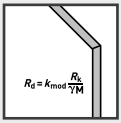
fermacell
Gypsum Fibreboards Installation Instructions

July 2015

fermacell at a glance

fermacell consists of gypsum and paper fibres without any binding agents. The material ensures a pleasant indoor climate and it is eco-friendly.

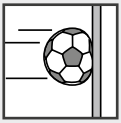
Healthy indoor climate



Statically approved

For the design of timber components according to DIN EN 1995-1-1 + National Annex (NA).

Completely fibre-reinforced: The homogeneous board structure makes fermacell stable and resistant to mechanical stress.

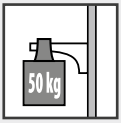


High load capacity

Easy to process

Drilling, scoring, jointing, filling, breaking, sawing, planing, milling, sanding. Working with it is easy and practical.

Taking the 12.5 mm **fermacell** Gypsum Fibreboard as an example for load-fixing/ carrying capacity:
– 50 kg per dowel
– 30 kg per screw
– 17 kg per picture hook



High load-carrying capacity

Easy installation

On substructures with screws or staples, on walls with **fermacell** Bonding Compound.

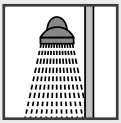
Fire protection structures F30 - F120 are already possible with 10 mm thick **fermacell** Gypsum Fibreboard.

Fire protection included

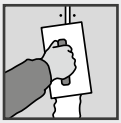
Economical adhesive joints

fermacell Jointstik bonds and joints at the same time. Even with cross joints without profile creation, full board strength is achieved.

Ideally suited for rooms with changing humidity, such as bathrooms. Once the **fermacell** Gypsum Fibreboard is dry, it returns to its original strength.



Suitable for wet rooms



Trouble-free jointing

With **fermacell** Joint Filler. Without special tools or reinforcing tapes.

Independent testing confirms the excellent sound insulation properties.

Best sound insulation

Natural strength

The environmentally friendly production process is subject to the strictest quality controls – eco-friendly.

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Board properties

fermacell consists of gypsum and recycled paper fibres. Both of these natural raw materials are mixed and pressed into solid boards under high pressure, after the addition of water. They are then dried, sealed on both sides and cut to the required sizes, with no additional binding agents.

The gypsum reacts with water, which penetrates and encloses the fibres. This ensures the high stability and non-combustibility of fermacell.

Due to the material composition, fermacell is a construction, fire protection and moisture-resistant board with homogeneous board properties on both sides.

The quality control information and production data is printed on the back of the **fermacell** Gypsum Fibreboards.

fermacell Gypsum Fibreboards do not contain hazardous materials. The absence of glues precludes any unpleasant odours.

Building biology

fermacell products meet the building biology requirements of the Institut für Baubiologie Rosenheim and thus they make a significant contribution to healthy living.

The awarding of the "low-emission product" certificate by the renowned eco-INSTITUT in Cologne shows that **fermacell** Gypsum Fibreboards meet strict health and ecological requirements.

eco INSTITUT
TESTED PRODUCT
ID 0907- 13701 - 001

Quality control

The quality characteristics of fermacell products are continually monitored in our DIN ISO 9001 certified production facilities through self-monitoring and, furthermore, they undergo constant quality controls with our official external materials testing institutes.

Physical behaviour

Sound insulation

Independent testing by various institutes confirms the excellent sound insulation properties of **fermacell** Gypsum Fibreboards.

Airborne sound insulation values of up to R_w = 71 dB, and impact sound reduction values of up to $L_{n,w}$ 31 dB for visible wooden beam ceilings, can be reached with approved fermacell constructions.

The corresponding test certificates are available upon request.

Fire protection

fermacell Gypsum Fibreboards, 10/12.5/15/18 mm thick, are approved to ETA-03/0050 as non-combustible, class A2-s1 d0 building materials according to EN 13501-1.

German and European material testing agency test certificates regarding fire resistance classes F30 to F120 for wall and ceiling constructions are available on request.

Thermal insulation

The thermal conductivity, tested by the Institute for Building Materials, Concrete Construction and Fire Protection (MPA-Braunschweig) according to DIN 52 612, is λ_R = 0.32 W/mK for the **fermacell** Gypsum Fibreboards, and the diffusion resistance factor μ = 13. The gross density = 1,150 ± 50 kg /m^3.

Structural/Load-bearing use fermacell

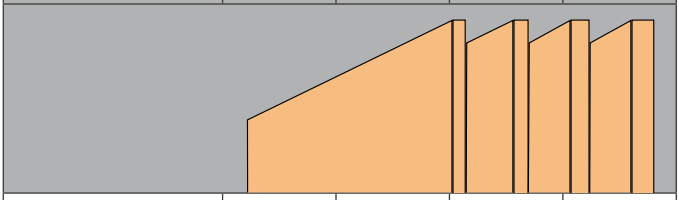
fermacell Gypsum Fibreboards are used for panelling and cladding components. They can also be used for load-bearing and bracing purposes.

The **fermacell** Gypsum Fibreboards can be used in performance classes 1 and 2 according to DIN EN 1995-1-1*.

* DIN EN 1995-1-1:2010-10 - Eurocode 5; Dimensioning and construction of wooden structures; part 1-1

Product range

fermacell board dimensions in standard sizes

Format	10 mm	12.5 mm	15 mm	18 mm
Thickness m²	11.5 kg	15 kg	18 kg	21 kg
				
1,500 × 1,000 mm	●	●	●	●
2,000 × 625 mm	—	●	—	—
2,000 × 1,250 mm	●	●	●	●
2,500 × 1,250 mm	●	●	●	●
2,540 × 1,250 mm	●	●	●	●
2,600 × 625 mm	—	●	—	—
2,750 × 1,250 mm	●	●	●	●
3,000 × 1,250 mm	●	●	●	●
Specially cut sizes on request				

fermacell accessories – for trouble-free construction

fermacell Joint Filler
Once the **fermacell** Gypsum Fibreboards are fixed in position, original **fermacell** Joint Filler is applied using the tapered-edge or joint-filling method.
Packaging: 5 kg bag and 20 kg sack

fermacell Fine Surface Treatment
Pre-mixed material for surfacing and fine finishing.
Packaging: Bucket with 3 l and 10 l capacity

fermacell Fine Surface Treatment (powdered form)
For surfacing and fine finishing.
Packaging: 5 kg bag and 25 kg sack

fermacell Jointstik/ fermacell Jointstik greenline
fermacell Jointstik or Jointstik greenline is used for filling the joints between **fermacell** Gypsum Fibreboards when adhesive joints are required.
Container: Cartridge – 310 ml capacity

fermacell Screws
These screws are used for fixing fermacell to wooden and steel substructures and for fixing **fermacell** Flooring Elements.
Available in five lengths:
3.9×19 mm or 3.9×22 mm for flooring elements and 3.9×30 mm for single-layer boarding,
3.9×40 mm for two-layer boarding,
3.9×55 mm for two-layer or multiple-layer boarding,
3.5×30 mm with drill tip for single-layer boarding on high-gauge steel substructures (e.g. frame-reinforcing profiles)
Packaging: 250 or 1,000 units/pack

fermacell Bonding Compound
Required for fixing bonding fermacell directly to walls.
Packaging: 20 kg sack

fermacell Board Knife
For scoring and snapping offcuts.

fermacell Glue Scraper
Efficient tool for scraping off adhesive residue.

fermacell Joint Repair Tape
Fleece fabric, 70 mm wide, also as joint reinforcement over filler joints for use with thin-coat plastering. Packaging: Roll size 50 m

fermacell Tapered Edge Mesh Jointing Tape
Self-adhesive alkali-resistant glass mesh reinforcement tape, 60 mm wide, for joint reinforcement for tapered edge fermacell boards. Packaging: Roll size 45 m.

fermacell Reinforcing Paper Tape
53 mm wide, for joint reinforcement for tapered edge fermacell.
Packaging: Roll size 75 m.

Areas of application

The preferred indoor areas of use for **fermacell** Gypsum Fibreboards are:

- Lightweight partition walls with steel and wooden substructures
- Wall linings
- Attic conversions
- Ceilings

For further details on areas of use, please refer to the relevant section.

TIP:
fermacell Gypsum Fibreboards are particularly economical as they are multi-purpose, with only one type of board being required for construction, fire protection and domestic wet rooms.

Board storage and transport

fermacell Gypsum Fibreboards are delivered on pallets and protected against moisture and soiling with protective packaging. Protective packaging is available for large-format boards upon request.

fermacell Gypsum Fibreboards should be stored flat and dry on a level surface.

Wet boards must be dried before use.

Single boards must be carried and transported upright (on edge).

Figure 1: Tools for installing **fermacell** Gypsum Fibreboards

General installation

Like all construction materials, **fermacell** Gypsum Fibreboards are also subject to expansion and shrinkage due to the influences of temperature and moisture.

Compliance with the following installation conditions is required for trouble-free dry lining for walls, ceilings and floors:

fermacell Gypsum Fibreboards and fermacell panelled (composite) components must not be installed at an average relative humidity ≥ 80%.

For installation reasons, the jointing of **fermacell** Gypsum Fibreboards must take place at an average relative humidity ≤ 80% and at a room temperature of at least +5 °C. When jointing, the glue temperature should be ≥ +10 °C. The boards must be conditioned to the surrounding room climate and this must not change significantly in the next 12 hours after jointing. Lower temperatures and relative humidities extend the drying times. **fermacell** Jointstik should not be exposed to frost during transport and storage.

The filling of fermacell joints must only take place at an average relative humidity of ≤ 70% (this corresponds to a residual board moisture content of ≤ 1.3%). After installation of the walls and ceiling elements, the room temperature should be ≥ + 5 °C.

The same installation conditions apply for the joint filler and finishing work.

Wet renders/screeds must be completed and dried before the filling of any joints (joint filler and fine filler), as building moisture impedes the drying of the filler and FST and these can be affected by longitudinal expansion of the boards.

Hot/mastic asphalt must be applied before the filling of board joints, as tensions caused by heat can cause cracks in the joints in the lower wall sections.

With the adhesive joint, the hot/mastic asphalt can be applied at a later stage. However, ensure there is sufficient heat distribution and ventilation.

Gas burner heating can lead to damage due to the risk of condensation. This applies especially to cold indoor areas with poor ventilation.

Rapid heating must be avoided, as this can lead to thermal shock and cracking.

Figure 2: Measuring and scoring

Figure 3: Breaking the sections / cuttings

Figure 4: Sawing with circular handsaw

Cutting and working with fermacell

Cutting tools

fermacell Gypsum Fibreboards can be machined and cut with ease due their fibre-reinforced homogeneous structure. Special tools are not required. Standard tools, which are normally used for dry lining work (figure 1), are sufficient.

Board cutting

Marking and cutting the **fermacell** Gypsum Fibreboards should take place at a convenient working height. Sections can easily be cut to size.

fermacell Gypsum Fibreboards are scored with a **fermacell** Board Knife or cutter (figure 2) along a line marked with a straight edge or similar tool.

The scored line is pushed to the work table or pallet edge, the larger board section is clamped down and the protruding section is then broken over the edge (figure 3). Scoring or cutting on the rear side of the **fermacell** Gypsum Fibreboards is not required.

