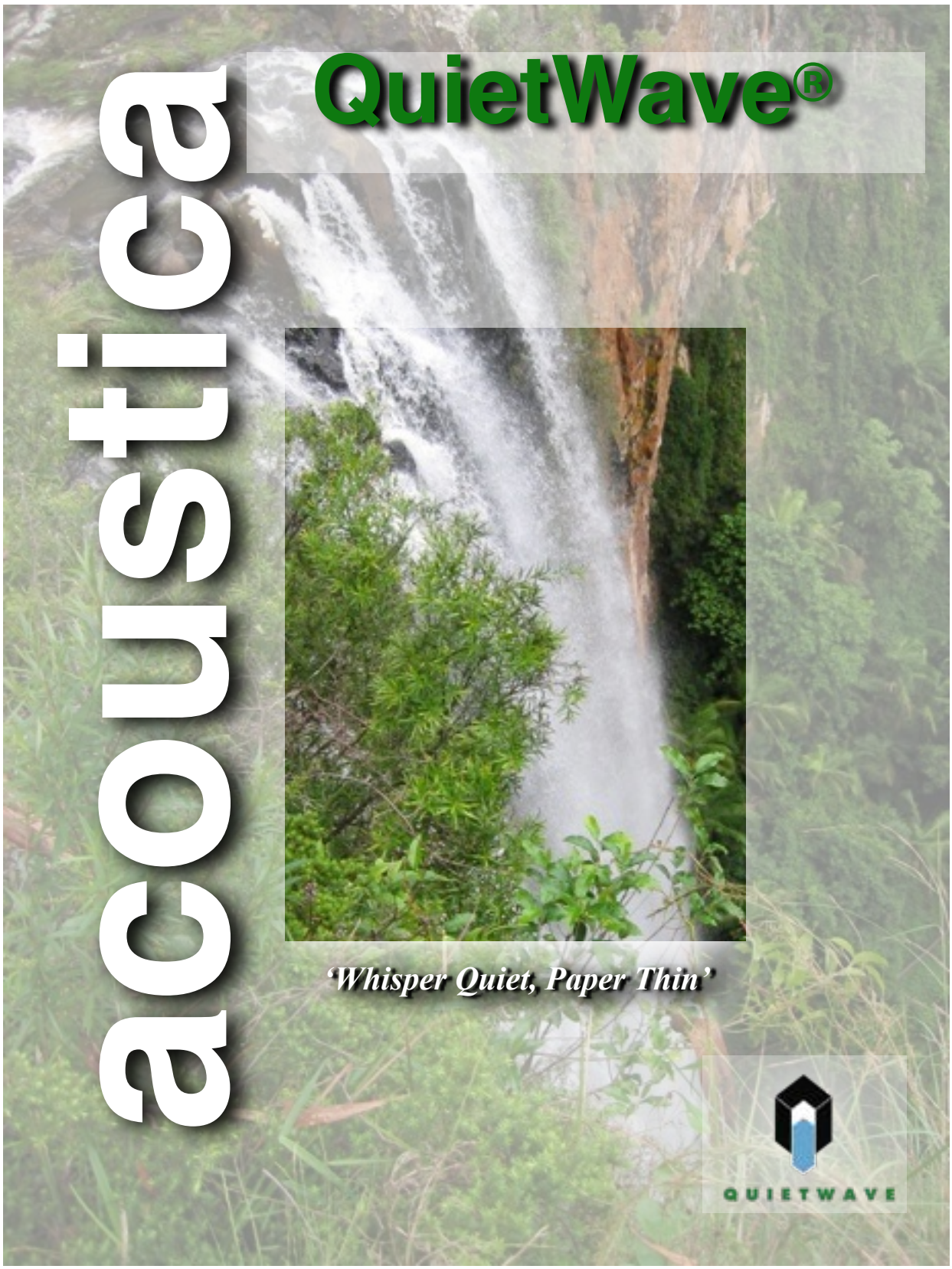
acoustica®
the quiet Australian



NZ Distributor, Advanced Acoustics Ltd, 41c William Pickering Drive, Albany, Auckland 0632

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www.advancedacoustics.co.nz

acoustica®
the quiet Australian

acoustic

Acoustica winner of...

Engineers Australia Excellence Award and Finalist in

the new inventors

Also Finalist and nominated for the Western Sydney Industry Award, NSW Pitchfest '07 and 'Next Big Thing Award' '08

ENGINEERS AUSTRALIA

anthill SMART 100

Western 2007 FINALIST

Featured in the Australian Technology Showcase

Western Sydney Industry Awards 2005 for excellence and innovation

Office of the Minister for Western Sydney
in partnership with

Greater Western Sydney Economic Development Board

Department of State and Regional Development

transurban

AMIF Australian Marine Industries Federation

nsw [pitchfest] '07

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QuietWave® Contents

Company Profile

Acoustica® is an Australian owned company founded in 1982 when perforated steel was a major component in soundproofing solutions. Today, the company is a global leader in the research, development and manufacture of leading technology sound control and noise abatement systems utilising visco-elastic technology.

In 1991 Acoustica® was the first to introduce polyester sound and thermal insulation materials to Australia, revolutionising the industry in overcoming health and recycling issues. This was followed by the adoption by SANIP (Sydney Airport Noise Insulation Program) of Acoustica's residential dwelling pilot program as the specification for all dwellings included in the insulation program.

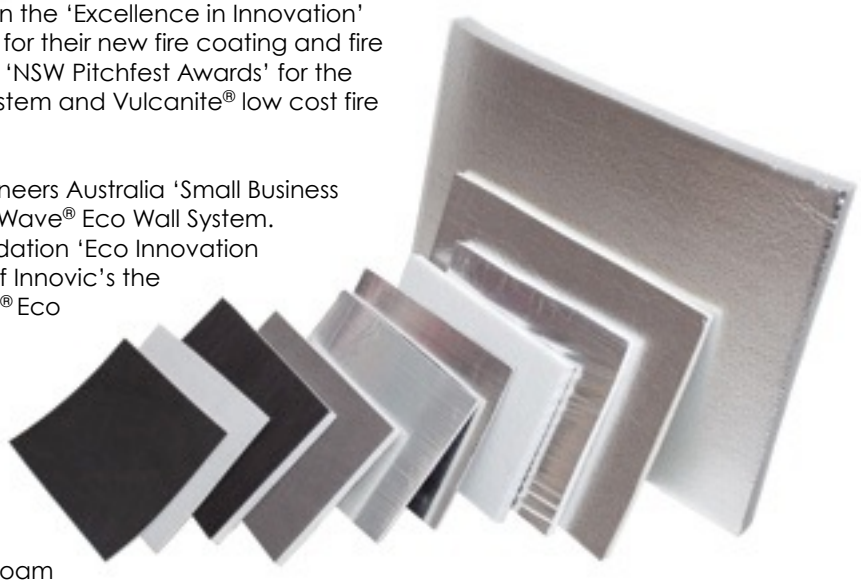
It was in 2005 when the NSW Government Industry Minister announced that Acoustica® had won the 'Excellence in Innovation Award for Outstanding Innovation', for the new QuietWave® plasterboard wall system. With a six star acoustic rating, QuietWave® has the highest drywall acoustic performance at half the thickness and 30Kg/m2 lighter than conventional drywall systems.

Also in 2005, Acoustica was accepted into the prestigious ATS (Australian Technology Showcase) for 'Revolutionary Technology for Acoustic Control'. The ATS is sponsored by the Australian Federal & State Governments to promote innovative Australian technology worldwide.

At the Australian Marine Industry Federation awards in 2006, Acoustica's world patented Vybar® marine acoustic insulation was recognised with a commendation award in the 'Innovative Product of the Year' category.

In 2007 the Acoustica® Group was recognised in three awards. Acoustica was the winner of the innovation category of the Australian Anthill Magazine 2007 'Cool Company Awards'. The Federal minister for Australian Industry presented Acoustica® with the Innovation Award for the QuietWave® wall system.

