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Agrément Certificate  
No 08/4525

## PRODUCT SHEET 1 — DURABASE FLOOR AND DWARF WALL SYSTEM

### PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to the Durabase Floor and Dwarf Wall System for use as a base for conservatories with floor areas not exceeding 30 m<sup>2</sup>.

#### 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

**Structural performance** — the system will have adequate strength to resist the loads associated with the construction and use of a conservatory (see section 6).

**Weathertightness and moisture penetration** — the system will resist the passage of moisture, water and wind-blown snow and dust into the interior of the conservatory (see section 7).

**Thermal insulation** — the system is available with a nominal (Standard) or an improved (Plus) level of thermal insulation, giving typical wall U values between 1.0 and 0.25 Wm<sup>-2</sup>K<sup>-1</sup> and floor U values between 0.6 and 0.2 Wm<sup>-2</sup>K<sup>-1</sup> (see section 8).

**Condensation risk** — the system incorporates thermal insulation and has minimal risk of condensation (see section 9).

**Durability** — the system will have an effective minimum design life of 25 years (see section 13).

The BBA has awarded this Agrément Certificate for Durabase Floor and Dwarf Wall System to Wye Valley Engineering Limited 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

Head of Approvals  
— Physics

Chief Executive

Date of First issue: 22 May 2008

*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.*

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# Regulations

In the opinion of the BBA, the Durabase Floor and Dwarf Wall System, 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)

The extension of a building by the addition at ground level of a conservatory, where the floor area does not exceed 30 m<sup>2</sup>, is exempt from the Building Regulations.



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

A conservatory forming a single-storey extension to an existing dwelling, where the conservatory does not contain a flue, a fixed combustion appliance or a sanitary facility and is not within one metre of a boundary and the floor area does not exceed 8 m<sup>2</sup>, is exempt from these Regulations. Conservatories above 8 m<sup>2</sup> are subject to all relevant Regulations. The glazing used in regulated and unregulated conservatories must meet Standard 4.8(b) *Danger from accidents*, with reference to clause 4.8.2<sup>(1)</sup> *Collision with glazing*.

A maximum U value of 2.2 Wm<sup>-2</sup>K<sup>-1</sup> is permissible for glazing (including frames) in a conservatory with a floor area of less than 50 m<sup>2</sup> and for those 20 m<sup>2</sup> or less, a maximum U value of 3.3 Wm<sup>-2</sup>K<sup>-1</sup> is permissible. The system, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the Regulations and related Mandatory Standards as listed below.

Regulation:	8(1)(2)	Fitness and durability of materials and workmanship
Comment:		The use of the system satisfies the requirements of this Regulation. See sections 12, 13.1 and 13.2 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards – construction
Standard:	1.1	Structure
Comment:		The system can contribute to satisfying this Standard, with reference to clauses 1.1.1 <sup>(1)</sup> to 1.1.3 <sup>(1)</sup> . See sections 6.1 to 6.3 of this Certificate.
Standard:	2.5	Internal linings
Comment:		The system can contribute to satisfying this Standard, with reference to clauses 2.5.1 <sup>(1)</sup> and 2.5.2 <sup>(1)</sup> . See sections 11.1 and 11.2 of this Certificate.
Standard:	2.6	Spread to neighbouring buildings
Comment:		The dwarf wall and associated conservatory wall should be considered as an unprotected area, with reference to clause 2.6.2 <sup>(1)</sup> . See sections 11.1 and 11.2 of this Certificate.
Standard:	3.1	Site preparation – harmful and dangerous substances
Comment:		The system can contribute to satisfying this Standard, with reference to clause 3.1.1 <sup>(1)</sup> . See sections 5.1 and 5.2 of this Certificate.
Standard:	3.2	Site preparation – protection from radon gas
Comment:		With reference to clause 3.2.1 <sup>(1)</sup> , necessary protection is outside the scope of this Certificate. See section 5.3 of this Certificate.
Standard:	3.4	Moisture from the ground
Comment:		The system can contribute to satisfying this Standard, with reference to clause 3.4.1 <sup>(1)</sup> . See section 5.2 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The system can contribute to satisfying this Standard, with reference to clauses 3.10.1 <sup>(1)</sup> . See section 7 of this Certificate.
Standard:	3.15	Condensation
Comment:		The system can contribute to satisfying this Standard. See sections 10.1 to 10.5 of this Certificate.
Standard:	6.2	Building insulation envelope
Comment:		The system can contribute to satisfying this Standard, with reference to clauses 6.2.1 <sup>(1)</sup> to 6.2.3 <sup>(1)</sup> 6.2.12 <sup>(1)</sup> and the <i>SBSA Technical Handbook for Conservatories</i> . Non-glazed elements should follow the guidance in the Table to 6.2.9 <sup>(1)</sup> . See sections 9.1 and 9.2 of this Certificate.

