

Ultimate Acoustic Solutions for **Walls & Partitions**

Uniclass L384+L516:N372	EPIC C441+E23:Y45	
CI/SfB (22.3)+(42)	R	(P2)

Contains SRS Ltd's Rigorous
Standard Details for:

- Building Regulations
Approved Document E
- BB93 – Schools
- HTM 2045/HTM 56 –
Hospitals

maxiboard



sound
reduction
systems

Manufacturers of Acoustic Insulation Products



Introduction

Sound Reduction Systems Ltd. (SRS) manufacture acoustic insulation and absorption products for use in domestic and commercial buildings. Over 25 years experience in the building acoustics industry ensures that our team of qualified acousticians can offer honest, practical advice and effective solutions to any acoustic challenge.

SRS Ltd's expertise includes compliance with current building regulations, in particular with Part E in housing, HTM 2045/HTM 56 in hospitals and Building Bulletin 93 in schools. This brochure details SRS Ltd's range of solutions to these standards.

Navigation symbols



Throughout this brochure you notice these **navigation symbols**, followed by a page number. These point you to corresponding data within the document - follow the symbols to transfer quickly between **acoustic data**, **fire data** and **installation guidance**.

Useful Contact Details:-

Technical and General Enquiries
Tel/Fax: 01204 380074 / 380957
Email: info@soundreduction.co.uk

Contents

Introduction	2
The Standards	4
Approved Document E	4
Approved Document E Specification Generator	5
BB93 - Acoustic Standards for Schools	6
HTM56/2045 - Acoustic Standards for Hospitals	7
Acoustic performance	8
Maxiboard on blockwork walls	8
Maxiboard on existing studwork	9
Maxi HP Partition	9
Installation Guide	10
Maxiboard on blockwork walls	10
Maxiboard on existing studwork	11
Maxi HP Partition	12
Physical Properties & Accessories	13
Additional Information & Important Notes (Including finishing and plastering details and information on acoustic testing)	15

Noise Control

To effectively control noise, it is important to understand the difference between sound absorption and sound insulation. Sound absorption relates to the amount of echo and reverberation within a room and its effect on sound quality and audibility. Sound insulation, on the other hand, relates to the actual attenuation of sound travelling from one area to another through a separating wall, floor or ceiling.

Sound transmission in buildings results from both airborne and impact noise sources.

Airborne sound is generated from sources such as human voices, Hi Fi's or TV sets, and travels through the air into the structure of a building.

Impact sound is the result of physical excitation of the structure of a floor from impacts such as footfall and dropped items.

The acoustic integrity of any separating structure can be compromised by flanking. Flanking sound occurs when there is an alternative path that sound can use to bypass an insulating element, this could be due to factors such as service penetrations and hidden cavities. Possible flanking paths must be identified and eliminated before effective sound insulation can be achieved.

The Regulations

Poor acoustic separation can lead to disturbance between residential dwellings, discomfort or lack of privacy in hospitals and in schools it leads to an environment which is not conducive to teaching or learning. The following regulations have been introduced to ensure that New Build and converted dwellings, schools and hospitals have an adequate level of acoustic separation.

Building Regulations Part E
Building Bulletin 93
HTM 2045/HTM 56

The Airborne Test (on site)

The airborne test is designed to measure the difference in sound level between two rooms with a large, steady sound source operating in one of the rooms. The result is known as the weighted Standardised Level Difference, or $D_{nT,W}$, which is essentially the difference in sound level between the two rooms, adjusted to take account of the reverberation in the receiving room. The result is adjusted again by the addition of the spectrum adaptation term, or C_{tr} , which is intended to place more emphasis on low frequency sound, such as that produced by the subwoofer in a modern home cinema or hi-fi system. Since this test measures the difference in sound level between the rooms, then the higher the figure, the better the insulation.

The Testing Process

Under the current Building Regulations, introduced in July 2003, acoustic testing is required to demonstrate compliance with the insulation standards for all conversions and for new build projects if not constructed using Robust Details. The tests will normally be carried out by an independent acoustic consultant and this can be arranged through our network of distributors. An additional list of suitable companies can be found on the internet at www.association-of-noise-consultants.co.uk.

Sound Reduction Systems Ltd technical team are also able to carry out the tests to the appropriate standards where required, although as a manufacturer, we cannot claim the status of an independent consultant. If you are unable to find a solution for your specific acoustic insulation problem or require further advice, please contact our experienced technical team on **01204 380074** or email info@soundreduction.co.uk where an advisor will be happy to assist.