In the same year Acoustica® were finalists in the 'Excellence in Innovation' category for the 'Western Sydney Awards' for their new fire coating and fire rated products which was followed by the 'NSW Pitchfest Awards' for the QuietWave® revolutionary acoustic wall system and Vulcanite® low cost fire resistant ceramic.



The Acoustica Group in 2008 won the Engineers Australia 'Small Business Ventures Excellence Award' for their QuietWave® Eco Wall System. They were also finalists in the Banksia Foundation 'Eco Innovation Award' and the Environmental category of Innovic's the 'Next Big Thing Award' for their QuietWave® Eco Wall System.

In November 2008 Acoustica wins the 'New Inventors' Episode 42 and the 'Peoples Choice Award' for QuietWave® Wall System and was one of the five Grand Finalists.

In 2013 the revolutionary QuietWave® BioFoam with it's patented micro-cellular membrane is developed and launched. It quickly is recognised and favoured for it's very low VOCs and GREEN TAG certification. Due to it's success, it is now incorporated into the GreenLAG®*SQ* Pipe Lagging and AngelStep®*SQ* Underlay with other products to follow.

QuietWave® BioFoam Noise Barrier

Incorporating the 'Green Chemistry' Principles

QuietWave® is a high performance drywall noise barrier that delivers exceptional performance due to it's micro-cellular membrane developed (patented, tested and manufactured in Australia).

The QuietWave® (BioFoam) biologically derived, flexible noise barrier and vibration damping material, is typically used in walls, floors, ceilings and pipe lagging. The product can also be applied to doors, partitions and furniture applications to reduce airborne noise and vibration transfer.

QuietWave®

- ✓ **Exceeds BCA minimum requirements**
- ✓ **Can achieve the highest AAAC acoustic rating of 6 stars**
- ✓ **Thinnest and lightest possible wall for the highest acoustic rating**
- ✓ **Most economic 6 star rating wall system available**
- ✓ **Low VOCs** (Less than a recognised threshold of 0.5mg "Green Star")

Acoustica's QuietWave® noise barrier isolates noise and dampens sound vibration to increase sound transmission loss.
The vibration decay in the organic QuietWave® viscoelastic noise barrier parallels the theoretical performance of the
ideal limp mass barrier.

The development of the World's first natural organic noise barrier has been achieved with a matching acoustic performance of R1,cw 27 for the 2.5kg/m^2 (Wilkinson & Murray test results following pages).

QuietWave® has been certified by the CSIRO Division of Materials Science and Engineering as Group 1 Fire Rated Tests are showing that when QuietWave® is sandwiched between two layers of 13mm Firecheck plasterboard, the Sound Transmission Loss (STL) achieves equivalent to 5 layers of the same plasterboard.

QuietWave® is incorporated into Acoustica's range of acoustic products for walls, partitions, floors, ceilings and pipe lagging.

Typical Applications:

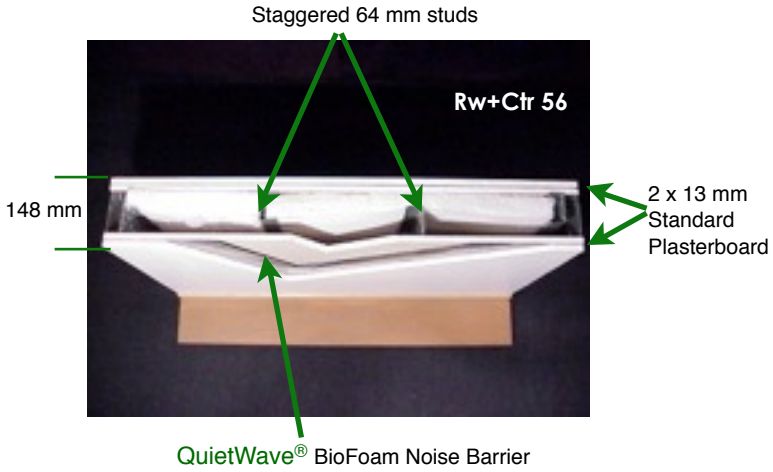
- Multi-residential walls and ceilings
- Retrofits
- High Confidentiality partition wall systems (for Lawyers, Doctors, Dentists, etc)
- Commercial walls and ceilings
- Improving existing partition wall & ceiling performance
- Sole occupancy unit dividing walls
- Boardroom and office division walls

The natural Environmental and Acoustic Choice

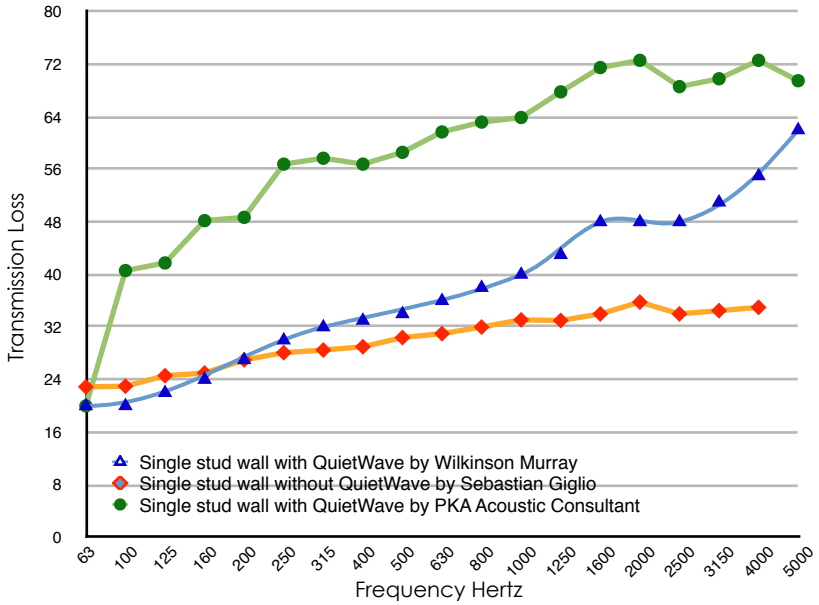
Incorporating the 'Green Chemistry' Principles

The QuietWave® (BioFoam) biologically derived, flexible noise barrier and vibration damping material, is typically used in walls, floors, ceilings and pipe lagging. The product can also be applied to doors, partitions and furniture applications to reduce airborne noise and vibration transfer.

A typical high performance partition wall



Comparison Transmission Loss Test Results



Typical QuietWave® wall construction system = Rw + Ctr 56 *

- One 13 mm standard plasterboard
- One 1.2 mm QuietWave® visco-elastic membrane

- One 13 mm standard plasterboard
- 64 mm staggered studs in a 92 mm track
- 50 mm thick insulation
- One 13 mm thick plasterboard
- One 1.2 mm thick QuietWave® visco-elastic membrane
- One 13 mm plasterboard

* PKA test report available on request

Test	Description	R_{iw}
1. Wilkinson Murray (Ref: PD 200813)	QuietWave sandwiched between 2 x 13 mm plasterboard	38 (Ctr-2)
2. Sebastian Giglio (Ref: 204335/D01a)	2 x 13 mm plasterboard panels	33 (Ctr-2)
3. PKA Acoustic Consulting (Ref: 204 202 R01)	148 mm Staggered stud wall with QuietWave sandwiched between 2 x 13 mm plasterboard on both sides of the studs	63 (Ctr-7)

Global GreenTag^{CertTM} GreenRate Level C Certification of QuietWave® BioFoam

QuietWave® BioFoam is a patented biologically derived, flexible noise barrier and vibration damping material used in commercial and residential applications as an acoustic noise barrier for walls, ceilings, partitions, flooring, furniture and pipe lagging.

