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Processing instructions

EGGER Laminates



EGGER laminate is a versatile material that can be processed in combination with wood-based materials or other core boards to form what are known as laminate composite elements. Applications for these composite elements are many and diverse, requiring different qualities of laminate appropriate to the fields in which the products will later be employed. Traditional applications and areas in which they can be used include the kitchen and door industries, the office furniture sector, exhibition stand construction, shop fitting, interior design and the shipbuilding and automotive industries.

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1. Description of the material

EGGER laminates are decorative laminates based on curable resins. They have a multilayer structure and consist of melamine resin impregnated decorative paper and one or more layers of soda craft paper impregnated with phenolic resins, which are laminated under high pressure and heat. The laminate composition, resin and paper quality, surface texture, use of special overlays and the press parameters during production determine the laminate quality and therefore the subsequent use or area of application.

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Laminate composition, showing EGGER Laminate as an example



Figure 1

2. Quality features

EGGER laminates essentially conform to EGGER's high quality standards as well as the applicable standards and regulations. EGGER laminates are tested according to EN 438-2 with respect to all relevant quality requirements. The various laminate qualities required for particular application areas conform to these requirements. For uses/application areas, quality requirements, technical data and supply formats, please see the relevant datasheets.

EGGER laminate qualities in overview:

Laminate qualities	Laminate type conforms to EN 438	Nominal thickness [mm]	Application
Laminate	P – Postformable	0.40 – 0.80 / 1.00 / 1.20	General purpose
Coloured core laminate	S – Standard	0.80	Design laminate
Laminate PerfectSense Topmatt	S – Standard	0.60 / 0.80	General purpose – surface with anti-finger print feature
Laminate XL	S – Standard	0.80	General purpose - laminate with synchronised pore
Laminate Flammex	F – Flame retardant	0.60 / 0.80	Flame-retardant laminate conforms to DIN 4102-1:198-05

3. Transport, storage and handling

3.1 Transport

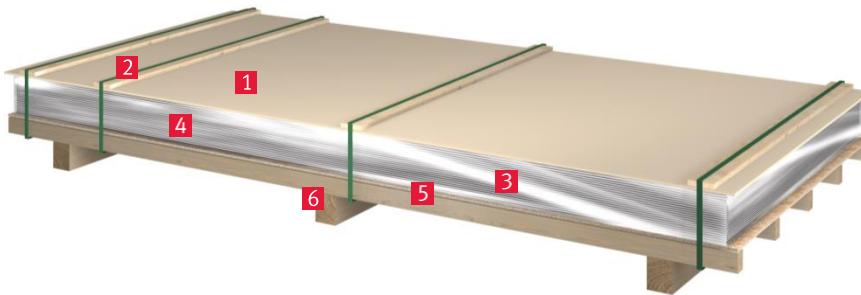
Laminates are generally transported on pallets – see figure 2. The pallet is suitable for the long-term storage of the laminates.

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- 1 Cover board
- 2 Plastic strap
- 3 Foil
- 4 Laminates
- 5 Cover board
- 6 Wooden pallet

Figure 2

Cardboard packaging is used for minimum quantities and for deliveries via courier service – see figure 3. We recommend unpacking the laminates after delivery and storing them according to chapter 3.2. Optimal conditions for the further processing of the laminates are only guaranteed under these circumstances.



Figure 3

3.2 Storage and conditioning

Laminates must be stored in an enclosed and dry room in normal temperate environments. Before processing, the core board and EGGER laminate should be conditioned for at least 24 hours under normal atmospheric conditions in order for the moisture content of the two materials to become balanced. In particular, material that is too moist when it is processed not only tends to bond poorly, but is also likely to shrink which can result in warping and cracking.

When the original packaging is removed, the laminate must be stored on full-surface, horizontal protective boards. Direct floor contact and/or exposure to the sun must be avoided. The uppermost sheet should be laid with its decorated side facing down and should be covered with a protective board of at least the same format – see figure 4.

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- 1 Laminate stack
- 2 Protective board

Figure 4

Where horizontal storage is not possible, the laminate sheets should be stored at an angle of approximately 80°, in an inclined rack, providing support to the surface area and ends – see figure 5. Using a protective board of at least the same format is required for this storage as well.



Correct



Incorrect

Figure 5

3.3 Handling

The EGGER laminate must be inspected for visible damage after removing the packaging and prior to processing. In principle, those transporting and / or handling laminates should wear personal protective equipment such as gloves, safety footwear and suitable work clothing. The decor sides should never be pushed against one another or dragged over one another. The laminate boards should either be raised, or the reverse side of one can be pulled over the reverse side of another. When laminate boards are being transported or carried, the method that has proved most satisfactory is to roll them up with the decor side on the inside, avoiding any rubbing movements. Sufficiently large, flat and stable pallets must be used for transporting laminate stacks. The stacked laminates must be secured against slipping.

4. Processing

As described in chapter 3.2, adequate conditioning must be ensured before processing laminates. The laminates must be conditioned for at least 24 hours under normal climatic conditions before processing.

4.1 Extraction

Compliance with all safety standards and regulations, applicable to the wood processing industry in terms of dust extraction, fire prevention etc., is essential when processing laminates. Breathing protection has to be worn if no adequate extraction system is in place. Fabricating laminate is not a critical issue, but there are people who can experience an allergic reaction to all types of dust.