Residential : Building Regulations Part E – Resistance to the Passage of Sound

Acoustic noise control in buildings for residential use is regulated using Part E. This Building Regulation now applies to any kind of building used as a dwelling, including houses, apartments, student accommodation, hotels and nursing homes. It also applies to dwellings that have been created as a result of a conversion or material change of use.

The aim of the regulation is to protect residents from the noise of activities in other rooms or adjoining properties. This has been highlighted as a major cause of tension between residents. The acoustic requirements are displayed below in tables 1.1a & 1.1b:-

Table 1.1a: Dwelling-houses and flats - performance standards for separating walls.

	Airborne sound insulation $D_{nT,w} + C_{tr}$ dB (Minimum Values)
Purpose built dwelling-houses or flats	
Walls	45
Dwelling-houses or flats formed by material change of use	
Walls	43

Table 1.1b: Rooms for residential purposes - performance standards for separating walls.

	Airborne sound insulation $D_{nT,w} + C_{tr}$ dB (Minimum Values)
Purpose built rooms for residential purposes	
Walls	43
Rooms for residential purposes formed by material change of use	
Walls	43

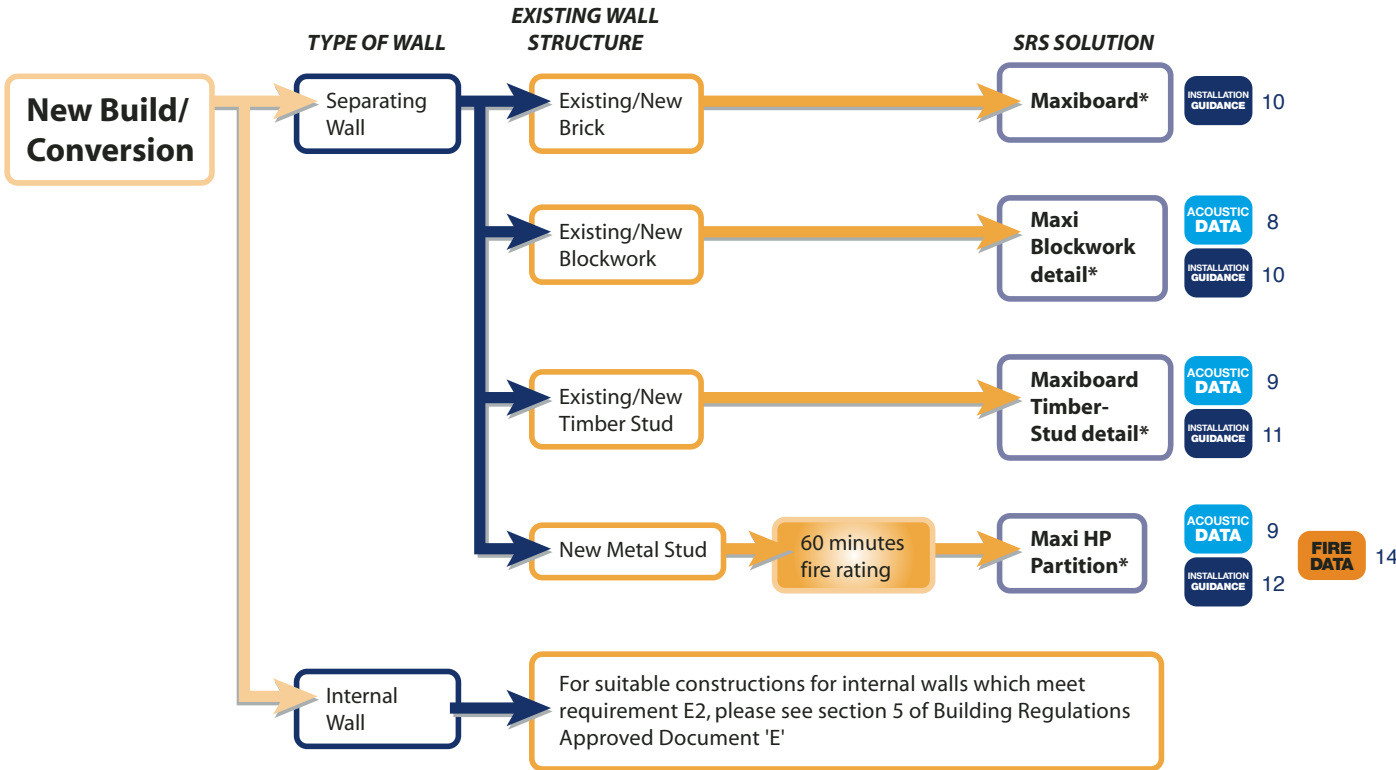
In addition to these targets, separating structures within a dwelling must also meet or exceed the following targets as set out in table 1.1c. It is anticipated that these standards should improve the level of privacy within a dwelling.