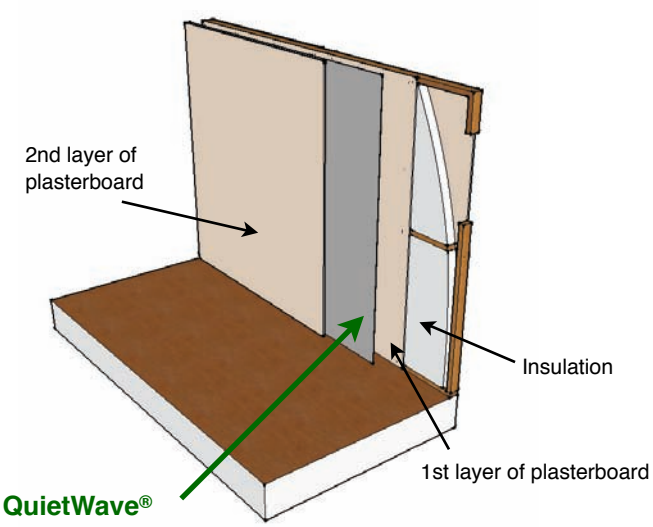
QuietWave® Wall System

Significant cost benefits

- The Developer has more useable floor space to sell
- Easier installation for Builders, less material handling, no Bridging issues, **saving over 35%**
- The Buyer has more useable floor space, more secure feeling from solid sounding walls and more privacy with the more soundproofed walls

Environmental Benefits

- The environmental improvements achieved with the QuietWave® wall system is by way of the direct reduction of the need for 30kg/m^2 of plasterboard to achieve the BCA code for adjoining walls. These are:
- Energy saving from the embodied energy of 30kg of plasterboard
- Water savings from the embodied water in 30kg of plasterboard
- The reduction in overall building size due to the extra floor space available from the significantly thinner walls
- The reduction in overall building foundations and structure because of the significantly lighter walls
- The reduction in transportation of plasterboard for walls
- The reduction in land fill through the plasterboard savings (12% of land fill is plasterboard)
- The increased efficiencies in the use of natural resources (Gypsum) - industry wide 17% wastage from manufacture to installation of plasterboard



QuietWave®
BioFoam Noise Barrier

- ✓ Exceeds BCA minimum requirements for airborne sound insulation for a wall between attached dwellings
- ✓ Meets the highest possible AAAC acoustic rating of 6 stars
- ✓ Rw62 and Rw + Ctr = 56 dB
- ✓ With the thinnest possible wall section of 148 mm
- ✓ Most economic 6 star rating wall system available

The building code of Australia (BCA 2004) acoustic requirements introduced new and more onerous acoustic standards of Rw + Ctr = 50 dB for party walls between apartments, townhouses and other attached dwellings. Acoustica's QuietWave® wall system not only meets the minimum requirements of the new BCA code (equivalent to AAAC 5 star rating) but is a class ahead at AAAC 6 stars.

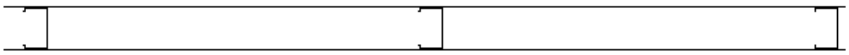
Acoustic Performance Index

When the concept of Acoustic Performance Index is applied to the QuietWave® BioFoam wall system, the score is extremely high. Acoustic Performance Index takes into account the cost of the wall compared to its acoustic performance and to the thickness of the wall and the floor space cost.

Thickness is a very important consideration as floor space in a typical apartment is $6,000 per square meter. The QuietWave® wall is only 148mm wide and has an acoustic performance that can only be matched by the best wall system at 280 - 300mm wide.

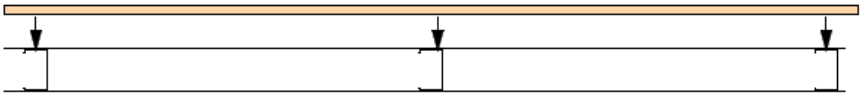
Installation Procedure

1. - Install stud & tracks as per manufacturers instructions

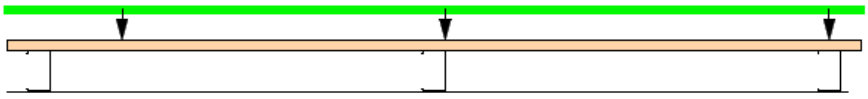


Side One

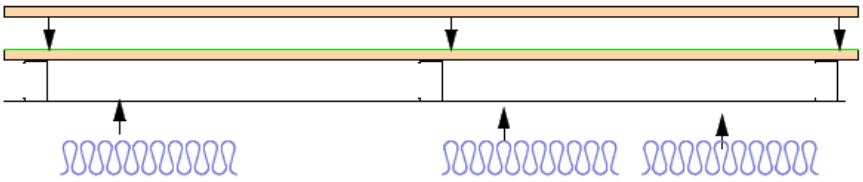
2. - Install first layer of plasterboard in a horizontal direction as per manufacturers instructions.
   - Seal the joints
   - Cut edges neatly leaving maximum 2mm gaps around the perimeter wall
   - Seal edges with resilient sealant (Silicone or No More Gaps)



3. - Unroll QuietWave® roll.
4. - Cut QuietWave® sheets to suit height of partition.
5. - With nails, staples or screws, hang 1st QuietWave sheets along the top of the 1st layer of plasterboard.
   - Does not need to be glued.
6. - Fix the second QuietWave® sheet next to the 1st one and so on. Sheets do not have to be butted and taped together. All cuts can be used. Sheets do not have to be cut accurately around the perimeter of the wall. Tolerance around the perimeter 5 to 10mm.



7. - Install 2nd layer of plasterboard in a vertical direction as per manufacturers instructions or ensure that 1st layer of plasterboard joints do not coincide with the second layer joints.
   - Seal the joints
   - Cut all edges neatly leaving maximum 2mm gap around the perimeter of the walls.
   - Seal edges with resilient sealant (Silicone or No More Gaps)

