

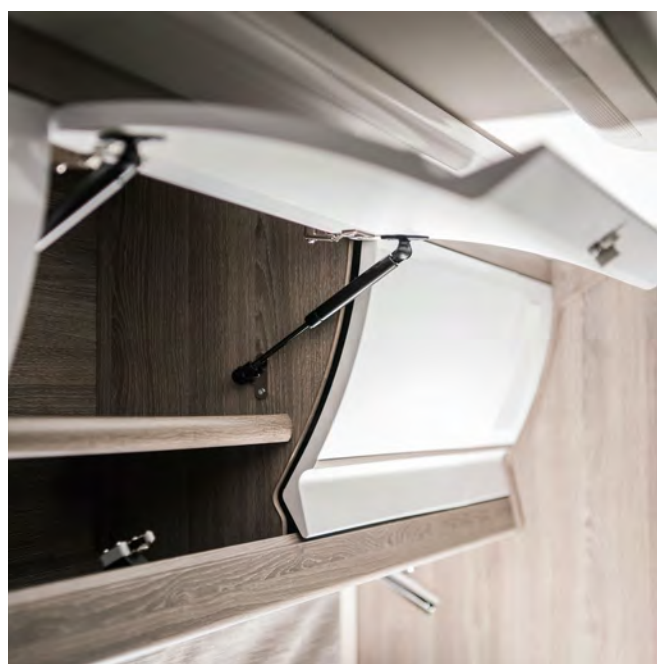


*Rely on it.*

## RENOLIT GORCELL – Advanced composite material

### Processing handbook for innovative panel products

Explore the  
versatility  
of **RENOLIT**  
GORCELL.



# CONTENT

|                                                          |    |
|----------------------------------------------------------|----|
| RENOLIT GORCELL                                          | 3  |
| RENOLIT GORCELL TYPES AND APPLICATION                    | 4  |
| RENOLIT WOOD-STOCK, RENOLIT CORK-STOCK, RENOLIT TECNOGOR | 5  |
| STORAGE                                                  | 14 |
| FABRICATION                                              | 16 |
| FAQ                                                      | 69 |
| PARTNER FIRMS                                            | 71 |
| SERVICE                                                  | 74 |

---

## RENOLIT – YOUR RELIABLE PARTNER IN THE INDUSTRY

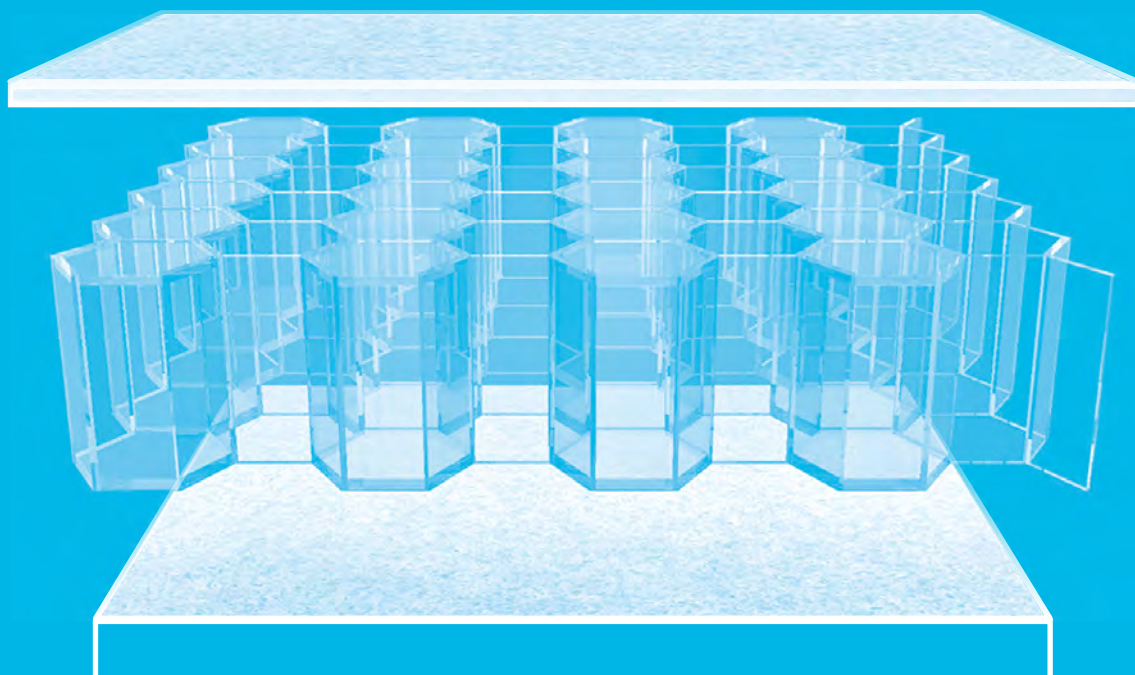
The RENOLIT Group is one of the leading manufacturers internationally of high-quality plastic films and related products for technical applications. For over 70 years, this independent family business has set new standards in quality and innovation, and today employs around 4,800 people at more than 30 production sites and distribution companies. The name RENOLIT stands for technical competency, modern product design and partnership-based services throughout the world.

RENOLIT plastic films are used to refine the surfaces of furniture, construction elements and hi-fi products, to insulate roof and underground structures and to line swimming pools. We produce films and tubes for medical applications and recyclable panels in combination with natural fibres for the building and automotive industries. RENOLIT films are also used to make products for office furniture and industries, self-adhesive products for the graphics and labelling industry, as well as technical products.

# RENOLIT GORCELL

Advanced composite material  
General data

|                                                              |    |
|--------------------------------------------------------------|----|
| RENOLIT GORCELL .....                                        | 3  |
| RENOLIT GORCELL – the material and its characteristics ..... | 5  |
| RENOLIT GORCELL availability .....                           | 11 |
| General data .....                                           | 13 |
| Application Examples                                         |    |
| ■ Caravan, yacht, furniture and panels .....                 | 8  |
| ■ Outdoor furniture .....                                    | 10 |
| ■ Furniture components and doors for wet rooms .....         | 10 |



# RENOLIT GORCELL SYSTEM

## Formed or flat furniture components – one material for multiple applications

RENOLIT GORCELL is composed of a variety of materials that facilitate the production of extremely lightweight, waterproof and rot-resistant furniture components.

Complex components consisting of flat surfaces and two-dimensional constructions are particularly common in caravan and yacht manufacturing. RENOLIT GORCELL is an ideal solution for matching elements, in that it provides a seamless presentation of the design throughout the interior.

## RENOLIT GORCELL Panels

RENOLIT GORCELL panels for lightweight furniture manufacturing consist of a RENOLIT WOOD-STOCK top layer. These panels are available either with surfaces from the wide range of RENOLIT ALKORCELL décors or with coverings that optimise subsequent adhesion or coating. Using processing conditions appropriate for the product construction, you can create modern, durable, yet lightweight furniture components.

## RENOLIT GORCELL panels for formed furniture elements

Two-dimensional furniture elements, such as cabinet doors or shower cubicle walls are usually produced on vacuum presses using materials constructed from various surface and core layers.

RENOLIT CORK-STOCK provides a variety of surface layers for these types of applications. These layers can be pressed with RENOLIT GORCELL core elements to produce two-dimensional components, usually in combination with anhydrous reactive bonding systems such as PUR adhesives.

A key advantage of this system is its homogenous and fully recyclable material usage that is in keeping with the demands of the circular economy of today.



*RENOLIT GORCELL is used in a wide range of applications, such as the interior design of motor homes.*

# RENOLIT GORCELL – THE MATERIAL AND ITS CHARACTERISTICS

RENOLIT GORCELL offers you a particularly light panel material with numerous advantages. This lightweight construction material is made by combining RENOLIT WOOD-STOCK composite panels with an ultra-light honeycomb structure.

The honeycomb structure of this high-tech product can withstand great pressure and is also watertight. It is manufactured from thermoplastic foil in a continuous production process, and then combined with top layers of composite panels. Both the EconCore procedure and the end product have to date been unique in Europe in this form. When covered with a RENOLIT WOOD-STOCK top panel, RENOLIT GORCELL has a multitude of possible applications, both interior and exterior, and offers completely new opportunities for the design of components.

## RENOLIT GORCELL surface layer

### RENOLIT WOOD-STOCK

RENOLIT WOOD-STOCK consists of a thermoplastic WPC (Wood Polymer Composite) – a combination of wood fibres and polymers that are compressed under heat and pressure. The 1.0 mm to 3.0 mm thick board materials can be three-dimensionally shaped after heating and are extremely dimensionally stable despite their low wall thickness.

### RENOLIT CORK-STOCK

RENOLIT CORK-STOCK consists of a thermoplastic CPC (Cork Polymer Composite) – a combination of cork fibres and polymers that are compressed under heat and pressure. The 1.0 mm to 3.0 mm thick panel materials are particularly suitable for the production of formed elements in the lightweight furniture sector or in decorative side wall paneling for caravans.

### RENOLIT TECNOGOR

RENOLIT TECNOGOR consists of a thermoplastic GRP (Glass Reinforced Plastic) composition – a combination of short glass fibres and polymers that are compressed under heat and pressure. The 0.8 mm to 3.0 mm thick panel materials can be three-dimensionally shaped after heating and are extremely dimensionally stable despite their low wall thickness.

## RENOLIT GORCELL – THE MATERIAL AND ITS CHARACTERISTICS

The surface of the composite material can either be coated with **RENOLIT ALKORCELL** PP decorative foils for indoor or outdoor use, with a decorative or functional fleece material and is also available as a recoatable panel for subsequent coating or lamination.

In addition, **RENOLIT WOOD-STOCK**, **RENOLIT CORK-STOCK** and **RENOLIT TECNOGOR** are almost hydrophobic,

waterproof and rot-proof. Full recyclability of the various top layers makes for a preferred choice of material for a closed cycle economy.

Decorative surface layers can be chosen from the over 400 colours and décors in the **RENOLIT 2D** and **3D** product range.

### RENOLIT GORCELL – characteristics

#### Particularly light

The core of the honeycomb has a specific weight of only 80 kg/m<sup>3</sup>. This light weight means that **RENOLIT GORCELL** panels are easy to handle.

#### High weather-resistance

Thanks to its excellent water-resistance, the material offers high weather-resistance for external use and for humid indoor locations.

#### Enormously strong

With compressive strength of up to 1.2 MPa (ASTM C365-57), **RENOLIT GORCELL** panels have extremely high load-bearing capacity. Although the sandwich structure is only a few millimetres thick, its internal honeycomb structure ensures unusually high strength.

#### Excellent to work with

With **RENOLIT GORCELL**, even curved shapes can be simply achieved with a visually attractive appearance. Surfaces can be simply achieved in most materials without any problem.

#### Versatile to use

In combination with coverings such as non-woven materials, various types of textile or decorative **RENOLIT** film, **RENOLIT GORCELL** can be used in many different ways. The external coating can be realised as a scratch-proof or weather-resistant finish, or a "soft-touch" surface.

#### Fully recyclable

**RENOLIT GORCELL** can be 100 % recycled. The whole sandwich structure is recyclable. **RENOLIT** also takes back all process waste produced, and returns it to production.

#### Wide selection

**RENOLIT** has various different thicknesses and surface layers of **RENOLIT GORCELL** available in its range, so that it is always possible to offer the technically and commercially optimum solution.

#### Cost-efficient

The sparing use of resources in the manufacture of **RENOLIT GORCELL** ensures sustainable cost savings.



# RENOLIT GORCELL – THE MATERIAL AND ITS CHARACTERISTICS

## Wide range of applications for interior and external use

Thanks to its numerous performance advantages, RENOLIT GORCELL offers new opportunities for numerous areas of application - from the transport industry, through furniture to the leisure sector.

### Example 1: Motor homes and caravans

RENOLIT sets new standards in the demanding motor home and caravan market with its innovative lightweight material. RENOLIT GORCELL can be used in caravan interiors for wall panelling, sliding doors, furniture fronts, side walls in wet rooms and flooring. Interior caravan panelling made from RENOLIT GORCELL can be as much as 50% lighter than that using conventional plywood based furnishings. The material can withstand high pressure and impact, and is also resistant to water and moisture, therefore ideal for caravan attachments such as flaps and doors. RENOLIT GORCELL can be coated with various surface materials, meaning that caravan ceilings, walls, flooring and furniture fronts can be co-ordinated with the same design, giving a seamless appearance to interiors.

RENOLIT WOOD-STOCK, RENOLIT CORK-STOCK for interiors and RENOLIT TECNOGOR exteriors are available for wall and floor construction.



RENOLIT GORCELL is particularly suitable for interior use in motor homes and caravans.



Example of motor home or caravan interior

## APPLICATION EXAMPLE CARAVAN AND MOTOR HOMES

Two dimensionally formed components comprising of RENOLIT CORK-STOCK, and RENOLIT WOOD-STOCK, RENOLIT TECNOGOR with RENOLIT GORCELL core materials for caravan interior furniture and partition walls.

Caravan interior wall using RENOLIT CORK-STOCK and RENOLIT WOOD-STOCK, RENOLIT TECNOGOR with RENOLIT ALKORCELL with an solid colour emboss.

Furniture elements, shower partitions and doors manufactured using RENOLIT GORCELL with RENOLIT ALKORCELL surface designs in plain colours or print designs.







Two dimensionally formed components comprising of RENOLIT CORK-STOCK, and RENOLIT WOOD-STOCK, RENOLIT TECNOGOR with RENOLIT GORCELL core materials for caravan interior furniture and partition walls.

Floor panels made in a combination of RENOLIT WOOD-STOCK or RENOLIT TECNOGOR with RENOLIT GORCELL core materials laminated with RENOLIT Flooring Components.

Caravan outer wall made of RENOLIT TECNOGOR with RENOLIT ALKORCELL Surrounding in plain colours or print designs.

## FURTHER APPLICATION EXAMPLES

### Example 2: Outdoor use around the home and garden

RENOLIT GORCELL is extremely versatile when it comes to outdoor applications, for example in summer houses, privacy screens for boundaries and waste bin areas or for outdoor furniture and storage boxes.

The material is visually appealing, easy to process and extremely durable. Unlike wood, the material does not require regular repainting, yet is highly weather resistant in outdoor use. Its lightweight construction makes light work of component assembly as well as incurring reduced freight costs.



*Furniture bodies, doors and drawers made from RENOLIT GORCELL with RENOLIT ALKORCELL Surrounding in solid colours and print designs.*

---

### Example 3: Furniture components and doors for wet rooms

RENOLIT GORCELL provides the ideal materials for challenges such as extreme humidity, cleaning water and condensation.

Wet room doors and sandwich panels made from RENOLIT GORCELL can also withstand extreme use of water and moisture. Waterproof and rot-resistant furniture components, including shaped parts, can be used in certain regions whose climatic conditions make wood-based materials an inappropriate choice, where extremes of temperature and humidity would often lead to mould growth and a heightened risk of warping.



*Sandwich panels for wet room applications made from a combination of RENOLIT CORK-STOCK, RENOLIT WOOD-STOCK or RENOLIT TECNOGOR with RENOLIT GORCELL core materials.*

## AVAILABILITY OF RENOLIT GORCELL



*Application example shower caravan.*



*Sandwich molded panels from RENOLIT GORCELL.*

## AVAILABILITY OF RENOLIT GORCELL

### ■ Availability:

- Per part/component
  - Only RENOLIT GORCELL
  - RENOLIT GORCELL with non-woven material
  - RENOLIT GORCELL with decorative surface
- Core option:
  - RENOLIT GORCELL with non-woven
  - RENOLIT GORCELL WOOD-STOCK with non-woven

### ■ Sending samples:

Samples can be requested from  
[interiorcollection.renolit.com](http://interiorcollection.renolit.com)

### ■ Panel dimensions:

Standard panels 1220 mm × 2440 mm  
 (Maximum size 1500 mm × 6000 mm)

RENOLIT GORCELL panels are made in accordance with your particular requirements and specifications. Decorative films from the RENOLIT ALKORCELL range refine the surface and give the product a good finish.

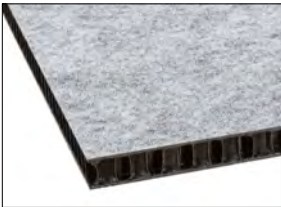
## STOCK PROGRAM LIGHTWEIGHT PRODUCTS

### RENOLIT GORCELL WOOD-STOCK ALKORCELL

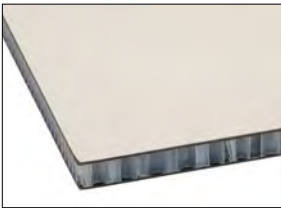
The waterproof lightweight panel for the precise construction of furniture and caravan components.

| Panel format:                                                                       | 1.220 x 2.440 mm                 |
|-------------------------------------------------------------------------------------|----------------------------------|
|   | Design: TWEEDY OAK GREY          |
|                                                                                     | ■ 12 mm   S40.79.31.0001.000     |
|                                                                                     | ■ 15 mm   S40.79.31.0002.000     |
|                                                                                     | ■ 21 mm   S40.79.31.0003.000     |
|  | Design: GLADSTONE OAK CAPPUCCINO |
|                                                                                     | ■ 12 mm   S40.79.31.0004.000     |
|                                                                                     | ■ 15 mm   S40.79.31.0005.000     |
|                                                                                     | ■ 21 mm   S40.79.31.0006.000     |

### Laminatable RENOLIT GORCELL WOOD-STOCK FLEECE

|                                                                                     |                              |
|-------------------------------------------------------------------------------------|------------------------------|
|  | Design: FLEECE               |
|                                                                                     | ■ 15 mm   S40.79.40.0001.000 |
|                                                                                     | ■ 21 mm   S40.79.40.0002.000 |

### RENOLIT GORCELL WOOD-STOCK ALKORCELL Recoatable

|                                                                                     |                                        |
|-------------------------------------------------------------------------------------|----------------------------------------|
|  | Design: BEIGE RECOATABLE / KASCHIERBAR |
|                                                                                     | ■ 12 mm   S40.79.33.0003.000           |
|                                                                                     | ■ 15 mm   S40.79.33.0001.000           |
|                                                                                     | ■ 21 mm   S40.79.33.0002.000           |

### RENOLIT CORK-STOCK ALKORCELL

The surface layer system for moulded components in furniture construction and caravan applications.

| Layer format:                                                                        | 1.220 x 2.440 mm                       |
|--------------------------------------------------------------------------------------|----------------------------------------|
|   | Design: TWEEDY OAK GREY                |
|                                                                                      | ■ 1,3 mm   S40.71.84.0001.000          |
|  | Design: GLADSTONE OAK CAPPUCCINO       |
|                                                                                      | ■ 1,3 mm   S40.71.84.0002.000          |
|  | Design: COCHA WHITE 87                 |
|                                                                                      | ■ 1,3 mm   S40.71.83.0001.000          |
|  | Design: BEIGE RECOATABLE / KASCHIERBAR |
|                                                                                      | ■ 1,3 mm   S40.71.88.0001.000          |

### RENOLIT GORCELL PP-FLEECE

|                                                                                      |                               |
|--------------------------------------------------------------------------------------|-------------------------------|
|  | Design: HONEYCOMB CORE        |
|                                                                                      | ■ 3,5 mm   S40.79.60.0001.000 |
|                                                                                      | ■ 4,6 mm   S40.79.60.0002.000 |
|                                                                                      | ■ 8,8 mm   S40.79.60.0003.000 |
|                                                                                      | ■ 9,8 mm   S40.79.60.0004.000 |

## GENERAL DATA EXAMPLE

Further product data-sheets are available on request.

