Ultralight Handbook
Technical product manual

Ultralight Sandwich Panels
Content

1. What is Ultralight? 2
2. Products 4
3. Applications 6
4. Formats 10
5. Technical Characteristics and Certifications 12
6. Introduction to Panel Connections 16
7. Results of technical analysis and pre-dimensioning tables 18
8. Comparison of Structural Thickness, Density and Technical Characteristics with other Materials 22

Annexes

Annex A. Creating Panel Connections
   Hinge 24
   Flat connection 26
   90º connection 50
   Insert 53
   Filled edge 63

Annex B. Best Practices for Use 68
What is Ultralight?

As a global reference in the production of plywood panels, Garnica has developed an innovative range of ultralight products. Combining the excellent mechanical properties of Garnica plywood—lightness, stability and machinability—with an insulating and ultralight material such as extruded polystyrene produces a panel with improved performance.

**Ultralight sandwich panels** comprise an insulating XPS core, plywood panel made from European poplar sourced from sustainable plantations and a wide range of finishes of exceptional surface quality.

The Ultralight product range is the lightest plywood that Garnica currently produces and is an excellent solution for numerous applications.

**Exceptional Properties**

Its extremely lightweight nature in combination with a robust structure gives Ultralight a series of characteristics that perform better when compared with conventional panels:

- The 18 mm panels are 45% lighter while the 60 mm panels can be up to 75% lighter than standard poplar plywood
- This lightweight nature is maintained even in giant format pieces
- Easy to handle, both during transport and production
- Easy to machine using all sorts of tools: traditional, CNC and wood shapers
- 30% faster cutting
- Perfect for covering with any type of material: veneers and papers, HPL/CPL, aluminium, HDF/MDF, etc.
- High-quality XPS core: exceptional thermal insulation, high mechanical resistances, low weight, high water tolerance, uniform seal and cellular structure

* Density: total thickness of 18 mm (4.5 + 9 + 4.5) ± 5% tolerance
Products

The Ultralight range includes a wide variety of products to meet numerous requirements.

- Light-coloured poplar faces of exceptional surface quality that are ideal for painting, filming/laminating or digital printing.

- Coated with decorative HPL (High Pressure Laminate), giving the panel an exceptional resistance to impact and scratching. Extensive range of available colours and HPL finishes.

- The main characteristics of this engineered wood are the significant surface uniformity that is ideal for covering and the outstanding surface toughness with excellent scratch and splitting resistance.

- High-quality ilomba faces that are perfect for filming or laminating.

- Decorative birch faces with soft and warm tones and elegant grain that are perfect for decoration and furniture.
Applications

Ultralight is specifically designed for applications seeking to lighten weight load, such as the caravan industry and the furniture and decoration trade, or where thermal insulation is especially important, such as doors, roofs or panelling.

<table>
<thead>
<tr>
<th>Caravan</th>
<th>Marine</th>
<th>Furniture</th>
<th>Decoration</th>
<th>Construction</th>
<th>Trains</th>
<th>Digital printing</th>
</tr>
</thead>
<tbody>
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<td>✓</td>
</tr>
</tbody>
</table>
Recycling

Ultralight has a very long life cycle, meaning there are numerous ways to reuse the product. The best way to manage Ultralight sandwich panels is to reuse them in another application.

Recycling methods vary from one country to another owing to specific legislation in each case. Always follow the rules that apply locally.

Specialised companies shred sandwich panels and recycle each part separately. Panels can also be repurposed at energy recovery plants.

Applications

Ultralight is perfect in each one of these industries or sectors for use in countless specific applications:

• Interior construction and furniture for caravans, boats and all type of vehicle
• Decoration and furniture for any interior design project
• Ceilings and panelling for buildings
• Stages and decorations
• Doors, floors, wall interiors and any kind of construction component
• Building models
• Trade fair stands and window displays
• Digital printing for posters, signs and any advertising medium
• Perfect for laminating or painting because of the high quality of the poplar faces
The composition of Ultralight has been optimised and comes in a wide range of sizes and thicknesses so it can be adapted to numerous projects.

