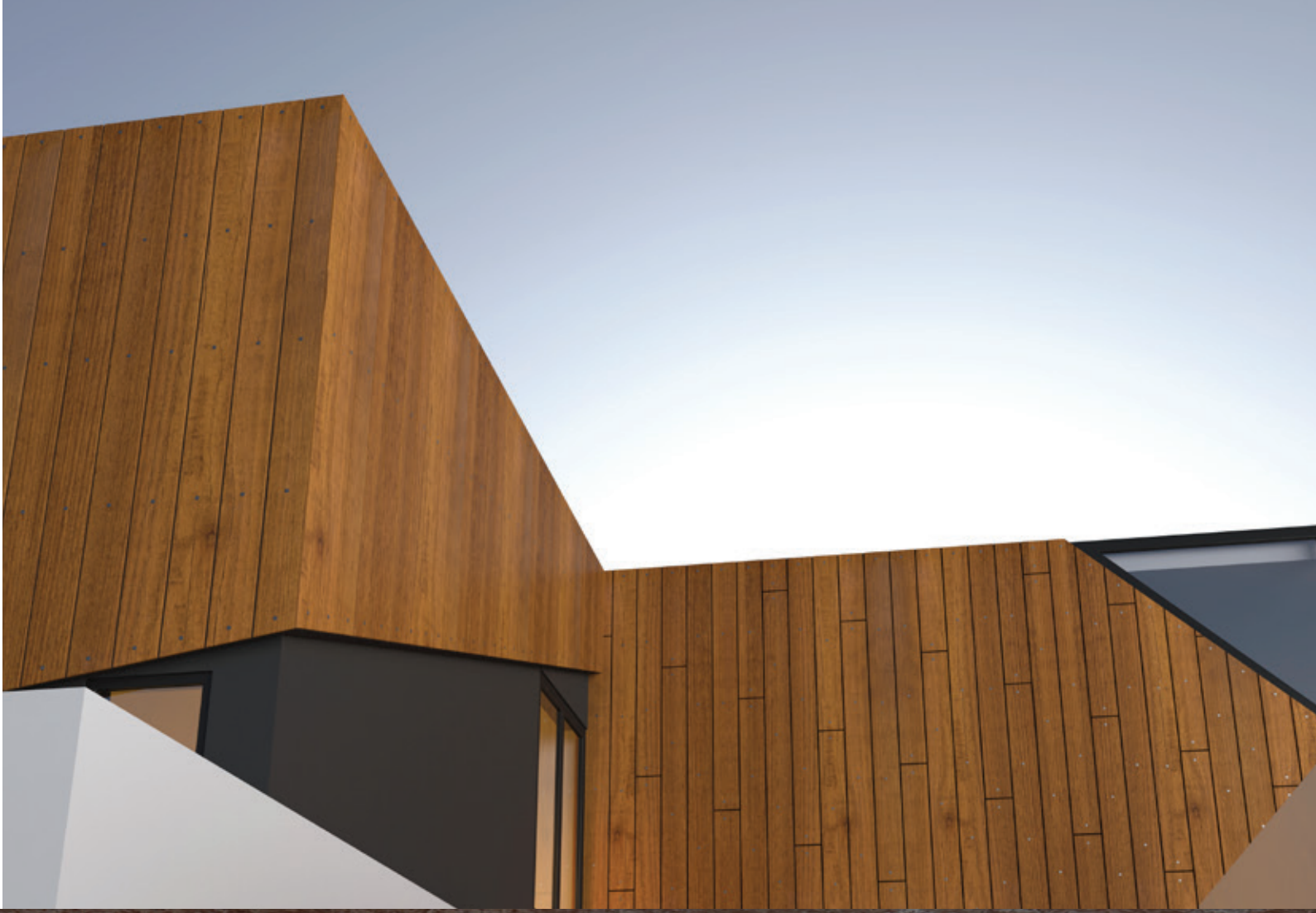


WORKING
RECOMMENDATION

Greenlam

CLADS®
EXTERIOR GRADE COMPACT LAMINATES

WORKING RECOMMENDATION

1 - CLEANING AND MAINTENANCE

It's very easy to maintain Greenlam CLADS panels – most dirt can be removed simply by wiping with a dampened cloth or sponge. More stubborn staining can be handled with a suitable household detergent. The UV-resistant panels may be cleaned with alcohol based cleaners, but it's always good practice to test-clean an unobtrusive area before undertaking complete cleaning. Products containing abrasives are not recommended for use with Greenlam CLADS ®. Pressure washing presents no problems, the jet should be directed from the bottom to top of each panel then laterally at a distance of 20-30 cm, finishing with a rinse of clean water. Jet wash pressure should not exceed 100 bar and water temperature should be no higher than 90-100°C.

This is most easily done as follows: for cleaning purposes, use unsoiled, warm water, clean cloth or rags, and soap (housework-related cleaners which are sold in shops). Avoid scouring substances.

Although the adhesion of inks/paints is very low on the Greenlam CLADS Panels, we recommend, not to clean the surface dry or by using any tools. The risk of damaging the top special polymeric surface is too high. Alternatively, solvent cleaners could be used for removing varnishes, paint sprays (graffiti), and other similar stains and marks.

2 - TRANSPORT AND HANDLING

Once installed, Greenlam CLADS panels offer exceptional durability, but in storage and handling surfaces and edges can be damaged if handled without care. The panels are supplied with foil protection covering, but it's recommended that when stacking dust and larger particles should be removed from between the panels. Panels should be stacked with thicker ones at the bottom, lighter panels towards the top, and care should be taken not to overload the stack. The panels should be secured against slipping against each other in transit and handling, and the protective foil should not be exposed to continual direct sun or heat.

Points to remember

- Greenlam CLADS must be secured against slippage during transport.
- When loading or unloading, the panels must be lifted not dragged.
- Do not push or pull them over the edge.