Alternatively, **fermacell** Gypsum Fibreboards can also be cut by handsaw or electrical jigsaw. When using a circular handsaw (figure 4) (e.g. for cutting the board for the adhesive joint), dust extraction is recommended. The saw should run at a low speed. For angular cutouts the following steps are recommended: first saw the short side, the score and snap the long side. For U-shaped cutouts saw the two sides, then score and snap the remaining side.

The saw blades should be carbide-tipped.

Planing of the edges of **fermacell** Gypsum Fibreboards is only required if the board edges are to be used as exterior corners or visible edges.

An uneven edge does not affect the subsequent jointing, but can only be finished with the gap filler joint method.

Figure 5: Screws on steel substructure

Figure 6: Staples on wooden substructure

Fixing:

Screws, staples

A particular advantage is that **fermacell** Gypsum Fibreboards can be screwed and stapled right up to the edge (approx. 10 mm) – without cracking.

fermacell Gypsum Fibreboards are fixed directly to steel substructures, without pre-drilling, using special **fermacell** Screws (figure 5). Other types of screw are not suitable. When fixing with screws, electric screwguns with a nominal speed of at least 4,000 rpm and with adjustable depth settings should be used.

Fixing **fermacell** Gypsum Fibreboards can also be fixed to wooden substructures with **fermacell** Screws.

However, fixing with staples using suitable staple guns (figure 6) is easier, quicker and more economical.

Please refer to tables on page 18 and following for information on screw and staple spacing.

Substructures for fermacell wall/ceiling installation

The substructure can be made of wood (battens, wooden frame construction) or steel profiles. If the boards are stapled, the substructure must not be springy. If necessary, it must be reinforced against the substrate. The substructure must have a sufficiently wide fixing face for **fermacell** Gypsum Fibreboards. The surface must be at least 15 mm wide at the edges for each board, thus as an absolute minimum the fixing face must be 31 mm for the adhesive joint method, or 38 mm for the filler joint method. Typically a 50 mm fixing face is recommended.

The wood used for the substructure must be generally suitable for timber construction and dry during installation.

Steel profiles for the substructure must be protected against corrosion. The minimum sheet metal thickness is 0.6 mm. The cross-section dimensions of wall and ceiling constructions comply with DIN 18182 part 1 and can be found in the relevant structural information. Connecting and fixing components must have adequate corrosion protection.

The maximum spacing for the substructure for fixing **fermacell** Gypsum Fibreboards can be found in the table below and is dependent on the specific application.

With regard to the substructure spacing, the selected board size must also be considered. In this regard it should be noted that the longer board edge should preferably be positioned on the substructure.

Centre spacing for the substructure for fermacell Gypsum Fibreboards

Area of application/ type of construction	Installation situation utility class: relative humidity	Max. centre distances support batten/ support profile in mm with different thicknesses of fermacell Gypsum Fibreboard			
		10 mm	12.5 mm	15 mm	18 mm
Vertical surfaces (partition walls, wall cladding, and wall linings)	—	500	625	750	900
Coverings for ceilings and roofs, suspended ceilings	Rooms for domestic use [1]	420	500	550	625
	Installation and/or use with occasionally high humidity [2]	335	420	500	550

Partition walls with fermacell boarding

Partition walls and their junctions to adjacent components must be designed so that they are suitable to withstand static (mainly stationary) and impact loads, as they occur for most uses.

The fixing components (dowels, screws) for the substructure must be suitable for this purpose. The spacing of the fixing points should be max. 70 cm on horizontal areas (floor and ceiling fixing) and max. 100 cm on vertical areas (wall fixing). Where there are uneven surfaces, flanking components and increased sound insulation requirements, the spacing of the fixing points should be reduced.

Steel profiles, the studs (vertical structural components in the wall surface) are pushed into the ceiling and floor track profiles without any further fixing. For wooden substructures, they are fixed with nails or brackets.

In most cases the vertical adhesive joint in wall systems offers an economical alternative for larger surfaces.

fermacell boards are suitable for lining by one-man-board or room-height-board sizes.

[1] E.g. domestic wet rooms in living areas or rooms with similar exposure for use-related with occasional high humidity.
[2] E.g. when installing wet screed or skim / plaster finish or if the aforementioned installation situation is exceeded, but not in rooms with constant high humidity (wet rooms etc.).

Installation conditions:

- The specified support centres apply regardless of the fixing direction
- Cladding must not be exposed to additional loads (e.g. insulation material)
- Point loads up to 0.06 kN (in compliance with DIN 18181:2008-10) per board span and per metre are taken into account
- With regard to fire protection requirements, the information and guidance on the appropriate test certificates must be followed

Ceiling coverings with fermacell Gypsum Fibreboards

With regard to ceilings, the load-bearing parts of the substructure should be designed in accordance with the table on the right. Other substructures should be measured so that the permissible deflection of $^{1}/_{500}$ of the span is not exceeded. The permissible deflection is taken into account in the table on the right. The axial dimensions of the supporting beams or battens depend on the board thickness (see table on p. 13).

Fix components to the substructure with the appropriate fixing components: screws, nails or staples (DIN 1052) for wood, and special fixings for steel profiles.

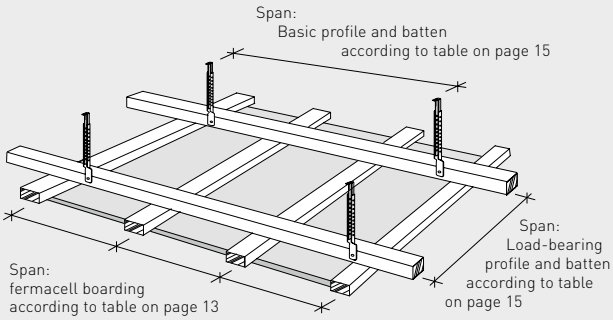


Figure 7: Suspended ceiling – layout of basic and load-bearing battens (corresponds to steel profiles)

Suspended ceilings with fermacell

Commercial suspending brackets, such as Nonius hangers, punched or slotted metal straps, wires or threaded rods, are used for suspended ceilings.

In order to fix these constructions to solid ceilings, suitable, building authority-approved fixings should be used for this application and loading.

The cross-section of the suspended brackets should be calculated so that the structural safety of the suspended ceiling is taken into account. This is especially important for fire protection constructions and double-layer fermacell boarding.

Spans, profile and batten cross-sections of ceiling coverings and suspended ceilings

Substructure in mm		Permissible span in mm[1] with a total load[4]		
		up to 15 kg/m²	up to 30 kg/m²	up to 50 kg/m²
Steel sheet profiles[2]				
Basic profile	CD 60 × 27 × 0.6	900	750	600
Supp. profile	CD 60 × 27 × 0.6	1,000	1,000	750
Wooden batten (width × height)				
Basic batten fixed fixed	48 × 24 50 × 30 60 × 40	750 850 1,000	650 750 850	600 600 700
Basic batten suspended	30 × 50[3] 40 × 60	1,000 1,200	850 1,000	700 850
Support batten	48 × 24 50 × 30 60 × 40	700 850 1,100	600 750 1,000	500 600 900

[1] The span is the spacing of suspended brackets for basic profiles or battens and the centre distance of basic profiles or battens for load-bearing profiles or battens, see figure 7.
With regard to fire protection requirements, smaller spans must be used where applicable, according to the applicable structural information and test certificates.
[2] Commercial steel sheet profiles (in accordance with DIN 18182 and DIN EN 14195)
[3] Only in connection with load-bearing battens with a width of 50 mm and height of 30 mm
[4] When calculating the total load, any potential additional loads, such as ceiling lights or fixing supporting parts should also be considered.

Fixing supporting components and spacing

fermacell Gypsum Fibreboards are fixed to timber with staples or **fermacell** Screws. **fermacell** Screws are used for steel profiles with a thickness of up to 0.7 mm. **fermacell** Drill Tip Screws are used for profiles with thicker sheets, e.g. U-reinforcement profiles. When fixing the fermacell boards, care must be taken to ensure that there are always at least 2 parallel-running board edges positioned on the substructure. All fixings should be sufficiently countersunk into the **fermacell** Gypsum Fibreboard and filled with **fermacell** Joint Filler.

The fixing of **fermacell** Gypsum Fibreboards must take place without any tension transferred into the boards. When inserting the screws, care must be taken to ensure that fixing takes place on the fixing axes (substructure) either from the middle of the board toward the edges (e.g. in the wall area) or working from one board edge to another edge.

It should be noted that the boards are pressed firmly to the substructure.

Do not fix to the corners of the boards first. Always fix to the centres and work outwards. Alternatively, fix to the top and work down.

With regard to double-boarded constructions, it is possible to staple or screw the outer board layer regardless of the substructure offset (≥20 cm) directly to the layer (closely abut first layer, second layer 5-7 mm for filler joint, max. 1 mm for adhesive joint). This provides a great material and installation advantage and even applies to walls with fire protection requirements of F90.

Diverging staples with a diameter of ≥1.5 mm with chisel points should be used for fixing **fermacell** Gypsum Fibreboards together. The leg length should be 2-3 mm shorter than the combined thickness of both board layers. A list of staples from various manufacturers is available on request.

Note:
All fixing components must have **adequate corrosion protection.**

Spacing and usage of fixing components for non-load-bearing wall constructions per m² partition wall for fermacell Gypsum Fibreboards

Board thickness/construction	Staples (galvanised and resinated) d ⩾ 1.5 mm, back width ⩾ 10 mm			fermacell Screws d = 3.9 mm		
	Length [mm]	Spacing [cm]	Consumption [unit/m²]	Length [mm]	Spacing [cm]	Consumption [unit/m²]
fermacell Screws						
10 mm	–	–	–	30	25	26
12.5 mm	–	–	–	30	25	20
15 mm	–	–	–	30	25	20
18 mm	–	–	–	40	25	20
Steel – 2-layer / 2nd layer in the substructure						
1st layer: 10 mm	–	–	–	30	40	16
2nd layer: 10 mm	–	–	–	40	25	26
1st layer: 12.5 mm or 15 mm	–	–	–	30	40	12
2nd layer: 10 mm, 12.5 mm or 15 mm	–	–	–	40	25	20
Wood – 1-layer						
10 mm	⩾30	20	32	30	25	26
12.5 mm	⩾35	20	24	30	25	20
15 mm	⩾44	20	24	40	25	20
18 mm	⩾50	20	24	40	25	20
Wood – 2-layer / 2nd layer in the substructure						
1st layer: 10 mm	⩾30	40	12	30	40	16
2nd layer: 10 mm	⩾44	20	24	40	25	26
1st layer: 12.5 mm	⩾35	40	12	30	40	12
2nd layer: 12.5 mm	⩾50	20	24	40	25	20
1st layer: 15 mm	⩾44	40	12	40	40	12
2nd layer: 12.5 mm or 15 mm	⩾60	20	24	40	25	20

Type, spacing and usage of fixing components for wall constructions with fermacell Gypsum Fibreboards for fixing board to board, fixing the 1st board layer to steel/wood - 1-layer (see page 18)

Board thickness /construction	Diverging staples (galvanised and resinated) d ≥ 1.5 mm Row spacing ≤ 40 cm			fermacell Screws d = 3.9 mm Row spacing ≤ 40 cm		
	Length [mm]	Spacing [cm]	Consumption [unit/m²]	Length [mm]	Spacing [cm]	Consumption [unit/m²]
Wall area per m² partition wall						
10 mm fermacell on 10 or 12.5 mm fermacell	18 – 19	15	43	30	25	26
12.5 mm fermacell on 12.5 or 15 mm fermacell	21 – 22	15	43	30	25	26
15 mm fermacell on 15 mm fermacell	25 – 28	15	43	30	25	26
18 mm fermacell on 18 mm fermacell	31 – 34	15	43	40	25	26

Note:

– With regard to a 4-layer wall construction boarded with 10 mm **fermacell** Gypsum Fibreboards, the last board layer can be fixed directly to the substructure with **fermacell** Screws 3.9×55 mm.

