Formica® Compact
UserGuide 2014

Formica® Compact

STRUCTURAL LAMINATES by FORMICA GROUP

This manual is only a general guide to good practise and constitutes no form of warranty or representation as to fitness for purpose in respect of the products and processes described in it. Contact Formica Group if you are in doubt regarding the instructions in this guide. For further product information please view the Formica Compact product brochure or visit our website formica.com.

Formica Group is engaged in a continuing programme of research and development and users should check, on a regular basis, whether the information contained in this guide has been updated. Any information or products contained in this guide must be verified and tested for suitability by the user for his or her particular purpose or specific application.

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UserGuide 2014

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PRODUCT DESCRIPTION

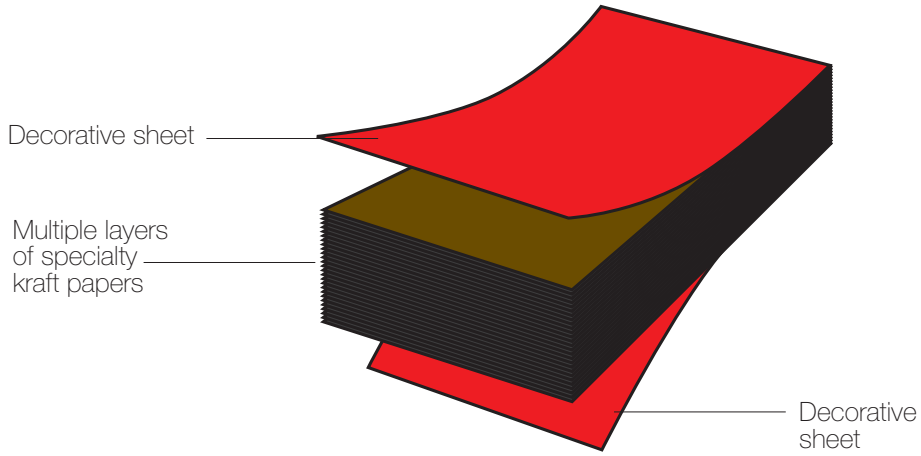
Formica® Compact is a high pressure structural laminate, built up from multiple layers of kraft paper to produce a laminate in thicknesses from 2 mm to 20 mm.

It has a decorative face on both sides and is ideal for interior use in washroom cubicles or locker doors, wall panels or laboratory furniture. It is particularly suited to use in high humidity (grade CGS), high impact areas.

With a density of 14,5 kg/m^2 (for 10 mm thickness), Compact is impressively strong and damage resistant and has remarkable structural stability, laminates over 4mm thickness can be regarded as self supporting. Laminates over 8mm thick are suitable for horizontal applications with the minimum of support.

Not only does Formica Compact meet all the requirements of EN 438:2005 and ISO 4586, the product also possess high impact and moisture resistant properties.

Compact laminates are available in both standard and flame-retardant grades.



PRODUCT GRADES

Formica® Compact grade CGS

Compact, general purpose, standard high pressure decorative laminate. EN 13501 Euroclass D-s2,d0.

Available with a black core. This grade is suitable for wet areas.

Formica® Compact grade CGF

Compact, General Purpose, Flame Retardant high pressure decorative laminate.

EN 13501 Euroclass ≥ 6 mm B-s1,d0

< 6 mm B-s2,d0

CGF grade is available with a brown core. The colour of the core may vary between manufacturing batches, this is due to the special manufacturing process and material properties and cannot be considered as a defect.

Because of the specific properties of CGF grade, it is not suitable for use in wet areas.

STORAGE AND HANDLING

TRANSPORT AND HANDLING

During transport it is essential to use pallets of sufficient size to support the whole of the panel area. Pallets must be strong and stable enough to support their load without bending or buckling. When transporting stacks of panels with mechanical handling vehicles, pallets of adequate size and rigidity should be used. The surface of each panel must be free from debris, grit or foreign bodies, as they can become embedded under the weight of the stack resulting in damage to the surface. Stacked panels must be made secure against slipping.

When loading and unloading, panels should be lifted, not slid. Abrasion between decorative faces should be avoided.