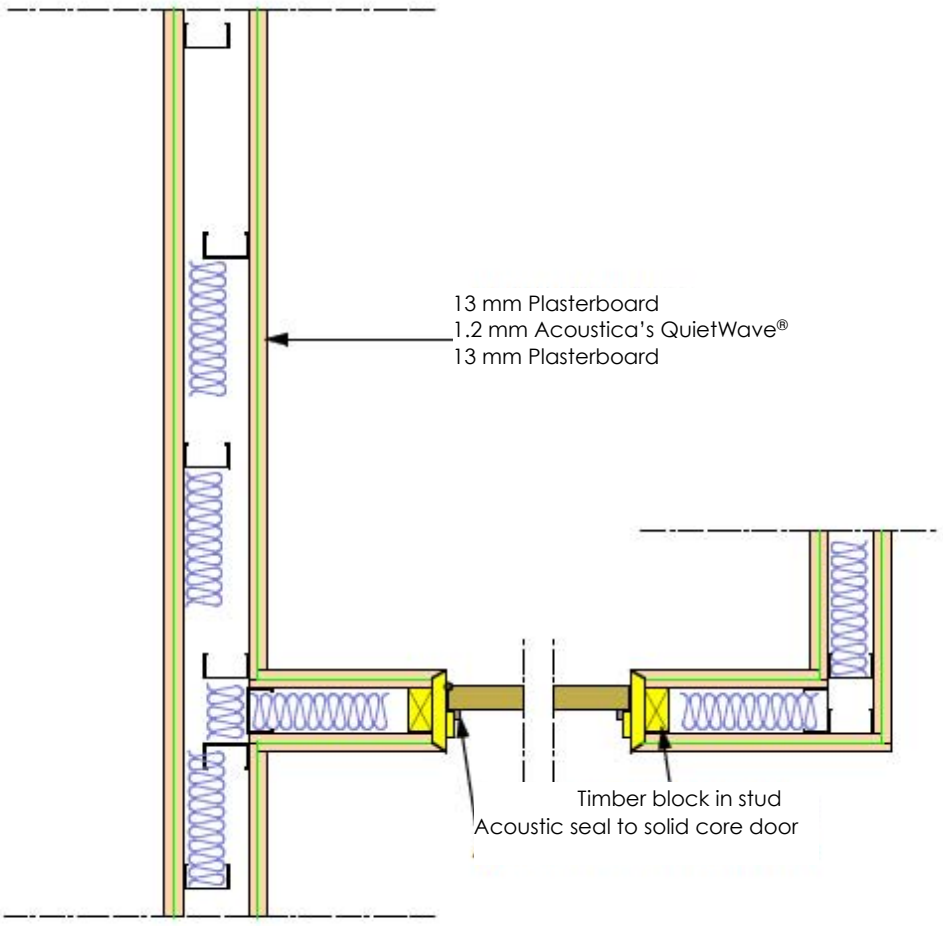


Side Two

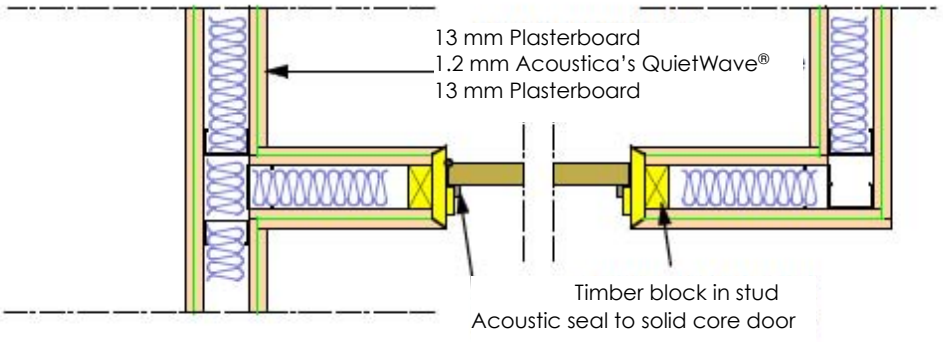
8. - Install specified High Density Batts
9. - Install QuietWave® wall system on side 2 following the same procedures as per described in Items 2 to 7

Services

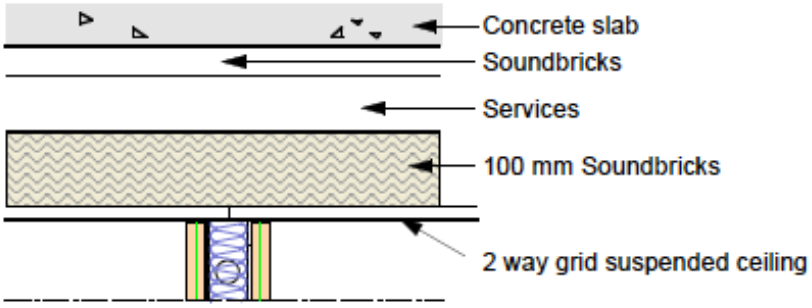
All power points and switches to be installed with firebox. Do not install services back to back.



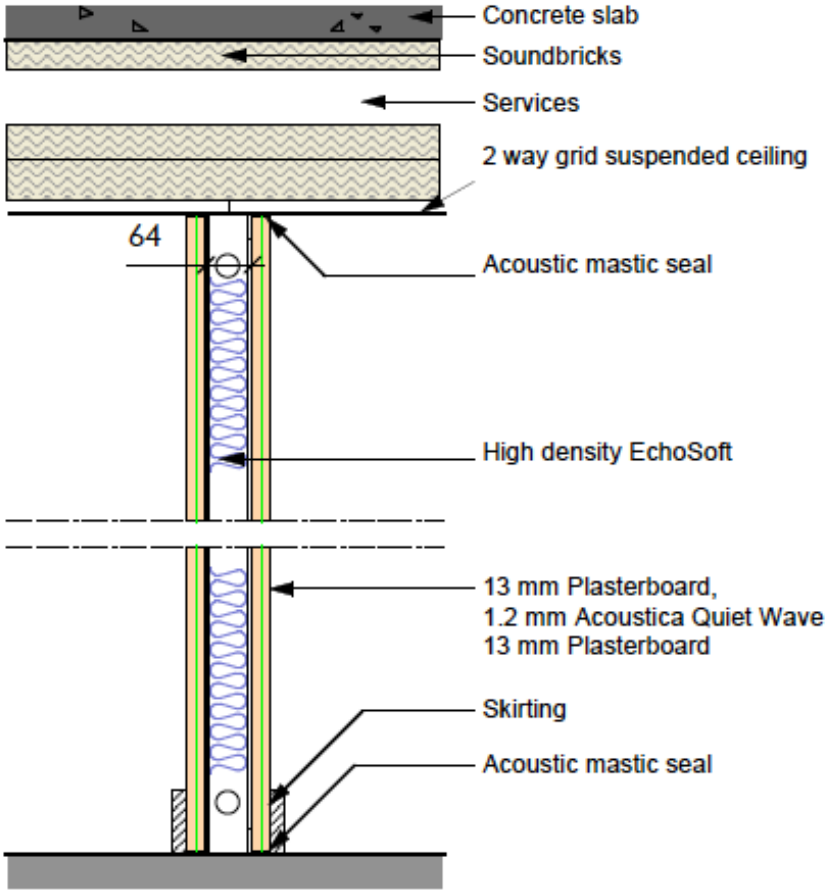
SB2 WD1 PLAN QUIETWAVE PARTITION
Stagged studs



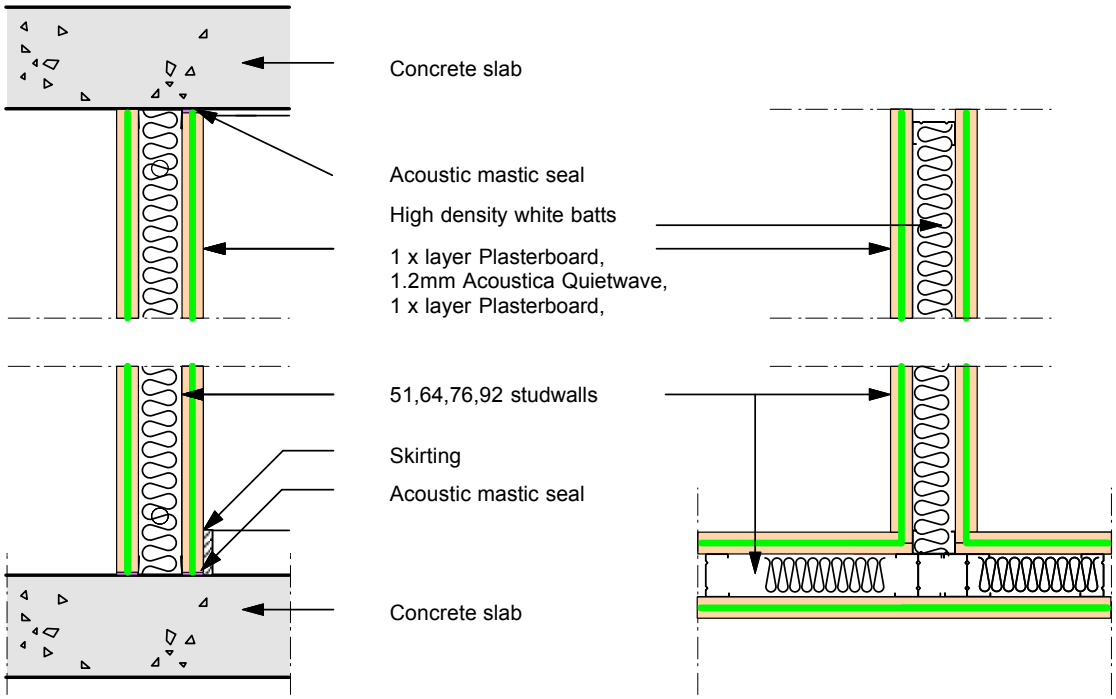
SB2 WD1 PLAN QUIETWAVE PARTITION



SB1 WD1 SECTION
Option 1
Sound bricks installation



SB2 WD1 SECTION QUIETWAVE PARTITION
Option 2
Sound bricks installation



STEEL STUD SECTIONS

Legend:
SD: Standard plasterboard
FC: Fyrcheck plasterboard
SC: Soundcheck plasterboard

