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Agrément Certificate
99/3600
Product Sheet 1

MONARFLOOR ACOUSTIC SYSTEMS

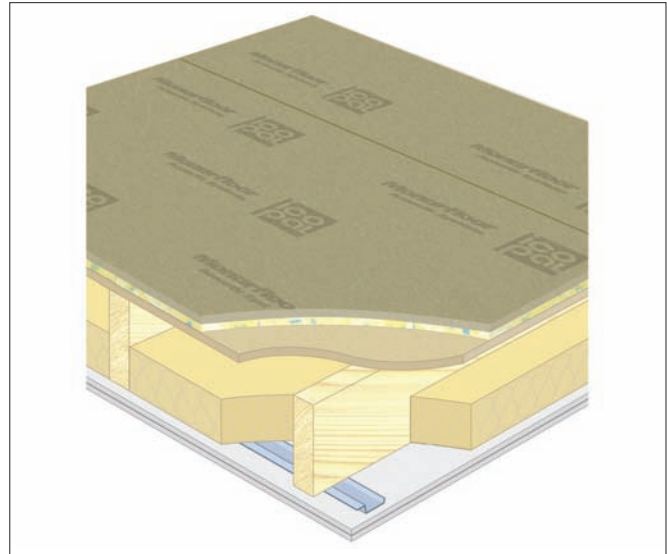
MONARFLOOR 9, 18 AND 22 ACOUSTIC DECK SYSTEMS

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Monarfloor 9, 18 and 22 Acoustic Deck Systems, for use on existing timber separating floors to reduce sound transmission in conversions and renovations of dwellings and flats.

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

Acoustic performance — the systems can be used to improve sound insulation in separating floors (see section 5).

Floor loading — the systems can support the design loading for self-contained dwelling units (see section 6).

Durability — the systems will perform satisfactorily for the life of the flooring (see section 9).

The BBA has awarded this Agrément Certificate to the company named above for the systems described herein. These systems 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

Chris Hunt
Head of Approvals — Physics

Greg Cooper
Chief Executive

Date of First issue: 4 September 2009

Originally certified on 29 March 1999

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, Monarfloor 9, 18 and 22 Acoustic Deck Systems, 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 systems can meet this Requirement. See section 6 of this Certificate.
Requirement:	E1	Protection against sound from other parts of the building and adjoining buildings
Comment:		When installed on a suitable floor, the systems can contribute to satisfying these Regulations. See sections 5.1, 5.3 and 5.5 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The systems are acceptable. See section 9 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 systems can contribute to a construction satisfying this Regulation. See section 9 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards – construction
Standard:	1.1(a)(b)	Structure
Comment:		Floors incorporating these systems can satisfy this Standard, with reference to clause 1.1.1 ⁽¹⁾ . See section 6 of this Certificate.
Standard:	5.1	Resisting sound transmission to dwellings using appropriate constructions
Comment:		The systems can contribute to satisfying this Standard, with reference to clauses 5.1.1 ⁽¹⁾ , 5.1.2 ⁽¹⁾ and 5.1.12 ⁽¹⁾ . See sections 5.1, 5.2, 5.4 and 5.5 of this Certificate.
Regulation:	12	Building standards – conversions
Comment:		All comments given for these systems under Regulation 9, also apply to this Regulation, with reference to clause 0.12.1 ⁽¹⁾ and Schedule 6 ⁽¹⁾ . (1) Technical Handbook (Domestic).



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

Regulation:	B2	Fitness of materials and workmanship
Comment:		The systems are acceptable materials. See section 9 and the <i>Installation</i> part of this Certificate.
Regulation:	D1	Stability
Comment:		Floors incorporating these systems can meet this Regulation. See section 6 of this Certificate.
Regulation:	G2(2)	Separating walls and separating floors
Regulation:	G3(2)	Existing walls and floors which become separating walls and separating floors
Comment:		When installed on a suitable floor construction, the systems can contribute to satisfying these Regulations. See sections 5.1, 5.2 and 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 section: 1 *Description* (1.1).

Non-regulatory Information

NHBC Standards 2008

NHBC accepts the use of Monarfloor 9, 18 and 22 Acoustic Deck Systems, when installed and used in accordance with this Certificate, in relation to *NHBC Standards for Conversions and renovations, Clause C18 Upper floors*.

