Deutsches Institut für Bautechnik

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Approval body for construction products and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and Laender Governments

Designated according to Article 29 of Regulation (EU) No 305/2011 and member of EOTA (European Organisation for Technical Assessment)

European Technical Assessment ETA-07/0087 of 22 October 2020

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the European Technical Assessment:	Deutsches Institut für Bautechnik
Trade name of the construction product	"FERMACELL Powerpanel H_2O"
Product family to which the construction product belongs	Cement-bonded board
Manufacturer	James Hardie Europe GmbH Bennigsen Platz 1 40474 Düsseldorf DEUTSCHLAND
Manufacturing plant	Werk 10
This European Technical Assessment contains	11 pages including 2 annexes which form an integral part of this assessment
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of	EAD 210024-00-0504
This version replaces	ETA-07/0087 issued on 29 June 2017

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Specific part

1 Technical description of the product

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

The boards can be produced with flat-edges.

The boards are usually available in nominal lengths up to 3010 mm and nominal width up to 1250 mm.

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

The boards shall be used with one of the following fixing elements:

- FERMACELL screw according to Annex A1
- Nails with 2,0 mm ≤ d ≤ 3,0 mm according to Annex A2
- Staples with a diameter of d = 1,5 mm according to Annex A3

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

2 Specification of the intended use in accordance with the applicable European Assessment Document

The performances given in Section 3 are only valid if the cement bonded board "FERMACELL Powerpanel H_2O" is used in compliance with the specifications and conditions given in Annex B.

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the cement bonded board "FERMACELL Powerpanel H_2O" of at least 50 years. 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.

3 Performance of the product and references to the methods used for its assessment

3.1 Mechanical resistance and stability (BWR 1)

The essential characteristics regarding mechanical resistance and stability are included under the Basic Works Requirement safety in use.

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1 according to EN 13501-1

[1] EN 13501-1 Fire classification of construction products and building elements; Part 1: Classification using data from reaction to fire tests

3.3 Hygiene, health and environment (BWR 3)

Essential characteristic	Performance
Vapour Permeability	μ = 56
Content, emission and/or release	
Substance(s) classified as EU-cat. Carc. 1A/1B in accordance with Regulation (EC) No 1272/2008.	The product does not contain these dangerous substances actively used.[a)]
Substance(s) classified as EU-cat. Muta. 1A/1B in accordance with Regulation (EC) No 1272/2008.	
Substance(s) classified as EU-cat. Acute Tox. 1, 2 and/or 3; EU-cat. Repr. 1A/1B; EU-cat. STOT SE 1 and/or STOT RE 1, in accordance with Regulation (EC) No 1272/2008.	
Biocides	Not contained.[a)]
Release scenarios regarding BWR 3: IA1, IA2, IA3 (according to EOTA TR 034)	

a) Assessment based on a detailed manufacturer's product declaration.

3.4 Safety and accessibility in use (BWR 4)

Essential characteristic	Performance
Thickness	e = 12,5 mm ± 1,25 mm
Dimension (length and width)	a = 3010 mm x 1250 mm ± 5 mm
Straightness of edges	0,1 % = Level I acc. to EN 12467
Squareness of edges	2 mm/m = Level I acc. to EN 12467
Density	ρ_{mean} = 1000 ± 100 kg/m³
Moisture content	H = 3,85 % by mass
Water impermeability	Passed
Dimensional stability	$\delta l_{65,30}$ = 0,15 mm/m $\delta l_{65,85}$ = 0,10 mm/m
Bending strength Bending modulus of elasticity	$f_{m,90,k}$ = 6,0 N/mm² $E_{m,90,mean}$ = 4200 N/mm²
Compressive strength Compressive modulus of elasticity	$f_{c,90,k}$ = 11,7 N/mm² $E_{c,90,mean}$ = 6500 N/mm²
Embedment strength Nails according to Annex A1 - d = 2,0 mm - 2,0 < d ≤ 2,5 mm - 2,5 < d ≤ 3,0 mm	 $f_{h,k}$ = 26,7 N/mm² $f_{h,k}$ = 23,1 N/mm² $f_{h,k}$ = 21,0 N/mm²
Pull through resistance - FERMACELL Powerpanel screws (Annex A1) - Nails with 2,0 mm ≤ d ≤ 3,0 mm (Annex A2) - Staples with d = 1,5 mm (Annex A3)	 $f_{head,k}$ = 500 N $f_{head,k}$ = 350 N $f_{head,k}$ = 350 N
Impact resistance	IR_{mean} = 11,90 mm/mm
Water adsorption	w_a = 8,5 % by mass

