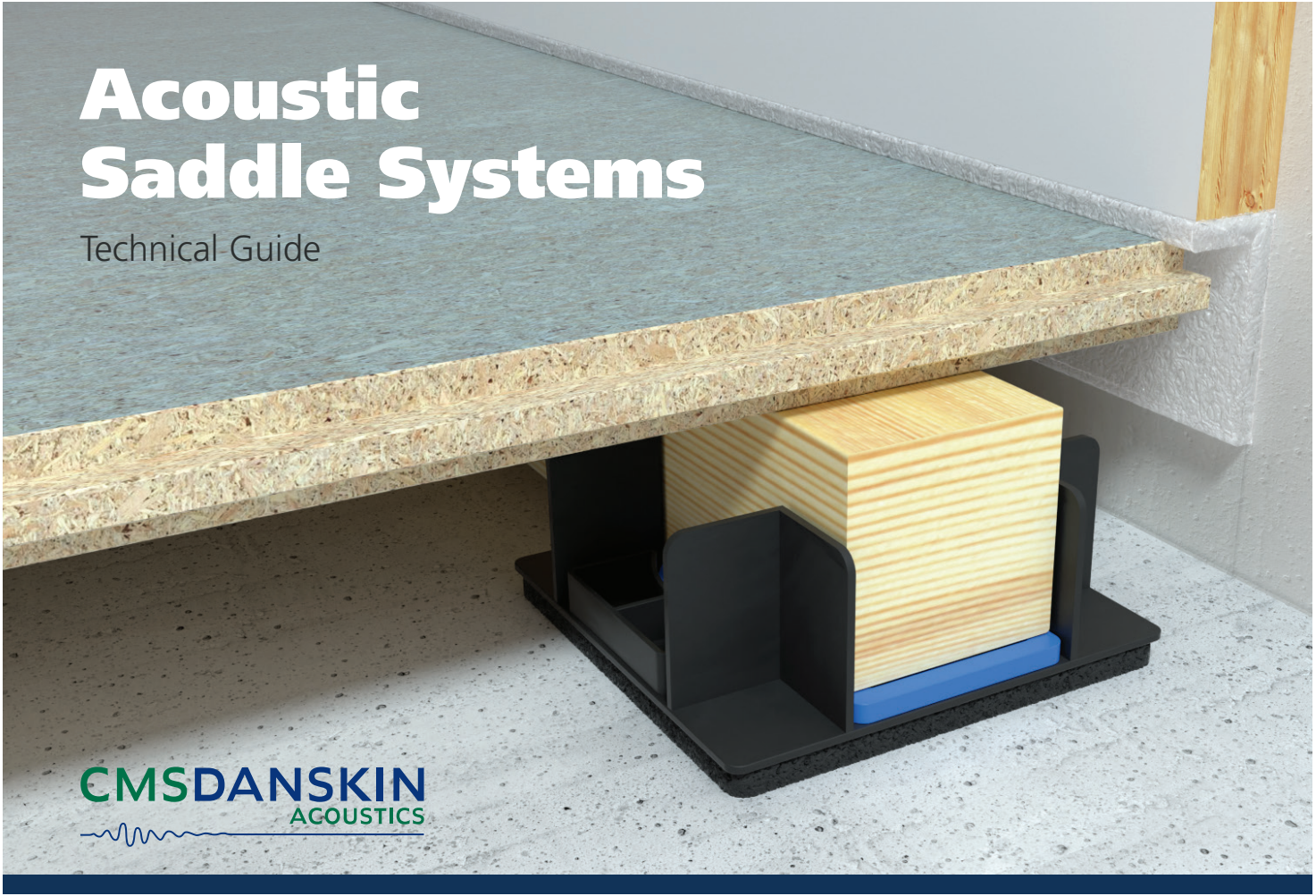
Acoustic Saddle Systems

Technical Guide



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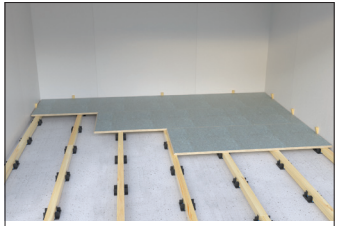
Acoustic Saddle Systems