### RENOLIT GORCELL – WOOD-STOCK 20

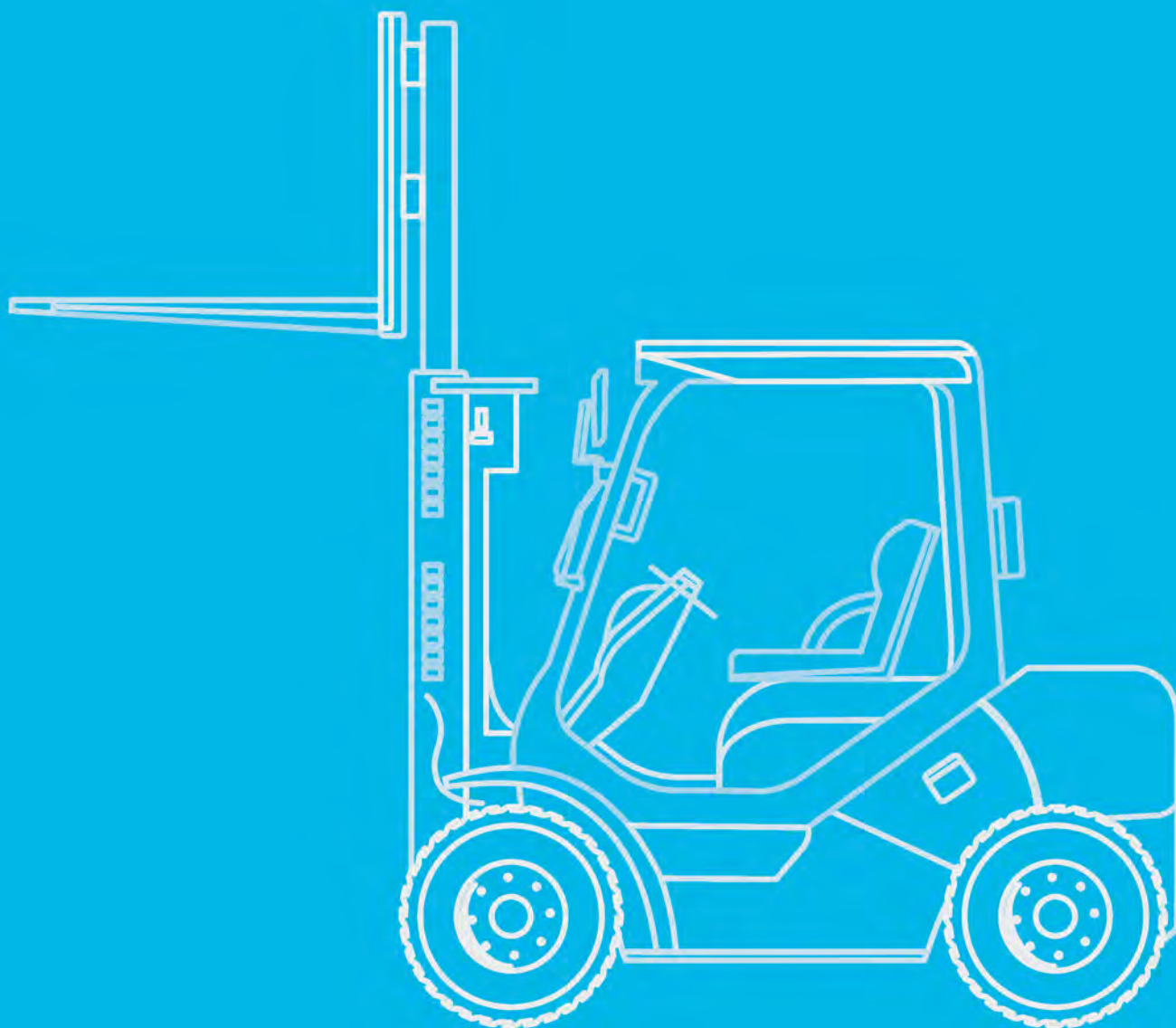
| Physical values                   | Method                                   | Unit              | Values                                   |
|-----------------------------------|------------------------------------------|-------------------|------------------------------------------|
| Panel thickness                   | I-Q 10 A15                               | mm                | 15.00 ± 0.4                              |
| Basis Weight                      | STD 1076                                 | g/m <sup>2</sup>  | 4,400 ± 500                              |
| Flexural strength                 | I.M. n°546859                            | MPa               | longitudinal ≥ 9.0<br>transverse ≥ 6.0   |
| Flexural modulus                  | I.M. n°546859                            | MPa               | longitudinal ≥ 950<br>transverse ≥ 750   |
| Compressive strength              | ASTM C/365-03                            | kPa               | ≥ 700                                    |
| Charpy impact strength            | I.M. n°546860                            | KJ/m <sup>2</sup> | longitudinal ≥ 12.0<br>transverse ≥ 14.0 |
| Chemical resistance               | DIN 68861/1                              | -                 | Classification 1 C                       |
| Abrasion resistance* <sup>1</sup> | Taber abrasor CS 10                      | -                 | min. 400 turns                           |
| Dry heat                          | DIN 68861/7                              | °C                | Classification 7 C<br>(= 100°C)          |
| Wet heat                          | DIN 68861/8                              | °C                | Classification 8 B<br>(= 70°C)           |
| Light fastness                    | DIN EN ISO 4892-2<br>DIN EN ISO 105 B 02 | -                 | ≥ 6                                      |

\*1 determined on flat surfaces

Werte unter Vorbehalt technischer Änderungen.

# STORAGE

Storage of RENOLIT GORCELL panels

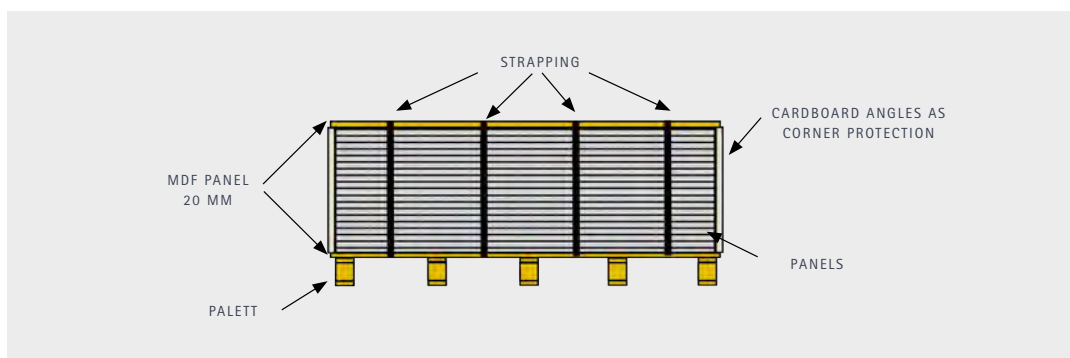




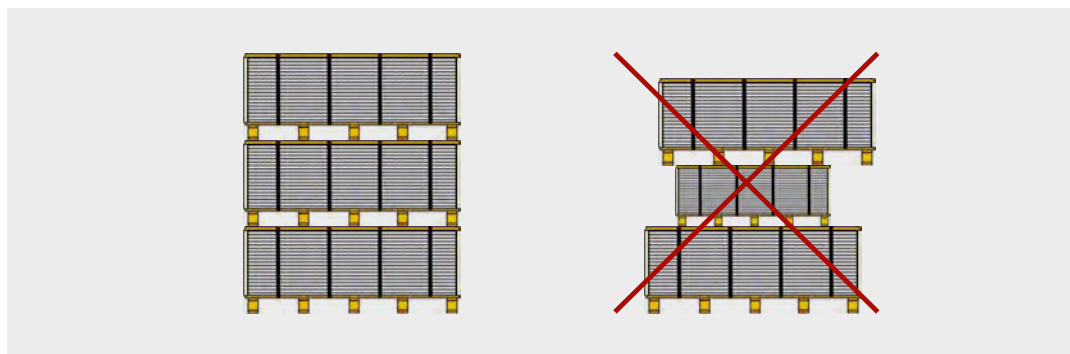
The RENOLIT GORCELL panels are delivered on wooden pallets with flat bases. Depending on the type of panel, a stack is also covered with a chipboard covering panel. The panels are packed in film as standard, and strapped down several times. The stacks of RENOLIT GORCELL should be stored in temperature-controlled rooms and protected from humidity. If several stacks are stored on top of one another, care must be taken to ensure that the load can be transferred vertically through the pallet uprights. Incorrect storage may lead to undesirable warping of the panels.



*Packed RENOLIT GORCELL panel stack*



*Packed stack of panels on pallet*

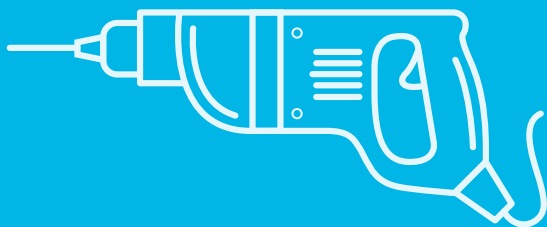
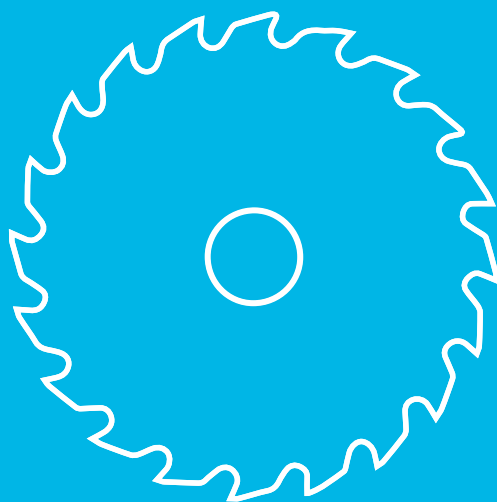
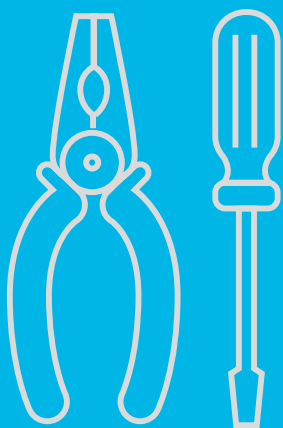


*Storage of RENOLIT GORCELL panels*

Storage is possible in a temperature range from  $-30^{\circ}\text{C}$  to  $+80^{\circ}\text{C}$ . Usually normal ambient temperatures are aimed for.

# FABRICATION

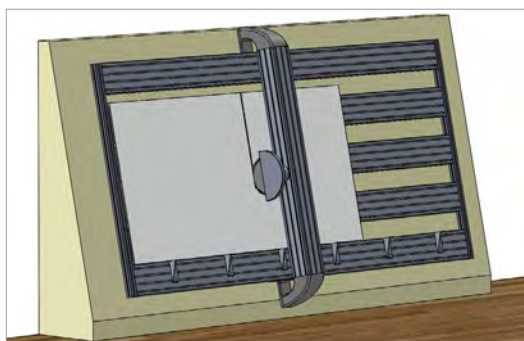
Process and treat RENOLIT GORCELL panels in the best way possible



|                                                                                                 |    |
|-------------------------------------------------------------------------------------------------|----|
| Fabrication .....                                                                               | 16 |
| Cutting .....                                                                                   | 18 |
| Saw blades .....                                                                                | 20 |
| Dust removal and extraction .....                                                               | 21 |
| Polishing RENOLIT GORCELL panels .....                                                          | 22 |
| Laminating film on RENOLIT GORCELL panel .....                                                  | 23 |
| Veneering and bonding HPL on the RENOLIT GORCELL panel .....                                    | 24 |
| Bonding and doubling surfaces of RENOLIT GORCELL panels .....                                   | 25 |
| Large format sandwich panels .....                                                              | 26 |
| Carcass bonding RENOLIT GORCELL panels .....                                                    | 28 |
| Process of bonding RENOLIT GORCELL panels .....                                                 | 29 |
| Edge gluing machine and joint cutter .....                                                      | 30 |
| Application of adhesive with roller unit .....                                                  | 31 |
| Edge banding with reactivation technology .....                                                 | 32 |
| Comparison of edging systems .....                                                              | 33 |
| Edge sealing of inner cut-outs .....                                                            | 34 |
| Alternative edging solutions .....                                                              | 36 |
| Drilling RENOLIT GORCELL panels .....                                                           | 37 |
| Panel joins and fixing points .....                                                             | 38 |
| Procedure for insert bonding, eg Hettinject by Hettich .....                                    | 38 |
| Procedure with EJOT friction welded joint and equipment from WEBER automatic screwdrivers ..... | 39 |
| Cold-melt connection process .....                                                              | 40 |
| Manual production of fixing points in RENOLIT GORCELL honeycomb panels .....                    | 42 |
| Fixing point with KVT pop rivets .....                                                          | 43 |
| Joints with inlays, RENOLIT GORCELL insert strips for glued panels .....                        | 44 |
| Screw joints and folds .....                                                                    | 46 |
| Folding and thermally expanding RENOLIT GORCELL panels .....                                    | 46 |
| Butt welding .....                                                                              | 48 |
| Examples of construction and joints .....                                                       | 49 |
| Corner of carcass with invisible joint .....                                                    | 49 |
| Gluing a corner joint .....                                                                     | 49 |
| Fastening with bonded bolt .....                                                                | 49 |
| Fastening with horizontal bondet bolt .....                                                     | 50 |
| Carcass corner visible .....                                                                    | 50 |
| Corner constructions with elongated fixings .....                                               | 52 |
| Horizontal parts .....                                                                          | 53 |
| Shelves .....                                                                                   | 54 |
| Hinges .....                                                                                    | 55 |
| Back wall connector .....                                                                       | 56 |
| Clothes rack support / wardrobe rail support .....                                              | 56 |
| Drawers .....                                                                                   | 57 |
| Handles .....                                                                                   | 58 |
| Cabinet suspension brackets .....                                                               | 58 |
| Corner construction with partial tongue and groove .....                                        | 60 |
| Production of formed furniture components .....                                                 | 62 |
| Production of pressing moulds .....                                                             | 63 |
| Preparation of top layers .....                                                                 | 64 |
| Pressing of formed elements .....                                                               | 65 |
| Automatic front edge banding machine from Koch Technology .....                                 | 67 |

## CUTTING

RENOLIT GORCELL WOOD-STOCK can be cut on horizontal or vertical circular saws



*Vertical panel saw*

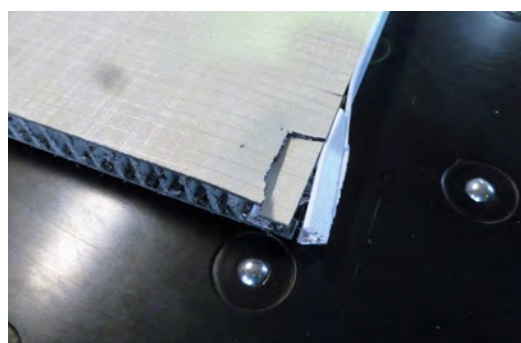


*Vertical panel saw Horizontal panel saw*

### **Reduce collet chuck pressure**

When cutting with an horizontal panel saw, the clamp pressure must be reduced, depending on the type of machine, from the normal 5.0 to 6.0 bar in cutting chipboard to approx. 2.0 to 2.5 bar. Collet chucks exert loads over small areas which can cause damage to the RENOLIT GORCELL panel.

The pressure beam of a panel saw can remain set to the usual 5.0 to 6.0 bar. The large contact area does not damage the RENOLIT GORCELL panel.



*Damaged RENOLIT GORCELL panel*



*Collet chuck pressure to high*

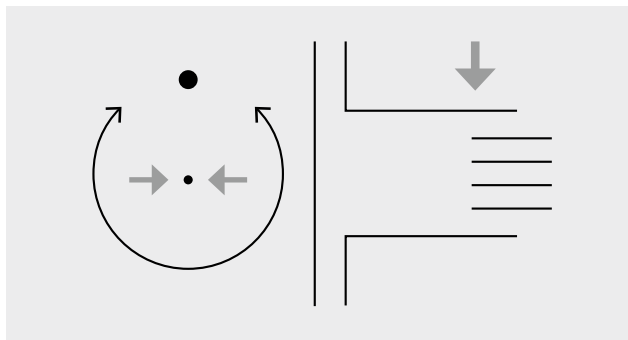


*Collet chuck pressure correct*

Setting collet chuck pressure 2.0 to 2.5 bar



*Manometer adjustment*

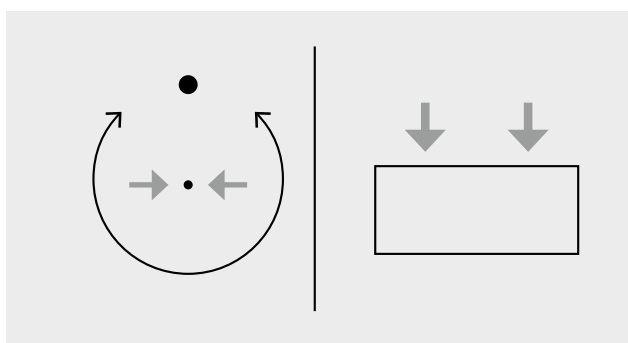


*Collet chuck symbol*

Setting collet chuck pressure 5.0 to 6.0 bar



*Manometer adjustment*



*Pressure beam symbol*

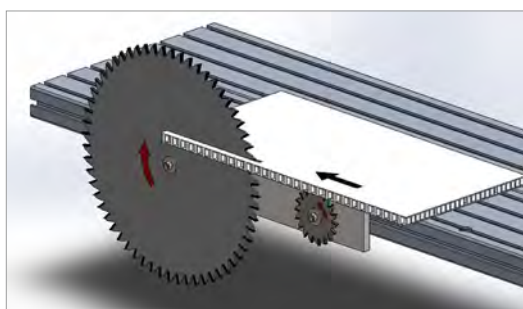
## SAW BLADES

### Suitable saw blades

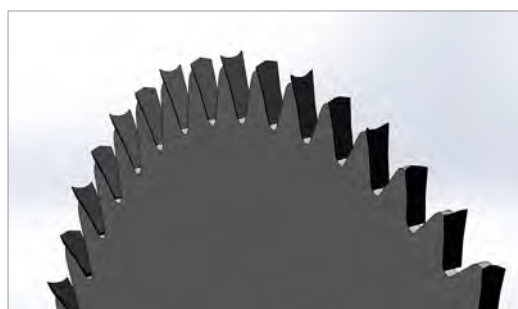
Hard metal and diamond saw blades are suitable for cutting RENOLIT GORCELL. Cutting is best done using a horizontal blade. To achieve a clean cutting edge so that edging can be done directly on the edge gluing machine, the use of a hollow-inverted blade for the main saw and,

if required, a scoring unit is recommended with the RENOLIT GORCELL WOOD-STOCK. The scoring unit works in synchronism and the main saw in counter direction.

*See illustration.*



*Saw with scoring unit in counter direction*



*Saw with scoring unit in a side view*



**Saw blade type main saw:**  
Hollow-inverted blade, 10° positive, Z 60 to Z 72

*Depending on machine and diameter*

**Cutting speed**

30–35 m/sec

**Scoring unit:**

Flat tooth conical, Z 12 to Z 18 depending on machine

Cutting speeds should be reduced if the saw blades heat up significantly.