4.2 Cutting

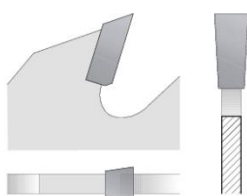
The laminates can be cut to size using standard woodworking equipment, e.g. panel saws, bench circular saws, hand-held circular saws or jigsaws and also CNC routers. Panel saws or bench circular saws are generally used to cut the laminates to size. A good cutting result depends on different factors including whether the decor side is facing upwards, saw blade projection, feed rate, tooth shape, tooth spacing, motor speed and cutting speed.

Example – Circular saw:

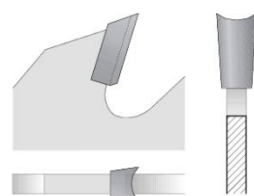
- Cutting speed: approx. 40 to 60 m/sec.
- Rotational speed: approx. 3,000 to 4,000 rpm.
- Feed rate: approx. 10 to 20 m/min (manual feed)

The laminate must also be held down across its surface, because allowing it to "flap around" will result in tiny cracks, which can later turn into notches or stress cracks. With the exception of panel saws and CNC routers, all cutting involves manual feed. Due to the high-quality melamine resins used for the surface of the EGGER laminate, the tool wear is considerably greater than with conventional wood-based materials. We recommend that you use carbide metal-tipped or even diamond-tipped saws cutters or router bits.

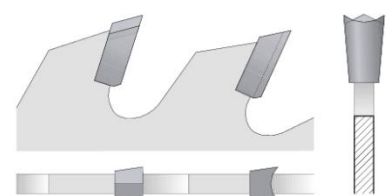
Use the following tooth shapes depending on the standard of finish you require (coarse or fine cut):



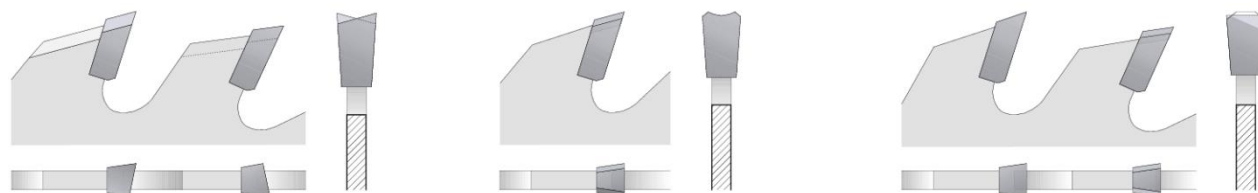
Flat tooth



Duplovit tooth with hollow tooth face



Pointed duplovit tooth



Alternate bevel tooth

Duplovit tooth with bevel

Trapezoidal flat tooth

Figure 6

Use a cutting guide when working with a hand-held circular saw or jigsaw. Cutting must be from the underside of the board.

4.3 Balancer

In general, when manufacturing laminate bonded elements, tension equalisation must be ensured with a suitable balancer. In this context, we may also speak about a symmetrical structure of the composite element, i.e., the use of identical laminate on the front and reverse side. An asymmetrical structure generally leads to the element's warping or insufficient flatness, and thus the production of asymmetrical composite elements remains the fabricator's responsibility! Laminate balancer is part of the **EGGER Decorative Collection** and is available ex stock and from just one sheet upwards, according to the country-specific availability guides.

In addition to the balancer used, flatness is also influenced by other criteria:

- Type of core board (chipboard, MDF, plywood board, etc.)
- Core board thickness
- Wood moisture content
- Amount of glue applied
- Size of component
- Press temperature

After the pressing, it is important to ensure proper handling and cooling of the composite boards. The core board thickness and the type of core board represent relevant criteria and the general rule is the thicker the board the less problematic. Using a laminate balancer with the same nominal thickness is generally appropriate. It is, however, recommended to verify the selection of a suitable balancer through pre-testing prior to producing the element.

Frequent causes of warpage include:

- Very thin core boards
- Large size of the laminate bonded board
- Lack of reinforcement or fastening of the composite board
- Different production direction on the front and the back side of the laminate. The production direction can be recognised by the finish of the laminate back side

For more detailed information please refer to the technical leaflet "EGGER laminate balancer".

4.4 Gluing

Depending on the field in which it will later be used and the challenges that will be posed, EGGER laminate can be glued to a range of different core boards using a variety of different types of adhesive. Traditional wood based products that are suitable for use as core boards include: Chipboard, MDF and HDF boards. Wood-based materials such as blockboards and veneer boards require special care and press tests should be carried out before series production.

Note that blockboards and veneer boards do not attain the same consistent structure of chipboards due to the use of veneer and/or solid wood. Constituents such as veneer and/or solid wood do not attain the uniformity of dimensional changes in fluctuating climatic conditions that can be guaranteed with chips. However, a flat and tension-free core board is a prerequisite for a smooth surface, therefore core board calibration and a wood moisture content test (indoor application $\leq 8\%$) must be carried out. Materials that are worked with while they are too moist tend to shrink over time, which may lead to cracks and warping.

When using Multiplex boards, veneer boards made of softwoods (e.g. poplar, birch, okoume, abachi) are most suitable. In the case of blockboards, laminated veneer with short strips and softwood-surface layers should be used to avoid surface irregularities. The core board has to be under no stress with a smooth, level surface. Bonding EGGER laminate with solid wood is not recommended.

The laminate and core board must always be cleaned thoroughly before gluing. Even before the adhesive is applied the materials must be free from dust, grease, oil or spots of moisture. It is important that the composite element has a symmetrical structure and that the adhesive is applied evenly to both the front and the reverse side; warping may otherwise occur.