Zurich Building Guarantee Technical Manual 2007

In the opinion of the BBA, Monarfloor 9, 18 and 22 Acoustic Deck Systems, when installed and used in accordance with this Certificate, satisfy the requirements of the *Zurich Building Guarantee Technical Manual, Section 4 Superstructure, Sub-section Sound insulation*.

General

Monarfloor 9, 18 and 22 Acoustic Deck Systems are flooring overlays used for reducing impact and airborne sound transmission through separating floors in conversions and renovations of dwellings and flats.

Technical Specification

1 Description

1.1 Monarfloor 9, 18 and 22 Acoustic Deck Systems comprise a range of rigid tongue-and-groove boards laminated to polyurethane foam, type 2 (density 80 kgm^{-3}). See Table 1 for details of each system.

Table 1 Nominal characteristics

Material	Thickness (mm)	Board size (mm)	Overall depth (mm)	Weight per board (kg)
Monarfloor 9 moisture-resistant MDF polyurethane foam	9.0 8.0	1200 x 600	17	5.1
Monarfloor 18 moisture-resistant chipboard polyurethane foam	18.0 8.0	2400 x 600	26	22.2
Monarfloor 22 Deck moisture-resistant chipboard polyurethane foam	22.0 8.0	2400 x 600	30	26.9

1.2 The moisture-resistant, medium density fibreboard (MDF) and moisture-resistant V313 P5 chipboard satisfy the minimum relevant requirements of BS EN 622-1 : 2003 and BS EN 312 : 2003, respectively.

1.3 Ancillary materials include Monarfloor Acoustic Flanking Band, for use between skirting, flooring and around pipes, and Monarfloor Adhesive.

2 Delivery and site handling

2.1 The systems are delivered to site shrink-wrapped in polythene on pallets. The corners are reinforced and cardboard plates protect where straps run around the consignment. Details on installation procedures are also enclosed.

2.2 The systems must be stored flat, under cover, in dry, well ventilated conditions similar to those they may experience in service. The systems should be stored away from naked flames.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Monarfloor 9, 18 and 22 Acoustic Deck Systems.

Design Considerations

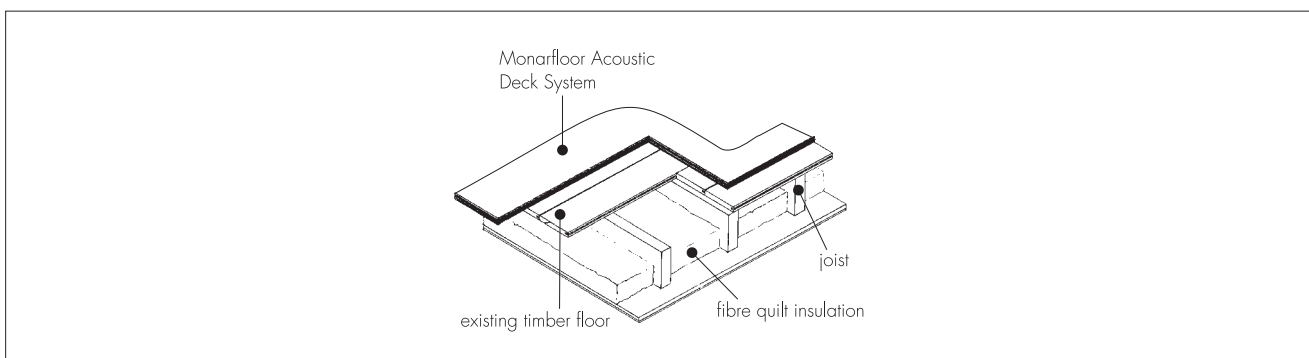
3 Use

3.1 Monarfloor 9, 18 and 22 Acoustic Deck Systems are used on existing sound, even based timber separating floors, to reduce airborne and impact sound transmission in conversions and renovations of dwellings and flats (see Figure 1).

3.2 The systems have not been assessed for use on exposed, semi-exposed and ground floors.

3.3 Mechanical fixings must not be used.

Figure 1 Monarfloor deck construction



4 Practicability of installation

The systems are designed to be installed by a competent general builder, or a contractor, experienced in these types of systems.

5 Acoustic performance



5.1 Test data to BS EN ISO 140-4 : 1998 and BS EN ISO 140-7 : 1998, calculated in accordance with BS EN ISO 717-1 : 1997 and BS EN ISO 717-2 : 1997 respectively, indicate that the timber separating floor constructions detailed in Table 2, incorporating any of the systems laid over an existing timber floor, can provide satisfactory airborne and impact sound insulation in conversions (see also Tables 3 and 4).

