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Agrément Certificate

99/3600

Product Sheet 3

MONARFLOOR ACOUSTIC SYSTEMS

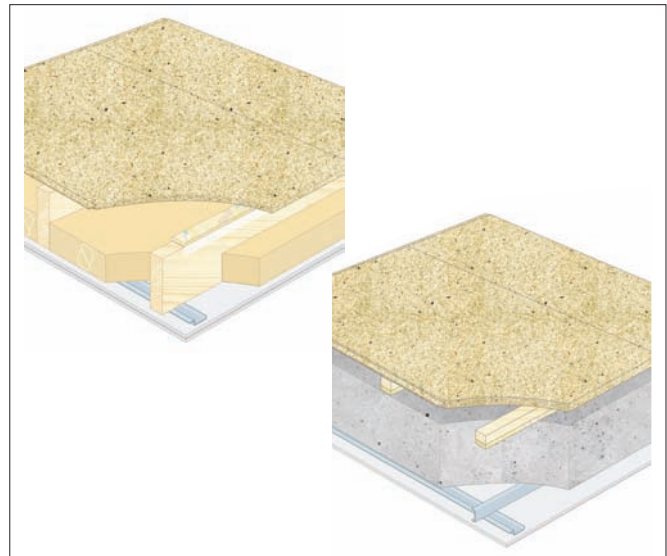
MONARFLOOR ACOUSTIC BATTEN AND MONARFLOOR ACOUSTIC STRIP

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Monarfloor Acoustic Batten and Monarfloor Acoustic Strip. The acoustic batten is for use in new dwellings or flats and the acoustic strip is for use in conversions and renovations of dwellings for the purpose of reducing sound transmission through separating floors.

THIS CERTIFICATE INCLUDES:

- factors relating to compliance with UK 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 products can be used to improve sound insulation in separating floors (see section 5).

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

Durability — the products 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 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

Chris Hunt
Head of Approvals — Physics

Greg Cooper
Chief Executive

Date of First issue: 4 September 2009

Originally certificated 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 Acoustic Batten and Monarfloor Acoustic Strip, 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 sections 6.1 and 6.2 of this Certificate.
Requirement:	E1	Protection against sound from other parts of the building and adjoining buildings
Comment:		When installed on a suitable floor, these products can contribute to satisfying this Requirement. See sections 5.2, 5.4 to 5.6 and 5.8 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		These products 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:		These products 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 products can satisfy this Standard, with reference to clause 1.1.1 ⁽¹⁾ . See sections 6.1 and 6.2 of this Certificate.
Standard:	5.1	Resisting sound transmission to dwellings using appropriate constructions
Comment:		These products 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 5.2 to 5.5, 5.7 and 5.8 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⁾ and Schedule 6 ⁽¹⁾ . (1) Technical Handbook (Domestic).



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

Regulation:	B2	Fitness of materials and workmanship
Comment:		These products are acceptable materials. See section 9 and the <i>Installation</i> part of this Certificate.
Regulation:	D1	Stability
Comment:		Floors incorporating these products can meet this Regulation. See sections 6.1 and 6.2 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, these products can contribute to satisfying these Regulations. See sections 5.2 to 5.5 and 5.8 of this Certificate.

Construction (Design and Management) Regulations 2007

Construction (Design and Management) Regulations (Northern Ireland) 2007

In the opinion of the BBA there is no information in this Certificate which relates to the obligations of the client, CDM co-ordinator, designer and contractors under these Regulations.

Non-regulatory Information

NHBC Standards 2008

NHBC accepts the use of Monarfloor Acoustic Batten and Monarfloor Strip, when installed and used in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 8.3 *Floor finishes* and *Conversions and renovations*, clause C18 *Upper floors* respectively.

Zurich Building Guarantee Technical Manual 2007

In the opinion of the BBA, Monarfloor Acoustic Batten and Monarfloor Strip, 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

This Certificate relates to Monarfloor Acoustic Batten and Monarfloor Acoustic Strip. The acoustic batten is for use in new dwellings or flats and the acoustic strip is for use in conversions and renovations of dwellings for the purpose of reducing sound transmission through separating floors.

