fermacell

FERMACELL dry flooring elements

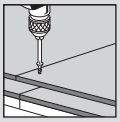
Instruction manual

The FERMACELL dry flooring system at a glance.

FERMACELL dry flooring elements come in a handy 1500 mm x 500 mm size, making them easy to carry and lay. No special tools are required.

Easy to lay!

Screw or staple the joints



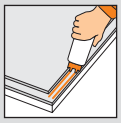
Prepare the sub-floor

Fill the joints

Place the elements in position

The floor is ready for use!

Apply glue to the projecting tongue



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The FERMACELL dry flooring system allows you to install a high-quality finish floor over an existing sub-floor with a minimum of time and effort. The dry flooring elements are not fixed to the sub-floor, but laid as a floating floor with staggered joints, the offcut from one row being carried over to start the next. The floor can be walked on as soon as the glue in the joints has dried, and any finishing work, including the laying of floor coverings, can proceed without delay. Various systems are available for all your flooring requirements, with solutions for every type of flooring problem:

- New construction
- Old buildings (particularly renovations and refurbishments)
- Living rooms
- Office buildings
- Domestic bathrooms, shower rooms and kitchens
- Fire resistance (fire attack from above only)
- Soundproofing
- Thermal insulation
- Compensating for differences in floor height/level
- Finished floor for laying over suitable underfloor heating systems

Preparation.

The FERMACELL dry flooring elements must be laid on a structurally sound, dry substrate with a flat, level surface that supports the elements at every point.

Solid concrete sub-floors.
When laying FERMACELL dry flooring elements over a solid concrete sub-floor containing residual moisture, a polythene damp-proof membrane (DPM) of 0.2 mm thickness must be laid over the sub-floor to prevent ingress of moisture into the flooring elements. Any joints in the membrane should be overlapped by not less than 200 mm. Ensure that the membrane is turned up at the walls and continued to the full height of the finished floor (any excess can be trimmed off later).

Ground-supported solid floors (incl. cellar floors).
Floors and walls that are in contact with the ground must be permanently sealed against moisture penetration. In most cases this is accomplished by sealing the exterior of the building during construction. The same applies to the sealing of the foundation slab or oversite concrete, depending on the proposed use of the building. Where the foundation slab or oversite concrete incorporates no damp-proof membrane, and the subsequent use of the room is intended, the floor must be sealed (using e.g. a bitumen-impregnated or plastic damp-proof membrane).

Levelling up uneven floors.
To ensure that the flooring elements are fully supported at every point, you can patch up any localised low spots (up to 10 mm deep) using FERMACELL bonding compound. Larger areas are best treated with a self-levelling mortar. Follow the manufacturer's instructions carefully, particularly with regard to drying times. Where the depth of filling required exceeds 10 mm, you can use FERMACELL levelling compound (see instructions for use on p. 21).

Timber floors.
Before FERMACELL dry flooring elements are laid over a timber floor, the structural integrity of the floor must be checked and any defects made good (e.g. loose floorboards must be screwed down tight). The floor structure must be solid enough not to deflect or flex under load. If it is necessary to level up the surface prior to laying the flooring elements, use FERMACELL levelling compound (see instructions on p. 21).

Other considerations.
Whilst FERMACELL is a moisture rated board, it is not waterproof and boards with elevated moisture content should be allowed to dry prior to use. Specifically, damp boards cannot be properly jointed, and may be subject to movement as the moisture content changes. We recommend that they are stored flat off the ground in a dry room. Under these conditions, boards should reach a normal moisture content within 48 hours if the temperature is >15 °C and relative humidity of the surrounding atmosphere is <70 % Rh. If you are in doubt, the moisture content may be measured by using a moisture meter, and must be no more than 1.3 %.

Laying the floor.

When laying FERMACELL dry flooring elements the relative humidity must not exceed 70% (daily mean value).

To eliminate sound bridging, a polyethylene foam strip (or mineral wool, where the installation has to be fire-rated) should be placed against the foot of the wall all around the room.

Lay the FERMACELL dry flooring elements as shown in figure 1, working from left to right with staggered joints, the offcut from one row being carried over to start the next. This method eliminates waste, and ensures that cross joints are well staggered.

Starting with the first element on the first row, saw off the projecting tongue on the short and long edges of the board.

For the next element (No. 2 in the layout pattern), the projecting tongue should be cut off on the long edge only.

Moving on to the next element (No. 3): First cut to length to complete the first row, then cut off the projecting tongue on the long edge of that portion. The remaining portion of the board – with the tongue still in place on the long edge – is then used to start the second row (No. 3 in the second row). When cutting an element to length to complete a row you should ensure that the remaining offcut is not less than 200 mm in length.

When cutting an element to length to complete a row you should ensure that the remaining offcut is not less than 200 mm in length.

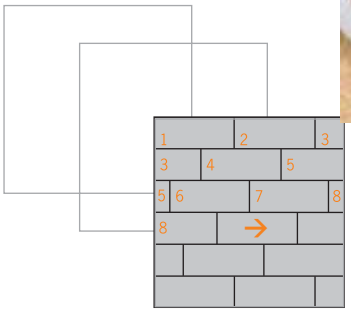

Fig. 1

When laying FERMACELL dry flooring elements you should take care to stagger the cross joints by a minimum of 200 mm. FERMACELL dry flooring elements can be cut and trimmed with a portable circular saw, used in conjunction with a straightedge guide and dust extraction attachment, an electric jigsaw or a suitable handsaw.

In halls and corridors or long, narrow rooms the FERMACELL dry flooring elements should be laid lengthways down the room.

If you are laying FERMACELL dry flooring elements on top of FERMACELL levelling compound, and you wish to proceed according to layout pattern 1, you must lay loose boards on the levelling compound to act as "stepping stones".

Alternatively you can adopt the layout in figure 2. For further information on working with FERMACELL levelling compound, see p. 21.

Because fluctuations in temperature and humidity will cause FERMACELL to expand and contract slightly, expansion joints should be incorporated into floors where the length of the room exceeds 20 m. For guidance on the design of expansion joints, see drawings of typical construction details on p. 27–29.