Compact grade laminates are heavy materials and therefore care should be taken whilst handling this product. Mechanical handling is recommended for panels with a thickness exceeding 10 mm.

Care should also be taken when handling decorative laminates to avoid breakages and damage.

STORAGE

Compact panels should be stored in enclosed warehouses where normal interior conditions (18-25°C and 50-60% relative humidity) are maintained.

Compact laminates will remain flat if stored horizontally in packs on a flat base board, with their edges flush with one another.

The base board must be dry and ideally it should be covered with a material impervious to water, to act as a moisture barrier.

The top sheet of each stack should also be covered with a moisture barrier/cover board, with sufficient weight to remain flat and in contact with the whole surface area of the top sheet of Compact. This procedure should be maintained throughout their storage (whether in a warehouse or on the fabrication shop floor) and reinstated whenever a sheet is removed from the stack.

If Compact sheets are not stored flat for any length of time, deformation can result which will be almost impossible to rectify, particularly with thicker boards.

When materials are brought into a workshop from temperatures or humidity levels different from ambient (e.g. after delivery), they should be allowed to stabilise before fabrication. Usually a minimum of seven days is required.

See section on pre-conditioning for further information on storage prior to fabrication.

STORAGE AND HANDLING

PRE-CONDITIONING

In common with all high-pressure decorative laminates, Formica® Compact laminates undergo a certain amount of dimensional movement when subjected to changes in humidity. In order to minimise the risk of bow occurring as a result of this movement, the following points should be observed:

In new buildings, or where excessive moisture conditions are present or high temperatures will occur, it is recommended that, prior to fixing compact laminates, a process of pre-conditioning be carried out to ensure the panels reach an equilibrium within the site conditions.

This can usually be achieved by laying the compact panels on a pallet, neatly and flat, using carefully aligned spacer sticks (20 x 20 mm) between the panels at 300 mm centres across the full area of the panels, in the area where they are to be used, (or in another area having identical conditions), for a minimum of 7 days prior to installation.

FABRICATION

CUTTING

The increased thickness of Formica® Compact laminates imposes greater demands on cutting tools and causes greater wear. Slower feed-speeds than those generally used for cutting HPL-faced composite boards are required. The degree of feed speed reduction will depend on the thickness of the laminate and the quality of finish required. Tool manufacturers should be consulted as to the type and quality of tungsten carbide tipping (TCT) to provide the best performance. Where long production runs are contemplated and where a high quality finish is required, it is worth considering PCD (Polycrystalline Diamond) tooling. In all machine processes, localised heating caused by poorly maintained saws and cutters must be avoided.

Panels should be cut with the long edge parallel to the length of the sheet. Dimensional movement across the width of the sheet is twice as great as it is along the length, so cutting panels with the long dimension running across the width of the sheet will greatly increase the risk of bowing. It is recommended that Compact panels be cut along the length of the panel whenever possible.

PROFILE CUTTING AND EDGE FINISHING

It is not necessary to apply edging strips or edge sealants to Compact panels and for many applications clean sawn edges are sufficient. A spindle moulder or router may be used to achieve a superior finish or a profiled edge. For this type of work PCD tooling is recommended. Although it is not possible to achieve complete freedom from cutter marks, they can be minimised by feeding the work at a constant controlled speed by the use of a mechanical power feed. Care should be taken to avoid pausing during cutting and profiling, as burn marks may result which are difficult to remove. Where it is desirable for edges to be completely free from cutter marks, a further sanding and scraping operation is necessary. Edges may be further enhanced by buffing with steel wool and applying silicone-free oil. Chamfering or profiling the edges of Compact panels will reduce the risk of edge impact damage.

There are various CNC cutters which could work well when cutting Compact panels. Formica Group has performed trials using a 16 mm PCD (Polycrystalline Diamond Tipped) cutter. TCT (Tungsten Carbide Tipped) will give similar results but with a shorter life span of the cutter.