Technical Specification

1 Description

1.1 Monarfloor Acoustic Batten comprises a softwood batten with a 15 mm layer of polyurethane foam, type 3 (density 96 kgm^{-3}). See Figure 1.

1.2 Monarfloor Acoustic Strip is a composite strip system comprising 6 mm thick plywood strip adhesively fixed to a 15 mm or 20 mm polyurethane foam layer type 2 and all fixed to a 0.6 mm non-woven fabric without facings (see Figure 2). The polyurethane layer has a minimum density of 96 kgm^{-3} and 80 kgm^{-3} respectively.

Figure 1 Monarfloor Acoustic Batten

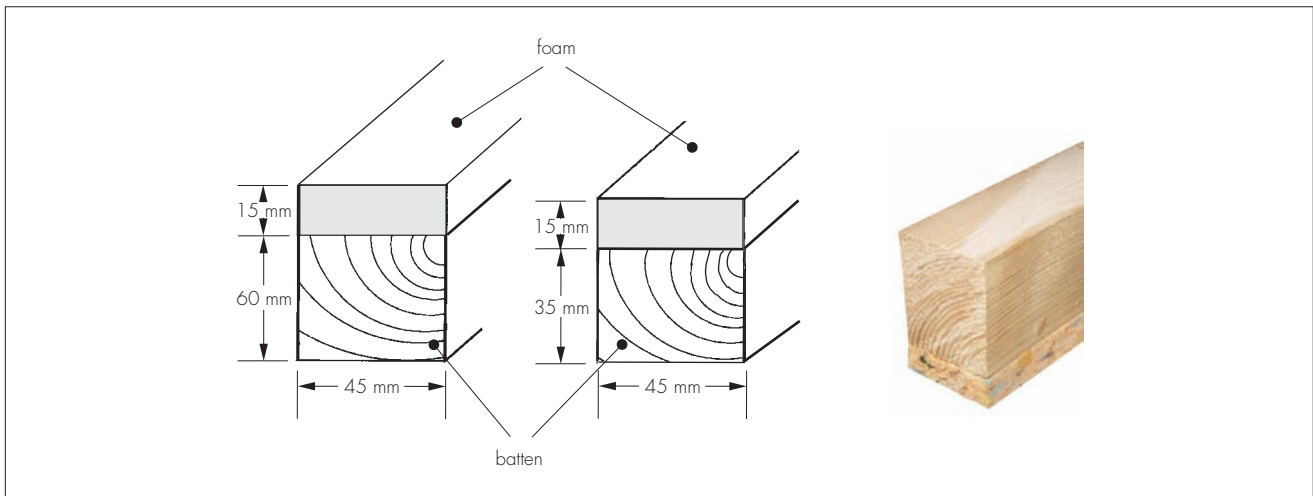
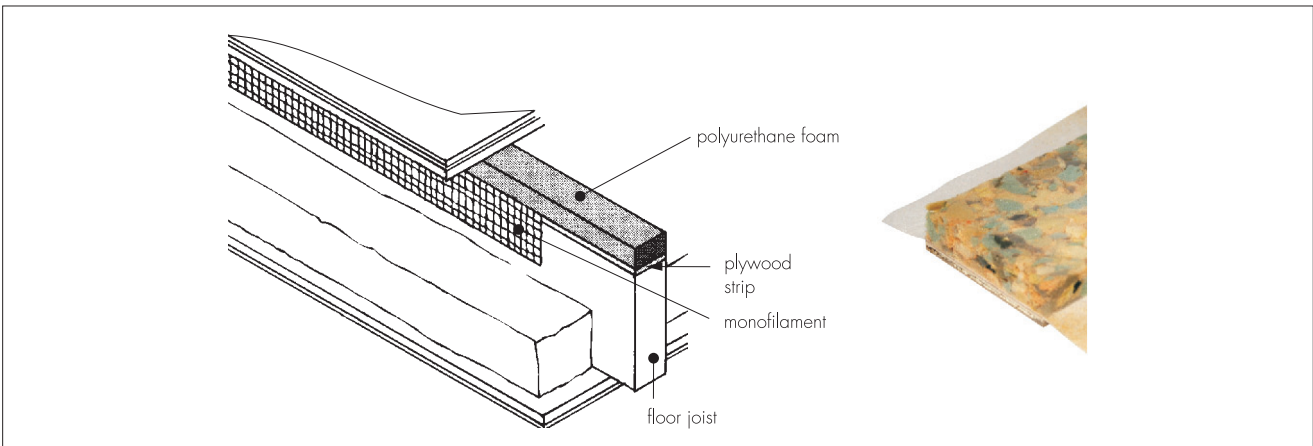