The lap joints between elements should be glued with FERMACELL floor glue (coverage = 35 g per m2 of flooring, which gives a maximum yield of 30 m2 per bottle). Apply two parallel beads of adhesive to the projecting tongue, as shown below.

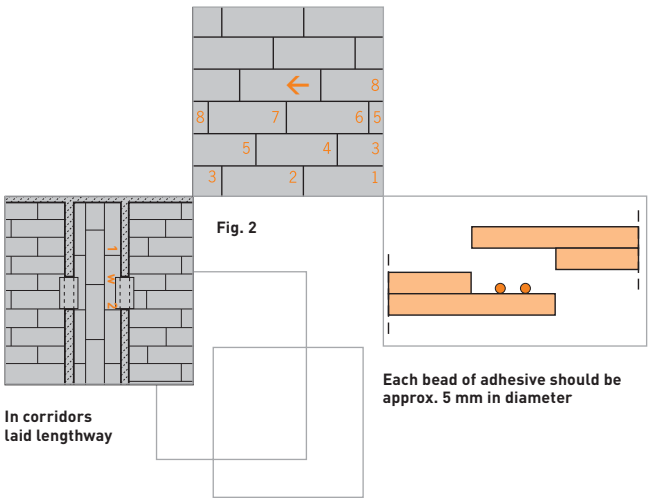

Fig. 2

In corridors laid lengthway

Each bead of adhesive should be approx. 5 mm in diameter

Expansion joints are required at 20 linear meter intervals!

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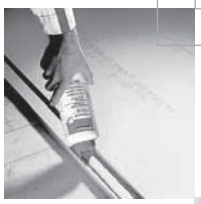

FERMACELL boards should be laid within 10 minutes of applying the floor glue.

Having applied the glue you must lay the boards within 10 minutes (= open time of glue). To apply clamping pressure to the joint while the glue sets, secure with FERMACELL countersunk cross-slot screws or diverging staples (for further information see p. 9, "Fixings"). Stand on the board you are fixing so that your own body weight prevents the joint from opening up or moving while you insert the fastenings.

When the glue has hardened, use a spatula or scraper to remove any excess that has been squeezed out of the joint. Detailed instructions for the use of FERMACELL floor glue are printed on the bottle.

FERMACELL dry flooring elements may be walked on with care as floor-laying proceeds. Full loading of the floor and any subsequent works – such as the installation of the floor covering – can commence after approximately 24 hours, when the FERMACELL floor glue will have fully cured under normal conditions of temperature and humidity.

Fixings.

The fastenings approved for use with the FERMACELL dry flooring system are as follows:

- **FERMACELL countersunk cross-slot screws.**
  The screws should not penetrate the insulating underlay (where used), nor should their points rest on the substrate or be driven into the substrate.

- **Diverging staples.**
  The diverging staples used for this purpose should be sized so as not to protrude from the underside of the FERMACELL flooring elements. Suppliers of suitable zinc-plated or galvanised staples are listed below:

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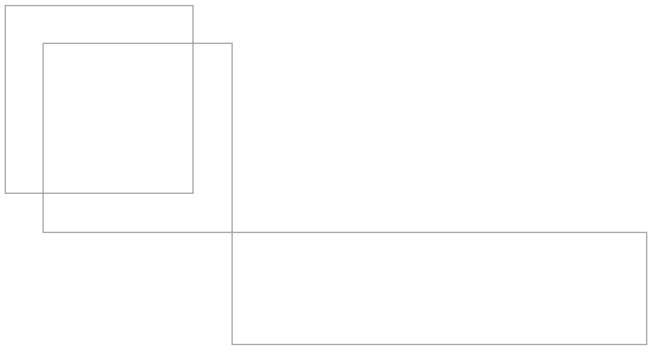
Staples suitable for use with the FERMACELL dry flooring elements.

		FERMACELL dry flooring elements (2x 10 mm FERMACELL)		FERMACELL dry flooring elements (2x 12,5 mm FERMACELL)	
		Leg length 18–19 mm	Wire gauge ≥ 1,5 mm	Leg length 21–22 mm	Wire gauge ≥ 1,5 mm
No.	Manufacturer	Product designation			
1	Schneider/Atro	114/18 CDNK HZ		114/22 CDNK HZ	
2	BeA	155/18 NK HZ CD		155/21 NK HZ CD	
3	Bostitch	BCS 4 19 CD		BCS 4 22 CD	
4	Bühnen	N 11 LAB		N 12 LAB	
5	Duo-Fast	76/18 CNK DNK		76/22 CNK DNK	
6	Haubold	KG 718 CDnk		KG 722 CDnk	
7	Holz-Her	G19 GALV/F		G22 GALV/F	
8	Paslode	S 16¾" CD		S 16⅞" CD	
9	Prebena	Z 19 CDNK HA		Z 22 CDNK HA	
10	Youngblack	G5562X18GC-DC		G5562X22GC-DC	



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2 E 11 FERMACELL dry flooring element (2x 10 mm).

- FERMACELL countersunk cross-slot screws, 3.9 mm x 19 mm
  Quantity required: 15 per m^2, spaced not more than 200 mm apart. (For floating floors laid directly onto the hard substrate).
- FERMACELL countersunk cross-slot screws, 3.9 mm x 22 mm
  Quantity required: 15 per m^2, spaced not more than 200 mm apart. (For floating floors laid over an insulating underlay).
- Diverging staples (1.5 gauge x 10 x 18–19 mm)
  Quantity required: 15 per m^2, spaced not more than 200 mm apart.

2 E 22 FERMACELL dry flooring element (2x 12.5 mm).

- FERMACELL countersunk cross-slot screws, 3.9 mm x 22 mm
  Quantity required: 15 per m^2, spaced not more than 200 mm apart.
- Diverging staples (1.5 gauge x 10 x 22 mm)
  Quantity required: 15 per m^2, spaced not more than 200 mm apart.

