass Plywood Panel is composed of 1" layers of Structural Composite Lumber (SCL), a veneer-based engineered wood product certified under ASTM D5456. Unique SCL layups allow the Mass Timber Panel to be constructed with stability across both axis of the panel.

3. What dimensions can MPP be provided in?

MPP is extremely versatile. While it can be cut to almost any shape and size, and with required joints, the raw panel size is limited to 12' wide by 48' long by up to 24" thick. MPP products can be used for almost any structural wood element in a mass timber building. Current operations limit cut panel thickness to 12", although plans are in the works to allow processing up to 24".

4. In a 12" thick MPP, how many layers of veneer are in it?

There are 108 veneer layers within a 12" deep MPP. We like to think of it as 108 layers of versatility to create the appropriate panel for your needs. Each veneer layer can be engineered by density, orientation and grade, allowing flexibility for every panel.

5. How will MPP be used in construction?

Freres MPP can be used as pre-fabricated timber panels to allow rapid construction on multi-story structures. MPP is also available in thicknesses as thin as 2", potentially allowing cost effective use in single-family residential structures. While current PRG-320 certification allows for the current use in plank orientation, in the future we anticipate the use of MPP for columns, beams, floors, roofs and walls.

6. How do you measure its strength?

We have APA Product Reports for our SCL products as well as our MPP products. Product design values are listed within the product reports. Typical measures of product strength are stiffness, moment capacity and shear. These values have all been established in the product report. Please visit www.apawood.org to view the Product Report and design values. Please note that as additional testing is completed more product reports will be added to our product list.

7. What tests has Freres done on the integrity of MPP?

Freres MPP products have conducted extensive product testing. The APA has performed extensive testing to certify our products under ASTM D5456 and PRG 320.

However, we are also working to establish design values outside those required by those standards with partners at Oregon State University, The Tallwood Design Institute and other labs across the country. These tests include cyclical loading, monotonic loading, compression, acoustics and fire testing. There are also labs independently testing for seismic performance and impact.

8. How strong is MPP compared to CLT?

The minimum design values for MPP exceeds the minimum design values of E2 CLT defined by PRG-320 in each comparable thickness in major force direction.

9. What made you think of this design? Why is this product necessary? What hole in the market are you filling?

Mass Timber Panels like CLT are an extraordinary development that will allow the manufacture of pre-fabricated structural wood panels to construct multi-story structures rapidly. Typically, wood framed buildings are limited to four stories due to fire concerns. The predictable char rate of mass timber panels allows buildings to be built taller with wood, allowing code approved multi-story structures out of wood up to 18 stories anticipated in the next iteration of the International Building Code (IBC).

10. What are you patenting? When will you get the patent?

Patents are pending worldwide. We anticipate all patents in-hand in 2019.

11. What is cross laminated timber (CLT)?

CLT is a type of Mass Timber Panel constructed of either machine graded or visually graded dimensional lumber typically consisting of odd layers of dimension lumber oriented perpendicular to one another and then glued to form structural panels.

12. How is MPP different from CLT products?

MPP uses veneer as the primary raw material to create an SCL panel, which is then used to create a Mass Timber Panel.

MPP can engineered to be as strong or stronger than a CLT of equivalent thickness. Each veneer is electronically graded, and the use of veneer effectively distributes and reduces the effect of defects such as knots. As a result, the panels have a more predictable performance than lumber-based products.

13. Are there any other MPP products on the market?

No, this is a new product designed from the ground up by the Freres family.

14. Are there any other similar products on the market that are APA certified?

Freres is only the third company in the United States to be certified in accordance with PRG 320. MPP is the only patent-pending product in this category on the market.

15. How are the layers of plywood adhered together?

The primary bond for each SCL lamella created using phenol-formaldehyde resin in a hot press. The secondary bond is created using a melamine formaldehyde cold-press resin.

16. What is the environmental impact of the resin?

All resins used within MPP are CARB-compliant. There is no additional formaldehyde off-gassing beyond what is normally observed in wood. For more information please visit www.apawood.org, APA Technical Note: Formaldehyde and Engineered Wood Products.

17. Can we put architectural appearance grade veneer on the face of the panel? In other words, what are options for finishing panels on the interior of a building?

Freres has designed the MPP production process to allow “skinning” the MPP panel with any finished architectural panel for appearance characteristics.

18. How does weather affect the outside of the product?

MPP is made to exterior exposure criteria much like plywood and other engineered wood products. However, MPP is not meant to be permanently exposed to the elements. Appropriate siding products should still be used in conjunction with the structural panels.

19. Can the panels be pressed in a way to make them curved?

No, the format is flat.

20. How does MPP compare to concrete and steel construction?

Increasingly, mass timber is being used as an alternative to concrete and steel construction for mid-rise building construction. Mass timber products have a number of advantages over steel and concrete. MPPs are renewable, have a significantly smaller carbon footprint, cost less and are much faster to install.

21. How do the pieces of MPP connect to one another?

Many of the traditional timber joints may be used when constructing with MPP. Spline joints, ship lap (half-lap) joints, and the like are very common when connecting one MPP panel to another. The particular joint used will depend on the specific application.

22. How will you transport the finished product?

MPP is transported by either rail or by truck. Rail loading facilities have been constructed at our manufacturing facility so that we may load a variety of rail cars for shipping long distances. Transportation in the Pacific Northwest and to local job sites will be by truck.

23. Does the local climate where MPP products are used affect its integrity? For example, how does MPP hold up in extremely hot, humid climates versus extremely wet or very cold climates?

MPP, as well as other Mass Timber products are not designed to be used as exterior construction elements. Weather proof materials should be used to protect structural products from the weather. Aside from this, MPP will perform similarly in a variety of climates.

24. How much has the company invested in this product?

Freres Lumber has invested over \$30 million in the development of the MPP product and the construction of its state-of-the art production facility. In addition, employees and managers have invested an extraordinary amount of time and effort into building this product from concept to reality.

25. How long have you been working on the development of MPP?

The idea for MPP began in the summer of 2015. It has taken two short years, but a significant time and effort to bring the first MPP facility online.

26. What has been your biggest obstacle in developing this product?

The biggest obstacle we have faced, and there have been many, is that Freres is blazing a trail that no one has walked before. It has been a trial every step of the way and, being the first people to develop the product, there have been very few people to fall back on to help solve problems encountered.

27. What is your biggest victory in the development of MPP thus far?

Licensed Manufacturing Questions

1. We would like to manufacture and sell MPP. Do you have a licensing program?

This is an area that we will need to work on. We don't currently have a licensing agreement, but would actively entertain opportunities to license MPP. These would most likely need to be negotiated with those that come to the table first.

2. Can you explain the licensing agreement and process for companies wanting to manufacture and sell MPP independently?

3. How long does it take to complete the agreement process to be an independent manufacturer of MPP?

4. What do you expect the start-up and equipment investment to be?

It would depend on the location and infrastructure. If there was a suitable structure and infrastructure in place, initial investment in MPP facilities alone would be in excess of \$15 million.