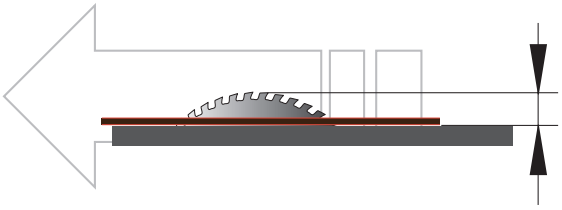
Before any CNC operations are carried out on Compact laminate, it is important to remove the protective film from the surfaces. The film may decrease the suction power of the CNC bed which could cause the laminate to move whilst a CNC program is running. The table below shows recommended feed speeds depending on the expected quality of the cut:

Panel thickness	Cutter speed	Feed speed	Comments
16 mm	18,000 rpm	1.6 m/m	Acceptable results with a finish suitable for visible edges
16 mm	18,000 rpm	0.8 m/m	Very good results with a finish suitable when a high standard is expected

FABRICATION

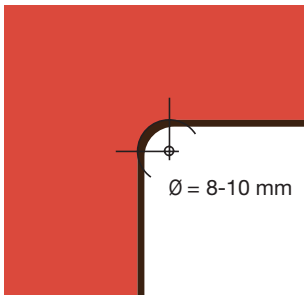
SAWING

Saw blades normally used for cutting double sided composites are generally suitable for cutting Formica® Compact grades. Saws of less than 2 mm in thickness are not recommended. Breakout on the underside of Compact sheets can be reduced by various methods:



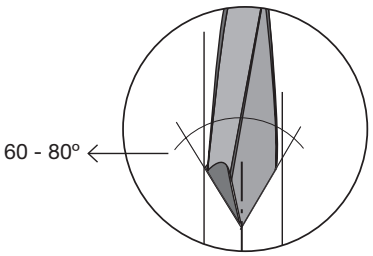
- By the use of a pre-scoring blade on the underside.
- Using a base-board of plywood or hardboard beneath the Compact sheet.
- Altering the exit angle of the saw blade by adjusting the height setting.

Note: The higher the saw blade the better the top cut and the worse the bottom cut and vice versa. The feed speed essentially governs the quality of the saw cut when sawing Compact laminates having two decorative faces. A speed of between 0.03 mm and 0.05 mm per saw tooth has been found to be the most successful.



Round off corners at cut-outs to avoid stress cracks or cracking. The recommended radius for all internal cut outs is 8-10 mm.

DRILLING



The most suitable drills for use on Compact 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.

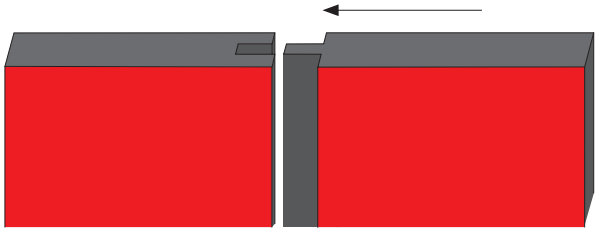
To avoid breakout on the reverse side, the feed speed of the drilling head and the pressure applied should be gradually reduced approaching the point of breakthrough. Working on a firm underlay, such as plywood or chipboard, will also reduce the risk of breakout. For blind boring into the face, the depth of the hole should be such that at least 1.5mm of material remains between the bottom of the hole and the other side of the sheet. TCT lip and spur drills will produce clean flat-bottomed blind holes, with less risk of point penetration on the reverse side. This will allow maximum depth of material to be used for fixings. Compact sheets less than 8 mm thick are not considered suitable for concealed fixing.

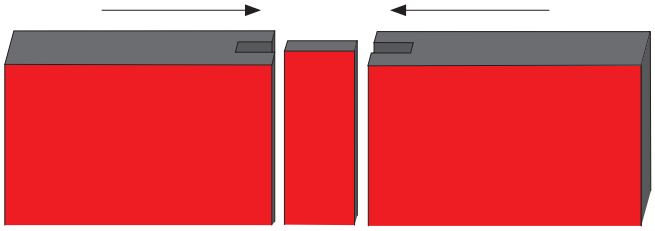
When drilling parallel to the surface (edge drilling) at least 3 mm of material must remain on either side of the hole. Threaded holes can be produced using engineers' screw cutting taps. Self-tapping screws or threaded brass inserts may also be used.