To avoid friction heat which leads to a poor cutting result and increased clogging of the panel edge, a wider cutting joint is recommended. The sprocket should protrude 0.8 mm above the main blade as far as possible. To avoid softening and clogging the WPC, attention should be paid to ensuring a sufficient forward feed.

A very sharp alternating tooth blade is best suited to cutting RENOLIT GORCELL with CURV (R) top layers.



*Best saw tooth geometry for RENOLIT GORCELL panel cutting*



## DUST REMOVAL AND EXTRACTION

Any WPC chips created normally have a static load, and can negatively influence the cleanness of the work piece and subsequent cutting. To avoid this, the use of ionising and cleaning nozzles is recommended. The ionised air removes the charge from the chips created, so that they can be vacuumed up effectively. The work piece edges produced are significantly cleaner and can be further processed more reliably.

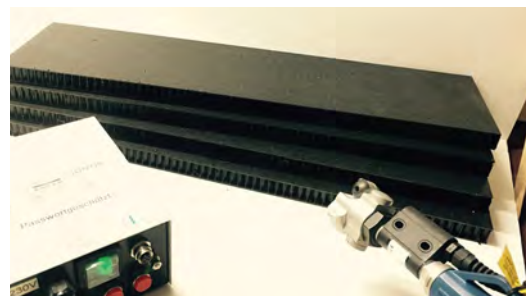


*Edge cleaning with compressed air*

### **Higher air humidity reduces static loading**

The static loading of the RENOLIT GORCELL panels is lower, the higher the air humidity in the processing room. Relative humidity levels of between 50 % and 70 % are beneficial.

Ionisation cleaning heads with rotating air flow are particularly effective. Chips which lodge in the honey-comb are actively released by these.



*Edge cleaning with ionised compressed air*

Beneficial extraction speeds for WPC and PP chips from RENOLIT GORCELL in the area of the extraction points are 20 m/sec to 25 m/sec. They should be adjusted accordingly.

When using ionisation guns in the edge gluing machine, care must be taken to ensure that the loosened chips are extracted at the same time.



*Ionisation with rotating nozzle*

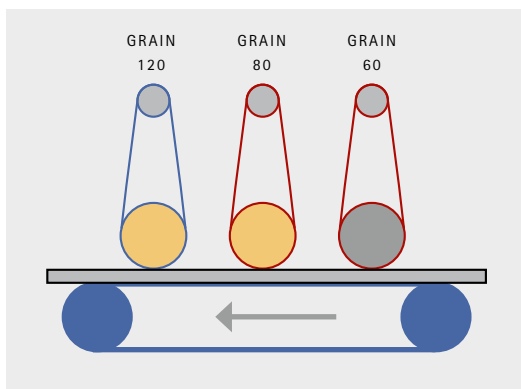


*Static ionisation gun*

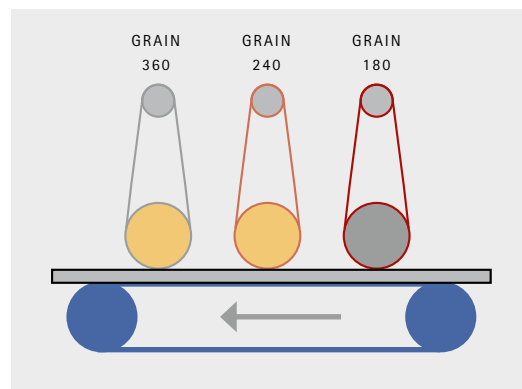
## POLISHING RENOLIT GORCELL PANELS

RENOLIT GORCELL panels can be polished before processing if some edge bonding is taken into account. This may be necessary if a particularly flat surface is required before laminating, eg for a highly polished surface. As the RENOLIT GORCELL top layers are generally made of a thermoplastic PP-wood mix, attention should be paid to heating of the grinding belts. It has proved effective to polish this material with similar machine parameters as for lacquer sanding.

- The grinding belt speed must be adjustable.
- Grind belt speeds of 1 m/sec have a positive impact on the heating of the belt.
- Start with grain 60 or less.
- One polish with grain 120 can result in a surface which can be laminated.
- Low material acceptance per abrasive grain.  
Approx. 0.1 mm total grinding thickness leads to a smooth surface which can be laminated.
- Take care to ensure that dust removal is well ionised.



*Basic polish before laminating, eg with RENOLIT ALKORCELL*



*Fine polish before laminating with high-gloss film*

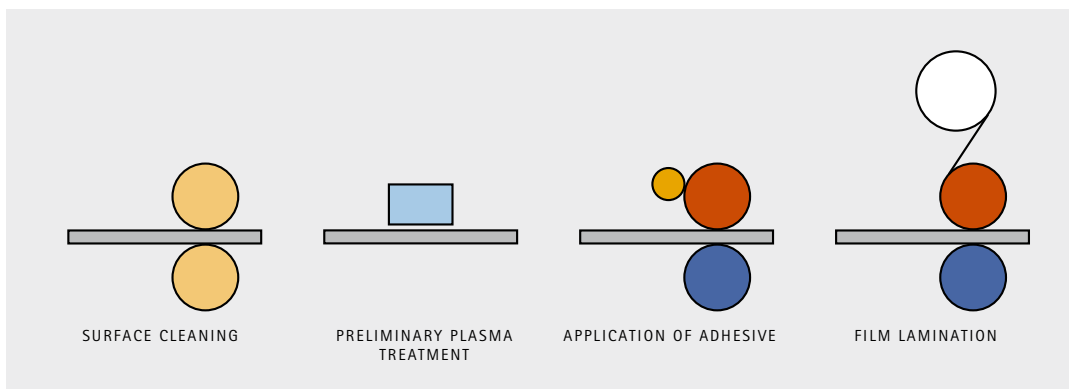
## LAMINATING FILM ON RENOLIT GORCELL PANEL

The RENOLIT GORCELL panels are cleaned post production. After unpacking or polishing the panels, the environmental temperature should be controlled. For foil lamination to take place as easily as possible, the polished surface or surface covered in non-woven material should be cleaned with an anti-static brush unit and ionised air to remove any particles present.

### Preliminary plasma treatment for polished surface

With a polished surface, preliminary plasma treatment must be carried out before bonding. The recommended bonding agent for a smooth polished surface is hot-melt polyurethane with application weight less than 60 g/m<sup>2</sup>. When applied to a non-woven material, application quantities of approx. 80 g/m<sup>2</sup> are usual.

Depending on the type of film, use moderate pressure when working to avoid the honeycomb structure coming through.



*Process of laminating a RENOLIT GORCELL panel with film*

### NOTE

Instead of the above described process, you can also order ready-made laminated panels with decorative surfaces from the RENOLIT ALKORCELL range. Please note our minimum order quantities

## VENEERING AND BONDING HPL ON THE RENOLIT GORCELL PANEL

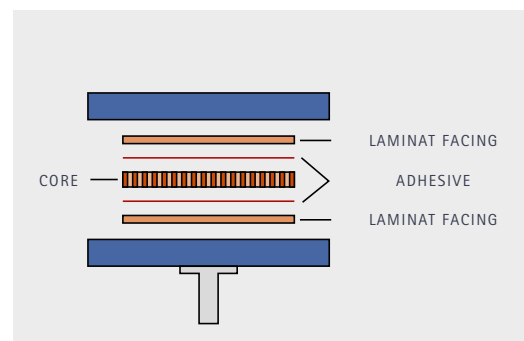
RENOLIT GORCELL panels can be hot and cold veneered, and covered with HPL. Attention must be paid to the heat expansion behaviour of the materials when choosing temperature. During veneering, temperatures between + 20 °C and + 40 °C should be used to avoid stress and cracks in the veneer.

### Apply dispersion glue very sparingly

When using dispersion glue, take care to ensure that the RENOLIT GORCELL panel shows practically no signs of water absorption. A dispersion glue must therefore be applied very sparingly, as all moisture has to escape through the veneer. The compression time must also be adjusted accordingly. In contrast to conventional MDF or chipboard, a double pressing time should be allowed. The binding time for the adhesive must also be increased. Dispersion glues should not be used for HPL, as the trapped water has no route out of the assembly.

If 1K-PUR adhesives are used, pay attention to any slight fogging of the bonded joints with water, as veneer and HPL are normally very dry and do not add moisture. It is necessary to observe the pot life of 2K-PUR adhesives, to achieve a good adhesion process.

The compressive pressure with flat pressure 0.1 N/mm<sup>2</sup> should be up to 0.5 N/mm<sup>2</sup>. With a vacuum membrane press, a rigid insert should also be fitted on the membrane side. Otherwise there is a danger that the corners will be squashed by the membrane.



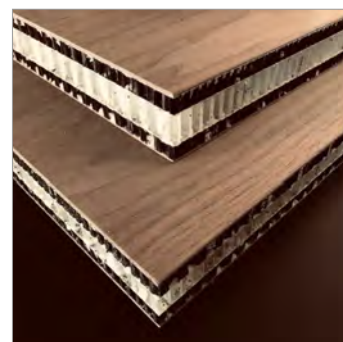
*Veneering a honeycomb panel*



*Veneered RENOLIT GORCELL panel*



*Sandwich panels for door leaves*



*Sandwich constructions with veneer*

## BONDING AND DOUBLING SURFACES OF RENOLIT GORCELL PANELS

RENOLIT GORCELL panels are available in 5 mm, 10 mm, 15 mm and 20 mm depth. The panels can be bonded together to form very stable and thick panel assemblies enabling high load-bearing capacity. The surface of the RENOLIT GORCELL panels can be bonded with all standard adhesives such as PVAC, EVA, 1K-PUR, 2K-PUR and hotmelt PUR.

### Water-free adhesive systems beneficial

As the panels are gas-impermeable and contain little moisture, water-free adhesive systems are preferred, in particular low-foaming options if 1K-PUR is used. It is essential to ensure that water spray is controlled, so that a setting reaction can occur. With a hot-melt PUR, quick-setting systems should be preferred over slow-setting systems due to their affinity with water. The best suited to doubling are the 2K-PUR systems, as they do not tend to foam nor are they reliant on environmental or material humidity.

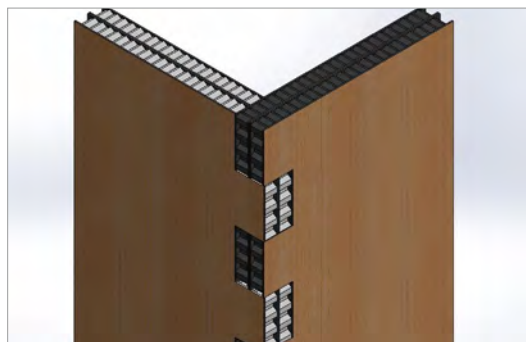
In practice, such doubling-up has a particular role to play in the cores of doors for wet rooms and outdoor furniture. The benefits of stability, light-weight construction and water resistance can be fully utilised for this purpose.



*Tripled RENOLIT GORCELL panel with RENOLIT OCEANDRIVE top surface*



*RENOLIT GORCELL panel milled T-joint*



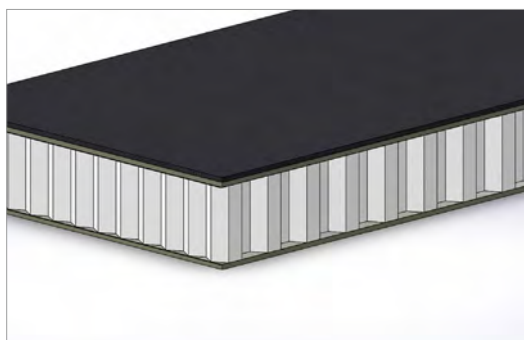
*RENOLIT GORCELL panel interlocking corner joint*

## LARGE FORMAT SANDWICH PANELS

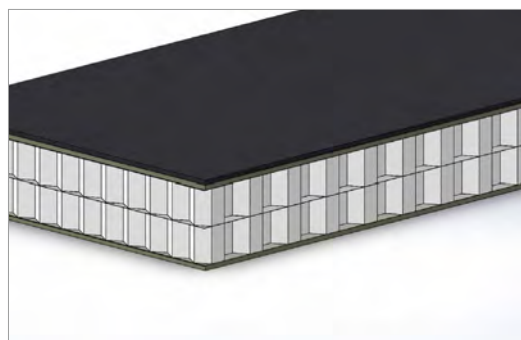
In motor home, camper van and yacht design there is a requirement for co-ordinated floor and ceiling panels in a lightweight, yet waterproof composition. The specific combination of **RENOLIT WOOD-STOCK** or **RENOLIT TECNOGOR** top layers with a **RENOLIT GORCELL** core achieves significant weight reduction. Depending on the construction there is a saving in weight of around 50% compared to lightweight plywood. Industry standard 1K PUR, 2K PUR or PUR hotmelt adhesive systems are suitable for bonding.

**RENOLIT GORCELL** cores can be interlocked to form large, yet extremely lightweight panel constructions with inconspicuous panel edges that nevertheless provide the best possible performance in terms of even load distribution.

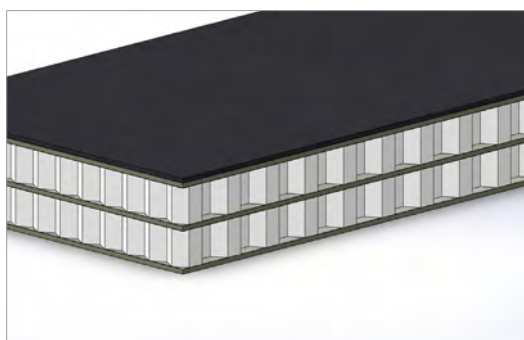
**RENOLIT** also offers a 0.25 mm gauge **RENOLIT PET** flooring layer in a 2,000 mm product width. The use of the thin **RENOLIT PET** flooring layer saves additional weight compared to the usual 0.8 mm gauge PVC covering.



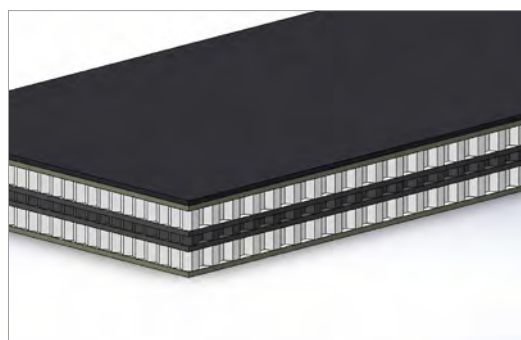
**RENOLIT TECNOGOR** with 20 mm **RENOLIT GORCELL**; core laminated with an acoustic fleece.



**RENOLIT TECNOGOR** with 2x 10 mm **RENOLIT GORCELL**; the core is offset glued and laminated with an acoustic fleece



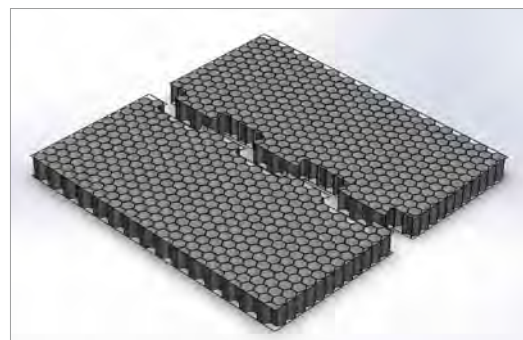
**RENOLIT TECNOGOR** with 2x 20 mm **RENOLIT GORCELL**; core and **RENOLIT TECNOGOR** inner reinforcement layer laminated with an acoustic fleece



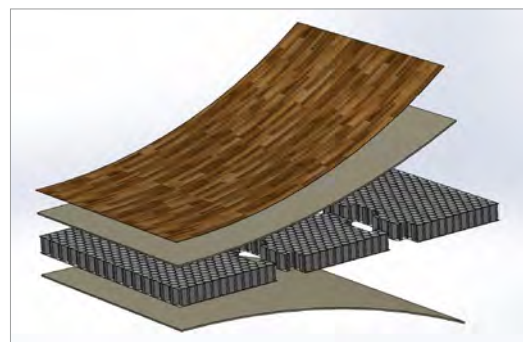
**RENOLIT TECNOGOR** in combination with **RENOLIT GORCELL**; core and **RENOLIT WOOD-STOCK FLEECE** panels laminated with an acoustic fleece



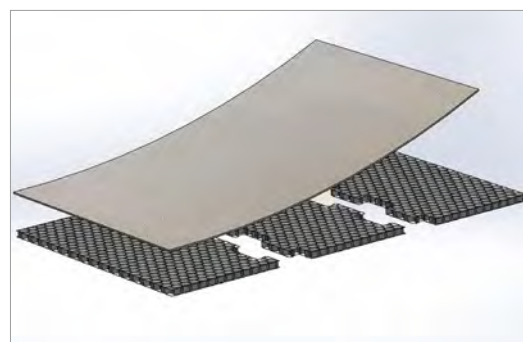
Punching or stamping technology, alternatively water jet or laser technology may be used to produce invisible edge joining in the largest possible sizes of panel combination. Creating joints is dependent on the panel thickness, surface layer and panel combination.



*Lasered or punched puzzle connection in  
RENOLIT GORCELL PP-FLEECE*



*Flooring panel made of RENOLIT TECNOGOR / RENOLIT  
GORCELL PP-FLEECE and RENOLIT PET flooring layer*



*Ceiling panel made of RENOLIT CORK-STOCK with uni-colored,  
embossed RENOLIT ALKORCELL and 5 mm RENOLIT GORCELL  
PP-FLEECE*

## CARCASS BONDING RENOLIT GORCELL PANELS

RENOLIT GORCELL panels consist of a PP-wood mix or PP in the honeycomb core, and must be pre-treated accordingly before processing to ensure good bonding to suitable adhesives. Experience has shown that using primer and plasma pre-treatment works well. For pre-treatment, manual as well as fully industrialised processing at various speeds is possible.

Normally the adhesion points are treated by priming or pre-treating with a cleaning agent suitable for the adhesive system. This removes dirt, grease and other substances which could negatively affect bonding.

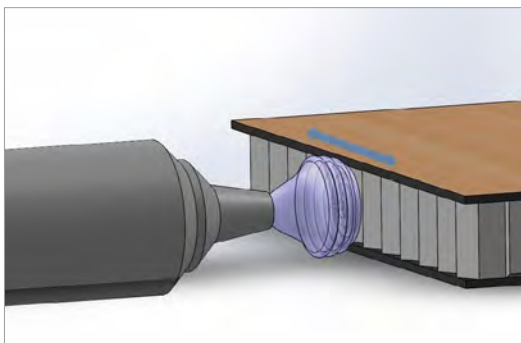
With moisture-curing adhesives, waiting a short time after application of the adhesive is recommended, so that the adhesive can absorb the necessary humidity from the air. Examples of suitable adhesive systems are shown in the table below; their suitability for the respective application should still be checked. The adhesive supplier's recommendations should be followed in all cases.

