

DURABASE



Base and Wall Systems for Single Storey Home Extensions

Durabase products are manufacture by Wye Valley Engineering Ltd (company registered no: 2382461).

Wye Valley Engineering Ltd is an ISO registered firm; ISO9001:2008. Certificate NO: 20073102.

Strucftural Testing of Durabase systems has been carried out to British standards by:

Scott White and Hookins, - Structural and Civil Engineers

U value calculations by; Knauf Insulation Ltd, Cellotex Ltd and Recticel.

DURABASE - Assessment and Technical Investigations.

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

Design Considerations

1 Use

- 1.1 The Durabase Floor and Wall System is suitable as a base for supporting conservatories, orangeries and similar single storey home extensions.
- 1.2 The structure stands on concrete pads and the frame is bolted to the house wall and eliminates the necessity for traditional footings.
- 1.3 The system, pre-clad with clay brick tiles, eliminates the need for a traditional brick wall.
- 1.4 The system can be designed to be located over manholes or drains by means of a trap door and removable joists.

2 Practicability of installation

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

3 Site preparation

- 3.1 The ground area to be covered by the base must be prepared. Unsuitable material, including top soil, vegetable matter and harmful/dangerous material must be removed.
- 3.2 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.
- 3.3 For sites where radon or landfill gas is present it may be necessary to incorporate a barrier within the structure.

4 Structural performance

- 4.1 The load bearing capacity of the system has been verified in accordance with BS 5950-1 : 2000.
- 4.2 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 kNm² or a point load of 1.4 kN has been considered and snow loads assumed to be 0.75 kM².
- 4.3 The safe load span date is given in Table 1.

Table 1 Load/ span data(1)

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	to structural engineers calculations	
Edge beam	80 x 80 x 3	available on request.	
	And	160 x 80 x 4	

(1)Assumptions:

- Floor imposed load 1.5 kNm² and 1.4kN point load
- Imposed load deflection span/360
- Conservatory glazing and panels dead load 0.3kNm²
- Snow load on roof taken as 0.75 kNm²
- 300mm sq footings for internal base frame support positions
- 450mm sq footings for base frame perimeter support positions

- 4.4 The adjustable support leg with 100 x 100 x 3mm base plate are adequate to transmit wind load, snow load and imposed loads to the foundation.
- 4.5 Concrete footings 300mm x 300mm in cross section for internal base frame support pads and 450mm x 400mm in cross section for perimeter base frame support pads will be adequate, provided the permissible ground bearing pressure exceeds 100 kNm².

5 Weather tightness and moisture penetration

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

6 Thermal insulation

- 6.1 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 the table below.
- 6.2 Where calculations of the thermal transmittance (Value) of the specific floor and wall constructions are required they should be carried out in accordance with BS EN ISO 13370:1998, BS EN ISO6946:1997 and BRE report (BR 443:2006) *Conventions for U-value calculations*, using the declared thermal conductivities and thickness of the given materials. Example U value calculations are shown in Table 2.

Table 2 Thermal performance of Durabase

	U value (Wm ² K)		
	Standard	Plus(England and Wales)	Plus(Scotland and NI)
Durabase wall system	0.98	0.25	0.18
Durabase floor system	0.54-0.58(1)	0.22-0.23(1')	0.18

(1) Subject to P/A ratio of 0.75-1.0

7 Condensation risk

Surface condensation

- 7.1 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.
- 7.2 The minimum temperature factor (1) 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 8.1 are observed.

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

Interstitial condensation

- 7.3 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.
- 7.4 Floors will adequately limit the risk of interstitial condensation where adequate sub-floor cross ventilation is provided of not less than 1500mm² per metre run on at least two opposite walls.

8 Ventilation

- 8.1 To provide adequate air flow beneath the floor a minimum 150mm gap between the ground and underside of the base frame must be ensured.
- 8.2 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.
- 8.3 In areas where there might be landfill gas, methane gas or radon gas contamination, special precautions may be necessary.

9 Behaviour in relation to fire

- 9.1 The brick slips and mortar have been tested in accordance with BS 476; Part 6 *Fire tests on building materials and structures: methods and of test for fire propagation* and BS 476 Part 7 *Surface spread of flame test for materials* resulting in a national product performance classification of Class 0 or low risk classification with respect to the appropriate Building Regulations.
- 9.2 Plasterboard used as an internal lining is Class O or 'low risk' in accordance with BS 476-6: 1987 and BS 476-7: 1997

10 Durability

- 10.1 The floor and wall system will have an effective minimum design life of 25 years
- 10.2 The base frame installed over a ventilated void is protected from weather exposure.
- 10.3 The paint system and plating of components are considered for this application.
- 10.4 The expanded polystyrene and floor boards are not in contact with any conditions liable to cause deterioration.
- 10.5 The galvanised steel modular wall system is further protected by a weatherproof cladding system.

11 Installation

Installation of the Durabase Floor and Wall System must be carried out in accordance with Durabase installation instructions.