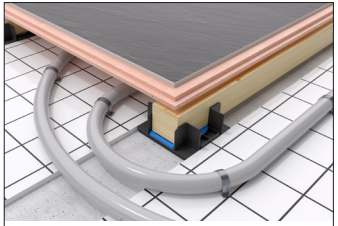
Adaptable acoustic solutions for uneven subfloors

CMS Danskin Acoustics` Saddle Systems can be laid on a wide variety of base floors to provide floating floors with excellent impact and airborne sound insulation. They create a void for services and where necessary can level uneven subfloors. Compatible sub-floor types include cast in-situ concrete, pre-cast concrete and steel-concrete composite decks. The systems qualify for many Robust Detail applications and, when used in a suitable floor and ceiling construction, have successfully demonstrated compliance with the acoustic requirements of Building Regulations in pre completion site tests (PCT) on many hundreds of projects across the UK.

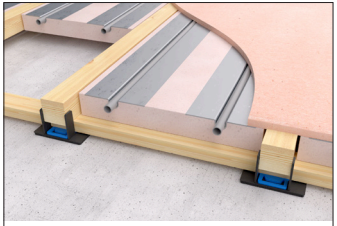


Acoustic Saddle System
Acoustic floor levelling system for floor voids up to 200mm (p5)

Pedestal Saddles
for voids over 200mm (p11)



Smartspan Flooring
For stone tiles or underfloor heating (p15)



Thermal saddles
For insulation or underfloor heating (p13)

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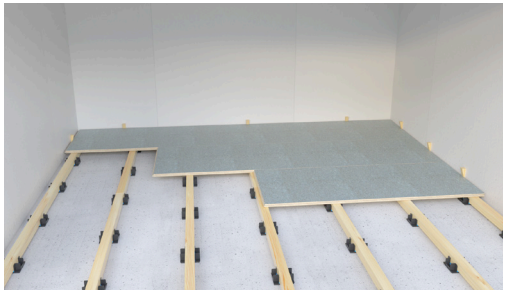
Benefits of Acoustic Saddle Systems

Sound reduction and levelling for separating floors

- Cost effective, lightweight solution
- Eliminate the delays caused by screeds
- Easy levelling of uneven subfloors
- Effective impact and airborne sound reduction for separating floors
- Creates a void for services or underfloor heating
- Can meet the FFT 2 accreditation requirements for Robust Details and Scottish Example Constructions
- Suitable for both new build and refurbishment

IMPORTANT FEATURES



Due to their spanning function timber support bearers must be strength graded at the finished size - not just cut from larger graded sections. (Timber Research and Development Association guidance) All Saddle system softwood bearers are C16 strength graded and FSC certified. Laminated softwood with defined strength capabilities is used for sections where support bearer sizes fall below grading limits.

To properly support flooring boards the WPIF Code of Practice for Particleboard Flooring requires a minimum support bearer width of 45mm (finished size). All CMS Danskin Acoustics Support Bearers are at least 45mm wide (finished size).

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Environment

CMS Danskin Acoustics work continuously with our supply chain to provide the best possible products with minimum environmental impact.

Please note: CMS Danskin Acoustics do not offer a waste collection service.

Saddles

The plastic in the injection moulded components in the Saddle System is manufactured from 100% recycled post production waste. The sources are consistent and of high quality. Saddles are manufactured from ABS and end of product life ABS is capable of being recycled.