Essential characteristic	Performance
Freeze-thaw resistance for category A	$R_{L,FTC}$ = 0,99
Heat-rain resistance for category A	Passed
Warm water resistance for category A	$R_{L,WW}$ = 1,39
Soak-dry resistance for category A	$R_{L,SD}$ = 1,37
Durability	Annex B

3.5 Energy economy and heat retention (BWR 6)

Essential characteristic	Performance
Thermal conductivity	$\lambda_{10,tr}$ = 0,173 W/(m x K)
Air permeability	The cement bonded board "FERMACELL Powerpanel H_2O" is not permeable to air.

4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

In accordance with EAD No. 21-0024-05.04, the applicable European legal act is: 1998/437/EC (EU).

The system to be applied is: 4

In addition, with regard to reaction to fire for products covered by this EAD the applicable European legal act is: 1989/106/EC (EU)

The system to be applied is: 3

In addition, with regard to dangerous substances for products covered by this EAD the applicable European legal act is: 98/437/EC (EU)

The system to be applied is: 3

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at Deutsches Institut für Bautechnik.

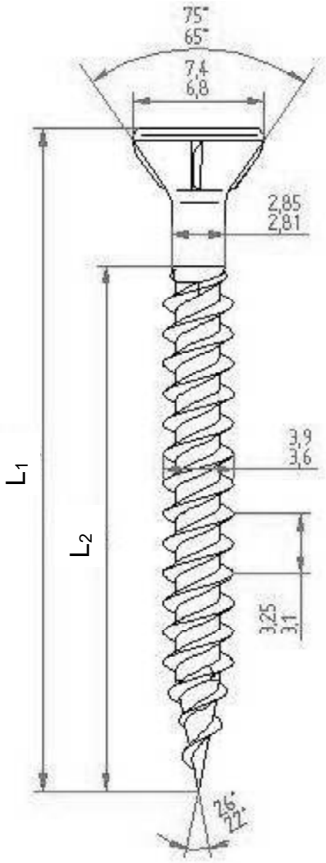
Issued in Berlin on 22 October 2020 by Deutsches Institut für Bautechnik

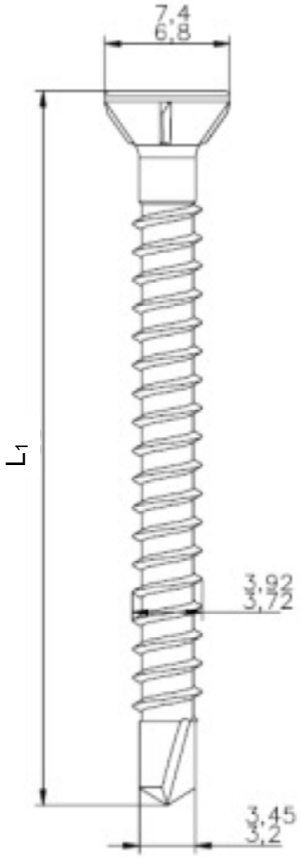
BD Dipl.-Ing. Andreas Kummerow
Head of Department

beglaubigt:
Schröder

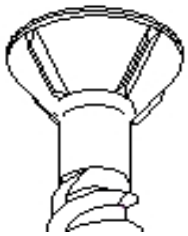
Deutsches Institut für Bautechnik DIBt

FERMACELL Powerpanel Screw K7,4-3,9 x L_1 mm

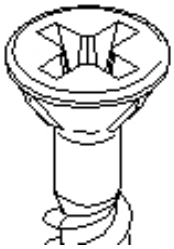




with drill point



Cutting rib



Recessed head

d_s = 2,9 mm

L_1	L_2
35 mm	29 mm
50 mm	29 mm
40 mm (DP)	29 mm

Dimensions in mm; without scale

Material:

Material:	Steel
Material No.	1.5523 according to EN 10263-4
Corrosion protection:	C4-medium according to EN ISO 12944

"FERMACELL Powerpanel H_2O"	**Annex A1**
Fastener for the cement bonded reinforced lightweight concrete board: FERMACELL Powerpanel screw with or without drill point	

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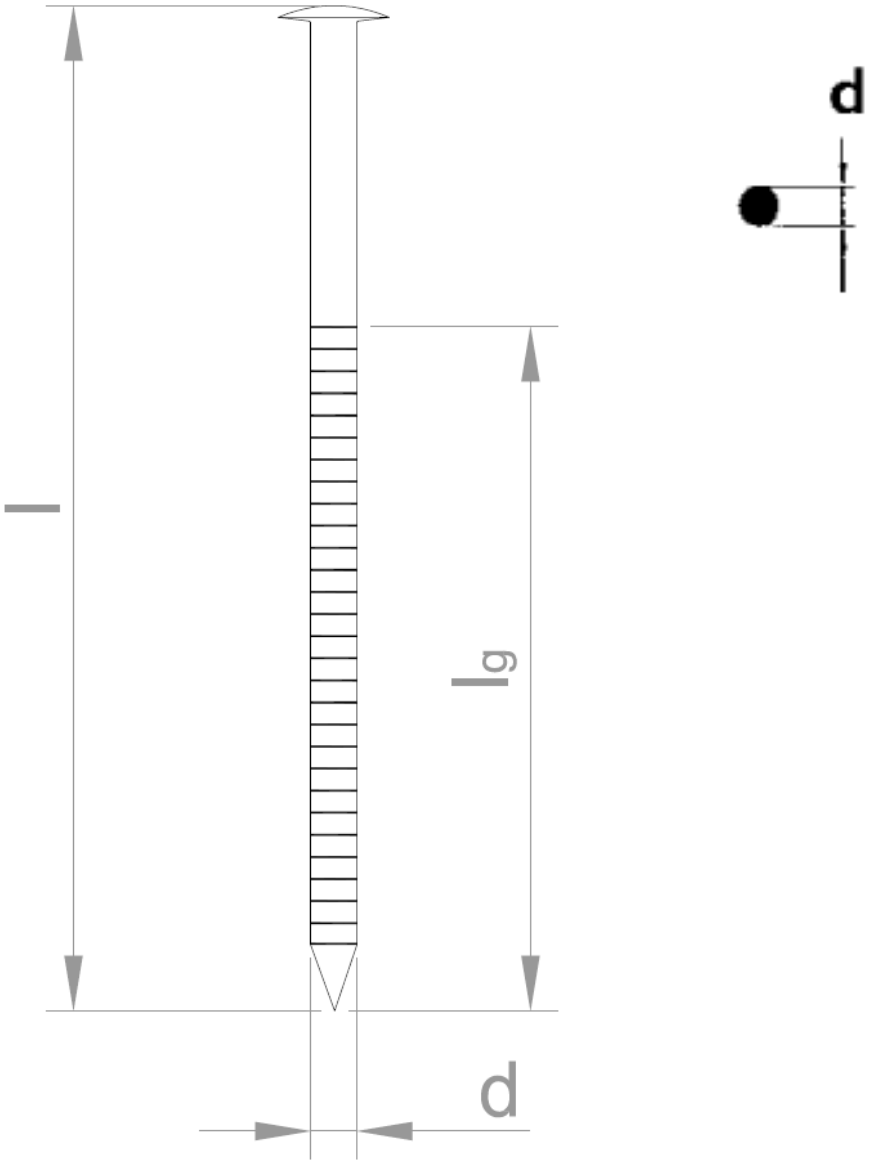
Nails according to EN 14592