INSTALLATION

EDGE TO EDGE JOINTING

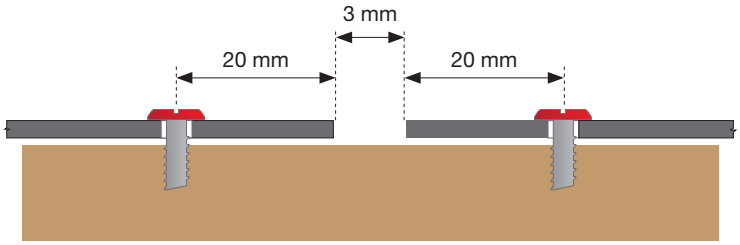
Edge-to-edge joints may be either tongued and grooved, or simply grooved and a loose spline inserted. Whichever method is chosen, the wall thickness of the groove should be greater than the width of the groove. The depth of the groove should be no greater than the thickness of the board and the length of the tongue/spline should be such as to accommodate the maximum anticipated movement. Compact laminates less than 8 mm thick are not suitable for edge grooving.





VERTICAL OPEN JOINT

When using an open joint a minimum of 3 mm spacing between sheets is required to allow for movement.



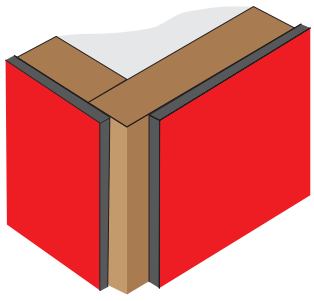
CORNERS

Corners can be installed using an open joint or a corner trim. Overlapping corners can also be used as long as a minimum gap of 3 mm between sheets is maintained.

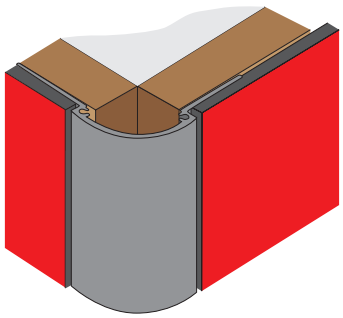
Postformed corners

It is possible to produce internal and external postformed Compact corners to a minimum radius of 15 mm and a maximum girth of 300 mm. Consult a specialist fabricator for more information.

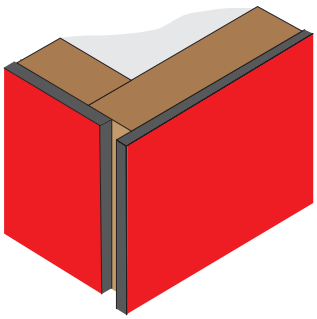
Open corner



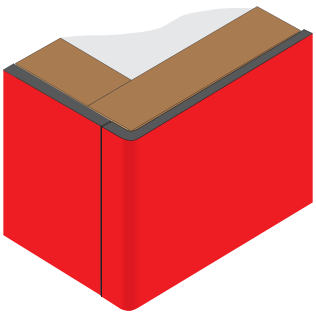
Corner profile



Overlapping corner

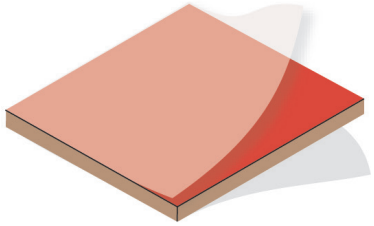


Postformed corner



INSTALLATION

In the planning of any installation, it is essential to take into account the dimensional movement that can occur with Formica® Compact laminates and allowances must be made in the design, fabrication and installation processes.



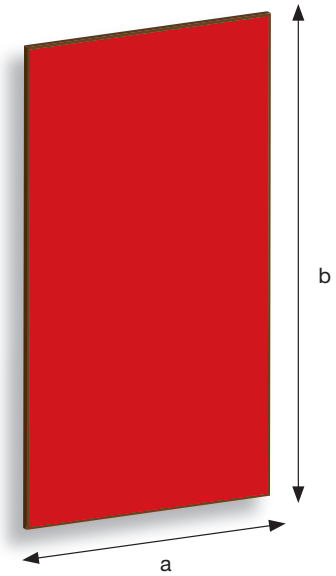
Protective films must be removed from both sides simultaneously before installation.