Figure 2 Monarfloor Acoustic Strip



1.3 The products are available in the sizes given in Table 1.

Table 1 Dimensions

	Length (m)	Thickness (mm) (including foam)	Width (mm)
Monarfloor Acoustic Batten	1.8	75	45
	1.8	50	45
Monarfloor Acoustic Strip	2.4	26	45 or 75
	2.4	21	45 or 75

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

2 Delivery and site handling

- 2.1 The battens are shrink-wrapped in polythene, and then boxed or palletted depending on the quantity. Details on installation procedures are also enclosed.
- 2.2 The acoustic strips are palletted and shrink-wrapped and details of installation procedures are also enclosed.
- 2.3 The products must be stored under cover, in dry, well-ventilated conditions, preferably similar to those experienced in service. The products 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 Acoustic Batten and Monarfloor Acoustic Strip.

Design Considerations

3 Use

- 3.1 Monarfloor Acoustic Batten is satisfactory for use in new dwellings or flats on sound, even bases of:
- concrete slab
 - concrete beams with infill blocks.
- 3.2 Monarfloor Acoustic Strip is satisfactory for use in conversions and renovations of dwellings on joisted timber floors.
- 3.3 The products follow the broad contours of the base and the batten system creates a void for underfloor services. They have not been assessed for use on exposed, semi-exposed and ground floors.
- 3.4 The acoustic batten and acoustic strip, with a chipboard overlay on suitable floor bases, provides impact and airborne sound insulation. To further improve resistance to airborne sound transmission, 19 mm plasterboard can be installed on the acoustic strip prior to the laying of a chipboard overlay.
- 3.5 The products are for use with suitable overlays of chipboard types P5 and P7 to BS EN 312 : 2003.
- 3.6 Mechanical fixings must not be used with Monarfloor Acoustic Battens.

4 Practicability of installation

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

5 Acoustic performance

5.1 The products, when used in conjunction with suitable floor bases, can enable a floor to provide satisfactory impact and airborne sound insulation.


 5.2 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 separating floor construction detailed in Table 2, incorporating Monarfloor Acoustic Strips, can provide satisfactory impact sound insulation in conversions (see also Tables 3 and 4).

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

Construction	Airborne $D_{nT,w}(C:C_b)$	Impact $L'_{nT,w}(C_I)$
22 mm tongue-and-groove chipboard on Monarfloor Acoustic Systems Acoustic Strip 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	57 (-3: -9)	48(2)

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



5.3 When undertaking conversions, improvements in airborne and impact sound insulation of floors can be achieved with a construction as details in Figure 3 incorporating Monarfloor Acoustic Strip with 20 mm foam (also see Tables 4 and 5)