Handle Greenlam CLADS with care in order to not damage the edges of surfaces. Despite the excellent surface hardness and the installation protection film, the stack weight of Greenlam CLADS can cause a possible damage.

Installation protection films must always be removed from both the surfaces immediately after the installation.

WORKING RECOMMENDATION

TRANSPORTATION AND HANDLING INSTRUCTIONS	
DOs	**DON'Ts**
Ensure storage of Greenlam CLADS in dry, clean, frost-free and enclosed warehouses where normal interior conditions (18°C - 30°C and 50% - 65% relative humidity) are maintained.	Don't stack the pallets in open yards, expose the stacks to sunlight and rainfall directly till they are fabricated and installed.
Cover the top board of each stack with a moisture barrier/cover board with sufficient weight to remain flat and in contact with the whole surface area of the top.	Don't allow Greenlam Compact panels or panels to rest on moisture absorbing supports like paper, cloth, or gunny bags. The base board must be dry, and should ideally be covered with a material impervious to water, to act as a moisture barrier.
The pallets or Compact panels or cut panels must be stored on a rigid and levelled surface that ensures support all across the full surface area of the panels or panels as the case may be.	Don't keep the panels or cut panels in a leaning position against walls, supports, or board stacks. This would cause the panels or panels to warp.
Greenlam CLADS will remain flat when stored horizontally in packs on a flat base board with their edges flush with one another.	Failure to store Greenlam CLADS flat for any length of time can cause deformation which is almost impossible to rectify.
Allow time for the stack of the Compact panels or the cut panels for conditioning at the fabrication site and allow them to reach equilibrium with the environment.	Don't attempt to fix the panels immediately after cutting and routing. This can lead to warp or twist. Allow them to condition in the environment for few hours.
Peel coat: - Try and keep the protection peel coat film till the installation is complete to avoid scratches, surface stains, dust, etc. - In case it is required to remove the protection peel coat film, please ensure that the film applied on both sides is removed at the same time.	Peel coat: Never keep one side's film intact and remove the film from the other surface. This causes imbalance in the panel and can lead to warp.