– With regard to wall constructions with fire protection requirements, the fixing component spacing that deviates from this table may be defined by the relevant test certificates.

– With regard to the fixing of 10 mm, 12.5 mm or 15 mm **fermacell** Gypsum Fibreboards to reinforced steel substructures of up to 2 mm material thickness, the **fermacell** Screws (Drill Tip) 3.5×30 mm can be used. The usage is approx. 4 screws per linear metre of profile.

Spacing and usage of fixing components for ceiling constructions with fermacell Gypsum Fibreboards per m² ceiling area

Board thickness/construction	Staples (galvanised and resinated) d ⩾ 1.5 mm			fermacell Screws d = 3.9 mm		
	Length [mm]	Spacing [cm]	Consumption [unit/m²]	Length [mm]	Length [cm]	Consumption [unit/m²]
Steel – 1-layer						
10 mm	–	–	–	30	20	22
12.5 mm	–	–	–	30	20	19
15 mm	–	–	–	30	20	16
Steel – 2-layer / 2nd layer in the substructure						
1st layer: 10 mm	–	–	–	30	30	16
2nd layer: 10 mm	–	–	–	40	20	22
1st layer: 12.5 mm	–	–	–	30	30	14
2nd layer: 12.5 mm	–	–	–	40	20	19
1st layer: 15 mm	–	–	–	30	30	12
2nd layer: 12.5 mm or 15 mm	–	–	–	40	20	16
Wood – 1-layer						
10 mm	⩾30	15	30	30	20	22
12.5 mm	⩾35	15	25	30	20	19
15 mm	⩾44	15	20	40	20	16
Wood – 2-layer / 2nd layer in the substructure						
1st layer: 10 mm 10 mm	⩾30	30	16	30	30	16
2nd layer: 10 mm	⩾44	15	30	40	20	22
1st layer: 12.5 mm	⩾35	30	14	30	30	14
2nd layer: 12.5 mm	⩾50	15	25	40	20	19
1st layer: 15 mm	⩾44	30	12	40	30	12
2nd layer: 12.5 mm or 15 mm	⩾60	15	22	40	20	16

Type, spacing and usage of fixing components for ceiling constructions with fermacell Gypsum Fibreboards for the fixing of board to board, fixing of 1st board layer such as ceiling steel/wood 1-layer (see page 20)

Board thickness /construction	Diverging staples (galvanised and resinated) d ≥ 1.5 mm Row spacing ≤ 30 cm			fermacell Screws d = 3.9 mm Row spacing ≤ 30 cm		
	Length [mm]	Spacing [cm]	Consumption [unit/m²]	Length [mm]	Spacing [cm]	Consumption [unit/m²]
Ceiling area per m² ceiling surface						
10 mm fermacell on 10 or 12.5 mm fermacell	18 – 19	12	35	30	15	30
12.5 mm fermacell on 12.5 or 15 mm fermacell	21 – 22	12	35	30	15	30
15 mm fermacell on 15 mm fermacell	25 – 28	12	35	30	15	30

Note:

- With regard to a 4-layer ceiling construction boarded with 10 mm **fermacell** Gypsum Fibreboards, the last board layer can be fixed directly to the substructure with **fermacell** Screws 3.9×55 mm.
- With regard to ceiling constructions with fire protection requirements, the fixing spacing that deviates from this table may be defined by the relevant test certificates.
- With regard to the fixing of 10 mm, 12.5 mm or 15 mm **fermacell** Gypsum Fibreboards to reinforced steel substructures of up to 2 mm material thickness, the **fermacell** Screws (Drill Tip) 3.5×30 mm can be used. The usage is approx. 5 screws per linear metre of profile.

Jointing options

Filled joint

In order to achieve a proper, stable joint connection for the joints of square-edged, cut or broken board edges, **fermacell** Gypsum Fibreboards must be filled with **fermacell** Joint Filler.

Regardless of whether the **fermacell** Gypsum Fibreboards are screwed or stapled to the substructure, the joints must have adequate gaps. These depend on the board thickness:

- 5 – 8 mm for 10 mm
- 6 – 9 mm for 12.5 mm
- 7 – 10 mm for 15 mm and 18 mm

The joints are filled with **fermacell** Joint Filler, without the need for fabric tape (except for skim or thin plaster: this requires reinforcement with the **fermacell** Tapered Edge Mesh Jointing Tape) and without the need for joint cover strips. The screw or staple heads are filled with the same material.

Horizontal joints in the partition wall area must be constructed as described in section 12.

Ensure that the joints are clean and free from dust before filling. Filling can only start when the boards are dry, i.e. free from high levels of building moisture. If there is also wet screed or wet plaster in the rooms, jointing can only take place after these areas have dried out.

If there is mastic asphalt, all filling can only take place once the screed has cooled down.

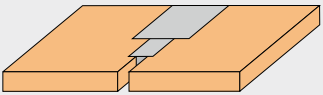


Figure 8: Filler joint: Joint width depends on board thickness

Figure 9: Clean containers, clean tools, clean water

Figure 10: Add **fermacell** Joint Filler to water

Figure 11: Fill joints and fixing heads

Mixing the fermacell Joint Filler

- Mixing ratio: approx. 1 kg joint filler in approx. 0.6 l water
- Leave for around 2-5 minutes
- Stir until free of lumps (the use of a mechanical mixer will affect and speed up the working/open time. i. e. reduce it)
- If the compound has become too thin, add more joint filler (the filler should not slide off a vertical trowel)
- The mixture has an open time of approx. 35 minutes

Attention!
Hardened plaster residues in the same container significantly reduce the working/open time of a new batch of filler.
Do not add water if the filler starts to harden, as this will cause the filler to lose its strength.

Filling
Filling is carried out with an initial first fill and then a fine fill. The first fill should be completely dry before any fine filling/finishing takes place. **fermacell** Joint Filler should be pressed into the joints to the full depth of the boards.

In order to ensure adhesion to both board edges, the filler is pressed against the board edge and scraped to the opposite edge (herringbone pattern). The countersunk heads of the fixings and any damage is also filled at the same time. Any unevenness can be sanded down once the first fill has dried (mesh or sand paper, min. 160 grain/grit). Once the sanded dust has been swept away, fine finishing can take place.

Material requirements
Around 7-8 linear m of joints and corresponding fixing heads can be filled with 1 kg **fermacell** Joint Filler. This corresponds to around 0.2 kg/m² for the board size 150 × 100 cm. A 5 kg container of **fermacell** Joint Filler is enough for approx. 25 m² wall area, a 20 kg sack is enough for approx. 100 m².

For room-height boards, the joint filler requirement is approx. 0.1 kg/m².

Note:
Do not continue to use once the filler has started to harden.

Figure 12: Guide the 310 ml cartridge along the edge of the board. The special nozzle releases the exact amount of adhesive for 10 and 12.5 mm boards. The nozzle must be cut for 15 and 18 mm boards.

Adhesive joint

fermacell Gypsum Fibreboards must be dry when installed. Only **fermacell** Jointstik or greenline Jointstik can be used for the glue jointing.

When forming the adhesive joint, care must be taken to ensure that the board edges are dust-free and the adhesive is applied to the middle of the board edge and not the stud frame. Factory-cut board edges are recommended for adhesive joints. fermacell boards cut on site should be cut with a circular saw with a guide to give an absolutely straight edge.

The first fermacell board is fixed to the substructure. The **fermacell** Jointstik is then applied to the board edge with the fermacell nozzle. The second fermacell board is then pressed firmly against the first board.

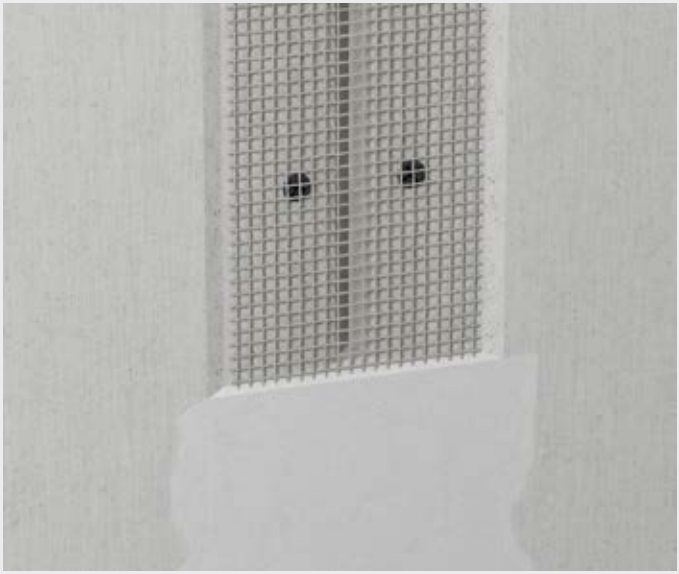
It is important that the adhesive completely fills the joint (i.e. the adhesive is visible at the joint) when the two board edges are pushed together. The maximum width of the joint must not exceed 1 mm. To prevent faults in the adhesive film during the subsequent installation and hardening, the joint should not be compressed to zero.

Depending on the room temperature and humidity, the adhesive will be set after approx. 18 to 36 hours and the excess adhesive is then scraped off. This can be done with, for example, the **fermacell** Glue Scraper, a paint scraper or a wide chisel. The joint area and the fixing heads are then finished with **fermacell** Joint Filler.

Tapered edge

The **fermacell** Gypsum Fibreboard also comes with a tapered edge (TE). The edge profile consists of a rebated flat section and a chamfer on the board edge.

The **fermacell** Tapered Edge Gypsum Fibreboard is used for interior walls, ceilings and the internal roof cladding.



Board properties		
Board thickness:	12.5 mm	
Board dimensions:	2,000 × 1,250 mm 2,540 × 1,250 mm	4 × DW edge 2 × DW edge

Other sizes are available, please call for further details

Tapered Edge Jointing

The TE boards are fitted with a dry butt joint with the same subframe spacing and fixings.

Joint tape must be applied to the tapered edge area. This could be the self-adhesive **fermacell** Tapered Edge Mesh Jointing Tape. **fermacell** Tapered Edge Mesh Jointing Tape is applied to the drywall edging before filling. The joint filler must be pressed through the mesh of reinforcement tape to fill the bottom of the joint and the whole Tapered Edge area must be completely filled.

