



European Technical Approval ETA-03/0050

English translation prepared by DIBt - Original version in German language

Handelsbezeichnung
Trade name

FERMACELL - Gipsfaserplatten - "FERMACELL Gipsfaser-Platte",
"FERMACELL Vapor", FERMACELL Gipsfaserplatte-greenline"-
FERMACELL Fibre gypsum boards

Zulassungsinhaber
Holder of approval

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Zulassungsgegenstand
und Verwendungszweck
*Generic type and use
of construction product*

Gipsfaserplatten für die Beplankung und Bekleidung von Bauteilen
Fibre gypsum boards for planking and lining of building components

Geltungsdauer:
Validity: vom
from
bis
to

17 June 2013
28 June 2018

Herstellwerk
Manufacturing plant

Werk 1, Werk 2, Werk 3, Werk 4, Werk 5
Plant 1, plant 2, plant 3, plant 4, plant 5

Diese Zulassung umfasst
This Approval contains

11 Seiten einschließlich 2 Anhänge
11 pages including 2 annexes

Diese Zulassung ersetzt
This Approval replaces

ETA-03/0050 mit Geltungsdauer vom 23.02.2009 bis 22.02.2014
ETA-03/0050 with validity from 23.02.2009 to 22.02.2014

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 products¹, modified by Council Directive 93/68/EEC² and Regulation (EC) N° 1882/2003 of the European Parliament and of the Council³;
 - *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 1998⁴, as amended by Article 2 of the law of 8 November 2011⁵;*
 - Common Procedural Rules for Requesting, Preparing and the Granting of European technical approvals set out in the Annex to Commission Decision 94/23/EC⁶.
- 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.
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- 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 the construction product and intended use

1.1 Definition of the construction product

"FERMACELL Gipsfaser-Platten", "FERMACELL Vapor" and "FERMACELL Gipsfaserplatte greenline" are special building boards made of gypsum and cellulose fibres. The "FERMACELL Vapor" additionally have a paper-faced functional layer. In contrast, "FERMACELL Gipsfaserplatten greenline" are coated. If individual characteristics concerned all previously mentioned building products at the same time, the plates are hereinafter referred as gypsum fibre boards.

They will be produced for the intended use after section 1.2 with a range of thickness between 10 mm and 25 mm.

Length and width of the boards are at least 500 mm.

The edges of the gypsum boards with fibrous reinforcement may be sharp edged or formed, e.g. "FERMACELL Trockenbau-Kante" (TB-Kante). The "FERMACELL TB"- edge consists of a 40 mm broad, to the edge of the board running flattening, whereby the largest reduction of the nominal thickness of the board is 2,5 mm. At the edge is additionally one chamfer.

The "FERMACELL Gypsum-Fibreboard" and "FERMACELL Gipsfaser-Platte greenline" meets the class A2-s1, d0 according to EN 13501-1⁷. At the "FERMACELL Vapor" has been no performance determined.

"FERMACELL Gipsfaser-Platten" correspond to type GF-W2 and type GF-I (see section 2.7.5).

1.2 Intended use

1.2.1 "FERMACELL Gipsfaser-Platten", "FERMACELL Vapor", "FERMACELL Gipsfaser-Platten greenline" are used for the planking (structural) and lining (non-structural) of building components. They may be used both as loadbearing and as stiffening boards.

The "FERMACELL Gipsfaser-Platten", "FERMACELL Vapor", "FERMACELL Gipsfaser-Platten greenline" may be used in the service classes 1 and 2 according to EN 1995-1-1⁸.

1.2.2 The provisions made in this European technical approval are based on an assumed intended working life of the Gypsum-Fibreboard of at least 50 years, provided that the conditions laid down in sections 4 and 5 for the 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.

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⁸

EN 13501-1:2002

Fire classification of construction products and building elements; part 1

EN 1995-1-1:2010-12

Eurocode 5; Design of timber structures; Part 1-1: General - Common rules and rules for building

2 Characteristics of the construction product and methods of verification

2.1 Mechanical resistance and stability

The characteristic values for strength and stiffness of the "FERMACELL- Gipsfaser- Platten" are indicated in Annex 1, table 1.

For bending strength perpendicular to the board plane, tested according to section 3.2.1.2, the following minimum value is required:

$$f_{m,90} \geq 5,8 \text{ N/mm}^2.$$

This value must not be used for the calculation according to EN 1995-1-1⁸.

The density of the gypsum fibre boards, tested according section 3.2.1.2, shall be at least 1000 kg/m³ and must not exceed 1250 kg/m³.

