

## Chemicals for Modern Buildings (CMB)

319 El-Haram Street

Giza

Egypt

Tel: 00 20 2 33 820 966 Fax: 00 20 2 33 860 172

e-mail: info@marmoxegypt.com

website: www.marmox.com



Agrément Certificate

09/4687

Product Sheet 1

### CMB BOARDS

### MARMOX TILEBACKER BOARDS

#### PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Marmox Tilebacker Boards, a range of extruded polystyrene foam boards finished on both sides with a polymer-modified mortar facing, reinforced with a glassfibre mesh. The boards are for use as an intermediate substrate to ceramic and natural stone tiling for internal use on walls and floors.

#### 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

**Performance in fire** — the boards are classified as Class '0' or 'low risk' in accordance with the national Building Regulations (see section 5).

**Impact resistance** — tiled boards will resist the effects of the normal impacts expected in-service (see section 6).

**Floor loading** — the boards are satisfactory for use in domestic and residential applications (see section 7).

**Condensation risk** — the use of the boards will reduce the risk of condensation (see section 9).

**Durability** — under normal conditions the boards will have a service life commensurate with the structure into which they are installed (see section 14).



The BBA has awarded this Agrément Certificate to the company named above for the products described herein. These products have been assessed by the BBA as being fit for their intended use provided they are installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of First issue: 17 September 2009

Simon Wroe  
Head of Approvals — Materials

Greg Cooper  
Chief Executive

*The BBA is a UKAS accredited certification body — Number 113. 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](http://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.*

British Board of Agrément  
Bucknalls Lane  
Garston, Watford  
Herts WD25 9BA

©2009

tel: 01923 665300  
fax: 01923 665301  
e-mail: [mail@bba.star.co.uk](mailto:mail@bba.star.co.uk)  
website: [www.bbacerts.co.uk](http://www.bbacerts.co.uk)

# Regulations

In the opinion of the BBA, Marmox Tilebacker Boards 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(1)	Internal fire spread (linings)
Comment:		The products meet the Requirement in every purpose group. See sections 5.1 to 5.4 of this Certificate.
Requirement:	C2(c)	Resistance to moisture
Comment:		Walls incorporating the products can meet this Requirement. See sections 9.1 to 9.3 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The products are acceptable. See section 14 and the <i>Installation</i> part of this Certificate.



## The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)	Fitness and durability of materials and workmanship
Comment:		The products can contribute to a construction satisfying this Regulation. See section 14 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards – construction
Standard:	2.5	Internal linings
Comment:		The products can contribute to satisfying this Standard, with reference to clauses 2.5.1 <sup>(1)(2)</sup> and 2.5.2 <sup>(1)(2)</sup> . See sections 5.1 to 5.4 of this Certificate.
Standard:	3.15	Condensation
Comment:		The products can contribute to satisfying this Standard, with reference to clauses 3.15.1 <sup>(1)</sup> , 3.15.4 <sup>(1)</sup> and 3.15.5 <sup>(1)</sup> . See sections 9.1 to 9.3 of this Certificate.
Regulation:	12	Building standards – conversions
Comment:		All comments given for these products under Regulation 9, also apply to this Regulation with reference to clause 0.12.1 <sup>(1)(2)</sup> and Schedule 6 <sup>(1)(2)</sup> . (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 products are acceptable. See section 14 and the <i>Installation</i> part of this Certificate.
Regulation:	C5	Condensation
Comment:		The products are acceptable. See sections 9.1 and 9.2 of this Certificate.
Regulation:	E3(a)(b)	Internal fire spread – Linings
Comment:		The products meet this Regulation. See sections 5.1 to 5.4 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: 2 *Delivery and site handling* (2.1 and 2.2) and *Installation* (1.5.2).