Note :
Gap between ceiling and wall
to be filled with Bostik Fireban 1 or equal
in fire rated wall

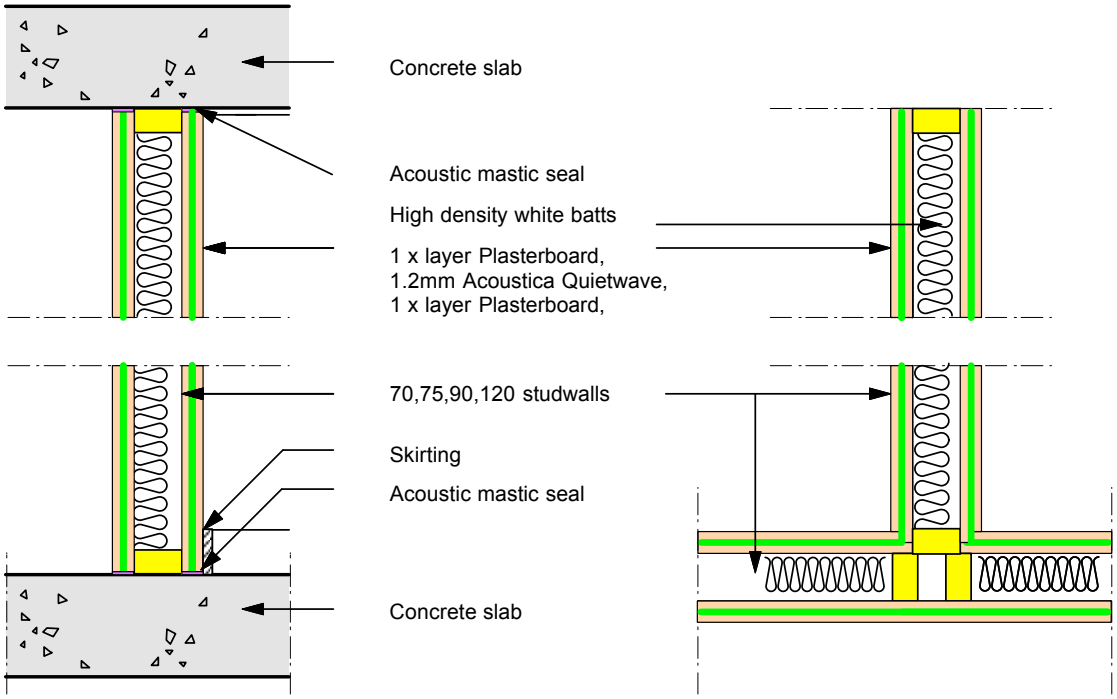
Fire rated > 50 Rw +ctr walls

>50Rw +ctr walls

Stud mm + plasterboard mm	Wall mm	Acoustic opinion Rw+Ctr	FRL
51-10 SD	94	45 db	-
51-13 SD	106	48 db	-
51-13 FC	106	51 db	-/120/120
51-16 FC	118	53 db	-/120/120
51-10 SC	94	49 db	-
51-13 SC	106	53 db	-
64-10 SD	107	47 db	-
64-13 SD	119	50 db	-
64-13 FC	119	53 db	-/120/120
64-16 FC	131	55 db	-/120/120
64-10 SC	107	51 db	
64-13 SC	119	55 db	
76-10 SD	119	48 db	-
76-13 SD	131	51 db	-
76-13 FC	131	54 db	-/120/120
76-16 FC	143	56 db	-/120/120
76-10 SC	119	52 db	
76-13 SC	131	56 db	
92-10 SD	135	49 db	-
92-13 SD	147	53 db	-
92-13 FC	147	55 db	-/120/120
92-16 FC	159	57 db	-/120/120
92-10 SC	135	54 db	
92-13 SC	147	58 db	

QUIETWAVE SINGLE STUD CONSTRUCTION

QWSS SF01



TIMBER STUD SECTIONS

Legend:
SD: Standard plasterboard
FC: Fyrcheck plasterboard
SC: Soundcheck plasterboard

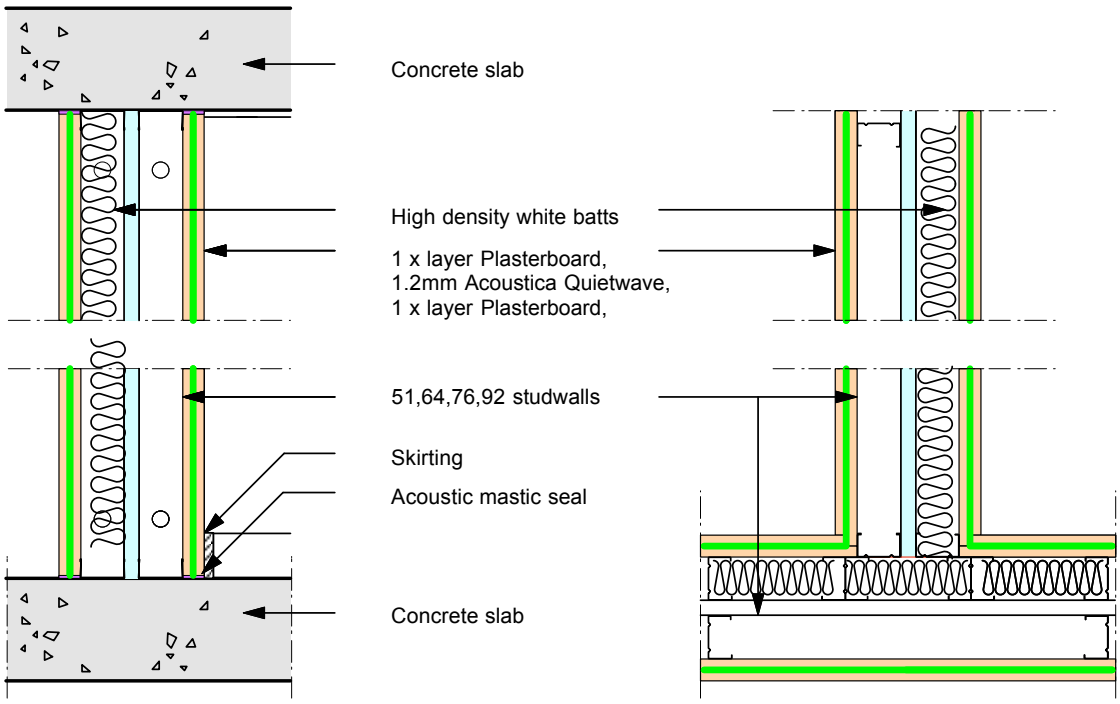
Note :
Gap between ceiling and wall
to be filled with Bostik Fireban 1 or equal
in fire rated wall

Fire rated > 50 Rw +ctr walls

>50Rw +ctr walls

Stud mm + plasterboard mm	Wall mm	Acoustic opinion Rw+Ctr	FRL
70-10 SD	113	54 db	-
70-13 SD	125	51 db	-
70-13 FC	125	53 db	-/120/120
70-16 FC	137	55 db	-/120/120
70-10 SC	113	52 db	-
70-13 SC	125	56 db	-
		48 db	
75-10 SD	118	51 db	-
75-13 SD	130	54 db	-
75-13 FC	130	56 db	-/120/120
75-16 FC	142	52 db	-/120/120
75-10 SC	118	56 db	
75-13 SC	130		
90-10 SD	133	49 db	-
90-13 SD	145	53 db	-
90-13 FC	145	55 db	-/120/120
90-16 FC	157	57 db	-/120/120
90-10 SC	133	54 db	
90-13 SC	145	58 db	
120-10 SD	163	52 db	-
120-13 SD	175	55 db	-
120-13 FC	175	57 db	-/120/120
120-16 FC	187	59 db	-/120/120
120-10 SC	163	56 db	
120-13 SC	175	60 db	

