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Agrément Certificate
22/6185
Product Sheet 1 Issue 1

CEM-ROCK BOARD

CEM-ROCK EXTREME FLOOR

This Agrément Certificate Product Sheet(1) relates to Cem-Rock eXtreme Floor, a magnesium oxide board for use as structural internal flooring over timber joists in residential and commercial buildings.

(1) Hereinafter referred to as 'Certificate'.

CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production†
- formal three-yearly review†.

KEY FACTORS ASSESSED

Structural performance — the product can resist the loads associated with its use in normal joisted constructions and transmit them to the supporting structure (see section 6).

Behaviour in relation to fire — the product has an A1 and $A1_{fl}$ reaction to fire classification in accordance with BS EN 13501-1 : 2018 (see section 7).

Resistance to moisture — when installed in accordance with this Certificate, the product will have adequate resistance to moisture (see section 8).

Durability — under normal service conditions, provided it is fixed to suitably stable and durable timber floor joists, the product will have a service life equal to the building in which it is installed (see section 10).

The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of First issue: 4 August 2022

Hardy Giesler
Chief Executive Officer

Certificate amended on 16 April 2024 to include Building Regulations for the Republic of Ireland and relevant text
Certificate amended on 3 September 2024 to add T&Cs for Irish Building Regulations

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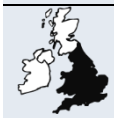
Regulations

In the opinion of the BBA, Cem-Rock eXtreme Floor, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



The Building Regulations 2010 (England and Wales) (as amended)

Requirement:	**A1**	**Loading**
Comment:		The product has sufficient strength and stiffness to sustain and transmit design loads to the primary structure without excessive deflection. See section 6 of this Certificate.
Regulation:	**7(1)**	**Materials and workmanship**
Comment:		The product is acceptable. See section 10 and the *Installation* part of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

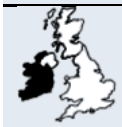
Regulation:	**8(1)**	**Durability, workmanship and fitness of materials**
Comment:		The use of the product satisfies the requirements of this Regulation. See section 10 and the *Installation* part of this Certificate.
Regulation:	**9**	**Building standards applicable to construction**
Standard:	1.1(a)(b)	Structure
Comment:		The product has sufficient strength and stiffness to sustain and transmit design loads to the primary structure without excessive deflection, in accordance with clauses 1.1.1(1)(2), 1.1.2(1)(2) and 1.1.3(1)(2) of this Standard. See section 6 of this Certificate.
Standard:	2.1	Compartmentation
Standard:	2.2	Separation
Standard:	2.3	Structural protection
Comment:		The product can contribute to satisfying these regulatory Standards in accordance with clauses 2.1.12(2), 2.2.4(2), 2.2.5(2), 2.2.6(1), 2.2.7(1), 2.2.8(1), and 2.3.2(1)(2). See section 7.1 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The product can contribute to meeting the relevant requirements of Regulation 9, Standards 1 to 6 and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.
Regulation:	**12**	**Building standards applicable to conversions**
Comment:		Comments in relation to the product under Regulation 9, Standards 1 to 6 also apply to this Regulation, with reference to clause 0.12.1(1)(2) and Schedule 6(1)(2).

(1) Technical Handbook (Domestic).
(2) Technical Handbook (Non-Domestic).

The Building Regulations (Northern Ireland) 2012 (as amended)

Regulation:	**23(a)(i)**	**Fitness of materials and workmanship**
Comment:	**(iii)(b)(i)**	The product is acceptable. See section 10 and the *Installation* part of this Certificate.

Regulation:	**30**	**Stability**
Comment:		The product has sufficient strength and stiffness to sustain and transmit design loads to the primary structure without excessive deflection. See section 6 of this Certificate.



The Building Regulations (Ireland) 1997 and subsequent revisions

Requirement:	**A1**	**Loading**
Comment:		The product is acceptable. See section 6.1 of this Certificate.
Requirement:	**B3(1)(2)(b)(3)**	**Internal fire spread (structure)**
Requirement:	**B8(1)(2)(b)(3)**	**Internal fire spread (structure)**
Comment:		The product can contribute to satisfying these Requirements. See section 7.1 of this Certificate.
Requirement:	**D1**	**Materials and workmanship**
Comment:		The product can contribute to satisfying this Requirement. See section 10 and the *Installation* part of this Certificate.

