

# fermacell

## External wall solutions

Render or rainscreen, fermacell has the answer.



fermacell<sup>®</sup>





## fermacell Powerpanel H<sub>2</sub>O

Top advantages for external application:

- Weather and mould resistant
- BBA and ETA certified
- Stable and robust, non-combustible
- Lightweight and easy to use
- Comprehensive product range

## fermacell External Wall Solutions

The fermacell brand has stood for high quality building boards for the last 40 years. Innovation and new systems approach help fermacell develop clever, sustainable and cost effective building materials.

All fermacell boards are manufactured to strict UK and European standards and undergo the most uncompromising tests – in house, as well as by third parties. This guarantees reliable, consistent product backed by years of industry experience and strong technical knowledge.

fermacell's comprehensive technical support starts from the design and planning to on site visits and training.

Dry construction methods are the preferred method of external construction in Europe – significantly reducing construction times in both refurb and new build projects, their streamlined designs save time and make it possible to implement economic solutions.

fermacell offers two simple dry solutions for external walls.

- fermacell Gypsum Boards
- fermacell Powerpanel H<sub>2</sub>O

### fermacell Rainscreen Backer Board

fermacell offers a fast, reliable, cost effective solution for external Rainscreen and EWI applications on timber and steel frames.

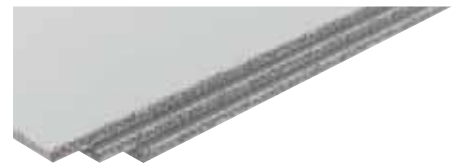
- Structural board with excellent racking strength
- Reliable Air Tightness
- Weather, moisture and mould resistance
- Improves fire and acoustic performance
- Multi-purpose board – less mistakes on site
- Environmentally friendly – approved by the ECO Institute
- Approved by the CWCT



### fermacell Powerpanel H<sub>2</sub>O Render Carrier

Superior render carrier board for fast, durable and versatile external walls, cladding and soffits on timber or steel frames.

- Lightweight solution
- Withstands extreme weather effects – can be left exposed for months
- Weather, water and mould resistant
- Non Combustible A1
- Easily curved
- BBA certified



# fermacell for Vented Rainscreen and EWI systems

The original fermacell gypsum fibreboard's suitability for use as part of external cladding systems has been certified following rigorous testing at the Taylor Woodrow Technology Centre under strict CWCT guidelines.

## Test Criteria:

- Water Tightness - PASS
- Air Permeability - PASS
- Wind Resistance - above 2/kN - PASS

It was the first gypsum based board to be tested and approved in the UK for a rainscreen and EWI backer board, and has been proved in timber frame solutions with rainscreen and EWI around Europe for over 20 years.

## The advantages of fermacell Gypsum Fibreboard

- fermacell gypsum fibreboard performs as well as a cement particle (CP) board at a significantly reduced cost
- Outperforms plasterboard and Oriented Strand Board (OSB) across the board – for sound, fire, impact, racking and moisture resistance
- Outstandingly sustainable, fermacell is produced using recycled materials, helping achieve better BREEAM ratings
- It is ideal in both load bearing and non load bearing walls, as well as for acoustic flooring and robust ceiling applications
- Can be used as the air tightness line within systems or buildings



### Racking Performance

fermacell Gypsum Fibreboards offer a Category 1 racking resistance provided by 12.5mm board.



### Impact resistant

fermacell Gypsum Fibreboards reduces double layering or use of sheathing ply. The homogeneous board structure makes it sturdy and able to withstand mechanical loading.



### Fire resistant

60 minutes fire resistance from single layer partitions up to 10m high. Class 'O' certification. European class A2.



### Environmentally Friendly

fermacell Gypsum Fibreboards are manufactured from recycled cellulose fibres from post consumer waste paper and recycled water.



### Moisture Resistant

fermacell Gypsum Fibreboards are extremely suitable for rooms with variable humidity, eg. kitchens and bathrooms.



### Best sound insulation

Tests conducted by various worldwide institutes confirm outstanding sound insulating properties.