Table 1.1c: laboratory values for new internal walls within: dwelling-houses, flats and rooms for residential purposes, whether purpose-built or formed by material change of use.

	Airborne sound insulation R_w dB (Minimum Values)
Walls	40

Note: The laboratory values for new walls apply to walls between bedrooms and other rooms, and to walls between rooms containing WCs and other rooms. However, it does not apply to any internal walls which contain a door, or to internal walls which separate an en-suite toilet from the associated bedroom.

Approved Document E



Notes:
 * For additional acoustic performance, both sides of the wall can be treated using Maxiboard.

Can't find an SRS solution?

Should your application/construction differ from those listed above, please contact our technical department on **01204 380074** for assistance.

Schools : Building Bulletin 93 – Acoustic Design of Schools

It is widely recognised that improving acoustic separation within a school can significantly improve children’s ability to learn without distraction from activities in other areas of the buildings. Building Bulletin 93 (BB93) gives guidance on the performance of separating structures within schools depending on the noise level or sensitivity of the activities occurring on either side of it. Table 1.2a has been created using data from BB93, and describes the

minimum weighted standardised level difference $D_{nT(T_{inf,max},w)}$ (dB) between rooms. The relationship between $D_{nT(T_{inf,max},w)}$ and D_{nTw} is dependant upon the required reverberation time in the receiving room. For most teaching rooms $D_{nTw} = D_{nT(T_{inf,max},w)} + 2/3dB$, though for rooms requiring higher reverberation times, such as gymnasiums and music performance rooms, the relationship can be as high as $D_{nTw} = D_{nT(T_{inf,max},w)} + 5dB$

Table 1.2a:

	Nursery Play Room	Nursery Quiet Room	Primary/Secondary Classroom	Open Plan Teaching / Resource area	Music Classroom	Music Performance Room	Lecture Room (Fewer than 50)	Lecture Room (More than 50)	Science Laboratory	Drama Studio	Assembly Hall	Gymnasium	Dining Room
Nursery Play Room	55												
Nursery Quiet Room	55	40											
Primary/Secondary Classroom	55	45	45										
Open Plan Teaching / Resource	50	45	45	40									
Music Classroom	55	55	55	55	55								
Music Performance Room	55	55	55	55	60	60							
Lecture Room (Fewer than 50)	55	45	45	45	55	55	45						
Lecture Room (More than 50)	55	45	50	50	60	60	50	50					
Science Laboratory	50	45	45	40	55	55	45	50	40				
Drama Studio	55	55	55	50	60	60	55	55	50	55			
Assembly Hall	55	55	55	50	55	55	55	55	50	55	55		
Gymnasium	55	55	55	50	55	55	55	55	50	55	55	50	
Dining Room	55	55	55	50	55	55	55	55	50	55	55	50	45

Hospitals : HTM 2045/HTM 56

Requirements for acoustic separation in hospitals and buildings used for health care is given in HTM 56, and also HTM 2045. Within hospitals acoustic separation is required for areas of privacy as well as treatment rooms and the comfort of in-patients. Table 1.3a below gives the performance requirement for airborne

sound insulation between rooms in dB (R'_w). R_w is a laboratory rating of sound insulation. There is no fixed relationship between R_w and D_{nTw} , but as a guide R_w is at least 5dB higher than the equivalent D_{nTw} .