Note: Other Standards may be applicable to a complete conservatory installation, but are not specifically covered by this Certificate.

(1) Technical Handbook (Domestic).



## The Building Regulations (Northern Ireland) 2000 (as amended)

A conservatory attached to an existing building and having a floor area not exceeding 30 m<sup>2</sup> and not less than one metre from any boundary is exempt from these Regulations provided that the conditions described in A5 Exemptions are met and that the glazing meets the requirements in Part V - *Glazing*.

## 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* (2.1 to 2.5).

## General

This Certificate relates to the Durabase Floor and Dwarf Wall System for use as a base for conservatories<sup>(1)</sup> used as extensions to new or existing buildings where an external grade door separates the conservatory from an inner room.

It is essential that the system is installed and used in accordance with the conditions set out in the *Design Consideration* and *Installation* parts of this Certificate.

- (1) A conservatory is defined as a building attached to a dwelling with a door and any other building elements dividing it thermally from that dwelling and having translucent glazing (including frames) forming not less than either:
- 75% of its roof area and 50% of its external wall area or
  - 95% of its roof area and 35% of its external wall area.

## Technical Specification

### 1 Description

1.1 The Durabase Floor and Dwarf Wall System comprises a rigid steel base frame with screw adjustment levelling feet which stand on concrete pads and provides a base for conservatories up to 30 m<sup>2</sup> floor area.

1.2 The base frame supports a galvanized steel modular dwarf wall system that is clad with a Eurobrick insulated thin brick cladding system.

1.3 The base frame is infilled with insulation boards and decked with a moisture-resistant particle board.

1.4 The components of the system (see Figures 1 and 2) comprise:

- base frame — front, back and side edge sections square tube 80 mm by 80 mm by 3 mm steel SH5 to EN 10219-1 S235 and primer painted. Front and back sills corners have pre-welded bolts and the side sills have pre-welded corner brackets for corner connection. The front and back sill sections have welded U-shaped steel support brackets to accept floor joists. Welded nuts are positioned on the base frame (according to the base frame foundation plan) to accept adjustable support screws bearing on spreader plates
- adjustable support screws — 20 mm or 24 mm diameter threaded, corrosion-resistant steel, sitting on 100 mm by 100 mm by 3 mm corrosion-resistant steel support plates. They are available in various lengths up to a maximum of 200 mm long
- floor joists — available in two sizes and used according to span rules 80 mm by 40 mm by 3 mm and 60 mm by 40 mm by 3 mm box section steel SSH5 to EN 10219-1 S235 and primer painted with Europrime 1 red oxide primer 35 µm thick. For larger spans, the base is intersected by a centre section 80 mm by 80 mm by 3 mm square steel tube. The floor joists are spaced at 400 mm centres
- intermediate joist supports — used to support the centre of any joist over 2 m long and are fitted between each pair of floor joists. They are used to prevent bounce in the floor and do not provide any structural strength. The adjustable support screws should sit on a firm surface eg a paving slab
- for larger spans, the base is intersected by an internal trimming beam 80 mm by 80 mm by 3 mm steel box section with support screws
- wall frames — 180 mm depth by 1.5 mm steel galvanized G275Z2 with ports in the end panels to insert plumbing and cables in the wall cavity. These are clad with a Eurobrick insulated brick system comprising:
  - insulated backer panel
  - panel fasteners
  - brick slips
- floor insulation — StyLite EPS 70 50 mm thick expanded polystyrene supported on galvanized brackets between floor joists
- floorboards — 18 mm tongue-and-groove chipboard P5 to BS EN 312 : 2003 is fixed to base frame with self-drilling screws
- brick skirt — with air bricks<sup>(1)</sup>.

(1) For conservatory installation with full length glazed panels a plain skirt option is offered without air bricks. It is recommended to fit air vents.