Alternatively, the **fermacell** Tapered Edge Mesh Jointing Tape or 50 mm to 60 mm wide commercial glass fibre reinforcement strips can be used for the drywall construction. These must be embedded in the first layer of filler.

Once the joint filler has dried, the joint area is filled with a second layer of filler, depending on the desired level of quality. **fermacell** Joint Filler is used to fill the joint.

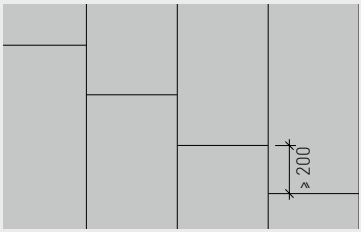


Figure 13:
Installation in a
running bond

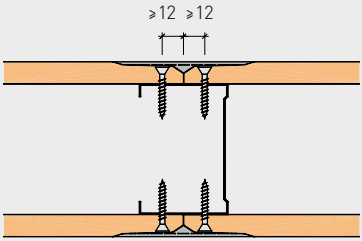


Figure 14:
Non-load-
bearing fixing

Installation

The waste-free installation of **fermacell** Gypsum Fibreboards with Tapered Edge is carried out in a set sequence.

The boards must be offset by at least 200 mm. Cross joints are not allowed!

The use of room-height boards is recommended for professional use.

The filling of joints and fixings must only be carried out with **fermacell** Joint Filler.

In multiple-layer boarding the first layer can consist of boards without tapered edges and the joints do not need to be filled. The second layer can be fixed to the first layer of **fermacell** Gypsum Fibreboards with 19 mm split staples.

The joints between the first and second layer must be offset by at least 200 mm.

If the tapered edge is used in the lower layer, the joint areas must be filled with **fermacell** Joint Filler for sound insulation and fire protection requirements.

Edge spacing

The edge spacing for the fixings must be observed for non-load-bearing wall constructions as shown in the to the drawings.

Joint variants

1. Two factory-made tapered edge boards with **fermacell** Tapered Edge Mesh Jointing Tape and **fermacell** Joint Filler
2. Two factory-made tapered edge boards with **fermacell** Reinforcing Paper Tape or glass-fibre reinforcement strips and **fermacell** Joint Filler
3. One factory-made tapered edge and one edge cut on-site and **fermacell** Joint Filler

Sawing as well as "scoring and snapping" methods can be used for cutting boards to size.

Advantages of fermacell drywall edging:

- Fast installation of **fermacell** Gypsum Fibreboards without gap
- Easy construction of level surfaces
- 2/3 of the fixing components are sealed with the filler in a single operation
- Waste-free installation due to surrounding tapered edge

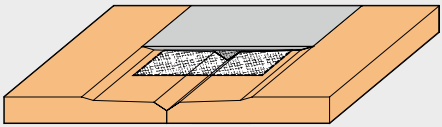


Figure 15:
Joint variant 1:
Two factory-made tapered edges with drywall reinforcement tape and **fermacell** Joint Filler

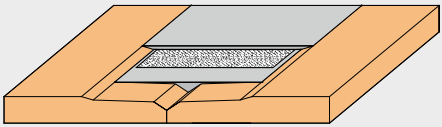


Figure 16:
Joint variant 2:
Two factory-made tapered edges with **fermacell** Tapered Edge Paper Jointing Tape or Glass-fibre Reinforcement Strips and **fermacell** Joint Filler

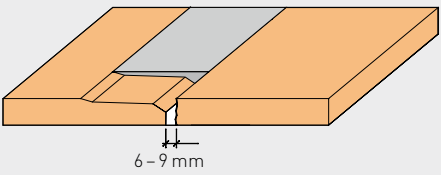


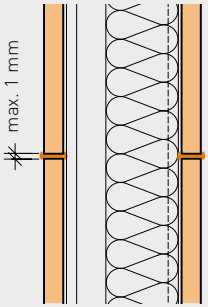
Figure 17:
Joint variant 3:
One factory-made tapered edge and one edge cut on-site and **fermacell** Joint Filler

Location of horizontal joints for fermacell walls

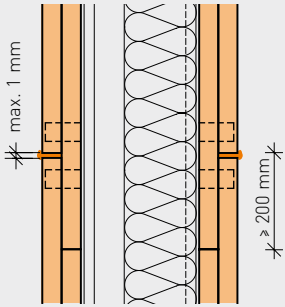
As horizontal joints can weaken the stability of free-standing drywall constructions, such as non-load-bearing walls, linings, fire and shaft walls, and normally create additional expense, they should be avoided or minimised and room-height boards should be used. If they are still required for heavy-duty areas, they should ideally be positioned in the upper wall area and finished with adhesive joints. The horizontal joints should be designed as adhesive joints, filled joints or tapered edge joints for each side the partition.

For double or multiple-layer partitions the lower layers can be butt-jointed, regardless of the structural requirements. Either joint solution is suitable for the outer layer of boards.

In general we recommend a minimum joint offset between the upper and lower board layers of ⩾ 200 mm, both vertically and horizontally.



Horizontal adhesive joint



1. Lower layer dry butt-jointed
2. Outer layer Jointstik joint

Note:
With regard to horizontal board edges, it should be noted that these must be dust-free directly before applying the joint adhesive. The same applies for the option with filled joints.

Dry-wall finish on walls

Substrate requirements

The substrate must be dry and sufficiently stable, as flat as possible and shrinkage-free, insulated against rising damp and waterproof against driving rain. Loam or loam plaster is not suitable as a substrate. Special advice should be sought in regard to rigid foams.

Loose plaster, old paints, residual wallpapers, wallpaper waste, formwork oil and impurities must be removed before the boards are fixed in position. If there is mastic asphalt, bonding of **fermacell** Gypsum Fibreboards with bonding compound and jointing can only take place once the screed has cooled down.

Highly absorbent substrates, such as aerated concrete, do not need to be specially pre-treated (e.g. wetted) due to the special properties of the **fermacell** Bonding Compound. Any minor wall unevenness up to 20 mm can be levelled out during installation with **fermacell** Bonding Compound. For greater depths, packing out is required.

If there is likely to be any uncertainty as regards the strength of the substrate, mechanical fixing– with wooden battens etc. – should be used.

fermacell Bonding Compound

fermacell Gypsum Fibreboards must only be installed with **fermacell** Bonding Compound.

Mixing the fermacell Bonding Compound

- Clean containers, clean tools, clean water
- Add **fermacell** Bonding Compound to water
- Mixing ratio: approx. 10 kg bonding compound to approx. 6 l water; allow to rest for around 2 minutes
- Stir until a smooth consistency is achieved.
- If the compound has become too thin, sprinkle in more bonding compound (mixture should not slide off a vertical trowel)
- The mixture has an open time of approx. 35 minutes

Attention!

Hardened plaster residues in the same container significantly reduce the working and setting time of a new batch of filler.

Do not add additional water. The bonding compound will lose its strength.

Do not continue to use once the bonding compound has started to harden.

The **fermacell** Bonding Compound is delivered in 20 kg sacks and is suitable for hand and electric mixing.

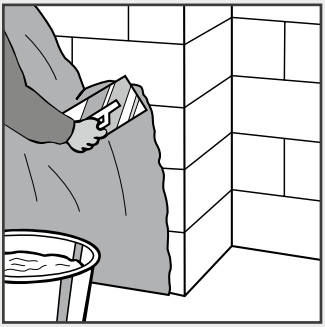


Figure 18: On chimney walls a layer of bonding compound is applied and the fermacell boards floated into position.

Fixing fermacell boards to chimney walls

fermacell Gypsum Fibreboards must be fully bonded to chimney walls. The bonding compound layer must not exceed 15 mm. A gap of 200 mm must be maintained between flues and the boards. This surface must be closed with **fermacell** Bonding Compound so it is flush. The local building regulations must be complied with. The centre-to-centre distances between the spots and beads applied to **fermacell**l Gypsum Fibreboards (10 mm thick) should not exceed 450 mm – or 600 mm for boards that are 12.5 mm thick.

Fixing to normal level substrate

Examples of such substrates are brick walls, sand-lime blocks and cavity blocks.

fermacell Bonding Compound is applied to the backs of the boards using the spot-and-bead method, or directly to the wall. The centre-to-centre distances between the spots and beads applied to **fermacell** Gypsum Fibreboards (10 mm thick) should not exceed 450 mm – or 600 mm for boards that are 12.5 mm thick.The distance to the board edge must not exceed 50 mm.

Around 3 to 4 kg of **fermacell** Bonding Compound is required per square metre of wall area.

figure 19 contains more information about the spot-and-bead method.

Fixing to very level substrate

This type of fixing is used, for example, for walls made of aerated concrete blocks or for very flat concrete surfaces.

fermacell Bonding Compound is mixed to a slightly more liquid consistency and beads are applied to the rear of the **fermacell** Gypsum Fibreboards so that the beads are not more than 50 mm from the edge of the board. The **fermacell** Bonding Compound must not penetrate the joint. The clear spacing between the spots and beads should not exceed 400 mm for **fermacell** Gypsum Fibreboards (thickness = 10 mm).

The boards coated with **fermacell** Bonding Compound are then offered up to the wall and gently tapped into position and aligned with a straight edge.

Aerated concrete walls must be brushed vigorously before the fermacell boards are fixed in position. This provides a suitable key for the substrate.

With regard to this type of fixing, around 1.5 - 2 kg of **fermacell** Bonding Compound is required per square metre of wall area.

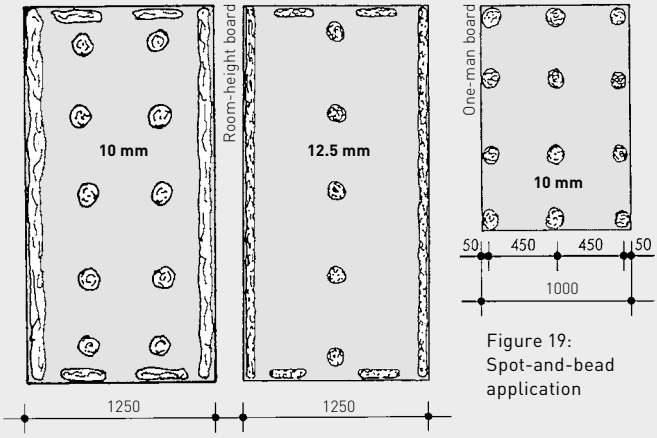


Figure 19:
Spot-and-bead application

In general **fermacell** Bonding Compound should form a solid bonded connection between the board and substrate at all points. With regard to door interfaces and around washbasins, brackets etc., **fermacell** Gypsum Fibreboards must be fully bonded to the substrate using **fermacell** Bonding Compound. We recommend a minimum of 2 mechanical fixings into the substrate and these should be in the top two corners of the boards, approximately 250 mm in from each edge.

Junctions

When connecting fermacell walls, suspended ceilings etc., which are lined with single or double layers of **fermacell** Gypsum Fibreboard, to different materials, such as plaster, exposed concrete, brickwork, steel or wood building materials, the different building materials should be separated. There are several options for these interfaces – as shown in figure 21 (page 34):

- Fit oiled paper or strips of PE film between the mineral-wool edge insulation and the adjacent component/material together with the wall and ceiling junction profiles. Select a strip width so that there is an overlap with the outer surface of the fermacell lining. Ensure a joint width of 5-7 mm, and fill with **fermacell** Joint Filler. Once the **fermacell** Joint Filler has set, cut off any excess strips on both sides flush with the boards.

