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Agrément Certificate
No 98/3538

PRODUCT SHEET 1 —FERMACELL DRY FLOORING ELEMENTS

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Fermacell Dry Flooring Elements, comprising gypsum fibreboards for use as a floor overlay on concrete or timber boarded floor decks.

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

Thermal performance — the thermal conductivity of the products can be taken as $0.30 \text{ Wm}^{-1}\text{K}^{-1}$. Improved U values can be achieved by combining the boards with different types of insulation (see section 5).

Acoustic performance — the products when installed on a suitable floor can satisfy the requirements for impact and airborne sound transmission (see section 6).

Durability — the products will perform satisfactorily for the life of the building, provided they are installed in accordance with the recommendations of this Certificate (see section 12).

The BBA has awarded this Agrément Certificate for Fermacell Dry Flooring Elements to Fermacell GmbH as fit for their intended use provided they are installed, used and maintained as set out in this Agrément Certificate.

On behalf of the British Board of Agrément

Head of Approvals
— Physics

Chief Executive

Date of First issue: 16 November 1998

Date of Second issue: 17 July 2008

Certificate amended on 26 January 2010 with a change to the company name.

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

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, Fermacell Dry Flooring Elements, 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:	A1	Loading
Comment:		Floors incorporating these products can meet this Requirement. See section 9.2 of this Certificate.
Requirement:	C2(c)	Resistance to moisture
Comment:		A concrete ground floor incorporating the products will meet this Requirement provided the floor complies with the conditions set out in sections 7.1 and 7.2 of this Certificate.
Requirement:	E1	Protection against sound from other parts of the building and adjoining buildings
Comment:		The products, when installed on a suitable floor, can meet these Requirements. See sections 6.1 to 6.4 of this Certificate.
Requirement:	L1(a)(i)	Conservation of fuel and power
Comment:		The products can contribute to enabling a floor to meet this Requirement. See sections 5.3 to 5.6 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The products are acceptable. See section 12 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 products can contribute to a construction meeting this Regulation. See sections 11 and 12 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards — construction
Standard:	1.1(a)(b)	Structure
Comment:		Floors incorporating these products can satisfy this Standard, with reference to clause 1.1.1 ⁽¹⁾ . See section 9.2 of this Certificate.
Standard:	3.15	Condensation
Comment:		Floors incorporating the products, can satisfy this Standard, with reference to clauses 3.15.1 ⁽¹⁾ and 3.15.4 ⁽¹⁾ . See sections 7.1 and 7.3 of this Certificate.
Standard:	5.1	Resisting sound transmission to dwellings
Comment:		The products, when installed on a suitable floor, can satisfy this Standard, with reference to clauses 5.1.1 ⁽¹⁾ and 5.1.12 ⁽¹⁾ . See sections 6.1, 6.2 and 6.4 of this Certificate.
Standard:	6.1(a)(b)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:		The products can contribute to satisfying clauses, or parts of, 6.1.2 ⁽¹⁾ , 6.1.6 ⁽¹⁾ , 6.2.1 ⁽¹⁾ , 6.2.3 ⁽¹⁾ , 6.2.4 ⁽¹⁾ and 6.2.5 ⁽¹⁾ of these Standards. See sections 5.3 to 5.6 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 ⁽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 products are acceptable. See section 12 and the <i>Installation</i> part of this Certificate.
Regulation:	B3(2)	Suitability of certain materials
Comment:		The products do not normally require maintenance. See section 11 of this Certificate
Regulation:	C5	Condensation
Comment:		The products are acceptable. See sections 7.1 and 7.2 of this Certificate.
Regulation:	D1	Stability
Comment:		Floors incorporating the products, can meet this Requirement. See section 9.2 of this Certificate.
Regulation:	G2(2)(1)	Separating walls and separating floors
Regulation:	G3(2)(1)	Existing walls and floors which become separating walls and separating floors
Comment:		The products, when installed on a suitable floor, can satisfy these Regulations. See sections 6.1, 6.2 and 6.4 of this Certificate.
Regulation:	F2(a)(i)	Conservation measures
Regulation:	F3(2)	Target carbon dioxide Emissions Rate
Comment:		The products can contribute to a building satisfying its Target Emission Rate. See sections 5.3 to 5.6 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 section: 2 *Delivery and site handling* (2.2).