Dimensions in mm; without scale

Nails according to EN 14592 with a characteristic tensile strength of the nail wire $f_{t,k}$ ≥ 600 N/mm²
d = 2,0 mm to 3,0 mm
d_{head} ≥ 1,8 x d
Material: Zinc coated steel or stainless steel
Material no.: C9D acc. to EN ISO 16120 or EN 1.4301 acc. to EN 10088

"FERMACELL Powerpanel H_2O"	**Annex A2**
Fastener for the cement bonded reinforced lightweight concrete board: Nails according to EN 14592	

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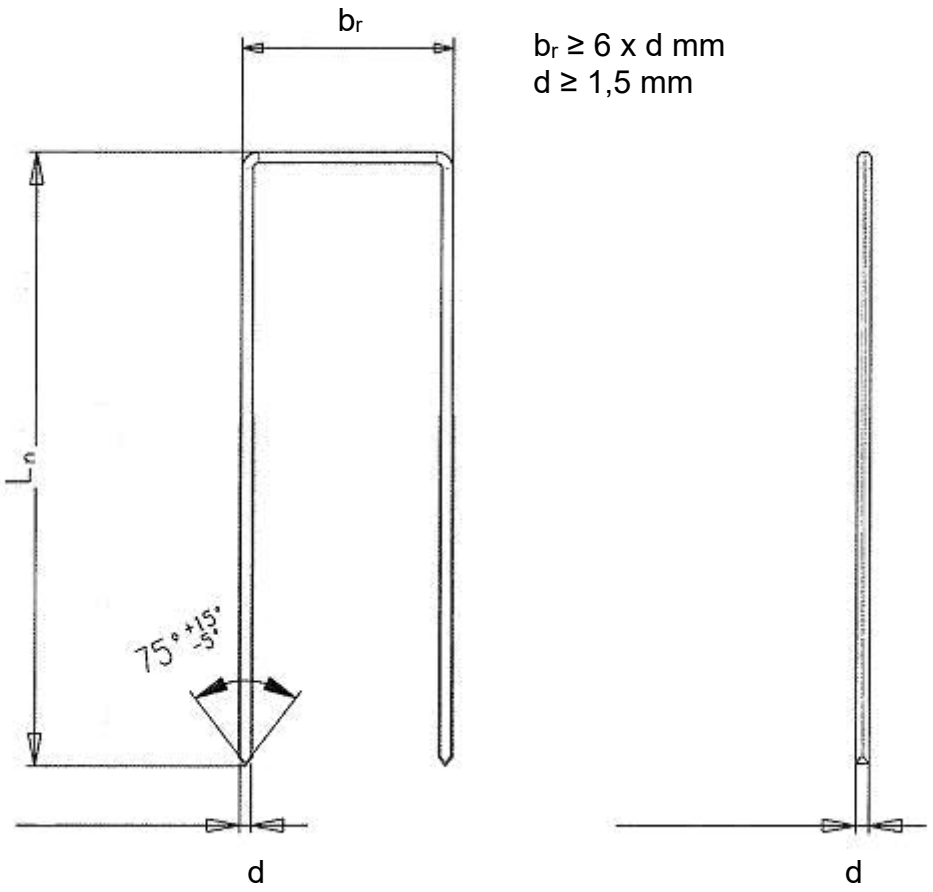
Staples according to EN 14592



Dimensions in mm; without scale

Material:

Material:	Zinc coated steel or stainless steel
Material No.	C20D acc. to EN ISO 16120 or 1.4301 acc. to EN 10088

"FERMACELL Powerpanel H_2O"	**Annex A3**
Fastener for the cement bonded reinforced lightweight concrete board: Staples according to EN 14592	

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Specification of the intended use

Cement Bonded Board subject to <u>non-structural applications</u>

- non-load bearing internal partitions
- lining of building components in indoor and outdoor areas
- for manufacturing of floor construction

Use conditions

<u>Cement bonded board</u>

Category **A** acc. to EN 12467:	Boards which are for applications where they may be subjected to heat, high moisture and severe frost.
Category **B** acc. to EN 12467:	Boards which are intended for applications where they may be subjected to heat, moisture and occasional frost, e.g. where they are either protected from or not subjected to severe weathering conditions.
Category **C** acc. to EN 12467:	Boards which are intended for internal applications, where they may be subjected to heat and moisture, but not to frost.
Category **D** acc. to EN 12467:	Boards for rigid underlayer applications.