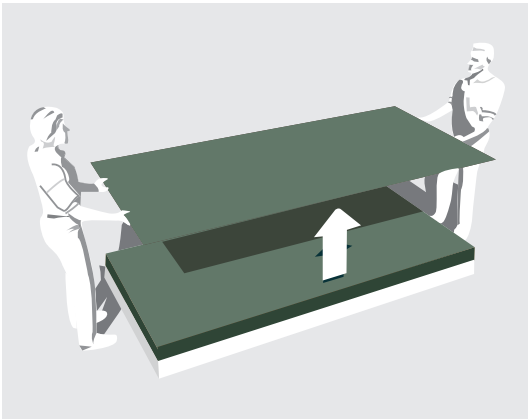
WORKING RECOMMENDATION

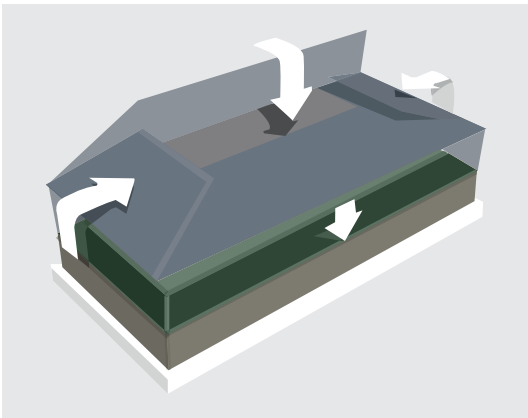
3 - STORAGE AND CONDITIONING

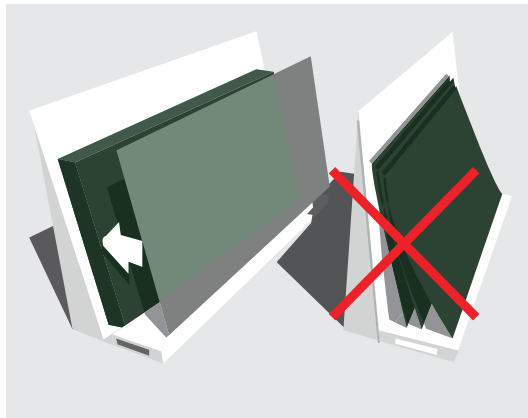
Greenlam CLADS panels must be stacked horizontally on flat, stable supports and supporting panels. The goods must lie completely flat. After removal of the panels, PE films must be closed over the stack again. The same applies, in principle, to the stack of cut panels.

Incorrect storage can lead to permanent deformation of the panels. CLADS panels are to be stored in closed rooms under normal climatic conditions, duly wrapped with PE film. Climate differences on the two surfaces of a panel are to be avoided.

- Stacking of Greenlam CLADS panels should be done up to 250mm in height (numbers may vary depending on the thickness of the panel).
- Stacking should be done on a raised sturdy platform.
- Ensure covering film after pulling out the required number of sheets systematically.







WORKING RECOMMENDATION

4 - MACHINING

Greenlam CLADS can be easily machined with tungsten carbide-tipped woodworking tools. They are cut from Stroke Cut and trim stationary circular saws or hand-held circular saws for installation cutting.

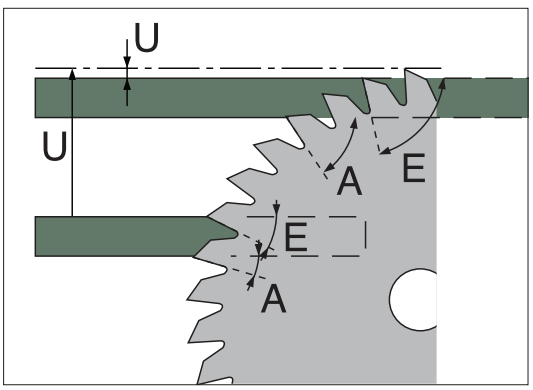
All world-renowned producers of hand-held machines like Festo, Bosch, and many others offer guide rails. Tungsten carbide-tipped circular saw blades with trapezoidal teeth FZ/TR have produced good results.