QUIETWAVE SINGLE STUD CONSTRUCTION QWSS TF01



STEEL STUD SECTIONS

Legend:
SD: Standard plasterboard
FC: Fyrcheck plasterboard
SC: Soundcheck plasterboard

Note :
Gap between ceiling and wall
to be filled with Bostik Fireban 1 or equal
in fire rated wall

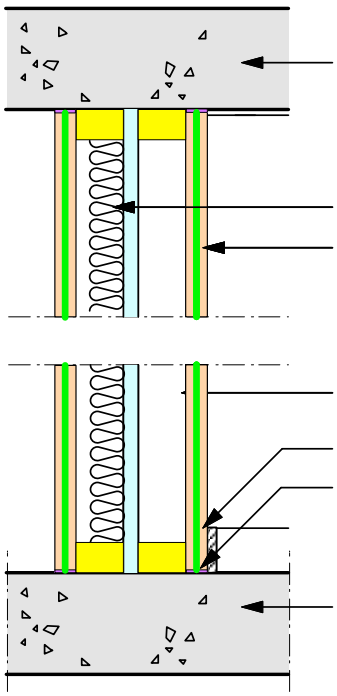
Stud mm + plasterboard mm	Wall mm	Acoustic opinion Rw+Ctr	FRL
51-10 SD	165	52 db	-
51-13 SD	177	55 db	-
51-13 FC	177	57 db	-/120/120
51-16 FC	189	59 db	-/120/120
51-10 SC	165	56 db	-
51-13 SC	177	59 db	-
64-10 SD	191	53 db	-
64-13 SD	203	56 db	-
64-13 FC	203	59 db	-/120/120
64-16 FC	215	61 db	-/120/120
64-10 SC	191	57 db	
64-13 SC	203	61 db	
76-10 SD	215	54 db	-
76-13 SD	227	57 db	-
76-13 FC	227	60 db	-/120/120
76-16 FC	239	62 db	-/120/120
76-10 SC	215	58 db	
76-13 SC	227	62 db	
92-10 SD	247	55 db	-
92-13 SD	259	58 db	-
92-13 FC	259	60 db	-/120/120
92-16 FC	271	63 db	-/120/120
92-10 SC	247	60 db	
92-13 SC	259	63 db	

Fire rated > 50 Rw +ctr walls

>50Rw +ctr walls

QUIETWAVE DISCONTINUOUS CONSTRUCTION

QWDC SF01



Concrete slab

High density white batts

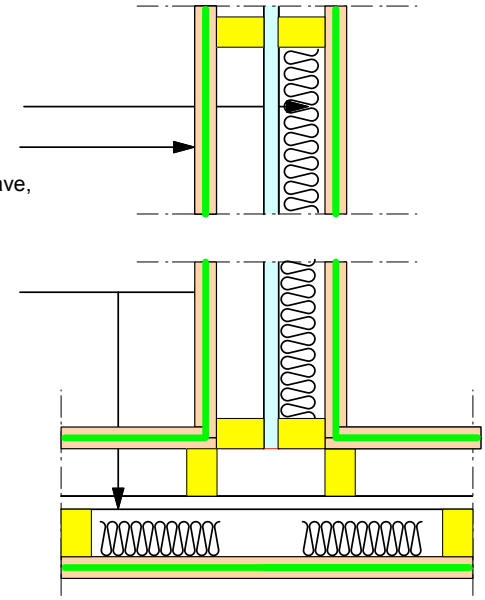
1 x layer Plasterboard,
1.2mm Acoustica Quietwave,
1 x layer Plasterboard,

51,64,76,92 studwalls

Skirting

Acoustic mastic seal

Concrete slab



TIMBER STUD SECTIONS

Legend:
SD: Standard plasterboard
FC: Fyrcheck plasterboard
SC: Soundcheck plasterboard

Note :
Gap between ceiling and wall
to be filled with Bostik Fireban 1 or equal
in fire rated wall

Fire rated > 50 Rw +ctr walls

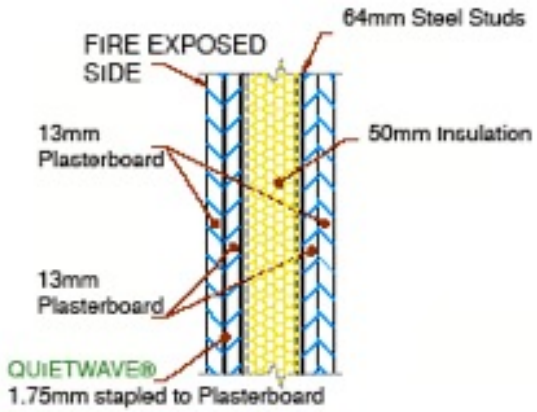
>50Rw +ctr walls

Stud mm + Plasterboard mm	Wall mm	Acoustic opinion Rw+Ctr	FRL
70-10 SD	208	54 db	-
70-13 SD	220	57 db	-
70-13 FC	220	59 db	-/120/120
70-16 FC	232	61 db	-/120/120
70-10 SC	208	58 db	
70-13 SC	220	62 db	
75-10 SD	213	54 db	-
75-13 SD	225	57 db	-
75-13 FC	225	59 db	-/120/120
75-16 FC	237	61 db	-/120/120
75-10 SC	213	58 db	
75-13 SC	225	62 db	
90-10 SD	243	55 db	-
90-13 SD	255	58 db	-
90-13 FC	255	60 db	-/120/120
90-16 FC	267	62 db	-/120/120
90-10 SC	243	59 db	
90-13 SC	255	63 db	
120-10 SD	303	57 db	-
120-13 SD	315	60 db	-
120-13 FC	315	63 db	-/120/120
120-16 FC	327	65 db	-/120/120
120-10 SC	303	61 db	
120-13 SC	315	65 db	

QUIETWAVE DISCONTINUOUS CONSTRUCTION

QWDC TF02

Tested by WFIRE research CONSULTANCY • TESTING



Test Specimen:

The wall system was constructed from 64mm steel studs clad on both sides with 13mm plasterboard with insulation in the cavity. On the exposed side of the wall system one layer of QuietWave® CMT was installed between the two layers of plasterboard.

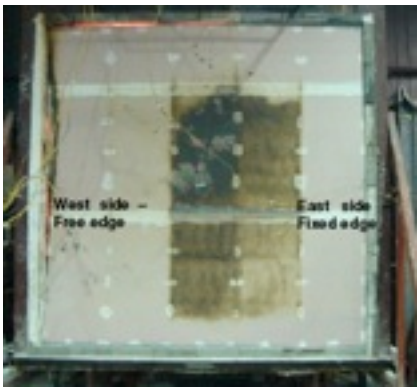
Assembly & Installation Methods:

The QuietWave® wall system was built into a steel restraint frame by WFRA representatives.

Orientation:

The specimen was exposed from the side lined with QuietWave®.

The QuietWave® was installed fixed to the face of the first layer of plasterboard on the exposed side, up to the concrete block surround leaving no gap at the edges.



1. Unexposed face of test specimen after the completion of the test

Statement of Compliance:

The test was performed in accordance with the requirements of BS 476: Pt 20: 1987 and BS 476: Pt 22: 1987 as appropriate for non-load bearing walls.

Variation to Test Method:

Between 30-35 and 95-100 minutes test duration, the pressure range exceeded the limits specified in BS 476: Pt 20: 1987. The average of the furnace pressure for the duration of the test though, remained within the specified limits specified in
BS 476: Pt 20: 1987.

Test Duration:

The test was terminated after 153 minutes after agreement between the test laboratory and Acoustica®.

Observations:

The table below includes observations of the significant behaviour of the QuietWave® and details of the occurrence of the various performance criteria specified in BS 476: Pt 20: 1987.

2. Exposed face of test specimen after the completion of the test

Result: Achieved Group 1
Full report provided upon request.