**fermacell is not only an excellent façade backer material, fermacell is also a high performance, multi-purpose building board. It combines in a single product, exceptional fire, impact and moisture resistance properties with high levels of acoustic insulation and weight carrying capacity.**



## Vented Rainscreen System

1. fermacell 12.5mm square edge board.
2. fermacell/internal lining board with vapour control layer if required.
3. Metal or timber stud to suit loading requirements, with appropriate head and foot track to manufacturers guidelines.
4. Insulation to main studs as per specification.

### 5. Fixings

Steel Frame – Screws wafer head zinc plated 4.2mm gauge with 10.5mm head e.g Hilti S-DD03Z 4.2x25mm at 150mm centres.

Timber Frame - Alternative fixings should be suitable for use in external and high humidity environments (min 1000hr salt spray resistance). Minimum nail diameter 2.2mm, 50mm long, suitable head size. Min 5mm. Contact the fermacell technical department for further details.

**NB.** Standard fermacell drywall screws must not be used in external / sheathing applications.

6. Breather membrane.
7. Vented rainscreen system by others.

### Jointing

Apply a minimum 50mm foil tape over all joints and screw heads. Where an airtight line is required, seal all joints with a suitable external grade mastic, fire and acoustic rated as required.

**NB.** We advise all loadings are taken back to their main supporting structure.

### Exposure to weather

Fermacell boards should not be left exposed to direct weathering for more than 14 days. After this time it must be protected with a breather membrane or similar, before the fitting of any final external system.

If severe weather is expected during the first 14 days, the boards must be protected immediately.

If the boards absorb any moisture ensure they are allowed to fully dry out before installation.

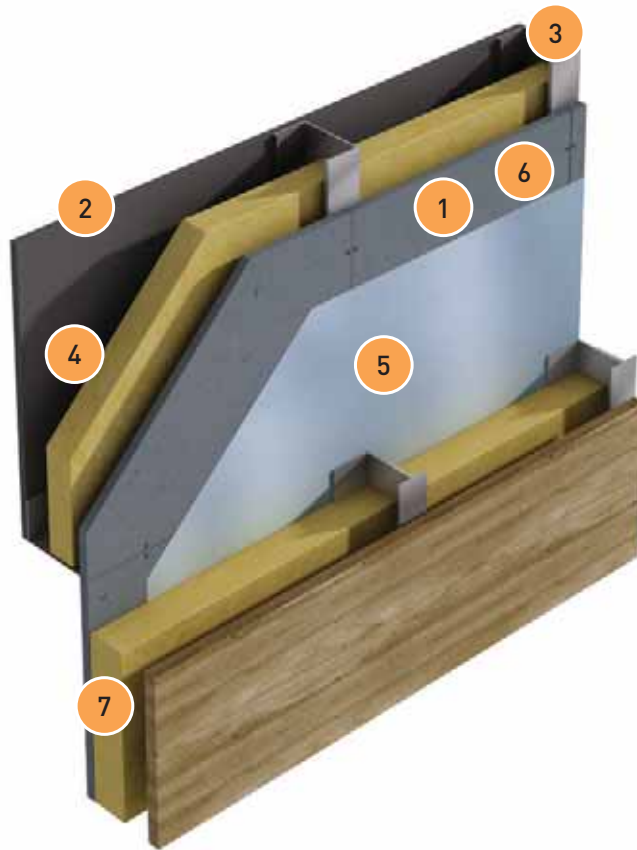
### Pull Out Test

Guidance results from tests as required on-site by EWI system manufacturer.