2.2 Behaviour against fire

2.2.1 Reaction to fire

Based on tests carried out according to EN 13823⁹ (SBI) in combination with EN ISO 1716 the "FERMACELL Gipsfaser- Platten" and the "FERMACELL Gipsfaserplatten greenline" meet the class A2-s1, d0 according to EN 13501-1⁷. For the "FERMACELL Vapor" no performance has been determined.

Fire protection clothing out "FERMACELL-Gipsfaser-Platten" with a thickness at least 10mm fulfills the requirements of the class K 10 according to EN 13501-2¹⁰.

2.3 Hygiene, health and environment

The European technical approval is issued for the product with the chemical composition and other characteristics as deposited with the issuing Approval Body. Changes of materials, of composition or characteristics, should be immediately notified to the Approval Body, which will decide whether a new assessment will 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.

2.4 Safety in use

The value of the impact resistance of the "FERMACELL Gypsum-Fibreboard", tested according to EN 1128, is at least IR = 11 mm/ mm thickness of the board.

2.5 Protection against noise

Not relevant.

2.6 Energy economy and heat retention

2.6.1 The value of thermal conductivity λ of the "FERMACELL Gipsfaser-Platten", tested according to EN 12664, is $\lambda \leq 0.32 \text{ W/mK}$.

For the "FERMACELL Vapor" and the "FERMACELL Gipsfaserplatte-greenline" no performance has been determined.

⁹ EN 13823:2010-12 Reaction to fire tests for building products – Building products excluding floorings exposed to the thermal attack by a single burning item

¹⁰ EN 13501-2:2003 Fire classification of construction products and building elements; part 2

- 2.6.2 The "FERMACELL Gipsfaser-Platten" are airtight.
- 2.6.3 The value of the water vapour diffusion resistance of the "FERMACELL Gipsfaser-Platten", tested according to EN ISO 12572¹¹, is $\mu = 13$. The s_d -value determined according to EN ISO 12572¹¹ for the "FERMACELL Vapor" of thicknesses 10 mm / 18 mm is $s_d = 3.1 \text{ m} / 4.5 \text{ m}$.

For the "FERMACELL Gipsfaserplatten greenline" no performance has been determined.

2.7 Aspects of durability, serviceability and identification

- 2.7.1 The thickness of the "FERMACELL Gipsfaser-Platten", "FERMACELL Vapor" and the "FERMACELL Gipsfaser-Platte greenline" for the intended use after section 1.2 must be between 10 mm and 25 mm.

Length and width of the boards must be at least 500 mm.

Dimensional tolerances of 0/-4 mm for nominal width of boards, 0/-5 mm for nominal length and $\pm 0.2 \text{ mm}$ for nominal thickness are permissible. They correspond to board type C1 in accordance with EN 15283-2¹².

- 2.7.2 The moisture content of the FERMACELL Gypsum-Fibreboard in normal climate (20 °C/ 65 % humidity), tested according to EN 322, ranges between 1.0 and 1.5 %. In this case the boards are dried up by 40 °C to mass constancy.
- 2.7.3 The relative change in length during testing according to EN 318 for "FERMACELL Gipsfaser-Platten" of thicknesses 10 mm to 18 mm for swelling is $\delta l_{65,85} = 0.33 \text{ mm/m}$. The relative change in length for "FERMACELL Gipsfaser-Platten" for shrinkage is $\delta l_{65,30} = -0.31 \text{ mm/m}$.
- 2.7.4 The chemical composition of the fibre gypsum boards shall correspond to the details deposited with the Deutsches Institut für Bautechnik.
- 2.7.5 The following additional type designations can be specified as a function of water absorption and surface hardness. If the water absorption is less than 1500g/m² according to testing as described in section 5.9 of DIN EN 15283-2¹² the "FERMACELL-Gipsfaser-Platte" can be designated as type GF-W2.

If the diameter of the indentation is less than 15 mm according to testing as described in section 5.11 of EN 15283-2¹² the panel may be designated as a "FERMACELL-Gipsfaser-Platte" of type GF-I with increased surface hardness.

3 Evaluation of conformity and CE marking

3.1 System of attestation of conformity

In its Decision 95/467/EC the European Commission has specified system 3 for the attestation of conformity of gypsum products (in the present case: fibre gypsum boards). The system is described in the Council Directive (89/106/EEC) in Annex III, 2 (ii), second possibility and provides for the following:

System 3: Declaration of conformity of the product by the manufacturer on the basis of:

- (a) Tasks of the manufacturer:
- (1) factory production control;
- (b) Tasks of the approved body:
- (2) initial type-testing of the product.