Resilient Layer

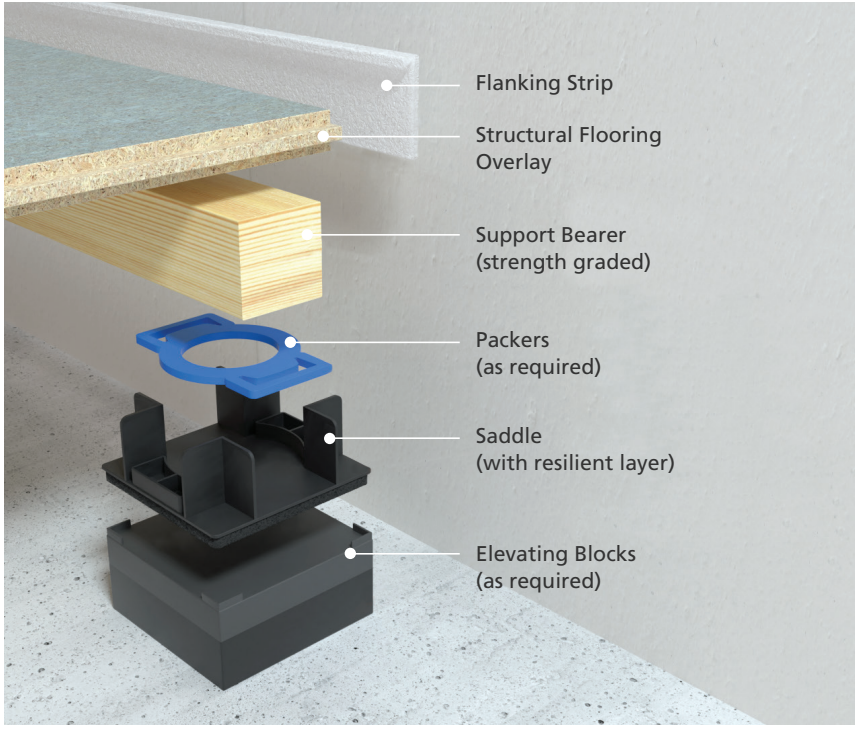
The resilient layer on CMS Danskin Acoustic`s Saddles has a zero Global Warming Potential (GWP) and Zero Ozone Depletion Potential (ODP). The material is capable of being recycled.

Support Bearers

The Support Bearers in the Saddle System are sourced from sustainable well managed forests. They are FSC certified as standard with PEFC available on request.

Standard Saddle System

The Standard Saddle System uses structural flooring boards, C16 strength graded timber Support Bearers and Saddles with an integral acoustic resilient layer to construct a floating floor on top of a base floor. This basic system without packing should be able to fit between the highest point of the base floor and the desired finished floor level. Packers and, where necessary Elevating Blocks, are then used to level out areas below the high point. Flanking strips are used to prevent sound passing into the structure at the perimeter of the floor.



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Standard Saddle System

Saddle systems can be designed using the following stock components:

Saddles with Resilient Layer

Small (8mm x 97mm x 97mm with 19mm upstands)
Medium (8mm x 97mm x 97mm with 33mm upstands)
Large (8mm x 97mm x 97mm with 55mm adapted upstands)

Support Bearers

Laminated Softwood (LVL) 22mm x 45mm x 2400mm
C16 Strength Graded Softwood 37mm x 47mm x 2400mm
C16 Strength Graded Softwood 45mm x 45mm x 2400mm
C16 Strength Graded Softwood 61mm x 45mm x 2400mm

Flanking Strip

6mm 'L' Shaped Flanking Strip (1800mm lengths)