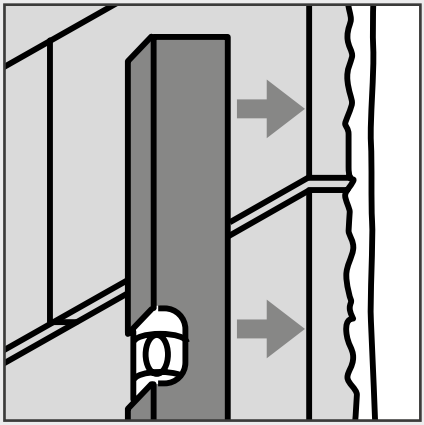
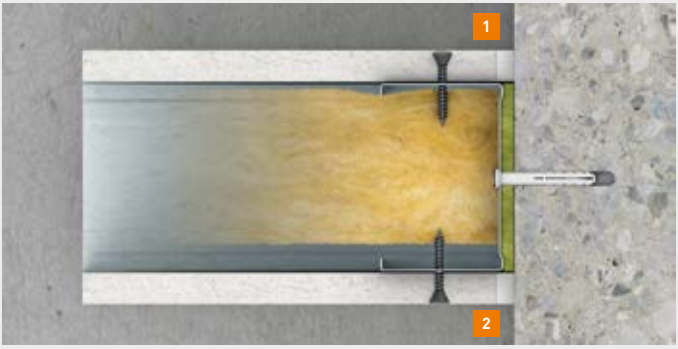
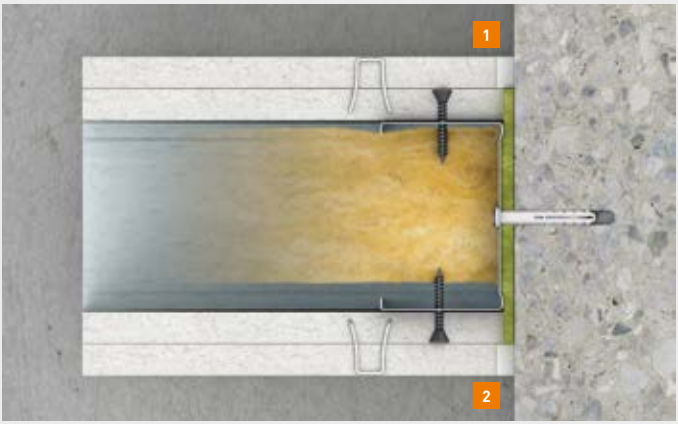


Figure 20: Offer board up to the wall, gently tap into position and align with a straight edge.

Wall and ceiling junctions with
single-layer fermacell lining



Wall and ceiling junctions with double-layer fermacell lining



1 Apply separator strips, e.g. oiled paper, PE film, adhesive strips and similar, to the interfaces. When the **fermacell** Joint Filler has set, cut these off flush with the boards or

2 seal with elastic sealing material.

Figure 21: fermacell system-built wall, separate wall and ceiling interfaces. Suspended ceiling junctions on walls are installed in the same way.

- Install the wall and ceiling junction profiles with mineral wool or similar perimeter insulation and fix to the adjacent component. Apply adhesive tape to the structure before lining the substructure with **fermacell** Gypsum Fibreboards and allow to project over the outer surface of the boarding. Ensure a joint width of 5-7 mm. Once the **fermacell** Joint Filler is dry, cut the overlapping adhesive tape flush with the wall.

- Seal the joints between the **fermacell** Gypsum Fibreboards and adjacent component with elastic sealing material with long-term expansion capability of at least 20%. The connecting joint should be 5-7 mm wide.

Follow the sealant manufacturer's instructions for filling the joints. Make sure that the sealant has adhered to both sides of the joint and that the connecting joint has the same width throughout.

The two separating options in figure 21 presuppose that no movement at all is likely to occur in the main walls and that consequently there are no external forces acting on the fermacell system-built wall, suspended ceiling, etc.

Movement joints

Movement joints must be incorporated in fermacell walls and suspended ceilings where there are movement and expansion joints in the shell construction. As **fermacell** Gypsum Fibreboards are subject to length variation in different indoor climates (shrinkage and expansion), this must also be taken into account by incorporating expansion joints. Movement joints in fermacell system-built walls and ceiling constructions should be no more than 800 cm apart if they are designed as filled joints. When using Jointstik, the expansion joints can be up to 1,000 cm apart.

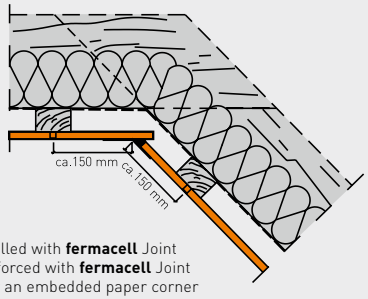
Note:
Maximum spacing for movement joints:
- Filled joints in walls/ceilings – 800 cm
- Jointstik joints in walls/ceilings – 1,000 cm

Loft conversions with fermacell

Collar beam construction on roof pitch

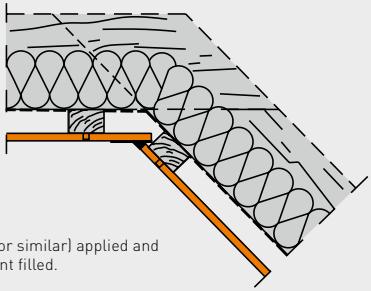
There are three options for joining a collar beam construction to a pitched roof.

Please make sure that the substructure does not continue right into the corner. Information concerning the installation of the filler joint can be found on page 22.



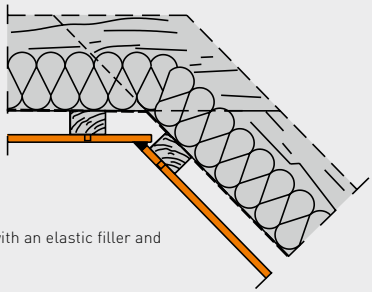
5-7 mm joint filled with **fermacell** Joint Filler and reinforced with **fermacell** Joint Repair Tape or an embedded paper corner reinforcement tape.

Figure 22:
1. Joint filler with **fermacell** Joint Repair Tape or an embedded paper corner reinforcement tape



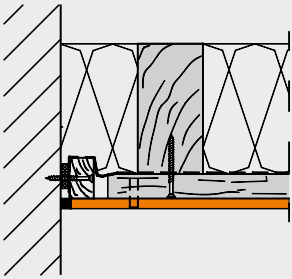
Masking tape (or similar) applied and the exposed joint filled.

Figure 23:
2. Filled joint with masking tape



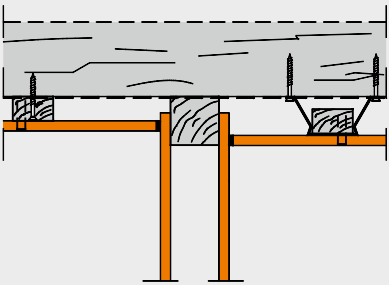
5-7 mm joint with an elastic filler and primed edges.

Figure 24:
3. Elastic joint (e.g. acrylic)



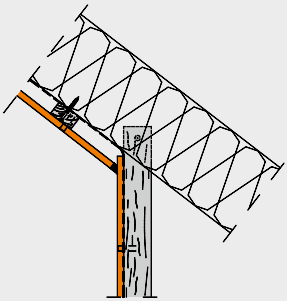
Corner with flexible joint or filled with the aid of masking tape

Figure 25: Interface between collar beam construction and gable wall



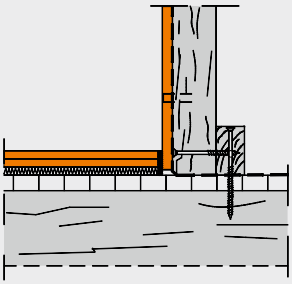
Corner as for collar beam construction connecting into roof pitch

Figure 26: Interface between collar beam construction and partition wall



Corner as for collar beam construction connecting into roof pitch

Figure 27: Interface between pitched roof and jamb sill/side aisle wall



Interface between jamb wall and timber joist roof floor – see also installation instructions for **fermacell** Flooring Elements

Figure 28: Interface between partition wall and floor

Surface finishing

Preparation of the substrate

The surface to be treated must be assessed for suitability prior to any finishing work, e.g. painting, wallpapering or tiling. The surface including the joint must be dry, solid and free of dirt and dust. In particular please ensure that

- splashes of gypsum, mortar etc. are removed,
- scratches, indentations, etc. are filled with **fermacell** Joint Filler or FST,
- all filled areas are smooth and sanded if necessary.

fermacell Gypsum Fibreboards are sealed at the factory. Additional undercoats and primer coatings are only required if stated by a system manufacturer for use with gypsum-based boards, e.g. for thin or textured plaster, paint finishes or tile adhesive.

Low-moisture primers must be used. With regard to multiple-layer systems, the drying times of the respective manufacturers must be observed.

In addition to the information provided in this section, other technical requirements or standards may apply, e.g. the German Construction Contract Procedures (VOB) part C and the General Technical Terms and Conditions for Construction Work (ATV) contained therein as well as guidelines from various associations.

Site conditions

The moisture content of **fermacell** Gypsum Fibreboards must be below 1.3%. This board moisture is reached within 48 hours if the air humidity is below 70% and the air temperature is above 15 °C.

All applied screeds and plasters must be dry. The surface must be dust-free.

Paints

All commercial paints, such as latex, dispersion or gloss paints, can be used on **fermacell** Gypsum Fibreboards for a painted finish. In principle, low-moisture systems are preferable. Mineral paints, e.g. lime paints and silicate paints, can only be applied to fermacell if they are approved by the paint manufacturer for gypsum fibre/gypsum boards.

With regard to latex paints, the desired opacity must be considered. User a lambswool or foam roller to suit the paint that is to be applied. Textured or filled paints must be selected for high-quality coatings.

The paint should be applied in at least two coats in accordance with the manufacturer's recommendations. We recommend coating a test area first. Please note the information provided by the system manufacturer.

Wallpapers

All types of wallpaper - even woodchip – can be applied with commercial methyl-cellulose-based wallpaper paste – wallpaper primer is not necessary. Stripping the wallpaper during renovation does not cause damage to the surface. For thick or dense wallpapers, such as vinyl, a low-moisture adhesive must be used.

Regardless of the type of wallpaper, primers are only needed on the fermacell surfaces if required by the adhesive manufacturer.

Thin plasters / Skim

If fermacell surfaces are coated with thin plaster (skim) (thickness 1 to 4 mm), the joint must be reinforced with **fermacell** Joint Repair Tape when using the joint filler and tapered-edge boards. The tape is applied with white glue (PVAC glue, 2 coats - diluted with equal parts of water), and does not need to be coated with filler. The adhesive joint and tapered edge constructed with **fermacell** Tapered Edge Paper Jointing Tape does not require additional reinforcement. Use the trowel to create a dummy joint in the thin layer of plaster at the corner and wall interfaces.