Non-regulatory Information

NHBC Standards 2007

NHBC accepts the use of Fermacell Dry Flooring Elements, when installed and used in accordance with this Certificate, in relation to *NHBC Standards*, Sections 5.1 *Substructure and ground bearing floors*, 5.2 *Suspended ground floors* and 6.4 *Timber and concrete upper floors*.

Zurich Building Guarantee Technical Manual 2007

In the opinion of the BBA, Fermacell Dry Flooring Elements when installed and used in accordance with this Certificate, satisfy the requirements of the *Zurich Building Guarantee Technical Manual*, Section 3 *Substructure*, Sub-section *Floors* and Section 4 *Superstructure*, sub-section *Sound insulation*.

General

This Certificate relates to Fermacell Dry Flooring Elements, a flooring overlay on concrete or timber boarded floor decks. The products are used to reduce impact and airborne sound transmission through separating floors in dwellings and flats, and also for use as a thermal insulation for ground supported and suspended concrete ground floors.

Technical Specification

1 Description

1.1 Fermacell Dry Flooring Elements consist of two bonded gypsum-fibreboards, staggered by 50 mm to provide a shiplap joint between adjacent elements. The gypsum-fibreboard consists of a homogeneous mixture of recycled water, recycled gypsum and recycled cellulose fibre compressed at high pressure. The undersides of the boards are available plain and lined with high-density rigid insulation panels. The insulations used are highly compressed mineral wool, wood fibre, extruded or expanded polystyrene.

1.2 The size of the elements is 1500 mm by 500 mm, including a 50 mm shiplap joint. The characteristics and types available are detailed in Table 1.

Table 1 Types of elements

Fermacell Dry Flooring Elements	Overall thickness (mm)	Thermal resistance values (m ² KW ⁻¹)
2 × 10 mm boards	20	0.06
2 × 12.5 mm boards	25	0.07
2 × 10 mm boards bonded to 10 mm wood fibre board ⁽¹⁾	30	0.26
2 × 10 mm boards bonded to 10 mm dense mineral wool	30	0.31
2 × 10 mm boards bonded to 20 mm expanded polystyrene	40	0.56
2 × 10 mm boards bonded to 30 mm expanded polystyrene	50	0.81

(1) Known as 2 E 31.

1.3 Proprietary ancillary items used with the products are:

- Fermacell floor glue
- Fermacell dry-levelling compound
- Fermacell self-levelling compound
- Fermacell floor screws (19 mm and 22 mm)
- Fermacell joint filler
- Fermacell bonded levelling compound
- Fermacell perimeter isolation strips
- Proprietary diverging staples (18 mm to 19 mm or 21 mm to 22 mm).

2 Delivery and site handling

2.1 The boards are delivered to site in stacks on wooden pallets and wrapped in polyethylene. Each stack has a label which bears the product name, date of manufacture, size and quality control stamp.

2.2 The products must be stored flat on a dry, level surface in a well ventilated area protected from rain and snow. Materials such as joint filler and metal components must be stored in dry conditions.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Fernacell Dry Flooring Elements.

Design Considerations

3 General

3.1 Fernacell Dry Flooring Elements are satisfactory for use on concrete or timber boarded floor decks in dwellings and flats.

3.2 The products reduce airborne and impact sound transmission through separating floors. The products have not been assessed for use on exposed or semi-exposed floors.

3.3 The elements, bonded with insulation are effective in reducing the U value (thermal transmittance) of ground supported and suspended concrete ground floors.

3.4 Ground supported floors incorporating the elements must include a suitable damp-proof membrane, laid in accordance with CP 102 : 1973, Section 11 (see section 8 of this Certificate).

3.5 Suspended concrete ground floors incorporating the elements must include suitable ventilation or a damp-proof membrane (see section 8 of this Certificate).

4 Practicability of installation

The products can be installed easily by operatives experienced with this type of material.