Table 1.3a: Minimum requirement for airborne sound insulation between rooms in dB (R_w) from HTM 56

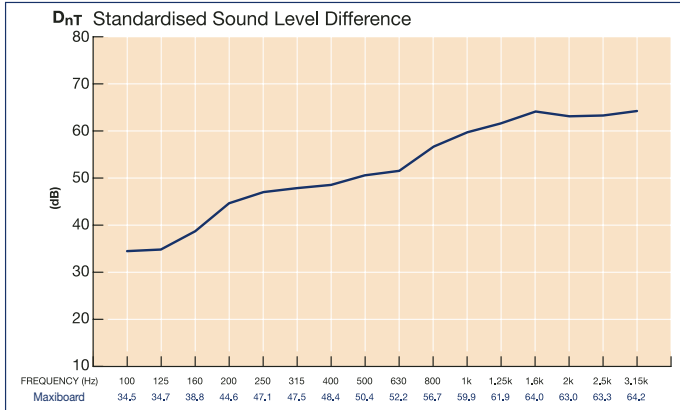
	Consulting Room	Examination Rooms	Treatment Rooms	Speech Therapy Rooms	Offices	Seminar Rooms	Single-bed Wards	Multi-bed Wards	Day Rooms	Nurseries	Toilets and Bathrooms	Utility Rooms	Ward Pantries
Consulting Room	43												
Examination Rooms	43	43											
Treatment Rooms	*	53	43										
Speech Therapy Rooms	48	48	*	48									
Offices	43	43	53	48	48								
Seminar Rooms	48	43	48	53	43	38							
Single-bed Wards	43	43	*	48	43	48	43						
Multi-bed Wards	53	53	48	*	48	43	53	43					
Day Rooms	53	53	43	*	48	43	53	43	38				
Nurseries	*	*	43	*	53	48	*	48	43	43			
Toilets and Bathrooms	48	48	48	53	43	43	48	48	48	48	43		
Utility Rooms	*	*	43	*	53	48	*	48	43	43	48	43	
Ward Pantries	48	48	48	53	43	38	48	43	43	48	43	48	38

* These relationships should be 'designed out' as the sound insulation requirements would require special construction.

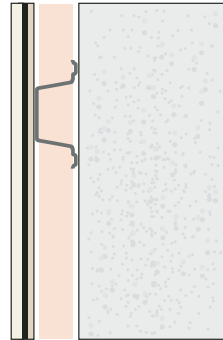
HTM 2045 encourages the principle of acoustic zoning, through the concepts of intrusive noise and privacy factors. The privacy is based upon the subjective privacy requirement for the area under consideration (PF) with a correction applied for the mechanical service noise levels (B) in that area.

Further corrections are applied where adjacent areas might be a source of increased voice effort (C) e.g. maternity wards, nurseries and A&E. In such areas the site tested weighted apparent sound reduction index (R'_w) is equal to $PF - B + C$. For example, in the case of a private office above a maternity ward R'_w becomes $80 - 30 + 20$ i.e. 70dB, a much more rigorous solution than given by HTM 56.

Maxiboard fixed to lightweight block wall (100mm, 630kg/m³) on SRS resilient bars



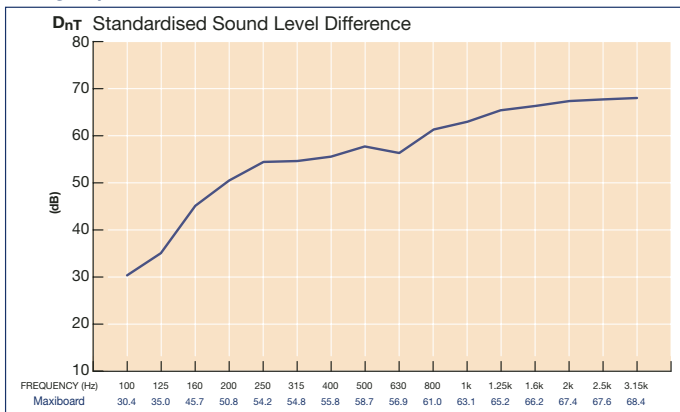
Tests carried out by Noise Control Services 8/11/05.
 Measured according to BS EN ISO 140-4:1998.
 Rated to BS EN ISO 717:1 1997. Test Reference No. NCS 11056/5.



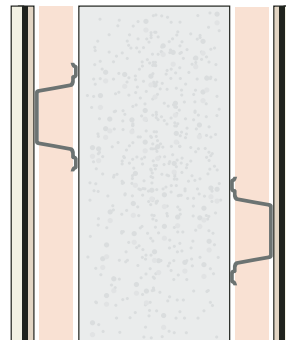
- ✓ Document E Solution for walls - conversion
- ✓ Document E Solution for walls - new build
- ✓ Minimal build up

Maxiboard 1 side lightweight blockwork	
Airborne	
D _{nT,w} (dB)	D _{nT,w} + C _{tr} (dB)
52	47