2 E 13 FERMACELL dry flooring element (2x 10 mm + 20 mm expanded polystyrene foam insulation).

2 E 14 FERMACELL dry flooring element (2x 10 mm + 30 mm expanded polystyrene foam insulation).

2 E 15 FERMACELL dry flooring element (2x 10 mm + 60 mm extruded rigid plastic foam insulation).

2 E 31 FERMACELL dry flooring element (2x 10 mm + 10 mm wood fibre insulation board).

2 E 32 FERMACELL dry flooring element (2x 10 mm + 10 mm mineral wool insulation).

- FERMACELL countersunk cross-slot screws, 3.9 mm x 22 mm
  Quantity required: 15 per m^2, spaced not more than 200 mm apart.
- Diverging staples (1.5 gauge x 10 x 18–19 mm)
  Quantity required: 15 per m^2, spaced not more than 200 mm apart.

Installing a third layer of FERMACELL.

If you wish you can install a third layer of FERMACELL to enhance the load-bearing and acoustic performance of the floor.

First, lay the FERMACELL dry flooring elements as already described to complete the floating floor. Remove all dust and traces of glue, ensuring that the glue is fully hardened (please refer to instructions supplied with glue).

The third layer is normally made up with standard FERMACELL building boards, 1000 mm x 1500 mm, which are available in 10 mm and 12.5 mm thickness. To maximize the increase in the floor's load-bearing capacity (rated load per m^2 and point loading: for information on permissible floor loadings, see p. 14), the additional layer of FERMACELL building boards should be laid at 90° to the axis of the dry flooring elements. The third layer is laid with staggered joints, the offcut from one row being carried over to start the next. Check that all joints are offset by a minimum of 200 mm from the nearest parallel joint in the dry flooring elements.

Bonding the third layer with FERMACELL floor glue: Apply the glue to the flooring elements in parallel beads of approx. 5 mm diameter, spaced at intervals of 100 mm or less (coverage = 130–150 g per m^2 of flooring, giving a yield of around 7 m^2 per bottle). Alternatively the third layer may be bonded with PVA wood glue. This should be applied in a thin layer over the entire area of the bond face, using a notched trowel or comb (3 mm notches). Coverage = approx. 400 g per m^2. Do not exceed the open time of the glue (refer to glue manufacturer's instructions).

Layout pattern for third layer over existing FERMACELL flooring system:

- Spacing of glue beads: 100 mm or less (coverage of FERMACELL floor glue: approx. 130–150 g per m^2).
- Location of fixings (x): at max. 250 mm centres (quantity of fixings required: approx. 25 per m^2).
- Edge clearance: position fixings 10–30 mm in from edge of board.

Fixings: To apply clamping pressure to the joint while the glue sets, secure with FERMACELL countersunk cross-slot screws or diverging staples (for further information see p. 9, "Fixings"). Fixings should be positioned in a grid pattern at approx. 250 mm centres (see diagram). The quantity required is approximately 25 per m^2.

Further finishing works, such as the installation of floor coverings, should be left until the glue (FERMACELL floor glue or PVA wood glue) has fully hardened (which may take up to 36 hours, depending on ambient temperature and humidity).

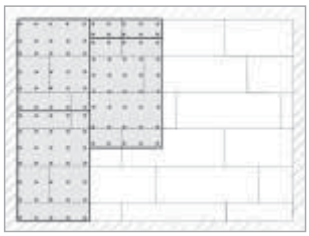

Fig. for third layer

Laying FERMACELL dry flooring elements over underfloor heating systems.

Used in conjunction with underfloor heating systems, the special 25 mm thick FERMACELL dry flooring elements serve as a load-distributing layer and as a substrate for the final floor covering. Underfloor heating systems, which are normally of the hot-water type, must be approved by the manufacturer for use with dry-laid flooring systems.

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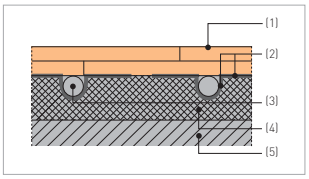
Suitable heating systems.

- Systems with heating pipes embedded in specially moulded backing boards, commonly made of polystyrene (density > 30 kg/m^3) or polyurethane plastics, and covered with a special heat-conducting metal sheet that distributes the heat evenly and at the same time forms a rigid, flat surface on which to lay the dry flooring elements.
- Systems where the heating medium is channelled through a specially designed element.

Electrically heated underfloor systems (e.g. heated wires in a bed of adhesive) are not suitable for use with FERMACELL.



(1) 2 E 22 FERMACELL dry flooring element (25 mm)
(2) Heat-conducting metal sheet
(3) Pipework carrying the heating medium
(4) Moulded plastic backing board
(5) Substrate (flat, dry)

→ Example of a suitable underfloor heating system

Boiler temperatures
should be adjusted so that the temperature beneath the FERMACELL flooring elements does not exceed 45° for any sustained period of time (water temperature ≤ 50°).

Installation instructions.
Prepare the substrate as already described. If the site conditions are such that additional layers of material have to be placed beneath the heating system, these materials must have sufficient compressive strength to support both the heating system and the flooring. Where underfloor heating systems are installed over FERMACELL levelling compound, an intermediate layer of 10 mm FERMACELL boards must be laid on top of the underlay to support the heating system. Any additional insulating layer of polystyrene foam boards (density > 30 kg per m^3) must be of uniform thickness throughout. The total thickness of insulation material, including the integral backing board of the underfloor heating system itself, must not exceed 90 mm (for further information see "Packing up and levelling up floors with additional thermal insulation", p. 26). If the flooring has to span larger cavities – where a number of heating pipes are bunched together close to the heating system manifold, for example – additional support for the FERMACELL dry flooring elements must be provided.

The recommended method – taking into account the requirements of heat conservation – is to fill such cavities with FERMACELL levelling compound. The heating pipes and heat-conducting plate must be laid so that the floor above them lies completely flat. Heat-conducting sheets and panel-type heating elements must not be bent or distorted in any way.

Further advice is available from the FERMACELL technical department.

Turning on the heating.

When installing floor heating systems in conjunction with FERMACELL dry flooring element 2 E 22, please refer to the heating manufacturer's detailed instructions. Most manufacturers will require the heating to be slowly brought up to temperature over a number of days. The heating should not be turned on until the flooring glue has fully dried (typically 24 hours). All floor coverings should be applied only after the heating has been tested.