## Non-regulatory Information

### NHBC Standards 2008

NHBC accepts the use of Marmox Tilebacker Boards when installed and used in accordance with this Certificate, in relation to *NHBC Standards, Part 8 Services and internal finishes, sections 8.2 Wall and ceiling finishes and 8.3 Floor finishes.*

### Zurich Building Guarantee Technical Manual 2007

In the opinion of the BBA, Marmox Tilebacker Boards when installed and used in accordance with this Certificate, satisfy the requirements of the *Zurich Building Guarantee Technical Manual, Section 5 Internal/external works, services & finishes, Sub-section Internal works – floors and Internal works – walls.*

## General

The products are marketed in the UK by Marmox UK Ltd, Unit 3, Forward Way, Laker Road, Rochester, Kent ME1 3QX. Tel: 01634 862277, Fax: 01634 864223, website: [www.marmox.co.uk](http://www.marmox.co.uk)

# Technical Specification

## 1 Description

1.1 Marmox Tilebacker Boards are made from extruded polystyrene, each side faced with a nominal 0.5 mm thick fibreglass mesh reinforced polymer-modified cement mortar.

1.2 The boards are available in the sizes given in Table 1.

Table 1 Nominal dimensions and weights

Thickness (mm)	Board dimensions (Width x Length) (mm)	Weight per board (kg)
6	600 x 1250	2.0
10	600 x 1250	2.2
	600 x 2500	4.4
12.5	600 x 1250	2.3
	1200 x 2400	8.8
	600 x 2500	4.6
20	600 x 1250	2.5
	600 x 2500	5.0
30	600 x 1250	2.7
	600 x 2500	5.5
40	600 x 1250	3.0
	600 x 2500	6.0
50	600 x 1250	3.3
	600 x 2500	6.5
60	600 x 1250	3.6
	600 x 2500	7.2

1.3 Ancillary items used with the boards include:

- a flexible tile adhesive conforming to EN 12004 : 2001
- a flexible waterproof grout conforming to EN 1338 : 2003
- Marmox washers — 38 mm diameter metal or 50 mm diameter plastic washers, for fixing the boards to the substrate. Screws used should be at least 20 mm longer than the board thickness to be fixed
- Marmox Reinforcing Tape — a self-adhesive glassfibre mesh tape for application over joints between boards
- Marmox Self-Adhesive Waterproof Tape — for application over joints between boards when used in areas likely to get wet
- Marmox Wall Brackets — for use connecting the boards to the wall or floor
- Marmox Joint Bracket — for joining boards together in-line on a stud wall frame
- Marmox Perpendicular Brackets — for use to hold two boards perpendicular while the adhesive is drying
- Marmox 60 mm Dowel Fixings — for fixing boards to solid surfaces when use of adhesive is inappropriate.

1.4 Quality control checks on the boards are carried out during production and on the final product.

## 2 Delivery and site handling

2.1 The long boards (2500 mm) are delivered loose on pallets and short boards (1250 mm) are supplied in cardboard boxes. The quantity supplied in each box will vary with the thickness of the boards.

2.2 The boards should be stored flat, under cover, on a dry, level surface away from extremes of temperature and sources of contamination.

2.3 The Certificate holder's advice should be sought with regard to storage of the accessories.

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Marmox Tilebacker Boards.

## Design Considerations

### 3 General

3.1 Marmox Tilebacker Boards are satisfactory for use on internal walls and floors as an intermediate substrate to ceramic and natural stone tiling.

3.2 The boards are suitable for use as part of a system comprising tiles, waterproof cement-based tile adhesive and grout, to install a stable, waterproof tile substrate in showers and wet areas. The Certificate holder should be consulted for suitable products.

3.3 The boards may also be used to produce various kinds of substructure, such as bath surrounds and partitions. The Certificate holder should be consulted for advice on the suitability of any proposed project.

3.4 The boards may be directly bonded to clean, sound brick, block or concrete walls and may also be used on concrete floors or suspended timber floors.

3.5 Boards 20 mm thick or greater can also be fixed to stud walling/partitions. The maximum unsupported span must be 600 mm.

3.6 Masonry walls of new buildings should be designed and constructed in accordance with BS 5628-3 : 2005, and the walls of existing buildings should be watertight.

3.7 When the boards are fixed to timber battens, services can normally be incorporated in the void behind the boards making chasing of the wall unnecessary. When using adhesive systems, or where the services have a greater depth than the void, the wall should be chased rather than the boards. It is recommended that services penetrating the boards, eg light switches, power outlets, are kept to a minimum.

3.8 The installation of the boards requires careful detailing around doors and windows to achieve a satisfactory finish. New work should be designed to accommodate the thickness of the overall installation.