¹¹ EN ISO 12572:2001 Hydrothermal performance of building materials and products - Determination of water vapour transmission properties

¹² EN 15283.-2:2009:12, Gypsum boards with fibrous reinforcement- part 2-Gypsum fibre boards

3.2 Responsibilities

3.2.1 Tasks of the manufacturer

3.2.1.1 Factory production control

The manufacturer shall exercise permanent internal control of 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 in consensus to the details deposited by the 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 at the Deutsches Institut für Bautechnik.¹³

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

3.2.1.2 Other tasks of manufacturer

The manufacturer shall control in each manufacturing plant compliance with the requirements given in section 2 of the present European technical approval for the bending strength and the density as well as with the requirements given in section 3.3 of the present European technical approval for the CE marking.

The determinations of the control plan to monitor the values must be observed.

The manufacturer shall, on the basis of a contract, involve a body which is approved for the tasks referred to in section 3.1 in the field of gypsum fibre boards in order to undertake the actions laid down in section 3.3. For this purpose, the "control plan" referred to in sections 3.2.1.1 and 3.2.2 shall be handed over by the manufacturer to the approved body involved.

The manufacturer must give an attestation of conformity for his product. So he declares, that the building product is in accordance with this ETA 03/0050.

3.2.2 Tasks of approved bodies

The approved body shall perform the

- initial type-testing of the product

in accordance with the provisions laid down in the "Control Plan" (see section 3.2.1.1)

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

¹³

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

3.3 CE marking

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

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

- the name and address of the manufacturer (legal entity responsible for the manufacture),
- the last two digits of the year in which the CE marking was affixed,
- the number of the European technical approval,
- the trading name,
- reaction to fire class,
- the thickness of the board,
- the type of the board.

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

4.1 Manufacturing

The manufacturing procedure for the fibre gypsum boards has been deposited by the Deutsches Institut für Bautechnik.

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

4.2 Design, calculation and execution of building components

The design, calculation and execution of building components which are manufactured using the present "FERMACELL Gipsfaser-Platten", "FERMACELL-Vapor", "FERMACELL-greenline" can take place according to Annex 2 or accomplish the standards EN 1995-1-1⁸ and EN 1993-1-1¹⁴.

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

¹⁴ EN 1993-1-1

4.3 Installation

As connectors for the "FERMACELL Gipsfaser-Platten", "FERMACELL Vapor" and the "FERMACELL Gipsfaser-Platten greenline" with the substructure can be used zinc-coated and/or stainless nails, screws or staples. Following conditions must be considered:

- The nails must have a diameter $2.0 \text{ mm} \leq d \leq 3.0 \text{ mm}$ and a diameter of the nail head at least $\geq 1.8 d$.
- The characteristic tensile strength of the nail steel must be at least 600 N/mm^2 .
- The staples must have a wire diameter $d \geq 1.5 \text{ mm}$. The back width b_R of the staples must be $6 d \leq b_R \leq 12 \text{ mm}$.
- The screws must have an outside diameter of the screw thread $d \geq 3.5 \text{ mm}$.

Tips for calculation of connecting systems contain Annex 2.

The distances of the connectors from the unstressed edge of the Gypsum fibre boards shall be at least $7 \cdot d$, from the stressed edge at least $10 \cdot d$.

5 Indications for the manufacturer and user

5.1 Packaging, transport and storage

During transport and storage the "FERMACELL Gipsfaser-Platten", the "FERMACELL Vapor" and "FERMACELL Gipsfaser-Platten greenline" and the components manufactured by using the present boards shall be protected against damaging and inadequate moisture, e. g. due to precipitation or high construction moisture (all-round covering of the boards or components by means of a foil).

5.2 Use, maintenance and repair

Damaged Gypsum fibre boards or components manufactured by using the present boards must not be used or installed.

Where components are produced on site by using fibre gypsum boards the moisture of the wood substructure must not increase inadequately until installation of the fibre gypsum boards (protection against precipitation or very high construction moisture).