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Materials usage.

Listed below are the flooring materials needed to cover 1 m²	
FERMACELL dry flooring elements	1.33 elements
FERMACELL floor glue	35 g approx.
FERMACELL floor glue (for a third layer, where required)	130 – 150 g
FERMACELL countersunk cross-slot screws	15 screws
FERMACELL countersunk cross-slot screws	
(for a third layer, where required)	25 screws
(diverging staples)	15 staples
(diverging staples for a third layer, where required)	25 staples
FERMACELL joint filler	0.1 kg approx.
FERMACELL one man board 10 mm (for a third layer)	0.66 board
FERMACELL levelling compound	10 litres per 10 mm of thickness
FERMACELL Honeycomb flooring	0.66 sheet
FERMACELL Honeycomb acoustic infill	2 bags for 30 mm Honeycomb
	4 bags for 60 mm Honeycomb

Floor loadings.

The quoted floor loadings for FERMACELL dry flooring systems incorporate an additional safety factor which allows for all types of floor coverings and floor finishes listed in this manual. In other words, the figures quoted for traffic loads (= rated load per m^2) and point loadings are still valid for floors with a covering of ceramic tiles.

Areas of Application and Maximum Point Loads for FERMACELL Flooring Elements

Flooring Type			with additional third layer (glued 10 mm FERMACELL)	
	Area of Application	Maximum Point Load	Area of Application	Maximum Point Load
2 E 11 2x 10 mm FERMACELL	1 + 2	1.5 kN	1 + 2 + 3	2.5 kN
2 E 22 2 x 12,5 mm FERMACELL	1 + 2 + 3	2.5 kN	1 + 2 + 3 + 4	3.5 kN
2 E 13 2x 10 mm FERMACELL + 20 mm PS20	1 + 2	1.5 kN	1 + 2 + 3	2.5 kN
2 E 14 2x 10 mm FERMACELL + 30 mm PS20	1 + 2	1.5 kN	1 + 2 + 3	2.5 kN
2 E 15 2x 10 mm FERMACELL + 60 mm XPS	1 + 2	1.5 kN	1 + 2 + 3	2.5 kN
2 E 31 2x 10 mm FERMACELL + 10 mm WF	1 + 2 + 3	2.5 kN	1 + 2 + 3 + 4	3.5 kN
2 E 32 2x 10 mm FERMACELL + 10 mm MW	1	1.0 kN	1 + 2	1.5 kN

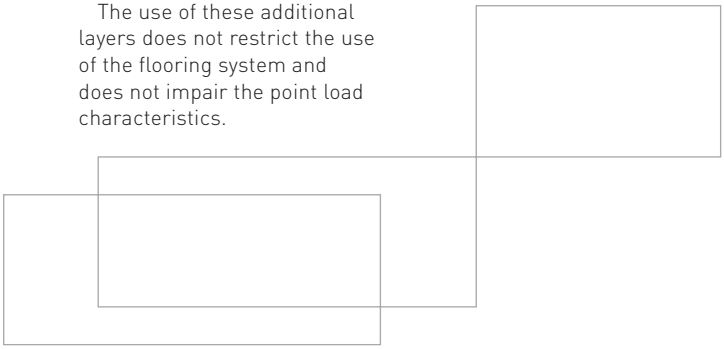
	Areas of Application
1	Living rooms, corridors and attic conversions in private dwellings.
2	Offices, corridors and attic conversions in office buildings, commercial areas up to 50 m^2 in private dwellings.
3	Wards and waiting rooms in hospitals, lecture theatres, classrooms, licensed premises and cellars in private dwellings
4	Treatment rooms and corridors in hospitals, corridors in schools and colleges, circulation areas in public buildings, churches, theatres and playhouses, ballrooms and sportshalls, exhibition and display areas, shops and warehouses, libraries and archives.

Point loads.
Point loads (which must be greater than 1000 mm^2) must be spaced at intervals of at least 500 mm. The distance from the edge of the floor must exceed 250 mm unless the loaded surface area is greater than 10,000 mm^2. The total point loading must not exceed the maximum permitted loading for the floor.

Additional layers below FERMACELL Flooring Elements.
- FERMACELL levelling compound up to max. 60 mm.
- FERMACELL Honeycomb 30 mm.
- FERMACELL Honeycomb 60 mm.
- Rigid expanded polystyrene sheets PS 20 to max. 30 mm (only under 2 E 11/2 E 22).
- Rigid expanded polystyrene sheets PS 30 to max. 70 mm total insulation thickness.
- Rigid extruded polystyrene sheets XPS to max. 120 mm total insulation thickness.

The use of these additional layers does not restrict the use of the flooring system and does not impair the point load characteristics.

Chairs mounted on castors.
FERMACELL dry flooring systems are suitable for use under all floor coverings designed to withstand the wear and tear of office chairs mounted on castors.



Priming.

FERMACELL dry flooring elements are primed before they leave the factory. For most applications no additional priming is necessary. If an adhesive manufacturer specifies the application of a primer as part of the adhesive system, priming should be carried out in accordance with the manufacturer's instructions.

However, any primer used on FERMACELL boards must be suitable for use with gypsum building boards in flooring applications.

Floors exposed to moisture.

This section deals with bathrooms, shower rooms, kitchens and other areas exposed to moisture in houses and flats, hospitals, office buildings, schools and other buildings used for similar purposes.

In areas where the floor is particularly exposed to moisture, such as bathrooms or entrance halls, FERMACELL dry flooring elements must be treated with a brush-on sealant or an adhesive sealant system. Designed for standard building substrates, this type of sealing system is applied to the floor immediately below the floor covering or finish, and the work can be carried out by any skilled tiler. Proprietary systems of this kind contain all the necessary components – primer, sealing tape, sealing membrane and adhesive – but check first that the system is specifically approved by the manufacturer for use with gypsum building boards in flooring applications!

FERMACELL dry flooring elements are not suitable for use in areas with a high degree of moisture exposure, such as swimming baths, saunas in sports and leisure centres, and showering areas that are subject to frequent daily use.