Thin plasters with mineral binding agents, which are suitable for gypsum fibre/ gypsum boards, and synthetic resin plasters may be used based on the manufacturer's instructions. We also recommend using barrier primers that are compatible with the plaster system.

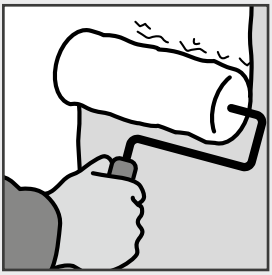


Figure 29: Painting

Figure 30: Wallpapering

fermacell Roll-on Surface Treatment

fermacell Roll-on Surface Treatment is a ready-to-use, dispersion-based, decorative white marble textured coating for **fermacell** Gypsum Fibreboards. It can be tinted with commercial tinting concentrates and pigments. For mixing do not exceed a mass percentage of 5 % .

fermacell Roll-on Surface Treatment can be used to coat walls and ceilings made of **fermacell** Gypsum Fibreboards in indoor areas and outside areas which are not directly exposed to the weather.

fermacell Roll-on Surface Treatment should not be used under a product and working temperature of + 5 °C. The substrate must be clean, dry and stable and the surface must be at least quality level 2 (see section 16, surface quality). **fermacell** Gypsum Fibreboards do not need to be primed.

Applying fermacell Roll-on Surface Treatment:

Stir the contents of the container thoroughly, also after each work break. After preparing the substrate, apply the undiluted **fermacell** Roll-on Surface Treatment horizontally with a suitable roller and then create the desired textured finish, e.g. with a sponge roller. The working time after application depends on the ambient temperature; typically this will be around 10-20 minutes. With regard to internal corners, the following process is recommended for an even texture. First coat one wall, allow to dry, cover the coated corner and then coat the other wall. The surfaces must be protected from draughts.

Due to the wide range of possible influences during installation and application, we recommend coating a test area.

fermacell Roll-on Surface Treatment can be coated with dispersion, latex, acrylic and silicone resin paints.

Panels/Tiles

Walls and facings are covered with one or two layers of **fermacell** Gypsum Fibreboards. The centre-to-centre distances between sections of the sub-structure must not exceed 50 × board thickness. Therefore

- board thickness = 10 mm centre-to centre distance = 50 cm
- board thickness = 12.5 mm centre-to-centre distance = 62.5 cm

All boards made of ceramics and plastics can easily be applied to **fermacell** Gypsum Fibreboards using the thin-bed method. Dispersion and reaction resin adhesives or polymer-modified cement powder adhesives are suitable in accordance with the manufacturer's recommendations.

A primer must be applied to gypsum fibre/gypsum boards if this has been specified by the manufacturer of the adhesive. This must be allowed to dry thoroughly (normally 24 hours) before tiling. Low-moisture tile adhesive should be used, e.g. polymer-modified cement powder adhesive, such as **fermacell** Flexible Tile Adhesive. The tiles must not be pre-soaked. The tile adhesive must be dry before grouting (drying time normally 48 hours).

Flexible grout should be used for the grouting.

Figure 31: Tiling

Waterproofing

According to the building regulations of the German federal states, constructions and components should be arranged in such a way "that water and moisture and other chemical, physical or biological influences do not result in any hazard or unacceptable nuisance". Structural installations, which are exposed to moisture, must therefore be protected against moisture.

Drywall constructions with wooden and metal substructures, lined with board materials, in combination with waterproofing systems in bathrooms and wet rooms, have been tried and tested in indoor areas for decades and this method is considered a generally recognised code of practice. Drywall constructions for bathrooms and wet rooms are used in hotels, hospitals, schools, office buildings and residential buildings, regardless of the design.

The designs of drywall constructions in these areas are only partially covered in standards and guidelines.

- Information concerning the area that is not regulated by the building authorities (e.g. domestic bathrooms) and the area that is regulated by the building authorities (e.g. public showers) can be found in information sheet 5 "bathrooms and wet rooms in timber and drywall constructions", written and published by the major drywall associations (IGG) and in the information sheet issued by ZDB, German Construction Federation, with reference to composite waterproofing systems.

According to these information sheets, the use of gypsum fibreboards is not permitted in applications that are regulated by the building authorities. The cementitious **fermacell** Powerpanel H_2O boards are suitable for such applications (see separate document).

Waterproofing systems

Please refer to your local building regulations and guidelines for waterproofing systems with regard to any specific application.

The **fermacell** Waterproofing System is a bonded waterproofing system, consisting of **fermacell** Deep Primer, the **fermacell** Waterproofing Application (polymer dispersion) and the **fermacell** Flexible Tile Adhesive (thin-bed mortar). The thin-bed mortar stipulated in the general building authority test certificate is tested according to DIN 12004 and bears the CE mark. This product standard also applies to alternative adhesive products in any area that is not regulated by the building authorities.

Table 1: Definition of moisture exposure classes in the wall area

Exposure class	Type of exposure	Areas of application
Moisture exposure classes in any area that is not regulated by the building authorities (light and medium duty)		
0	Walls, floors and ceiling surfaces, which are only occasionally exposed to small amounts of spray water	■ Guest WCs (with no shower and bathtub) ■ Domestic kitchens ■ On walls in sanitary installations, e.g. washbasins and wall-hung WCs
A0	Surfaces of walls, floors and ceilings, which are only occasionally exposed to moderate amounts of spray water	In domestic bathrooms directly exposed to water spray from showers and bathtubs with shower panels
Moisture exposure classes in areas regulated by the building authorities (heavy duty) Pursuant to ZDB information sheet "Bonded waterproofing – Notes for the installation of liquid bonded waterproofing with lining and coverings with tiles and panels for internal and external areas" Revised 01/2010		
A	Surfaces of indoor walls, floors and ceilings with major exposure to non-pressing water	Walls in public showers
C	See above, but also with exposure to chemicals	Walls in commercial kitchens and laundries

Typical guidance levels.
Please refer to your local building regulation guidelines.

No or little exposure to spray water,
exposure class 0

Moderate exposure to spray water (spray water area),
exposure class A0

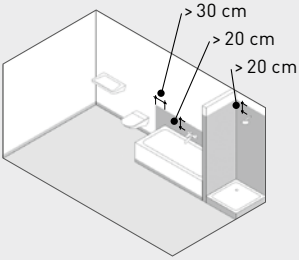


Figure 32:
Domestic bathroom with
bathtub and shower

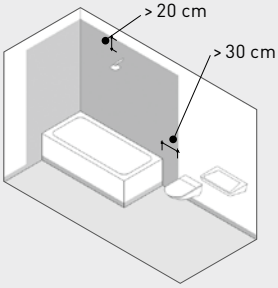


Figure 33:
Domestic bathroom with shower bath

Waterproofing system
Installation

fermacell Gypsum Fibreboards are installed following the guidelines for dry areas.

The joints and fixings must at least be filled to comply to quality level Q1 (see section 16 "surface quality") before installing the **fermacell** Waterproofing System.

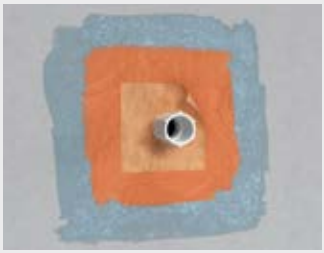
Please refer to the illustrated waterproofing areas for the surfaces that require water-proofing. The waterproofing should extend at least 20 cm above the shower head for fixed shower rails.

System sealing tapes, sealing corners and pipe penetration patches must be applied to wall/wall and wall/floor edge junctions and movement and connection joints, e.g. at openings. Furthermore, the entire base area of the walls in a room with a shower or bathtub should be waterproofed to protect against any moisture rising from the floor.

The waterproofing components are applied as shown in the following figures.

Figure 34: Full-surface application of **fermacell** Deep Primer

Figure 35: Press the **fermacell** Sealing Tape into the previously applied, wet **fermacell** Waterproofing Application and coat directly with the liquid waterproofing



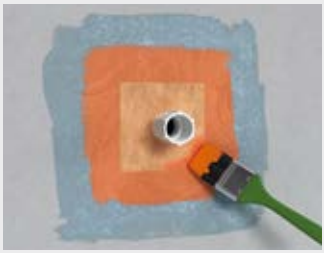


Figure 36: Embed the pipe penetration patches in the wet **fermacell** Waterproofing Application to seal pipe penetrations and re-coat directly

Figure 37: 2 × full-surface application of **fermacell** Waterproofing Application with a roller (minimum total thickness 0.5 mm)

Figure 38: Tiling with **fermacell** Flexible Tile Adhesive depending on the moisture exposure class

Sealing penetrations and individual components

In principle, according to the details, there should be a primary and secondary seal, e.g. for bathtubs and showers. The primary seal is the non-visible seal between the bathtub rim and the panelling.

The secondary seal is the visible connection between the bathtub or shower rim and the tiles (maintenance joint). Further information can be found in the previously mentioned information sheets.

Table 2: Suitable substrates for bonded waterproofing in the area that is not regulated by the building authorities

	Moisture exposure classes			
	Wall		Floor	
	0 low	**A0 med.**	**0 low**	**A0 med.**
fermacell Gypsum Fibreboard **fermacell** Flooring Element	○	●	○	● [3]
Gypsum boards[1]	○	●	○ [2]	● [2] [3]
Other gypsum construction boards	○	●		
Gypsum plaster	○	●	X	X
Cement-lime plaster	○	●		
fermacell Powerpanel H_2O **fermacell** Powerpanel TE	○	○ [4]	○	○ [4]
Calcium-sulphate screed	X	X	○	● [3]
Cement screed	X	X	○	○ [4]

[1] Use according to DIN 18181 (as of 02/2007).
[2] Comply with manufacturer's recommendations.
[3] Not suitable in areas with regularly used floor drainage (e.g. barrier-free shower area).
[4] Edge connections and movement joints must have sealing tape in the waterproofing system.
X Application not suitable.
○ Area without need for waterproofing (waterproof if required and commissioned by client or planner).
● Waterproofing required.

Table 3: Areas of application for the fermacell Waterproofing System Components for fermacell Gypsum Fibreboards

			fermacell Gypsum Fibreboards			
Product name	**Area of application**	**Procedure**	**Area not regulated by building authorities**		**Area regulated by building uthorities**	
			Wall	**Floor**	**Wall**	**Floor**
			Moisture exposure classes			
			Class A0 (moderate)	**Class A0 (moderate)**	**Class A (high)**	**Class A (high)**
fermacell Deep Primer	Full-surface	Fig. 1	●	●	The use of gypsum products as a substrate is not allowed*	
fermacell Sealing Tape in system **fermacell** Sealing Corners	Edge connections wall/wall, wall/floor Movement joints, connection joints	Fig. 2	●	●		
fermacell Waterproofing Application	Full-surface	Fig. 3	●	●		
fermacell Pipe Penetration Patches	Pipe penetrations for shower and bath fittings	Fig. 4	●	●		
fermacell Flexible Tile Adhesive[1)]	Tile adhesive for wall and floor areas	Fig. 5	●	●		

● Waterproofing necessary in the moisture exposure class.
With regard to moisture exposure class 0 (low exposure), waterproofing is not required for the use of fermacell products (gypsum fibre and Powerpanel)
* **fermacell** Powerpanel H_2O and TE are suitable products for class A.
[1)] or suitable product pursuant to page 43 "waterproofing systems".
The **fermacell** Waterproofing System can be used in class A in wall areas on suitable substrates.

