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Authorised and notified according to Article 10 of the Council Directive of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products (89/106/EEC)

Deutsches Institut für Bautechnik

DIBt

Mitglied der EOTA
Member of EOTA

European Technical Approval ETA-07/0087

English translation prepared by DIBt - Original version in German language

Handelsbezeichnung *Trade name*	"FERMACELL Powerpanel H_2O" *"FERMACELL Powerpanel H_2O",*
Zulassungsinhaber *Holder of approval*	Xella Trockenbau-Systeme GmbH Dammstraße 25 47119 Duisburg DEUTSCHLAND
Zulassungsgegenstand und Verwendungszweck *Generic type and use of construction product*	Zementgebundene bewehrte Leichtbetonplatten zur Verwendung als Bauplatte für nichttragende innere Trennwände, für Wände und Decken im Innen- und Außenbereich sowie als Trocken-Unterboden *Cement-bonded reinforced lightweight concrete boards to be used as building board for non-load-bearing internal partitions, for walls and ceilings in indoor and outdoor areas as well as dry sub-floor*
Geltungsdauer: *Validity:* vom *from* bis *to*	28 June 2012 28 June 2017
Herstellwerk *Manufacturing plant*	Werk 10

Diese Zulassung umfasst *This Approval contains*	10 Seiten einschließlich 2 Anhänge *10 pages including 2 annexes*
Diese Zulassung ersetzt *This Approval replaces*	ETA-07/0087 mit Geltungsdauer vom 28.06.2007 bis 28.06.2012 *ETA-07/0087 with validity from 28.06.2007 to 28.06.2012*

I LEGAL BASES AND GENERAL CONDITIONS

1 This European technical approval is issued by Deutsches Institut für Bautechnik in accordance with:

- Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products[1], modified by Council Directive 93/68/EEC[2] and Regulation (EC) N° 1882/2003 of the European Parliament and of the Council[3];
- *Gesetz über das In-Verkehr-Bringen von und den freien Warenverkehr mit Bauprodukten zur Umsetzung der Richtlinie 89/106/EWG des Rates vom 21. Dezember 1988 zur Angleichung der Rechts- und Verwaltungsvorschriften der Mitgliedstaaten über Bauprodukte und anderer Rechtsakte der Europäischen Gemeinschaften (Bauproduktengesetz - BauPG) vom 28. April 1998[4], as amended by Article 2 of the law of 8 November 2011[5];*
- Common Procedural Rules for Requesting, Preparing and the Granting of European technical approvals set out in the Annex to Commission Decision 94/23/EC[6].

2 Deutsches Institut für Bautechnik is authorized to check whether the provisions of this European technical approval are met. Checking may take place in the manufacturing plant. Nevertheless, the responsibility for the conformity of the products to the European technical approval and for their fitness for the intended use remains with the holder of the European technical approval.

3 This European technical approval is not to be transferred to manufacturers or agents of manufacturers other than those indicated on page 1, or manufacturing plants other than those indicated on page 1 of this European technical approval.

4 This European technical approval may be withdrawn by Deutsches Institut für Bautechnik, in particular pursuant to information by the Commission according to Article 5(1) of Council Directive 89/106/EEC.

5 Reproduction of this European technical approval including transmission by electronic means shall be in full. However, partial reproduction can be made with the written consent of Deutsches Institut für Bautechnik. In this case partial reproduction has to be designated as such. Texts and drawings of advertising brochures shall not contradict or misuse the European technical approval.

6 The European technical approval is issued by the approval body in its official language. This version corresponds fully to the version circulated within EOTA. Translations into other languages have to be designated as such.

1 Official Journal of the European Communities L 40, 11 February 1989, p. 12
2 Official Journal of the European Communities L 220, 30 August 1993, p. 1
3 Official Journal of the European Union L 284, 31 October 2003, p. 25
4 *Bundesgesetzblatt Teil I 1998*, p. 812
5 *Bundesgesetzblatt Teil I 2011*, p. 2178
6 Official Journal of the European Communities L 17, 20 January 1994, p. 34

II SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

1 Definition of product/ products and intended use

1.1 Definition of the construction product

"FERMACELL Powerpanel H_2O" is a special cement-bonded reinforced lightweight concrete board with sandwich structure. The reinforcement consists of a double-sided topping reinforcement of alkali-resistant glass fibre fabric.