1.5 The Durabase Plus base frame and wall system (for use in Scotland to provide a better thermal performance).

- the base outer frame members are steel box section 160 mm x 80 mm x 4 mm steel and the floor joists are lowered to accept a 9 mm decking ply and 75 mm expanded polystyrene. The top of the base frame is covered with 22 mm chipboard
- the wall frame cavities are fitted with 150 mm thick extruded polystyrene board (supplied by customer)
- the internal lining is 12 mm thick foil-backed plasterboard (supplied by customer).

Figure 1 Partial exploded view of Durabase Standard (For Scotland, the Durabase Plus system, as described in section 1.5, is applicable)

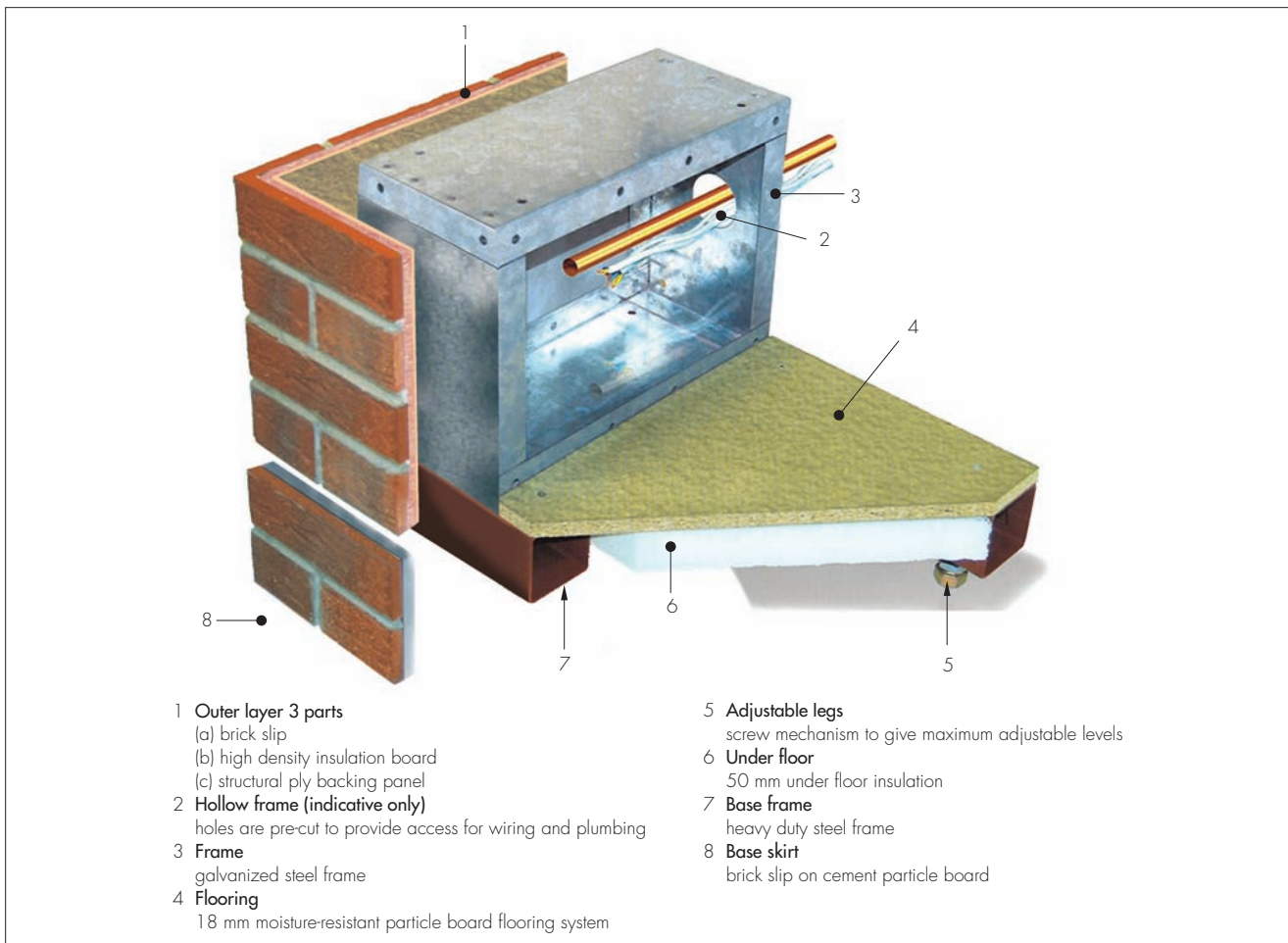
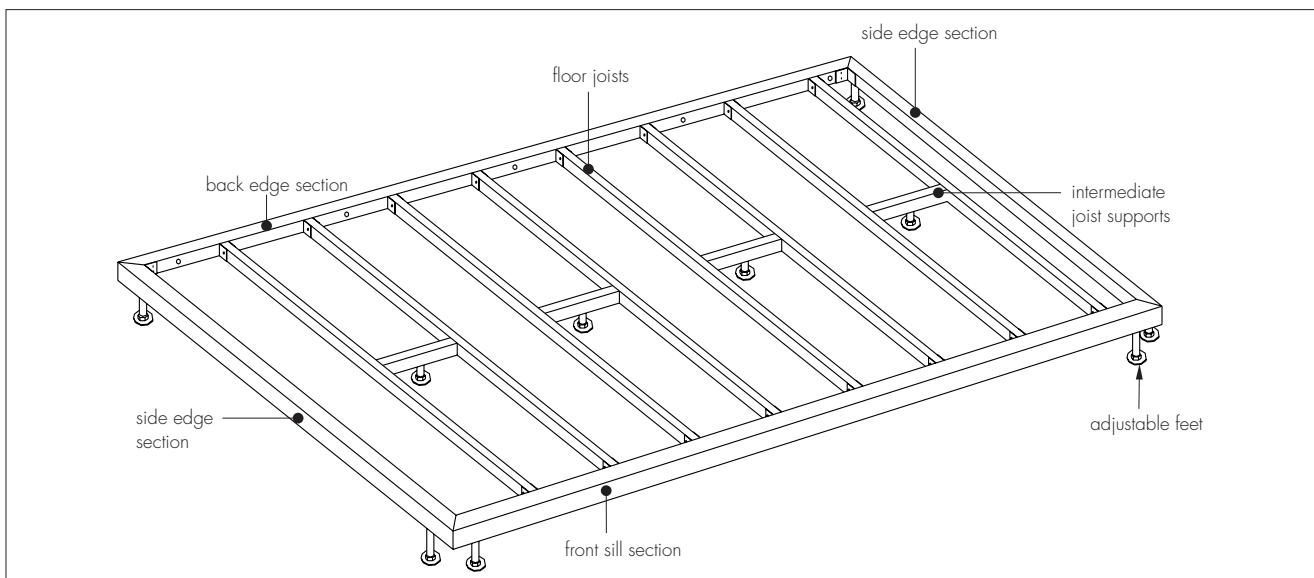