FORMICA® COMPACT PANELS USED FOR WALL CLADDING

When using Formica Compact laminates as wall cladding, the panels should not be fixed to freshly constructed blockwork or brickwork until adequate drying has taken place, nor should they be fixed to damp interior walls which form the external shell of the building without the protection of a damp-proof membrane.

Compact panels used for wall cladding may be fixed by screwing directly through the face, or by hanging on a rigid supporting timber or metal framework with different types of fixing systems. Thinner panels, 4-6 mm, may be bonded to a wood-based framework with heavy duty building adhesives.

The chosen method of attachment will depend on the installation, board thickness and visual design criteria.



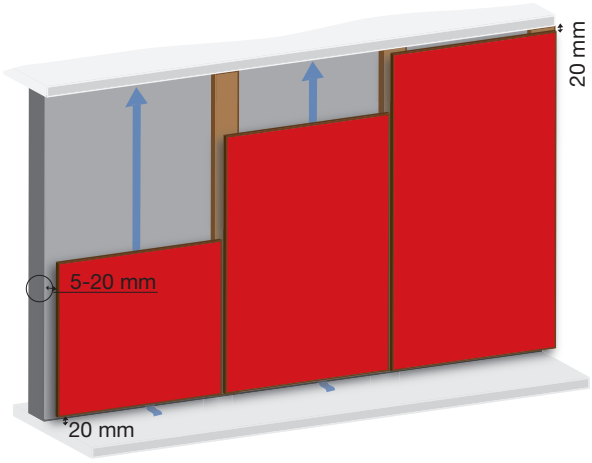
Allowance for dimensional movement

Movement in the length direction of the sheet is about half of that in the width direction. Typical dimensional movement values resulting from extreme change in relative humidity are as follows:

a) Transverse direction of the sheet: 2.5-3.0 mm per metre

b) Longitudinal direction of the sheet: 1.0-1.5 mm per metre

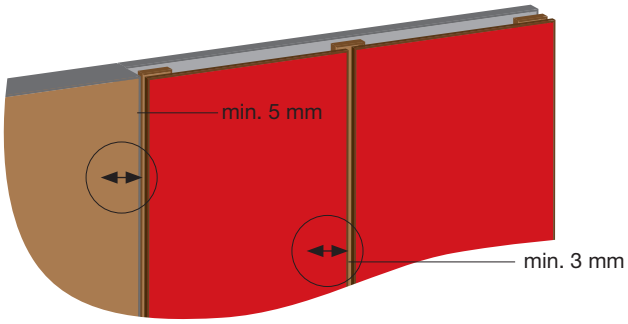
INSTALLATION



Air gap

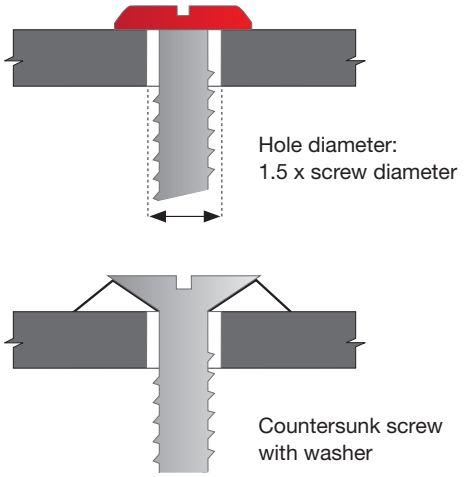
For existing buildings, with dry walls, Compact panels can be installed with a minimum air gap for circulation of 5 mm.

For new buildings, or buildings with damp walls, a damp-proof membrane must be used. A minimum air gap of 20 mm must be maintained behind the panels, between the base of panel and the floor and between the top of the panel and the ceiling.



Distance between panels

The distance between a solid object and a Formica Compact panel must be minimum 5 mm and the distance between two Compact panels should be minimum 3 mm.