3.9 If present, mould or fungal growth present on the substrate should be treated prior to fixing the boards. The Certificate holder should be consulted for suitable anti-fungal products.

3.10 When using adhesive fixing methods, it is essential to establish, before installation, that a satisfactory bond can be achieved between the wall and the adhesive. If difficulty is experienced with adhesion, the Certificate holder's advice should be sought.

## 4 Practicability of installation

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

## 5 Performance in fire



5.1 When tested to BS 476-6 : 1989 an untiled 20 mm thick board achieved a fire propagation index (I) of 8.1 with a sub-index ( $i_1$ ) of 3.8.

5.2 When tested to BS 476-7 : 1997 an untiled, 20 mm thick board achieved a Class 1 rating.

5.3 Therefore, the boards are classified as Class 0 or 'low risk' as defined in the various national Building Regulations.

5.4 This performance may not be achieved when the product is covered/overcoated and care should be taken to select a finish with the appropriate performance in fire for the installation in question.

5.5 Recessed lighting must not be used with the boards.

## 6 Impact resistance

6.1 When tested in accordance with BBA test methods, tiled boards performed in a satisfactory manner.

6.2 Soft body impacts resulted in no damage being observed. Hard body impacts resulted in tile damage directly under the impact with minor indentation into the board. No tile detachment occurred. The damage observed was no greater than to be expected from tiled boards of this type.

## 7 Floor Loading

7.1 For design purposes the compressive strength of the boards at 10% compression should be taken as 300 kNm<sup>-2</sup> (level CS(10\Y)300 as defined in EN 13164 : 2001).

7.2 The boards are capable of resisting a uniformly distributed load of 1.5 kNm<sup>-2</sup> with minimal deflection.

7.3 The level of resistance to concentrated loads will depend on the size and strength of the tiles used to cover the boards.

7.4 Provided the tiles selected are correctly specified to resist the designed distributed and concentrated loads, the boards are suitable for use in Categories A1 and A2 and appropriate Type A situations for domestic and residential activities as defined in BS EN 1991-1-1 : 2002, National Annex, Table NA.2 and BS 6399-1 : 1996, Table 1 respectively.

## 8 Thermal insulation

The boards will provide some thermal insulation. For calculation purposes the Certificate holder should be consulted for the thermal conductivity characteristics of the boards.

## 9 Condensation risk

### Interstitial condensation



9.1 The boards can offer significant resistance to water vapour transmission provided all joints and penetrations are taped and sealed and the tiling is bonded and grouted in accordance with the Certificate holder's instructions.

9.2 When carrying out condensation risk assessments, the water vapour transmission factor ( $\mu$ ) of the untiled boards may be taken as 106.

### Surface condensation



9.3 Walls incorporating the products can be designed to meet the requirements of the national Building Regulations with regard to surface condensation.

## 10 Impact noise reduction

The use of the boards can reduce noise resulting from impacts. Laboratory tests in accordance with BS EN ISO 140-8 : 1998 carried out on the 10 mm board gave a Weighted Impact Sound Improvement Index ( $\Delta L_w$ ) of 21 dB.

## 11 Proximity of flues and heat producing appliances

When installing boards in close proximity to hot flue pipes and/or heat-producing appliances the provisions of the following national Building Regulations are necessary to minimise the risk of damage to the boards due to radiated, convected and/or conducted heat:

**England and Wales** — Approved Document J

**Scotland** — Mandatory Standard 3.19, clause 3.19.4<sup>(1)(2)</sup>

Technical Handbook (Domestic).

Technical Handbook (Non-Domestic).

**Northern Ireland** — Technical Booklet L.

## 12 Wall-mounted fittings

Objects other than lightweight items must be fixed through the board into the wall behind using suitable proprietary fixings. The recommendations of the Certificate holder should be followed.

## 13 Maintenance

As the products are confined within the wall structure and have suitable durability (see section 14) maintenance is not required. However, it must be ensured that damage occurring before tiling is repaired (see section 17).

## 14 Durability



The durability of the products are satisfactory and if used in accordance with this Certificate and the Certificate holder's instructions, and are fixed to satisfactory, stable and durable backgrounds, the products will have a life commensurate with the structure in which they are installed.