### Dimensions (mm)

<table>
<thead>
<tr>
<th>Total thickness (mm)</th>
<th>12</th>
<th>15</th>
<th>18</th>
<th>22</th>
<th>24</th>
<th>25</th>
<th>26</th>
<th>28</th>
<th>30</th>
<th>32</th>
<th>38</th>
<th>40</th>
<th>50</th>
<th>60</th>
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<tbody>
<tr>
<td>Ultralight Poplar*</td>
<td>312</td>
<td>284</td>
<td>227</td>
<td>193</td>
<td>184</td>
<td>179</td>
<td>168</td>
<td>160</td>
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<td>133</td>
<td>120</td>
<td>110</td>
<td>97</td>
<td></td>
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<tr>
<td>Ultralight Poplar HPL</td>
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<tr>
<td>Ultralight E-wood</td>
<td></td>
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<td></td>
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<tr>
<td>Ultralight Ilomba</td>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Ultralight Birch</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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</tr>
</tbody>
</table>

* Ultralight Poplar for digital printing (BB8 quality poplar faces) only available in 2500 x 1220 and thicknesses of 12, 15, 18, 22, 24, 28, and 30 mm.

### Palletisation

<table>
<thead>
<tr>
<th>Total thickness (mm)</th>
<th>2640x1220, 2500x1220</th>
<th>3050x1220, 3050x1300</th>
<th>3100x1530</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>100</td>
<td>100</td>
<td>-</td>
</tr>
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</tr>
<tr>
<td>60</td>
<td>20</td>
<td>20</td>
<td>19</td>
</tr>
</tbody>
</table>

* The panels are made of 4.5 mm plywood except for the 12 mm total thickness, which can only be produced using 4 mm plywood for the 2500x1220 mm size.
* Due to technical issues, the sizes of 3050x1220 and 3100x1530 mm contain a core made using more than one piece of XPS.
* Other thicknesses available on request. Formats may vary without prior notification. Please contact your local sales rep to check availability in your area.
Technical Characteristics and Certifications

**Glue Type:** Class 1 (interior) or, on request, Class 3 (exterior) according to EN 314-2 standards

**Emission:** Class E1 according to the EN 13986 standard. CARB Phase 2 / TSCA Title VI upon request. «E05» Emission ≤0.05ppm according to EN 717-1 standards upon request.

**Quality faces:**

<table>
<thead>
<tr>
<th>Face Screw Holding (N)</th>
<th>Moisture content (%)</th>
<th>Long.</th>
<th>Perp.</th>
<th>Thermal resistance (m²•K/W)</th>
<th>Thermal transmittance (W/m²K)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B/B</td>
<td>6-14</td>
<td>1500</td>
<td>2500</td>
<td>17</td>
<td>14</td>
</tr>
<tr>
<td>B/BB</td>
<td></td>
<td></td>
<td></td>
<td>0.496</td>
<td>2.01</td>
</tr>
</tbody>
</table>

* B/BB faces available for digital printing

The data shown here are purely for information purposes and have no contractual value. The technical characteristics may vary with no prior notification based on new developments and technological advancements. The buyer is responsible for deciding whether the Garnica product is suitable for the desired application, and will be required to ensure that the location and way in which it is used are suitable according to the manufacturer’s instructions and suggestions, as well as its compliance with current regulations.
Protection against Fire

The extruded polystyrene (XPS) used for the Ultralight core as insulation is an HBCD-free flame retardant component and contains none of the foam blowing agents CFC and HCFC. According to Specification STM-S-001, Index D (2014), Ultralight possesses a very low smoke gas index and has been classified as F1, a material of low toxicity.

The I.F. smoke gases index measures the maximum specific optical density (Dm), the smoke obscuration value (VOF4) and the toxicity index (I.T.C.).

The test establishes requirements related to the smoke and potential toxicity of practically all flammable materials on a railway vehicle.

F1

Acoustic Insulation

The XPS core and excellent physical-mechanical properties of plywood panels from Garnica mean that Ultralight possesses outstanding levels of thermal and acoustic insulation. Ultralight has been accredited by the most demanding acoustic tests, such as the UNE-EN ISO 10140-2:2011 standards. It has been laboratory tested to measure acoustic insulation and accredit its use in construction. Please contact your local sales rep to see the tests.