Typical guidance levels.
Please refer to your local building regulation guidelines.

Detailed solutions for wet room interfaces

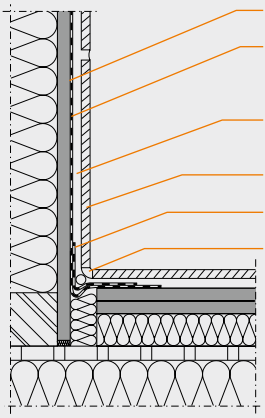


Figure 39: Wall-floor interface in area exposed to water

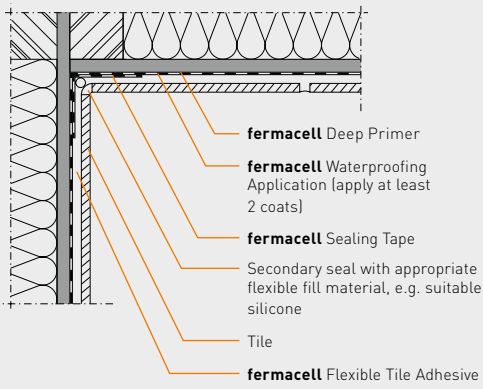


Figure 40: Wall-corner interface in area exposed to water

Surface filling

fermacell offers two products for the production of high-quality surfaces through surface filling. Surface qualities up to Q4 can be produced with ready-to-use **fermacell** FST (Fine Surface Treatment) or **fermacell** Fine Surface Treatment (powdered form).

fermacell FST (Fine Surface Treatment) is suitable for both surface filling of indoor wall and ceiling surfaces and for fine filling of joint areas. Do not use **fermacell** FST on cement-based boards.

The products should not be applied at temperatures below + 5 °C. The substrate must be free of dust, dry (average humidity ⩽ 70% over a period of several days), clean, stable and free of any separating agents.

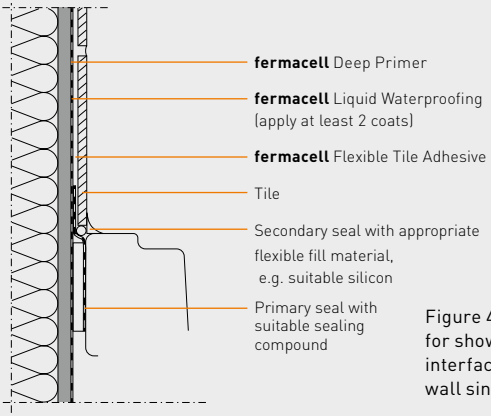


Figure 41: Wall interfaces for showers or bathtubs, interface with fermacell wall single-layer boarding

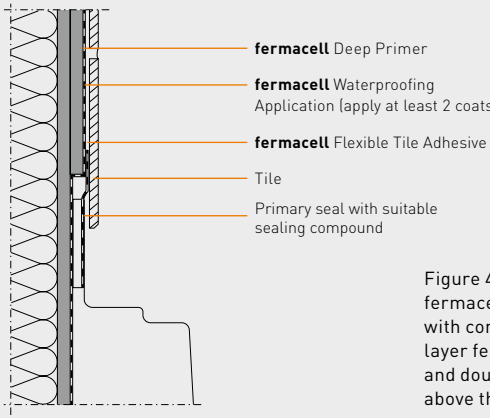


Figure 42:
fermacell wall interface with continuous single-layer fermacell boarding and double-layer fermacell above the bathtub

As the **fermacell** Gypsum Fibreboards are factory-sealed, additional priming of the boards is not necessary.

Where the work planned involves high levels of moisture exposure, such as the installation of wet screed or wet plaster work, filling work can only take place after drying.

With regard to hot/mastic asphalt, the filler can only be applied after cooling.

We recommend the **fermacell** Spatula, trowel or smoothing trowel for efficient application of **fermacell** Fine Surface Treatment.

Application of fermacell Fine Surface Treatment:

fermacell Fine Surface Treatment can be used straight from the tub without time-consuming preparation. The white ready-to-use dispersion filler contains water and very finely ground high-purity dolomite marble and it should be applied as thinly as possible. The layer thickness should be under 0.5 mm per application.

The applied material can be scraped away again with the 250 mm **fermacell** Spatula. This installation technique ensures that there are no application marks left by the applied **fermacell** Fine Surface Treatment. If excess material is returned to the tub, it should be used within a short period of time.

Layer thicknesses ⩾ 0.5 mm should be carried out in several steps. The previous surface treatment layer must be completely dry.

Application of fermacell Fine Surface Treatment (powdered form):

The powdered, synthetic-resin modified **fermacell** Fine Surface Treatment is mixed on site according to the instructions on the packaging.

Container, tools and water must be clean. Mix **fermacell** Fine Surface Treatment (Powdered Form) thoroughly with water, stir and allow to stand for 2-3 minutes, and then quickly stir once again to remove any lumps. The working time is approximately 45 minutes at 20 °C.

fermacell Fine Surface Treatment (Powdered Form) can be applied to zero thickness. It hardens in layer thicknesses up to 4 mm without disappearing into the surface or forming cracks and it is also suitable for the production of decorative trowel finishes.

If the gypsum surface treatment is applied in a layer thickness of 1 to 4 mm in one work cycle, the joint must be reinforced with **fermacell** Tapered Edge Mesh Jointing Tape when using the filler joint and drywall edging with **fermacell** Joint Repair Tape (see page 39 "Thin plasters").

Follow-up:

The **fermacell** Spatula can be easily cleaned with water and a brush after use. The spring steel blade must then be dried thoroughly to prevent rust formation.

Sanding:

If necessary, minor unevenness can easily be rectified with a hand sander or long-handled sander. The use of either mesh or sand paper with grain size P100 to P120 is suitable for this purpose. A safety mask and goggles must be worn during sanding. The sanded surfaces must be free from dust and, if necessary, primed before further surface finishing.

Figure 43: Surface treatment with **fermacell** FST (Fine Surface Treatment) and **fermacell** Fine Surface Treatment (powdered form)

Figure 44: Surface finishing
fermacell Gypsum Fibreboards

Surface quality

Terms such as "ready to paint" or the like are often found in the specification texts for wall and ceiling constructions, but they do not present a precise definition of the surface quality required.

On the basis of the design differences, the four quality classes are listed separately for the various joint systems. The current installation instructions for **fermacell** Gypsum Fibreboards are the basis for the fermacell joint system designs.

As a rule, the permissible tolerances in DIN 18202 apply for the evenness of wall surfaces. In connection with quality level 3, the increased evenness deviations should always be contractually agreed according to table 3 line 7. With regard to quality level 4 specifications, the increased evenness deviations must be contractually agreed according to table 3 line 7. If there is no information concerning filling in the specifications, quality level 2 (standard filling) will always be considered to have been agreed.

If the client uses grazing light or artificial lighting to assess the surface quality, then the client must ensure that the desired light conditions are met when implementing the work. The desired light conditions must also be contractually agreed for particular requirements.

If there are no optical requirements for the surface, basic filling and the filling of visible fixings is not required with regard to static or fire protection requirements. The prerequisite for this is that the butt-jointed boards have a maximum joint width of 1 mm (this does not apply for the use of boards with tapered edge).

Flatness deviations

Extract from DIN 18202 table 3 –Limit values for flatness deviations						
Column	**1**	**2**	**3**	**4**	**5**	**6**
		Gauges as limit values in mm for Meas. point distances in mm up to				
Row	**Reference**	**0.1**	**1**	**4**	**10**	**15**
6	Finished walls and undersides of ceilings, e.g. plastered walls, wall cladding, suspended ceilings	3	5	10	20	25
7	As for line 6, but with increased requirements	2	3	8	15	20

Typical guidance levels.
Please refer to your local building regulation guidelines.

Relationship between gauge and distance between measuring points

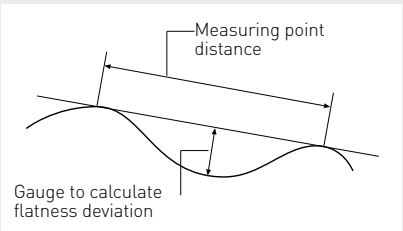


Figure 45: Filler joint

Figure 46: Tapered edge joint

Filler joint and tapered edge joint

Quality level 1: (Q1 gypsum fibre) Basic filling

For surfaces with low optical requirements, which require filling for technical or structural reasons (e.g. sealing layers).

Required work:

- Filling of joints with **fermacell** Joint Filler
- Filling of visible fixings with **fermacell** Joint Filler or Fine Surface Treatment
- Removal of excess filling material

Quality level 2: (Q2 gypsum fibre) Standard filling

The surfaces of fermacell constructions are quality level 2 with the following normal requirements:

- Structural wall covering in medium and coarse texture, such as wallpapers and woodchip (medium or coarse grain according to DIN 6742)
- Matt filler coatings, which are applied with rollers (dispersion coatings, thin plasters)

Required work:

- Filling of joints with **fermacell** Joint Filler
- Filling of visible fixing with **fermacell** Joint Filler or Fine Surface Treatment
- Smooth and continuous filling of joints and fixings

Quality level 2 does not rule out application marks on joints, particularly under grazing light.

Quality level 3: (Q3 gypsum fibre) Special filling

For surfaces, the quality of which exceeds the normal requirements. The surface quality must be contractually agreed and specified separately. Quality level 3 is suitable for the following surfaces:

- Fine-textured wall coverings
- Matt, non-textured coatings
- Final coat with a grain size < 1.00 mm, provided that this is approved or **fermacell** Gypsum Fibreboards

Required work:

- Filling of joints with **fermacell** Joint Filler
- Filling of visible fixings with **fermacell** Joint Filler or Fine Surface Treatment
- Broad filling (feathering) over joints
- Full-surface covering and scraping back of entire surface with **fermacell** Fine Surface Treatment or other suitable filling materials

Unevenness visible under grazing light, such as application marks on joints, cannot be excluded, but the unevenness is less than for Q2. Differences in surface texture must not be visible.

Quality level 4: (Q4 gypsum fibre) Special filling

fermacell Gypsum Fibreboards are provided with full surface treatment for the highest level of quality. The surface quality must be contractually agreed and specified separately. Quality level 4 must be contractually agreed in the following cases:

- Smooth or fine-textured wall coatings, e.g. gloss coated surfaces
- Metal or thin vinyl wallpapers
- High-quality finishing technologies

Required work:

- First filling of joints with **fermacell** Joint Filler
- Filling of visible fixings with **fermacell** Joint Filler or Fine Surface Treatment
- Broad filling (feathering) over joints
- Full-surface covering and smoothing of entire surface with **fermacell** Fine Surface Treatment or other suitable filling materials

Unevenness at the joints must not be visible. Different shades due to minor large-area unevenness cannot be excluded.