Figure 3 Timber-ribbed floor construction with absorbent layer

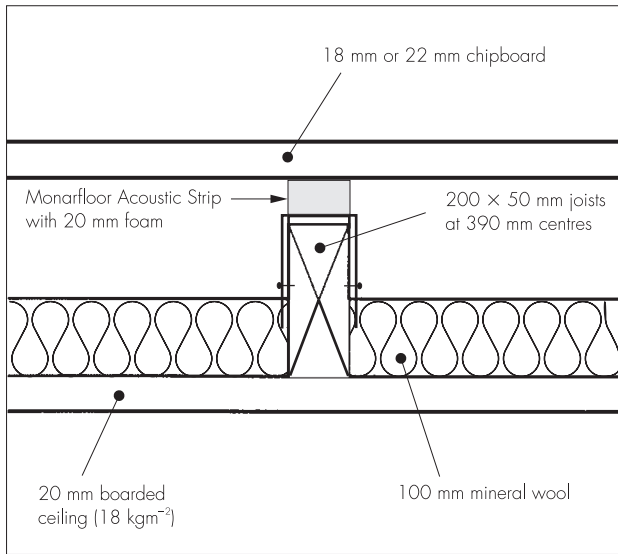


Table 5 Airborne and impact sound insulation of Monarfloor Acoustic Strip with 20 mm foam (dB)⁽¹⁾ for conversions only

Field test results	$D_{nT,w}^{(2)}$	$L'_{nT,w}$
18 mm chipboard with acoustic strip		
Test room layout 1	52	55
Test room layout 2	51	54
22 mm chipboard with acoustic strip		
Test room layout 1	52	53
Test room layout 2	52	52
Test room layout 3	55	52
Test room layout 4	56	52
Reference floor (no acoustic strip)		
Test room layout 1	38	72
Test room layout 2	37	70
Test room layout 3	42	70
Test room layout 4	44	69

(1) See Figure 7 for room layouts.

(2) Flanking wall construction — 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.



5.4 Satisfactory airborne and impact sound insulation of floors can be achieved with a construction as detailed in Table 6 incorporating the acoustic batten when used with suitable flanking elements (see Tables 3, 4 and 6).

Table 6 Sound insulation (dB) — Laboratory test results⁽¹⁾

Construction	$R_w(C : Ctr)$	$L_{n,w}$
concrete base floor only (300 kgm ⁻²)	52 (-1; -5)	77
concrete base floor (300 kgm ⁻²) incorporating 50 mm Monofloor Acoustic Batten with 15 mm polyurethane foam ⁽²⁾	57 (-2; -8)	57

(1) Tests to BS EN ISO 140-3 : 1995 and BS EN ISO 140-6 : 1998.

(2) At 400 mm centres. Walking surface comprised 18 mm thick tongue and groove chipboard screw fixed to battens at nominally 300 mm centres.

5.5 For concrete floor bases of the type listed in section 3.1, these measures include fully grouted joints (particularly beam and block flooring), no air paths and a minimum mass of 300 kgm⁻².



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



5.7 Separating floors incorporating the products may be subject to pre-completion testing to demonstrate satisfactory sound insulation in accordance with clauses 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.

(1) Technical Handbook (Domestic).



5.8 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 sections 11, 12 and 13 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.

5.9 When undertaking refurbishments, improvements in airborne and impact sound insulation can be achieved with constructions as detailed in sections 5.2 and 5.3.

6 Floor loading



6.1 The products are suitable for occupancies defined in this Certificate (see sections 3.1 and 3.2) when covered with a suitable floor covering and are capable of resisting a uniformly distributed load of $< 1.5 \text{ kNm}^{-2}$ and a concentrated load of $< 1.4 \text{ kN}$ 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.

6.2 Floorings, with either of the following features, installed in accordance with sections 11 and 12, can support these design loadings without undue deflection⁽¹⁾:

- acoustic battens at maximum 400 mm centres for 18 mm chipboard or maximum 500 mm centres for 22 mm chipboard, and if required, perimeter battens, or
- acoustic strip attached to floor joists.

(1) Acoustic batten and acoustic strip with 15 mm foam — 9 mm maximum. Acoustic strip with 20 mm foam — 6 mm maximum.

6.3 Acoustic batten spacing closer than that recommended in BS 8201 : 1987 and/or support battens may be necessary where heavy items such as washing machines and freezers are to be located.

6.4 Where the acoustic battens are used under lightweight non-loadbearing partitions it is essential that double rows are used or a ladder layout directly below the partition. If in doubt the advice of the Certificate holder should be sought.