5 Thermal performance

5.1 Calculations of the thermal transmittance (U value) of specific floor constructions should be carried out in accordance with BS EN ISO 13370 : 1998, BS EN ISO 6946 : 1997 and BRE report (BR 443 : 2006) *Conventions for U-value calculations*, using the declared thermal conductivity (in $\text{Wm}^{-1}\text{K}^{-1}$) for the component items given in Table 2.

5.2 Example U values are shown in Table 3, where 40 mm corresponds to two 10 mm thick boards with 20 mm thick expanded polystyrene (EPS). The U value of a floor will depend on the thickness of the board, the perimeter/area (P/A) ratio and the floor type. This table is for use as guidance only, a detailed calculation should be carried out for each proposed application.

Table 2 Thermal conductivity values (λ)

Fernacell Dry Flooring Elements	Thermal conductivity ($\text{Wm}^{-1}\text{K}^{-1}$)
Boards	0.30
Wood fibre	0.05
Mineral wool	0.04
Expanded polystyrene	0.04

Table 3 Example U values ($\text{Wm}^{-2}\text{K}^{-1}$)

Construction	P/A ratio	Thickness (mm)
		40
Slab on ground ⁽¹⁾	0.2	0.28
	0.4	0.43
	0.6	0.53
	0.8	0.60
	1.0	0.65
Beam and block suspended concrete	0.2	0.29
	0.4	0.39
	0.6	0.45
	0.8	0.50
	1.0	0.53

(1) Edge insulation is not included.



5.3 Subject to the selection of an appropriate construction, P/A ratio and insulation thickness, a floor construction can contribute to achieving the following design U values:

England and Wales and Northern Ireland

- $0.25 \text{ Wm}^{-2}\text{K}^{-1}$ required for 'notional' dwellings in SAP 2005 (see also section 5.4)
- $0.25 \text{ Wm}^{-2}\text{K}^{-1}$ limit average specified in Approved Documents L1A (Table 2), and Technical Booklet F1 (Table 2.2)
- $0.70 \text{ Wm}^{-2}\text{K}^{-1}$ limit for an individual element specified in Approved Documents L1A (Table 2), and Technical Booklets F1 (Table 2.2).

Scotland

- $0.20 \text{ Wm}^{-2}\text{K}^{-1}$ required for fuel packages 3 and 6 and $0.22 \text{ Wm}^{-2}\text{K}^{-1}$ required for packages 1, 2, 4 and 5 in Mandatory Standard 6.1, clause 6.1.2⁽¹⁾ for 'notional' U values for floors (see also section 5.4)
- $0.25 \text{ Wm}^{-2}\text{K}^{-1}$ required for simplified 'notional' dwellings as described in Mandatory Standard 6.1, clause 6.1.6⁽¹⁾ (see also section 5.4)
- $0.25 \text{ Wm}^{-2}\text{K}^{-1}$ maximum U value outlined in the table to Mandatory Standard 6.1, clause 6.2.1⁽¹⁾
- $0.22 \text{ Wm}^{-2}\text{K}^{-1}$ for extensions, the value described by diagram to Mandatory Standard 6.2, clause 6.2.9⁽¹⁾
- $0.70 \text{ Wm}^{-2}\text{K}^{-1}$ limit for an individual element specified in clause Mandatory Standard 6.2, clause 6.2.1⁽¹⁾.

(1) Technical Handbook (Domestic).

5.4 Where a proposed floor U value is not greater than the relevant 'notional' value specified in section 5.3, additional energy saving measures will be required in the building envelope and/or services to achieve the required overall carbon dioxide emission rate reduction of about 20% in dwellings (18% to 25% in Scotland).

5.5 Compliance with the guidance referred to in section 5.6 will allow the use of the default psi values from Table 3 of BRE Information Paper IP 1/06 *Assessing the effects of thermal bridging at junctions and around openings* and Table K1 of *The Government's Standard Assessment Procedure for Energy Rating of Dwellings* (SAP 2005), in Target Emission Rate calculations to SAP 2005.