Packing

2mm, 3mm & 5mm packers
15mm & 30mm Elevating Blocks

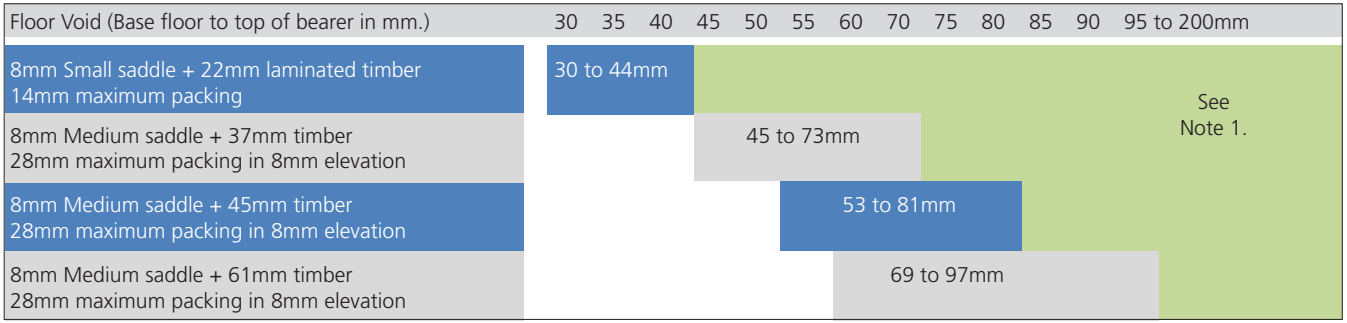
Flooring Boards

18mm chipboard 2400mm x 600mm T&G4
22mm chipboard 2400mm x 600mm T&G4
18mm Engineered Ply 2400mm x 600mm T&G4
22mm Engineered Ply 2400mm x 600mm T&G4
18mm Smartspan 1200mm x 600mm T&G4
25mm Smartspan 1200mm x 600mm T&G4
28mm Smartspan 1200mm x 600mm T&G4

Please note: Non standard timber sections are available to order.
LVL = laminated veneered lumber

Height Ranges

The table below sets out the range of floor void depths which can be achieved using different Support Bearers in the Saddle System. To calculate the full height of the system please add the thickness of the preferred floor boarding.



Note 1: The use of packers and elevating blocks can increase the void height of the standard Saddle

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Acoustic Saddle Systems

For each standard Support Bearer size the maximum centres at which Support Bearers and Saddles can be spaced are set out below. This information must be read in combination with any specific project guidance and the detailed installation guidelines. The centres are applicable to any of the following load conditions as defined by NA BS to EN 1991-1-1 UK National Annex to Eurocode 1, Part 1-1: General Actions - Densities, self-weight, imposed loads for buildings:

A1 : Self contained dwellings / Student accommodation — UDL 1.5kN/m^2, Concentrated Load 2.0 kN
A3 : Bedrooms in hotels and motels — UDL 2.0kN/m^2, Concentrated Load 2.0 kN
A6 : Communal Areas in blocks of flats — UDL 3.0 kN/m^2, Concentrated Load 2.0 kN

Support Bearer - CMS Danskin Laminated Softwood LVL 22mm high x 45mm x 2400mm		
FLooring Board Type	Maximum Bearer Centres (mm)	Maximum Saddle Centres (mm)
18mm chipboard T&G4	400	400
22mm chipboard T&G4	400	400
18mm Engineered Plywood T&G4	400	400
22mm Engineered Plywood T&G4	400	400
18mm Smartspan	400	400
25mm Smartspan	400	400

Support Bearer - Scandinavian Softwood Kiln Dried C16 45mm high x 45mm x 2400mm		
FLooring Board Type	Maximum Bearer Centres (mm)	Maximum Saddle Centres (mm)
18mm chipboard T&G4	400	600
22mm chipboard T&G4	600	600
18mm Engineered Plywood T&G4	400	600
22mm Engineered Plywood T&G4	600	600
18mm Smartspan	400	600
25mm Smartspan	600	600

Support Bearer - Scandinavian softwood Kiln dried C16 37mm high x 47mm x 1800mm		
FLooring Board Type	Maximum Bearer Centres (mm)	Maximum Saddle Centres (mm)
18mm chipboard T&G4	400	450
22mm chipboard T&G4	600	450
18mm Engineered Plywood T&G4	400	450
22mm Engineered Plywood T&G4	600	450
18mm Smartspan	400	450
25mm Smartspan	600	450