Construction (Design and Management) Regulations 2015
Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See sections: 1 *Description* (1.1), 3 *Delivery and site handling* (3.1, 3.2 and 3.4) and 11 *General* (11.1 and 11.2) of this Certificate.

Technical Specification

1 Description

1.1 Cem-Rock eXtreme Floor is a magnesium oxide board manufactured with the following characteristics:

Length (mm)	1200, 2400
Width (mm)	600, 900, 1100, 1200
Thickness (mm)	20
Average density ($kg \cdot m^{-3}$)	935
Average mass per unit area ($kg \cdot m^{-2}$)	18.7
Edge type	Square, z-type, tongue and groove
Colours	White and light grey
Finishes	Standard (smooth on front and rough on back).

1.2 The Certificate holder recommends the following as ancillary items for use with the product, but these materials have not been assessed by the BBA and are outside the scope of this Certificate:

- corrosion resistant stainless steel screw fixings (minimum 60 mm long by 4.8 mm diameter)
- damp proof membranes
- vapour control layers.

2 Manufacture

2.1 The board is manufactured from magnesium oxide, magnesium minerals, perlite and sawdust, with binders and reinforcing fibre glass mesh and non-woven cloth. The magnesium oxide paste is poured onto the fibre glass and non-woven fabrics, then the paste is left to dry and cure. The board is cut to size after the curing process is completed.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The product is manufactured in China and are marketed/distributed in the UK by Greenspan System Sales Ireland Ltd. The management system at the factory has been assessed and registered as meeting the requirements of ISO 9001 : 2015 by Beijing Hyde International Certification Co. Ltd (Certificate 7697A18Q10902R0S).

3 Delivery and site handling

3.1 The boards are delivered to site on wooden pallets. Each pallet is labelled with the board type, size, thickness, edge type, pallet quantity, pallet weight, pallet measurements and the batch number.

3.2 The pallets may be stacked, but stacks must not exceed five pallets. The boards are supplied with a protective plastic sheet wrap which should not be removed until the boards are ready to be used, and are supplied on pallets suitable for unloading by forklift. Steel cable or chains should not be used in order to avoid damage to the pallets and the boards. Care should be taken not to subject pallets to any impact shock.

3.3 Boards should be stored horizontally in a ventilated and dry environment, on a firm, flat, raised surface, away from the working area or any mechanical plant. The boards should be covered and protected from the weather prior to installation. Boards should be installed dry. Boards should not be stored on edge.

3.4 The boards should always be lifted by at least two people and should be lifted from the stack rather than slid across, in order to prevent damage or scratches. The boards should be carried on edge.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Cem-Rock eXtreme Floor.

Design Considerations

4 General

4.1 Cem-Rock eXtreme Floor is suitable for use as a structural internal flooring over timber joists for dry moisture conditions in residential and commercial buildings (see section 6). The boards are for use in conjunction with a range of floor finishes, such as tiles, vinyl and carpets.

4.2 In suspended timber floor applications:

- timber support work must be designed and used in accordance with BS EN 1995-1-1 : 2004 and its UK National Annex, and the relevant national Building Regulations
- timber support joists must be at maximum centres of 600 mm and must be a minimum of 45 mm thick.

4.3 Ventilation underneath ground floors must be provided in accordance with BS 5250 : 2021. The ground beneath the floor should be free of topsoil and vegetation and be covered to resist moisture and prevent plant growth.

4.4 The product will provide a suitable substrate for loose-laid floor coverings or those bonded with suitable adhesives. Resilient floor coverings such as cork, linoleum, rubber or vinyl should be laid in accordance with BS 8203 : 2017.

4.5 The product has not been assessed for use with underfloor heating systems and its use with such systems is outside the scope of this Certificate.

5 Practicability of installation

The product is designed to be installed by a competent general builder, or a contractor, experienced with this type of product.

6 Structural performance

6.1 For floor applications, designers must ensure that the selected board will satisfy the load requirements specified in BS EN 1991-1-1 : 2002. Characteristic values for structural design using wood-based flooring may be determined in accordance with BS EN 12871 : 2013 and used in accordance with the UK National Annex to BS EN 1995-1-1 : 2004.

