



Airolam Compact Laminates Technical Guide

Contents

1	Introduction	3
2	Pre-Fabrication.....	3
2.1	Transport, Storage & Handling.....	3
2.1.1	Transport & Storage	3
2.1.2	Handling	4
2.2	Preconditioning & The Environment.....	4
3	Fabrication.....	4
3.1	Cutting.....	4
3.2	Bonding & Trimming	5
3.3	Drilling & Fasteners for Fixtures and Attachments	6
3.4	Cutouts, Edge Profiling & Finishing	7
4	Post Fabrication.....	9
5	Maintenance & Care	9

1 INTRODUCTION

Airolam Compact laminates are a high-performance, interior surfacing solution used in both structural and decorative applications.

Compact laminates, also known as compacts, are thick High-Pressure Laminates sheets that conform to EN 438 standards. They generally range from at least 2mm in thickness, and can go as high as 35mm. Compared to most engineered materials, compacts are highly homogenous and twice as dense as Plywood and MDF boards.

Compacts are offered in a Dual Sided Design configuration and can be fabricated for use in a diverse range of applications, such as wall panels, railings, furniture units, lab equipment etc. For more details on the possibility of applications, please refer to Applications Guide.

2 PRE-FABRICATION

Compact laminates can be applied in both horizontal and vertical standalone applications, as well as furniture assemblies where high impact resistance and strength are desired, along with an attractive look.

All safety standards and regulations which are applicable to the decorative HPL and wood processing industry in terms of dust extraction, fire prevention should be adhered during processing Compact Laminate. If adequate extraction is not provided, appropriate respiratory protection must be worn as some people experience an allergic reaction to dust and fine particles.

2.1 TRANSPORT, STORAGE & HANDLING

While compact laminates have a density comparable to decorative laminates, they are many times thicker. Consider a typical compact laminate sheet with dimensions of 8x4 feet and 5 mm thickness- with a typical density greater than 1.35 kgs/m³, this sheet can weigh greater than 20 kgs or 44 lbs.

Thus, compact laminate require more care when being transported, handled and stored. Carelessness during any of these stages can cause issues which may affect the quality of the product and the installation. Please keep the following guidelines in mind to ensure best results.

2.1.1 TRANSPORT & STORAGE

Compact panels are thick and if stored improperly can warp or telegraph due to their own weight.

Store the panels in a closed area with regulated environment, specifically temperature and humidity. The panels should remain as flat as possible, as any irregularity can cause a range of issues- from warping, telegraphing to chipped edges.

Ensure the protective film stays on the panel as long as it is stored, though storage beyond 9 months is not recommended.

Use pallets wherever possible, and lay a protective board on the top and bottom of the stack.

2.1.2 HANDLING

Always lift panels one at a time, avoiding sliding sheets over one another. The top and bottom surface of each panel should be clean and free from any dust particles or impurities. If forklifts and similar mechanized vehicles are used to load or unload a vehicle, ensure that the pallets are clean and structurally sound. NEVER ALLOW THE LAMINATES TO TOUCH THE GROUND OR THE WALLS WHILE THEY ARE BEING CARRIED

Airolam Compact laminates should be gently stacked over each other in a horizontal manner, in a back-to-back configuration. A board with similar size may be placed over the top and bottom panel of the stack, to maintain a uniform pressure on the underlying sheets and prevent any warpage in bulk stock.

2.2 PRECONDITIONING & THE ENVIRONMENT

Preconditioning the compact panels is vital for a quality product installation.

Store the Compact Panels for at least 48 hours (ideally 72 hours) in the following environmental conditions-

- 18-24C temperature
- 55% relative humidity

for a period of 48 hours. These numbers may vary slightly depending on general environment conditions in the geographical area.

The best approach is to make sure all material to be fabricated are conditioned together. The stock must be kept in an area that allows for ventilation all around the stored material.

3 FABRICATION

Compact panels are thick laminate sheets and must be fabricated and machined using power tools. As is the case with any fabrication involving power tools, safety and processing norms must be followed closely to create a safe working space.