Heavily surface-densified chipboard and HDF boards achieve better adhesion with PVAc gluing after calibration with 80-120 grain size. P3 chipboards, as well as waterproof, possibly even phenolic resin bonded materials are worse at draining the water from PVAc glues. This causes pressing intervals to be longer.

Contact adhesives are often used for producing bent elements and to glue laminates with non-absorbent materials, such as metals. Contact adhesives generally consist of polychloroprene and a solvent. Prior to assembly, the solvents must be allowed to evaporate, the adhesive film must feel dry. The adhesive force depends on the polychloroprene crystallising under pressure. For this reason, the strength of adhesion depends on the pressure to which the parts are subjected. In order to achieve good adhesion, it is necessary to put the adhesive surfaces under high pressure for a short interval.

The final strength of the adhesive joint, irrespective of the type of adhesive used, will only be reached after several hours to days. Take into account curing times. For this reason, particularly large components should be handled with care immediately following gluing, given that bending or twisting may damage the adhesive joint.

The data included in the following table refers to the use of wood-based cores. They represent reference values that are influenced by:

- The type and quality of core board
- Processing conditions
- The type of adhesive corresponding to the later degree of exposure D1, D2, D3 or D4¹⁾

Adhesion under local conditions on a test basis is always advisable, and the adhesive manufacturer's instructions must always be observed!

Adhesive type	Classified ¹⁾ EN 204/205	Temperature resistance [°C]	Adhesive application [g/m ²]	Setting time ²⁾ [Min.]	Press pressure [bar]	Pressure temperature / time		
						20 °C	40 °C	60 °C
Dispersion adhesives								
PVAc	D2 / D3 / D4	- 20 to + 100	90 - 150 on CPL or core board	max. 10	approx. 3	8-30 Min.	4-12 Min.	3-5 Min.
Two-part PVAc	D3 / D4	- 20 to + 120			approx. 3	Observe manufacturer's instructions		
Condensation resin								
Urea resin	D2 / D3	- 20 to + 150	90 - 150 on CPL or core board	2 - 20	approx. 3 - 5	15-180 Min.	5-30 Min.	1-12 Min.
Melamine / urea resin	D3					Depending on hardener system		
Phenol / resorcinol resin	D3 / D4							
Contact adhesives (basis polychloroprene)								
without hardener	-	- 20 to + 70	150 - 200 on CPL and core board	Finger test ³⁾	min. 5	min. 1 minute		
with hardener		- 20 to + 100						
Reaction adhesives								
Epoxy, unsaturated polyester, and polyurethane adhesives	D3 / D4	- 20 to + 100	150 - 250 on CPL or core board	Depending on type	Stack pressure store flat	depending on type and hardener system		

Adhesive type	Classified ¹⁾ EN 204/205	Temperature resistance [°C]	Adhesive application [g/m ²]	Setting time ²⁾ [Min.]	Press pressure [bar]	Pressure temperature / time		
						20 °C	40 °C	60 °C
Hot melt adhesive								
EVA	-	- 20 to + 80	80 - 150 on CPL or core board	Extremely short	Rolling pressure	160 - 220 °C		
PA / PO		- 20 to + 100						
PUR	D3 / D4	- 20 to + 120	60 - 100 on CPL or core board			120 - 160 °C		

¹⁾ Groups D1, D2, D3 and D4 according to EN 204 classify glue according to minimum shear strength values and conduct upon exposure to moisture and water.

²⁾ Depending on ambient temperature and type of glue.

³⁾ Setting time is dependent on the ambient temperature and the adhesive type, and is defined by what is known as the finger test.

In general, the pressing process is carried out by means of flat, short-cycle and double belt presses in a hot or cold process. Please find below a list with manufacturers of veneer presses:

- Format-4 www.format-4.com
- Höfer www.hoefer-maschinen.com
- Itaipresse www.italpresse.com
- Joos www.joos.de
- Langzauner www.langzauner.at
- Ott www.ottpaul.com
- Wieder www.wieder-maschinenbau.at



5. Fabrication: Postforming process

In addition to the flat laminate bonded boards, with their angular edge designs, EGGER laminates are also used for post-forming purposes. Postforming elements are characterised by their seamless laminate transition from flat surface to edge. The postforming of laminates requires the use of a **P** (Postformable) laminate type.

Because of the large number of profiles and designs and the technical requirements of different systems, it is essential that agreement be reached in advance on defining the quality parameters and the laminate dimensions. Profiles should preferably be designed in the form of convex radii and carried out using stationary postforming machinery or postforming machinery operating continuously. Concave profile designs can only be achieved with stationary equipment and require the core board to be prepared in a specific way. Experience of postforming and the subsequent machining processes is also necessary.

5.1 Selection and processing of core boards

The correct choice of core board, plus factors such as temperature of the board, moisture content of the wood, surface characteristics, board structure, profile design, adhesive system and adhesive application rate, etc., determine the eventual quality of the postforming elements. The EGGER Eurospan raw chipboards, with their smooth, even surface and consistent board structure, have proven themselves over time. Particular care needs to be taken when using chipboards on a dense, solid middle layer; failure to do so may result in adhesion problems or so-called "pressing through" of the middle layer.