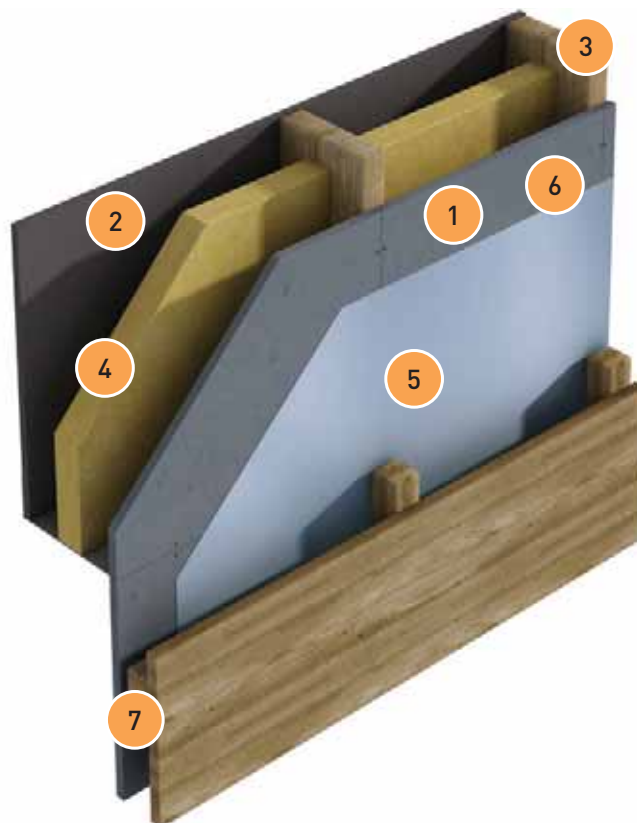
12.5mm <b>fermacell</b> Gypsum Fibreboard	0.742kN
15mm <b>fermacell</b> Gypsum Fibreboard	0.880kN
18mm <b>fermacell</b> Gypsum Fibreboard	1.091kN

**NB.** The results above are obtained from 10 tests per sample board carried out in accordance with equipment conforming to BS5427 on EJOT fixing SW8R 4.8mm x 60mm. The information above should form part of a general guide only.

## Steel frame with rainscreen cladding



## Timber frame with rainscreen cladding



For board characteristics see table on page 11.

## EWI Backing System

1. fermacell 12.5mm square edge board.
2. fermacell/internal lining board with vapour control layer if required.
3. Metal or timber stud to suit loading requirements, with appropriate head and foot track to manufacturers guidelines.
4. Insulation to main studs as per specification.
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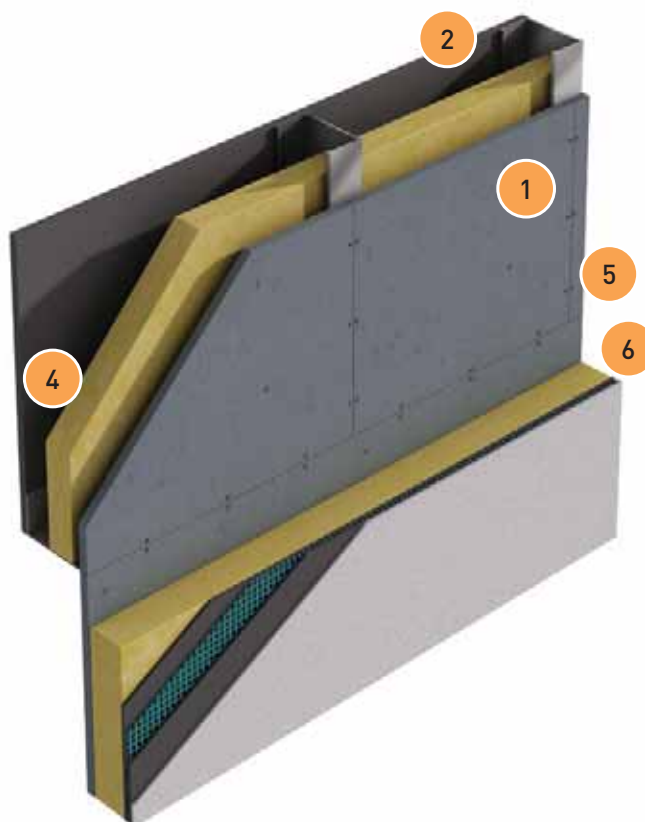
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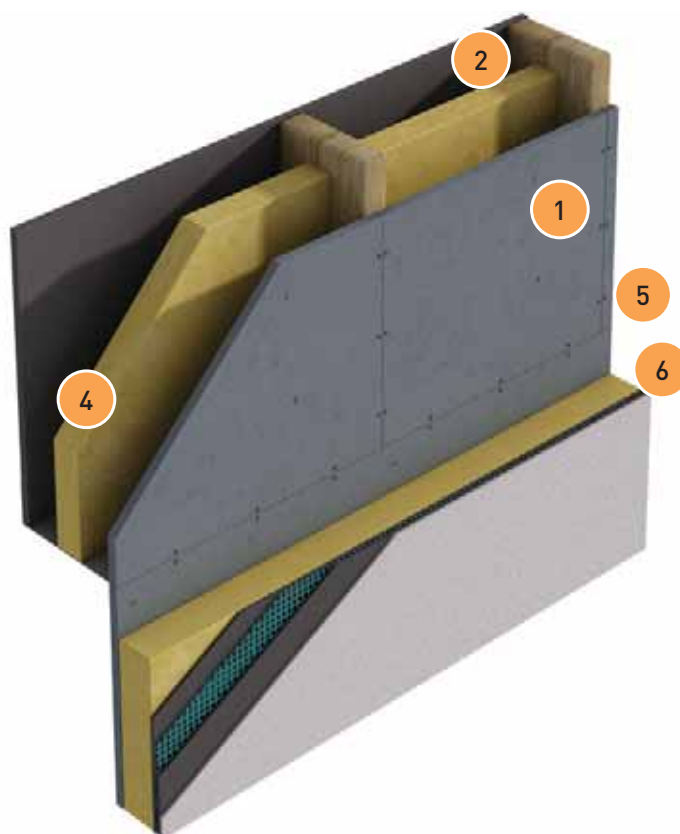
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## Steel frame with EWI