### ADHESIVE SYSTEMS

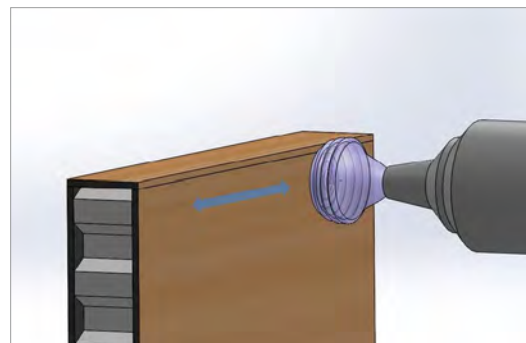
| Manufacturer | Cleaning agent | Primer           | Adhesive      | Type of adhesive |
|--------------|----------------|------------------|---------------|------------------|
| SABA         | Sabaclean 48   | Saba Primer 4518 | Sabatack 790  | 1K MS Polymer    |
| Klebchemie   | Reiniger 820   | Plasma           | 601.1         | 1K MS Polymer    |
| SABA         | Sabaclean 48   | Saba Primer 4518 | Sabatack Fast | 2K MS Polymer    |
| Klebchemie   | Reiniger 820   | Plasma           | 602.1         | 2K MS Polymer    |
| 3M           | Reiniger 151   | Without          | DP 8005       | 2K Acrylat       |

The adhesives shown are only examples of possible adhesive systems. Other adhesive systems can be obtained from reputable adhesive manufacturers (see reference and list of partners appended).

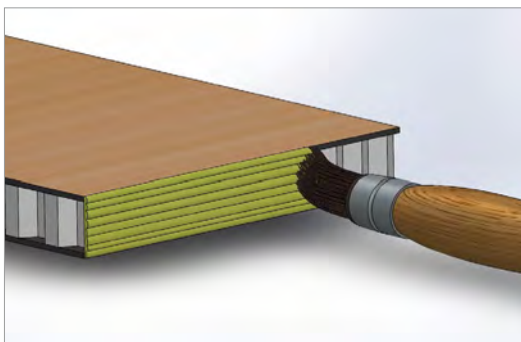
# PROCESS OF BONDING RENOLIT GORCELL PANELS



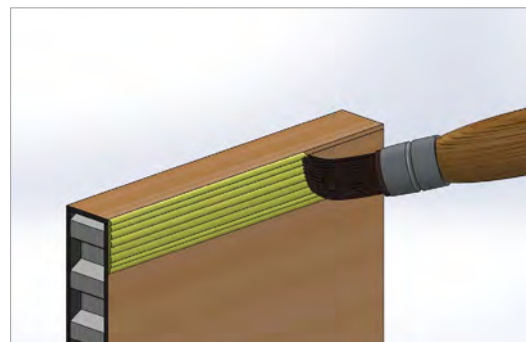
*Plasma pre-treatment RENOLIT GORCELL honeycomb*



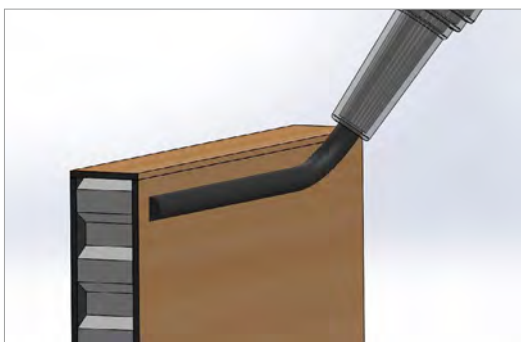
*Plasma pre-treatment surface*



*Primer pre-treatment RENOLIT GORCELL honeycomb*



*Primer pre-treatment decorative surface*



*Application of adhesive to RENOLIT GORCELL panel side*



*Bonded RENOLIT GORCELL panels*

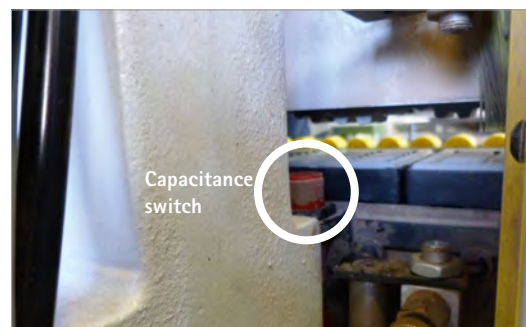
## EDGE GLUING MACHINE AND JOINT CUTTER

### EDGE GLUING MACHINE

The high-quality application of edging materials to RENOLIT GORCELL panels can be carried out with standard machinery and edge strip materials. Some characteristics of the panels still have to be taken into account to avoid errors.

#### Work-piece recognition in the machine intake

Because of the low density of a RENOLIT GORCELL panel, capacitance switches on the machine intake cannot reliably recognise the panel when there is a normal interval (approx. 5 mm), as is usual for wooden materials. A smaller gap of around 1.0mm to 1.5 mm should be set. In some model ranges, panel recognition can be guaranteed by changing the sensitivity of the switch.



*Position of work-piece sensor on an edge gluing machine*

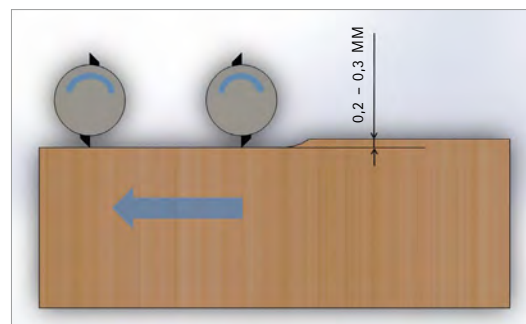
### JOINT CUTTER

On joint cutters, using diamond cutters with double-sided pulling cut is beneficial. Fitting ionisation nozzles in the chip covering reduces chip adhesion.

The most beneficial joint thicknesses are in the range 0.2 mm to 0.3 mm. Greater joint thicknesses lead to twisting in the central honeycomb layers. This can result in increased reset forces when the adhesive is applied.



*Joint cutters on an edge gluing machine*



*Chip removal on joint cutter*

## APPLICATION OF ADHESIVE WITH ROLLER UNIT

Care must be taken to ensure that adhesive is applied evenly to the edges and central layers of the RENOLIT GORCELL panels. To achieve particularly high edge peeling forces, application of the adhesive in the counter direction is recommended when applied by roller. This ensures that a lot of adhesive is applied to the central layer, which increases edge strength.

For roller application, non-reactive, easily refillable polyolefin edge adhesives from various manufacturers are suitable.

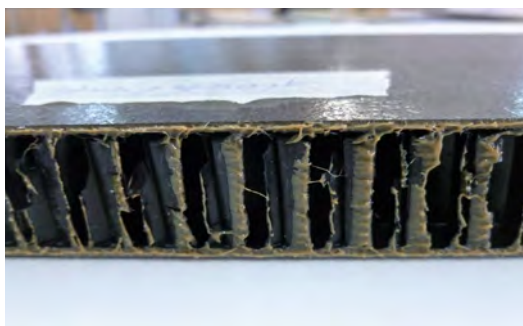


*Application of adhesive with glue roller*

### **Durable edge bonding with polyurethane adhesives**

Very durable and waterproof edge bonding with roller application can also be produced using polyurethane edge adhesives. This is bonded to the RENOLIT GORCELL

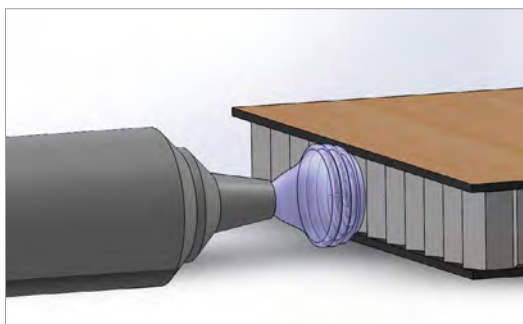
panel edge with plasma pre-treatment before gluing. Special flat plasma nozzles are available from various plasma equipment manufacturers for this purpose.



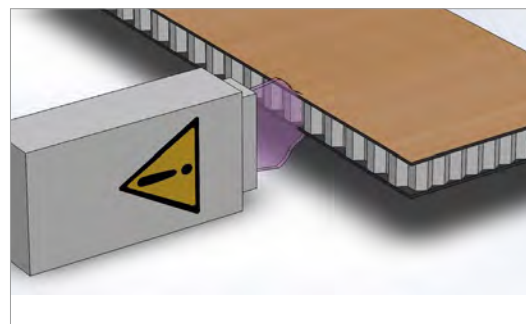
*Synchronised application of adhesive*



*Application of adhesive in counter direction*



*Pre-treatment with round plasma nozzle*

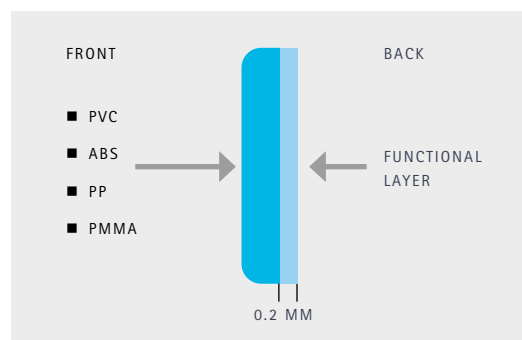


*Pre-treatment with flat plasma nozzle*

## EDGE BANDING WITH REACTIVATION TECHNOLOGY

Another highly efficient possibility for edge banding is offered by the use of laser edging. For this type of edge, a coating with a low melting point first applied to the edge material.

The coating can be activated in a correspondingly equipped edge gluing machine, either with a laser unit, plasma head, hot compressed air unit or throughput hot air unit in such a way that a very thin, but very strong bonded joint is created.



Edge material with reactivatable functional layer



### Laser technology

With laser processing, a laser activates the functional layer.



### Hot-air Technology

With hot-air technology, hot compressed air allows the functional layer to melt.



### NIR Technology

With near-infra-red technology, heat energy can be transferred quickly and accurately.



### Plasma technology

If a customer uses the plasma process, air plasma from a nozzle melts the functional layer.

*Technologies for processing pre-coated edge materials (photo source: Rehau)*

All these technologies are available on the market in various price ranges and with various forward feed rates from different manufacturers.



Laser edge bonding (Source: Rehau Laseredge)



Fracture pattern edge bonding



## COMPARISON OF EDGING SYSTEMS

RENOLIT's own test series on edging systems produced the following results under near-production conditions:

### EDGE BANDING TECHNOLOGY AND ADHESIVES

| Adhesive or technology | Strength |
|------------------------|----------|
| Hot-air edging         | + +      |
| Laser edging           | + +      |
| PO adhesive            | + +      |
| PUR plasma-treated     | + +      |
| PUR hand-fired         | +        |
| EVA adhesive           | - -      |
| POR adhesive           | - -      |
| PUR edge untreated     | - -      |

Until further notice, the following are recommended for edging RENOLIT GORCELL:

- 1) Reactivation using laser technology, hot-air technology, infrared technology and plasma technology
- 2) Polyurethane melting adhesives with plasma pre-treatment of the RENOLIT GORCELL panel edge
- 3) Polyolefin melting adhesives without pre-treatment of the RENOLIT GORCELL panel edge

In choosing the edge gluing procedure, subsequent use and capacity loading are basically the important factors. Strength and temperature-resistance in subsequent use must be taken into account here by the manufacturer.

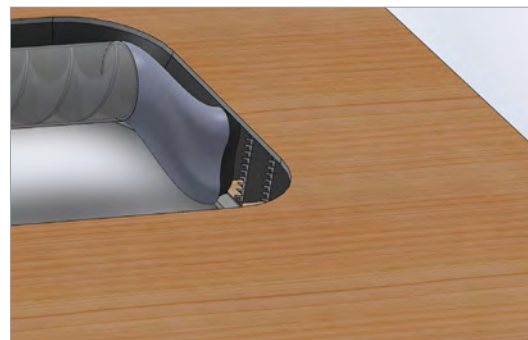
## EDGE SEALING OF INNER CUT-OUTS

Edge sealing of small interior cut-outs in lightweight furniture design presents a particular challenge. With large cut-outs, adhesive and hot air technology can be used to produce attractive, durable and freeform edging systems. There is less scope for smaller cut-outs, however the use of cover rosettes and edge extrusion fillings prove their worth here, which is particularly beneficial for recessed grips.

With edge extrusion, the first step is to reduce the middle layer to the top layer by a fixed amount of approx. 2.0 mm to 3.0 mm. Then fill the resulting groove with a PP compound using a small handheld or table-based extruder. After this has cooled down, mill and plaster to the desired shape.



*Milling a groove into the core*



*Backfilling of the groove with PP*



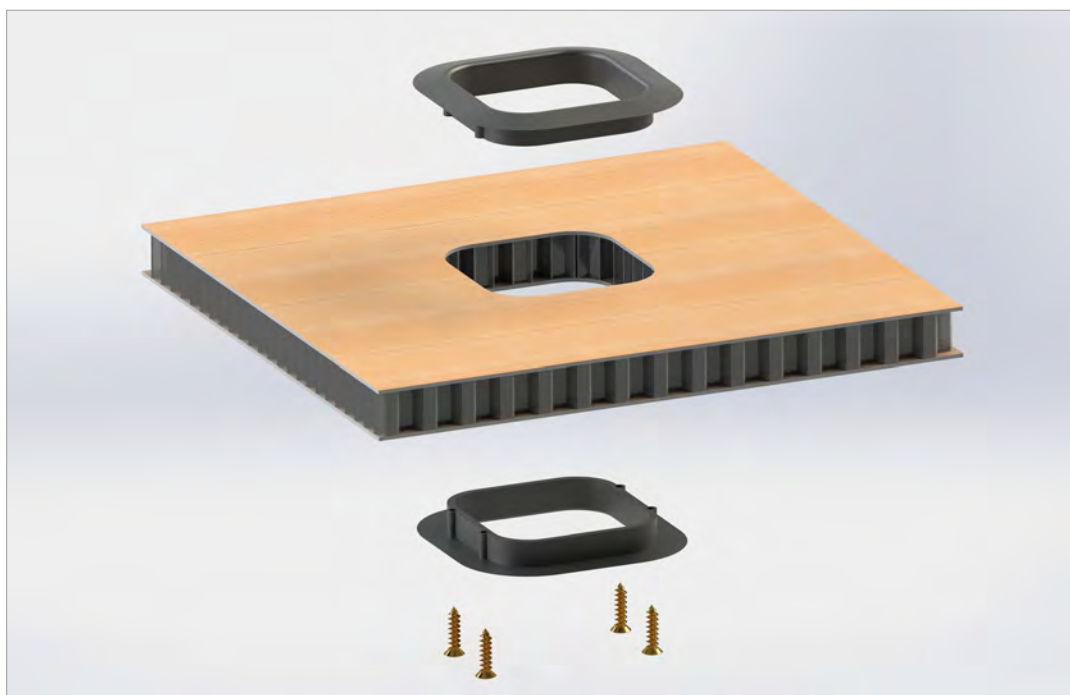
*PP-filled extruded edge*



*Shaping of the resulting edge contour*

The easiest way to cover inner edges of **RENOLIT GORCELL** panels is with cover rosettes, which are available in a two-part front and back format. These rosettes are normally screwed in from back to front and clamp the panel in a form-fitting way.

Please take in to account the rosette thickness (1.5 mm to 2.0 mm) in construction design.



## ALTERNATIVE EDGING SOLUTIONS

As an alternative to thick edges, a supporting edge may be bonded to the honeycomb panel before a decorative trim is fitted. This can be done manually or edge gluing machines with a corresponding step cutter are suitable for this purpose. Polyolefins are normally used as adhesives in this case.

In partition wall construction, PP hollow profiles are more frequently used as the edge trim. These are bonded using a combination of primer and flexible MS-polymer adhesive.

For craftsmen who want to work with standard techniques such as dowels, slats or screws, bonding bars is a good alternative. The edging materials available include, for instance, solid plastic materials or lightweight foams with density and strength characteristics similar to plywood.



*Edge trim with supporting edge*



*Edge trim with hollow section*



*Edge trim with rigid foam material*

## DRILLING RENOLIT GORCELL PANELS

As RENOLIT GORCELL panels have top layers made of WPC, the panels can be drilled just like a wooden material. In choosing the drill, ensure a flat front clearance. If the drill has a centering tip, this should be as small as possible ( $< 0.3 \text{ mm}$ ) to avoid damage to the opposite top layer, which is generally an exposed side. The feed rate should not be slow, to counteract melting of the surfaces by friction heat produced.

Ionised anti-static air is beneficial for blowing out the blind holes and extracting the chips created.



*Cutter*



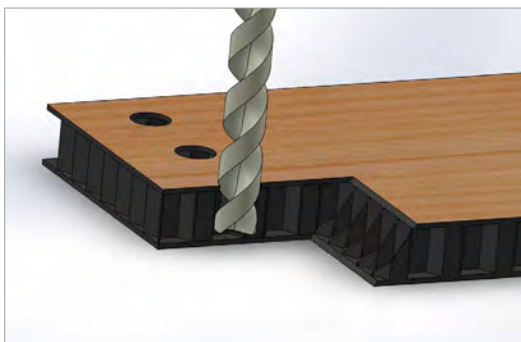
*Drill with flat cutting clearance*

## PANEL JOINTS AND FIXING POINTS

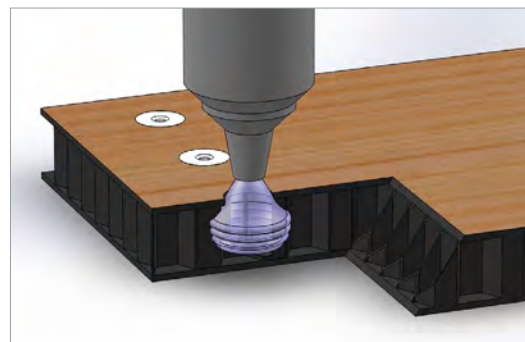
### Procedure for insert bonding, e.g. Hetting by Hettich

To create panel joints or fixing points, experience has shown that inserts or glued dowels work well. A dowel used in the furniture industry for years is Hetting, made by Hettich. The dowel is normally anchored in the honeycomb structure with a high-melt adhesive such

as polyamide or two-component adhesives such as 2K polyurethane or 2K acrylate. If 2K polyurethane is used, the drill hole should be pre-treated with a plasma ray for greater adhesion.



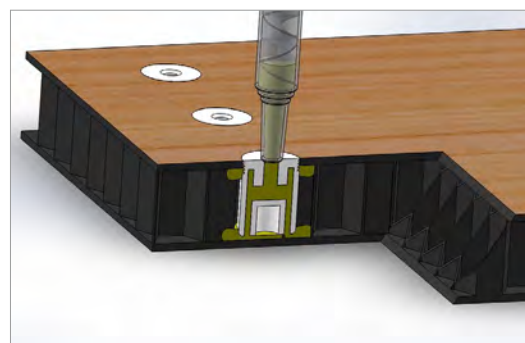
*Drilling blind holes*



*Plasma treatment of drill hole*



*Manual or automatic setting*



*Filling the cavity with the Hetting dowel*



## Procedure with EJOT friction welded joint and equipment from WEBER automatic screwdrivers

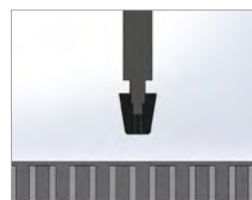
One of the most modern processing technologies for producing joints and fixing points in the thermoplastic RENOLIT GORCELL honeycomb panel is the friction welding technology from EJOT in conjunction with automatic screwdriving equipment from WEBER.

Using this technology (which was developed for production in the automotive industry), a large insert is rubbed into the panel – this is made of material which works in harmony with the RENOLIT GORCELL PP panel. The defined friction heat created enables the inner top layer and the honeycomb material to melt in a controlled and recorded process, producing a correct adhesive bond. To obtain the necessary strength values, various diameters and lengths are available.