Correct core board selection must be observed already upon profile execution, i.e., depending on profile depth, the use of MDF may be necessary. Particular care must be taken when using plywood panels and veneer boards. It is most important that the moisture content of the boards is low (max. 8%) and that the different materials are properly conditioned – see chapters 3.2 and 4.4. Because of the layers of glue and the changing arrangement of fibres between the layers of veneer, it is more difficult to mill a profile than it is with chipboards or

MDF boards; milling these boards also results in uneven wear to the saws. Cutting should follow the direction of the fibres in the top layer of veneer.

5.2 Profile milling

The tools generally used for profiling core boards are carbide-tipped or, for large batches, diamond-tipped cutters. There are various factors that determine the milling quality, including feed speed, rotational speed, the number of cuts and the quality of the core board. The quality of profile milling (blade marks, protruding chips, etc.) can be improved by using diamond sanding disks or sanding units. The choice and design of tools should be discussed and agreed with a tool manufacturer. It is important for profiles to be milled with precision and stepped cuts and incomplete milling should be avoided; there may otherwise be difficulties at the postforming stage. The creation of small radii in particular demands extreme milling precision. It is also important that any dust and loose chips are removed by brush, air jet or suction once the milling process is complete.

5.3 Gluing

In addition to the recommendations and the adhesives for large-area gluing detailed in chapter 4.4, , there are also certain restrictions that apply to the postforming process. Irrespective of the postforming process, the gluing of the laminate is generally carried out in two stages:

- **Step 1:** Gluing the surface of the laminate (front and back) on the profiled core board
- **Step 2:** Gluing in the area of the profile (rounding) in the course of the Postforming process

As a general rule the amount of adhesive applied for gluing a surface should be such that none oozes out into the profile or rounding, especially when using condensation resin adhesives (urea resin). The adhesives used for gluing in the profile area are special PVAc adhesives with rapid initial adhesion and a quick setting time. This is necessary in order to "accommodate" the aligning forces of the laminate.

Always follow the instructions of the respective adhesive manufacturer!

5.4 Stationary postforming process

There is a considerable variety of stationary postforming methods, but here only the commercial process that uses contact heat is explained in more detail. It enables convex postforming elements to be produced in small and medium batches. Before the actual postforming (forming) is started, first the following preparatory production steps must be performed:

- **Step 1:** Gluing the surface of the laminate (front and back) on the profiled core board
- **Step 2:** Flush-milling the laminate on the rear and / or any necessary profiling on the rear of the core board
- **Step 3:** Applying special PVAc adhesive to protruding laminate and the profile area of the core board

In step 1, care should be taken to ensure that the laminate on the front protrudes as far as necessary beyond the core board in accordance with the core board thickness and the profile design. This is known as a laminate flag or laminate projection – see figure 7. The postforming itself - the reshaping of the laminate and the simultaneous bonding with the core board – is carried out using a flat, heated, pressurised and movable metal bar – see figures 8-10.



Figure 7

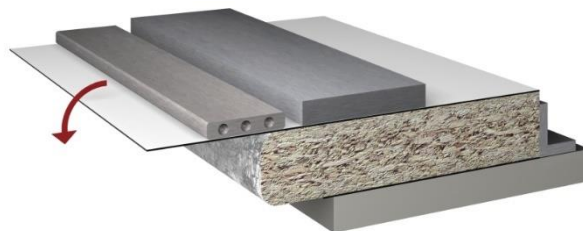


Figure 8

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Figure 9



Figure 10

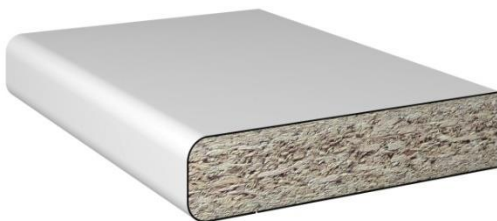


Figure 11

The contact heat from the heated metal bar has the effect of heating the laminate up to the required postforming temperature. The required temperature of EGGER laminates lies in the range of approx. 150 °C to 170 °C. The temperature may be influenced by the following factors:

- Laminate thickness and decor
- Type and amount of adhesive in the postforming area
- Rate of shaping

The precise control of the laminate temperature in the postforming area with the help of a temperature sensor is therefore very important. Once the postforming temperature has been achieved, the metal bar, remaining under constant pressure, automatically follows the outline of the profile on the postforming element, thus joining the laminate to the core board. The speed of the sequence of movements in the postforming process can be controlled, thus enabling the temperature to be adjusted.

If the optimum temperature is exceeded the result may be delamination of the laminate (blister formation); if, on the other hand, the temperature is too low, the likely result is that cracks (fractures) will form. The speed of shaping essentially depends on the amount of energy and the laminate thickness, but also on the profiling of the core board. To prevent the laminate from drying out and heat from being lost, the laminate must be warmed through and postformed as quickly as possible. EGGER laminates should preferably be postformed in the same direction as that in which they were fabricated; this can be recognised from the direction of the sanding marks on the reverse side.

5.5 Postforming in a continuous operation

Postforming in a continuous operation is more economical than the stationary postforming process described above. It requires the production of large series and is not suitable for piece production. This method is only suitable for producing convex curves. Here again, the laminate should be deformed in the same direction as that in which it was initially fabricated. Although in principle transverse deformation is possible, it does involve considerable limitations with regard to postformability (minimum radius) and the component dimensions; the postforming process is, moreover, considerably longer and more difficult. Depending on the design of the plant, the necessary production steps are carried out sectional and/or online. It is a requirement with both machinery designs that the profile milling of the core board (see section 5.2) and the gluing together of the laminate and the core board (see section 5.3) are done before the actual postforming, and both have certain advantages and.