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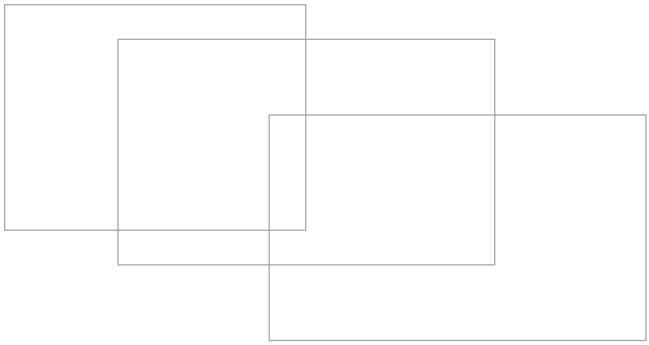

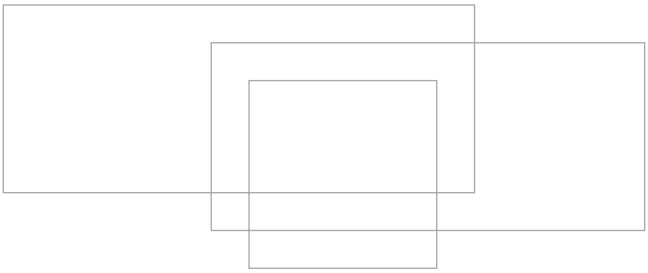

Floor coverings and finishes.

Carpeting, PVC, cork and other floor coverings.

- When laying self-adhesive carpet tiles and water-permeable floor coverings, the use of a penetrating primer is recommended.
- Generally speaking, carpeting should be secured with double-sided adhesive tape.
- If the carpet is to be stuck down over the entire area of the floor, we recommend the use of a peel-off adhesive system that will allow the carpet to be taken up in one piece at a later date without leaving pieces of carpet glued to the FERMACELL elements.
- When laying non-permeable floor coverings it is advisable to use an adhesive with a low water content.

For thin floor coverings (carpet, PVC, etc.) in broadloom or tile form you will need to prepare the entire floor surface with a suitable self levelling cement. Various proprietary self levelling cement suitable for use with gypsum building boards in flooring applications are available from your local builders' merchant or flooring specialist. These are applied in liquid form, drying to form a perfectly flat, level surface. The idea is to ensure that the joints between the panels and any other minor surface irregularities – including any slight protrusions or indentations made by the fastenings – do not show through the floor covering when laid.

The self levelling cement must be completely dry before proceeding with the next stage of the work. The drying times specified by the manufacturer must be strictly adhered to.

In the case of thicker carpeting material, such as foam-backed carpets, it will normally be sufficient to apply a thin layer of FERMACELL joint filler to smooth the line of the joints between boards, and to fill in the slight indentations left by the screws or staples.

Ceramic tiles, natural stone paving and terracotta tiles.

- The tiles must be approved by the manufacturer for thin-bed fixing. The fixing of floor tiles to FERMACELL dry flooring elements by the thick-bed method is not permissible.
- Tiles may be fixed with polymer-modified cement-based tile adhesives, emulsion-based adhesives or reactive resin adhesives which have been approved by the manufacturer for use with gypsum building boards in flooring applications.
- Tiles should not be soaked prior to fixing, and at least 80% of the back of the tile must be in contact with the adhesive bed (lift the occasional tile to check adhesion).
- The foam strip laid around the perimeter of the floor to prevent sound bridging should be trimmed back level with the finished floor only after all tiling and grouting work has been completed.
- Tiles should always be laid with open joints. Tiles should never be laid with tightly butted joints, since this may lead to the formation of capillary joints.
- Grout the tiles only when the tile adhesive has fully hardened, i.e. when all the moisture in the adhesive has evaporated through the open joints. This normally takes about 48 hours, depending on the ambient temperature and humidity.
- Internal corners must be sealed with a suitable elastic sealant, such as silicone (with a movement accommodation factor of 20% or more).
- The application of a thin layer of FERMACELL joint filler to smooth the line of the joints between boards and to fill in the slight indentations left by the screws or staples is only necessary in conjunction with the use of an adhesive sealant system (see also p. 16, "Floors exposed to moisture").

Ceramic floor tiles.

FERMACELL boards are suitable for the fixing of floor tiles or mosaic. Larger floor tiles (30 cm square or more) are generally unsuitable for thin-bed fixing, since the nature of the manufacturing process (firing at high temperatures) makes it impossible to guarantee the flatness of the tile.

Natural stone paving and terracotta tiles.

Because of their weight and other physical characteristics, these floor covering materials should not be used in conjunction with the 30 mm 2 E 32 FERMACELL dry flooring element (2 x 10 mm + 10 mm mineral wool insulation). The maximum permissible sizes are 300 mm square for natural paving stones and 400 mm for terracotta floor tiles. Floors covered with these materials may need to be treated with a suitable floor sealer.

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Parquet, solid timber and laminate flooring.

- FERMACELL flooring elements are suitable as a substrate for laminate flooring and mosaic or herringbone parquet.
- FERMACELL flooring elements are not suitable as a substrate for solid timber flooring including parquet and solid strip flooring, unless laid as a floating floor or using special techniques. More information is available from FERMACELL.
- Laminate timber flooring, including parquet can be laid as a floating or bonded floor (the manufacturer's recommendations must be adhered to).
- Mosaic parquet must be laid in a pattern that allows expansion in multiple directions such as box or herring bone pattern.
- It is not necesssary to fill the joints or screw head in the FERMACELL flooring elements.
- The appropriate British Standards must be followed in respect of laying, surface finish and quality of the parquet floor.
- The moisture content of any wood flooring when laid must correspond to the requirements of the appropriate British Standard.
- For bonded parquet floors only base preparations and adhesives specifically designed for gypsum based substrates must be used. We recommend the use of low water content base preparations and adhesives. These must be applied in accordance with the manufacturer's instructions.

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Packing up and levelling floors.