## Installation

### 15 General

15.1 Marmox Tilebacker Boards are for installation on internal walls and floors and floors to provide a substrate for the application of ceramic tiles.

15.2 The boards can be cut with either a hand knife or saw. When working in enclosed areas precautions should be taken to ensure dust levels are controlled in accordance with the current issue of EH40/2005 *Occupational exposure limits*, 2005. The Certificate holder should be consulted for advice.

15.3 Installation of the boards must be in accordance with the Certificate holder's instructions and the provisions of this Certificate.

15.4 Short boards (1250 mm by 600 mm) are the most suitable for installing on floors.

15.5 Boards must not bridge movement joints. These must be carried through the board/tile bed and sealed in an appropriate manner.

15.6 The boards are laid in a staggered pattern to ensure that four corners never meet at one point.

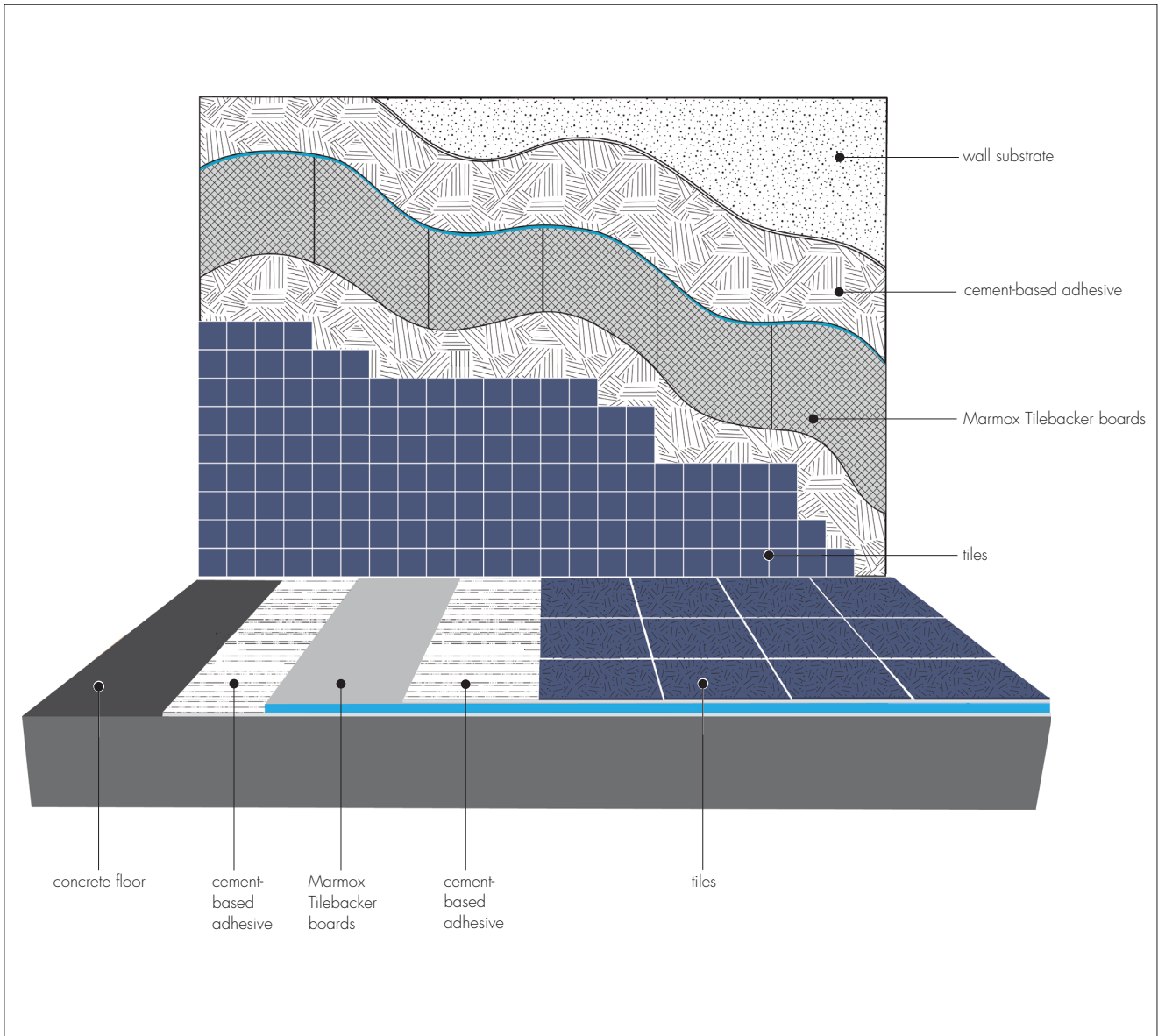
15.7 In wall applications, the boards may be aligned vertically or horizontally.