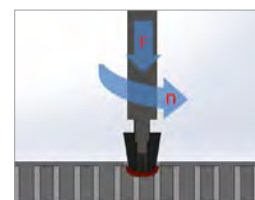
### Friction welding assembly from WEBER screw technology



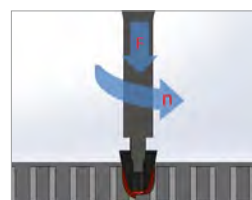
TSSD Friction welding equipment



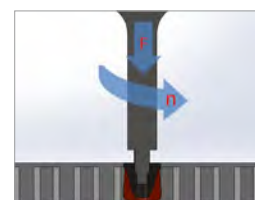
Positioning the insert



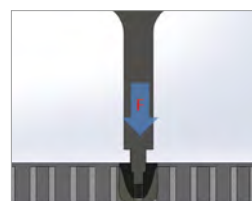
Melting the honeycomb panel



Penetrating the honeycomb panel



Completing the insert



Securing with contact pressure



Removing the tool

## Corner connections and fixing points with WÜRTH COLDMELT® technology

Würth COLDMELT® technology, in combination with Würth handheld devices or other fully or partially automatic machinery, is an established method on the market for corner connections and fixing points on RENOLIT GORCELL panels. The COLDMELT® technology is based on development by WoodWelding®.

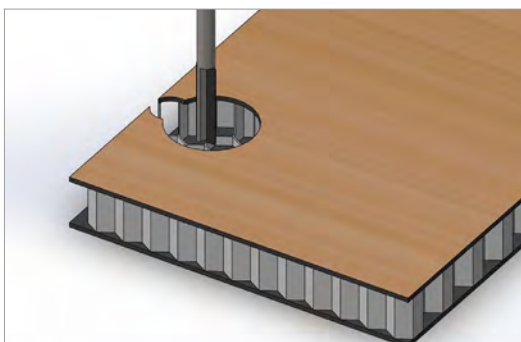
This technology uses ultrasound technology to fuse the plastic connecting element with the plastic of the RENOLIT GORCELL panel after a drilling and insertion process. The precise fitting connection is mounted using an appropriate screw during assembly. Components for both fixed screw connections and eccentric connections for detachable applications are available.

Würth handheld devices are available, as are a variety of other machines with which can insert the connectors either fully or semi-automatically.

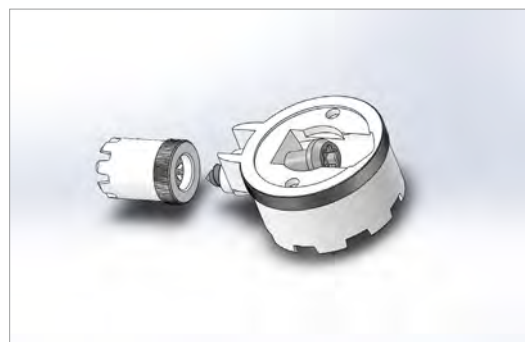


*Würth cold-melt handheld device*

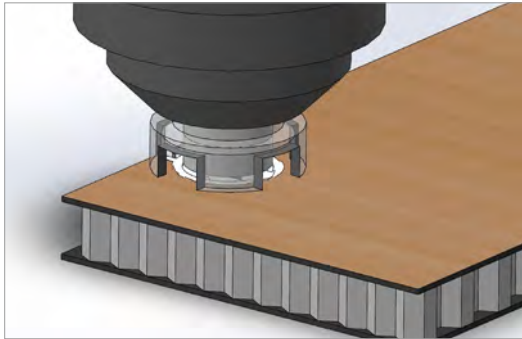
### Cold-melt connection process:



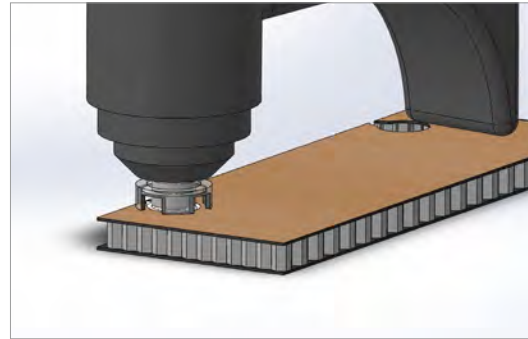
*Routing or drilling of the dowel hole*



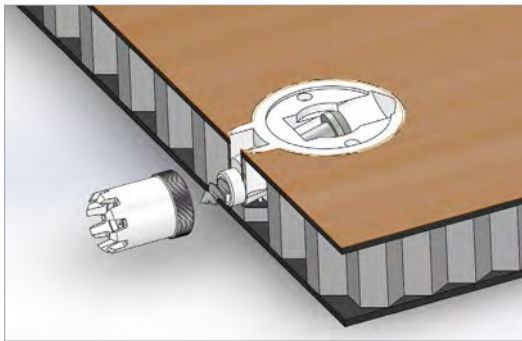
*Cold-melt screw connection*



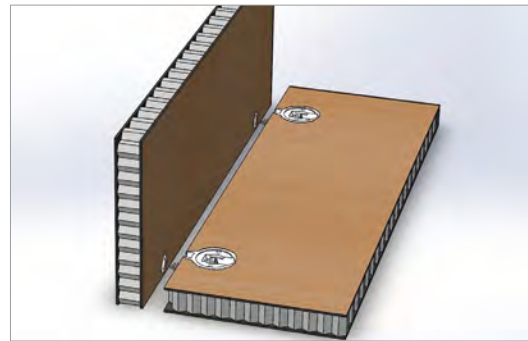
*Positioning of the Würth COLDMELT® device on RENOLIT GORCELL*



*Ultrasonic melting of connection*



*Exploded view of connection*



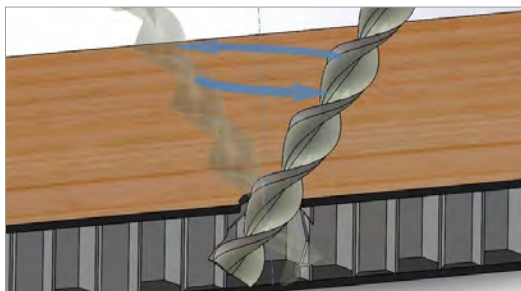
*Corner connection prior to assembly*

## PANEL JOINTS AND FIXING POINTS

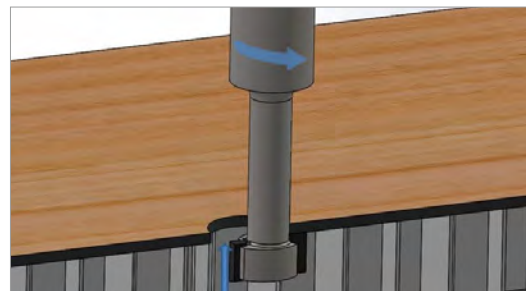
### Manual production of fixing points in RENOLIT GORCELL honeycomb panels

As an alternative to creating fastenings and fixing points fully automatically, manual fixing techniques can be appropriate, particularly for small series and the production of prototypes. For this purpose, a conical hole is made in the RENOLIT GORCELL

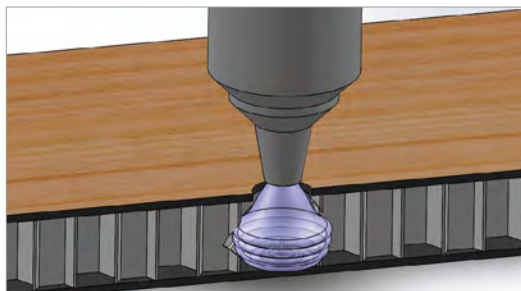
honeycomb panels with a cutter, or an undercut stepped hole with a stepped cutter. The hole is then filled with a very strong thermoplastic filler material or a 2K adhesive/2K setting compound.



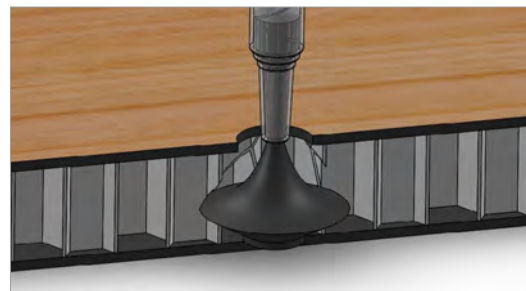
*Option 1: Cutting out a tapered cavity*



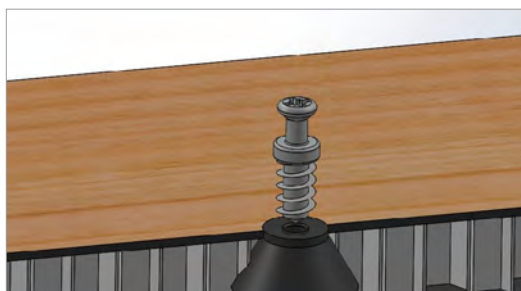
*Option 2: Cutting out a stepped cavity*



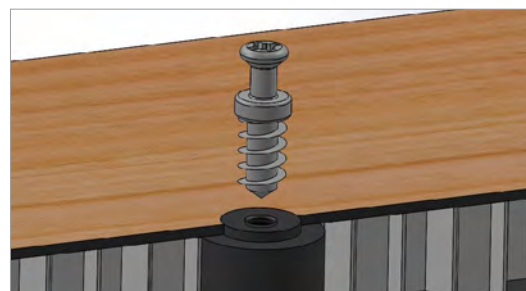
*Option 3: Plasma pre-treatment*



*Option 4: Filling a tapered cavity*



*Assembly of the fixing element*



*Assembly of the fixing element*



Back view of a screw hole filled manually



Gun for 2K adhesive cartridges

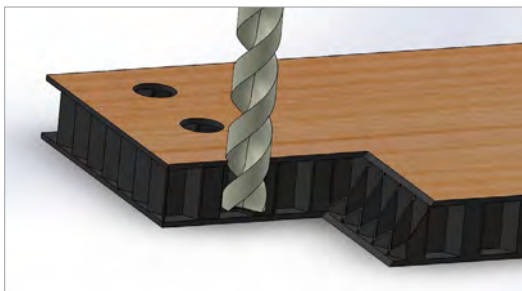


Melted adhesive guns from various manufacturers and 2K guns are available as tools

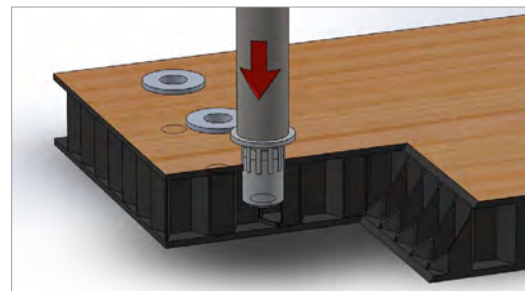


Melted adhesive gun for adhesive sticks

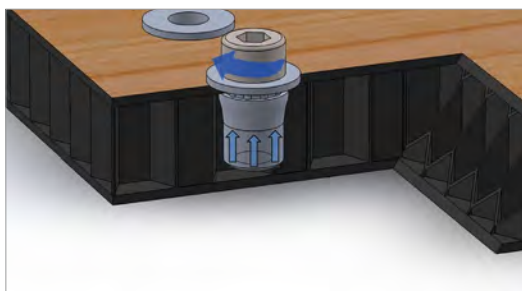
## Fixing point with pop rivets



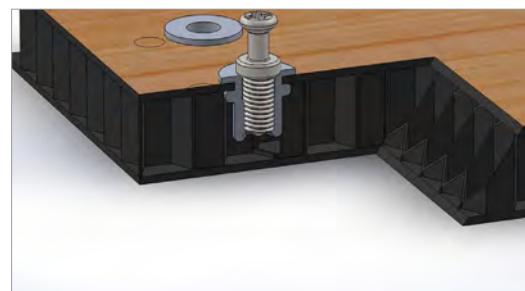
Drilling blind holes



Manual or automatic setting



Expanding the rivet



Screwing fixings together



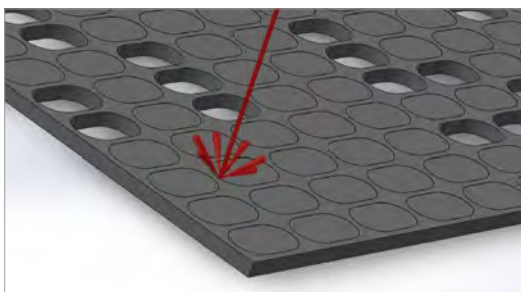
## Joins with inlays, RENOLIT GORCELL insert strips for glued panels.

Glued panels are usually used in cupboard flaps, formed parts and front panels.

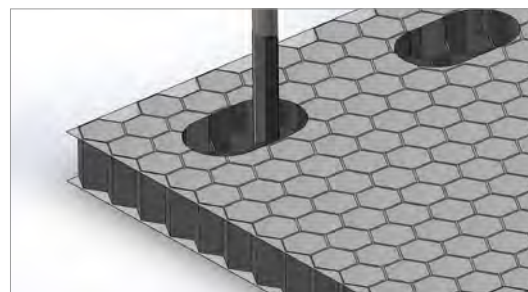
For such applications RENOLIT CORK-STOCK top layers coated with RENOLIT ALKORCELL are glued to one or more layers of RENOLIT GORCELL cores. For extremely rigid screw mounting, insert elements and insert strips (e.g. made of a solid plastic) can be milled into the

RENOLIT GORCELL core before gluing in vacuum presses or other compression molding machines.

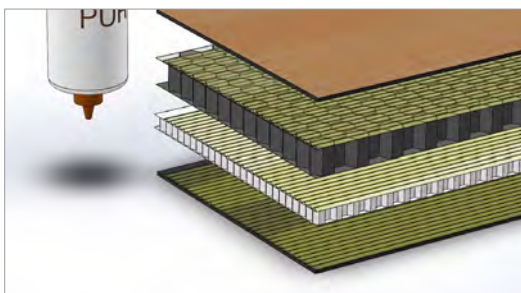
An advantage of these insert elements is that they can be laser cut from sheet material. Screw-in strips can be cut down using a circular saw.



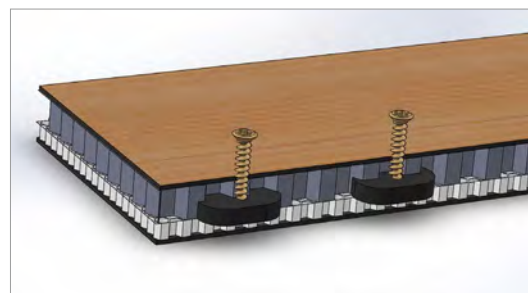
*Laser cutting a screw inlay*



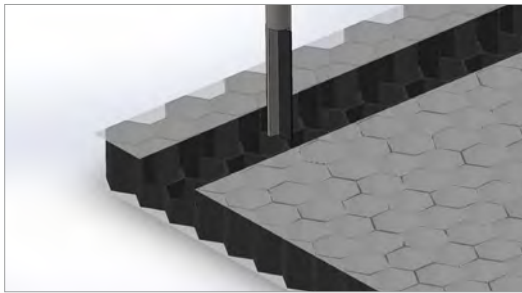
*Shaping of a screw inlay in RENOLIT GORCELL*



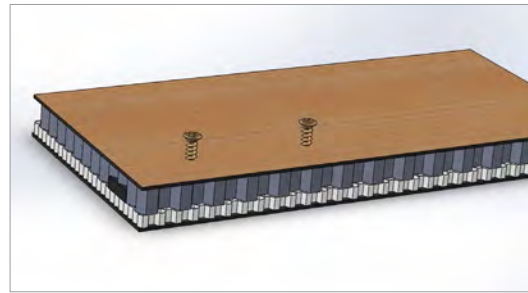
*Lamination of RENOLIT GORCELL layers*



*Laminated RENOLIT GORCELL Panel with screw mounting*



*Groove routing in RENOLIT GORCELL core*



*Laminated RENOLIT GORCELL panel with insert strips*



## SCREW JOINTS

### FOLDING AND THERMALLY EXPANDING RENOLIT GORCELL PANELS

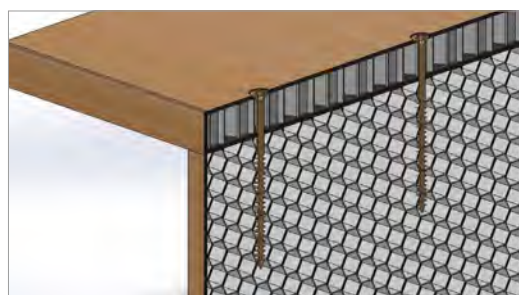
## SCREW JOINTS

If there are no aesthetic objections, in many cases RENOLIT GORCELL panels can be screwed together directly or after preliminary drilling. The following rule

applies: the longer the thread of the screws, the greater the forces which can be transmitted by action on the honeycomb structure.



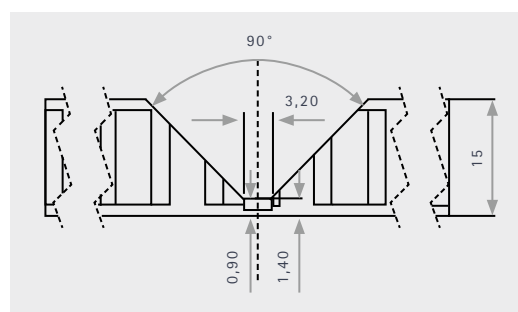
*Screwed corner of carcass*



*Screwed corner of carcass (section)*

### FOLDING AND THERMALLY EXPANDING RENOLIT GORCELL PANELS

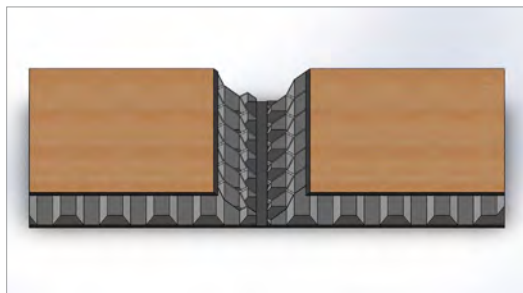
RENOLIT GORCELL panels have a thermoplastic top layer in most designs. This top layer, mostly made of a Wood Polymer Composite (WPC), is suitable for shaping a folded corder, e.g. for carcasses. The panels are taken out for this purpose, e.g. at a 90° angle at the back. In the base of this recess, a notch is then made with a flattooth saw blade. Between 0.8 and 1.0 mm of the top material then remains as reinforcement.



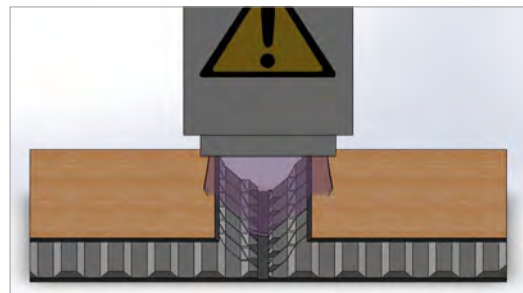
*Notching for folding RENOLIT GORCELL*

The folded connection can be very well bonded with standard silane-terminated adhesives (STP adhesives) in combination with pre-treatment of the surfaces to be

bonded. For the pre-treatment, either primers which suit the adhesive or corona pre-treatment are suitable.