It may be necessary to install additional packing under dry flooring systems for a number of reasons:

- To level up an uneven substrate.
- To adjust the finished height of the floor.
- To improve sound insulation performance (airborne and impact sound).
- To increase the thermal insulation value of the floor.

FERMACELL levelling compound should be used to level up uneven surfaces. To pack up floors and at the same time improve their thermal insulation value, various design options are available (see "Packing up and levelling floors with additional thermal insulation", p. 26).

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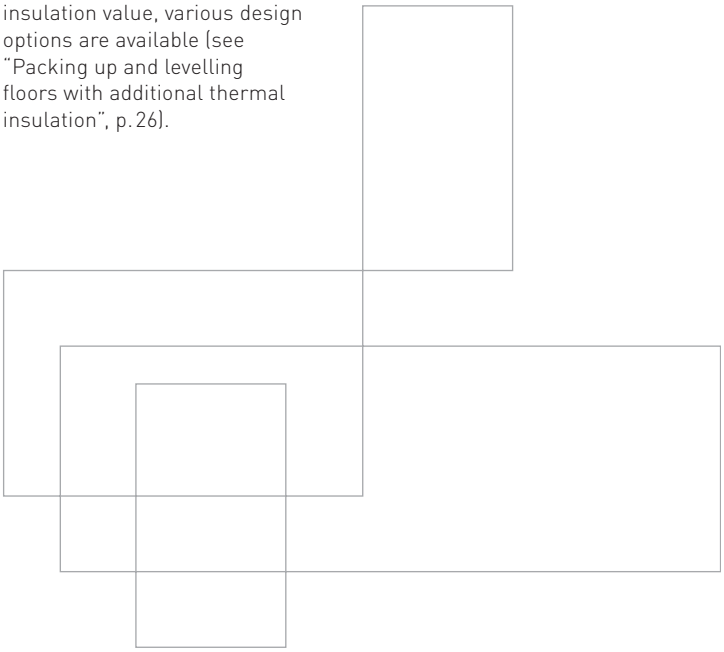

FERMACELL levelling compound.

This is a granular material of porous mineral composition, whose special physical properties make it eminently suitable for a wide range of building applications. The rough surface texture of the grains causes them to lock together, forming an extremely stable supporting layer. With their excellent thermal and acoustic insulation properties they offer a low-cost way of upgrading the performance of floor constructions – including a significant improvement in fire resistance. Because of its low unit weight, the product can also be safely used in suspended floors of lightweight construction (timber joist floors).

Composition and material properties.
FERMACELL levelling compound consists of specially formulated dried granules of mineral aerated concrete.

- Thermal conductivity value: R = 0.09 W/mK.
- Grading: 0.2–4 mm.
- Uncompacted density: 400 kg per m^3 approx.
- Minimum fill depth: 10 mm.
- Maximum fill depth (uncompacted): 60 mm.
- Material requirement per m^2: 10 litres approx. per cm of fill depth.

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Areas of application.

FERMACELL levelling compound is used to level up uneven floors in old buildings and new building construction. It can be tamped and screeded to the exact level required using tools such as the FERMACELL levelling float.

This material is ideal for use under FERMACELL dry flooring elements. FERMACELL levelling compound can also be used as an insulating infill in suspended timber floors of approved load-bearing construction: i. e. as a pugging material.

Installing.

FERMACELL levelling compound can be poured straight from the bag onto the dry substrate. Where there is a risk, in suspended timber floor constructions, that the material could trickle down through knot-holes or gaps between floorboards – gaps which may open up later as the timber dries out and shrinks – a suitable barrier layer of building paper or plastic sheeting must be installed beneath the underlay. The barrier layer should be turned up at the walls to form a continuous tray. Before using a polythene membrane for this purpose you should check that the site conditions are appropriate.

The material may be poured directly over any underfloor service pipes, provided the depth of cover to such pipes is at least 10 mm. Appropriate precautions to avoid condensation should be taken in accordance with good plumbing practice.

Once the levelling underlay has been laid and screeded off, it should not be walked on. Lay the floor as shown in layout pattern 2 on p. 6 ("Laying the floor"). Alternatively you can place loose FERMACELL dry flooring elements on top of the underlay to act as "stepping stones".

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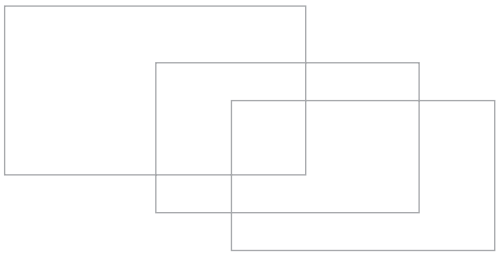
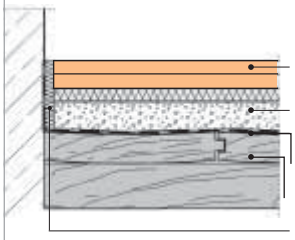


FERMACELL levelling compound: some typical installation details.

Suspended timber floor with old floorboards



Detail described from top to bottom with wall connection

2 E 31 FERMACELL dry flooring element (2x 10 + 10 = 30 mm)

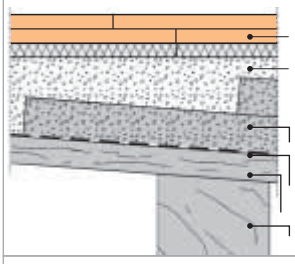
FERMACELL levelling compound (to level up an uneven sub-floor and improve impact sound performance)

Trickle-proof barrier layer (building paper or similar)

Old floorboards

Perimeter strip to insulate/isolate floor construction from walls

Suspended timber floor inclined at an angle



Detail described from top to bottom with wall connection

2 E 32 FERMACELL dry flooring element (2x 10 + 10 = 30 mm)

FERMACELL levelling compound (used in conjunction with a proprietary non-compressible packing material to level up an uneven sub-floor – no need for mechanical compaction even when packing out large voids)

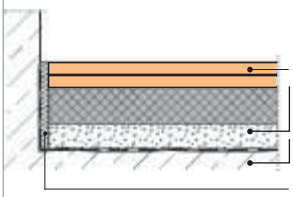
Proprietary non-compressible packing material