6.5 Under normal traffic loading the systems are slightly resilient due to compression of the foam layer.

7 Underfloor services

7.1 The acoustic battens and acoustic strips have not been assessed for use with underfloor heating systems.

7.2 Water pipes present in any void formed by the system must be lagged.

7.3 The position of services under the batten floor system must be designed to ensure adequate space for the perimeter batten to be placed approximately 50 mm from the wall.

7.4 If the short ends of the flooring fall between the line of battens, an appropriate length of the batten should be placed to support the joint.

7.5 Where access is required to services under the floor for maintenance purposes, access panels should be provided. These should be appropriately supported.

8 Maintenance

As the products are contained within a floor structure and it has suitable durability (see section 9), maintenance is not required.

9 Durability



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

Installation

10 General

10.1 Installation of Monarfloor Acoustic Batten and Monarfloor Acoustic Strip should not commence until the building is weatherproof and wet trades complete and dried out.

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

10.3 In the immediate area of toilet pan bases and other features with rigid plumbing connections, the foam should be removed from the acoustic battens and replaced by timber. In the case of acoustic strips on the joists, this should also be removed and replaced with timber. This is to ensure that any flexing of the floor does not affect these connections.

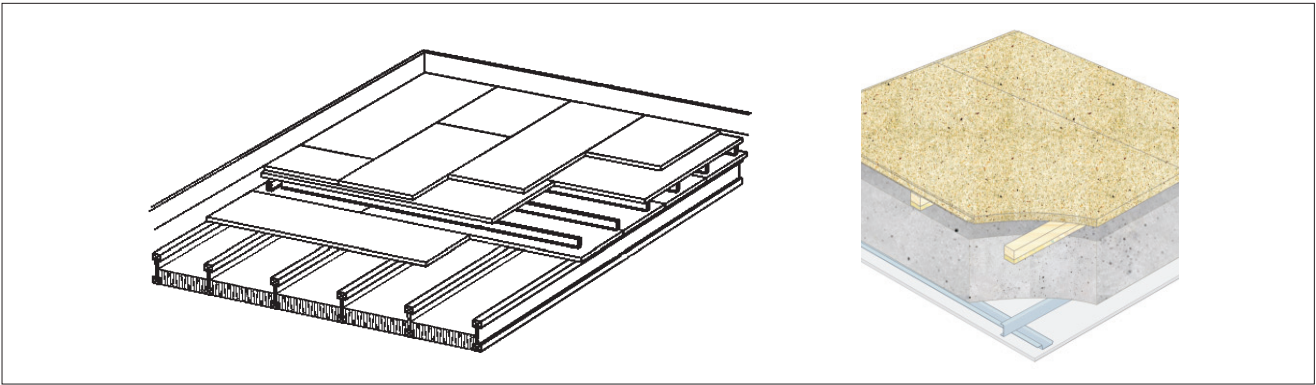
10.4 Flexible connected appliances such as washing machines are not affected.

11 Fixing and placing of acoustic battens

11.1 Battens should be installed foam side down without the use of mechanical fixings and laid in accordance with BS 8201 : 1987 (see Figure 5). The localised surface finish of a concrete or screed base should not exceed $\pm 3 \text{ mm}$ from the mean when measures over a 3 m distance using a straight edge.

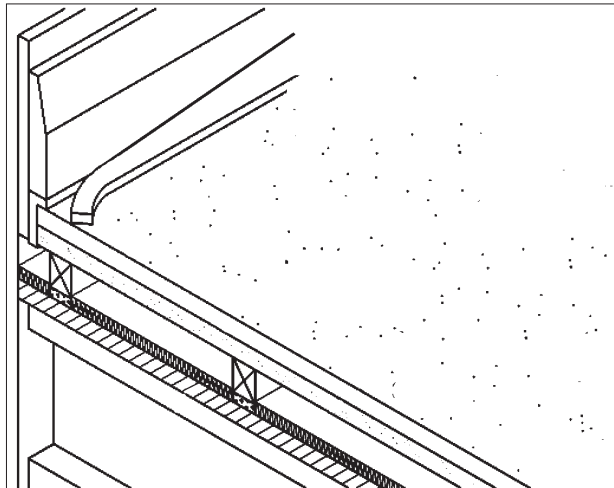
11.2 Batten spacing should be at maximum 400 mm or maximum 500 mm centres when using 18 mm or 22 mm type P5 wood chipboard respectively.