All safety standards and regulations which are applicable to the wood processing industry in terms of particle extraction, fire prevention should be adhered to during processing of compact laminate. If adequate extraction is not provided, appropriate respiratory protection must be worn to avoid allergic reaction.

CNC machines, circular saws, routers and drills are some of the tools used typically when fabricating compact laminate based furniture.

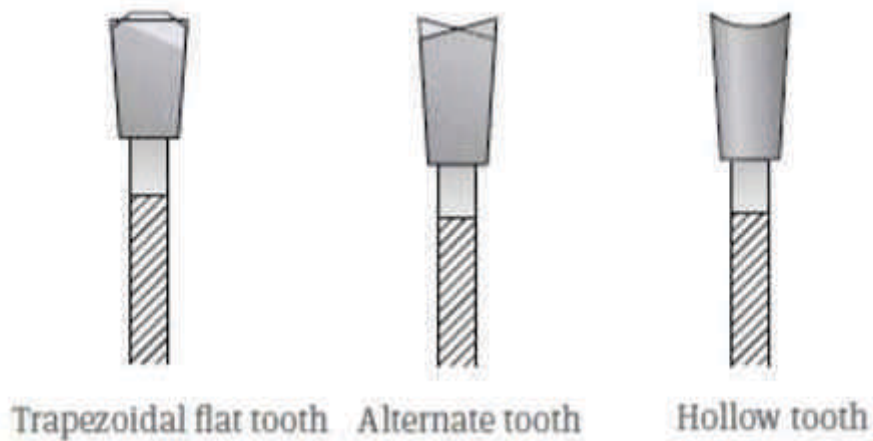
3.1 CUTTING

Airolam recommends the use of diamond tipped tools whenever possible, with sharp, well maintained blades.

Before cutting the panels, ensure that the final panel dimensions are planned in order to minimize any possible shade variations from placing two different parts of panels side by side.

Circular bench or table saws are generally recommended for cutting compact laminates to desired size. The quality of the cut depends on multiple factors such as tooth shape, tooth pitch, proper saw blade projection, feed rate, rotational and cutting speeds.

Recommended tooth shapes are alternate and hollow tooth. The trapezoidal flat tooth is used for ensuring longer tool life and consistently good cutting quality (see Figure below).



Use a slower feed speed for thicker panels. Always cut along the length of the entire panel, avoid cutting more than 1/4" thickness of material in a single pass.

In order to get a clean cut and maintain the look of both decorative faces, the quality of the cut edge can be controlled by adjusting the height of the saw blade. Saw entry angle of 45° is considered as optimal. To achieve this, 10 percent of the saw blade diameter needs to protrude over the work piece. In case of any issues, refer-

- When cut on face side is not clean → Saw blade should be set higher
- When Cut on the underside is not clean → Saw blade should be set lower

To further improve cut quality, a combination of a scoring blade and a sacrificial panel can be used.

The scoring blade must be used in a climb cut configuration- this scoring blade is smaller in size than the main blade, cuts only upto 1/8" deep and rotates in opposite direction (along the direction of the feed) to that of the main blade. Care must be taken to prevent kickback or backlash.

The sacrificial panel can be plywood, hardboard or similar base underneath the compact laminate sheet.

When using a CNC for cutting and machining, use a carbide blade, with suggested rotation speed ranging from 20000-27000 rev/min.

3.2 BONDING & TRIMMING

Prior to bonding, compact panels must be prepared by sanding and cleaning to remove dust, grease and any contamination, especially around the cuts on the edge.

While bonding two compact laminates panels together, it is essential to ensure that dimensional movements are not arrested. To avoid post-bonding stress, only adequately conditioned compact laminates should be bonded together. Machine directions of the panels must always be same during bonding. It is recommended to avoid bonding of large surface areas; the required

application solutions and/or visual effects should be achieved by a partial build-up of the required section.

Joints that are subjected to heavy stress, for example due to vibrations, impacts or similar, should be reinforced with mechanical connecting elements.

For final trimming, diamond-tipped tools are highly recommended. Tools with segmented blades are not recommended for this operation as the overcut in the overlap zone remains visible. Securing work piece and controlling the tool is of prime importance as the cutting pressure is high.