Support Bearer - Scandinavian Softwood Kiln Dried C16 61mm high x 45mm x 2400mm		
FLooring Board Type	Maximum Bearer Centres (mm)	Maximum Saddle Centres (mm)
18mm chipboard T&G4	400	600
22mm chipboard T&G4	600	600
18mm Engineered Plywood T&G4	400	600
22mm Engineered Plywood T&G4	600	600
18mm Smartspan	400	600
25mm Smartspan	600	600

Extract from Structural Engineer`s report: PM Law Design report reference 184-1901 November 2019

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Acoustic Performance

The sound insulation of party floors is a necessary requirement of the Building Regulations. Methods of satisfying the Regulations are set out in Approved Document E in England & Wales, Section 5 of the Technical Handbook in Scotland and Technical Booklet G in Northern Ireland. The CMS Danskin Acoustics Saddle System contributes significantly to the reduction of impact and airborne sound through party floors. When used with appropriate structural floor and ceiling constructions it has been demonstrated to meet the performance standards of the Building Regulations in Pre Completion testing.

The Saddle System also qualifies for use as an FFT2 floor in Robust Details and Scottish Example constructions. Details of the minimum performance requirements and laboratory test results for these schemes are given below.

Design Approach	Performance Requirement	Laboratory Tested Performance
England & Wales Robust Detail Constructions (Note 1)		
E-FC-1, E-FC-2, E-FC-7, E-FS-1,	**FFT2** Floor void to be at least 50mm high (compressed) with 10mm (min.) void below Support Bearer Minimum rdDelta Lw 17dB	**Saddle System with 55mm void** rdDelta Lw 23dB
Scottish Robust Detail Constructions		
V-FS-1 Steel/Concrete Composite	**FFT2** Floor void to be at least 50mm high (compressed) with 10mm (min.) void below Support Bearer Minimum rdDelta Lw 17dB	**Saddle System with 55mm void** rdDelta Lw 23dB
Scottish Example Constructions		
Floor Type 1B - Insitu concrete slab with FFT Floor Type 2B - Precast concrete slab with FFT	**FFT2** Floor void to be at least 50mm high (compressed) with 10mm (min.) void below Support Bearer Minimum rdDelta Lw 22dB, Minimum rdDelta Rw 5dB	**Saddle System with 52mm void** rdDelta Lw 23dB

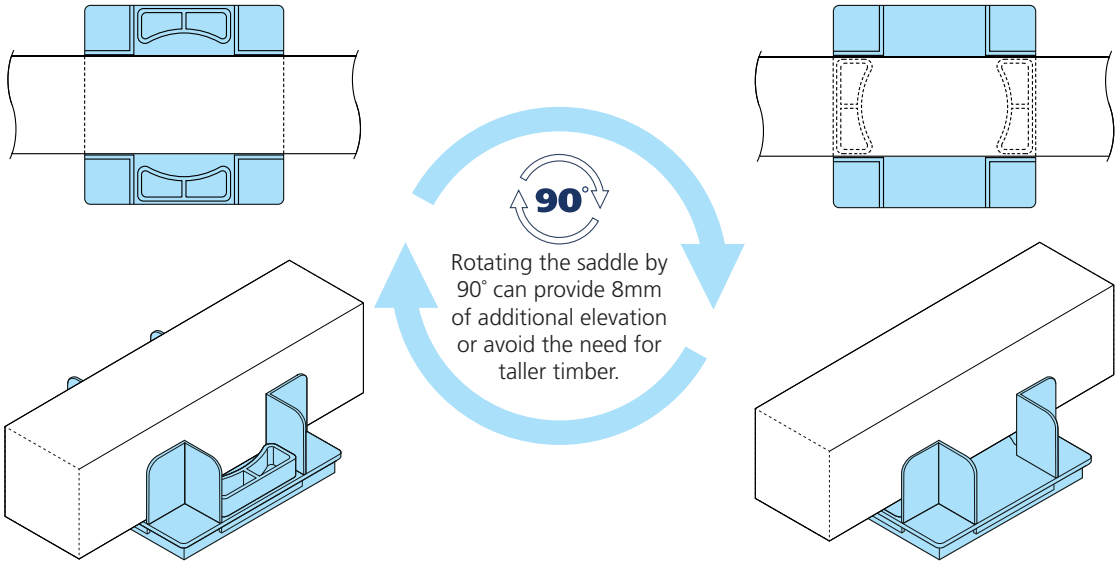
Notes:

1) In Northern Ireland these constructions are accepted as an alternative to PCT to demonstrate compliance with Part G (NI) for new dwellings.