Table 2 Sound insulation (dB) — pre-completion test results

Construction	Airborne $D_{nT,w}$ (C:C _w)	Impact $L'_{nT,w}$ (C)
Monarfloor Deck 9 ⁽¹⁾	57 (-3: -9)	48(2)
Monarfloor Deck 18 ⁽¹⁾	58 (-3: -9)	49(1)
Monarfloor Deck 22 ⁽¹⁾	58 (-2: -8)	50(1)

(1) Monarfloor Deck laid on 18 mm tongue-and-groove chipboard on 200 mm x 50 mm timber joists at 300 mm centres. The ceiling consisted of two layers of 12.5 mm plasterboard finished with a 3 mm plaster skim fixed to resilient bars. The floor cavity contained 100 mm mineral wool RWA45.

Table 3 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

Table 4 Sound insulation (dB). Deemed to satisfy — Scotland and Northern Ireland

	Airborne $D_{nT,w}$	Impact $L'_{nT,w}$
<i>Scotland and Northern Ireland (new constructions)</i>		
Mean value	≥52	≤61
Individual value	≥48	≤65
<i>Northern Ireland (conversions)</i>		
Individual value	≥48	≤65



5.2 When undertaking conversions, improvements in airborne and impact sound insulation of separating floors can be achieved, with a construction as detailed in Figure 2, incorporating any of the systems (see Tables 4 and 5).

Figure 2 Section through floor used for impact and airborne sound insulation tests

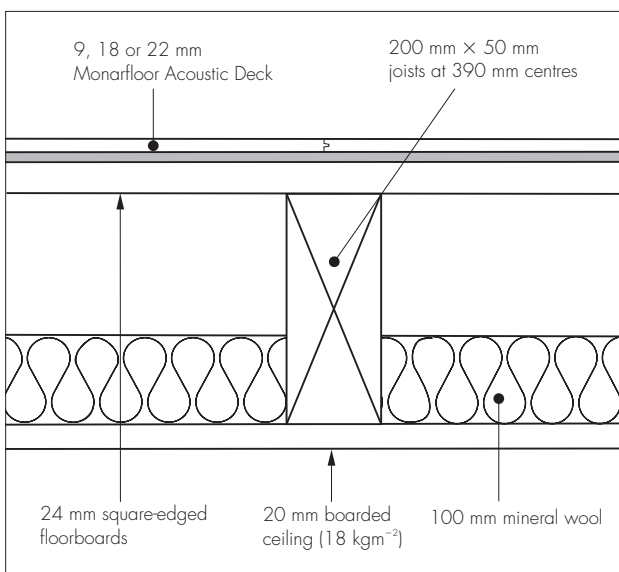


Table 5 Impact and airborne sound insulation (dB) for conversions only

Field test results ⁽¹⁾⁽²⁾⁽³⁾	$D_{nT,w}$ $L'_{nT,w}$		$D_{nT,w}$ $L'_{nT,w}$	
	(without cavity infill)		(with cavity infill)	
<i>Monarfloor Deck 9</i>				
Test room layout 3	49	62	51	61
Test room layout 4	51	60	54	62
<i>Monarfloor Deck 18</i>				
Test room layout 3	51	61	52	60
Test room layout 4	52	59	55	59
<i>Monarfloor Deck 22</i>				
Test room layout 3	53	60	53	58
Test room layout 4	51	62	55	59
Reference floor				
Test room layout 3	42	70	—	—
Test room layout 4	44	69	—	—

(1) See Figure 5 for room layouts (room layout 3 and 4 only).

(2) Flanking wall constructions — external and internal walls 215 mm brick with plasterboard finish (approximately 405 kgm⁻²).

(3) Product tested to BS 2750-4 : 1980 and BS 2750-7 : 1980.



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



5.4 Separating floors incorporating the systems may be subject to pre-completion testing to demonstrate satisfactory sound insulation in accordance with clause 5.1.12⁽¹⁾ and Annex 5C⁽¹⁾ if a verifier is not satisfied that a specific construction has not been built in accordance with the warrant and Mandatory Standard 5.1.



5.5 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 section 10 and in the relevant documents supporting the national Building Regulations:

England and Wales — Approved Document E

Scotland — Mandatory Standard 5.1, clauses 5.1.1⁽¹⁾, 5.1.2⁽¹⁾ and 5.1.12⁽¹⁾

(1) Technical Handbook (Domestic).

