

FREQUENTLY ASKED QUESTIONS



WHAT IS MASS PLY?

Mass Ply is a patented, veneer-based engineered wood product developed by Freres Engineered Wood. Mass Ply is a mass timber panel, assembled by combining extremely thin layers of Douglas Fir veneers, which are densely layered together to create a large-format wood platform that may be engineered to exact specifications and cut with advanced CNC technologies. Mass Ply is strong, fire-resistant and lighter per volume than traditional building materials, such as concrete or steel.

WHAT IS MASS PLY PANEL (MPP)?

MPP is a mass timber panel, similar in application to cross-laminated timber, that was developed, produced and patented by Freres Engineered Wood. Layers of structural composite lumber are assembled and glued to produce a panel up to 12' wide and 48' long, meeting the requirements of ANSI/APA PRG 320, and designed to be used in the construction of mid-rise to high-rise structures.

WHAT IS MASS PLY LAM (MPL)?

MPL is the beam and column equivalent of Mass Ply Panels (MPP), with dimensions up to 4' wide and 24" thick. MPL has many similar characteristics to MPP, but with a thicker cross section. Structural grades are available in 2.0E and 1.9E, allowing for direct replacement of glulam beams in structures.

ARE 4' X 8' SHEETS OF PLYWOOD USED TO MAKE MASS PLY? IN WHAT THICKNESS?

Although its name may suggest otherwise, Mass Ply is not composed of sheets of plywood. Rather, it 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 axes of the panel.

IN WHAT DIMENSIONS CAN MASS PLY BE PROVIDED?

Mass Ply 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 and up to 24" thick. Mass Ply products can be used for almost any structural wood element in a mass timber building.

HOW MANY LAYERS OF VENEER ARE IN A 12" THICK MASS PLY PANEL?

Every inch of Mass Ply consists of nine layers, so there are 108 veneer layers within a 12" thick Mass Ply Panel. We consider it 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.

ARE THERE ANY OTHER MASS PLY PRODUCTS ON THE MARKET?

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

ARE THERE ANY OTHER SIMILAR PRODUCTS ON THE MARKET THAT ARE APA-CERTIFIED?

Freres is the third company in the United States to be certified in accordance with PRG 320. Mass Ply is the only patented product in this category on the market.

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.

HOW STRONG IS MASS PLY COMPARED TO CLT?

The minimum design values for Mass Ply exceed the minimum design values of E2 CLT, defined by PRG-320 in each comparable thickness in the major force direction. E2 CLT is the most comparable grade of CLT, in terms of engineering and species, that we have to compare to Mass Ply.



HOW CAN MASS PLY BE USED IN CONSTRUCTION?

Freres Mass Ply can be used as pre-fabricated timber panels to allow rapid construction on multi-story structures. Freres MPP and MPL can currently be used in a wide variety of applications, including floors, roofs, beams, columns and exterior envelopes. Visit apawood.org for the latest Freres Engineered Wood reports for Mass Ply products.

HOW DO YOU MEASURE THE STRENGTH OF MASS PLY?

Typical measures of Mass Ply product strength are stiffness, moment capacity and shear. These values have been established in APA Product Reports (applicable to our SCL and Mass Ply products). Visit apawood.org to view current product report and design values.

HOW HAS FRERES TESTED THE PERFORMANCE OF MASS PLY?

Freres Mass Ply products have been subjected to rigorous testing. The APA has performed extensive testing to certify our products under ASTM D5456 and PRG 320. We are also working to establish design values and standards outside those required by these product 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, ballistic testing, fire testing and seismic performance and impact. We have also acquired the following certifications: Life Cycle Assessment (LCA) and Environmental Product Declaration (EPD). Ongoing and daily Quality Assurance testing ensures that our products perform as anticipated.

HOW IS MASS PLY DIFFERENT FROM CLT PRODUCTS?

Mass Ply uses veneer as the primary raw material to create an SCL panel, which is then used to create the Mass Ply Panel. Mass Ply is 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 impact of defects such as knots. As a result, the panels have a more predictable performance than lumber-based products.

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. With years of experience in the veneer business, we realized we could produce a better product in this category that would open doors from a building and construction standpoint, would be better for the environment and would be more cost-effective than current market offerings.

Mass Ply uses about 20% less wood than CLT and is as strong as other SCL products. In addition, the dense layering of wood veneers in Mass Ply can result in high levels of thermal insulation. Mass Ply can be produced in varying lengths and thicknesses as well as from small-diameter trees, which helps mitigate over-stocked forests in the Northwest. Finally, wood-framed buildings have typically been limited to four stories due to fire concerns. The predictable char rate of mass timber panels allows for taller wood construction, supporting code-approved structures up to 18 stories.

HOW ARE THE LAYERS OF PLYWOOD ADHERED TOGETHER?

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

WHAT IS THE ENVIRONMENTAL IMPACT OF THE RESIN?

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

WHAT OPTIONS ARE THERE FOR MODIFYING THE APPEARANCE OF FINISHING PANELS ON THE INTERIOR OF A BUILDING?

Freres has designed the Mass Ply production process to allow “skinning” the Mass Ply Panel with any finished architectural panel for appearance characteristics. This said, the small knot appearance of 2nd or 3rd growth Douglas Fir is aesthetically pleasing and a good complement to any structure.



HOW DOES WEATHER AFFECT MASS PLY?

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

DOES THE LOCAL CLIMATE WHERE MASS PLY PRODUCTS ARE USED AFFECT ITS INTEGRITY? FOR EXAMPLE, HOW DOES MASS PLY HOLD UP IN EXTREMELY HOT, HUMID CLIMATES VERSUS EXTREMELY WET OR VERY COLD CLIMATES?

Mass Ply, as well as other mass timber products, are not designed to be exterior construction elements. Weather-proof materials should be used to protect structural products from the weather. Mass Ply Panels leave the production facility at 8% +/- 2% moisture content. Depending upon the local humidity in the region of installation, the panels will increase or decrease in moisture content over time.

CAN THE PANELS BE PRESSED IN A WAY TO MAKE THEM CURVED?

No, the format is flat. Over a longer span there is a natural deflection which can be incorporated into a curve, depending on the thickness of the panel. Curvatures can be cut into the panels and used in a joist orientation. Please coordinate with our design team.

HOW DOES MASS PLY 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. Mass Ply products are renewable, have a significantly smaller carbon footprint, cost less and are much faster to install.

HOW DO PIECES OF MASS PLY CONNECT TO ONE ANOTHER?

Many of the traditional timber joints may be used when constructing with Mass Ply. Spline joints or steel strapping are common when connecting one Mass Ply Panel to another. The particular joint used will depend on the specific application.

HOW MUCH HAS THE COMPANY INVESTED IN THIS PRODUCT?

Freres Engineered Wood has invested \$40 million in the development of Mass Ply 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.

HOW LONG HAVE YOU BEEN WORKING ON THE DEVELOPMENT OF MASS PLY?

The idea for Mass Ply began in the summer of 2015. Product development, however, is a never-ending process, as we continue to roll out new grades and configurations for Mass Ply layout.

WHAT WAS YOUR BIGGEST OBSTACLE IN DEVELOPING MASS PLY?

The biggest obstacle we have faced is blazing a trail for an innovative new product in a nascent market. Mass timber upends many traditional construction techniques, which is forcing massive change on an established industry. Change of this kind has both obstacles and opportunities.