3.3 DRILLING & FASTENERS FOR FIXTURES AND ATTACHMENTS

DRILLING: Drill bits used for drilling plastic sheet materials, with a point angle between 60° and 80°, are recommended for drilling compact laminate. The cutting speed and feed rate should be decided by the material type drill bit – HSS, HM, DIA. Specification of the tool manufacturers should be referred.

Spiral bits for drilling metal or wood can also be used, provided rotation speed and speed rate are reduced.



For drilling through holes, the compact laminate needs to be resting on a solid base which can be drilled into. Before the drill bit breaks through the compact laminate, the feed rate should be reduced to avoid break-outs on the exit side. For blind holes, (drill holes that do not go through) the minimum board thickness that must remain is 1.5mm. In order to drill parallel to the surface of panel, the minimum panel thickness on either side of the drill hole should be 3mm (Figure below).



FIXING: Through holes must have adequate clearance to take care of the dimensional movement. The diameter of the drill hole should be 2 – 3 mm larger than the diameter of the fixing device to avoid cracking. Using Countersunk screws is not recommended for fixing. If countersunk screws cannot be avoided, countersunk cup washers must be used.



Right!



Wrong!

Cutting screw threads in compact laminate is straightforward and self-tapping screws can also be used for this purpose. Slow thread screws are recommended as they ensure a better pull-out resistance. Pre-drilling is must for all cases. Metal and chipboard screws are appropriate for screw connections parallel to the panel surface. Screws must go through to a minimum depth of 25 mm and the diameter of the drill hole must be selected suitably to prevent splitting.

Jointing: Joints between compact laminate panels can be made with a combination of gluing and fixing devices viz. splines or biscuits (made of compact laminate) or grooves. While joining compact panels, it is important to ensure that connecting panels always follow the same production direction. Varieties of mechanisms for creating sturdy compact laminate joints can be seen in Figures below.



Grooved

Grooved/rebated

Splined

3.4 CUTOUTS, EDGE PROFILING & FINISHING

Cut-outs: Cut-outs and slots e.g. for switches or access openings, always should be rounded, as sharp corners can cause in formation of cracks. Internal corners should be finished with an inner radius of at least 3 mm. Grooves and rebates must be rounded to avoid cracks. Cut-outs can be made directly with a router. Adequate gaps for dimensional movements must be allowed for integrated components.

Edge Profiling: Numerous edge profiling options are available (Figure below).



Cutter marks can be removed by sanding operation and an even edge colour can be achieved by applying a silicone-free oil. Sharp corners and edges should be chamfered to eliminate the chance of injury and chipping.

FASLE EDGES: Visually thicker boards can be made with built-up edges or by introducing downturns or upstands. For built-up edges, compact laminate strips of required dimension are glued along the edge of the main panel while ensuring the same machine direction. For thicknesses up to 100 mm or to ensure the decor remains visible on the edge for aesthetic reasons, a downturn or upstand is a preferred solution. At first, the two components to be connected are mitred at 45 degrees. Next, the work piece is placed on a level surface, face side down, so that the tips of the mitres touch each other and adhesive tape is applied over this joint. Then, both work pieces must be turned over carefully.



Built-up edge



Downturn

Finally, adhesive is applied and the shorter work piece or upstand is then folded over and pressed home. The upstand must be secured in the correct position with adhesive tape until the adhesive sets properly.



4 POST FABRICATION

During fabrication processes, the protective film must be left on. Once all the fabrication processes have been completed, and the worksite cleaned, it is recommended to remove the film from both sides simultaneously.

5 MAINTENANCE & CARE

Compact laminates require similar maintenance and care compared to standard decorative laminates.

- Care

HPL do not suffer from corrosion or oxidation, so no further surface protection and basic maintenance is required. Protect the compact surface from any heat sources. Do not use sharp objects on the decorative surface.

- Cleaning

In case of ordinary stains, Airolam recommends cleaning the surface gently with a clean, damp, soft cloth.

For persistent stains like coffee or tea, use a mild cleaner/detergent followed by wiping with a clean cloth. Do not use brushes or scourers at any time.