Northern Ireland — Technical Booklets G and G1.

5.6 When undertaking refurbishments, improvements in airborne and impact sound insulation can be achieved with constructions as detailed in sections 5.1 and 5.2.

6 Floor loading



The systems are suitable for occupancies defined in this Certificate (see section 3.1) and are capable of resisting a uniformly distributed load of < 1.5 kNm⁻² and a concentrated load of < 1.4 kN for category A1 and type A situations for domestic and residential activities as defined in NA to BS EN 1991-1-1 : 2002 Table NA.2 and BS 6399-1 : 1996, Table 1. The systems can support these design loads without undue deflection (4.5 mm maximum).

7 Properties in relation to fire

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

8 Maintenance

The systems have suitable durability (see section 9) and, therefore, maintenance is not required.

9 Durability



The systems will perform satisfactorily and provide sound insulation for the life of the flooring.

Installation

10 General

10.1 Installation of Monarfloor 9, 18 and 22 Acoustic Deck Systems should not commence until the building is weatherproof and wet trades complete and dried out.

10.2 Installation of the boards should be carried out in accordance with the Certificate holder's instructions.

10.3 The boards should be acclimatised to site conditions prior to fixing for a minimum of 24 hours.

10.4 Mechanical fixings must not be used.

10.5 Partitions must be built from the base floor surface and not the boards.

10.6 To minimise wastage, careful planning of the floor area is essential.

10.7 To minimise sound transmission paths through the floor assembly, and the flanking elements, the following points should be observed:

- junctions between the flanking elements and the sub-floor deck are suitably sealed
- junctions in cavity walls flanking the floor should be stopped
- junctions with internal non-loadbearing walls should be sealed
- junctions between ceiling and wall linings should be filled and taped
- service risers penetrating the floor should be fire collared, wrapped with quilt and boxed with two layers of suitable gypsum-based board
- the floor incorporates a minimum of 100 mm thick mineral fibre quilt in the cavity
- the ceiling comprises resilient bars, counter battens or independant ceiling with two layers of (not less than 30 mm overall) plasterboard with joints staggered between layers and filled/taped
- fixings or services must not bridge the resilient layers of the boards.

11 Procedure

11.1 An expansion gap between the flooring boards and the perimeter walls should be provided at the rate of 2 mm per metre run or a minimum of 10 mm, whichever is the greater.

11.2 Where there are long, uninterrupted lengths of floor, eg corridors, proprietary expansion joints should be installed at intervals on the basis of a 2 mm gap per metre run of board.

11.3 A protective layer should be laid immediately after boards are installed to protect the surface and prevent damage by any subsequent trades.

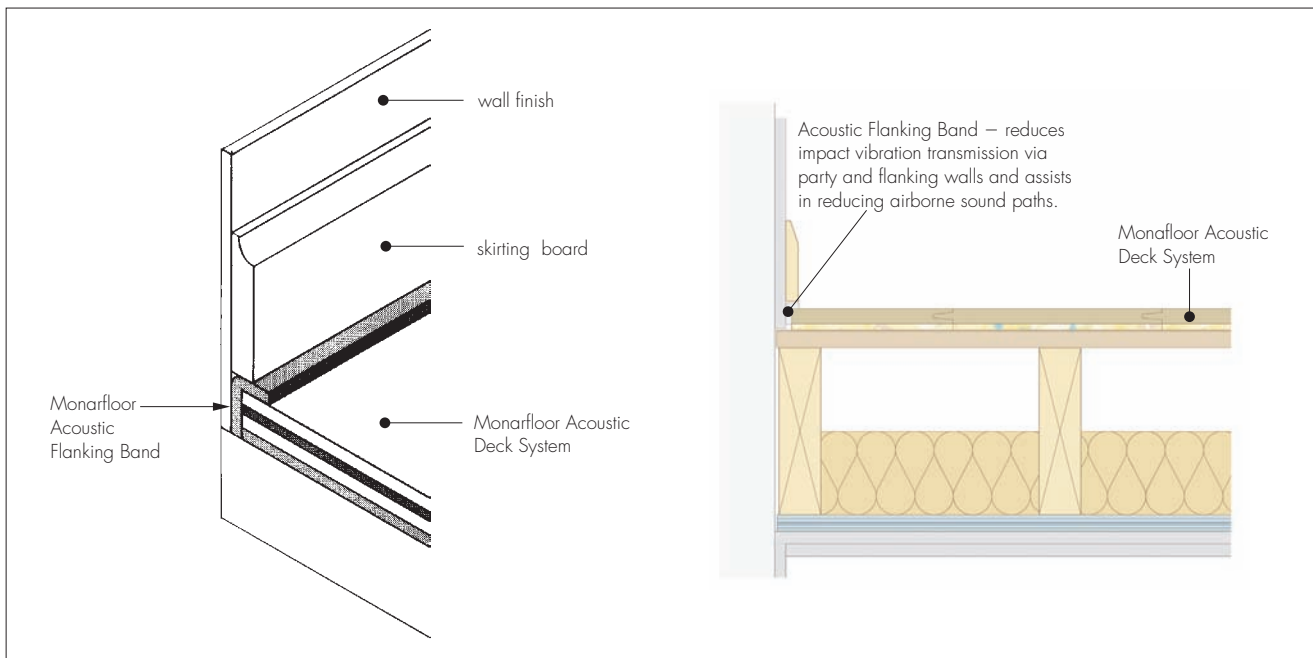
11.4 Where there is a likelihood of regular water spillage, in rooms such as kitchens, bathrooms, shower and utility rooms, protection should be considered, eg by the use of flexible vinyl sheet flooring with welded joints and cove skirtings.