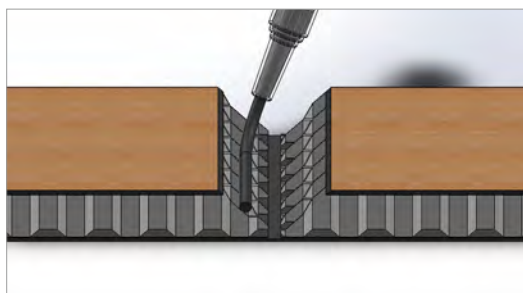


*Notched RENOLIT GORCELL panel*

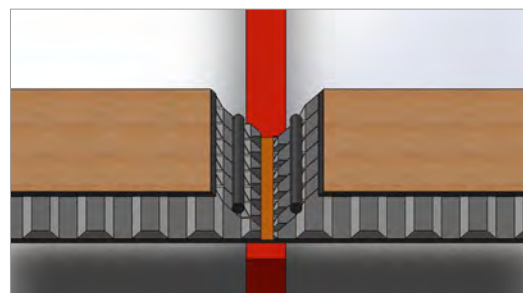


*Plasma pre-treatment*

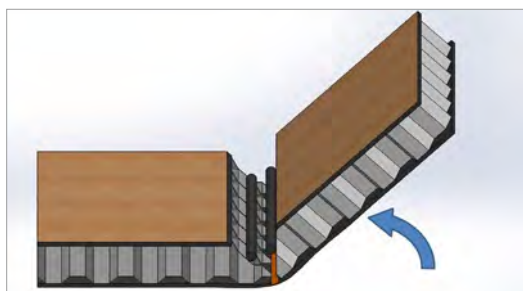
To carry out folding without damaging the top layer, the folding area is heated to approx. 80 °C bis 90 °C, and the fold made carefully.



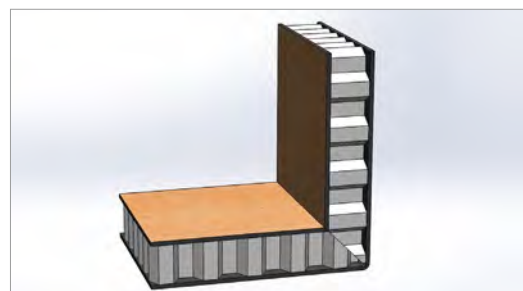
*Application of adhesive*



*Local heating*



*Folding procedure*



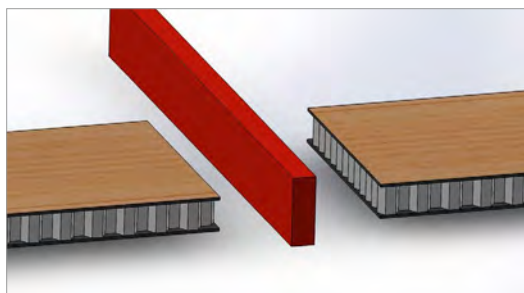
*Folded corner*

When folding is carried out in this way, corner radii of approx.  $r = 2 \text{ mm}$  can be achieved.

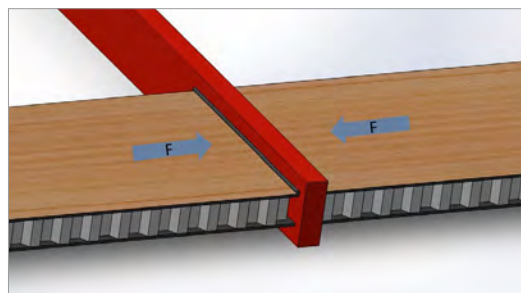
## BUTT WELDING

The dimensions of RENOLIT GORCELL panels can be extended by butt welding. Using this technique, the blunt edges are pressed against a hot welding plate. The thermoplastic material of the RENOLIT GORCELL panel melts and as a next step, after removal of the

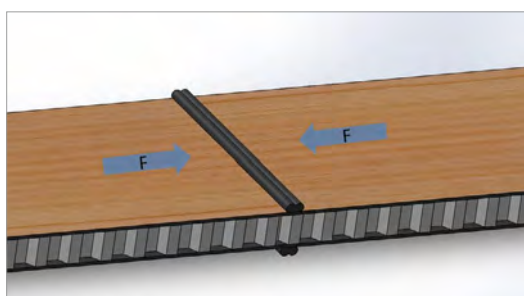
welding plate, the panels and material are pressed together. The melted areas on both panels join together and then cool down. A knife appropriate for the material then removes the welding burr created.



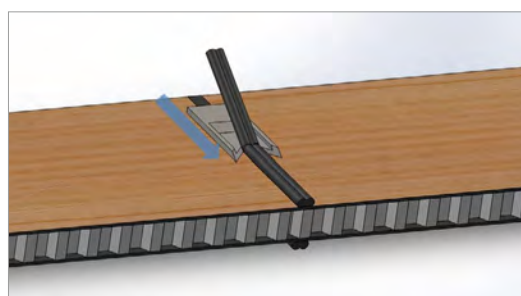
*Positioning of RENOLIT GORCELL panels*



*Melting the RENOLIT GORCELL panels*



*Joining the panels*



*Cutting off the welding burr*



*Wegener international GmbH butt welding machine*

## EXAMPLES OF CONSTRUCTION AND JOINTS

### Corner of carcass with invisible joint

Several systems are available for producing an invisible carcass corner joint for the RENOLIT GORCELL panel.

### Gluing a corner joint

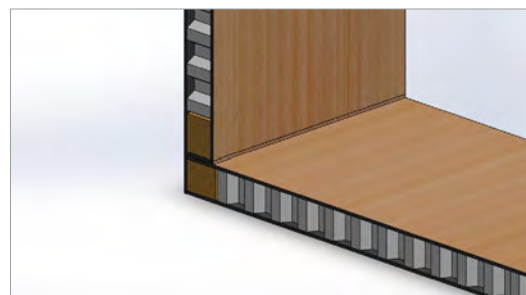
The process is similar to making a corner with adhesives. There is a list of possible adhesives under "Bonding RENOLIT GORCELL carcasses".



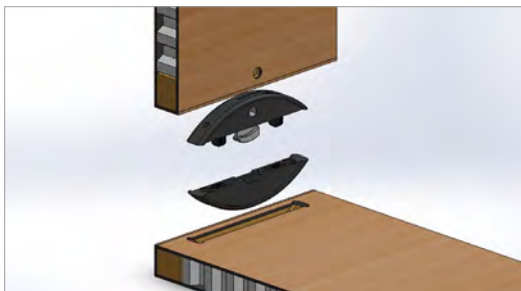
RENOLIT GORCELL carcass corner bonded abutted

### Fastening with bonded bolt

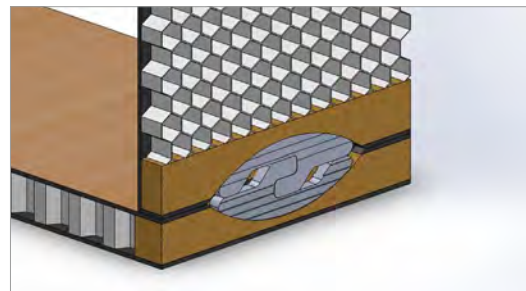
Corner joining using a bonded bolt makes it possible to work with all joining methods which are in standard use for chipboard or solid wood. The most frequently used are dowels, Lamello flat dowels, Lamello P-system, Knapp connectors, OVO® connectors and many more. An adhesive is necessary to bond the connecting elements for some of these connectors, e.g. a moisture-hardening PUR adhesive.



Corner joint with bolt



Corner joint with Lamello Clamex



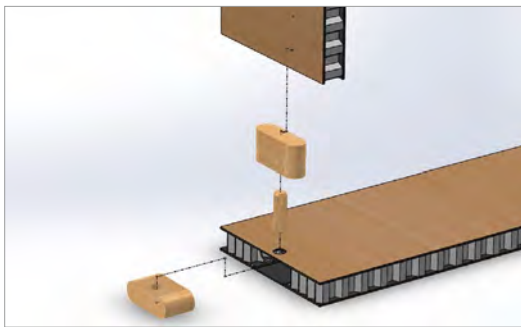
Corner joint with Lamello Clamex (section)

## EXAMPLES OF CONSTRUCTION AND JOINTS

### Fastening with horizontal bonded bolt

As well as the possibility of gluing a continuous locking bar into the honeycomb panel to accept adhesives, there are also locally effective bolts such as the GO.FAST horizontal bolt. With this system, a cut section of the bolt is glued into a recess which has been made

beforehand with a slot drill. Similarly to a bolt, all the standard fixing fittings such as Lamello, dowels, Knapp connectors, OVO® connectors etc. can be used as fixing elements.



*GO.FAST corner fixing and dowels*

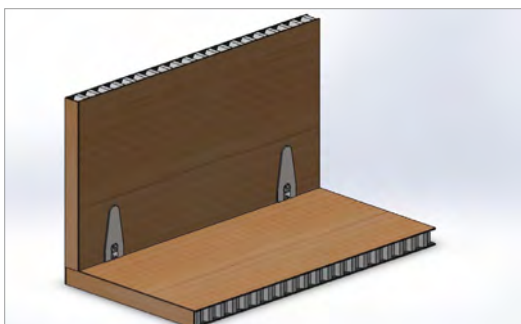
---

### Carcass corner visible

To create carcass corner joints, in addition to the invisible options, visible connectors which are quick to fit are also available. These are used particularly in the self-assembly furniture sector, and for the interior

fittings of caravans. For vertical panels, screw points are created using various techniques. These can be fixed with screw connectors or eccentric connectors to make corner joints with high load-bearing capacity.

### Combination of screw point and eccentric supports



*Eccentric K support*



*Eccentric K support (exploded diagram)*



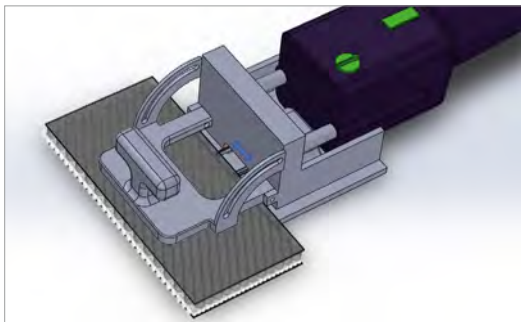




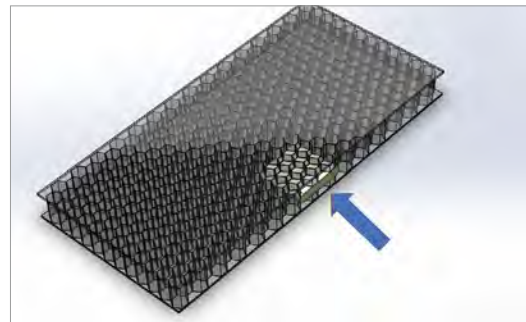
## Corner constructions with elongated fixings

A simple way of making screwed constructions is with elongated fixings. This technology is primarily used for edge or corner fixings of carcasses. It is particularly useful for screwed connections that require retrofitting or the repair of doors or flaps. PP fittings are advisable to ensure a waterproof and fully recyclable result, however alternative fixing options are also available.

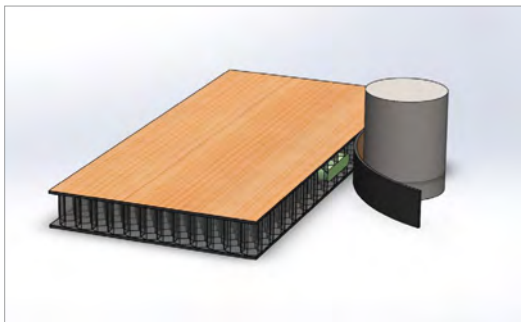
This process requires a fundamental change to the workflow. After milling a rectangular recess in a central area, the fixing is inserted. In this example the edge is introduced to the assembled part after gluing, i.e. with corner connectors and other longitudinal forceabsorbing connectors.



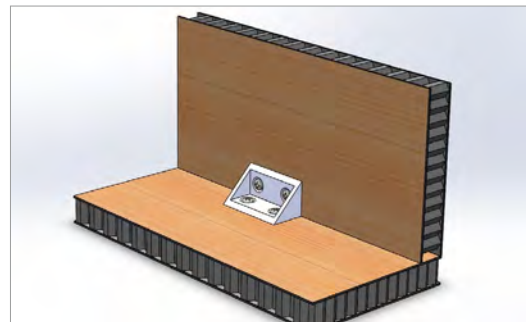
*Routing of a rectangular recess with FESTOOL DOMINO*



*Insertion of elongated fixing*

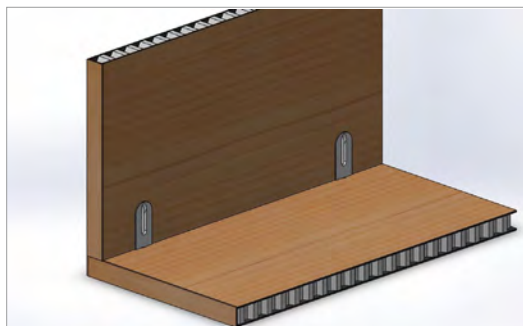


*Edge banding*

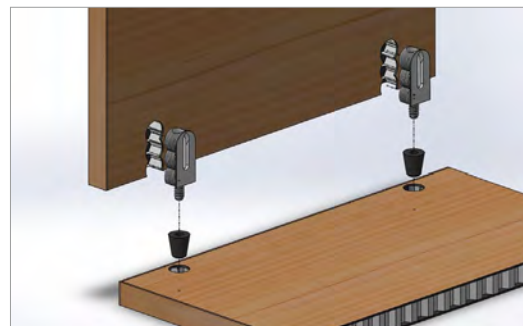


*Assembly with corner connector*

## Combination of fixing point EJOT INSERT with caravan connector



*Lamello Cabineo connector*



*EJOT TSSD with Lamello Cabineo connector*

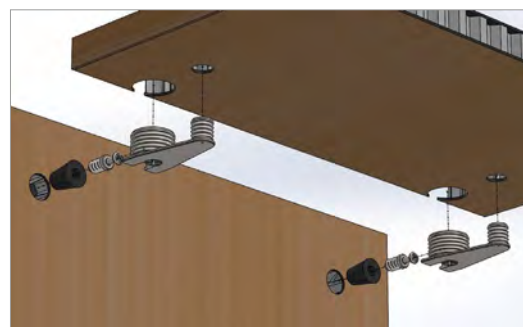
## Horizontal parts

When long side components are used, inserting an intermediate horizontal fixing to add rigidity to the furniture unit or the whole structure is often

recommended. Structural supports for horizontal parts are particularly beneficial here to achieve a higher degree of rigidity in the components.



*EJOT TSSD with K support*



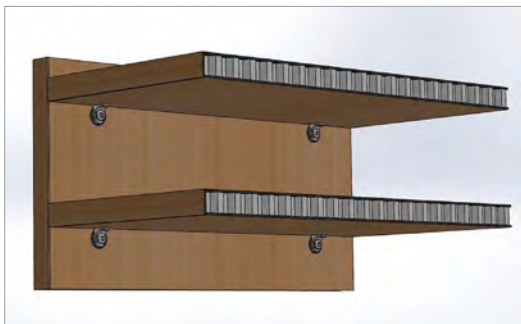
*EJOT TSSD with K support (exploded diagram)*

## EXAMPLES OF CONSTRUCTION AND JOINTS

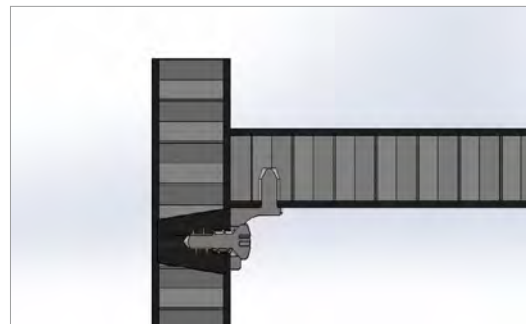
### Shelves

Shelves can be fixed either with screwed shelf supports or with plugged shelf supports. The choice of a fixed screw point to take the shelf peg or the Euro screw is

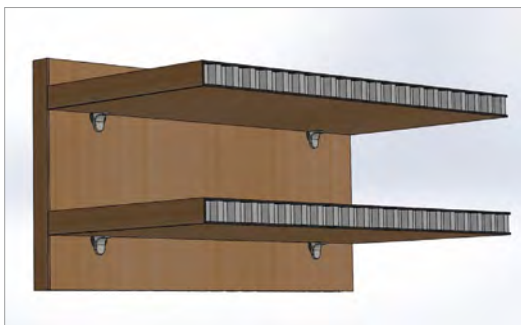
recommended. To ensure that the shelf cannot slip sideways, using a shelf with position peg is recommended.



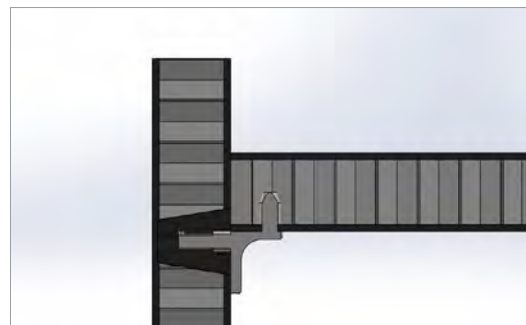
*Shelf with peg screw fit*



*Screwed shelf (section view)*



*Shelf with peg*

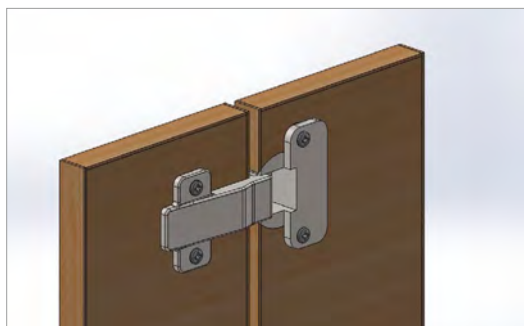


*Shelf fitted with peg (section view)*

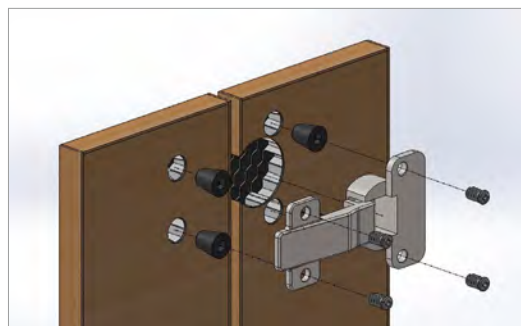
## Hinges

Doors and flaps are subject to constant dynamic stress due to the opening and closing movement. Particularly in caravan construction, hinges with a particularly strong closing force are fitted. The forces produced are

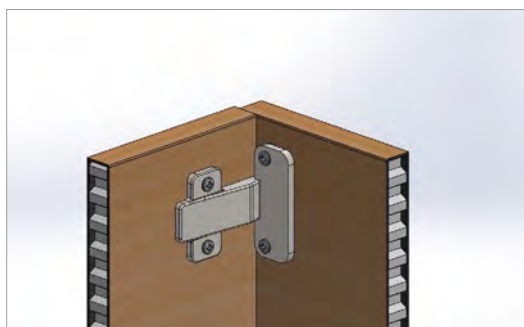
safely transmitted by the use of very strong screw points in combination with the drill hole.