Figure 47: Jointstik joint

Jointstik joint

Quality level 1: (Q1 gypsum fibre) Basic filling

For surfaces with low optical requirements, which require filling for technical or structural reasons (e.g. sealing layers).

Required work:

- Application of adhesive to the joints
- Scraping off excess joint adhesive after hardening
- Filling of visible fixings with **fermacell** Joint Filler or Fine Surface Treatment

Quality level 2: (Q2 gypsum fibre) Standard filling

The surfaces of **fermacell** Gypsum Fibreboard constructions are quality level 2 with the following normal requirements:

- Structural wall coverings in medium and coarse textures, such as wallpapers and woodchip (medium or coarse grain according to DIN 6742)
- Matt fillers, which are applied with rollers (dispersion coatings, thin plasters)

Required work:

- Application of adhesive to the joints
- Scraping off excess joint adhesive after hardening
- Filling of visible fixings with **fermacell** Joint Filler or Fine Surface Treatment
- Smooth and continuous filling of joints and fixings

Quality level 2 does not rule out application marks on joints, particularly under grazing light.

Quality level 3: (Q3 gypsum fibre) Special filling

For surfaces, the quality of which exceeds the normal requirements. The surface quality must be contractually agreed and specified separately. Quality level 3 is suitable for the following surfaces:

- Fine-textured wall coverings
- Matt, non-textured coatings
- Final coat with a grain size < 1 mm, provided that this is approved for **fermacell** Gypsum Fibreboards

Required work:

- Application of adhesive to the joints
- Scraping off excess joint adhesive after hardening
- Filling of visible fixing components with **fermacell** Joint Filler or Fine Surface Treatment
- Broad filling of joints
- Full-surface coating and smoothing of entire surface with **fermacell** Fine Surface Treatment or other suitable filling materials

Unevenness visible under grazing light, such as application marks on joints, cannot be excluded, but the unevenness is less than for Q2. Differences in surface structure must not be visible.

Quality level 4: (Q4 gypsum fibre) Special filling

fermacell Gypsum Fibreboards are provided with full surface treatment for the highest level of quality. The surface quality must be contractually agreed and specified separately quality level 4 must be contractually agreed in the following cases:

- Smooth or fine-textured wall coatings, e.g. gloss coated surfaces
- Metal or thin vinyl wallpapers
- High-quality finishing technologies

Required work:

- Application of adhesive to the joints
- Scraping off excess joint adhesive after hardening
- Filling of visible fixing components with **fermacell** Joint Filler or Fine Surface Treatment
- Broad filling of joints
- Full-surface coating and smoothing of entire surface with **fermacell** Fine Surface Treatment or other suitable filling materials

Unevenness at the joints must not be visible. Different shades due to minor large-area unevenness cannot be excluded.

Load-fixing to walls and ceilings

Fixing point loads

Light point loads that run vertically parallel to the wall surface, such as pictures or light decorations, can be fixed directly to fermacell panel without fixing to the substructure. These can be fixed with suitable, simple commercial fixing components. For example, nails, picture hooks with single or double nail fixing or screws and dowel (toggle fixings) are suitable for this purpose. Details on the load-carrying capacity of fixing components can be found in the table below.

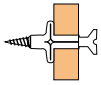
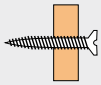
The specified permissible loads are based on a safety factor of 2.

Light point loads on fermacell walls

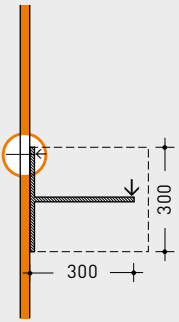
Picture hooks[1] with nail fixing	Permissible loads per hook in kN for different fermacell Gypsum Fibreboard thicknesses [2] (100 kg = 1 kN)				
	10 mm	12.5 mm	15 mm	18 mm	12.5 + 10 mm
	0.15	0.17	0.18	0.20	0.20
	0.25	0.27	0.28	0.30	0.30
	0.35	0.37	0.38	0.40	0.40

[1] Breaking strength of hooks depends on product.
Fixing of hooks to board linings only regardless of substructure.
[2] Safety factor: 2 (Static load with relative humidity of up to 85%)

Unit or dead loads on vertical fermacell walling[1]

Unit or dead loads mounted with dowels or screws	Permissible load for suspension in kN for different fermacell board thicknesses[3] (100 kg = 1 kN)					
	10 mm	12.5 mm	15 mm	18 mm	10 + 10 mm	12.5 + 10 mm
Rear-fixed dowel / toggle fixing[2] 	0.40	0.50	0.55	0.55	0.50	0.60
Screw with continuous thread ø 5 mm 	0.20	0.30	0.30	0.35	0.30	0.35

[1] Introduced according to DIN 4103, safety factor 2.
[2] Observe installation information from the dowel / toggle fixing manufacturer.
[3] Support spacing of substructure ⩽ 50 × board thickness.



Fixing Load [1] placed between vertical substructure

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The listed load values in the table above can be added together if the dowel spacing ⩾ 50 cm. If the spacing is less than 50 cm, then only 50% of the permissible max. load is applied per dowel. The sum of the point loads must not exceed 1.5 kN/m for walls, and 0.4 kN/m for free-standing wall lining and separated double stud walls. With regard to single-layer walls, the cross joints must be shown or designed as adhesive joints if the load values exceed 0.4 kN/m. Higher loads must be designed separately.

Load-fixing to ceiling linings

Ceiling loads can be installed or mounted to fermacell ceiling linings and suspended ceilings. Special toggle fasteners and metal spring dowels have proven their worth for this purpose.

Light "static" loads up to 0.06 kN (in compliance with DIN 18181:2008-10) can also be directly fixed to the lining with screws (screw diameter ⩾ 5 mm).

Additional loads must be designed for the substructure. With regard to fire protection requirements, special conditions exist for the load introduction.

The permissible loads per fixing component in an axial direction can be found in the following table.

Load-fixing to ceiling linings [1]

Loads on ceiling linings mounted with toggle or spring dowels	Permissible load for suspension in kN for different fermacell board thicknesses (100 kg = 1 kN)				
	10 mm	12.5 mm	15 mm	10 + 10 mm	12.5 + 12.5 mm
Toggle fastener [2] 	0.20	0.22	0.23	0.24	0.25
Spring dowel [2] 					

[1] Introduced according to DIN 4103, safety factor 2.
[2] Observe installation information from the dowel manufacturer.

fermacell Flooring Element:

for new constructions and old buildings, for solid and wooden joist ceilings

The fermacell Flooring Element is a dry screed. It has many advantages:

- Increase in living comfort.
- The elements can be installed quickly and easily. The installation time is very short.
- There are no static problems with the low weight. Particularly advantageous for lightweight ceilings in prefabricated houses and old buildings. An element in standard size 1,500×500 mm, 20 mm thick, weighs just approximately 18 kg.
- There are no drying times. All of the following on work can start immediately after the adhesive has hardened.

In addition to the practical properties and the excellent airborne and impact sound insulation, **fermacell** Flooring Element provides additional fire protection safety: with regard to fire exposure from above, e.g. 90 min at a construction height of 30 mm. Even the element itself achieves F30.

Further important information can be found in the **fermacell** Flooring Element installation instructions.

fermacell accessories for flooring elements:

- **fermacell** Self-levelling Compound, in 25 kg sacks. Self-levelling, for height adjustment up to 20 mm.
- **fermacell** Dry Levelling Compound, grain size 1-4 mm in 50 l sacks for levelling up to 100 mm fill depth in residential areas.
- **fermacell** Bonded Levelling Compound, in 80 l sacks. For fill depths of 30 to 2,000 mm.
- **fermacell** Honeycomb infill, highly sound-insulating granulate for the **fermacell** Honeycomb, in 15 l sacks.
- **fermacell** Honeycomb, highly sound-insulating honeycomb insulation system in 30 mm and 60 mm heights, for filling with honeycomb infill.
- **fermacell** Floor Glue for bonding joints
- **fermacell** Floor Screws
- **fermacell** Glue Scraper
- **fermacell** Perimeter Insulation Strip
- **fermacell** Trickle Protection Sheet
- **fermacell** Levelling Set

For wet room floors

fermacell offers the Powerpanel H_2O Flooring Element and the matching Powerpanel H_2O Showertray Element for barrier-free bathrooms and the **fermacell** Powerpanel H_2O Linear Shower Outlet 2.0, which are specifically for floor areas which are exposed to high levels of water.

Furthermore, you can find a complete waterproofing system in the fermacell range, consisting of **fermacell** Deep Primer, **fermacell** Waterproofing Application, **fermacell** Sealing Tape, **fermacell** Internal/External Corners, **fermacell** Pipe Penetration Patches and **fermacell** Flexible Tile Adhesive.

Figure 48: **fermacell** Flooring Element for damping impact noise and thermal insulation in size 150×50 cm. Available in nine different thicknesses and options.

fermacell Composite Boards: Custom thermal insulation – simple, fast and efficient

fermacell Composite Boards consist of a **fermacell** Gypsum Fibreboard, which is laminated on one side with a rigid foam board (EPS 040 WI according to DIN 13163). These components combine the properties of a stable gypsum fibreboard with the high thermal insulation of expanded polystyrene. In other words: In addition to thermal insulation, the **fermacell** Composite Boards provide a ready-made surface with a fibre-reinforced and stable fermacell structure.

Above all, **fermacell** Composite Boards are fixed to the inside face of external walls or on walls between rooms with high temperature differences. An economical solution, particularly in comparison to expensive retro-fixed exterior insulation. The costs for the **fermacell** Composite Boards are recouped in a very short time due to the energy savings.

Advantages at a glance

- Economical custom thermal insulation through two different thicknesses: 10 mm gypsum fibreboard plus either 20 or 30 mm thick insulation material
- Increase in living comfort
- Energy cost savings
- Comfortable living climate
- Handy size: 150 × 100 cm
- Stable, resilient and high edge strength
- Installation without special tools
- Simple cutting
- Fast, easy fixing
- Simple jointing without joint strips (except for surface coating with textured thin plaster)
- Wallpapering with commercial wallpaper paste (wallpaper primer is not necessary)
- Tiling - using the thin-bed method
- Further information can be found in the laminate board brochure

Figure 49: The thermal insulating **fermacell** Composite Board. In size 150 × 100 cm. Available in two different thicknesses.

fermacell Firepanel A1: The new dimension in fire protection

The fire protection board **fermacell** Firepanel A1 is the new dimension in fire protection for drywall construction. The innovative further development of the original **fermacell** Gypsum Fibreboard meets building material class A1 (non-combustible) and it offers new and efficient/economical solutions for constructions. The European harmonisation of fire protection examinations and component classifications is leading to stricter national requirements for building materials and components.

The new **fermacell** Firepanel A1 fulfils these strict requirements and thus provides a safe solution for preventive structural fire protection in Europe.

All known properties of the **fermacell** Gypsum Fibreboard in drywall construction are maintained, but with even better fire protection properties. **fermacell** Firepanel A1 boards can be installed just as easily and quickly as the original **fermacell** Gypsum Fibreboards.

Further information can be found in the **fermacell** Firepanel A1 installation instructions.

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For additional information please visit the fermacell website.

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The most recent edition applies. Should you require additional information, please contact our fermacell customer service.

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