2) Where a 10mm clearance is required for FFT compliance a 2mm packer is placed in each Saddle.

Dual Height Saddle

The medium saddle has a raised plinth which can support timber in a higher position.



Lower position

Higher position

Pedestal Saddles For floor voids above 200mm

For floor voids above 200 mm Pedestal Saddles are a hybrid of the highly successful Saddle system and the proven technology of raised access flooring systems, blending together the components to achieve deeper floor systems with acoustic properties.

CMS Danskin Acoustics have adapted a steel raised access floor pedestal and developed an injection moulded headcap with an integral 3mm resilient layer on the upper surface which clips on top. This creates an acoustic flooring system capable of providing deeper voids with useful space.

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Pedestal Saddles For floor voids above 200mm

The raised access floor pedestals are bonded to a clean, dry and dust free concrete substrate in the normal way using a one part, solvent free adhesive, and where appropriate, mechanical fixings.

The acoustic headcaps are clipped on top and standard C16 Support Bearers and packers are then used in the same way as in the standard Saddle System. Flooring boards are fitted to the top of Support Bearers.

SRL Test Report C/24144/T07

Pedestal Range

Pedestal Reference	Height Adjustment (mm)
H4 Ped	110/185
H4E Ped	135/210
H5 Ped	150/225
H5E Ped	185/260
H6 Ped	200/275
H6E Ped	235/310
H7 Ped	250/325
H8 Ped	300/375
H9 Ped	350/425
H10 Ped	400/475
X11	450/525
X12	500/575
X13	550/625
X14	600/675
X15	650/725
X16	700/775
X17	750/825
X18	800/875
X19	850/925
X20	900/975

Acoustic performance

Small sample test on ISO 10140-8 Heavyweight Standard Floor	
Delta Lw	19dB

Accessories

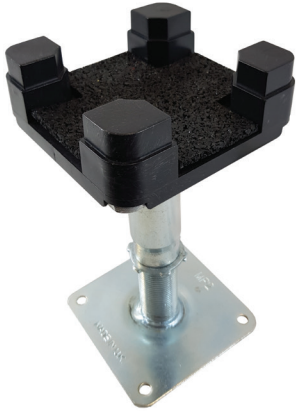
Pedestal Adhesive - 9kg
(Coverage - approx. 150 peds)

Saddle Headcap c/w resilient layer

Notes

Standard pedestals over 300mm high must be adhesive bonded and mechanically fixed.

HD pedestals over 500mm high require cross bracing. Higher elevations available on request.



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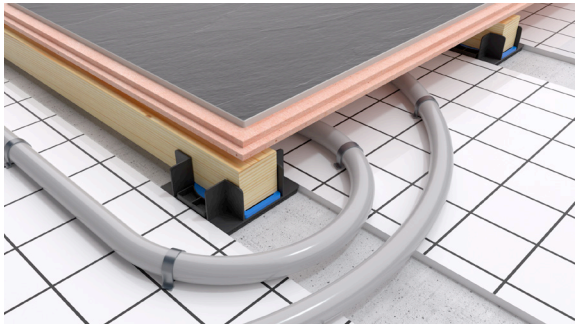
Thermal Saddles

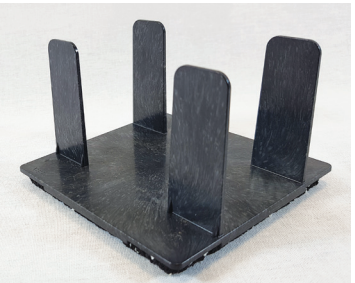
Optimal integration with underfloor heating

Underfloor heating pipes can be accommodated in the service zone provided by a standard Small or Medium Saddle. Typically warm water heating pipes are clipped to or inserted in insulation boards which are loose laid between the rows of Saddles and Support Bearers on top of the base floor.