The boards are manufactured with a range of thickness between 10 mm to 15 mm.

The length of the boards can amount to 3000 mm and the width to 1250 mm.

"FERMACELL Powerpanel H_2O" is a non-combustible building material of class A1 according to EN 13501-1[7].

1.2 Intended use

1.2.1 "FERMACELL Powerpanel H_2O" may be used as building board for non-load-bearing internal partitions, as lining of building components in indoor and outdoor areas, as lathing boards for façades and for suspended ceilings.
"FERMACELL Powerpanel H_2O" may be used in the fields of application of categories A, B, C, or D according to EN 12467[8] and in addition in all fields, which are defined by the service classes 1, 2, or 3 according to EN 1995-1-1[9].

Beyond the use is permissible in ranges with limited chemical demand.

1.2.2 The provisions made in this European technical approval are based on an assumed working life of the board "FERMACELL Powerpanel H_2O" of 50 years, provided that the conditions laid down in sections 4 and 5 for packaging, transport, storage, installation, use, maintenance and repair are met. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

2 Characteristics of the construction product and methods of verification

2.1 Characteristics of the construction product

2.1.1 Mechanical resistance and stability

Not relevant.

(Material properties of "FERMACELL Powerpanel H_2O" see section 2.1.4).

2.1.2 Reaction to fire

The board "FERMACELL Powerpanel H_2O" meets the requirements of class A1 according to EN 13501-1[7].

Fire protective coverings made of "FERMACELL Powerpanel H_2O" with a thickness of ≥ 12.5 mm meet the requirements of class K 10 according to EN 13501-2[10].

7	EN 13501-1	Fire classification of construction products and building elements; part 1 -
8	EN 12467	Fibre-cement flat sheets -
9	EN 1995-1-1	Eurocode 5 – Design of timber structure – Part 1-1: General -
10	EN 13501-2	Fire classification of construction products and building elements; part 2 -

2.1.3 Hygiene, health and environment

The ETA is issued for the product with the chemical composition and other characteristics as deposited with the issuing Approval Body. Changes to the material, to the composition or the properties should immediately be notified to the approval body, which will decide whether a new assessment shall be necessary.

In addition to the specific clauses relating to dangerous substances contained in this European technical approval, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Directive, these requirements need also to be complied with, when and where they apply.

2.1.4 Safety in use

2.1.4.1 The density of the boards, tested according to section 3.2.1.2, shall amount to at least 900 kg/m^3 and may not exceed 1100 kg/m^3.

2.1.4.2 For bending strength with a load perpendicular to the board plane, tested according to section 3.2.1.2, the following minimum value (5%-fractile) is required:

$f_{m,90}$ = 6.0 N/mm^2 .

This value has to be kept in tests for each board thickness as follows:

From 100 samples in sequence not more than 5 samples are allowed to remain under the minimum value. No sample is allowed to remain more than 10 % under the minimum value.

The mean value of the bending modulus of elasticity amounts to

$E_{m,mean}$ = 5500 N/mm^2.

The mean value of Modulus or rupture of the boards, tested according to EN 12467, amounts to 8.32 MPa.

2.1.4.3 For the cross tension strength (tensile strength perpendicular to the board plane), tested according to EN 319, the following minimum value (5 %-fractile) is required:

$f_{t,90}$ = 0.20 N/mm^2.

2.1.4.4 For selected pin-shaped connecting devices the embedding strength was determined according to EN 383, the pull-through resistance according to EN 1383, as well as the withdrawal capacity of timber according to EN 1382 and of metal according to EN 14566[11].

Appropriate data are given in Annex 2.

2.1.4.5 The value of the impact resistance of "FERMACELL Powerpanel H_2O", tested according to EN 1128, amounts to IR = 11.9 mm/mm board thickness.

2.1.5 Protection against noise

Not relevant.

2.1.6 Energy economy and heat retention

2.1.6.1 The value of the thermal conductivity $\lambda_{10,tr}$ of "FERMACELL Powerpanel H_2O", tested according to EN 12664, amounts to $\lambda_{10,tr} \leq 0.173$ W/mK.