## Timber frame with EWI



For board characteristics see table on page 11.

## CASE STUDY



### fermacell scores heavily in Old Trafford test

The Point is the £12 million hospitality and events building at Lancashire County Cricket Club's historic Old Trafford ground, officially opened in June 2010.

fermacell was specified by architects BPD as the backer board for the rainscreen

cladding along the fascia of the spectacular elevated glass fronted structure.

**Why fermacell?** Because it offered significant cost savings and was a more environmentally friendly option than the established alternatives.

Above all, fermacell has the moisture resistance and all-round resilience required – especially at a stadium that's almost as famous for 'rain stopped play' as it is for some of the great moments in test cricket.

# fermacell Powerpanel H<sub>2</sub>O for render systems

## What is Powerpanel H<sub>2</sub>O?

Powerpanel H<sub>2</sub>O is a cement bonded light concrete board with a laminated structure, reinforced on both sides with an alkali resistant glass fibre mesh, manufactured in fermacell's factory in Calbe, Germany. Powerpanel H<sub>2</sub>O is non combustible and conforms to construction material class A1.

## Proven performance

- BBA approved for use in external wall constructions as a direct render carrier board
- Can be painted directly with a suitable exterior grade painting system
- Ideal for installation behind curtain facades
- Can be used for semi-exposed areas, such as soffits, walls and wall linings in covered balconies, car ports and garages

## Board features

- Board sizes (standard format) 1000, 2600, 3010 x 1200 x 12.5mm
- Bulk density: approx. 950-1050 kg/m<sup>3</sup>. Board weight: approx 13kg/m<sup>2</sup>. Building material class acc. to EN 13501-1: A1
- Frost resistant to EN 12467
- Environmentally compatible building material tested and recommended by IBR and ECO Institute

## Surface Coating

### Render Coating

Proprietary render systems can be applied to Powerpanel H<sub>2</sub>O as per our BBA certification, ensure board is supported correctly to fermacell UK guidelines.

Boards should be butted together with a maximum gap of 2mm, joints should be taped in line with the render system manufacturer's guidelines.

When using a manufacturers render system, refer to their details for full system performance.

## Fixings

### Timber Frame

Screw Type	i. Powerpanel H <sub>2</sub> O Screws. 3.9mm x 35mm @ 200mm centres ii. Stainless Steel Ejoyt SH3 STS-5.0 x 42mm @ 200mm centres
Staple Type	i. Stainless Steel - 1.5mm Gauge, 10mm Head, 38mm long @ 150mm centres

### Steel Frame

Screw Type	i. Powerpanel H <sub>2</sub> O Drilltip Screws. 3.9mm x 40mm @ 200mm centres ii. Stainless Steel Ejoyt JT3 STS-2-6.0 x 28mm @ 200mm centres
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## Fixing & Sub-frame Construction Details

### Maximum Sub-frame Spacing - 600mm centres

NB: The timber or steel studs should be designed to limit mid-span deflections to L/250 and cantilever deflections to L/180. Refer to Structural Engineers calculations.