Service class **1** acc. to EN 1995-1-1:	Is characterised by a moisture content in the materials corresponding to a temperature of 20 °C and the relative humidity of the surrounding air only exceeding 65 % for a few weeks per year.
Service class **2** acc. to EN 1995-1-1:	Is characterised by a moisture content in the materials corresponding to a temperature of 20 °C and the relative humidity of the surrounding air only exceeding 85 % for a few weeks per year.
Service class **3** acc. to EN 1995-1-1:	Is characterised by climatic conditions leading to higher moisture contents than in service class 2

<u>Fasteners</u>

- Structures subject to dry internal conditions
  (zinc coated steel or stainless steel)
- Structures subject to external atmospheric exposure (including industrial and marine environment) and to permanently damp internal condition, if no particular aggressive conditions exist (stainless steel)

  Note: Particular aggressive conditions are e.g. permanent, alternating immersion in seawater or the splash zone of seawater, chloride atmosphere of indoor swimming pools or atmosphere with extreme chemical pollution (e.g. in desulphurization plant or road tunnels where de-icing materials are used)

"FERMACELL Powerpanel H_2O"	**Annex B1**
Specification of the intended use: Use conditions	

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Design

1. The design, calculation and execution of building components which are manufactured using the cement bonded board "FERMACELL Powerpanel H_2O" can be carried out according to EN 1995-1-1 considering the characteristics given below.

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

Type of stress		Thickness d = 10 mm to 15 mm
Characteristic strength values [N/mm²]		
Bending	$f_{m,90,k}$	6,0
Compression	$f_{c,90,k}$	11,7
Values of stiffness [N/mm²]		
Bending modulus of elasticity	$E_{m,90,mean}$	4200
Compressive modulus of elasticity	$E_{c,90,mean}$	6500
Density value [kg/m³]		
Density	ρ_k	1000

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

		d	=	2,0 mm	amounts to $f_{h,k}$ = 26,7 N/mm²
2,0 mm	<	d	≤	2,5 mm	amounts to $f_{h,k}$ = 23,1 N/mm²
2,5 mm	<	d	≤	3,0 mm	amounts to $f_{h,k}$ = 21,0 N/mm²

   For the characteristic value of the embedding strength of FERMACELL Powerpanel screws (Annex A1) the shaft diameter is applied with d = 2,9 mm.

4. The characteristic value of the pull-through resistance, determined according to EN 1383, for
   - FERMACELL Powerpanel screws (Annex A1) $f_{ax,k}$ = 500 N
   - Coil nails with 2,0 mm ≤ d ≤ 3,0 mm (Annex A2) $f_{ax,k}$ = 350 N
   - Staples with d = 1,5 mm (Annex A3) $f_{ax,k}$ = 350 N

5. 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 $F_{ax,1,Rk}$ = 10,4 N/mm²
   - steel profiles, determined according to EN 14566 amounts of

     $F_{ax,Rk}$ = 607 N for metallic profile with a thickness of t = 0,6 mm (not predrilled)

     $F_{ax,Rk}$ = 1661 N for metallic profile thicknesses of t = 1,5 mm (predrilled).

   The characteristic value of yield moment for FERMACELL Powerpanel screws is

   $M_{y,k}$ = 3150 Nmm.

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Installation

During transport and storage the cement bonded board "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).

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

If cement bonded boards "FERMACELL Powerpanel H_2O" are 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).

As connecting devices of the cement bonded board "FERMACELL Powerpanel H_2O" to the substructure appropriate nails, screws or stamples with adequate corrosion protection shall be used, see Annex A.

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

"FERMACELL Powerpanel H_2O"	**Annex B3**
Specification of the intended use: Installation	