To achieve a good cutting stroke from Greenlam CLADS, please adhere to the following recommendations:

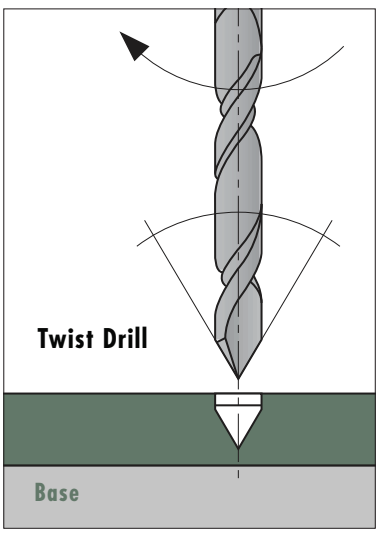
S. No	Particulars	Units	Typical Values
1	**Circular Saw Dimensions:** - Diameter - Material - Thickness - Speed of the saw - Teeth	 mm mm rpm nos.	300-400 Tungsten Carbide, Polycrystalline Diamond etc. 3.0 - 4.0 2500 – 6000 72 - 96
2	**Scouring Saw**		Recommended
3	**Pressurised Holding Beam**		Mandatory to prevent vibration of the board
4	**Cutting Speed**	meters/ minute	8 to 16

Note: The higher the saw blade, the better the top cut and the worse the bottom cut; and vice versa.

Sharp saws and the optimum setting of the saw blade projection are necessary in order to achieve clean cut edges. For fitting work and chamfering on the construction site, electrical hand planes with a chamfering or a mitering groove have proven effective. Use HSS twist drills for manual drilling. Drill tip ≤ 90°. When using carbide-tipped drills, use pillar drilling machines – carbide metal tends to break off when drilling by hand. Drill against an appropriate base applying enough pressure to ensure a clean exit hole.



If the projection 'U' becomes greater, the top cut edge gets better and bottom cut edge worse, and vice versa. E = Entry angle; A =



WORKING RECOMMENDATION

Profile Cutting and Edge Finishing

a. It is not necessary to apply edging strips or edge sealants to Greenlam CLADS panels, and for many applications clean sawn edges are sufficient.

b. To achieve a superior finish or a profiled edge, use a spindle moulder or router. For this type of work, PCD tooling is recommended. It is not possible completely to avoid cutter marks, but they can be minimised by feeding the work at a constant controlled speed with a mechanical power feed.

c. Take care to avoid pausing during cutting and profiling, as it may result in burn marks which are difficult to remove. Where edges must be completely free from cutter marks, carry out a further sanding and scraping operation.

d. Radius should be limited at the transition to the face in order to minimise the "feathering" of the decorative surface.

e. Buffing with steel wool and applying silicone free oil enhances edges. Chamfering or profiling the edges of Greenlam CLADS panels reduce the risk of edge impact damage.

Drilling

a. The most suitable drills for use on Greenlam CLADS laminates are those designed for plastic sheet materials. These drills have a point angle of 60° - 80° instead of the normal 120° for drilling metal.

b. To avoid break-out on the reverse side, gradually reduce the feed speed of the drilling head and the pressure applied when approaching the point of breakthrough.

c. Working on a firm underlay, such as plywood or chipboard, also reduces the risk of break-out.