There follows an explanation of the postforming process with reference to EGGER model series 200, also known as L-profile:

1. Postforming element following profile milling and surface gluing of the front and back side of the laminate, also known as a pressed part – see figure 12.
2. In the first section of the postforming machinery, the pressed part is progressed to its final profile shape by additional milling units. With the so-called L-profiles, only the rear side of the laminate is glued to the core board, while the front side of the laminate is milled to leave the required projection – see figure 13.
3. In the second section the special PVAc adhesive is applied evenly to the core board and the laminate flag using a glue roller and/or spray nozzles. To ensure good adhesion both now and in the future, it is extremely important that the glue is applied evenly to both surfaces – see figure 14.
4. In the third section the special PVAc adhesive that has been applied is aerated, the water contained in the adhesive evaporates, thus activating it for the shaping that is to follow. At the same time the laminate is heated up by an infrared heater to prepare it for the deformation process. This is sometimes referred to as "plasticising" – see figure 15.
5. In the fourth section the deformation process itself takes place. The forming rod (a.k.a. bending rod) is used to draw the laminate in the direction of the profile. In the pressure zone behind the rod the laminate is changed to its final shape using profile and pressure rollers, i.e. the profile and pressure rollers generate the compression force required for adhesion and within a short time the laminate is bonded with the core board – see figures 16-19.
6. In the fifth section the final reworking of the postforming elements is carried out. With L-profiles, the projecting laminate on the front side is milled flush to the rear side of the element, and the fibre milling rebuffed as necessary. With U-profiles, such as the EGGER model series 300, a seal and/or hot-melt adhesive seal should be applied – see figure 20.



Figure 12

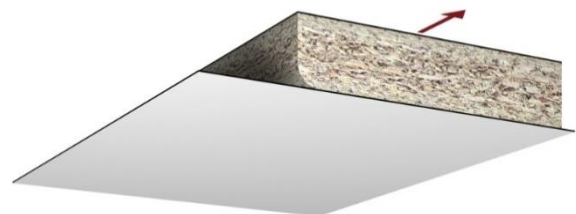


Figure 13

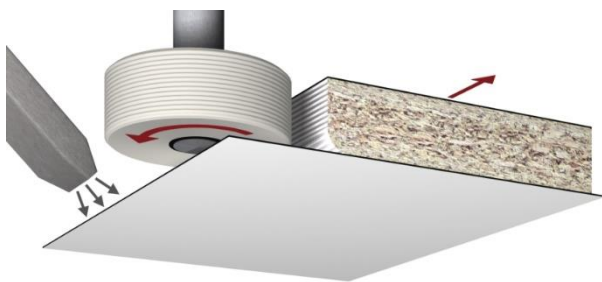


Figure 14

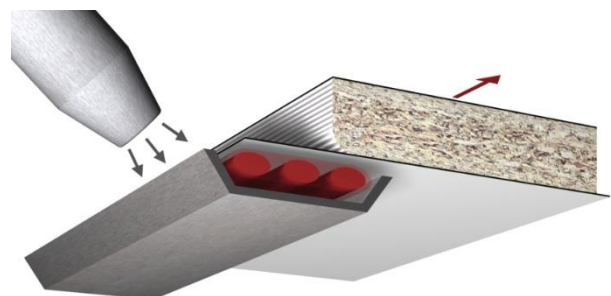


Figure 15

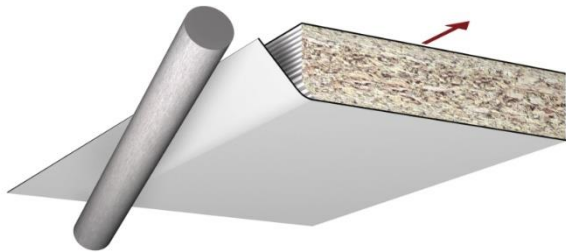


Figure 16

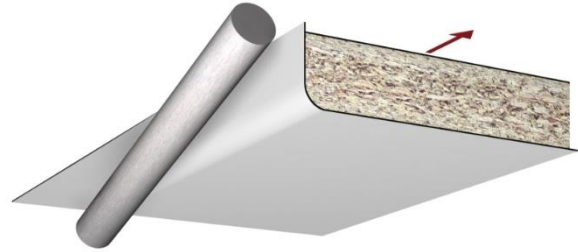


Figure 17

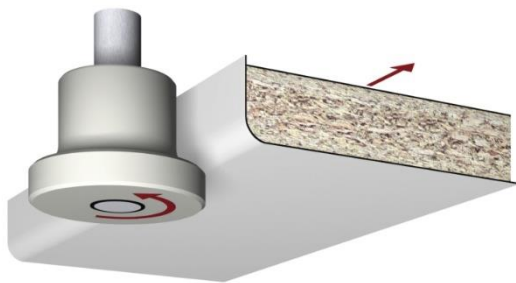


Figure 18

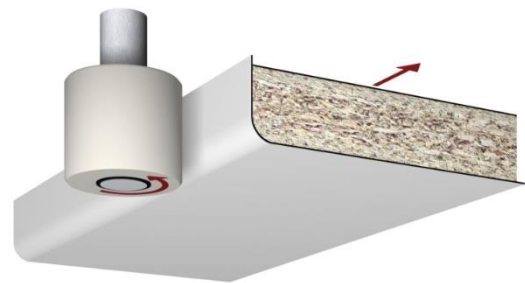
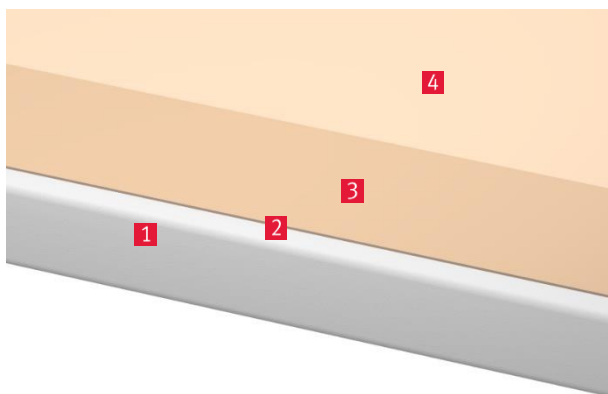