Figure 2 Base frame sections



## 2 Delivery and site handling

2.1 The system is delivered in kit form with a set of installation instructions.

2.2 Base frame sections can be lifted by hand.

2.3 All modular wall sections are a two-man lift.

2.4 Unless required for immediate use, all components should be stored level and off the ground. Particle boards should be protected from the weather.

2.5 Care should be taken to avoid mechanical damage particularly to painted components. Any damaged paint should be touched up.

# Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Durabase Floor and Dwarf Wall System.

## Design Considerations

### 3 Use

3.1 The Durabase Floor and Dwarf Wall System is suitable as a base for supporting conservatories with floor areas not exceeding 30 m<sup>2</sup>.

3.2 The floor stands on concrete pads (see section 1.5) and the frame is bolted to the house wall and eliminates the necessity for traditional foundations.

3.3 The system, pre-clad with clay brick tiles, eliminates the need for a traditional brick dwarf wall.

3.4 The system can be designed to be located over manholes or drains by means of a trap door and removable joists.

### 4 Practicability of installation

Installation of the system is straightforward and can be carried out by persons using traditional tools and skills.

### 5 Site preparation



5.1 The ground area to be covered by the baseframe must be prepared. Unsuitable material, including topsoil, vegetable matter and harmful/dangerous material must be removed.

5.2 A strong weed killer should be applied to the area covered by the base if it's being installed on bare ground. It is also advisable to lay a breathable weed suppressant membrane on the ground beneath the base.

5.3 For sites where radon or landfill gas is present special precautions may be necessary (outside the scope of this Certificate).