Through-fixing holes

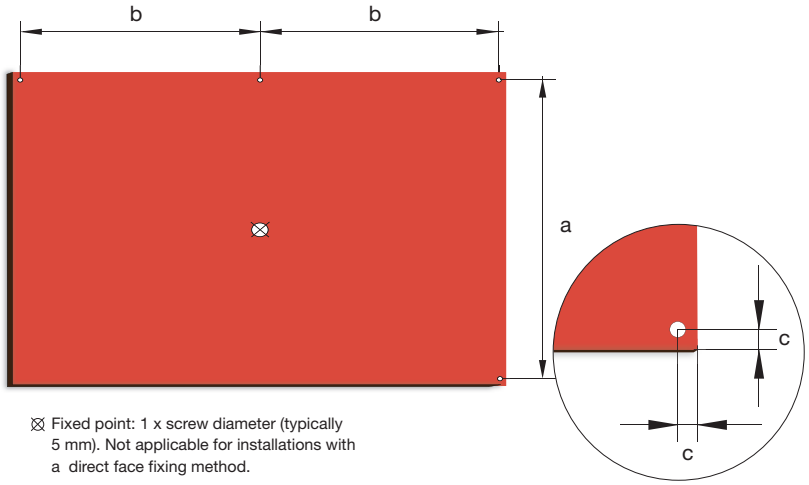
It is generally recommended that through - fixing holes should be at least 1.5 times the outside diameter of the screw being used and should be positioned a minimum of 20 mm from the edge of the panel.

Countersunk screws should not be used unless together with a washer.

INSTALLATION

FIXING USING SCREWS

In all applications the panels must be fixed to a rigid, secure system of horizontal supports at not more than 600 mm centres, with vertical support members at the joints appropriate to the detailing.



⊠ Fixed point: 1 x screw diameter (typically 5 mm). Not applicable for installations with a direct face fixing method.

The maximum distance between screws depends on the thickness of the Formica® Compact panel.

	a	b
Panel thickness	2 fixings in one direction	3 or more fixings in one direction
4 mm	300 mm	300 mm
6 mm	600 mm	600 mm
8 mm	600 mm	600 mm
10-20 mm	600 mm	600 mm

	c		
Panel thickness	Minimum	Minimum (concealed)	Maximum
4 mm	20 mm	75 mm	40 mm
6 mm			60 mm
8 mm			80 mm
10 mm			100 mm

INSTALLATION

DEMOUNTABLE WALL PANELS

'Z' clips, or strong plastic panel fixings such as Keku panel clips, can provide a simple means of incorporating demountable or removable panels within wall lining applications, for example to allow for access to services.

A suitable rigid, secure supporting timber or metal framework should be used and appropriate allowances made in panel design, layout and configuration to provide sufficient clearances for panel removal and replacement.

Fixing devices

'Keku' clips and other concealed fixing devices may be attached to the back of panels with PTS type screws or threaded brass expansion inserts. Screws and bolts with slow threads provide better resistance to working loose than those with fast threads. In all cases a blind pilot hole of the correct size must first be bored in the back of the panel. The depth of the hole should be at least 1 mm greater than the penetrating depth of the screw, and should leave at least 1.5 mm of material between the bottom of the hole and the face of the panel.

Rigid items, such as 'Keku' clips and fixing angles, fixed to Compact panels, should have oversize holes to accommodate differential movement. A slip foil between the two components is also recommended. Expansion fasteners should not be used in edge-drilled holes (i.e. parallel to the surface).

Fixing clips should be installed at maximum 600 mm centres.

EDGE RETAINING PROFILES

Edge retaining profiles of steel or aluminium should be used in situations where some movement of adjoining panels is anticipated.

DIRECT FACE FIXING

Formica Compact panels can be installed directly on to blockwork or plastered walls using a face fixed method. This can only be done in existing buildings as the walls must be free from damp. Please note that all of Formica Group's recommended pre-conditioning methods must be observed.

Formica Compact sheets can be fixed using screws at 600 mm centres. All screw holes should be 1.5 x the outside diameter of the screw. A fixed point screw should also be used if expansion is anticipated. This will ensure that each sheet returns to its original position should it contract.

It should be noted that no guarantee of flatness can be given as the product will only be as flat as the wall it is being fixed to and no airflow is allowed. If panel flatness is essential then alternative fixing methods more appropriate to the installation should be used, for example fixing panels to a framework of timber battens.