Figure 19



- 1 Postforming-edge MOD 300/3
- 2 Seal
- 3 UV lacquer seal
- 4 Balancer

Figure 20

6. General processing instructions

6.1 Cut-outs

Cut-outs are generally only made after the processing of the laminate. In general, it must be ensured before processing that the bonded boards are securely supported so that no damage is caused by sawing, milling or drilling work. In particular, narrow board areas surrounding apertures can break or crack if the board is inappropriately handled during processing. The board cut-outs should also be secured so that they cannot break or fall out in an uncontrolled way and thereby cause injury to individuals or damage property.

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The cut-out edges should be radiused (minimum radius > 5 mm) as sharp edges have an adverse effect on the material and can lead to crack formation – see figures 21 and 22. This applies particularly to the hob area where the frequent exposure to heat causes the laminate to dry out, thereby increasing shrinkage tension.

The cut-outs should preferably be made using a portable hand router or CNC milling machine. When using jigsaws, the cut-out corners should be pre-drilled with an appropriate radius and the cut-out sawn out from radius to radius. You should cut from the underside of the board to prevent the laminate coating from ripping off. The edges should be finished by means of sandpaper, filing or manual top milling to eliminate cracks due to chipping. The same careful post-processing has to be considered when using so-called "circle cutters" for e.g. halogen spotlights.

Please specifically observe the instructions and installation templates supplied by the respective manufacturer!