Gluing or Jointing: Following techniques are used for jointing or gluing. Gluing application calls for appropriate selection of glue and it is recommended that the user consults the glue supplier for the right type of glue.

a. Lock Shouldering

b. Butt Jointing

c. Lap Jointing

WORKING RECOMMENDATION

Routing and Milling

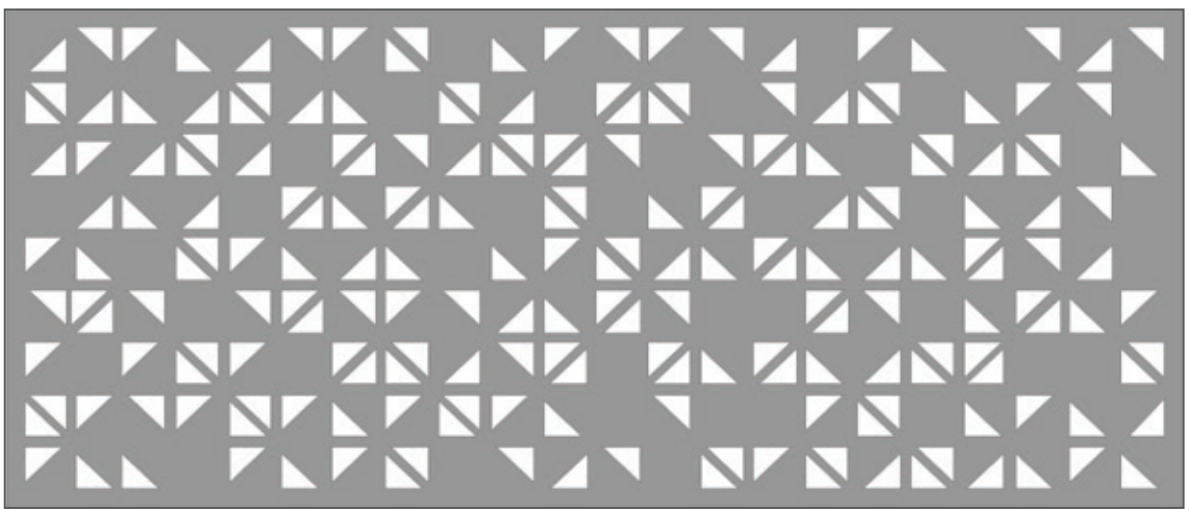
a. Routing/Milling can be performed by

   i) Hand routers and ii) Automated CNC machines.

b. Hand Routing - finished edges of Greenlam Compact laminate should be routed/milled for achieving good finishing. Rough cut panels to approximately 1/16" before finish routing. It is recommended to use cutters with larger diameter shanks (1/2") however, smaller tools may be used with minimal feed rates and trim amounts. Two-flute carbide straight cutting bits work well for trimming double-sided panels.

c. CNC Routing - the appropriate cutting sequence is largely determined by the type of machining required. For example, large panel sizing may be completely different than cutting out nested parts. In any case, the specific panel's thickness, cutting sequence, and type/condition of the machine will require appropriate adjustments according to the particular process. A good starting point for machining is:

   i) Spindle speed - 16,000 - 18,000 RPMs and ii) Feed-rate - 200 - 900 in/min



▲
PERFORATED CLAD PANEL

WORKING RECOMMENDATION

5 - PROCESSING

Safety Precautions: The usual best practice applies when operating machinery - appropriate personal protection and hi-vis clothing must be used and tools must be in good condition. The edges of unbeveled panels are sharp, so suitable anti-slip gloves should be worn. Cutting will create dust; protective eyewear and a dust mask are required. Ear defenders must be worn when operating machinery.

Preferred Tools: Good quality tools are required to ensure clean cutting and drilling - diamond tipped drills and sharp, hardened metal blades are recommended. When machining panels, they must be laid on clean, flat, and well-supported surfaces. Chips and particles should be removed to avoid marking the panels.

Tooth Forms

- HZ/FA (Beveled concave tooth) Similar to WZ/FA and HZ/DZ but providing a higher machine longevity.
- TR/TR (Trapezoid tooth/Trapezoid). Best for cutting hard, abrasive laminates.
- FZ/TR (Flat tooth/Trapezoid tooth) Suitable for cutting Greenlam CLADS® panels as well as laminates.
- HZ/DZ (Pendulum tooth/Concave tooth). Useful when cutting on machines where scoring unit is not available.
- WZ/FA (Variable bevelled tooth). This type can be used interchangeably with the Pendulum/Concave tooth.

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