5.6 The products can contribute to maintaining continuity of thermal insulation at junctions between the floor and the other building elements. Guidance in this respect, and on limiting heat loss by air infiltration, can be found in:

England and Wales — *Limiting thermal bridging and air leakage: Robust construction details for dwellings and similar buildings* TSO 2002

Scotland — Accredited Construction Details (Scotland)

Northern Ireland — Accredited Construction Details (version 1.0).

6 Acoustic performance

6.1 The details shown in Figures 1 to 3, incorporating Fermacell Dry Flooring Elements as the overlay, are typical examples of assembled systems and are included for the purposes of expressing sound insulation performance (see Tables 4 and 5).

6.2 A construction as detailed in Figure 3 incorporating two by 10 mm thick boards bonded with 10 mm thick mineral wool (highly compressed) as the overlay, provides satisfactory airborne and impact sound insulation for individual pairs of rooms (see Table 6).

Figure 1 Concrete sub-floor/separating floor

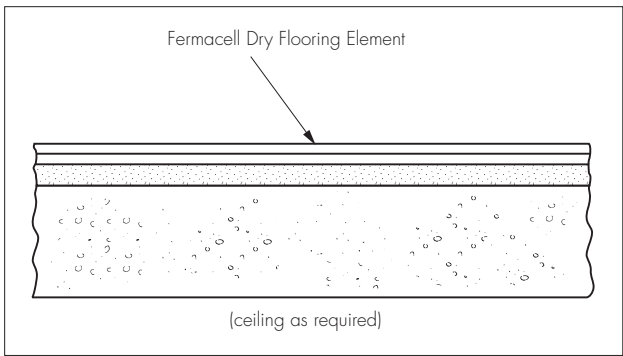


Figure 2 Fermacell timber-based separating floor

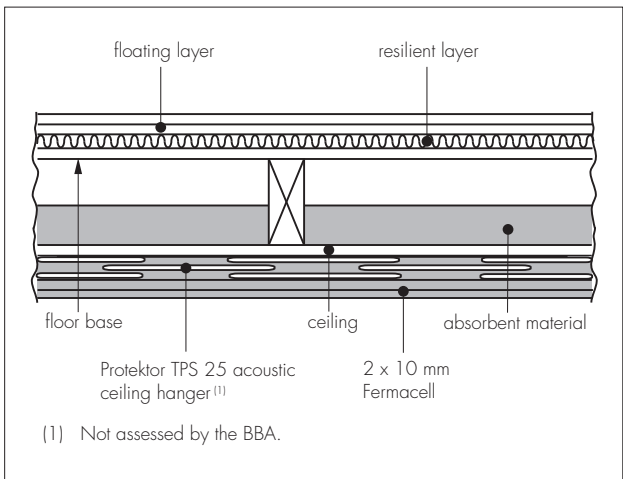


Table 4 Sound insulation (dB) deemed to satisfy – England and Wales

Construction	Airborne $D_{nT,w} + C_{tr}$	Impact $L'_{nT,w}$
Purpose-built dwelling-houses and flats	≥ 45	≤ 62
Dwelling-houses and flats formed by material change of use	≥ 43	≤ 64