Figure 5 Batten layout



11.3 A gap of approximately 50 mm should be left between the wall and the acoustic batten around the perimeter of the room. To allow for expansion of the flooring system, a space of no less than 10 mm should be allowed between the edge of the floor perimeter and wall or abutment. Monarfloor Acoustic Flanking Band should be used at all perimeters to isolate the floor from wall structures and door frames (see Figure 6).

Figure 6 Installation detail of flanking band



11.4 Where the floor surface does not achieve the permissible deviations defined in section 11.1, as a limited measure, isolating packing strips can be placed under the acoustic battens to stabilise the floor where necessary. If packing is used, it should be secured to the batten with a suitable adhesive. Minor irregularities may be levelled with mortar.

11.5 For floors exceeding 150 m², or where the camber is greater than 20 mm, advice should be sought from the Certificate holder.

11.6 Where pipes/services obstruct the normal batten spacing, the battens should be cut through and placed either side of the obstruction, leaving a gap, or placing Monarfloor Acoustic Flanking Band around it. Care should be taken not to allow service pipes to touch the batten system. Services should be isolated with flanking band to prevent contact with the flooring panel.

11.7 For floors supporting heavy loads and in areas such as doorways additional support battens should be used and other battens spaced more closely (see section 6.4). When the chosen floor boards fall between a line of battens a selected length of acoustic batten should be placed immediately under the joint and glued in the same way as the rest of the system.

12 Fixing of acoustic strip

12.1 Prior to installation, all timber joists must be clear of nails and screws to avoid damage to the acoustic strip. The ceiling should be fixed to the underside of the joists before commencing work on the floor.

12.2 The acoustic strip is laid foam side up on the joists with the reinforced fixing flaps nailed or stapled to the joists' sides (see Figure 2).

12.3 Monarfloor Acoustic Flanking Band should be used around the perimeter of the room and adhered to the wall and pulled down over the floor so that the skirting board rests on the flanking band. The excess is trimmed flush to the skirting (see Figure 6).

13 Flooring

13.1 Monarfloor Adhesive is applied across the top of the foam on the acoustic batten or acoustic strip and the flooring is placed on top of the adhesive covered foam strip. All tongues along the edges of the panels should be glued before being butted together. Surplus adhesive should be removed from the surface with a damp cloth before it dries.

13.2 The ends of the batten in one row must be at least 150 mm from the ends of the battens in the adjoining row.

13.3 When fitting up to skirting or wall, boarding must not touch any part of the wall and a gap must be allowed for sealing with flanking band.

