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Agrément Certificate
No 04/4100

PRODUCT SHEET 1 — HARDIEBACKER CEMENT BOARD

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to HardieBacker⁽¹⁾ Cement Board, for use as an intermediate substrate to ceramic and natural stone tiling for internal use.

(1) Registered trademark of James Hardie International Finance B.V.

AGRÉMENT 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

Properties in relation to fire — the product has a reaction to fire classification of A2-s1, d0 and is 'non-combustible' as defined in the national Building Regulations (see section 5).

Resistance to mechanical damage — the product will accept the normal impacts likely to occur in service (see section 6).

Durability — the product has acceptable durability and will have a life equal to that of the structure onto which it is fixed (see section 8).



The BBA has awarded this Agrément Certificate for HardieBacker Cement Board to James Hardie Building Products Ltd as fit for its intended use provided it is installed, used and maintained as set out in this Agrément Certificate.

On behalf of the British Board of Agrément

Date of First issue: 6 May 2004
Date of Second issue: 12 August 2008

Head of Approvals
— Materials

Chief Executive

The BBA is a UKAS accredited certification body — Number 1113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Regulations

In the opinion of the BBA, HardieBacker Cement Board, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements of the following Building Regulations:



The Building Regulations 2000 (as amended) (England and Wales)

Requirement:	B2	Internal fire spread (linings)
Comment:		The product is unrestricted by this Requirement. See sections 5.1 to 5.5 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The product is acceptable. See section 8 and the <i>Installation</i> part of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Fitness and durability of materials and workmanship
Comment:		The use of the product satisfies the requirements of this Regulation. See sections 7 and 8 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards – construction
Standard:	2.5	Internal linings
Comment:		The product is classified as 'low risk' and so satisfies the requirements of this Standard, with reference to clause 2.5.1 ⁽¹⁾⁽²⁾ . See sections 5.1 to 5.5 of this Certificate.
Regulation:	12	Building standards – conversions
Comment:		All comments given for this product under Regulation 9, 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) 2000 (as amended)

Regulation:	B2	Fitness of materials and workmanship
Comment:		The product is acceptable. See section 8 and the <i>Installation</i> part of this Certificate.
Regulation:	B3(2)	Suitability of certain materials
Comment:		The product does not normally require maintenance. See section 7 of this Certificate.
Regulation:	E3	Internal fire spread – Linings
Comment:		The product is unrestricted by this Regulation. See sections 5.1 to 5.5 of this Certificate.

Construction (Design and Management) Regulations 2007

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See sections: 1 *Description* (1.3) and 2 *Delivery and site handling* (2.1 and 2.4).

Non-regulatory Information

NHBC Standards 2007

NHBC accepts the use of HardieBacker Cement Board, when installed and used in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 8.2 *Wall and ceiling finishes*, Clauses M3 *Plasterboard and dry lining* and M4 *Ceramic wall tiling*.

Zurich Building Guarantee Technical Manual 2007

In the opinion of the BBA, the use of HardieBacker Cement Board, when installed and used in accordance with this Certificate, satisfies the requirements of the *Zurich Building Guarantee Technical Manual*, Section 5 *Internal/external works, services & finishes*, Sub-section *Walls (finishes)*.

General

This Certificate relates to HardieBacker Cement Board, for use as an intermediate substrate to ceramic and natural stone tiling for internal use.

The product is manufactured to satisfy the requirements of BS EN 12467 : 2004 and the product packaging has CE Marking accordingly.

Technical Specification

1 Description

1.1 HardieBacker 250 (plain and profiled face) and 500 Cement Board (plain only), are fibre-reinforced cement tile Cement Boards for internal use.

1.2 The product is made from fibre-reinforced sheets which satisfy the requirements for Category C material to BS EN 12467 : 2004 and Type B to ISO 8336 : 1993.

1.3 The product characteristics are given in Table 1.

Table 1 Nominal dimensions and weights

	HardieBacker 250	HardieBacker 500
Thickness (mm)	6	12
Width (m)	0.9	0.8
Length (m)	1.5	1.2
Board weight (kg)	12.5	13.8

1.4 The product is manufactured by batch blending, followed by the Hatschek process and high-pressure steam autoclaving. Quality control is maintained over raw materials, during processing and on the final product.

1.5 Ancillary components comprise:

- glassfibre mesh reinforcing tape — 50 mm wide, alkali-resistant
- ceramic tiles — to BS EN 14411 : 2006
- ceramic tile adhesive — of Type C or D to BS EN 12004 : 2001
- grout to BS EN 13888 : 2002
- HardieBacker screws for timber (M5 x 32 mm)
- HardieBacker screws for steel (M4.8 x 30 mm).

2 Delivery and site handling

2.1 The product is delivered on wrapped pallets, typically weighing approximately 800 kg. It can be offloaded by either mechanical handling equipment or manually removing individual boards.

2.2 Each sheet is marked with the product name, unique manufacturing code, the appropriate classification to ISO 8336 : 1993 and CE Marking in accordance with BS EN 12467 : 2004.

2.3 The sheets should be stored flat, under cover, and on a dry, level surface. Stacks of loose boards should not exceed one metre in height.