Maxiboard fixed to both sides of a lightweight block wall (100mm, 630kg/m³) on SRS resilient bars



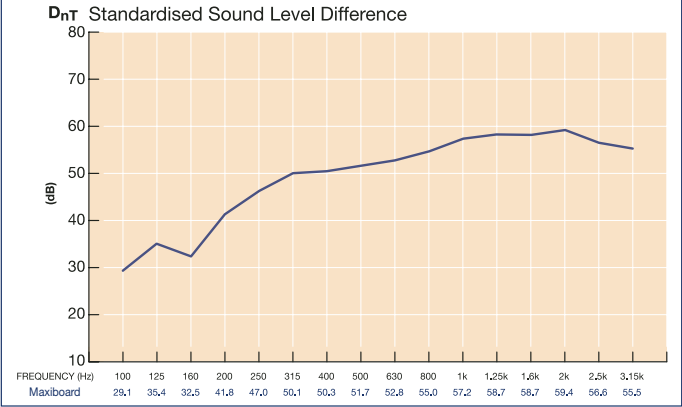
Tests carried out by Noise Control Services 11/11/05.
 Measured according to BS EN ISO 140-4:1998.
 Rated to BS EN ISO 717:1 1997. Test Reference No. NCS 11056/2.



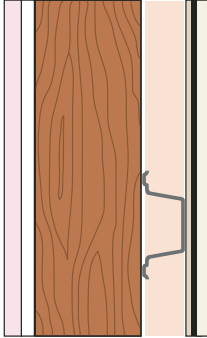
- ✓ Document E Solution for walls - conversion
- ✓ Document E Solution for walls - new build
- ✓ Minimal build up

Maxiboard either side lightweight blockwork	
Airborne	
D _{nT,w} (dB)	D _{nT,w} + C _{tr} (dB)
60	49

Maxiboard fixed on SRS resilient bars on an existing partition



Tests carried out by Noise Control Services 12/01/04.
 Measured according to BS EN ISO 140-4:1998.
 Rated to BS EN ISO 717:1 1997. Test Reference No. NCS 01044/1.



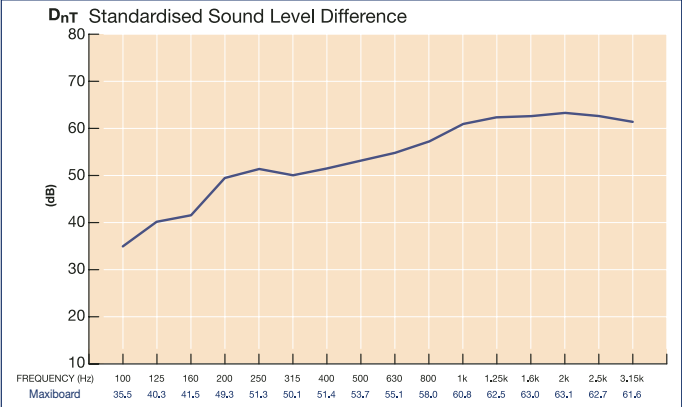
INSTALLATION GUIDANCE 11

- ✓ Document E Solution for walls - conversion
- ✓ Total thickness: 147mm for 75mm stud

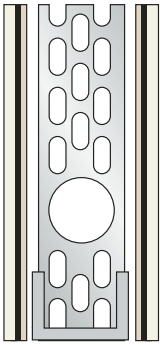
Maxiboard on resilient bars - existing partition

Airborne	
$D_{nT,w}$ (dB)	$D_{nT,w} + C_{tr}$ (dB)
54	45

Maxi HP Partition



Tests carried out by Noise Control Services 04/08/03. Measured according to BS EN ISO 140-4:1998. Rated to BS EN ISO 717:1 1997. Test Reference No. NCS 08032/3. Fire performance: Achieved 1 hour fire resistance to BS EN 1364-1:1999 (WARRES 129082).



INSTALLATION GUIDANCE 12

FIRE DATA 14

- ✓ Document E Solution for walls - conversion
- ✓ Document E Solution for walls - new build
- ✓ 1 hour fire rated partition
- ✓ Minimal thickness: 109mm plus surface skim

Maxi HP Partition

Airborne	
$D_{nT,w}$ (dB)	$D_{nT,w} + C_{tr}$ (dB)
58	51

Maxiboard on resilient bars



Where Maxiboard abuts a wall, floor or ceiling, the shiplap edge should be removed so the board sits flush to the adjunct. The edge should then be treated with a bead of SRS Acoustic Sealant to reduce sound transmission into the existing structure. Any further inconsistencies or gaps should be treated with a general purpose filler to ensure acoustic integrity.