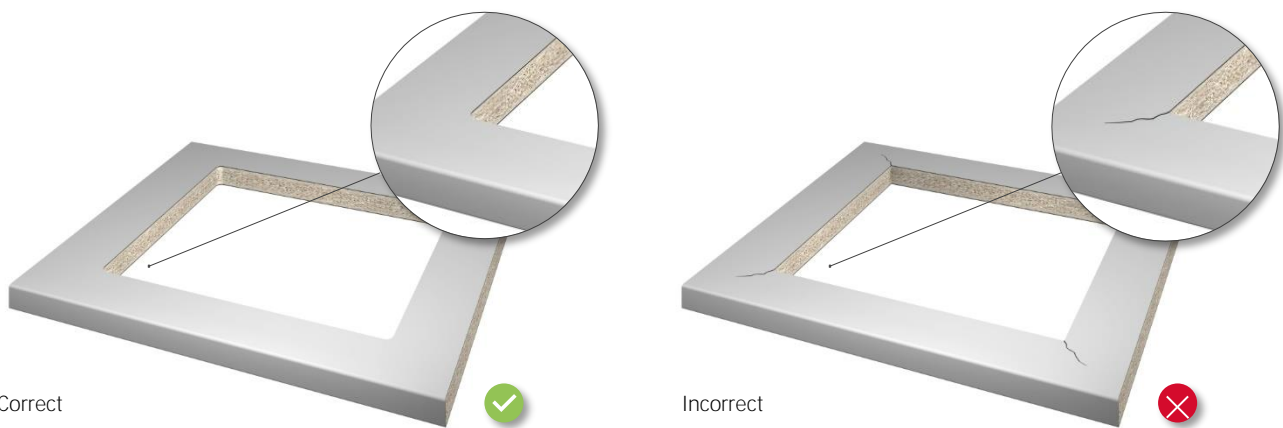


Figure 21

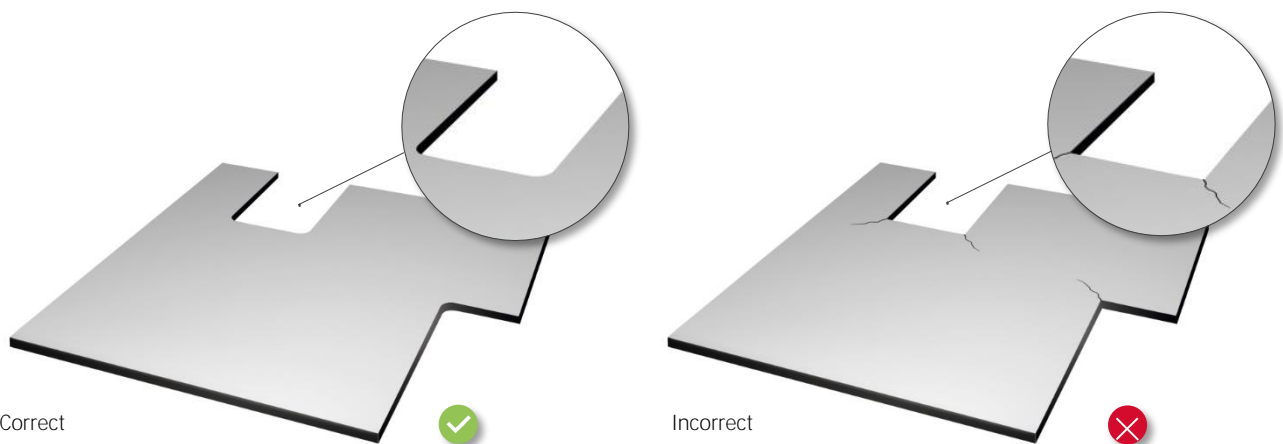


Figure 22

6.2 Sealing edges, cut-outs and drilled holes

Laminate elements, such as worktops, fronts, etc., are effectively protected from moisture penetration by the laminate surface. Moisture and damp can still reach the core board, however, via unprotected edges such as cut-outs, corner joins, mitres, back edges, drill holes, screw holes and fixtures. The necessary final sealing operations should always be carried out during the final assembly phase, especially with horizontal surfaces (worktops). EGGER melamine edging or EGGER ABS security edging (thermoplastic edging) is used to seal visible cut edges.

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The best products for sealing hidden cut edges have been found to be sealing profiles and self-curing sealants, such as silicon rubber, polyurethane and acrylic. When using sealants a primer also has to be applied; either one that forms a film or a cleaning primer depending on the material.

You must follow the manufacturer's instructions carefully when using these materials!

It is essential that you clean the areas you are sealing and to allow the manufacturer's specified venting time when using primer. Apply the sealant leaving no gaps or holes and smooth over with water and detergent. Areas near joints should be masked off to prevent the surface from becoming dirty. Any pipes or cables must be centred so that a minimum distance of 2 to 3 mm is maintained on all sides of the feedthrough. Careful sealing is also required – see figure 23.

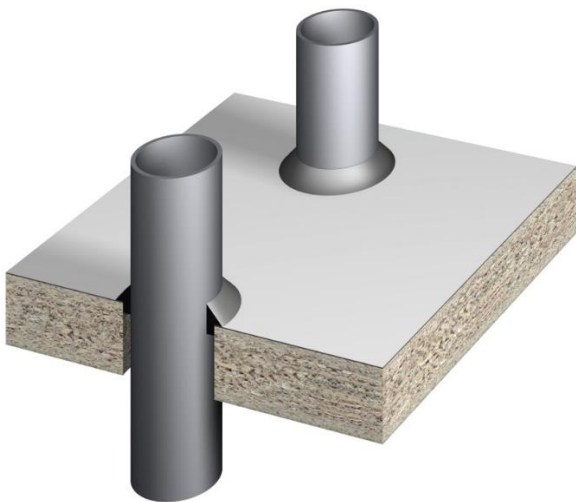


Figure 23

Cut edges can also be sealed using a two-part lacquer or two-part adhesive. Manufacturers supply sealing rings, profiles or collars with attachments such as mixer taps, sinks and hobs. Always follow the manufacturer's instructions when fitting these items.

6.3 Fastenings

Where fittings, wall terminating strips, etc., are to be secured to the bonded boards, the laminate should be pre-drilled for the screws. The bore holes must be at least 1 mm larger than the screw diameter in order to avoid tension in the material – see figures 24 and 25. With horizontal surfaces we also recommend protecting the inside of the screw hole with sealing before screwing.



Figure 24

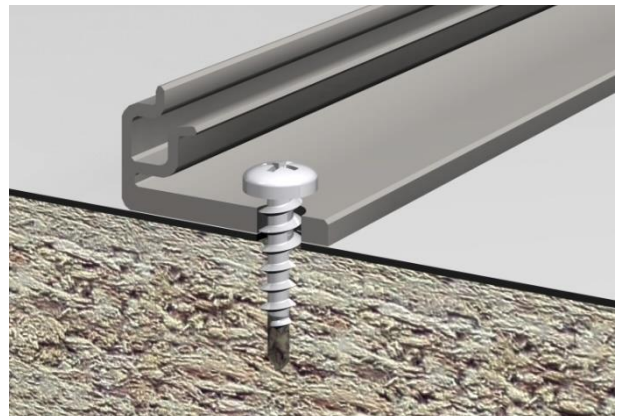


Figure 25

7. EGGER laminate with coloured core

EGGER offers various uni decors as laminate with coloured core. These laminates are also called "solid-coloured". In addition to the papers and resins used, this laminate also differs from the laminate with brown core in its product features.

As a rule, when processing laminate with coloured core, the processing guidelines listed above apply, but the following specifications must be taken into account.

7.1 Description of the material

In the case of the laminate with coloured core, the focus is on the possibility of realising solid-coloured applications and underlining the laminate edge in particular as design solution. EGGER laminate with coloured core has a multiple layer structure and consists of impregnated decor papers leading to the solid-colour look.

According to EN 438-9, EGGER laminate with coloured core is classified as **BTS** (Coloured core laminate, thin Laminate, standard grade). This means that it can be used for horizontal applications, but postforming is not possible.

7.2 Cutting

The use of special synthetic resins decreases the flexibility of the laminate with coloured core. This should be taken into account during the individual processing steps, e.g. sawing, milling, drilling, etc. Take care when using carbide- or diamond-tipped saw blades, and select an appropriate feed rate. A good cutting result depends on different factors including whether the decor side is facing upwards, saw blade projection, feed rate, tooth shape, tooth spacing, motor speed and cutting speed. Tooth shapes such as Duplovit tooth with hollow tooth face or trapezoidal tooth have proven suitable – see figure 6.