2.4 The product includes crystalline silica and reference should be made to EH40/2005 *Occupational Exposure Limits*, 2005 (as amended). In particular, when cutting, drilling or sanding in confined areas, dust levels should be controlled using suitable extraction equipment.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on HardieBacker Cement Board.

Design Considerations

3 Use

3.1 HardieBacker Cement Board is suitable for use on walls and floors as an intermediary substrate to ceramic and natural stone tiling for internal use.

3.2 The boards are suitable as part of a system comprising tiles, cement-based tile adhesive and grout, to install a stable, water-resistant tile substrate in showers, bathrooms and wet areas (excluding shower floors).

3.3 Walls and sub-floors to be tiled should comply with the requirements of BS 5385-1 : 1995 and BS 5385-3 : 2007 respectively, including the provision of movement joints as appropriate. Where necessary, reference should also be made to BS 5385-4 : 1992.

4 Practicability of installation

The product can be installed by competent operatives experienced with this type of material.

5 Properties in relation to fire



5.1 The boards will not adversely change the fire resistance of the wall on which they are installed.

5.2 When tested to BS 476-6 : 1989, samples of HardieBacker 250 and 500 Cement Board gave fire propagation indices (I) of 0.0 and 0.1 respectively and sub-indices (i_1) of 0.0 and 0.1 respectively.

5.3 When tested to BS 476-7 : 1997, both HardieBacker 250 and 500 Cement Board achieved a Class 1 result.

5.4 When tested to BS EN ISO 1182 : 2002 and BS EN 13823 : 2002, samples of HardieBacker Cement Board achieved a reaction to fire classification in accordance with BS EN 13501-1 : 2002 of A2-s1, d0.

5.5 Therefore, both products are classified as 'non-combustible' as defined in the various national Building Regulations.

6 Resistance to mechanical damage

6.1 When tested in accordance with BBA test methods, the 250 and 500 tiled boards satisfied the requirements for a Category I₂ opaque vertical movement as defined in Table 3.2 of MOAT No 43 : 1987.

6.2 The test results indicate that the boards can accept without damage the normal impacts likely to occur in service.

6.3 Wall-mounted fittings should be fixed through the board into the wall behind, using suitable fixings. The recommendations of the manufacturers should be followed.

7 Maintenance



As the boards are inaccessible and have suitable durability (see section 8), maintenance is not required. However, it must be ensured that damage occurring before enclosure is repaired (see section 12).

8 Durability



Provided the boards are used and installed in accordance with this Certificate and the manufacturer's instructions, and are fixed to suitable, stable and durable backgrounds, they should have a life equal to that of the structure onto which they are fixed.

Installation

9 General

9.1 Installation of HardieBacker Cement Board is for installation on internal walls and floors of new and existing buildings, in accordance with the provisions of this Certificate and the Certificate holder's instructions, using suitably experienced and trained personnel.

9.2 Cutting of boards can be performed by scoring a straight edge using a carbide-tipped knife, and snapping upwards along the score line.

9.3 Large cut-outs can be made using a circular saw with a diamond-tipped HardieBlade saw blade. Small holes may be drilled using a carbide-tipped masonry bit, or scored out as above and broken out with a hammer. Reference should be made to section 2.4.

9.4 The fixings (see section 1.5) to be used must be of sufficient length to penetrate:

- wooden sub-floors and wall framing — 19 mm into the substrate, or the full thickness of the substrate (whichever is less)
- metal wall framing — the metal framing by at least three full threads.

10 Procedure

Floor installations

10.1 A minimum 15.8 mm thick plywood sub-floor⁽¹⁾ should be laid over the floor joists, at a maximum of 400 mm centres.

(1) Or equivalent thickness of alternative sub-floor.

10.2 Deflection must not exceed 1/360 of the span under the live and dead design loads.

10.3 On sound existing structures, all existing floor coverings should be removed and any damaged sections at the sub-floor replaced to give a clean flat surface.

10.4 Boards should be cut so that they fit the floor area with joints staggered in a stretcher-bond brick pattern. Four sheet corners should not meet at one point.

10.5 HardieBacker sheet joints should not align with the underlying sub-floor joints.

10.6 A 3 mm wide gap should be allowed between the edges of the sheets and walls or cabinet bases.

10.7 A levelling bed of tile adhesive should be applied to the clean and dry sub-floor, using a 6 mm square notched trowel.

10.8 The HardieBacker sheets should be firmly and evenly embedded in the adhesive, with the sheet edges in moderate contact.

10.9 The fixings specified in section 1.5 should be set flush with the sheet surface, at 200 mm centres. The fixings should be set-back between 12 mm and 19 mm from the sheet edges and 50 mm back from sheet corners.

Wall installations

10.10 Masonry walls of new buildings should be designed and constructed in accordance with BS 5628-3 : 2005. Walls of existing buildings should be sound and watertight.

10.11 Framing grade timber studs or galvanized steel framework should be provided at 400 mm centres. Timber studs should be nominally 75 mm by 50 mm or 100 mm by 50 mm; steel framework should be a minimum of 0.59 mm thickness.