*Hinge 180° position*



*Hinge (exploded diagram)*



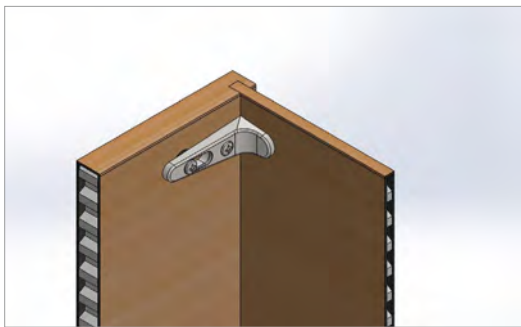
*Hinge 90° position*

## EXAMPLES OF CONSTRUCTION AND JOINTS

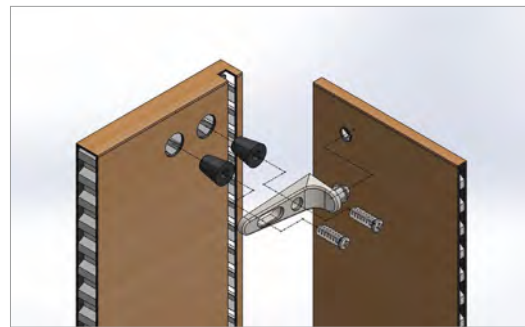
### Back wall connector

Back walls are normally fitted into a groove and fixed with back wall connectors. The screw connections in the sides are formed with standard screw point constructions. Due to the thin material, a clip or hoe

connection is fitted. In cases with high carcass rigidity requirements, bonding into the structure is again recommended.



*Back wall connector*



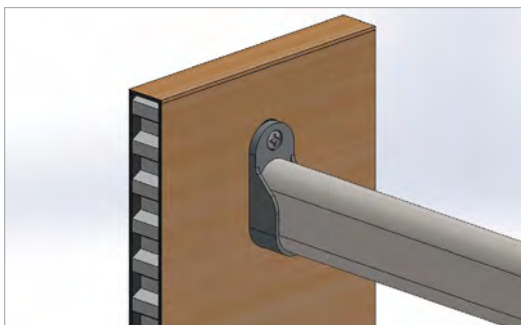
*Back wall connector (exploded diagram)*

---

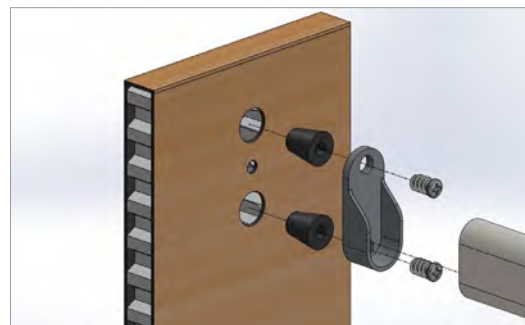
### Clothes rack support/wardrobe rail support

Clothes racks of course have to support heavy loads. To guarantee this, the use of wardrobe rail supports which are both screwed in and also transmit the loads with positive-locking pins are recommended. Clothes

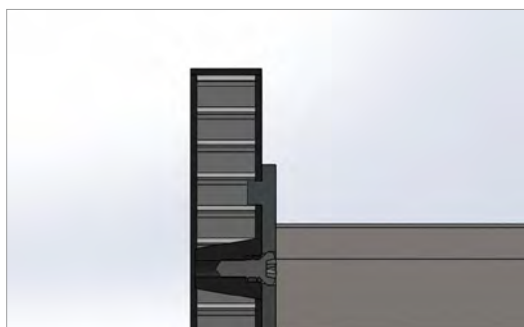
racks in the form of rails with catch pins are recommended, as these further increase the shape retention of the structure.



*Wardrobe rail support*



*Wardrobe rail support (exploded diagram)*



*Wardrobe rail support with catch pins*



*Wardrobe rail support without catch pins*

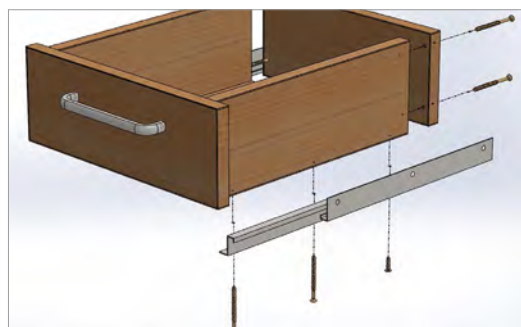
## Drawers

Drawers can be connected to the side walls with screw points.

To fix the fittings with the carcass, direct screw connections may also be used.



*Drawer assembly*



*Drawer (exploded diagram)*

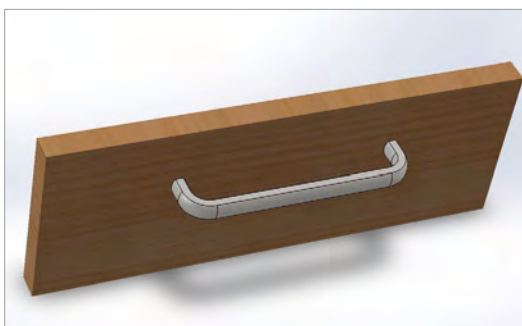


## EXAMPLES OF CONSTRUCTION AND JOINTS

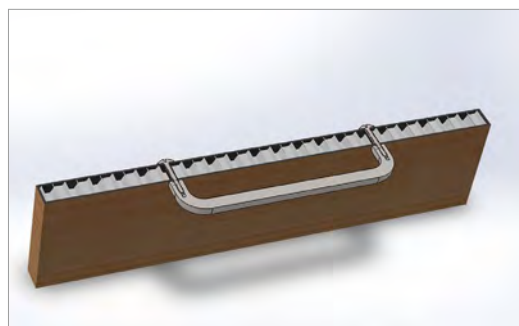
### Handles

It is very easy to fit handles to RENOLIT GORCELL panels. Generally, a through hole with a 4.5 or 5.0 mm drill is sufficient. Thanks to the rigidity of the panels,

no further reinforcement by screw connections is generally required.



*Handle in trim*



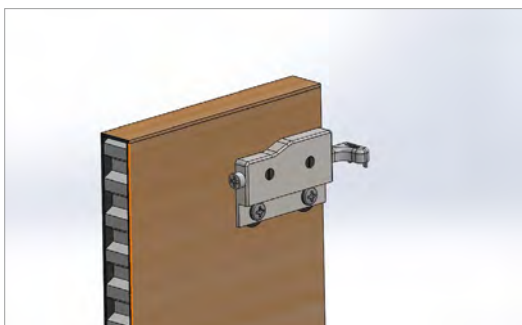
*Handle (section)*

---

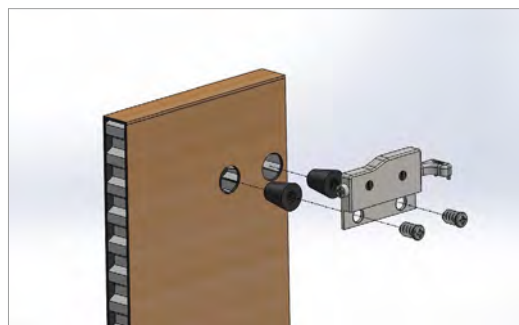
### Cabinet suspension brackets

Top cabinets have to be particularly well secured, due to their position. To secure cabinet suspension brackets correctly, very strong fixing points are required. Inserts which have been bonded with dual-component reactive

adhesives and the corresponding pre-treatment, or which use connectors which provide a firm bond and have high loading capacity should be used in this case.



*Cabinet suspension with screw fitting*



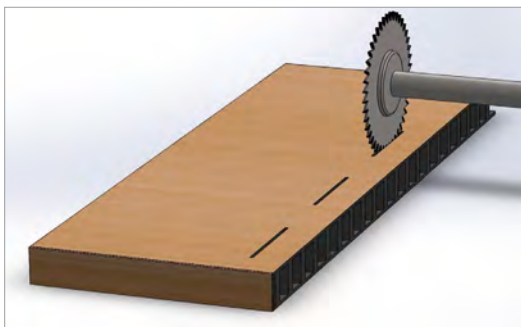
*Cabinet suspension (exploded diagram)*



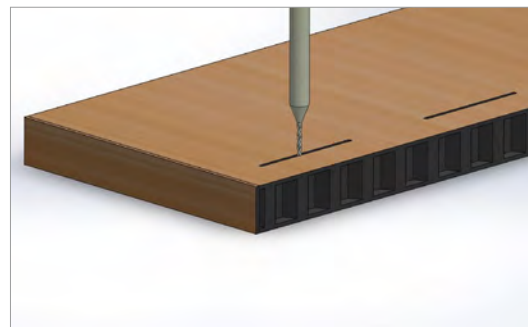
## Corner construction with with a partial tongue and groove

For lightweight panels such as RENOLIT GORCELL, it can make sense to design the corner with a partial tongue and groove. Doing so replaces the need for dowels for positioning.

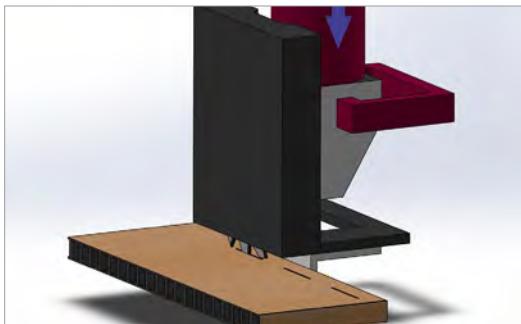
### Processing of a partial groove



*Sawing of grooves on CNC*



*Routing of grooves on CNC*



*Sawing of groove with Lamello Router*



*Elements ready to assemble*

### Processing of partial tongue connections

It is advantageous to use a CNC machine with a saw unit when manufacturing mini tongue and groove connections. Milling the mortices is also possible, however

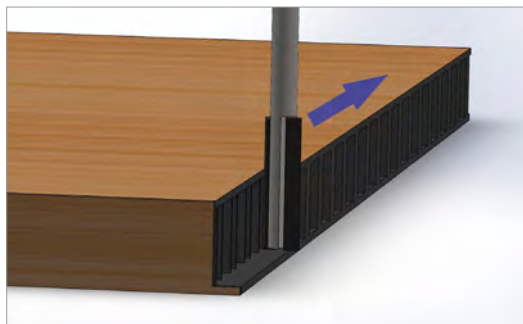
requires more time than sawing. For such applications, milling cutters with a diameter in excess of 25 mm are advised.



*Vertical sawing of mortice*



*Horizontal sawing of mortice*



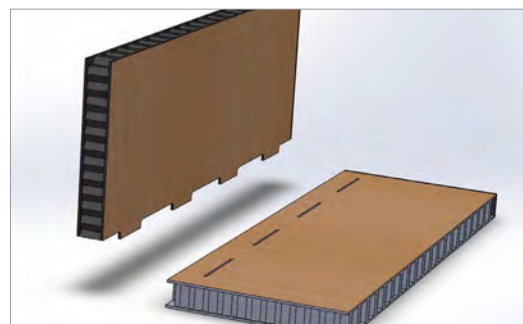
*Routing of mortice*



*Fully-routed RENOLIT GORCELL panel*



*Routing of mini tongues*



*Components ready for assembly*

## PRODUCTION OF FORMED FURNITURE COMPONENTS

The manufacture of waterproof and rot-proof moulded components is easy and versatile with **RENOLIT GORCELL** components.

Surface layers are available as **RENOLIT CORK-STOCK**, **RENOLIT WOOD-STOCK** or **RENOLIT TECNOGOR** in a standard décor range. The **RENOLIT** product range is available for other decorative surfaces.

These films can be applied to the recoatable products in the **RENOLIT GORCELL** range, and combination with other flexible decorative materials is also possible.

**RENOLIT GORCELL** cores in various thicknesses can be used as middle layers, with the desired component thickness being a clever combination of the different available cores.



*Formed elements with a minimum inside radius of  $r = 15\text{ mm}$*



*Formed elements with different constructions*



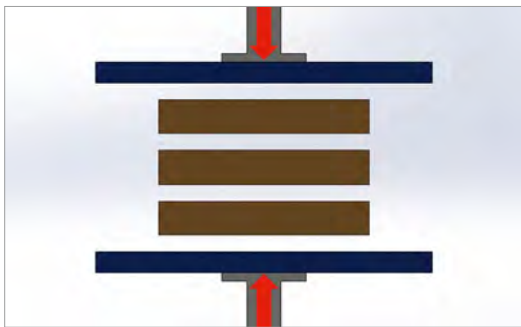
*Formed elements in caravan or yacht*

The production of moulded parts essentially uses the following process:

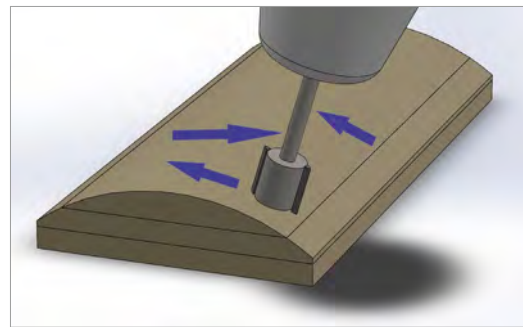
- Production of pressing moulds
- Preparation of core and top layers
- Adhesive application
- Pressing of the mould, waiting for adhesive curing
- Format cutting
- Edge banding and final trimming
- Fixing of the connectors and hinges



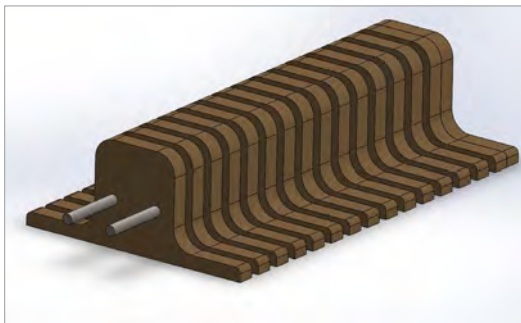
## Production of pressing moulds:



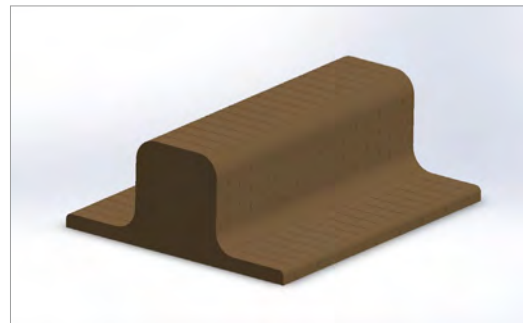
*Lamination of MDF panels*



*Routing a mould out of a MDF block*



*Adhesion of a contour mould with separate form panels*



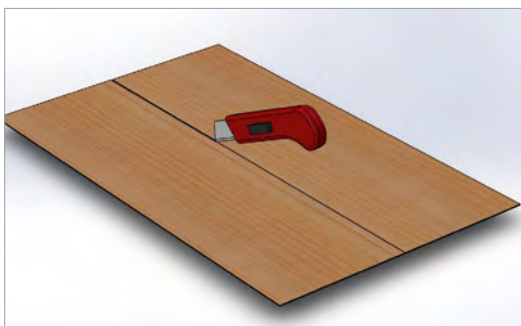
*Final contour panel mould*



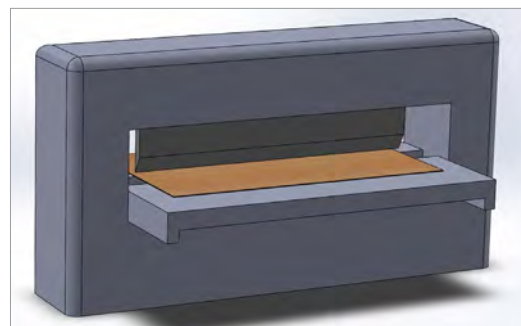
## Preparation of top layers

With RENOLIT CORK-STOCK or RENOLIT WOOD-STOCK cover layers, assembly is particularly easy. Top layers can be cut very easily on a guide rail with a cutter, alternatively they can be put together into precisely fitting

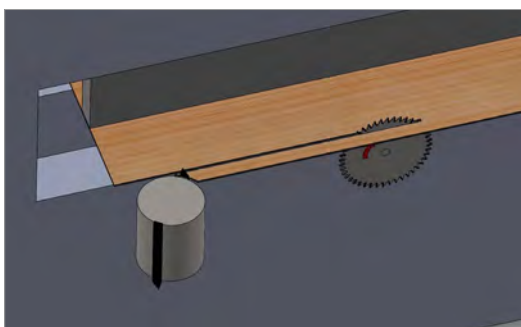
units on veneer punches or veneer saws with a joining unit.



*Cutting of WPC top layers*



*Punching of WPC top layers*



*Joining on a veneer saw with a joining unit*



*Connecting jointed top layers*

## Pressing of formed elements

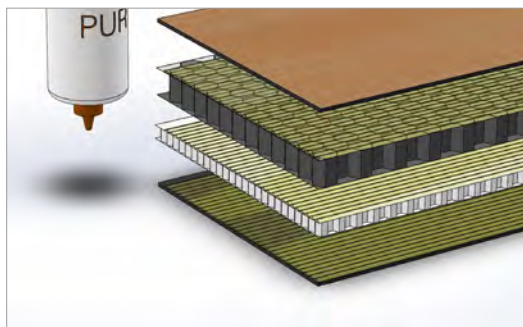
Various technologies are available for pressing moulded parts. For example, cold or hot pressing or high-frequency pressing with form and counter-form can be used. Alternatively, simple vacuum presses with a single mould and one press membrane can be used. Advantages

include lower costs of mould construction and greater flexibility when changing the thickness of the materials.

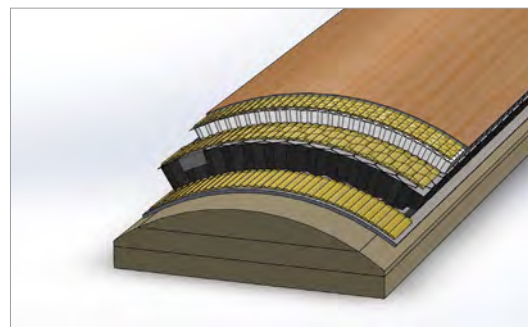


*Vacuum press by Fa. BARTH GmbH*

## Processing of moulded components

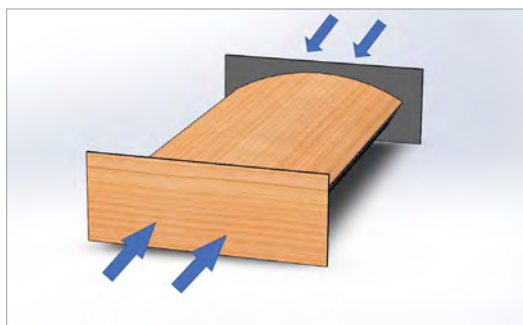


*Adhesive application on individual layers*

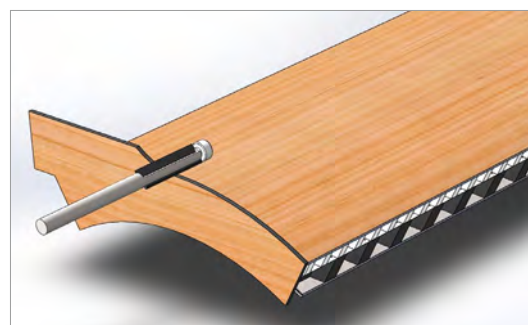


*Positioning in the mould and pressing*

Once the adhesive has cured, the semi-finished moulded parts are cut lengthways and then the front edges are glued on. This can be done manually or using appropriate devices or CNC machines.