### 6 Structural performance



6.1 The loadbearing capacity of the system has been verified in accordance with BS 5950-1 : 2000.

6.2 The loading used to establish the safe load/span data was generally based on BS 6399-1 : 1996, BS 6399-2 : 1997 and BS 6399-3 : 1988. Normal domestic floor loading of 1.5 kNm<sup>-2</sup> or a point load of 1.4 kN have been considered and snow loads assumed to be 0.75 kNm<sup>-2</sup>.

6.3 The safe load span data is given in Table 1.

Table 1 Load/span data<sup>(1)</sup>

Location	Element (mm)	Floor joist spacing (mm)	Maximum span (m)
Floor joist	60 x 40 x 3	400	2.4
Floor joist	80 x 40 x 3	400	3.1
Internal trimming beam	80 x 80 x 3	← see Figure 3 →	
Edge beam	80 x 80 x 3 and 160 x 80 x 4	← see Figure 4 →	

(1) Assumptions:

- floor imposed load 1.5 kNm<sup>-2</sup> and 1.4 kN point load
- imposed load deflection span/360
- conservatory glazing and panels dead load 0.3 kNm<sup>-2</sup>
- snow load on roof taken as 0.75 kNm<sup>-2</sup>
- 300 mm square footings for internal baseframe support positions
- 450 mm square footings for baseframe perimeter support positions.

6.4 The adjustable support leg with 100 mm by 100 mm by 3mm spreader plate are adequate to transmit wind load, snow load and imposed loads to the foundation.

6.5 Concrete footings 300 mm by 300 mm in cross section for internal baseframe support pads and 450 mm by 450 mm in cross section for perimeter baseframe support pads will be adequate, provided the permissible ground bearing pressure exceeds 100 kNm<sup>-2</sup> (see the Figure in section 1.5.2).