10.12 Care should be taken to ensure that studs are straight and properly aligned.

10.13 Corners should be either solid blocked or otherwise reinforced, for example using a 35 mm by 35 mm by 0.8 mm galvanized steel angle.

10.14 In wet areas, a corner flashing should be used to provide additional protection to the framing members.

10.15 Boards may be installed horizontally or vertically, using the fixings specified in section 1.5. The fixings should be set flush with the surface, at 200 mm centres, and set-back between 12 mm and 15 mm from the board edges and 50 mm back from corners.

10.17 When using HardieBacker Cement Board, board perimeters and joints should be directly supported by frame members.

10.18 A wet-area sealant complying with the requirements of BS 6213 : 2000 and BS ISO 11600 : 2003 should be applied at corner junctions of boards and tiles.

11 Tiling

11.1 The surface of the boards should be wiped with a damp sponge to remove residual dirt and dust.

11.2 Joints between boards should be filled with the tile adhesive to be used and taped using 50 mm wide, alkali-resistant, glassfibre mesh tape.

11.3 Tiles should then be installed and grouted in accordance with the tile manufacturer's instructions, BS 5385-1 : 1995, BS 5385-3 : 2007 and BS 5385-4 : 1992 and conventional good practice.

12 Repair

Under normal conditions of occupancy, the boards are unlikely to suffer damage, but should it occur, repairs are carried out by replacing damaged boards and re-tiling.

Technical Investigations

13 Tests

Tests were carried out to determine:

- resistance to hard body impact
- resistance to soft body impact
- water absorption
- tensile bond strength to ceramic tiles
- effect of humidity and exposure to water
- pull-through strength of fixings.

14 Investigations

14.1 Classifications were made to BS EN 12467 : 2004 and ISO 8336 : 1993 on the basis of test data supplied on:

- dimensions
- resistance to freeze/thaw
- resistance to heat/sum cycling
- bending strength
- resistance to water soak
- water impermeability.
- apparent density
- resistance to soak/dry cycling

14.2 Examination was made of existing data relating to:

- fire propagation to BS 476-6: 1989
- reaction to fire to BS EN 13501-1 : 2002.
- surface spread of flame to BS 476-6 : 1997

14.3 The manufacturing process was examined, including the methods adopted for quality control.

Bibliography

- BS 476-6 1989 *Fire tests on buildings materials and structures – Method of test for fire propagation for products*
- BS 476-7 : 1997 *Fire tests on building materials and structures – Method of test to determine the classification of surface spread of flame of products*
- BS 5385-1 : 1995 *Wall and floor tiling – Code of practice for the design and installation of internal ceramic and natural stone wall tiling and mosaics in normal conditions*
- BS 5385-3 : 2007 *Wall and floor tiling – Design and installation of internal and external ceramic and mosaic floor tiling in normal conditions – Code of practice*
- BS 5385-4 : 1992 *Wall and floor tiling – Code of practice of tiling and mosaics in specific conditions*
- BS 5628-3 : 2005 *Code of practice for use for masonry – Materials and components, design and workmanship*
- BS 6213 : 2000 *Selection of construction sealants – Guide*
- BS EN 12004 : 2001 *Adhesives for tiles – Definitions and specifications*
- BS EN 12467 : 2004 *Fibre-cement flats sheets – Product specifications and test methods*
- BS EN 13823 : 2002 *Reaction to fire tests for building products – Building products excluding floorings exposed to the thermal attack by a single burning item*
- BS EN 13888 : 2002 *Grouts for tiles – Definitions and specifications*
- BS EN 13501-1 : 2002 *Fire classification of construction products and building elements. Classification using test data from reaction to fire tests*
- BS EN 14411 : 2006 *Ceramic tiles – Definitions, classifications, characteristics and marking*
- BS EN ISO 1182 : 2002 *Reaction to fire tests for building products – Non-combustibility test*
- BS EN ISO 11600 : 2003 *Building construction – Jointing products – Classifications and requirements of sealants*
- ISO 8336 : 1993 *Fibre-cement flat sheets*
- MOAT No 43 : 1987 *UEAtc Directives for Impact Testing Opaque Vertical Building Components*

15 Conditions

15.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is granted only to the company, firm or person named on the front page — no other company, firm or person may hold or claim any entitlement to this Certificate
- is valid only within the UK
- 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
- is subject to English law.

15.2 References in this Certificate to any Act of Parliament, Statutory Instrument, Directive or Regulation of the European Union, British, European or International Standard, Code of Practice, manufacturers' instructions or similar publication, are references to such publication in the form in which it was current at the date of this Certificate.

15.3 This Certificate will remain valid for an unlimited period provided that the product/system and the manufacture and/or fabrication including all related and relevant 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.

15.4 In granting this Certificate, the BBA is not responsible for:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- individual installations of the product/system, including the nature, design, methods and workmanship of or related to the installation
- the actual works in which the product/system is installed, used and maintained, including the nature, design, methods and workmanship of such works.

15.5 Any information relating to the manufacture, supply, installation, use and maintenance of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used and maintained. It does not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date 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. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the manufacture, supply, installation, use and maintenance of this product/system.