However CMS Danskin Acoustics can also offer an adapted version of the Saddle System which can enhance the efficiency of these systems by elevating the insulation and pipes closer to the underside of the flooring panel. The patented shape of the Large Saddle also reduces gaps in the insulation coverage thereby reducing heat loss.

In most cradles the shape of the corner upstands prevent a snug fit between insulation boards and the support bearers, causing gaps between the insulation and the sides of the Support Bearers. The unique design of the Large Saddle means that these gaps are largely eliminated.





Large "Thermal" Saddle

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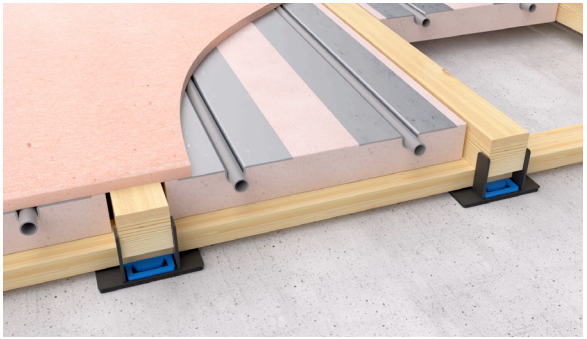
Thermal Saddles

Optimal integration with underfloor heating

A system of counterbattens positioned within the Thermal Saddle means that underfloor heating insulation panels can be fully supported during installation and over the lifetime of the floor.

Previously clips have been placed on top of Support Bearers to hold the pipework and insulation panels against the underside of the flooring boards. However these clips often provide insufficient support when loops of pipework are pushed into place during installation, causing sag and introduction of inefficient air gaps.

To alleviate this, Large Thermal Saddles are used to allow the insulation and pipework to be supported with counter battens if required.



Dimensions

The Thermal Saddle is 90mm x 90mm x 8mm high.The upstands are 55mm high.

Please note the pictoral example of the counterbatten system is only one configuration. Many factors will determine the size of support bearers and counterbatten to be used, including floor depth, position and thickness of any insulation panel. For further advice please contact CMS Danskin Acoustics Technical.

Acoustic Performance

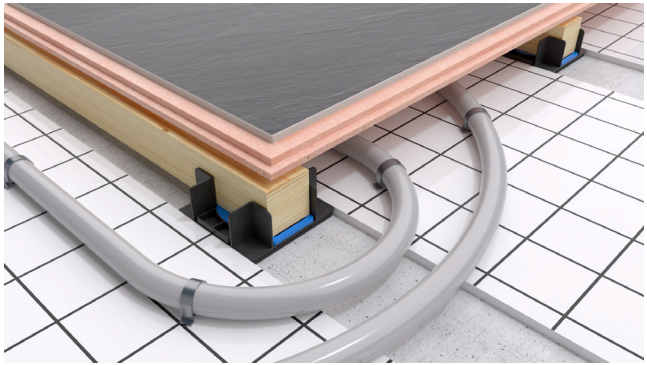
The Large Thermal Saddle uses the same resilient layer as other Standard Saddles; Please refer to Acoustic Performance table on Page 9.

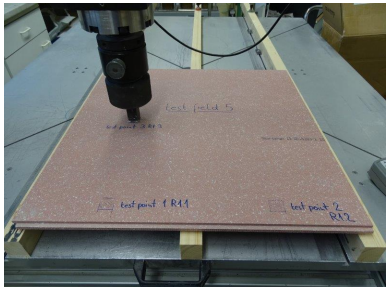
Smartspan Flooring

Enhanced thermal conductivity and stiffness for the Saddle System.