15.8 When boards are fixed using adhesive, tests must be carried out to ensure adequate adhesion can be achieved. The Certificate holder's advice should be sought.

#### Fixing to solid walls

15.9 Boards may be fixed to smooth and level masonry and concrete walls using a thin sold bed of cementitious tile adhesive (see Figure 1). The Certificate holder's advice must be sought on suitable adhesives.

Figure 1 Fixing to solid walls and floors using adhesive



15.10 Any residual materials from previous coatings must be removed.

15.11 If the wall is slightly uneven, contaminated or in another way incompatible with the recommended adhesive, the boards can be mechanically fixed in accordance with the method for fixing to stud walls (see sections 15.15 to 15.21).

15.12 The adhesive is applied to either the wall or board at an approximate thickness of 6 mm and combed out using an 8 mm notched trowel in straight lines ensuring complete coverage.

15.13 Starting at the bottom of the wall, the boards are placed in position and tamped evenly over the entire surface to ensure complete contact. Subsequent boards are fixed in place in the same way without any gaps between adjacent boards.

15.14 When the adhesive is set, the joints between the boards are taped with Marmox Reinforcing Tape.

#### Fixing to stud walls

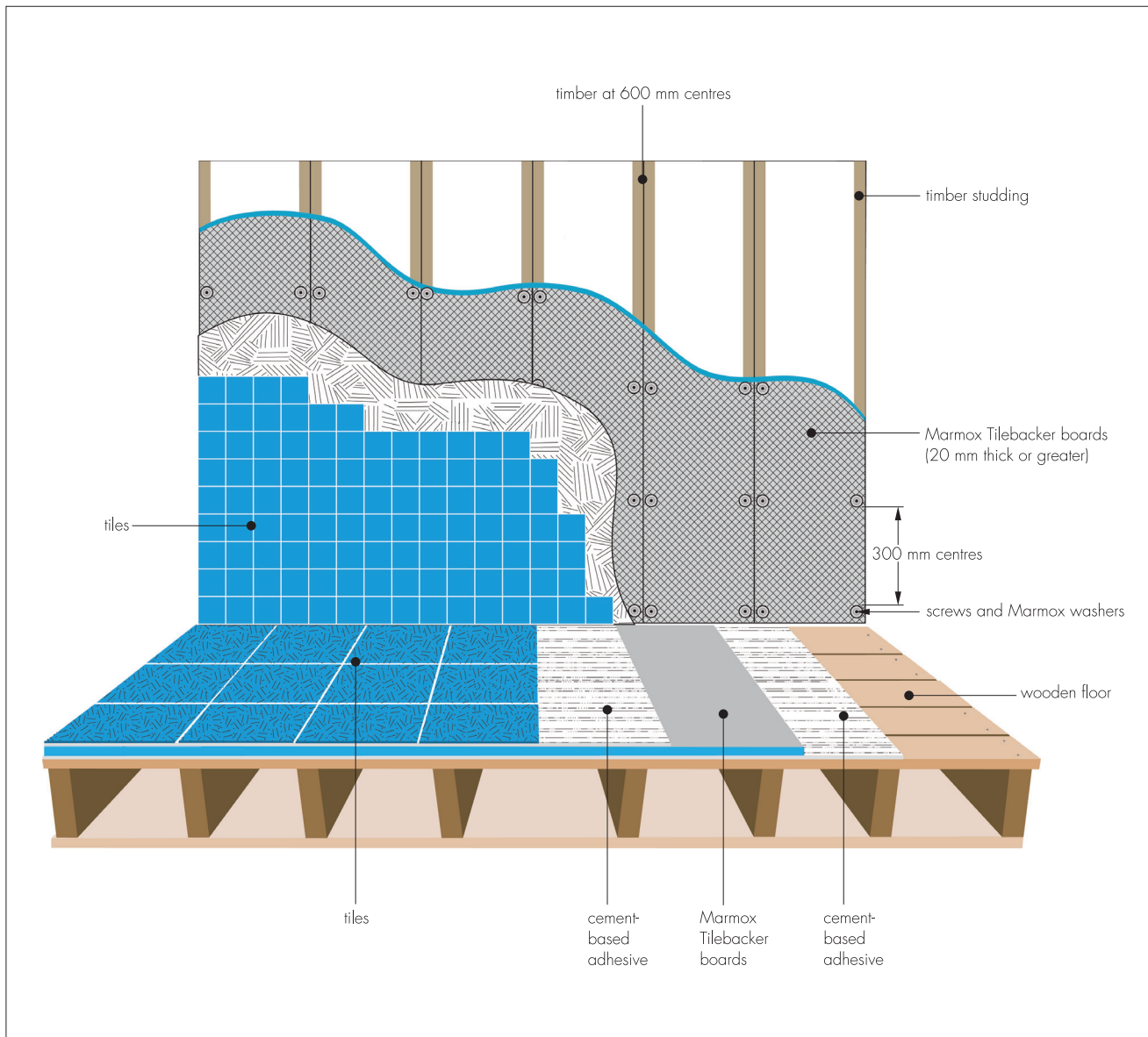
15.15 Boards 20 mm thick and greater can be mechanically fixed onto timber or metal studding (see Figure 2) at maximum 600 mm centres using Marmox washers with appropriate screws at least 20 mm longer than the thickness of the board to be fixed. The fixings should be placed at least 25 mm from the edge of the board and screwed tight so that the washer is reasonably flush with the board surface.