Figure 3 80 mm by 80 mm by 3 mm internal trimming beam

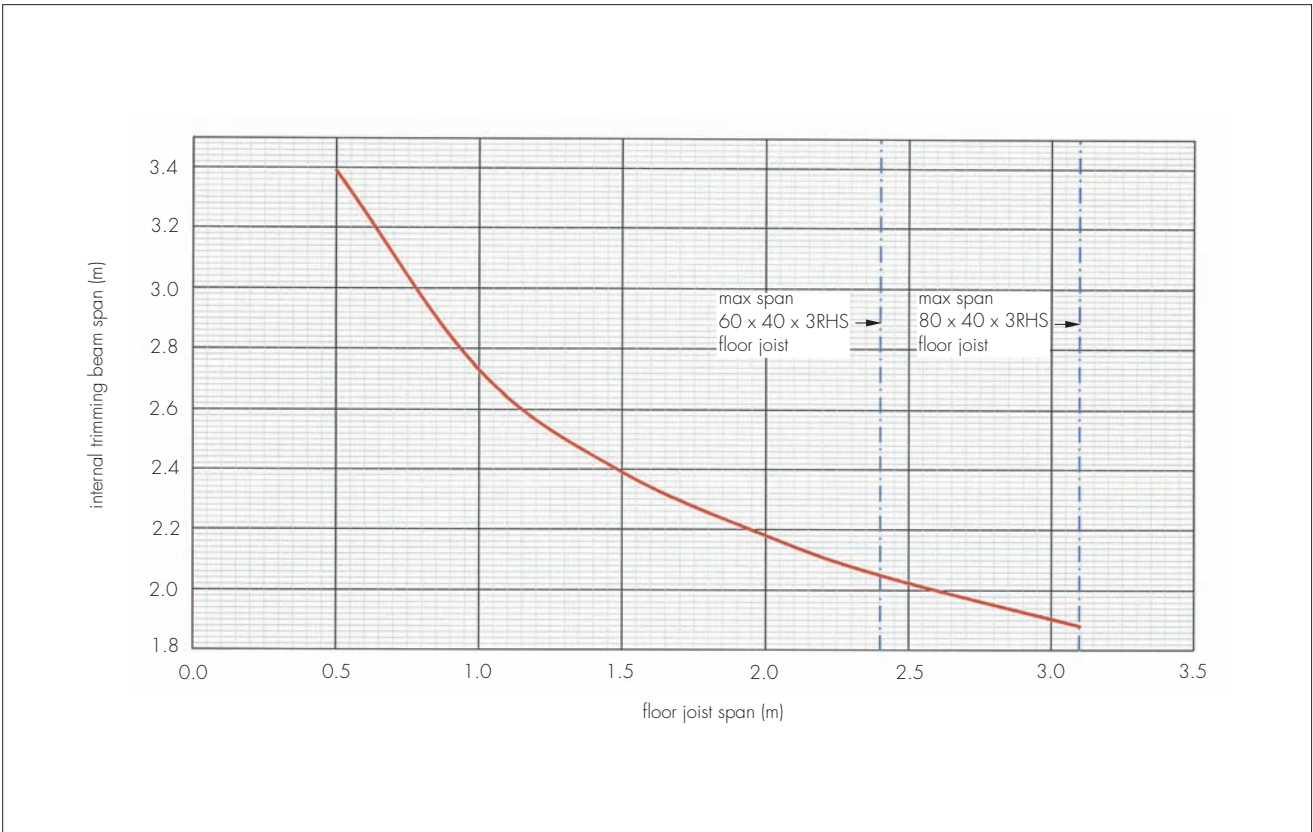
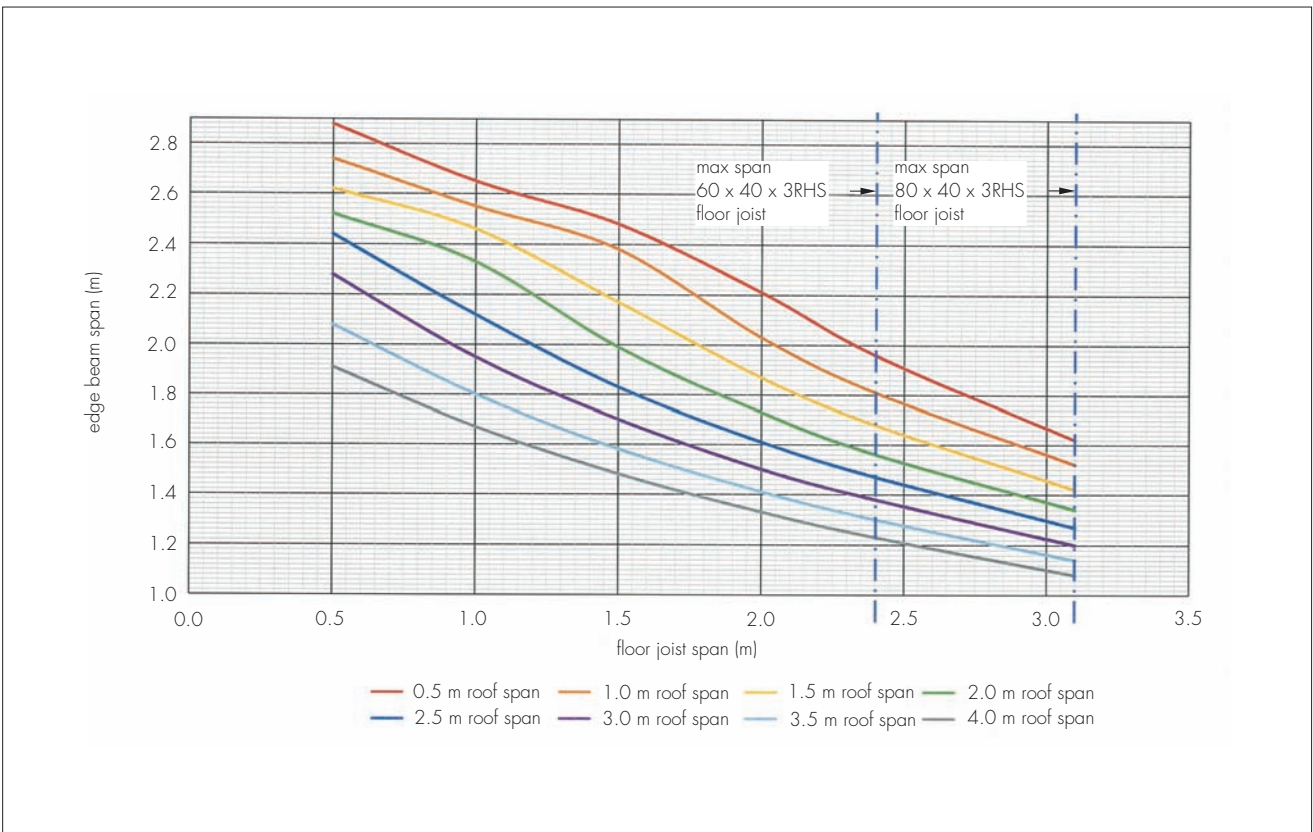


Figure 4 80 mm by 80 mm by 3 mm edge beam and 160 mm by 80 mm by 4 mm edge beam with 20 mm diameter adjustable support screw



## 7 Weathertightness and moisture penetration



The system when correctly installed in accordance with the manufacturer's installation instructions will resist the passage of moisture, water and wind-blown snow and dust into the interior of a conservatory.