For increased acoustic performance or to remedy any unevenness in the existing wall, 25 x 50mm timber battens should be fixed vertically at 600mm centres with 25mm mineral fibre hung between them.

The resilient bars and Maxiboard panels are fixed to the timber battens using the same fixing spacings and installation method as described above.

SRS recommend that plasterboard be fitted over the Maxiboard and finished according to manufacturers instructions. Please see 'Finishing and Plastering' section on page 15 for further finishing details.

Maxiboard – Masonry Wall Applications

ACOUSTIC DATA 8

Maxiboard can be applied to most 100mm dense and lightweight blockwork or double skinned brick walls to improve the sound insulation or to meet Approved Document E (2003).

Installation

SRS Resilient Bars are fixed horizontally across the wall. A resilient bar should be placed at the top and bottom of the wall and then at 600mm centres from the bottom upwards. Where the resilient bars are applied directly to the wall, 25mm mineral fibre should be installed in between them.

The boards are fixed to the resilient bars using 3.9 x 30mm Maxi HP screws. The existing masonry wall will need to be completely free of moisture before the Maxiboard is installed. To ensure the back of the Maxiboard is protected from moisture, it may be necessary to install a damp proof membrane. Maxiboard must be installed in a brick pattern, with staggered joints, and the utmost care should be taken to ensure there are no gaps. A bead of SRS Gripfix should be applied to the shiplap edge of the Maxiboards as they are placed together.

Maxiboard on battens and resilient bars



Maxiboard on resilient bars



Maxi socket box from rear

Maxiboard – Existing Timber Stud and/or Plasterboard Partitions

ACOUSTIC DATA 9

Should the plasterboard remain on the studwork it should be removed from one side of the partition and the area between the existing studs filled with a 50mm mineral fibre. SRS Resilient bars should then be placed at the top and bottom of the wall and then at 600mm centres from the bottom upwards. The Maxiboards are then installed exactly as described in the 'Upgrading Masonry Walls' section.

If the plasterboard on the other side of the studwork is in good condition it can remain, with an extra layer of 12.5mm fire rated plasterboard fixed directly through the existing plasterboard, into the studwork.

If the existing boards are damaged, they should be replaced by two layers of 12.5mm fire rated plasterboard with all offset joints.

For the Optimum acoustic performance any sockets or switches that need to be installed on the Maxiboard wall should be surface mounted, or flush fitted using Maxi Socket Boxes.

SRS recommend that plasterboard be fitted over the Maxiboard and finished according to manufacturers instructions. Please see 'Finishing and Plastering' section on page 15 for further finishing details.

Maxiboard HP Partition



Maxi HP Partition System



Prior to installation, the self adhesive Maxi HP felt is applied to the recess on the outside of the floor channel. The floor and soffit tracks are then secured prior to fitting Maxi studs, which are positioned at 600mm centres. Please note the studs are not secured to the floor and soffit channels.

All stud mesh profiles are fitted in same direction. 50mm mineral fibre slab, of nominal 590mm width, is placed within the stud cavity. Maxiboard panels are then fixed to the studs in a brick pattern with half panel overlap, using 3.9 x 30mm Maxi HP screws.

The partition is constructed with the 10mm lighter coloured gypsum side of the board facing outwards, unless specification requirements determine otherwise, ready to be skimmed (please see plastering instructions) or drylined. Fixings are at a maximum of 250mm centres with the lowest fixing not greater than 30mm from the floor and the uppermost fixing at 60mm from the head. All fixings are positioned at 20mm from the edge of the Maxiboard. The uppermost Maxiboard panels are fitted 5mm short of the perimeters, with a bead of intumescent sealant being used to fill this gap.

SRS Gripfix is applied to all shiplap edges of the Maxiboard panels. All face joints are filled and screw heads spotted out with a standard filler. Where Maxiboard abuts a wall, floor or ceiling, the shiplap edge should be removed so the board sits flush to the adjunct. A bead of SRS Acoustic Sealant should be applied to the edge of the Maxiboard when fitting to ensure isolation from the existing structure.