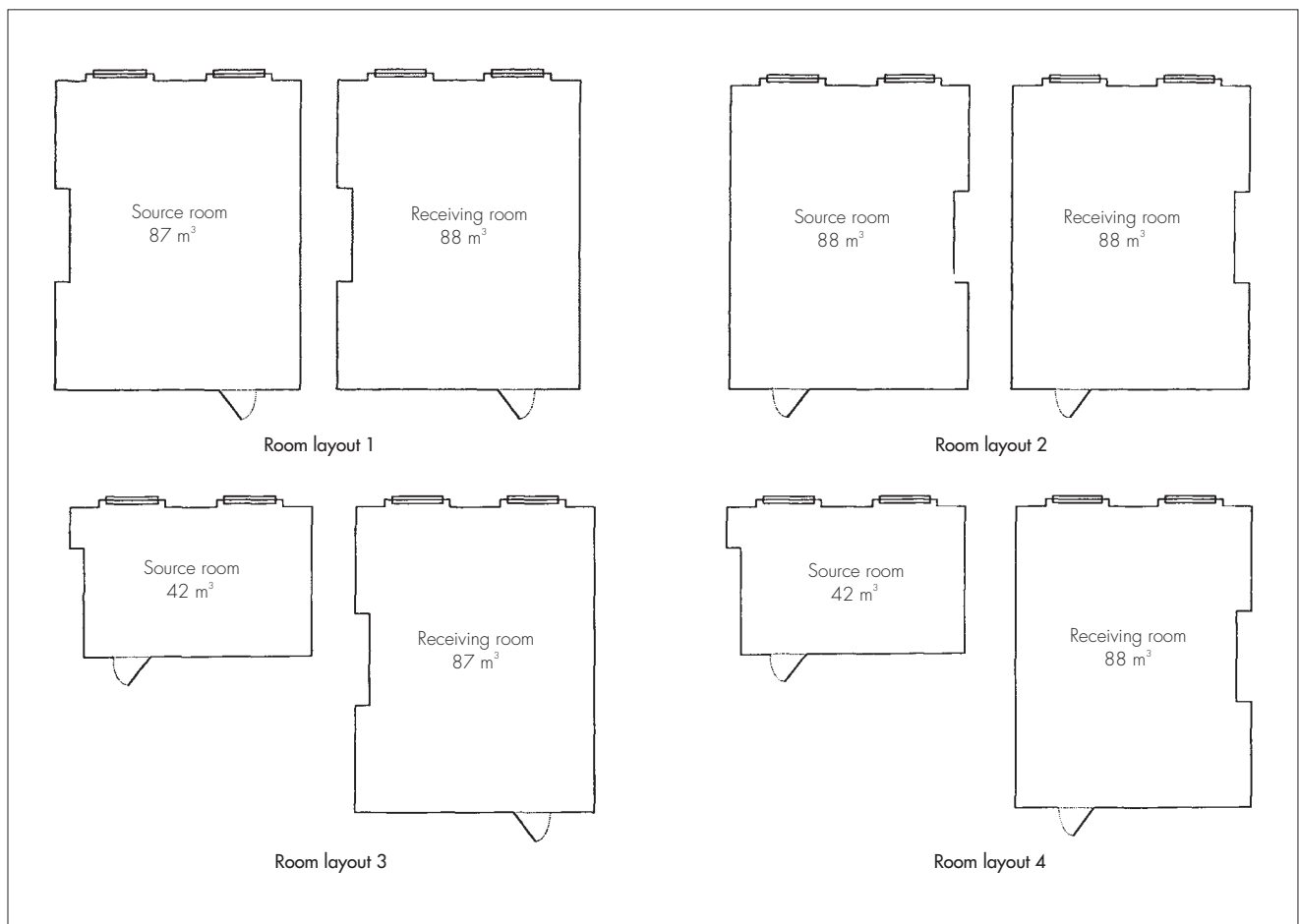
13.4 The skirting should be fixed to the wall on top of the flanking band, which should be trimmed once skirtings are in place. The flanking band should also be placed between the bottom of the door frame and finished floor.

Technical Investigations

14 Tests

14.1 Acoustic performance tests were carried out on Monarfloor Acoustic Batten and Monarfloor Acoustic Strip in the room layouts shown in Figure 7 and the results were evaluated in accordance with BS 2750-4 : 1980, BS 2750-7 : 1980, BS 5821-1 : 1984 and BS 5821-2 : 1984 (see also Figure 3 and Table 5).

Figure 7 Room layouts



14.2 Hygrothermal movement deflection under distributed load deflection under concentrated load creep under distributed load.

15 Investigations

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

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

15.3 An assessment was made of data relating to practicability of installation and acoustic data reports.

15.4 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 8201 : 1987 *Code of practice for flooring of timber, timber products and wood based panel products*
- BS EN 312 : 2003 *Particle boards — Specifications*
- 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 140-3 : 1995 *Acoustics — Measurement of sound insulation in buildings and of building elements — Laboratory measurement of airborne sound insulation of building elements*
- 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 140-6 : 1998 *Acoustics — Measurement of sound insulation in buildings and of building elements — Laboratory measurements of impact sound insulation of floors*
- 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*

16 Conditions

16.1 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.

16.2 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.

16.3 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.

16.4 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.

16.5 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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