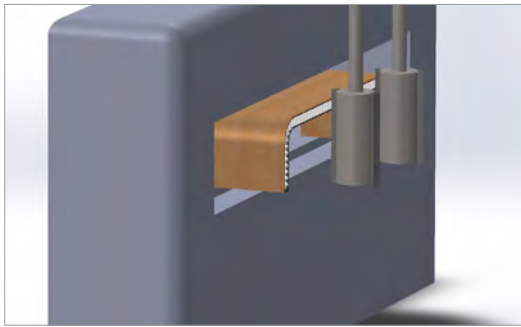


*Manual gluing of front edges*

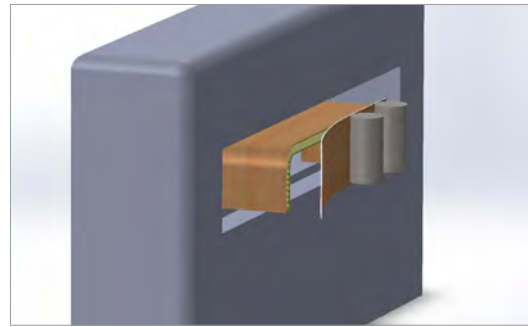


*Manual trimming of the front edge material*

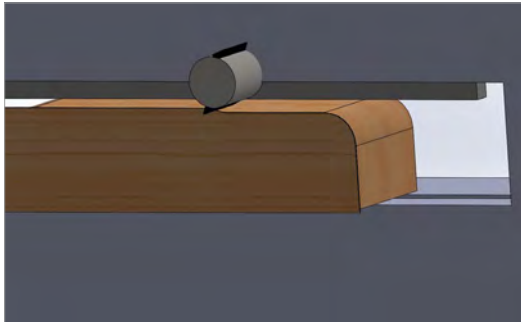
## Automatic front edge banding machine from Koch Technology:



*Automatic front end edge routing*



*Edge banding*



*Automatic trimming of the edge banding material*



# FAQ

## Frequently asked questions:

- 1) **What is the RENOLIT GORCELL construction?**  
*RENOLIT GORCELL is made of a hexagonal thermoplastic honeycomb core, and a thermally applied top and bottom layer.*
- 2) **What material is RENOLIT GORCELL made of?**  
*The honeycomb core is made of polypropylene (PP), and the outer panels of PP or PP with natural or mineral fibres.*
- 3) **Is it possible to use other materials?**  
*Yes, theoretically any thermoplastic, weldable synthetic material can be used.*
- 4) **What technology is used to manufacture the core material?**  
*The core material is manufactured using EconCore Honeycomb Technology from Leuven (Belgium)*
- 5) **What core diameters/thickness are available?**  
*RENOLIT GORCELL is available in core strength 5 mm, 10 mm, 15 mm and 20 mm.*
- 6) **What are the standard panel dimensions, and MTO possibilities?**  
*The standard dimensions are 1,220 mm x 2,440 mm (width x length). Dimensions to customer specifications are available up to a maximum of 1,500 mm x 6,000 mm (width x length).*
- 7) **What are the options for the top layers?**  
*Various options are available for the top layer:*
  - RENOLIT ALKORCELL PP foil: 0.12 - 0.6 mm, any choice of colour (depending on minimum order quantities of foil)
  - RENOLIT WOOD-STOCK Sheets (WPC = Composition PP and natural fibres): 0.8 - 1.5 mm, standard colours black and brown, other colours by arrangement
  - RENOLIT TECNOGOR sheets (composition PP and (short) glass fibres): 0.8 - 1.3 mm
  - RENOLIT ALKORCELL PP curved top layers with high impact resistance (high-tensile PP fibres). No glass fibre insert, reference for PROPEX "Curv"
  - RENOLIT ALKORCELL foils, heat-laminated on RENOLIT WOODSTOCK or TECNOGOR
  - Weather-resistant RENOLIT ALKORCELL foils, heat-laminated on RENOLIT WOODSTOCK.
  - Various types of non-woven fabric (Non-Woven, PP/PET, Automotive non-woven fabric)
- 8) **How are the top layers applied?**  
*The top layers are applied by thermal bonding in a continuous process.*
- 9) **Can external top layer materials also be applied?**  
*Yes, depending on the production technique, PVC decor and high-gloss foils, wood, metals and other plastics, including impact-resistant non-slip materials can be applied.*
- 10) **How are these external top layers applied?**  
*The external top layers can be applied during the preceding thermal bonding of non-woven fabrics during the production process - non-woven fabrics permits bonding solutions using traditional adhesives (PUR, EVA, PVAC etc.). Other options are plasma pre-treatment and flat-lamination, or priming the surfaces with suitable primers.*



- 11) What are the advantages of RENOLIT GORCELL?**  
 RENOLIT GORCELL is very light (honeycomb core material approx. 80 kg/m<sup>3</sup>) but at the same time very durable (up to 1,2 MPa (ASTM C365-57)). The material is water-resistant, has an unusually high chemical resistance and can be thermally applied extremely well (Forming, welding). It is also suitable for machining. Due to its modular assembly system, RENOLIT GORCELL has diverse applications. Last but not least, it is cheap to produce and not resource-intensive, meaning it is sustainable.
- 12) What RENOLIT GORCELL options are there for the furniture sector?**  
 For the furniture sector there is the 15 mm and 20 mm honeycomb core RENOLIT WOOD-STOCK with double-sided outer panels.
- 13) What fire protection class is RENOLIT GORCELL?**  
 A standard PP-RENO LIT GORCELL can reach a category C or better in the construction sector. The flammability can be adjusted through addition of the WPC matrix. Certificates and proofs are required for fire protection requirements. These can be requested if required.
- 14) In which temperature range the material should be stored?**  
 Storage is possible in a temperature range of -30°C to +80°C possible. Usually normal ambient temperatures are aimed for. In general, the usual storage recommendations on level surfaces apply.
- 15) How can edging tapes be applied to the narrow side?**  
 Edging tapes can be applied to the narrow side using a number of methods: with laser or another reactivatable edging, with PUR hotmelt adhesive in joints with a plasma treatment of the narrow side or with polyolefin hotmelt adhesives.
- 16) How can the panels be joined together?**  
 RENOLIT GORCELL panels can be joined in a number of ways:
- By using bolts and conventional panel connectors.
  - By screwing the panels together directly.
  - By using EJOT/Weber friction welding.
  - By using lightweight construction anchors and furniture fittings.
  - By adhesion of the panel edges and surfaces using suitable primers and adhesion systems.
- 17) Can the panels be expanded?**  
 The RENOLIT GORCELL panels can be made longer or wider by means of butt welding technology.
- 18) Can the panels be made thicker?**  
 The RENOLIT GORCELL panels can be stuck together to increase the thickness or stuck to other substrates. For sticking to other substrates, PUR adhesives are most suitable.
- 19) How should panel offcuts and superfluous parts be disposed of?**  
 Because the panels are 100 % recyclable, customers can reuse offcuts in the production process. Otherwise disposal is possible using the respective monitoring system for recyclables or the regular waste disposal system.

# PARTNER FIRMS

## CUTTING

Biesse S.p.A.  
Via della Meccanica 16  
61122 Pesaro  
Italy  
Phone +39.0721.439100  
info@biesse.com  
www.biesse.com

HOLZ-HER GmbH  
Ploching Str. 65  
72622 Nürtingen  
Germany  
Phone +49.7022.702.0  
Fax +49.7022.702.101  
kontakt@holzher.com  
www.holzher.com

HOMAG  
Plattenaufteiltechnik GmbH  
Holzmastr. 3  
75365 Calw-Holzbronn  
Germany  
Phone +49.7053.690  
Fax +49.7053.6174  
info-holzbronn@homag.com  
www.homag.com

Schelling Anlagenbau GmbH  
Gebhard-Schwärzler-Str. 34  
6858 Schwarzach  
Austria  
Phone +43.5572.396.0  
Fax +43.5572.396.177  
info@schelling.at  
www.schelling.com

## DUST REMOVAL

INVEKO  
Enderlestr. 2  
89335 Ichenhausen  
Germany  
Phone +49.8223.7059808  
info@inveko.de

PRINTCONCEPT  
Grafische Maschinen GmbH  
Philipp-Jakob-Manz-Str. 18  
72664 Kohlberg  
Germany  
Phone +49.7025.84330.0  
Fax +49.7025.84330.40  
office@printconcept-gm.de  
www.printconcept-gm.de

## POLISHING

Costa Levigatrici S.p.A.  
Via Venezia, 144  
36015 Schio (VI)  
Italy  
Phone +39.0445.675000  
Fax +39.0445.675110  
www.costalev.com  
info@costalev.com

Karl Heesemann  
Maschinenfabrik  
GmbH & Co. KG  
Reuterstr. 15  
32547 Bad Oeynhausen  
Germany  
Phone +49.5731.188.0  
Fax +49.5731.3571  
office@heesemann.de  
www.heesemann.de

HOMAG Group AG  
Homagstr. 3-5  
72296 Schopfloch  
Germany  
Phone +49.7443.13.0  
Fax +49.7443.13.2300  
info@homag.com  
www.homag.com

## PLASMA AND CORONA PRETREATMENT

Ahlbrandt System GmbH  
Altebergstr. 23-25  
36341 Lauterbach/Hessen  
Germany  
Phone +49.6641.9700  
Fax +49.6641.97050  
info@ahlbrandt.de  
www.ahlbrandt.de

Arcotec GmbH  
Rotweg 24  
71297 Mönsheim  
Germany  
Phone +49.7044.9212.0  
Fax +49.7044.9212.12  
info@arcotec.com  
www.arcotec.com

Plasmatreat GmbH  
Queller Str. 76-80  
33803 Steinhagen  
Germany  
Phone +49.5204.9960.0  
Fax +49.5204.9960.33  
mail@plasmatreat.de  
www.plasmatreat.de

## IONISING

Eltex-Elektrostatik-GmbH  
Blauenstr. 67-69  
79576 Weil am Rhein  
Germany  
Phone +49.7621.7905.422  
Fax +49.7621.7905.330  
info@eltex.com  
www.eltex.com

IONTIS Elektrostatik GmbH  
Isteiner Str. 3  
79588 Efringen-Kirchen  
Germany  
Phone +49.7628.3594064  
michael.kolkmeier@iontis.de  
www.iontis.de

## GLUING EDGES

Biesse S.p.A.  
Via della Meccanica 16  
61122 Pesaro  
Italy  
Phone +39.0721.439100  
info@biesse.com  
www.biesse.com

HOLZ-HER GmbH  
Ploching Str. 65  
72622 Nürtingen  
Germany  
Phone +49.7022.702.0  
Fax +49.7022.702.101  
kontakt@holzher.com  
www.holzher-nullfuge.de

HOMAG Group AG  
Homagstr. 3-5  
72296 Schopfloch  
Germany  
Phone +49.7443.13.0  
Fax +49.7443.132300  
info@homag.com  
www.homag.com

IMA Schelling  
Deutschland GmbH  
Industriestraße 3  
32312 Lübbecke  
Germany  
Phone +49.5741 331-0  
Fax +49.5741 4201  
contact@ima.de  
www.ima.de

Schugoma System GmbH  
Hünegräben 17  
57392 Schmallenberg  
Germany  
Phone +49.2972 978 18-0  
Fax +49.2972 978 18-200  
info@schugoma.de  
www.schugoma.de

Koch Technology  
GmbH & Co. KG  
Industriestr. 18-22  
33818 Leopoldshöhe  
Germany  
Phone +49.5202.990.201  
Fax +49.5202.990.9201  
info@kochtechnology.de  
www.kochtechnology.de

## JOINING TECHNIQUES

Adolf Würth GmbH & Co. KG  
Reinhold-Würth-Straße 12-17  
74653 Künzelsau-Gaisbach  
Germany  
Phone +49.7940 15-0  
Fax +49.7940 15-1000  
info@wuerth.com  
www.wuerth.de

EJOT GmbH & Co. KG  
Im Herrengarten 1  
57319 Bad Berleburg  
Germany  
Phone +49.2751.529.0  
Fax +49.2751.529.559  
info@ejot.de  
www.ejot.de

WEBER  
Schraubautomaten GmbH  
Hans-Urmiller-Ring 56  
82515 Wolfratshausen  
Germany  
Phone +49.8171.406.0  
Fax +49.8171.406.111  
info@weber-online.com  
www.weber-online.com

Hettich Holding  
GmbH & Co. oHG  
Vahrenkampstr. 12-16  
32278 Kirch Lengern  
Germany  
Phone +49.5223.77.0  
Fax +49.5223.77.1414  
info@de.hettich.com  
www.hettich.com

Koch Technology  
GmbH & Co. KG  
Industriestr. 18-22  
33818 Leopoldshöhe  
Germany  
Phone +49.5202.990.201  
Fax +49.5202.990.9201  
info@kochtechnology.de  
www.kochtechnology.de

Novoryt AG  
Zietmattweg 14  
CH-4462 Rickenbach  
Switzerland  
Phone +41.61.985.83.83  
Fax +41.61.985.83.80  
info@novoryt.ch  
www.novoryt.ch

KVT-Fastening GmbH  
Max-Eyth-Str. 14  
89186 Illerrieden  
Germany  
Phone +49.7306.782.0  
Fax +49.7306.2251  
info-DE@kvt-fastening.com  
www.kvt-fastening.com

SPECIALINSERT Srl  
Via Monfalcone, 144  
10136 TORINO (TO)  
Italy  
Phone +39.011.700301  
Fax +39.011.702947  
www.specialinsert.it

## ADHESIVES

3M Deutschland GmbH  
Carl-Schurz-Str. 1  
41453 Neuss  
Germany  
Phone +49.2131 / 14 - 0  
Fax: +49.2131 / 14 2649  
Innovation.de@3M.com  
www.mmm.com

Jowat SE  
Ernst-Hilker-Straße 10 - 14  
32758 Detmold  
Germany  
Phone +49.5231 749-0  
info@jowat.de  
www.jowat.com

VIP Voelkel Industrie  
Produkte GmbH  
Frauenstr. 31  
82216 Maisach  
Germany  
Phone +49.8141.35549.0  
Fax +49.8141.35549.99  
sales@vip-gmbh.com  
www.polyurea-solutions.com

SABA Vertrieb und  
Anwendung von  
Chemiewerkstoffen GmbH  
Bärendorfstr. 3  
46395 Bocholt  
Germany  
Phone +49.2871.292400  
Fax +49.2871.292401  
sababocholt@  
saba-adhesives.com  
www.saba-adhesives.com

KLEBCHEMIE M. G. Becker  
GmbH & Co. KG  
Max-Becker-Str. 4  
76356 Weingarten  
Germany  
Phone +49.7244.62.0  
Fax +49.7244.700.0  
info@kleiberit.com  
www.kleiberit.com

## EDGE MATERIALS

MKT  
Moderne Kunststoff-Technik  
Gebrüder Eschbach GmbH  
Herrenhöfer Landstraße 2  
99885 Ohrdruf  
Germany  
Phone +49.3624.36923  
Fax +49.3624.313708  
info@mkt-gmbh.com  
www.mkt-gmbh.com

REHAU AG + Co  
Otto-Hahn-Str. 2  
95111 Rehau  
Germany  
Phone +49.92.83.77.0  
info@rehau.com  
www.rehau.com

## EDGE EXTRUSION

Fa. Munsch Kunststoff-  
schweißtechnik GmbH  
Im Staudchen  
56235 Ransbach-Baumbach  
Germany  
Phone +49.2623.898.0  
Fax: +49.2623.898.85  
info-kst@munsch.de  
www.musch-kunststoff-  
schweißtechnik.de

## BENDING AND WELDING

WEGENER  
International GmbH  
Ernst-Abbe-Str. 30  
52249 Eschweiler  
Germany  
Phone +49.2403.70484.0  
Fax +49.2403.70484.99  
info@wegenerwelding.de  
www.wegenerwelding.de

# SERVICE

## Design Centre

Design advice and development are a central part of what we do at RENOLIT and one of the key pillars of our success. Our goal is to offer our customers modern décors that anticipate the trends of the future. As a company with a strong design focus, we know our market and understand what our customers need and want. You can select décors from our comprehensive design pool or work with us to develop your own design. Subject to a minimum order size, we can also develop your design exclusively for you. Our worldwide design teams provide advice and support in your language.

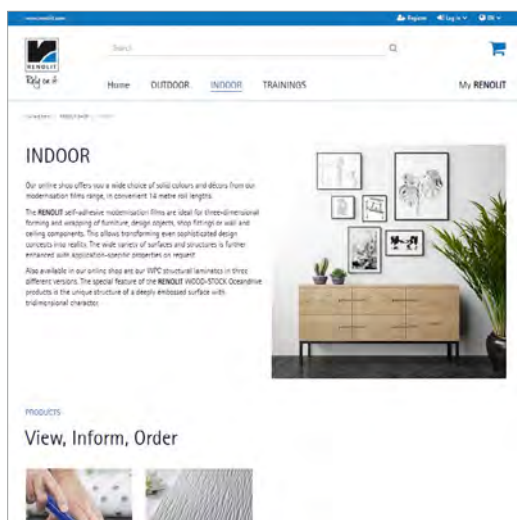
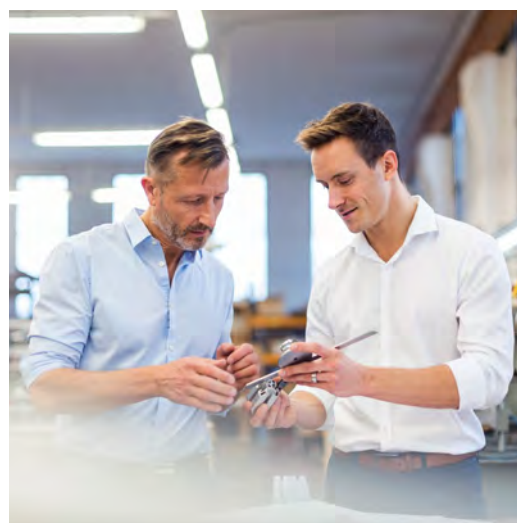


## Colour Road trend service

The RENOLIT Colour Road trend service is designed to help you keep pace with the rapidly evolving world of style and interior design, using trends to give your business the edge. We work closely with global trend institutions and colour designers to analyse the multifaceted relationships between society and culture and environment and design and to filter out the key patterns. Based on this information, our Colour Road team predicts global colour preferences and specific sector trends and presents its findings in an annual trend report and via a number of trend-related tools. Find out more about the current Colour Road by clicking [here](#).

### Central Technical Support

Our technical service team works with our customers on site to ensure optimum machine configuration and perfect film adhesion and surface quality. They also support and advise customers with the optimisation of their entire production process. Working in close collaboration with leading machine manufacturers keeps our team fully up to date with the latest technology and features.



### RENOLIT online shop and customer platform

In the RENOLIT online shop, you can order products such as RENOLIT COVAREN and RENOLIT ALKOREN in lengths of up to 30 metres conveniently and securely online. The shop also stocks our modernisation films, RENOLIT WOOD-STOCK Oceandrive and other products from the RENOLIT range.

More information here: [www.shop.renolit.com](http://www.shop.renolit.com)





*Rely on it.*

**RENOLIT SE**

Market Unit Interior Surfaces

Horchheimer Str. 50

67547 Worms | Germany

Phone: +49.6241.303.1222

Fax: +49.6241.303.18.1141

Email: [interiorsurfaces@renolit.com](mailto:interiorsurfaces@renolit.com)

[renolit.com/interiorsurfaces](http://renolit.com/interiorsurfaces)

**vinyl**<sup>plus</sup>