Trickle-proof barrier layer (building paper or similar)

Old floorboards

Timber joist

Ground-supported concrete floor



Detail described from top to bottom with wall connection

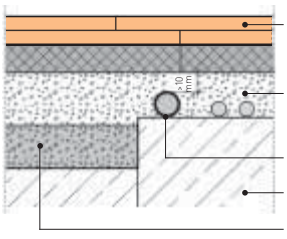
2 E 14 FERMACELL dry flooring element (2x 10 + 30 = 50 mm)

FERMACELL levelling compound (to level up an uneven sub-floor and provide additional thermal insulation)

Concrete slab (fully dried out, and incorporating a suitable damp-proof membrane to prevent the ingress of rising water from the ground)

Perimeter strip to insulate/isolate floor construction from walls

Solid concrete floor, stepped construction



Detail described from top to bottom with wall connection

2 E 13 FERMACELL dry flooring element (2x 10 + 20 = 40 mm)

FERMACELL levelling compound (used in conjunction with a proprietary non-compressible packing material to level up an uneven sub-floor without the need for mechanical compaction: service pipes should be embedded within the underlay material)

Service pipes (depth of cover not less than 10 mm)

Stepped floor of solid concrete construction

Proprietary non-compressible packing material

FERMACELL Honeycomb acoustic system.

The sound insulation performance of suspended timber floors is often poor due to the fact that the basic floor construction does not have sufficient mass to block the transmission of sound. Flooring systems designed to upgrade the acoustic performance or existing suspended timber floors are normally restricted in terms of their height of thickness and their weight per unit area. The FERMACELL Honeycomb acoustic system has been specially developed with this in mind.

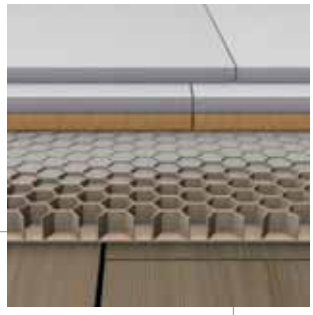
The FERMACELL Honeycomb insulation mat is laid wall to wall on top of the existing floor and then filled with the special FERMACELL acoustic infill. The system increases the mass of the existing floor construction by approx. 45 kg/m^2, producing a significant reduction in sound transmission. To complete the installation, FERMACELL dry flooring elements incorporating an integral layer of mineral wool or wood fibre insulation slab are laid on top. Any impact sound (footsteps, etc.) transmitted to these elements is further reduced by the layer of acoustic insulation laminated to their underside.

This acoustic floor construction adds only 60 mm to the height of the existing floor. Yet with a total mass of approx. 70 kg/m^2 it is capable of improving impact sound performance by as much as 34 dB.

The FERMACELL Honeycomb acoustic system is suitable not only for upgrading the performance of existing floors, but also for new construction, where the design of suspended timber floors can be greatly simplified as a result. Used in conjunction with a suspended ceiling mounted on acoustic hangers the system achieves sound insulation ratings that meet the requirements for increased sound insulation set forth in Building Regulations Approved Document 'E'. For further information the sound insulation ratings attained by different types of suspended timber floor incorporating the FERMACELL Honeycomb acoustic system, please see the FERMACELL booklet "Improved living conditions through better acoustic and thermal insulation".

Copies of the relevant test certificates are available on request.

Method of installation.
FERMACELL Honeycomb insulation mats are laid so as to cover the entire area of the floor. For optimum acoustic performance the mats should be laid directly on top of the floor decking (floorboards, chipboard, plywood, etc.). The projecting strip of paper along the long edge is positioned under the neighbouring mat to produce an overlapping joint. The short edges are not overlapped, and here it may be necessary to place building paper or similar under the joints if there are knot holes or cracks in the floor decking where the acoustic infill material might trickle through. Whole mats can be cut to size using a carpet knife. Cut-outs can be made for pipes and services (maximum width 10 cm) and subsequently filled with FERMACELL acoustic infill. When all the Honeycomb insulation mats have been laid, the next step is to fill them with the FERMACELL acoustic infill. It is possible to walk on the unfilled Honeycomb insulation mats with care, but it is better to fill them first before walking on them, working outwards from the door of the room. The FERMACELL acoustic infill should be struck off flush with the top of the Honeycomb sections by drawing a straight-edge over the surface to remove the excess material, thus producing a completely flat and level surface on which to lay the FERMACELL dry flooring elements. When upgrading old suspended timber floors it may be necessary to pack up the surface to obtain a truly level substrate. The Honeycomb sections may be overfilled with FERMACELL acoustic infill by up to 3 mm. If this is insufficient, FERMACELL levelling compound may be laid on top of the Honeycomb insulation mats to a maximum depth of 60 mm.



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Packing up and levelling floors with additional thermal insulation.

In suspended floor constructions, because of weight restrictions, a high-density expanded plastic foam may be used to pack up a FERMACELL floor. Please note that you are restricted to a maximum of two layers of additional insulation material under this type of floor construction. In order to comply with current thermal insulation standards, you should select an appropriate combination of FERMACELL dry flooring elements and expanded plastic foam insulation materials.

To provide additional thermal insulation beneath a FERMACELL floor and/or pack the floor up to the required height, the FERMACELL dry flooring systems listed below may be used in combination with approved insulation materials as specified:

2 E 11 FERMACELL dry flooring element (2x 10 mm).
To provide additional thermal insulation or pack up the floor to the required height, the following may be used:

- Expanded polystyrene foam (PS 20), up to a maximum of 30 mm.
- Expanded polystyrene foam (density > 30 kg/m^3), up to a maximum thickness of 70 mm.
- Extruded rigid plastic foam (density not less than 33 kg per m^3), up to a maximum thickness of 100 mm.

2 E 22 FERMACELL dry flooring element (2x 12.5 mm).
To provide additional thermal insulation or pack up the floor to the required height, the following may be used:

- Expanded polystyrene foam (PS 20), up to a maximum of 30 mm.
- Expanded polystyrene foam (PS 30), up to a maximum thickness of 90 mm.
- Extruded rigid plastic foam (density not less than 33 kg per m^3), up to a maximum thickness of 120 mm.