6.2 Deflection must not exceed L/360 of the span (where L is the length of the board) under the permanent and imposed design loads.

6.3 When tested to BS EN 1195 : 1998, the board with a joist span of 600 mm achieved a mean stiffness value of 1810 $N \cdot mm^{-1}$, a characteristic concentrated point load value of 3.68 kN and a characteristic uniformly distributed load (UDL) value of 10.14 $kN \cdot m^{-2}$. The board is suitable for use in Category A, B, C11, C13, C21, C22, C36, C37, C41, C51, D and E11 applications, as per Tables NA.3 and NA.5 of the UK National Annex to BS EN 1991-1-1 : 2002 (Categories defined in Tables NA.2 and NA.4, excerpts of which have been reproduced in Tables 1 and 2 of this Certificate).

Table 1 Categories for residential, social, commercial and administration areas for the UK[1][2]

Category of loaded area	Specific use	Sub-category	Example
A	Areas for domestic and residential activities	A1	All usages within self-contained dwelling units (a unit occupied by a single family or a modular student accommodation unit with a secure door and comprising not more than six single bedrooms and an internal corridor) Communal areas (including kitchens) in blocks of flats with limited use. For communal areas in other blocks of flats, see A5, A6 and C3
		A2	Bedrooms and dormitories except those in self-contained single family dwelling units and in hotels and motels
		A3	Bedrooms in hotels and motels; hospital wards; toilet areas
		A4	Billiard/snooker rooms
		A5	Balconies in single family dwelling units and communal areas in blocks of flats with limited use
		A6	Balconies in hostels, guest houses, residential clubs and communal areas in blocks of flats except those not more than three storeys in height and with not more than four self-contained dwelling units per floor accessible from one staircase
		A7	Balconies in hotels and motels
B	Office areas	B1	General use other than in B2
		B2	At or below ground floor level
C	Areas where people may congregate (with the exception of areas defined under category A, B and D)	C1	Areas with tables
		C11	Public, institutional and communal dining rooms and lounges, cafes and restaurants
		C12	Reading rooms with no book storage
		C13	Classrooms
		C2	Areas with fixed seats
		C21	Assembly areas with fixed seating
		C22	Places of worship
		C3	Areas without obstacles for moving people
		C31	Corridors, hallways, aisles in institutional type buildings not subjected to crowds or wheeled vehicles, hostels, guest houses, residential clubs, and communal areas in blocks of flats not more than three storeys in height and with not more than four self-contained dwelling units per floor accessible from one staircase
		C32	Stairs, landings in institutional type buildings not subjected to crowds or wheeled vehicles, hostels, guest houses, residential clubs, and communal areas in blocks of flats not more than three storeys in height and with not more than four self-contained dwelling units per floor accessible from one staircase
		C33	Corridors, hallways, aisles in all buildings not covered by C31 and C32, including hotels and motels and institutional buildings subjected to crowds
		C34	Corridors, hallways, aisles in all buildings not covered by C31 and C32, including hotels and motels and institutional buildings subjected to wheeled vehicles, including trolleys
		C35	Stairs, landings in all buildings not covered by C31 and C32, including hotels and motels and institutional buildings subjected to crowds
		C36	Walkways — Light duty (access suitable for one person, walkway width approx 600 mm)
		C37	Walkways — General duty (regular two-way pedestrian traffic)
		C38	Walkways — Heavy duty (high density pedestrian traffic including escape routes)
		C39	Museum floors and art galleries for exhibition purposes
		C4	Areas with possible physical activities
		C41	Dance halls and studios, gymnasia, stages
		C42	Drill halls and drill rooms
		C5	Areas susceptible to large crowds
		C51	Assembly areas without fixed seating, concert halls, bars and places of worship
		C52	Stages in public assembly areas
D	Shopping areas	D1	Areas in general retail shops
		D2	Areas in department stores

(1) Excerpt from Table NA.2, of the UK National Annex to BS EN 1991-1-1 : 2002.
(2) Cem-Rock eXtreme Floor is suitable for use in Category A, B, C11, C13, C21, C22, C36, C37, C41, C51 and D applications (as defined by this table) only.