11.5 When the boards are to be used as underlay for smooth floor finish, only fully flexible material, class A, to BS EN 649 : 1997 should be used. Plywood or hardboard of 6 mm thickness can be fixed over the top, using impact adhesive only, where a higher quality finish is specified or as a base for non-flexible floor finishes.

11.6 To ensure perimeter support and isolation of the flooring system, Monarfloor Acoustic Flanking Band should be used. The band is fixed to the wall and turned down onto the decking. The skirting board is fixed to the wall, securing the flanking band between the skirting and the deck.

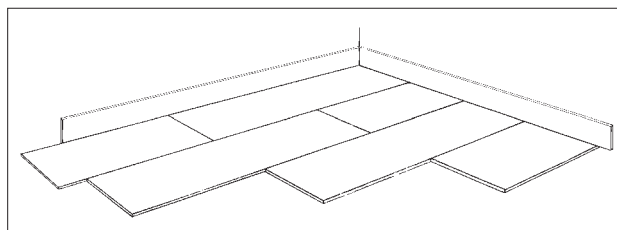
11.7 The boards are laid from the furthest point from the access to the installation area. The flanking band is folded to ensure it is positioned between the perimeter structure and the panel (see Figure 3)

Figure 3 Flanking strip installation



11.8 The boards must be laid in brick-bond pattern so that the cut-off from one board forms the beginning of the next panel to be fitted (see Figure 4).