INSTALLATION

INSTALLATION USING ADHESIVES

Different types of construction adhesives can be used to install Formica® Compact laminates as wall panels. Some general guidance follows below. For more detailed information please contact Formica Group or your chosen adhesive supplier.

Due to differences in the expansion rate between Compact laminate and adhesives, we recommend a maximum panel size of 3050x1300 mm when using adhesives. Larger panel sizes should be installed by using screws or other appropriate methods.

Installation on plasterboard walls is not recommended when bonding direct using adhesives as the adhesive will only grip the paper surface of the plasterboard. In some instances this paper surface will not be strong enough to support the weight of the Compact panel due to its weight and dimensional movement.

General recommendations

- Ensure the substrate is clean before gluing to ensure optimal bonding results.
- Use the correct amount of adhesive for the type of substrate. Dense substrates require less adhesive, whilst absorbent substrates require more.
- Apply the adhesive to the studs and apply pressure on the Compact panel. The adhesive should be applied in vertical beads approximately 50 mm apart.
- Allow air to circulate to help curing process.
- Do not apply too much pressure. The most common cause of loss of adhesion is a glue line that is too thin. Even if you apply a sufficient amount of adhesive, there is a risk of most of it being pressed out when you apply pressure. After pressing, you should therefore check that the glue line is approx.1–2 mm thick on dense substrates and approx. 3 mm thick on absorbent substrates.

Gluing to studs

1. The wall should be dry and have a stud wall so that there are gaps of at least 20 mm for air to circulate between the underlying wall and the Compact panel. If the underlying wall is damp, an EPDM membrane must be installed to prevent the dampness from affecting the panel.
2. The Compact laminate must be allowed to acclimatise in the same room for a minimum of 7 days in advance.
3. The adhesive should be at room temperature before being applied and be stored at room temperature for at least 1 day before being applied, but longer if possible.
4. In new constructions, windows and doors should be closed to avoid drafts and / or temperature changes.
5. The reverse side of the Compact laminate, i.e. the glued side, should be sanded with P80 grade sandpaper.
6. Compact laminate which is being glued should have a clean, grease-free surface.

INSTALLATION

7. Apply adhesive to the studs. Hold the cartridge at a right-angle to the studs (90°). Make sure that the V-shaped tip is pointing forward when applying the adhesive. Press the tip firmly against the surface. The tip must not be allowed to leave the surface at any time or be held at any other angle. The glue line should be pressed against the stud. If you do not press the tip firmly against the surface, there is a major risk that the glue line will remain "unbonded" on the surface. Squeeze out the adhesive while moving the cartridge in the direction of movement so that the line has a distinct V shape. This ensures that the correct amount of glue is used, i.e. beads of approx. 10 mm.
8. Glue the panel and apply pressure within 20 minutes, i.e. before a "skin" forms on the adhesive – see below.
9. Make sure that pressure is applied to the panel during assembly and during the curing period. You can either brace the layers together or use adhesive pads/double-sided tape – the tape bonds directly to the panel and the wall.
10. As an alternative to tape or bracing, you can put a screw at each corner of the panel, approx. 20 mm from the edge.
11. The temperature of the room should be approx. 20°C +/- 2°C. Humidity should be between 30%-60% RF. This is vital as the adhesive needs humidity to cure. Full bonding strength is achieved after 1-3 days.
12. In all vertical laminate-to-laminate joints, and at the corners, you should leave a gap of at least 6 mm between the panels to allow room for dimensional movement.

Gluing directly on the wall

Formica® Compact laminate can be glued directly to the underlying wall, with no wall stud, if the following conditions are in place:

- The underlying wall should be a completely dry interior wall.
- The substrate should be plywood, OSB panel or similar (the Compact laminate cannot be glued directly onto plaster).
- The Formica Compact laminate must be allowed to acclimatise in the final environment for a minimum of 7 days prior to assembly. Make sure there is room for air to circulate behind the laminate panel and existing plywood/OSB wall (this is done by leaving gaps between the beads of adhesive).