**Minimum Timber Sizes:** Timber Studs (with/without Timber battens) – as directed by the Structural Engineer or external system manufacturer.

**Minimum Steel Sizes:** External Grade SFS system – as directed by the Structural Engineer or external system manufacturer.

**Movement Joints:** Horizontal and Vertical movement joints should be incorporated as part of the design to BS EN 13914-1:2005. Vertical movement joints must be set at maximum 15m intervals.

**Installation:** Should be kept above damp-proof course level and a minimum of 150mm above ground level.

**Detailing:** Ensure correct detailing around doors, windows and other openings and penetrations to reduce and avoid thermal bridging where possible.

**Penetrations:** Where required any penetrations, within systems acting as part of a fire construction, must be adequately fire stopped.

Refer to Powerpanel H<sub>2</sub>O BBA certificate 13/5044-Product Sheet 2 for further information. For board characteristics see table on page 11.

### CASE STUDY



### Casa ZII, Paratico (Brescia), Italy

On the shores of beautiful Lake Iseo in Italy's Lombardy region, architects Paola Belussi and David Moriggia have created a striking home using fermacell.

In creating a structure that uses bold geometric shapes and ratios, they wanted to specify a material they could rely on to be as efficient as their design. fermacell fitted the bill perfectly.

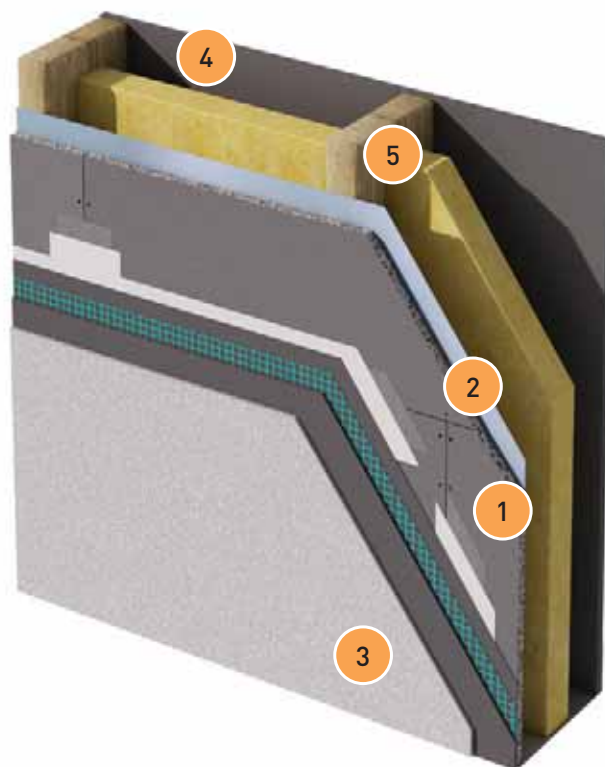
The project's unique setting meant every space of the building was at a different height, but its simple architectural composition has given it a visual harmony – while fermacell has given it an added dimension.

Constructed from pre-fabricated timber sections, fermacell Gypsum Fibreboard and fermacell Powerpanel H<sub>2</sub>O boards were chosen for their mechanical properties – acting as both finishing panels and adding racking strength to the building.

## Direct Render Powerpanel H<sub>2</sub>O System

1. fermacell Powerpanel H<sub>2</sub>O
2. Powerpanel H<sub>2</sub>O fixings
3. Render System by others
4. Supporting timber frame system by others
5. Breather membrane to face of supporting frame as required

System construction when installing Powerpanel H<sub>2</sub>O as a backing board for thin coat render systems. Fixed to battens and incorporating a ventilation cavity (ventilated facades).