F1

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**Screw pull-out resistance**

<table>
<thead>
<tr>
<th>Plywood thickness (mm)</th>
<th>1 panel</th>
<th>2 panels</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>364</td>
<td>728</td>
</tr>
<tr>
<td>4.5</td>
<td>409.5</td>
<td>819</td>
</tr>
<tr>
<td>6</td>
<td>546</td>
<td>1092</td>
</tr>
</tbody>
</table>

To use screws with greater resistance (non-standard), we recommend selecting the 6 mm plywood thickness.

By providing greater mechanical inertia to the assembly owing to perfect industrial adhesion capacity, this combination of layers in the form of a sandwich panel also creates a stiffness in the Ultralight panels that is genuinely surprising when considering their lightweight nature and easy machinability.

Determination of screw pull-out resistance from fibreboards is performed under UNE EN 320:1993 standards.
The strength and lightweight nature, as well as the easy machinability using standard furniture and panelling production tools, of Ultralight panels means they can be used in various applications for all sorts of pieces and in combination with various fittings, tools, edges and fillings.

This section provides a compilation of recommendations, a practical solution for mounting and Ultralight machining. Details of several standard solutions are provided, as well as a number of innovative solutions for various market segments and applications in which their daily use have been tested and approved. These solutions will be constantly updated with the latest mounting and machining technologies.

The information to be found in this handbook supports the standard industry information for quickly and precisely choosing fixed and mobile connections and machining solutions while optimising the use of Ultralight panels in combination with other materials.

Standard carpentry machines and tools are used for this list of recommendations. However, certain specific tools or items may be needed in some cases due to the specialist nature of the fixture in question.

See Annex A. Creating Panel Connections.
Results of technical analysis and pre-dimensioning tables

Ultralight is mainly used for interior applications where panel stiffness and stability is important, as well as reduced weight.

From a static perspective, the panels commonly have a bending moment similar to that found in shelve panels, for example.

To support our customers in the planning process, we have produced the following information and tables:

Calculation Method and Premises

The pre-dimensioning tables were produced under the assumption that the panel is supported in two locations and subject to bending under an constant uniformly distributed load (Figure 2) for \( q \) values of 0.5, 1.0, 1.5 and 2.0 kN/mm\(^2\) and inter-support spans of between 400 and 1200 mm.

Possible external influences were not taken into consideration, such as humidity content variance or panel yield owing to long-term loads, among others.

The dimensioning was limited by the maximum permitted span deflection between 300 (L/300).

Checks were performed to verify panel deflection resistance for the previously defined spans and loads and based on the resistance values provided by Garnica (Table 1). Shear verifications were not included.

Pre-dimensioning tables

USING THE TABLES

1. Select the table according to the work direction of the panel: longitudinal or transversal.
2. Select the table based on the load applied: 50, 100, 150 or 200 Kg/m\(^2\).
3. Select the panel inter-support span in the first column of the table: 400, 500, 600, 800, 1000 or 1200 mm.
4. In the tables the colour blue denotes combinations of panel thickness and span that result in an instantaneous deflection less than the span between 300 (<L/300). The colour pink denotes combinations that result in a deflection below that limit.
## Results of technical analysis and pre-dimensioning tables

### Panels Working Longitudinally

<table>
<thead>
<tr>
<th>Distributed load (kg/m²)</th>
<th>Panel thickness (mm)</th>
<th>Limit (l/300)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15</td>
<td>18</td>
</tr>
<tr>
<td>50</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>100</td>
<td>0.6</td>
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<td>0.8</td>
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<td>200</td>
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<td>3.8</td>
</tr>
<tr>
<td>900</td>
<td>4.0</td>
<td>4.0</td>
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</table>

### Panels Working Transversally

<table>
<thead>
<tr>
<th>Distributed load (kg/m²)</th>
<th>Panel thickness (mm)</th>
<th>Limit (l/300)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>15</td>
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<tr>
<td>50</td>
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<tr>
<td>900</td>
<td>9.0</td>
<td>9.0</td>
</tr>
</tbody>
</table>
Comparison of Structural Thickness, Density and Technical Characteristics with other Materials

One of the most remarkable benefits of Ultralight is its perfect dimensional stability and extremely lightweight nature combined with an excellent result in terms of elasticity and rupture moduli. These excellent physical-mechanical properties are shown below in various analyses of density, weights and numerous performance tests in comparison with other types of panels.