Apply the adhesive in vertical lines/beads approximately 150 mm in length, reaching the edge. NB: Do not apply the adhesive in a "frame" around the sides of the panel as it prevents air from circulating, which prevents the adhesive from curing. The adhesive bead should have a diameter of approx. 10 mm. Glue the panel and apply pressure within 20 minutes, i.e. before a "skin" forms on the adhesive.

Please refer to 'Gluing to studs', above, for guidance regarding humidity, temperature, vertical joints and hole punching etc.

INSTALLATION

WET AREAS

Formica® Compact laminates are well suited to wet area applications such as shower cubicles, swimming pool lockers, etc. providing certain safeguards are observed.

Formica Compact laminate will withstand frequent wetting with hot or cold water and/or prolonged exposure to high humidity, but is not recommended for applications involving long term total immersion. Only standard grade Compact laminates (CGS) should be used in wet areas, as the hygroscopic nature of flame-retardant additives may give rise to surface blisters on Flame Retardant Compact laminates (CGF) if subjected to prolonged exposure to wet conditions.

As far as possible, the ambient conditions should be the same on each side of the panel, as it is important that both sides gain or lose moisture at roughly the same rate. Where panels are mounted on a wall or enclose a vanity unit or Integrated Plumbing System (IPS), adequate ventilation must be provided to ensure that temperature and humidity conditions at the backs of the panels are essentially the same as those at the front.

Fixing centres should be sufficiently close to prevent excessive freedom of movement. Shower cubicle doors greater than 1500 mm high should have three hinges.

CLEANING & MAINTENANCE

Formica Compact laminates will resist the effects of vandalism and, properly fabricated, will provide very durable surfaces suitable for public areas.

Laminate surfaces are best kept clean using water and mild detergent, for stubborn stains it is recommended to use non-scratch liquids or creams.

Ink marks from felt-tip and ball-point pens can be removed with a suitable solvent (e.g. methylated spirits, acetone, etc.) on a clean cloth. Organic solvents such as white spirit and cellulose thinners can also be used to remove paint splashes and graffiti, as they will not affect the laminate surface.

Acid-based ceramic cleaners and lime scale removers must not be used as they can cause permanent staining. Any spillage or splashes of these cleaners must be washed off the laminate surface immediately.

After using a cleaner, the surface should be rinsed with clean water and polished dry with a soft cloth.

Proprietary window-cleaning products are excellent for avoiding and removing drying marks and smears on the final finish.

Furniture polishes should not be used, as a build up of silicone wax on the surface may result, causing eventual discolouration and smear marks which can be very difficult to remove.

DISPOSAL

Waste can be recycled as combustible.

SUSTAINABILITY

Formica Group is committed to making sustainable principles and practices a part of everything we do. We strive to adhere to the highest ethical standards as we advance in our efforts to protect vital resources for future needs.

Products from Formica Group's ten international manufacturing sites have achieved **Greenguard** product certification, the premier marks for low-emitting products.

Formica Group are **FSC®** certified and comply with the requirements of FSC. Network of participating European Formica Group sites is shown on certificate number TT-COC-003588.

Formica Group has made a commitment to reduce carbon emissions and is the first laminate manufacturer in the world to be awarded the **Carbon Trust's Carbon Reduction Label.**

COMPLIANCE & CERTIFICATIONS

Euroclass B-s1,d0 Fire Retardant test report (grade CGF) in accordance with European regulation EN 13501-1.

Formica Compact laminates are certified by the CE Mark to meet or exceed conformity with European consumer safety, health and environmental requirements.

Certificate for Quality Management Systems, (ISO 9001:2000), Lloyd's Register Quality Assurance Limited.

Formica Compact laminates are manufactured in accordance with EN438.

reducing with the Carbon Trust
CO2
We have committed to reduce the carbon footprint of this product
carbon-label.com

FSC
www.fsc.org
FSC® C106553
The mark of responsible forestry

GREENGUARD
PRODUCT CERTIFIED FOR LOW CHEMICAL EMISSIONS
UL.COM/GG
UL 2818

BUREAU VERITAS Certification
ISO 14001:2004

ISO 9001:2000

CE
N ° 0402

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