2.1.6.2 The mean value of the water vapour diffusion resistance of "FERMACELL Powerpanel H_2O", tested according to EN ISO 12572, amounts to μ = 56.

2.1.6.3 "FERMACELL Powerpanel H_2O" is not permeable to air.

2.1.7 Aspects of durability, serviceability and identification

2.1.7.1 Durability

- The moisture resistance was tested according to EN 12467, "Warm-water-test".
  "FERMACELL Powerpanel H_2O" meets the requirements of categories A, B, C and D.

[11] EN 14566 Mechanical fasteners for gypsum plasterboard systems - Definitions, requirements and test methods

- The durability was tested according to EN 12467, "Wet-dry-test".
  "FERMACELL Powerpanel H_2O" meets the requirements of category A.
- The resistance against freeze was tested according to EN 12467, "Freeze-thaw-change-test".
  "FERMACELL Powerpanel H_2O" meets the requirements of category A.
- The resistance against heat and rain was tested according to EN 12467, "Heat-rain-change-test".
  "FERMACELL Powerpanel H_2O" meets the requirements of category A.
- The water permeation of the boards was tested according to EN 12467.
  "FERMACELL Powerpanel H_2O" meets the requirements of categories A, B and D.

2.1.7.2 Serviceability

- The thickness of "FERMACELL Powerpanel H_2O", tested according to section 3.2.1.2, is between 10 mm and 15 mm.
  The length of the boards can amount to 3000 mm and the width to 1250 mm
  The dimensional tolerances may be ± 1.0 mm for the thickness of the board, ± 3 mm for the length of the board and ± 2 mm for the width of the board.
- The moisture content of "FERMACELL Powerpanel H_2O", tested according to EN 322, amounts to ≤ 5 % under standard climate (20° C / 65 % air humidity).
- The relative change in length (dimensions of swelling and shrinking in the plane of the board), tested according to EN 318, is
  in the range between 30 % and 65 % relative air humidity: amounts to 0.15 mm/m,
  in the range between 65 % and 85 % relative air humidity: amounts to 0.10 mm/m.
- For the water absorption, tested according to EN 520, the following values shall apply:
  water absorption at the surface: 650 g/m^2
  total water absorption of the boards: 8.5 %.

2.1.7.3 Identification

- "FERMACELL Powerpanel H_2O" meets the requirements of categories A, B, C and D according to EN 12467.
- The chemical composition of "FERMACELL Powerpanel H_2O" shall correspond to the details deposited with Deutsches Institut für Bautechnik.

3 Evaluation and attestation of conformity and CE marking

3.1 System of attestation of conformity

According to the Decisions 98/437/EC (Internal and external wall and ceiling finishes) of the European Commission system 4, with respect to reaction to fire system 3, of the attestation of conformity applies to construction products (here: "FERMACELL Powerpanel H_2O" as construction product, which as far as the use is concerned shall be assigned to both decisions). The system is defined in the Council Directive (89/106/EEC), Annex III, 2.(ii), second possibility, and provides for the following:

System 3: Declaration of conformity of the product by the manufacturer with respect to reaction to fire on the basis of:

(a) Tasks for the manufacturer:
  (1) factory production control;

(b) Tasks for the approved body:
  (2) initial type-testing of the product.

System 4: Declaration of conformity of the product by the manufacturer on the basis of:

Tasks for the manufacturer:

(1) initial type-testing of the product;

(2) factory production control.

3.2 Responsibilities

3.2.1 Tasks for the manufacturer

3.2.1.1 Factory production control

The manufacturer shall exercise permanent internal control of the production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall insure that the product is in conformity with this European technical approval.

The manufacturer may only use raw and constituent materials which in terms of a formulation are deposited with Deutsches Institut für Bautechnik.

The factory production control shall be in accordance with the "control plan", which is part of the technical documentation of this European technical approval. The "control plan" is laid down in the context of the factory production control system operated by the manufacturer and deposited with Deutsches Institut für Bautechnik[12].

The results of the factory production control shall be recorded and evaluated in accordance with the provisions of the "control plan".