15.16 All board edges must be supported.

15.17 Fixings should be applied to each supporting timber at approximately 300 mm centres..

15.18 The joints between the boards are taped with Marmox Reinforcing Tape.

Figure 2 Fixing to stud walls and floors using screws and washers



### Fixing to concrete and other solid floors

15.19 A suitable flexible cementitious adhesive is applied to the prepared floor in a straight line using a notched trowel.

15.20 Starting in a corner, the boards are laid in a brick bond pattern leaving a gap of about 5 mm between the board and wall/skirting to allow for expansion.

15.21 The joints between the boards are taped with Marmox Reinforcing Tape.

### Fixing to wooden floors

15.22 The floor must be flat and secure before fixing the boards.

15.23 The boards are then fixed in accordance with the method described for fixing the boards to concrete and other solid floors (see sections 15.19 to 15.21). However, a 10 mm gap should be left between the boards and the wall/skirting to allow for expansion of the floor.

15.24 Alternatively, provided the floor is flat, boards at least 10 mm thick can be mechanically fixed using the Marmox washers and suitable screws. At least 12 fixings per short board must be used.

15.25 Joints between boards are taped with Marmox Reinforcing Tape.

### Installation to surfaces exposed to water

15.26 Joints between boards used in areas that may be exposed to water must be sealed using a waterproof tape or suitable sealant. The Certificate holder must be consulted for suitable products.

## 16 Tile fixing

16.1 The surface of the boards must be free from dust and other contamination that may adversely affect the adhesion of the tiles.

16.2 Tiles are fixed to the board using a suitable flexible cement-based tile adhesive applied in accordance with the manufacturer's instructions, and the relevant parts of BS 8000-11 and BS 5385.

16.3 When fixing to floors, tiles should be a minimum of 50 mm by 50 mm in size and a solid-bed fixing technique is used to ensure that no voids remain under the tiles.

16.4 A solid-bed fixing technique should also be used on surfaces likely to be exposed to water to ensure that no voids remain under the tiles.

16.4 Once the tile bed has hardened sufficiently, the joints between the tiles can be grouted using a suitable cement-based flexible waterproof grout.