A list of manufacturers of compatible render systems, coating and finishes can be requested from fermacell customer services.  
\*When using a manufacturer's render system, always follow their recommendations for optimum system performance.

## fermacell Gypsum Fibreboard

Dimensional tolerances at constant humidity - board dimensions	
Length	+0/-2mm
Width	+0/-2mm
Diagonal difference	≤2mm
Thickness 10/12.5/15/18	±0.2mm
Nominal density, strength	
Nominal density (production target)	1150+ 50kg/m <sup>3</sup>
Bending strength (after drying at 40 OC), at right angles to the board surface	≥5.8 N/mm <sup>2</sup>
Transverse strength	≥0.3 N/mm <sup>2</sup>
Certified tensile values according to DIN 1052 (Permit No: Z-9,1-434)	
Bending perpendicular to the board surface	1.2N/mm <sup>2</sup>
Bending in board surface	1.1 N/mm <sup>2</sup>
Tension in board surface	0.5 N/mm <sup>2</sup>
Pressure in board surface	2.0 N/mm <sup>2</sup>
Pressure perpendicular to the board surface	2.5 N/mm <sup>2</sup>
Shearing in board surface	0.3 N/mm <sup>2</sup>
Shearing perpendicular to the board surface	0.6 N/mm <sup>2</sup>
Modulus Calculations	
E-Modulus perpendicular to the board surface	3800 N/mm <sup>2</sup>
E-Modulus parallel to the board surface	3800 N/mm <sup>2</sup>
E-Modulus tension	3800 N/mm <sup>2</sup>
E-Modulus compression	3800 N/mm <sup>2</sup>
Shearing modulus G perpendicular to the board surface	1600 N/mm <sup>2</sup>
Shearing modulus G bending in the board surface	1600 N/mm <sup>2</sup>
Additional data	
Vapour Diffusion Resistance EN ISO 12572 μ	13
Thermal Conductivity λ	0.32 W/mK
Specific heat capacity C	1.1 kJ/kgK
Brinell hardness	30 N/mm <sup>2</sup>
Swelling after 24 hours saturation	<2%
Thermal co-efficient of expansion	0.001%/K
Expansion/shrinkage on alteration of the relative humidity of 30% (20°C)	0.25mm/m
Moisture content at 65% relative air humidity and 20°C air temperature	1.30%
Construction material category according EN 13501-1	A2-s1, d0
pH value	7-8

### Weather Exposure fermacell Gypsum fibreboards:

- Fermacell boards should not be left exposed to direct weathering for more than 14 days. After this time boards must be protected with a breather membrane or similar, before the fitting of any final external system
- With direct rain exposure the stability of the boards can decrease and some deformation may occur. The stability and strength of the boards returns once they dry out, any resultant deformation may remain in the boards
- If the boards absorb any moisture, then they must be allowed to dry out fully before further cladding, covering etc
- Do not install fermacell boards (without protection), in temperatures below 4 °C

### Board Storage and Handling

- Store on a flat level surface
- Wet board should be allowed to dry out before installation
- Packed in pallets of up to 50 boards
- Maximum 3 pallets are stacked on top of one another
- Before unloading, check load bearing capacity of the floor
- Boards should be carried upright
- Do not stack boards on their edges

### Health and Safety

- fermacell products do not contain and harmful or dangerous chemicals but please follow HSE Guidance Note EA44
- Ensure good ventilation
- Use dust extractors where possible
- Use dust mask that meets EN149

**NB.** Please adhere to full Health and Safety recommendations and regulations, for further details please contact fermacell technical department.