Criteria	Result
Load-bearing capacity	Not applicable
Integrity	No failure at 153 minutes
Insulation	145 minutes

CETEC
Professional Scientific Solutions

Emission Test Certificate

Wednesday, November 07, 2012

Supplier: Acoustica Pty Ltd (6A Nelson St, Annandale, NSW, 2038)

Sample Description: QuietWave

Date Tested: October 2012

Test Method: ASTM D5116 "Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Material/Products".

Emission Data:

Specification **Green Building Council of Australia** **Green Star Office Design V2/V3 IEQ-13**	**QuietWave**
Total Volatile Organic Compound emission rate <0.5 $mg/m^2/hr$	Total Volatile Organic Compound emission rate <0.016 $mg/m^2/hr$

Dr. Vyt Garnys
PhD, BSc(Hons) AIMM, ARACI, ISIAQ
ACA, AIRAH, FMA
Managing Director and Principal Consultant

Travis Hale
BSc
Consultant

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TEST REPORT

FOR

Acoustica Pty LTD

6A Nelson Street
Annandale, NSW 2038
AUSTRALIA

Standard Test Method for
Surface Burning Characteristics of Building Materials
ASTM E84 – 12a

Test Report No: FH-2424

Assignment No: H-985

Test Date: 07/19/2013

Report Date: 07/24/2013

Subject Material: QuietWave BioFoam Organic Flexible Acoustic Barrier

Prepared by: _____

Michael J. Rizzo
Test Engineer

Reviewed by: _____

Robert J. Menchetti
Director, Laboratory Facilities and Testing Services

TEST REPORT REVISION HISTORY:

DATE	SUMMARY
July 24, 2013	Original issue date. Original NGCTS report FH-2424.

INTRODUCTION:

This report presents the results of specimens tested in accordance with the requirements of ASTM E84-12a Standard Test Method for Surface Burning Characteristics of Building Materials. This test method is also published under the designations ANSI/UL 723, NFPA 255, and UBC 8-1.

The purpose of this test method is to determine the relative behavior of the material by observing the flame spread along the specimen. Flame spread and smoke developed index are reported. However, there is not necessarily a relationship between these two measurements.

This standard is used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled laboratory conditions. It should not alone be used for fire hazard or fire risk assessment of the materials, products, or assemblies under actual fire conditions.

MATERIAL TESTED:

Material submitted by Acoustica Pty LTD, of Annandale, NSW, Australia was identified by the client as:

"QuietWave BioFoam Organic Flexible Acoustic Barrier"

The material was submitted as (3) nominally 28 in. wide x 116 in. long x 0.145 in. thick rolls. The rolls, which were received in good condition on July 15, 2013, were cut to the required size (width and length) by NGC Testing Services personnel prior to testing.

The material had a silver "foil" surface on one side and a foam "barrier" surface on the other side. The "foil" side of the material was exposed to the flames.

MOUNTING METHOD:

The specimen was unrolled over 1/4 in. diameter steel rods, which were located directly on the tunnel ledges and spaced approximately 24 in. on center. The specimen material was butted tightly together to achieve the required 24 ft. length.

Non-combustible, fiber-reinforced cement board (1/4 in. thick) was placed over the specimen panels as lid protection.

TEST RESULTS:

The test results, computed on the basis of observed flame front advance and electronic smoke density measurements are presented in the table below.

The reported flame spread and smoke developed indices, as presented below, are the computed comparison to the standard calibration materials – mineral fiber-reinforced cement board and select grade red oak flooring. The cement board is used to establish relative 0 values for flame spread and smoke developed; red oak decks are used to establish relative 100 values for flame spread and smoke developed.

TEST NO.	MATERIAL TESTED	SIDE EXPOSED	SUPPORT	CALCULATED FLAME SPREAD	CALCULATED SMOKE DEVELOPED
1	"QuietWave BioFoam" Organic Flexible Acoustic Barrier	"Foil"	Steel Rods	10.76	9.91

	MATERIAL TESTED	SIDE EXPOSED	SUPPORT	FLAME SPREAD INDEX *	SMOKE DEVELOPED INDEX*
	RED OAK FLOORING	FINISHED	SELF SUPPORTING	100	100
	REINFORCED CEMENT BOARD	SYMMETRICAL	SELF SUPPORTING	0	0
1	"QuietWave BioFoam" Organic Flexible Acoustic Barrier	"Foil"	Steel Rods	**10**	**10**

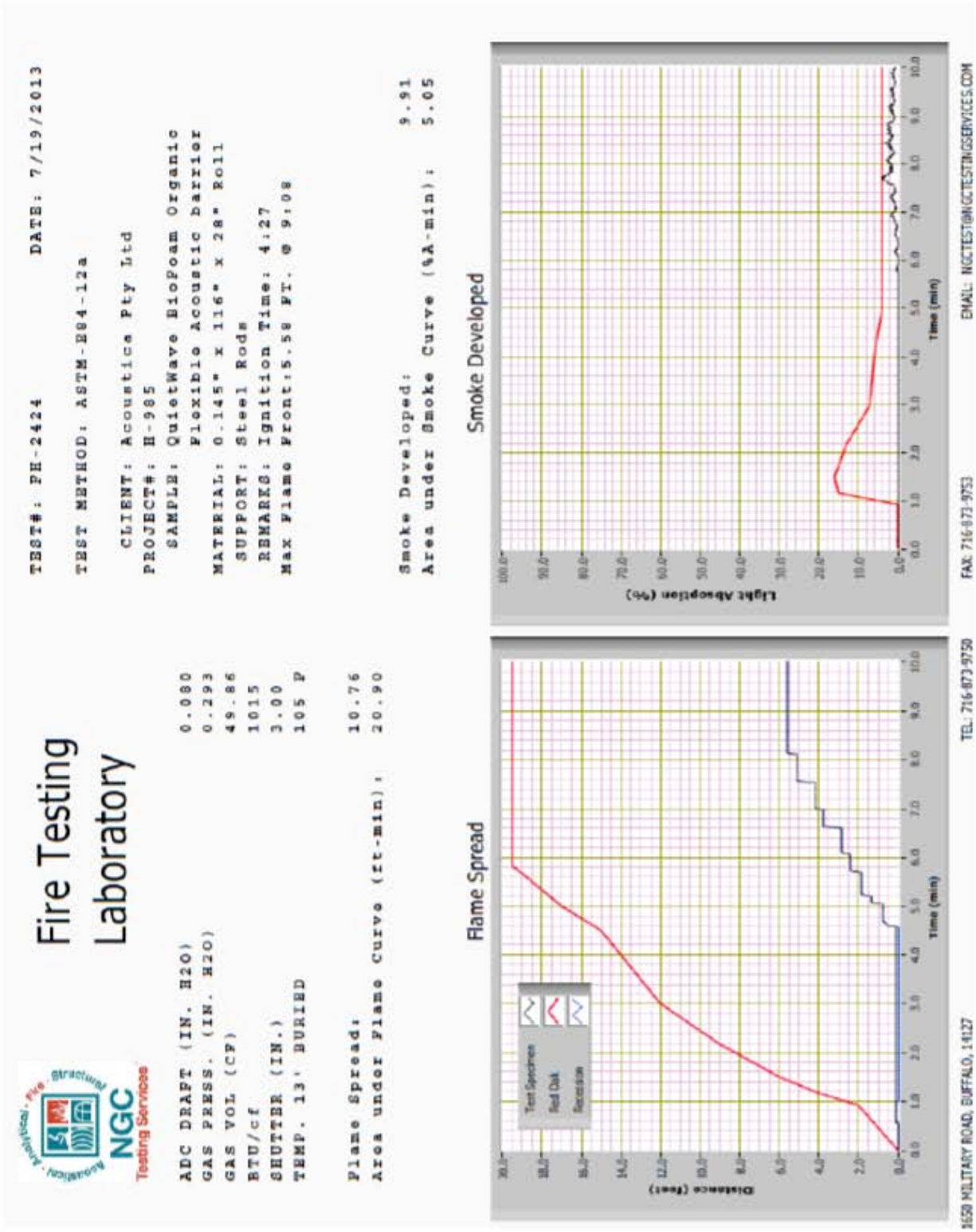
* Flame Spread / Smoke Developed Index is the result (or the average of the results of multiple tests), rounded to the nearest multiple of 5. Smoke developed results in excess of 200 are rounded to the nearest multiple of 50.	CLASSIFICATION	FSI	SDI
	CLASS "A"	0 - 25	0 - 450
	CLASS "B"	26 - 75	0 - 450
	CLASS "C"	76 - 200	0 - 450

The use of supporting materials on the underside of the test specimen may lower the flame spread index from those which might be obtained if the specimen could be tested without such support.