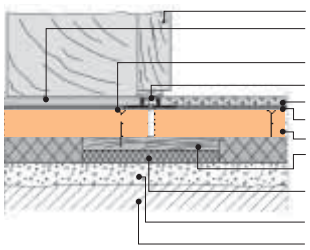
2 E 13 FERMACELL dry flooring element (2x 10 mm + 20 mm expanded polystyrene foam insulation).

2 E 14 FERMACELL dry flooring element (2x 10 mm + 30 mm expanded polystyrene foam insulation).
To provide additional thermal insulation or pack up the floor to the required height, the following may be used:

- Expanded polystyrene foam (density > 30 kg/m^3), provided that the overall thickness of insulation material (including the foam backing to the FERMACELL boards) does not exceed 70 mm.

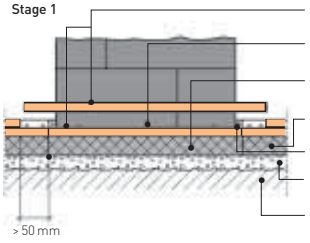
Typical construction details.

Door opening with movement joint.



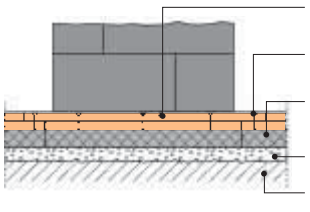
Door opening – flooring carried through opening.

Stage 1



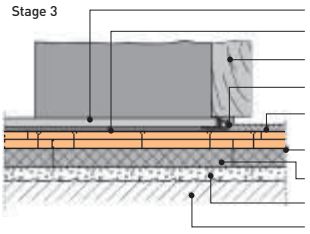
Door opening – flooring carried through opening.

Stage 2

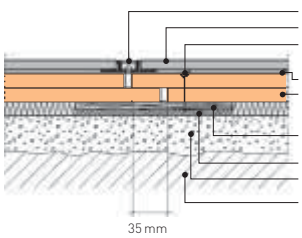


Door opening – flooring carried through opening

Stage 3



Expansion joint within room.

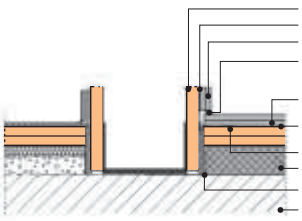


Movement joint strip
Ceramic tile
FERMACELL countersunk cross-slot screws (3.9 x 30 mm)
Thin-bed mortar
2 E 32 FERMACELL dry flooring element (30 mm)
Packing piece (e.g. plywood, width minimum 100 mm)
Insulation underlay (not less than 150 kg per m^3)
FERMACELL levelling compound with DPM
Concrete floor slab (dry, as cast)

Junction with FERMACELL partition wall.

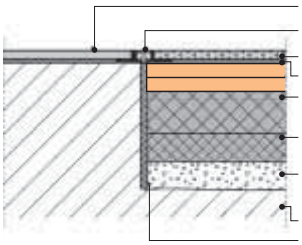
– for normal rooms

– for bathrooms, shower rooms, etc.



12.5 mm FERMACELL building board
Thin-bed tile adhesive
Ceramic tile
Flexible sealant (e.g. silicone, with a movement accommodation factor of 20 % or more)
Thin-bed tile adhesive
Liquid sealing membrane or adhesive sealant system
Angle profile sealing strip
2 E 14 FERMACELL dry flooring element (50 mm)
Perimeter strip
Concrete floor slab with DPM (dry, trowelled to a smooth finish)

Junction with solid mortar screed.



Ceramic tile
Movement joint strip
Ceramic tile
Thin-bed mortar
2 E 14 FERMACELL dry flooring element (50 mm)
Expanded polystyrene foam (density >30 kg/m^3), 20 mm thick (loose laid – total thickness of insulation material not to exceed 70 mm)
FERMACELL levelling compound with DPM (compact the underlay material where it adjoins the solid screed)
Concrete floor slab (dry, as cast)
Perimeter strip

FERMACELL accessories.

FERMACELL
Floor glue.

Coverage:
25 m^2 – 30 m^2 per bottle
Packaging:
Special 1 kg bottle

FERMACELL
Countersunk cross-slot screws.

Usage: 15 screws per m^2 approx.
Quantity required when fixing third layer of FERMACELL boards: 25 screws per m^2 approx.
Packaging: 3.9 x 19 mm
(boxes of 250 or 1000)
3.9 x 22 mm
(boxes of 250 or 1000)

FERMACELL
Joint filler.

Usage:
0.1 kg per m^2 approx.
Packaging: 5 kg bag

FERMACELL
Levelling compound.

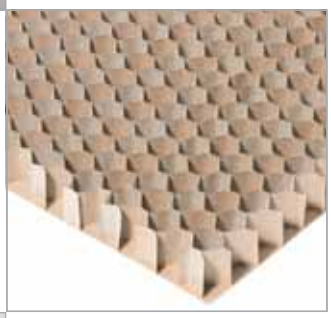
Usage:
5 m^2 per bag at 10 mm thickness
Packaging: 50 l bag
(approx. weight: 18.5 kg)

FERMACELL
Perimeter strip.

Dimensions:
Depth 30 mm
Depth 50 mm
Packaging:
60 lm in 1 m lengths

FERMACELL
Honeycomb flooring.

Usage:
1 Honeycomb sheet ≈ 1.5 m^2
Sheetsize:
1500 x 1000 x 30 mm
1500 x 1000 x 60 mm
Pack size: 30 per pallet
(45 m^2) for 30 mm thick sheet
15 per pallet (22.5 m^2)
for 60 mm sheet



FERMACELL
Honeycomb acoustic infill.

Usage:
2 bags/m^2 for 30 mm
Honeycomb
4 bags/m^2 for 60 mm
Honeycomb
Pack size:
15 l/sack = 22.5 kg
42 per pallet

Notes.

This publication contains detailed instructions for the correct installation of FERMACELL dry flooring elements.

We reserve the right to make changes in the interest of technical improvement.

All information correct as at 11.09

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