### Ultralight Elastic Modulus based on panel thickness

<table>
<thead>
<tr>
<th>Thickness (mm)</th>
<th>Density* (kg/m³)</th>
<th>MOE** (N/mm²)</th>
<th>Weight (kg/m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>312</td>
<td>1300</td>
<td>2800</td>
</tr>
<tr>
<td>15</td>
<td>276</td>
<td>1600</td>
<td>2700</td>
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<td>18</td>
<td>227</td>
<td>1500</td>
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<td>184</td>
<td>1200</td>
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<td>1500</td>
</tr>
<tr>
<td>60</td>
<td>97</td>
<td>650</td>
<td>1250</td>
</tr>
</tbody>
</table>

* MOE variance: +/- 30%

### Thermal performance of Ultralight panels based on total thickness

<table>
<thead>
<tr>
<th>Format 18 mm thick</th>
<th>Density* (kg/m³)</th>
<th>MOE** (N/mm²)</th>
<th>“R” thermal resistance (m²·K/W)</th>
<th>“U” thermal transmittance (W/m²K)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ultralight</td>
<td>227</td>
<td>1500</td>
<td>2300</td>
<td>0.346</td>
</tr>
<tr>
<td>Poplar plywood</td>
<td>420</td>
<td>3500</td>
<td>4800</td>
<td>0.411</td>
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<tr>
<td>Birch plywood</td>
<td>700</td>
<td>7000</td>
<td>10000</td>
<td>0.406</td>
</tr>
<tr>
<td>MDF</td>
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<td>Particleboard</td>
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<td>0.839</td>
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</table>

* Density variance: +/- 5%

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* Density variance: +/- 5%
** MOE variance: +/- 30%
### Annex: Creating Panel Connections

#### Connections

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hinge</td>
<td>Overlay hinge</td>
</tr>
<tr>
<td>Flat connection</td>
<td>Fastmount</td>
</tr>
<tr>
<td>90° connection</td>
<td>Ovolo connector, Shelf bracket, Wood screw connection, Countersunk wood screw connection, Inclined wood screw connection, 90° connection with dowel pin, Long eccentric, Short eccentric, Lamello Cabineo</td>
</tr>
<tr>
<td>Insert</td>
<td>Insert for metric screw (visible), Insert for metric screw (concealed), Blind rivet, Würth Coldmelt Technology, Sliding door system</td>
</tr>
<tr>
<td>Filled edge</td>
<td>Flipped Edges</td>
</tr>
</tbody>
</table>

#### Tools

- Saw
- Rivet gun
- Cutter
- Drill
- Special

#### Accessories

- Dowel pin
- Wood screw
- Rivet
- Metric
- Filled
- Edge
- PVA adhesive
- PU adhesive
- PC adhesive
- EVA adhesive
Overlay hinge

Overlay hinge used on doors, cupboards, kitchen furniture.

* The wood screw used must apply grip force between 2 and 8 mm of the shank.
** The resistance of the 4.5 mm poplar faces is usually sufficient for standard connections. 6 mm poplar faces are also available for applications that require greater strength, such as large furniture, doors, etc.

ADVANTAGES:
✓ Less stress on the hinge and screws thanks to the lighter weight of the Ultralight panel
✓ High screw pull-out resistance
✓ Only standard components are required

SUPPLIER:
Regular supplier

Exterior folding hinge

Exterior folding hinge for use on both interior and exterior doors.

ADVANTAGES:
✓ Less stress on the hinge and screws thanks to the lighter weight of the Ultralight panel
✓ High screw pull-out resistance
✓ Only standard components are required

SUPPLIER:
Regular supplier
Concealed hinge

Concealed hinge used for both exterior and interior doors and cupboards.