Figure 3 Fermacell with 10 mm mineral wool

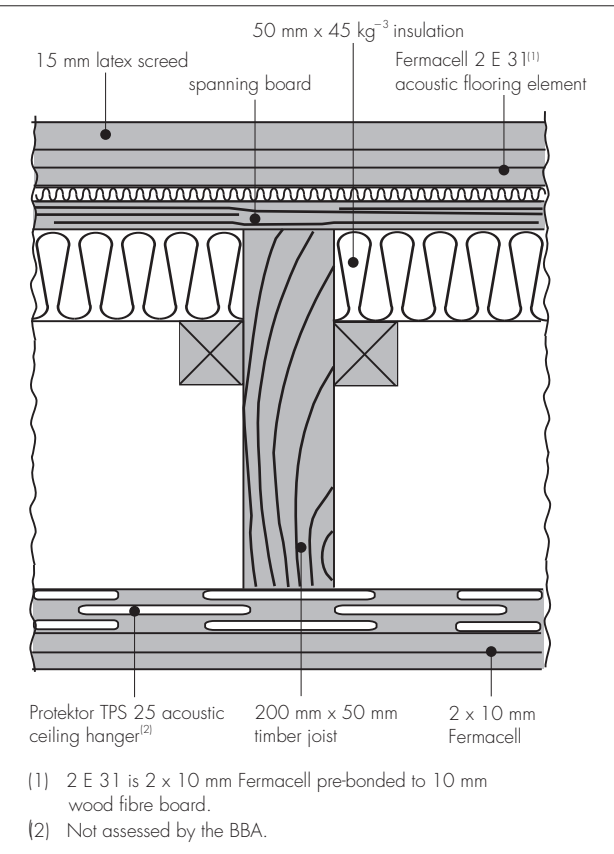


Table 5 Sound insulation (dB) deemed to satisfy – Scotland and Northern Ireland

	Airborne $D_{nT,w}$	Impact $L'_{nT,w}$
Scotland and Northern Ireland (New constructions)		
Mean value	≥ 52	≤ 61
Individual value	≥ 48	≤ 65
Northern Ireland (Conversions)		
Individual value	≥ 48	≤ 65

Table 6 Sound insulation (dB) – pre-completion test results

Pre-completion test results	Airborne $D_{nT,w}$	Impact $L'_{nT,w}$
Fermacell 2 E 31 ⁽¹⁾ acoustic flooring element	58	52

(1) 2 E 31 is 2 x 10 mm Fermacell pre-bonded to 10 mm wood fibre board.



6.3 In England and Wales, separating floors incorporating the product, are subject to pre-completion testing in accordance with Section 1 of Approved Document E.



6.4 The measures to be taken in design and during installation to avoid direct paths for airborne sound and to minimise flanking sound transmission are given in the national Building Regulations:

England and Wales — Approved Document E and the Robust Details, Part E *Resistance to the passage of sound*

Scotland — Mandatory Standard 5.1, clauses 5.1.1⁽¹⁾ and 5.1.12⁽¹⁾.

(1) Technical Handbook (Domestic).

Northern Ireland — Technical Booklets G and G1.

7 Condensation

Interstitial condensation



7.1 Floors will adequately limit the risk of interstitial condensation when they are designed and constructed in accordance with BS 5250 : 2002, Section 8.5 and Appendix D.

Surface condensation



7.2 Floors will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed $0.7 \text{ Wm}^{-2}\text{K}^{-1}$ at any point, and the junctions with walls are designed in accordance with the relevant requirements of *Limiting thermal bridging and air leakage : Robust construction details for dwellings and similar buildings*, TSO 2002 or BRE Information Paper IP 1/06.



7.3 Floors will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed $1.2 \text{ Wm}^{-2}\text{K}^{-1}$ at any point. Guidance may be obtained from Section 8 of BS 5250 : 2002 and BRE report (BR 262 : 2002) *Thermal insulation : avoiding risks*.

8 Moisture penetration

8.1 Provided the elements are installed in accordance with this Certificate, moisture will be prevented from crossing completed ground floor construction.

8.2 For ground floors subject to national Building Regulations, construction should be as detailed or designed in accordance with:

England and Wales — Approved Document C, Section 4

Scotland — Mandatory Standard 3.4, clauses 3.4.2⁽¹⁾ to 3.4.4⁽¹⁾ and 3.4.6⁽¹⁾

(1) Technical Handbook (Domestic).

Northern Ireland — Technical Booklet C, Section 1.

9 Floor loading

9.1 The design loadings for self-contained dwelling units as defined in BS 6399-1 : 1996 are:

intensity of distributed load (kPa)	1.5
concentrated load (kN)	1.4



9.2 The elements can support these design loadings without undue deflection.

9.3 A BRE survey of imposed floor loadings in domestic buildings (see BRE Current Paper No 2/77 *Floor loadings in domestic buildings — the results of a survey*) indicates that loadings in flats are commonly in the region of 0.6 kPa and loadings of 1.5 kPa are normally associated with fixed items.

9.4 Before installation, the existing floor structure should be checked for the additional loading to be applied as a consequence of using the product.