## 8 Thermal insulation



8.1 Walls and floors incorporate a nominal level of thermal insulation and provide a greater resistance to heat loss than glazed elements. Higher levels of insulation can also be provided as shown in Table 2

8.2 Where calculations of the thermal transmittance (U value) of the specific floor or wall constructions are required, they 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 conductivities and thicknesses of the given materials. Example U value calculations are shown in Table 2.

Table 2 Thermal performance of Durabase

	U value ( $\text{Wm}^{-2}\text{K}^{-1}$ )		
	Standard	Plus	Scottish Regulation – 6.2.9
Durabase wall system	0.98	0.25	0.27
Durabase floor system	0.54–0.58 <sup>(1)</sup>	0.22–0.23 <sup>(1)</sup>	0.22

(1) Subject to P/A ratio of 0.75–1.0.

8.3 For conservatories with floor areas in excess of 8 m<sup>2</sup>, the Durabase Plus system (subject to P/A ratio) meets the area weighted U values in the table to clause 6.2.9<sup>(1)</sup> of 0.27  $\text{Wm}^{-2}\text{K}^{-1}$  and 0.22  $\text{Wm}^{-2}\text{K}^{-1}$  respectively.

(1) Technical Handbook (Domestic).

## 9 Condensation risk

### Surface condensation



9.1 The risk of condensation forming on a surface is dependent on its temperature and the temperature and humidity of the adjacent air. This risk can be minimised by providing means for adequate ventilation and limiting activities which produce large amounts of moisture.

9.2 The minimum temperature factor<sup>(1)</sup> of the Standard and Plus system is 0.63 at the dwarf wall floor junction. This is sufficient to minimise the risk of surface condensation provided that the measures in section 10.1 are observed.

(1) Ratio of difference in temperature between internal surface and outside air and internal air and outside air.

### Interstitial condensation

9.3 The risk of interstitial condensation in walls is minimal provided that the internal lining integrity is maintained. A vapour control layer is not required, provided the internal lining integrity is maintained.

9.4 Floors will adequately limit the risk of interstitial condensation where adequate sub-floor cross ventilation is provided of not less than 1500 mm<sup>2</sup> per metre run on at least two opposite walls.

## 10 Ventilation

10.1 To provide adequate air flow beneath the floor a minimum 150 mm air gap between the ground and underside of the base frame must be ensured.

10.2 It is recommended to fit an air vent in the fascia skirting board on both ends of the base to ensure adequate ventilation under the floor.

10.3 In areas where there might be landfill gas, methane gas or radon gas contamination, special precautions may be necessary (outside the scope of this Certificate).

## 11 Behaviour in relation to fire



11.1 The dwarf walls should be considered as unprotected areas for regulatory purposes in Scotland.

11.2 Plasterboard used as an internal lining is Class 0 or 'low risk' in accordance with BS 476-6 : 1989 and BS 476-7 : 1997.

## 12 Maintenance



The system, once installed, does not require any regular maintenance. However, should any maintenance be required on installed services, the normal hot work precautions should be taken.

## 13 Durability



13.1 The floor and wall system will have an effective minimum design life of 25 years.

13.2 The base frame installed over a ventilated void is protected from weather exposure.

13.3 The paint system and plating of components is considered durable for this application.

13.4 The expanded polystyrene and Kronospan particle boards are not in contact with any conditions liable to cause deterioration.

13.5 The galvanized steel modular wall system is further protected by a weatherproof cladding system.

## Installation

### 14 General

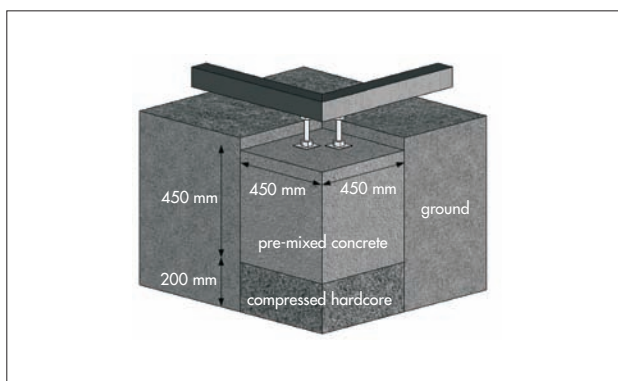
Installation of the Durabase Floor and Dwarf Wall System must be carried out in accordance with the Certificate holder's installation instructions.