3.2.1.2 Other tasks for the manufacturer

To ensure the properties of the product it suffices that each manufacturing plant observes compliance at the factory with the requirements given in section 2.1 of this ETA as to the bending strength, raw density and thickness as well as the CE marking given in section 3.3 of this ETA.

- The bending strength perpendicular to the plane of the board (see section 2.1.4.2) shall be tested according to EN 12467. Deviating the test specimen may have the following dimensions:
  Width W = 300 mm, length L = 400 mm, support distance L_A = 350 mm.
  The tests shall be carried out seven days after manufacturing the boards on one sample per shift; per sample the tests shall be performed as follows: parallel and perpendicular to the manufacturing direction of the boards and when loading each side of the board (top and bottom side).
- The density (see section 2.1.4.1) shall be determined according to EN 12467 on two samples per shift.
- The thickness of the board (see section 2.1.7.1) shall be determined according to EN 12467 on two samples per shift.

The manufacturer shall, on the basis of a contract, involve a body which is approved for the tasks according to section 3.3 in the field of product referred to in section 3.1 (wood-based panels as well as internal and external wall and ceiling finishes) to perform the tasks referred to in section 3.1. For this purpose the "control plan" according to sections 3.2.1.1 and 3.2.2 shall be presented by the manufacturer to the approved body.

The manufacturer shall make a declaration of conformity, stating that the construction product is in conformity with the provisions of the European technical approval ETA-07/0087 issued on 28 June 2012.

[12] The "control plan" is a confidential part of the European technical approval and only handed over to the approved body involved in the procedure of attestation of conformity. See section 3.2.2.

3.2.2 Tasks of approved bodies

In accordance with the "control plan" the approved body shall perform the following task in accordance with section 3.2.1.1:

- initial type-testing of the product.

The results of the approval examinations can be consulted as initial type-testing of the product.

The approved body shall retain the essential points of its actions and document the results obtained and conclusions drawn in a written report.

3.3 CE marking

The CE marking shall be affixed on the product itself, on a label attached to the product, on the packaging or on the accompanying commercial documents.

The letters "CE" shall be followed by the following additional information:

- Name and address of the producer (legal entity responsible for the manufacture),
- the last two digits of the year in which the CE marking was affixed,
- number of the European technical approval,
- trade name of the construction product (FERMACELL Powerpanel H_2O),
- reaction-to-fire class A1,
- thickness of the board.

4 Assumptions under which the fitness of the product for the intended use was favourably assessed

4.1 Manufacture

The manufacturing process of "FERMACELL Powerpanel H_2O" is deposited with Deutsches Institut für Bautechnik.

The European technical approval was issued for the product on the basis of data and information determined by testing which are deposited with Deutsches Institut für Bautechnik and which serve to identify the product that has been assessed and judged. Changes of the product or of the production process, which could result in the deposited data/information being incorrect, should be notified to Deutsches Institut für Bautechnik before the changes are introduced. Deutsches Institut für Bautechnik will decide whether or not such changes affect the ETA and consequently the validity of the CE marking on the basis of the ETA and if so whether further assessment or alterations to the ETA shall be necessary.

4.2 Design and execution of components (informative)

The design, calculation and execution of building components which are manufactured using the present "FERMACELL Powerpanel H_2O" can take place according to Annex 2 or accomplish the standards EN 1995-1-1[9] and EN 1993-1-1[13].

The data of this European technical approval including Annex 1 and if necessary the references in valid additional national regulations may be considered.

[13] EN 1993-1-1 Eurocode 3: Design of steel structures - Part 1-1: General rules and rules for buildings

4.3 Installation (informative)

As connecting devices of "FERMACELL Powerpanel H_2O" to the substructure appropriate nails, screws, clamps or rivets with adequate corrosion protection shall be used. The following conditions shall be observed:

- Nails shall have a diameter d off 2.0 mm ≤ d ≤ 3.0 mm and a head diameter of ≥ 1.8 d.

  The characteristic tensile strength of the nail wire shall be at least 600 N/mm².
- Screws shall be "FERMACELL Powerpanel screws".

  The technical details concerning this screws are deposited with Deutsches Institut für Bautechnik.
- Clamps shall have a wire diameter d ≥1.5 mm.