10 Properties in relation to fire

When properly installed on fire-resistant floors, the elements will not add significantly to any existing fire hazard.

11 Maintenance



The products will be covered by a finish (eg carpet, vinyl) and have suitable durability, therefore, no maintenance should be required.

12 Durability



The products will perform satisfactorily and provide thermal and sound insulation for the life of the building provided they are installed in accordance with the recommendations of this Certificate.

Installation

13 General

13.1 Fermacell Dry Flooring Elements must be installed in accordance with the Certificate holder's instructions. Installation should not commence until the building is weatherproof and wet trades complete and dried out.

13.2 The elements should be acclimatised to conditions in service before laying. The elements themselves are not fixed to the floor, but float.

13.3 The concrete floor over which the elements are to be laid should be left as long as possible to maximise drying out, eg the recommendations of BS 8203 : 2001, should be followed.

13.4 The floor surface must be smooth and flat and to ensure the elements are fully supported at every point, localised irregularities (up to 10 mm deep) can be patched using Fermacell bonding compound or Fermacell self-levelling compound. Larger areas should be levelled using a self-levelling mortar, following the manufacturer's instructions. When the irregularities are 10 mm deep or greater, use Fermacell self-levelling compound.

14 Procedure

14.1 The overlapping joint should be cut from one long side and one short side of first element and laid next to the wall, ensuring a close fit. Perimeter isolation strip should be applied first. Elements are cut to size as necessary and laid with insulation side downwards.

14.2 Where there are long, uninterrupted lengths of floor, for example, corridors, proprietary expansion joints should be installed at intervals on the basis of a 2 mm gap per metre run of board. Alternatively, a 10 mm expansion joint should be installed every 20 metres.

14.3 A gap of 3 mm to 5 mm should be allowed around pipes and other obstructions. The gap should later be sealed using a flexible sealant.

14.4 When fitting skirting over the product, a gap of 1 mm to 2 mm between skirting and the product should be allowed.

14.5 Before the elements are interlocked, the interlocking layers should be glued with Fermacell flooring adhesive and then fastened with Fermacell screws or diverging staples to ensure a close fit of the interlocking layers. The joints of successive rows of elements should be staggered by a minimum of 250 mm. Always stand on the overlapping floor element when fixing to ensure a tight, flush joint.

14.6 Where there is a likelihood of regular water spillage or standing water, eg in rooms such as large kitchens, bathrooms, shower and utility rooms, Fermacell elements should be lined with the Fermacell waterproofing system. Protection should be considered, eg by the use of flexible vinyl sheet flooring with welded joints and cove skirtings.

Acoustic applications

14.7 A proprietary border insulation strip should be applied to the base of perimeter walls to prevent flanking sound transmission (such as Fermacell perimeter isolation strip).

Technical Investigations

15 Tests

Tests were carried out to determine load deflection characteristics and creep.

16 Investigations

16.1 An examination was made of data relating to:

- durability
- thermal conductivity of insulants
- fire resistance
- resistance to airborne and impact sound transmission.

16.2 A user survey was conducted to evaluate performance in use.

16.3 An assessment of the risk of interstitial condensation in typical constructions was carried out.

Bibliography

BS 2750-4 : 1980 *Measurement of sound insulation in buildings and of building elements — Field measurements of airborne sound insulation between rooms*

BS 2750-7 : 1980 *Measurement of sound insulation in buildings and of building elements — Field measurements of impact sound insulation of floors*

BS 5250 : 2002 *Code of practice for control of condensation in buildings*

BS 6399-1 : 1996 *Loading for buildings — Code of practice for dead and imposed loads*

BS 8203 : 2001 *Code of practice for installation of resilient floor coverings*

BS EN ISO 6946 : 1997 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*

BS EN ISO 13370 : 1998 *Thermal performance of buildings — Heat transfer via the ground — Calculation methods*

CP 102 : 1973 *Code of practice for protection of buildings against water from the ground*

Conditions of Certification

17 Conditions

17.1 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.

17.2 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.

17.3 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.

17.4 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.

17.5 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.