Table 2 Categories for storage and industrial areas including additional sub-categories for the UK[1][2]

Category of loaded area	Specific use	Sub-category	Example
E1	Areas susceptible to accumulation of goods, including access areas	E11	General areas for static equipment not specified elsewhere (institutional and public buildings)
		E12	Reading rooms with book storage, e.g. libraries
		E13	General storage other than those specified
		E14	File rooms, filing and storage space (offices)
		E15	Stack rooms (books)
		E16	Paper storage for printing plants and stationery stores
		E17	Dense mobile stacking (books) on mobile trolleys, in public and institutional buildings
		E18	Dense mobile stacking (books) on mobile trucks, in warehouses
		E19	Cold storage
E2	Industrial use	-	See PD 6688 for imposed loads on floors for areas of industrial use

(1) Excerpt from Table NA.4, of the UK National Annex to BS EN 1991-1-1 : 2002.
(2) Cem-Rock eXtreme Floor is suitable for use in Category E11 applications (as defined by this table) only.

7 Behaviour in relation to fire

7.1 The product is classified as A1 and $A1_{fl}$ in accordance with BS EN 13501-1 : 2018. Full details are available in Report No. 211019016SHF-006, issued on 22 November 2021, available from the Certificate holder.

7.2 Where the fire resistance of floor constructions incorporating the boards is required, the fire resistance should be confirmed by an appropriate tests or assessments by a suitably accredited laboratory.

7.3 Constructions incorporating the boards achieved the period of fire resistance shown in Table 3. Users should refer to the referenced test reports, available from the Certificate holder, for the full construction details.

Table 3 Fire resistance duration – loadbearing constructions

Duration[1] (minutes)	Load ($kg.m^{-2}$)	Construction (from face exposed to fire outwards / upwards)	Classification to BS EN 13501-2	Test method / Report reference
R = 52 E = 52 I = 52	153	15 mm gypsum plasterboard SpaceJoists (4000x219x72) spaced at 418 mm 20 mm Cem-Rock eXtreme Floor boards	REI 45	BS EN 1365-2 : 2014 Report No. 10094/21, dated 11 November 2021

(1) Where R is loadbearing capacity, E is Integrity and I is Thermal insulation, as defined in BS EN 13501-2 : 2016.

8 Resistance to moisture

8.1 Damp-proof membranes and vapour control layers should be incorporated for ground floors as necessary in accordance with the requirements of BS 8103-3 : 2013 and BS 5250 : 2021.

8.2 The board has a water vapour resistance of 19.8 $MN \cdot s \cdot g^{-1}$ in accordance with BS EN ISO 12572 : 2001.

8.3 The board has a water absorption of 10.9% in accordance with BS EN 520 : 2004.

8.4 When exposed to a relative humidity change from 30% to 90%, the board underwent a linear sheet moisture movement of 0.11% in the longitudinal direction and 0.13% in the transverse direction.

8.5 When exposed to high humidity environments as defined in PAS 670 : 2021, Section 13, for a duration of 170 days the board did not exhibit any liquid droplets on the surface.

8.6 If wetted, the board must be allowed to dry out thoroughly before applying any floor coverings or surface coatings, or applying the full design load.

8.7 When used in high risk areas such as wet rooms, the board must be protected from wetting with provision of a continuous waterproofing, sealed at wall junctions and where services protrude through the floor.

9 Maintenance

As the board has adequate durability (see section 10), will normally be confined within the flooring structure and, in most cases, will be covered with finishes, maintenance is not required. However, care must be exercised to ensure the surface of the board is not damaged when the floor finish is removed or replaced.

10 Durability

10.1 The board has been tested and is not susceptible to algal growth.

10.2 Under normal service conditions, provided the product is fixed to suitably stable and durable timber floor joists, it will have a service life equal to the building in which it is installed.

Installation

11 General

11.1 Cem-Rock eXtreme Floor can be cut and fixed using conventional woodworking tools, though the use of handsaws with hardened teeth is recommended. The board may be cut using a circular saw with tungsten carbide tipped blade or a jigsaw. All cutting should take place in well ventilated spaces and using dust extraction facilities. Suitable dust control measures must be taken (eg protective safety glasses and respiratory masks) observing all necessary health and safety regulations. The boards must be stored, handled and used in accordance with this Certificate and the Certificate holder's installation and health and safety instructions.