**ADVANTAGES:**
- Less stress on the hinge and screws thanks to the lighter weight of the Ultralight panel
- High screw pull-out resistance
- Only standard use components are required
- Concealed hinge

**SUPPLIER:**
Regular supplier

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**Häfele hinges and connectors**

Hinges and connectors for interior caravan furniture.

**HINGE ADVANTAGES:**
- Lighter than a standard hinge
- Less stress on the hinge and screws thanks to the lighter weight of the panel
- High screw pull-out resistance
- Only standard components are required

**CONNECTOR ADVANTAGES:**
- Reversible connection and exceptionally lightweight
- High screw pull-out resistance
- Easy to use with common tools

**SUPPLIER:**
www.haefele.de

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**Tools**
- saw
- cutter

**Accessories**
- wood screw
- filed

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**Drill**

**Accessories**
- wood screw
Creating Panel Connections

Fastmount

The Fastmount connection is perfect for countless uses in panelling, false ceilings, acoustic panels, furniture, upholstery, etc.

* The website of the supplier indicates the technology necessary for this system.

ADVANTAGES:

- Easily machinable
- Lightweight
- Reversible
- Easy to install
- Wide variety of solutions
- Suitable for outdoor use
- Absorbs expansions and contractions

SUPPLIER:

www.fastmount.com

Tools

- saw
- drill
- special

Knob/Handle (metric screw)

Knob/handle (wood screw) for handle use.

ADVANTAGES:

- Easily machinable

SUPPLIER:

Regular supplier

Tools

- saw
- drill
- wood screw

Accessories
Knob/Handle (wood screw)

Knob/handle (wood screw) for handle use.

**ADVANTAGES:**
- Easily machinable

**SUPPLIER:**
Regular supplier

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Connection on the same plane

**Lengthening Ultralight panels.**

- The cutting gear must be central on the edge and 1mm thicker than the XPS.
- The connecting piece must be twice as thick as the insulation.

**ADVANTAGES:**
- Lengthens the Ultralight panel surface

**SUPPLIER:**
Regular supplier

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**Tools**
- saw
- drill

**Accessories**
- wood screw

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**Tools**
- saw
- cutter

**Accessories**
- PVA adhesive
- PVA

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Ovvo connector

Ovvo connector used in furniture.

* Requires edging of at least 0.2 mm on the edge.
** The website of the supplier contains the technical information necessary.

ADVANTAGES:
✓ Connection versatility
✓ Connector option for joining parallel planes, at an angle or perpendicular
✓ Fixed or reversible connection option

SUPPLIER:
www.ovvotech.com

Shelf bracket

Shelf bracket connection used for supporting shelves, removable assemblies.

ADVANTAGES:
✓ Component allows reversible shelf support
✓ High screw pull-out resistance
✓ Option to create removable assemblies
✓ Concealed hinge

SUPPLIER:
Wood screw connection with washer

Wood screw connection with washer used for 90° connections in furniture.

**ADVANTAGES:**
- Strong mount with flush head
- High screw pull-out resistance
- Standard components only

**SUPPLIER:**
Regular supplier

Countersunk wood screw connection

Countersunk wood screw connection used for 90° connections in furniture.

**ADVANTAGES:**
- Strong mount with flush head
- High screw pull-out resistance
- Standard components only

**SUPPLIER:**
Regular supplier
Inclined wood screw connection

Inclined wood screw connection used for 90° connections in furniture.

**ADVANTAGES:**
- Strong mount with flush head.
- High screw pull-out resistance

**SUPPLIER:**
Regular supplier

90° connection with dowel pin

90° connection with dowel pin used in furniture.

* The dowel pin must have a diameter of 1 mm or be larger than the XPS and the drilling must be central on the edge.

**ADVANTAGES:**
- Concealed anchoring
- Standard components only

**SUPPLIER:**
Regular supplier
Creating Panel Connections

Long eccentric
Long 90° eccentric connection for drawers, removable assemblies.

* No edging required for use.
** For a better connection, filled edge recommended on eccentric side.