Smartspan is a calcium sulphate board which can span between the timber support bearers of the Saddle System with minimal deflection, making it an ideal substrate for stone and tiled finishes.

With a thermal conductivity of 0.44W/mK the Smartspan flooring panel is much more responsive to changes in underfloor heating settings than a standard chipboard panel.





Features and benefits

Ideal substrate for large format and stone tiles. High thermal conductivity maximises energy efficiency.

Makes room temperature control more responsive. High density assists with reduction of sound transmission. Excellent fire rating. Dry solution enhances on site efficiency.

Acoustic Performance

The high density of the board also enhances the acoustic performance of the Saddle System. In an independent test conducted by the Building Research Establishment (BRE) 25mm Smartspan laid on the Standard Saddle system on top of a standard heavyweight concrete floor achieved an impact performance of Delta Lw 24dB.

Physical Characteristics

Panel size:	1200 x 600mm
Thicknesses:	18 , 25 , 28 & 32mm
Edge detail:	T&G - 4 sides
Density:	1500 kg /m³
Fire rating:	Class A1 non combustible to EN 13501-1

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Design Considerations

Base Floor

The building must be weatherproof and completely dried out before commencing installation of flooring systems.

Moisture

Where floating floors are used over a new in-situ concrete slab construction (with or without a screed) , a DPM should be positioned over the slab or screed to protect the floating floor from moisture. Where a pre-cast concrete floor has a relative humidity in excess of 75% when tested according to Annex A of BS 8201 a DPM should be placed over the base floor surface before laying the floating floor.

Fire

It is presupposed that compartmentation provision within the building and the structural floor on which the Saddle System is laid provides all necessary fire protection. Approved Document B states in para. 6.2 c that platform floors are excluded from the definition of an element of structure which would require a minimum fire performance as defined in Table B3.

Services

The size and location of services running under the floor should be detailed at an early stage.Services should be kept at least 150mm away from walls to allow space for the flooring system at the perimeter and runs should not be wider than 350mm. It is recommended to allow at least 10mm above the height of services to allow for the deflection of resilient layers.Please note that services may have to cross. Acoustic Bearers or Support bearers must never be notched as this will affect the load bearing capacity of the product.

Partitions

Load bearing partitions should not be built on top of a floating floor. For best acoustic performance it is preferred that non-loadbearing partitions are built from the subfloor but where lightweight non-loadbearing partitions are built on top of the floating floor a double row of Acoustic Bearers or Support Bearers should be placed directly below. In joisted subfloors, if the line of a partition does not fall above a structural joist then a ladder frame of bearers should be created.

Communal Areas in Flats

It should be noted that the UK Annex to Eurocode 1 requires a higher load condition be considered for Communal Areas in blocks of flats. Please refer to "Actions on Structures , Part1-1 : General Actions , self weight , imposed loads for buildings " - in particular tables NA.2 and NA.3. CMS Danskin Acoustics can provide assistance on suitable System components and centres for higher load conditions.

Design Considerations - Commissioning of UFH

Underfloor heating should be commissioned gradually to prevent excessive or accelerated drying of timber components. It is important that floor finish temperatures do not typically exceed 27 degrees centigrade. Please carefully refer to the floor finish manufacturer guidance on commissioning with use of underfloor heating.

Finishes

Carpet and sheet flooring - Please refer to BS 8203 for guidance. An extra layer of thin plywood or hardboard may be necessary to prevent chipboard flooring panel joints showing through. Ceramic Tiling - follow the guidance on tiling to timber substrates produced in the Tile Association document - "Internal Ceramic Tiling to Sheet and Board Substrates " or follow manufacturers` guidance when using proprietary fixing solutions.

Installation

To ensure correct installation of floors the manufacturer`s detailed fixing instructions must be followed carefully. Copies of these instructions are available from CMS Danskin Acoustics.

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