  The back width b_R of the clamps shall be $b_R \geq 6$ d.

Tips for calculation of connecting systems contain Annex 2.

The distances of the connecting devices from the unstressed edge of "FERMACELL Powerpanel H_2O" shall be at least 4 · d, from the stressed edge at least 7 · d.

5 Indications to the manufacturer

5.1 Packaging, transport and storage

During transport and storage "FERMACELL Powerpanel H_2O" and the components manufactured by using these boards shall be protected against damaging and inadequate moisture, e.g. from precipitation or high building moisture (e.g. covering the boards or the components on all sides with foil to avoid standing water).

5.2 Use, maintenance, repair

Damaged "FERMACELL Powerpanel H_2O" or components manufactured by using these boards may neither be used nor installed.

If "FERMACELL Powerpanel H_2O" is processed on site (on-site fabrication), the moisture of the timber substructure may not detrimentally increase until installing the boards (protection from precipitation or high building moisture).

Georg Feistel
Head of Department

beglaubigt:
Schröder

Deutsches Institut für Bautechnik DIBt

Characteristic strength and stiffness values as well as the density value of the "FERMACELL Powerpanel H_2O", which are to be used during design and calculation

Table 1: Characteristic values of strength and values of stiffness as well as density value of "FERMACELL Powerpanel H_2O"

Type of stress		Thickness of the board 10 mm to 15 mm
Characteristic strength values [N/mm²]		
Stress perpendicular to the plane of the board		
Bending	$f_{m,k}$	**6.0**
Compression	$f_{c,k}$	**11.7**
Values of stiffness [N/mm²]		
Stress perpendicular to the plane of the board		
Modulus of elasticity, Bending	$E_{m,mean}$	**5500**
Modulus of elasticity, Compression	$E_{c,mean}$	**6500**
Density value [kg/m³]		
Density	ρ_k	**1000**

"FERMACELL Powerpanel H2O",	Annex 1: (informative)
Characteristic strength and stiffness values as well as density value of the "FERMACELL Powerpanel H_2O"	

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Describing notes for design and calculation

1. Design, calculation and execution of building components which are manufactured by using the present "FERMACELL Powerpanel H_2O" can take place considering the table 1 in Annex 1 and the regulations in mark 2 according to EN 1995-1-1:2010-12.

   Additional national annexes shall be considered. For design the characteristic strength values and values of stiffness indicated according to table 1 and the regulations according to mark 2 shall be considered.

2. The characteristic value of the embedding strength, determined according to EN 383, for pin-shaped connecting devices with

		d	≤	2.0 mm	amounts to $f_{h,1,k}$ = 26.7 N/mm²
2.0 mm	<	d	≤	2.5 mm	amounts to $f_{h,1,k}$ = 23.1 N/mm²
2.5 mm	<	d	≤	3.0 mm	amounts to $f_{h,1,k}$ = 21.0 N/mm²

   For the characteristic value of the embedding strength of FERMACELL Powerpanel screws the shaft diameter is applied with d = 2.9 mm.

   The characteristic value of the pull-through resistance, determined according to EN 1383, for

   - FERMACELL Powerpanel screws amounts to $f_{2,k}$ = 500 N
   - nails with 2.0 mm ≤ d ≤ 3.0 mm amounts to $f_{2,k}$ = 350 N
   - clamps with d = 1.5 mm amounts to $f_{2,k}$ = 350 N.

   The characteristic value of the pull-out resistance for FERMACELL Powerpanel screws with d_1 = 3.9 mm (Major diameter of thread) for

   - softwood of strength class C24, determined according to EN 1382 amounts to $f_{1,k}$ = 10.4 N/mm²
   - metallic profiles, determined according to EN 14566 amounts of

     $f_{1,k}$ = 607 N for metallic profile thicknesses of t = 0.6 mm (not predrilled)

     $f_{1,k}$ = 1661 N for metallic profile thicknesses of t = 1.5 mm (predrilled).

   The characteristic value of yield moment for FERMACELL Powerpanel screws amounts to

   $M_{y,k}$ = 3150 Nmm

"FERMACELL Powerpanel H2O",	Annex 2: (informative)
Describing notes for design and calculation	