16.5 The Certificate holder should be consulted for suitable adhesives and grouts.

## 17 Repair

In the event of accidental damage, repairs can be carried out by replacing damaged boards and tiles in accordance with the relevant parts of sections 15 and 16.

# Technical Investigations

## 18 Tests

18.1 Samples of Marmox Tilebacker Boards were obtained from the Certificate holder for testing by the BBA. The following is a summary of the tests carried out on the boards.

18.2 Tests were carried out on the boards to determine dimensional accuracy.

18.3 A series of tests were carried out on the 20 mm boards to establish:

- impact resistance of tiled<sup>(1)</sup> boards (soft and hard body)
- pull-through strength of fixings
- compression strength
- flexural strength of wet and dry samples
- bond strength of ceramic tiles to boards<sup>(1)</sup>
- compressive creep.

(1) Using Ardex-Flex 6001 tile adhesive and Ardex-Flex FS waterproof grout.

## 19 Investigations

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

19.2 An assessment was made on the risk of interstitial condensation using the water vapour transmission properties of the extruded polystyrene component of the board.

19.3 Sites in progress were examined to establish the practicability of installation.

19.4 A user survey of existing installations was carried out to support the performance in use.

19.5 An examination was made of test reports relating to:

- surface spread of flame to BS 476-7 : 1997
- thermal conductivity to ASTM C 518 : 2004
- fire propagation test to BS 476-6 : 1989
- transmitted impact noise to EN ISO 140-8 : 1998.

# Additional Information

The Quality Management System operated by Chemicals for Modern Building (Marmox — Egypt) has been assessed and registered as meeting the requirements of ISO 9001 : 2000 by Bureau Veritas (Certificate Registration No 231739).

## Bibliography

- BS 476-6 : 1989 *Fire tests on building 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 the surface spread of flame of products*
- BS 5385-1 : 2009 *Wall and floor tiling — Design and installation of ceramic, natural stone and mosaic wall tiling in normal conditions — Code of practice*
- BS 5385-2 : 2006 *Wall and floor tiling — Design and installation of external ceramic and mosaic wall tiling in normal conditions — Code of practice*
- BS 5385-3 : 2007 *Wall and floor tiling — Design and installation of ceramic and mosaic floor tiling in special conditions — Code of practice*
- BS 5385-4 : 2009 *Wall and floor tiling — Design and installation of ceramic and mosaic tiling in special conditions — Code of practice*
- BS 5385-5 : 2009 *Wall and floor tiling — Design and installation of terrazzo, natural stone and agglomerated stone tile and slab flooring — Code of practice*
- BS 5628-3 : 2005 *Code of practice for the use of masonry — Materials and components, design and workmanship*
- BS 6399-1 : 1996 *Loading for buildings — Code of practice for dead and imposed loads*
- BS 8000-11.1 : 1989 *Workmanship on building sites — Code of practice for wall and floor tiling — Ceramic tiles, terrazzo tiles and mosaics*
- BS 8000-11.2 : 1990 *Workmanship on building sites — Code of practice for wall and floor tiling — Natural stone tiles*
- BS EN 1991-1-1 : 2002 *UK National Annex to Eurocode 1 : Actions on structures — General actions— Densities, self-weight, imposed loads for buildings*
- ISO 9001 : 2000 *Quality management systems — Requirements*
- EN 1338 : 2003 *Concrete blocks — Requirements and test methods*
- EN 12004 : 2001 *Adhesives for tiles — Definitions and specifications*
- EN 13164 : 2001 *Thermal insulation products for buildings — Factory made products of extruded polystyrene foam (XPS) — Specification*
- ASTM C 518 : 2004 *Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus*
- EN ISO 140-8 : 1997 *Acoustics. Measurement of sound insulation in buildings and of building elements. Laboratory measurements of the reduction of transmitted impact noise by floor coverings on a heavyweight standard floor*

## 20 Conditions

20.1 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.

20.2 Publications and documents referred to in this Certificate are those that the BBA deems to be relevant at the date of issue or re-issue of this Certificate and include any: Act of Parliament; Statutory Instrument; Directive; Regulation; British, European or International Standard; Code of Practice; manufacturers' instructions; or any other publication or document similar or related to the aforementioned.

20.3 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.

20.4 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.

20.5 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.

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