## fermacell Powerpanel H<sub>2</sub>O

Building inspectorate approval	ETA-07/0087
Construction materials to DIN EN 13501-1	Non-flammable A1
Dimensional tolerance at constant humidity for standard board sizes	
Board thickness	12.5mm
Length, width	±1mm
Diagonal difference	≤2mm
Thickness tolerance	±0.5mm
Board sizes	1000 x 1200mm
	1200 x 2600mm
	1200 x 3010mm
Characteristic values	
Density	~ 1000kg/m <sup>3</sup>
Weight per unit area	~ 13kg/m <sup>2</sup>
Moisture equilibrium	~ 5%
Water vapour diffusion resistance co-efficient	μ = 56
Thermal conductivity (to DIN EN 12664)	λ <sub>10.tr</sub> =0.17W/mK
Thermal resistance (to DIN EN 12664)	R <sub>10.tr</sub> = 0.07 m <sup>2</sup> K/W
Specific heat capacity	C <sub>p</sub> =1000J/(kgK)
Flexural strength	≤6.0N/mm <sup>2</sup>
Modulus of elasticity in bending	~ 6000N/mm <sup>2</sup>
Alkalinity	~ 10
Relative change in length (to EN 318)	0.15mm/m*
	0.10mm/m**

\*Betw. 30% and 65% r.h.  
\*\*Betw. 65% and 85% r.h.

For further data and information please refer to the European Technical Approval ETA-07/0087

Call fermacell UK for more details and system accessories.  
T: **0121 311 3480**

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West Midlands, B75 7BU  
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E-Mail: fermacell-uk@xella.com

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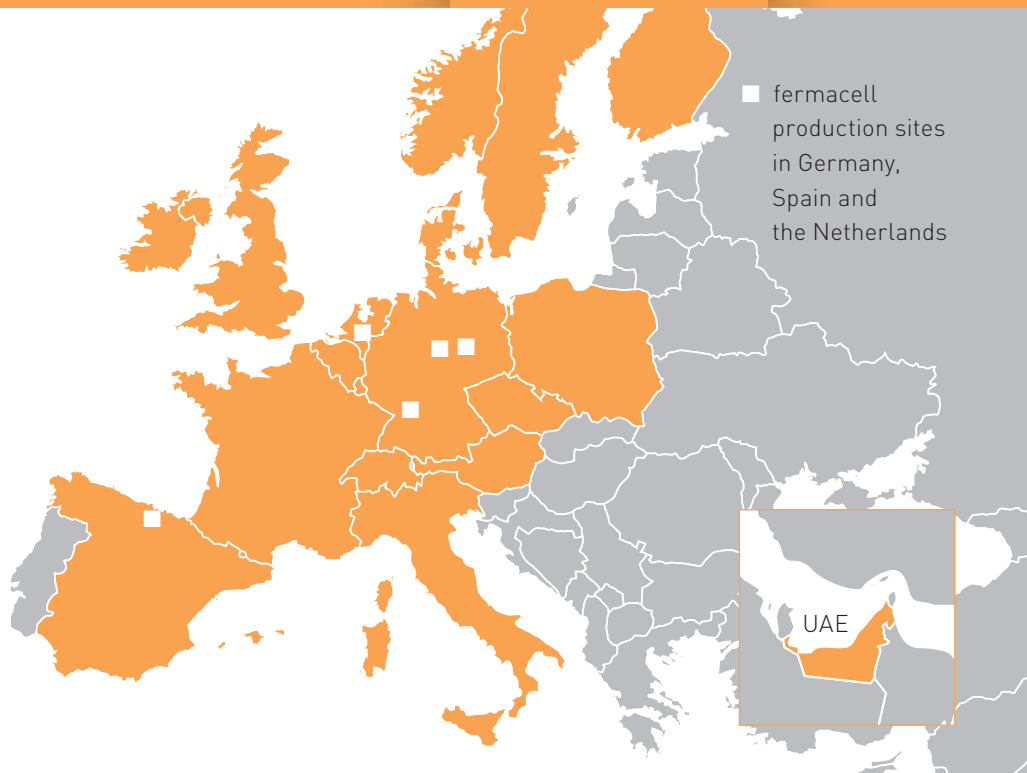
[www.fermacell.co.uk](http://www.fermacell.co.uk)

**fermacell**<sup>®</sup>

## A European business

The fermacell product range is today manufactured in 5 factories across Germany, the Netherlands and Spain.

With sales operations across Europe and one in the Middle East, fermacell products are used in construction projects from Aberdeen to Sicily and from Madrid to Warsaw. UK and international case studies demonstrate that construction industry professionals across Europe understand and value fermacell as the "ultimate building board".



Orejo Factory, Spain



Calbe Factory, Germany



Wijchen Factory, the Netherlands