When installing a door into a Maxi HP partition you will need a door casing to suit the thickness of the partition. The total unplastered thickness is 109mm. It is also important to note that the inclusion of a door, in any partition system, will have a detrimental effect on the overall acoustic performance. For optimum acoustic performance, all sockets and switches should be surface mounted or flush fitted with Maxi socket boxes.

SRS recommend that plasterboard be fitted over the Maxiboard and finished according to manufacturers instructions. Please see 'Finishing and Plastering' section on page 15 for further finishing details.

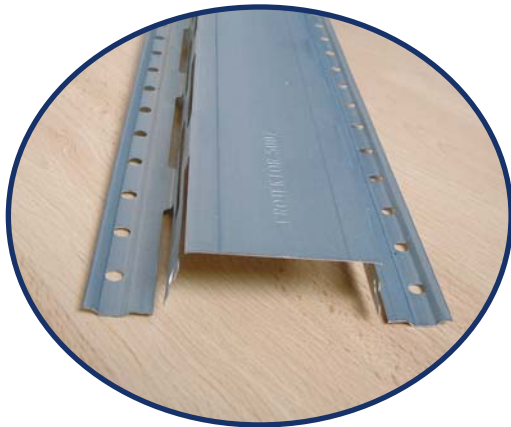
Maxiboard Dimensions:

Size = 1200mm x 600 mm (nominal)
 Thickness = 17 mm
 Weight = 24 kg/m²

Maxiboard Accessories

Maxi Resilient Bars:

Galvanised steel isolating strip used to separate the Maxiboard from the existing structure, thereby enhancing its performance.
 Size = 3000mm x 120 mm
 Depth = 30mm



SRS Gripfix:

Specially developed adhesive for use on all Maxiboard joints.
 Size = 310ml tube
 Coverage = 4-5 sheets of Maxiboard per tube



SRS Acoustic Sealant

Provides adhesion with acoustic performance where Maxiboard abuts perimeters.
 Size = 900ml tube
 Coverage = 30-40 linear metres



SRS Jumbo Sealant Gun

Large sealant gun for use with SRS Acoustic Sealant.

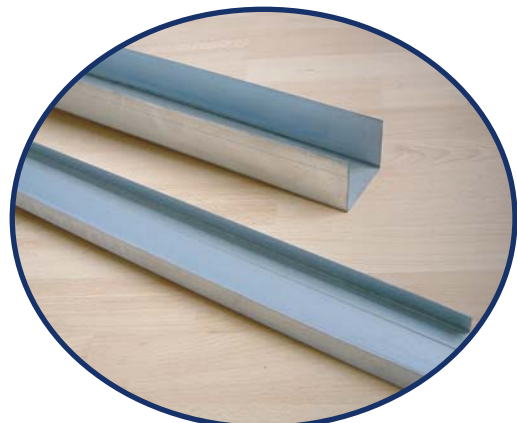


HP Floor and Ceiling Track

Unique metal stud system introducing isolation to the wall structure.

Sizes:

Maxi HP Deep Ceiling Track = 4m
 Maxi HP Floor Track = 4m



Maxi HP Stud = 75mm x 3m



Maxi HP Felt = 20m roll



Maxi HP Screws:

Self drilling screws.

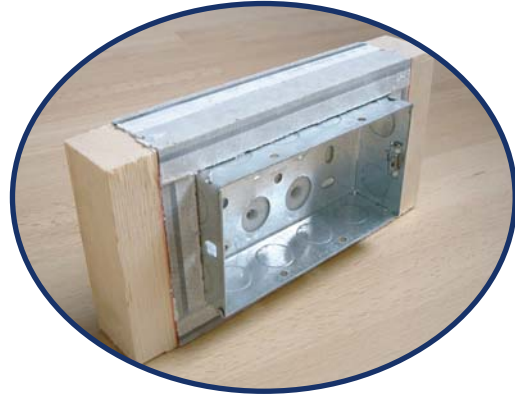
Size = 3.9 x 30mm



Maxi Socket Box:

Acoustic socket boxes allowing flush fitted sockets without compromising the acoustic integrity of the wall.

Size = Twin and single sockets - 35mm deep



Fire Properties

Maxiboard: Fire Propagation BS 476 : Part 6 : 1989 Class 0

Surface Spread of Flame: BS476 : Part 7 : 1997 Class 1

Maxi HP Partition

Fire performance: Achieved 1 hour fire resistance to BS EN 1364-1 : 1999 (WARRES 129082). Actual results were: Integrity 72 minutes. Insulation 72 minutes

Cutting:

Best cut using circular saw with dust extraction fitted. Can also be cut using a jigsaw.