Andreas Kummerow
p. p. Head of Department

beglaubigt:
Wehlan

Annex 1:

Characteristic strength and stiffness values of the FERMACELL Gypsum-Fibreboard, which are to be used during design and calculation

Table 1: Characteristic strength and stiffness values of the "FERMACELL Gipsfaser-Platte", "FERMACELL Vapor" and "FERMACELL Gipsfaser-Platten greenline" in N/mm²

Type of stress		Thickness of boards in mm				
		10	2,5	15	18	25
Characteristic strength values						
Perpendicular to the plane of the board						
Bending	$f_{m,k}$	4,6	4,3	4,0	3,6	3,0
Shear	$f_{v,k}$	1,9	1,8	1,7	1,6	1,4
In plane of the board						
Bending	$f_{m,k}$	4,3	4,2	4,1	4,0	3,8
Tension	$f_{t,k}$	2,5	2,4	2,4	2,3	2,1
Compression	$f_{c,0,k}$	8,5				
	$f_{c,90,k}$	7,3				
Shear	$f_{v,k}$	3,7	3,6	3,5	3,4	3,2
Stiffness values						
Perpendicular to the plane of the board						
Modulus of elasticity	$E_{m,mean}$	3800				
Shear modulus		1600				
Compression Modulus of elasticity ⊥ to the plane	$E_{c,perp}$	800				
In plane of the board						
Bending, Tension, Compression Modulus of elasticity	$E_{m,t,c,mean}$	3800				
Shear modulus	G_{mean}	1600				
Value of density (in kg/m³)						
Density	ρ_k	1150				

Annex 2 (informative)

Describing notes for design and calculation

- Design, calculation and execution of building components which are manufactured by using the present "FERMACELL Gipsfaser-Platte", "FERMACELL Vapor" and the "FERMACELL Gipsfaser-Platten greenline" can take place considering the table 1 in Annex 1 and the regulations in mark 3 according to EN 1995-1-1⁸. Additional national regulations are to be considered.
- For this calculation the characteristic strength values and values of stiffness indicated in table 1 and the regulations in mark 3 are relevant.
- As design data of the modification factor k_{mod} the following values are valid:

Class of load action duration	service class 1	service class 2
permanent	0,20	0,15
long	0,40	0,30
average	0,60	0,45
shortterm	0,80	0,60
very short	1,10	0,80

As design data of the deformation parameter k_{def} the following values are valid:

Class of load action duration	service class 1	service class 2
permanent	3,0	4,0
long	2,0	2,5
average	1,0	1,25
shortterm	0,35	0,5

As partial safety factor of fibre gypsum boards $\gamma_m = 1,3$ is recommended, provided that the regulations applicable at the location of application do not specify another value.

The characteristic embedding strength of the face of the hole can be determined as follows:

$$f_{h,1,k} = 7 \cdot d^{-0,7} \cdot t^{0,9} \quad (\text{N/mm}^2)$$

with d = nominal diameter of the connector (mm)

t = thickness of board (mm)

(in the range of the TB-Kante is the reduced board thickness to set)

The characteristic value of the load-bearing capacity of connecting devices for each shear joint R_k can be determined for board thickness $t \geq 7d$ (within the range of the TB-Kante is the reduced board thickness to set) simplifying as follows:

$$R_k = 0,7 \cdot \sqrt{2 \cdot M_{y,k} \cdot f_{h,1,k} \cdot d} \quad (\text{N})$$

with $M_{y,k}$ = characteristic value of the flow moment of the connecting device (Nmm).

If the board thickness t is smaller than $7d$, R_k is to be reduced in the relationship $t / 7d$.

If the characteristic load-bearing capacity R_k will be determined for boards with TB-Kante, for staples connections with demand perpendicular to edge of the board the characteristic load-bearing capacity R_k is to reduce in the relationship $1.5 : d$. For nailed connections the characteristic load-bearing capacity R_k is always to reduce in the relationship $2.5 : d$ by a thickness of the board $t \leq 12.5$ mm and a nail diameter $d > 2.5$ mm.

By one set connections with predominantly short actions on structures parallel to the edge of the gypsum fiber board the determined characteristic load-bearing capacity R_k can be increased by a share ΔR_k as follows:

$$\Delta R_k = \min \{ 0,5 \cdot R_k; 0,25 \cdot R_{ax,k} \}$$

For board thicknesses of 10 mm to 25 mm the characteristic values of head pull-through resistance $R_{ax,head,k}$ shown below apply.

1	2	3	4	5
Board thickness t	10 mm	12.5 mm	15 mm	18 mm - 25 mm
$R_{ax,head,k}$	500 N	900 N	1100 N	1300 N

As design data for the slip modulus of displacement for each shear joint K_{ser} of connecting devices can k_{ser} calculated as a function of the density in according EN 1995-1-1⁸.