### 15 Preparing the site

15.1 The modular base can be installed on an existing patio or concrete area providing the foundations are adequate. If the foundations are not adequate or the base is to be installed on bare ground, then a concrete pad is required under each adjustable leg, except on the rear sill section, which are non-loadbearing. Pad positions are indicated on the plan for each specific base.

15.2 Each pad (see Figure 5) should measure 450 mm square by 450 mm deep on firm subsoil. On clay, sand or peaty subsoil there should be an additional layer of well-compacted hardcore to a depth of 200 mm below the concrete.

Figure 5 Concrete pad foundation



15.3 The ground area to be covered by the baseframe must be prepared. Unsuitable material, including topsoil, vegetable matter and harmful/dangerous material must be removed.

15.4 A strong weed killer should be applied to the area covered by the base if it's being installed on bare ground. It is also advisable to lay a breathable weed suppressant membrane on the ground beneath the base.

15.5 For sites where radon or landfill gas is present special precautions may be necessary (outside the scope of this Certificate).

### 16 Assembly and positioning

16.1 Adjustable legs are fitted to each of the base frame members.

16.2 The rear sill section is positioned against the house wall in the required position and fixed using Rawl bolts M10 by 80 mm long.

16.3 The rear, side and front sill sections are bolted together.

16.4 The loadbearing plates are positioned under the adjustable legs and the legs adjusted to the required height and level.

16.5 The floor joists are placed onto the U-shaped support brackets and secured with nuts and bolts. Intermediate supports are fitted and the legs adjusted during this stage.

16.6 The brick skirt is fitted to the base frame with self-drilling screws.

#### Fitting modular wall

16.7 A damp-proof course membrane is laid on the perimeter of the outer frame.

16.8 Starting at the house wall, a bead of mastic should be placed approximately 15 mm from the outer edge of the end of the wall panel that butts against the house.

16.9 The wall panels are located in position around the perimeter of the base frame. The panel joints are sealed with mastic and then bolted together.

16.10 End panels are fixed to the house wall and all panels fixed to the base frame with self-drilling screws.

16.11 Before fitting floor insulation and floorboards the conservatory is now erected as per the conservatory manufacturer's installation instructions. The conservatory walls are fitted to the dwarf walls with self-drilling screws.

16.12 The polystyrene floor insulation is cut to fit the gaps between the floor joists and is located and supported in position with hanger brackets.

16.13 The floor boards are cut, laid and fixed to the floor joists with self-drilling screws.

## Technical Investigations

### 17 Tests

Cross cut adhesion tests were carried out on the paintwork of the base frame members.

### 18 Investigations

18.1 Structural calculation, and load/span tables were reviewed in accordance with BS 5950-1 : 2000, BS 6399-1 : 1996, BS 6399-2 1997 and BS 6399-3 : 1988.

18.2 Floor U values, perimeter heat loss and risk of condensation were assessed in accordance with BS EN ISO 13370 : 1998 and BRE Information Paper IP 1/06 *Assessing the effects of thermal bridging at junctions and around openings*.

18.3 Existing data relating to the durability of the system components were examined.

### 19 Other investigations

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

19.2 A visit was made to a site to assess the practicability of installation.

19.3 The component specifications and methods for maintaining the required product quality and composition were examined.

## 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 5950-1 : 2000 *Structural use of steelwork in building — Code of practice for design — Rolled and welded sections*
- BS 6399-1 : 1996 *Loading for buildings — Code of practice for dead and imposed loads*
- BS 6399-2 : 1997 *Loading for buildings — Code of practice for wind loads*
- BS 6399-3 : 1988 *Loading for buildings — Code of practice for imposed roof loads*
- BS EN 312 : 2003 *Particleboards — Specifications*
- 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*
- EN 10219-1 : 2006 *Cold formed welded structural hollow sections of non-alloy and fine grain steels — Technical delivery conditions*

## 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 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.

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.