Storage:

Maxiboard must be laid flat and kept dry. Maxiboard should only be stored on site if the building has been sealed and is completely dry.

Finishing & Plastering

We recommend that plasterboard be fitted over the Maxiboard and finished according to manufacturer's instructions.

However, should you need to plaster directly onto the Maxiboard, we advise skimming the 10mm lighter coloured, gypsum board side of the Maxiboard. Prior to skimming, all Maxiboard joints should be filled with proprietary joint filler and taped, using paper tape, applied with undiluted plastering PVA. The whole surface should then be bonded with PVA, diluted according to the manufacturer's recommendations. A skim coat of multi-finish may then be applied. Unfortunately, SRS cannot be held responsible for the quality of any plaster finish applied directly onto Maxiboard.

It is essential that the Maxiboard is free from moisture before plastering to avoid the risk of cracking at the joints. Factors such as product storage prior to installation and site conditions must be assessed before applying the skim. Should the plastering contractor suspect moisture in the Maxiboard, they should wait until the boards are fully conditioned on site.

Maxiboard – Other Applications

Maxiboard is perfect for constructing small acoustic housings for noisy machinery and services, or whole room enclosures. The durability of Maxiboard combined with its capacity to take direct fixings makes it simple to use as a basic building board. To add acoustic absorption to enclosures and housings SRS Coustifoam should be applied to the internal surfaces. (See separate leaflet).

Patents & Trademarks

'Maxiboard' is a registered trademark of Sound Reduction Systems Ltd. Maxiboard is a patented product.

Maxiboard Patent No: GB2375358

Important Notes

Approved Document E 2003 introduces a new unit of measurement for airborne sound, which places much more emphasis on low frequency performance. Due to the inherent difficulties of measuring low frequency noise, a significant tolerance on the accuracy of airborne sound test results should be expected. In practical test PASM have witnessed relatively large variations in airborne sound results by different measurement contractors on the same floor. Site conditions and workmanship

can also limit reproducible results; therefore previous results should be viewed as indicative of performance only.

Site conditions and installation standards vary. SRS cannot take responsibility for the performance of any installed system of which Maxiboard is only a part, or that has been installed incorrectly. Prior to installation it is necessary to identify and eliminate possible flanking paths that may compromise the acoustic performance of any SRS system.

Acoustic Testing

The final performance of a separating structure is assessed during a Sound Insulation (SI) test. In the case of both walls and floors, this is done by determining the level difference achieved when measuring a loud noise source through the structure, in accordance with BS EN ISO 140-4 'Measurement Procedure for Airborne Noise transmission'. The result is given as a single figure known as the Standardised Level Difference, or $D_{nT,w}$, in decibels dB. A higher figure indicates better performance. A similar measurement made in a laboratory under ideal conditions gives the Sound Reduction Index (SRI) which is abbreviated to R_w . Typically, an R_w is around 5dB higher than the equivalent $D_{nT,w}$ figure. In Building Regulations Part E – Resistance to the Passage of Sound, relating to residential buildings, there is an additional frequency weighting, C_{tr} , which gives greater significance to performance at low frequencies.

Separating floors have an additional test to assess the level of impact noise insulation. This is made using a calibrated tapping machine which delivers regular and repeatable impacts. The level in the receiver room is measured, giving a $L_{nT,w}$ (dB) figure. Similarly, the level measured in a laboratory is given as L_{nw} dB. A lower figure indicates better performance.

When Part E was introduced in 2003, a requirement for pre-completion testing was added. The regulations now require 10% of each type of construction to be tested in order to show that they meet or exceed the Part E standards. The only alternative for new build projects is to use Robust Details. These are a range of constructions which have been demonstrated to exceed Part E standards by at least 5dB.



sound
reduction
systems

Manufacturers of Acoustic Insulation Products

Sound Reduction Systems Ltd

Adam St, Off Lever St, Bolton BL3 2AP

Tel: +44 (0)1204 380074 · Fax: +44 (0)1204 380957

E-mail: info@soundreduction.co.uk · Web: www.soundreduction.co.uk

Site conditions and installation standards vary. SRS cannot take responsibility for the performance of any installed system of which SRS products are only a part, or that have been installed incorrectly. Prior to installation, it is necessary to identify and eliminate possible flanking paths that may compromise the acoustic performance of any SRS product.