Figure 4 Brick-bond pattern



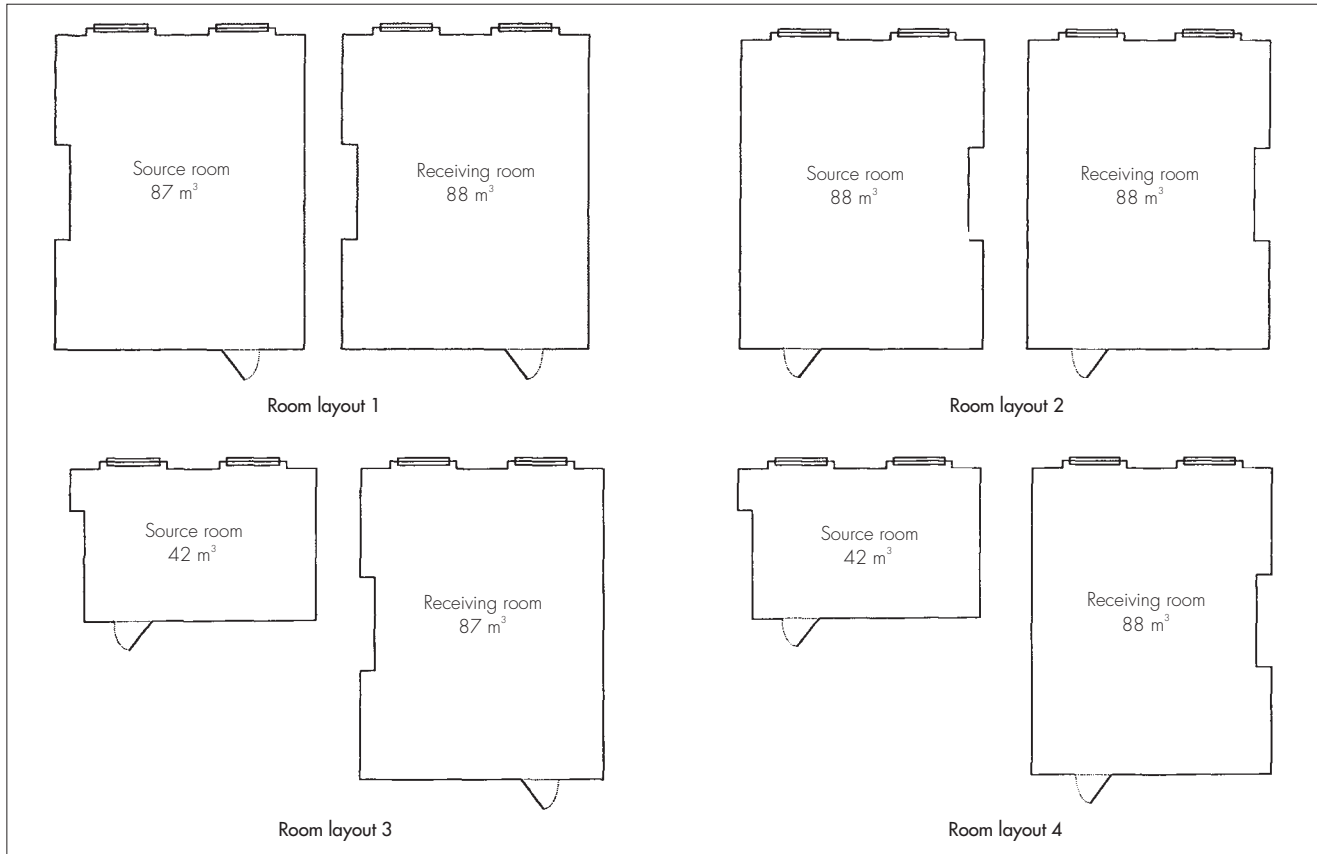
11.9 If required, small wedges can be placed between the acoustic decking and the walls. These must be removed before skirtings are fixed into position.

11.10 Monarfloor Adhesive is applied to the tongue-and-groove joints of the boards before butting them together.

12 Tests

12.1 Acoustic performance tests were carried out on Monarfloor 9, 18 and 22 Acoustic Deck Systems in the room layouts shown in Figure 5 and rated in accordance with BS 5821-1 : 1984 and BS 5821-2 : 1984 (see also Figure 2 and Table 5).

Figure 5 Room layouts



12.2 Tests were carried out on the boards to establish:

- resistance to long- and short-term loading
- hygrothermal behaviour
- dimensional accuracy
- creep under distributed load.

13 Investigations

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

13.2 An assessment was made of properties in relation to fire.

13.3 An assessment was made of data relating to practicability of installation.

13.4 The manufacturing process was assessed, including the methods adopted for quality control. Details were obtained of the quality and composition of the materials used.

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 5821-1 : 1984 *Methods for rating the sound insulation in buildings and of building elements — Method for rating the airborne sound insulation in buildings and of interior building elements*

BS 5821-2 : 1984 *Methods for rating the sound insulation in buildings and of building elements — Method for rating the impact sound insulation*

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

BS EN 312 : 2003 *Particleboards — Specifications*

BS EN 622-1 : 2003 *Fibreboards — Specification — General requirements*

BS EN 649 : 1997 *Code of practice for installation of resilient floor coverings*

BS EN 1991-1-1 : 2002 *UK National Annex to Eurocode 1 : Actions on structures — General actions— Densities, self-weight, imposed loads for buildings*

BS EN ISO 140-4 : 1998 *Acoustics — Measurement of sound insulation in buildings and of building elements — Field measurements of airborne sound insulation between rooms*

BS EN ISO 140-7 : 1998 *Acoustics — Measurement of sound insulation in buildings and of building elements — Field measurements of impact sound insulation of floors*

BS EN ISO 717-1 : 1997 *Acoustics — Rating of sound insulation in buildings and of building elements — Airborne sound insulation*

BS EN ISO 717-2 : 1997 *Acoustics — Rating of sound insulation in buildings and of building elements — Impact sound insulation*

Conditions of Certification

14 Conditions

14.1 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.

14.2 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.

14.3 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.

14.4 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.

14.5 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.