ADVANTAGES:
✓ Reversible connection
✓ High screw pull-out resistance

SUPPLIER:

Tools
- saw
- cutter
- drill

Short eccentric
Short 90° eccentric connection for drawers, removable assemblies.

ADVANTAGES:
✓ Reversible connection
✓ High screw pull-out resistance

SUPPLIER:

Tools
- saw
- cutter
- drill
Lamello Cabineo

Lamello Cabineo 90° connection for drawers, removable assemblies.

* The website of the supplier contains the technical information necessary.

**ADVANTAGES:**
- Reversible connection
- High screw pull-out resistance

**SUPPLIER:**
www.lamello.com

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Insert for metric screw (visible)

Insert for metric screw (visible) for furniture feet, connections on the same plane with metric screws.

**ADVANTAGES:**
- Reversible connection
- High screw pull-out resistance

**SUPPLIER:**
www.lamello.com

**Tools:**
- saw
- cutter
- drill
Insert for metric screw (concealed)

Insert for metric screw (concealed) for furniture feet, connections on the same plane with metric screws.

ADVANTAGES:
- Insert for connection with metric screws and bolts to affix all sorts of components, furniture feet, other panels on the same plane, extra thicknesses

SUPPLIER:
Regular supplier

Blind rivet

Blind rivet for furniture feet, connections on the same plane with metric screws.

* The drill diameter must be that which is defined by the rivet manufacturers.

ADVANTAGES:
- Permanent connection

SUPPLIER:
Regular supplier

Tools
- saw
- drill

Tools
- saw
- cutter
- rivet gun
Würth Coldmelt Technology

Würth Coldmelt Technology for mounting screws and fittings on lightweight panels.

* The website of the supplier indicates the technology necessary for this system.

**ADVANTAGES:**
- Technology for adhesive-free insertion of adjustable plastic anchors in lightweight panels
- For mounting screws and fittings

**SUPPLIER:**
www.wuerth.com

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Sliding door system

Sliding cupboard door system

* The wood screw used must apply grip force between 2 and 8 mm of the shank.

**ADVANTAGES:**
- Easier to move due to lightweight Ultralight panel
- Less wear on the fitting due to lightweight Ultralight panel
- High screw pull-out resistance

**SUPPLIER:**
www.gedotec-beschlage.de  |  www.ducasseindustrial.com
Filled

Reinforced edges.

- The cutting gear must be central on the edge and 1 mm thicker than the XPS.

ADVANTAGES:

- Gives plywood characteristics to the edge
- Can be machined like a solid plywood panel
- High screw pull-out resistance

SUPPLIER:

Regular supplier

Edges

Edge protection.

- The right adhesive for the type of edging must be used.
- Due to the lower density of Ultralight when compared with conventional plywood panels, it may be necessary to reduce the roller pressure during the edging process.

ADVANTAGES:

- Ultralight panels can be edged with all types of edges, PVC, ABS, veneer and melamine

SUPPLIER:

Regular supplier
Annex: Best Practices for Use

Storage

- Do not expose the material to extreme storage conditions, e.g. sudden changes to temperature and/or humidity conditions, direct exposure to sunlight, rain, extreme temperatures, etc.
- These panels are best stored in a well ventilated environment with relative humidity between 30% and 80%.
- Avoid contact with agents that might damage the panels (puddles, earth, mould or fungus, etc.). The extruded polystyrene core will begin to dissolve when it comes into contact with materials that contain volatile ingredients - such as solvents, petrol, tar and formic acid - or gases such as methane, ethane, propane or butane.
- To keep this material in the best possible condition, the panels should be stored in their original packaging, correctly strapped and covered with film to avoid damp getting into the panel edges.
- We recommend storing the material horizontally on flat surfaces, levelling it with the necessary supports as required.
- Any supports should be aligned vertically to guarantee suitable weight distribution.
- No more than four pallets should be stacked on top of each other to prevent damage to the panels.
- Stacks should always meet minimum safety requirements.
- Avoid placing panels near machinery transit areas.
- Avoid the use of mechanical handling equipment, metal slings or other items that are harder than the wood itself, as this may mark and/or damage the panels.
- When these storage instructions cannot be followed and the panel is exposed to extreme conditions, please contact our Quality Department.
Use and treatment