11.2 The board can withstand normal site handling and fixing. Damaged boards should not be used. Normal safety precautions should be observed when handling large panels. Reasonable precautions must be taken to ensure the board is not damaged during installation.

11.3 The board should be installed in dry conditions at an ambient temperature of 5°C or above.

12 Procedure

12.1 The boards must be laid perpendicular to floor framing members, ensuring that all short edges of the flooring are fully supported on joists or perimeter timber framing (ie noggins). A minimum 10 mm gap must be provided between floor perimeter and wall or projections.

12.2 The boards must be cut so that the joints fit the floor area tightly, with joints staggered in a stretcher-bond brick pattern ensuring four board corners do not meet at one point.

12.3 Starting from the corner, the first board is laid and mechanically fixed at maximum 200 mm centres. Fixings are positioned at a minimum of 12 mm from any board edge and a minimum of 50 mm from the board corners. Subsequent boards are laid out and fixed in the same manner with staggered joints.

12.4 After installation of the boards, they should be left for approximately 24 to 48 hours to allow the boards to equalise to the moisture content of the ambient atmosphere. Once equilibrium moisture content is achieved, the surface of the joints should be cleaned.

13 Repair

Under normal conditions of occupancy, the board is unlikely to suffer damage. Should damage occur, repairs are carried out by replacing the damaged board.

Technical Investigations

14 Tests

Tests were carried out and the results assessed to determine:

- density
- reaction to fire
- resistance to algal growth
- dimensional tolerances
- resistance to freeze/thaw
- resistance to heat/rain
- bending strength
- resistance to pull-through of fixings
- water absorption
- moisture movement
- performance in high humidity conditions
- resistance to static load
- resistance to impact load
- water vapour permeability.

15 Investigations

The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

BS 5250 : 2021 *Management of moisture in buildings – Code of practice*

BS 8103-3 : 2013 *Structural design of low-rise buildings – Code of practice for masonry walls for housing*

BS 8203 : 2017 *Code of practice for installation of resilient floor coverings*

BS EN 520 : 2004 *Gypsum plasterboards. Definitions, requirements and test methods*

BS EN 1195 : 1998 *Timber structures – Test methods – Performance of structural floor decking*

BS EN 1991-1-1 : 2002 *Eurocode 1 – Actions on structures – General actions – Densities, self-weight, imposed loads for buildings*
NA to BS EN 1991-1-1 : 2002 *UK National Annex to Eurocode 1 – Actions on structures – General actions – Densities, self-weight, imposed loads for buildings*

BS EN 1995-1-1 : 2004 + A2 : 2014 *Design of timber – General – Common rules and rules for buildings*
UK National Annex to BS EN 1995-1-1 : 2004 + A2 : 2014 *Design of timber – General – Common rules and rules for buildings*

BS EN 12871 : 2013 *Wood-based panels – Determination of performance characteristics for load bearing panels for use in floors, roofs and walls*

BS EN 13501-1 : 2018 *Fire classification of construction products and building elements – Classification using data from reaction to fire tests*

BS EN ISO 9001 : 2015 *Quality management systems – Requirements*

BS EN ISO 12572 : 2001 *Hygrothermal performance of building materials and products – Determination of water vapour transmission properties*

PAS 670 : 2021 *Magnesium oxide-based boards for use in buildings — Specification*

Conditions of Certificate

Conditions

1 This Certificate:

- relates only to the product that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page – no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- has to be read, considered and used as a whole document – it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- and any matter arising out of or in connection with it or its subject matter (including non-contractual disputes or claims) is governed by and construed in accordance with the law of England and Wales
- the courts of England and Wales shall have exclusive jurisdiction to settle any matter arising out of or in connection with this Certificate or its subject matter (including non-contractual disputes or claims)

2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

3 This Certificate will be displayed on the BBA website, and the Certificate Holder is entitled to use the Certificate and Certificate logo, provided that the product and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

5 In issuing this Certificate the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product or any other product
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product
- actual installations of the product, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to UKCA, UKNI or CE marking.

6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product which is contained or referred to in this Certificate is the minimum required to be met when the product is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

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