Example – Circular saw:

- Number of teeth: approx. 50 – 60
- Cutting speed: approx. 40 – 60 m/sec.
- Motor speed: approx. 3.000 – 4.000 rpm
- Feed: approx. 5 – 10 m/min (manual feed)

7.3 Gluing

The stiffness of laminates with coloured core, as well as the need to hide the adhesive joint for optical reasons, require a particular selection of adhesives. Therefore, it is recommended to coordinate the special application with the supplier of adhesives. In general, laminate with coloured core is glued onto chipboard, which is a good core material thanks to its consistency. A flat and tension-free core board is a basic requirement for the further processing of laminates with coloured core. Please note that blockboards and veneer boards are not used.

In order to reach dimensionally stable elements, it is necessary under all circumstances to apply the exact same product on front and reverse – laminate with coloured core. In addition, the production direction (recognizable by the grinding direction on the reverse side of the laminate) must be identical on the front and the reverse side. In order to reach adhesion that is as tension-free as possible, it is recommended to press the elements exclusively at cold temperatures. Thermoplastic adhesive systems, such as PVAc adhesives, should be preferred. Recommended adhesive quantity: 120 – 150 g/m².

Please follow the machinery and adhesive suppliers' instructions.

8. EGGER laminate XL

As a rule, when processing laminate XL, the processing guidelines listed above apply, but the following specifications must be taken into account when handling laminate XL.

8.1 Handling

The EGGER Laminate XL must be inspected for visible damage after removing the packaging and prior to processing. In principle, those transporting and / or handling laminates should wear personal protective equipment such as gloves, safety footwear and suitable work clothing. Due to the width of the laminate and the weight involved, handling and cutting should be carried out by two people. The decor sides should never be pushed against one another or dragged over one another. The laminate boards should either be raised, or the reverse side of one can be pulled over the reverse side of another. When laminate boards are being transported or carried, the method that has proved most satisfactory is to roll them up with the decor side on the inside, avoiding any rubbing movements. Sufficiently large, flat and stable pallets must be used for transporting laminate stacks. The stacked laminates must be secured against slipping.

9. EGGER laminate with protective film

As a rule, when processing laminate with protective film, the processing guidelines listed above apply, but the following specifications must be taken into account.

9.1 Storage

Please observe the processing instructions in **chapter 3**. The use of a protective board of at least the same format not only improves flatness, but also prolongs the UV resistance of the protective film.

The protective film must be removed at the latest 12 months after production of the laminates, as adhesive may otherwise be left over on the surface.

9.2 Processing

The temperature resistance of the protective film is at about 70°C. Therefore, the following pressing parameters must be observed:

- maximum pressing temperature 70 °C for a pressing time of 3 minutes
- press pressure 3.5 kg/cm²

Postforming is not possible, due to the low heat resistance of the films.

9.3 Recycling / Disposal

The used protective film can be recycled. In as far as reuse is not possible, the protective film may be disposed of without hazard in a waste incineration plant.

10. Thermal properties

The use of laminate elements under certain temperature and moisture conditions requires the careful selection of the components used. Core material, adhesive and processing must be adjusted accordingly.

With regard to this, please observe in particular the instructions in chapter 4.4 and chapter 6.!

10.1 Dry heat

In accordance with product standard EN 438, the resistance to dry heat is tested with an alloy block heated to 160 °C and a contact time of 20 minutes. A slight surface change in gloss and colour is permitted according to the standard. Longer exposure to heat or higher temperatures lead to surface damage. For this reason, avoid placing hot cooking utensils, e.g. casseroles, pans, etc., that have come straight from the oven or the hob onto the laminate surface.

If the laminate is exposed to increased temperature for a longer period of time (up to 8 hours), for example in the proximity of cooktops or ovens, the temperature may not exceed 100°C. For applications with permanent heat exposure, temperatures of up to 60°C, are admissible. Trapped heat must be avoided in all cases.

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10.2 Water vapour

Water vapour and cooking water do not cause changes to the surface in the case of short-term exposure. The degree of gloss or the colour only change with longer exposure. Sufficient aeration and ventilation is essential, so that the surfaces are able to dry out completely after exposure to moisture. Laminates may not be exposed to trapped moisture.

10.3 Cold

Very dry cold environments do not pose problems for EGGER laminates. However, shock sensitivity is greater than under normal climate conditions.

11. Maintenance and cleaning recommendations

For detailed information, please refer to the leaflet "EGGER Laminate Cleaning and Maintenance instructions".

12. Additional documents / Product information

You will find further information in the following documents:

- Technical leaflet "EGGER Laminate with the surface texture ST9 – Smoothtouch Matt"
- Technical leaflet "EGGER Laminate Cleaning and Maintenance instructions"
- Technical leaflet "Resistance to chemicals – EGGER Laminate"
- Technical leaflet "EGGER Laminate with protective film"
- Technical leaflet "EGGER Laminate surface texture HG – HighGloss"
- Technical leaflet "EGGER Laminate with pearlescent decors"
- Technical leaflet "EGGER Laminate balancer"

Provisional note:

These processing instructions have been carefully drawn up to the best of our knowledge. The information provided is based on practical experience, in-house testing and reflects our current level of knowledge. It is intended for information only and does not constitute a guarantee in terms of product properties or its suitability for specific applications. We accept no liability for any mistakes, errors in standards, or printing errors. In addition, technical modifications may result from the continuous development of EGGER laminates, as well as from changes to standards and public law documents. The contents of these processing instructions should therefore not be considered as instructions for use or as legally binding. Our General Terms and Conditions apply.