Any handling, treatment or process applied to the panel may change its intrinsic characteristics, leading to serious defects. Generally speaking our recommendations are as follows:

• The coefficient of expansion ($\alpha (ºC^{-1})=10^{-6}$) of the material must be taken into consideration for any use, bearing in mind the need to respect expansion joints when installing the material.
• Ultralight panels contain an extruded polystyrene core. They should not be exposed to temperatures above 75 °C, as this would affect their properties. This should be especially considered when subjecting the panel to any processes or handling operations.
• When using and treating these panels, the polystyrene core should never come into contact with materials that may cause it to dissolve (volatile ingredient and gases).
• Prolonged exposure to substances such as minerals and edible oils (paraffin, phenol and fats) may affect the characteristics of the panel.
• Panels should be acclimatised to environmental working conditions before use, while considering the environmental limitations indicated in the previous section.

Suitable cutting tools that produce clean, tear-free cuts should be used when machining the panels. The use of unsuitable tools may lead to shredding, tearing, poor machining, etc.
• The panels should not be struck with any material that is harder than the wood itself or be subjected to impacts.
• With the standard XPS density, the recommended Ultralight laminate pressure is 2.5 kg/cm². If an XPS with greater compression resistance is required, please contact your local sales rep at Garnica so we can recommend the right value.
• The strength of the 4.5 mm poplar faces is usually sufficient for standard connections. 6 mm poplar faces are also available for applications that require greater strength, such as large furniture, doors, etc.

Surface finish

Ultralight is sanded on both faces of the panel, ready for laminating.

The sheet surfaces have natural colour variations and different characteristics depending on the selected product and quality.

The appearance of the faces may vary from one panel to another due to the natural characteristics of wood, such as knots, discolouration, fibres or grain.

The colour of the XPS may also vary without prior notice, without this affecting the characteristics of the product.

The general instructions for this type of panel in terms of finish are as follows:

• The panel surface should be clean before applying any product or digital printing. We recommend choosing the Ultralight Poplar product with selected B faces for achieving the best digital printing results.
• Only apply the finish in favourable weather conditions (avoid rain, temperatures that are too high or too low, excessive solar radiation, etc.).
• We recommend applying protective products using a brush or roller rather than a spray gun, as this will lead to better impregnation.

• Although the product has demonstrated good performance when being mounted directly (no edge sealing), we recommend sealing the edges and mounting points, as this will extend the useful life of the product and improve its characteristics.
• The protection and sealing of edges and any altered area (panel edges, especially when cut) will preserve the characteristics of the product for longer.
• Use a suitable water-repellent product when sealing. For example, varnish, sealants, paint, etc.
• Combining Ultralight with different laminates on the faces, such as HPL, HDF/MDF, aluminium and other veneers and papers, will improve the surface properties as well as scratch and impact resistance.

Before laminating, the panel should be stored in similar conditions to where the laminate will be applied. We recommend an acclimatisation period of 24 hours, but this also depends on the local climate and its corresponding humidity. If the sheets do not acclimatise, dimensional stability is reduced and the panels may warp. This is a natural characteristic of wood that can be handled with correct use and is not grounds for complaint.
Maintenance

- Proper maintenance of the surface finish is necessary for maintaining the properties of the panel and protecting it from sunlight, adverse weather conditions, etc. Always be mindful of the first treatment that was applied.
- Firstly, decide whether the initial treatment needs to be removed. If so, always use non-aggressive products. Then apply a new layer of the protective product or paint. Repeat the process periodically, following the manufacturer’s instructions for the product applied.
- A lack of maintenance or excessive maintenance (applying too many layers of protective product) may reduce the degree of protection afforded to the panel.
- As stated above, we recommend sealing the edges. We also recommend checking sealed edges periodically to ensure they are kept in the best possible condition. Reapply the protection if signs of damage appear.

- Regarding the use of adhesives, we recommend standard products for wood. We provide no recommendations on individual products or suppliers. The technical parameters, such as adhesive expansion, cycles or useful life, should be checked on the technical data sheet of the product from the corresponding supplier and controlled during the lamination process.