"QuietWave BioFoam
Organic Flexible Acoustic Barrier"

FLAME SPREAD INDEX	**10**
SMOKE DEVELOPED INDEX	**10**

The following data sheet is an actual printout of the computerized data system which monitors the tunnel furnace. The sheet contains all calibration and specimen data needed to calculate the test results.



Fire Testing Laboratory

NGC Testing Services

TEST#: PE-2424 DATE: 7/19/2013

TEST METHOD: ASTM-E84-12a

CLIENT: Acoustica Pty Ltd
PROJECT#: E-985
SAMPLE: QuietWave BioFoam Organic Flexible Acoustic Barrier
MATERIAL: 0.145" x 116" x 28" Roll
SUPPORT: Steel Rods
REMARKS: Ignition Time: 4:27
Max Flame Front:5.58 FT. @ 9:08

ADC DRAFT (IN. H2O)	0.080
GAS PRESS. (IN. H2O)	0.293
GAS VOL (CF)	49.86
BTU/cf	1015
SHUTTER (IN.)	3.00
TEMP. 13' BURIED	105 F

Flame Spread:	10.76
Area under Flame Curve (ft-min):	20.90

Smoke Developed: 9.91
Area under Smoke Curve (%A-min): 5.05

Smoke Developed

Light Absorption (%)

Time (min)

Flame Spread

Distance (feet)

Time (min)

Test Specimen
Red Oak
Reference

1650 MILITARY ROAD, BUFFALO, 14127 TEL: 716 873 9750 FAX: 716 873 9753 EMAIL: NGCTESTING@NGCTESTINGSERVICES.COM

ACOUSTIC CONSULTING

Determination of Sound Transmission Loss of Staggered Stud Plasterboard Partition Damped with Acoustiflex, Carried out for Acoustica at Rintoul Acoustic Laboratory, Seven Hills

Project 204 202

November 2004

Document Information

File: *204 202 R01*

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Contents

1 Introduction

Sound transmission loss tests were carried out with various types of Acoustica "Acoustiflex" sound damping used as a laminate in conjunction with plasterboard sheets installed in a staggered stud partition system. The tests were carried out at Rintoul, Seven Hills in a half-size acoustic laboratory.

Results of sound transmission loss tests are contained in this report.

Test numbers 1 and 2 were performed on Monday 1st November 2004, tests 3 to 6 were performed on Tuesday 2nd November 2004 and test 7 was performed on Wednesday 3rd November 2004.

The results listed in this report are based on measurements and analysis performed by PKA Acoustic Consulting.

2 Test Specimen Descriptions

A 64mm staggered steel stud, in 90mm track, frame was built in the opening on the source side of the two rooms with 70mm 20kg/m^2 polyester insulation in cavity. A total of seven tests with various laminate layers of Acoustiflex and 13mm standard plasterboard CD (Controlled Density) were carried out with this configuration.

The Acoustiflex and linings were screw fixed to the studs. Mastic was used to seal gaps around the perimeter and where the sheets of plasterboard join and was allowed to set for a short time before testing. Insulation was fitted between studs so there were no gaps or overlapping.

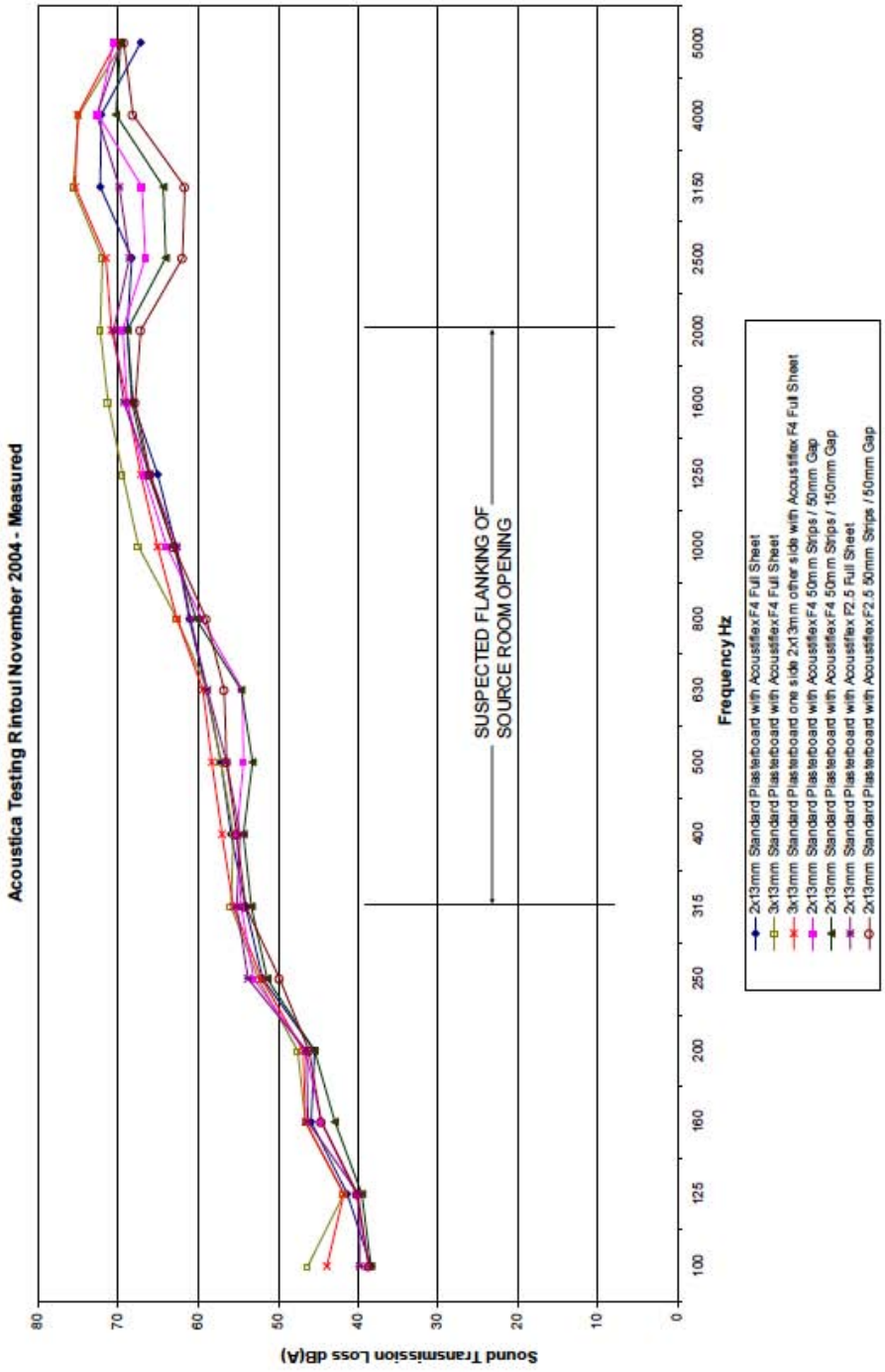
For four tests full single sheets of Acoustiflex were used between the plasterboard and shown on the result summary and transmission loss calculation sheets as full sheet. For the remaining tests strips of Acoustiflex were used between the plasterboard sheets. This is shown on the result summary and transmission loss calculation sheets as 50mm strips and 50mm gap (50% coverage) or 50mm strips and 150mm gap (25% coverage). Strips of Acoustiflex were used around the perimeter of the plasterboard.

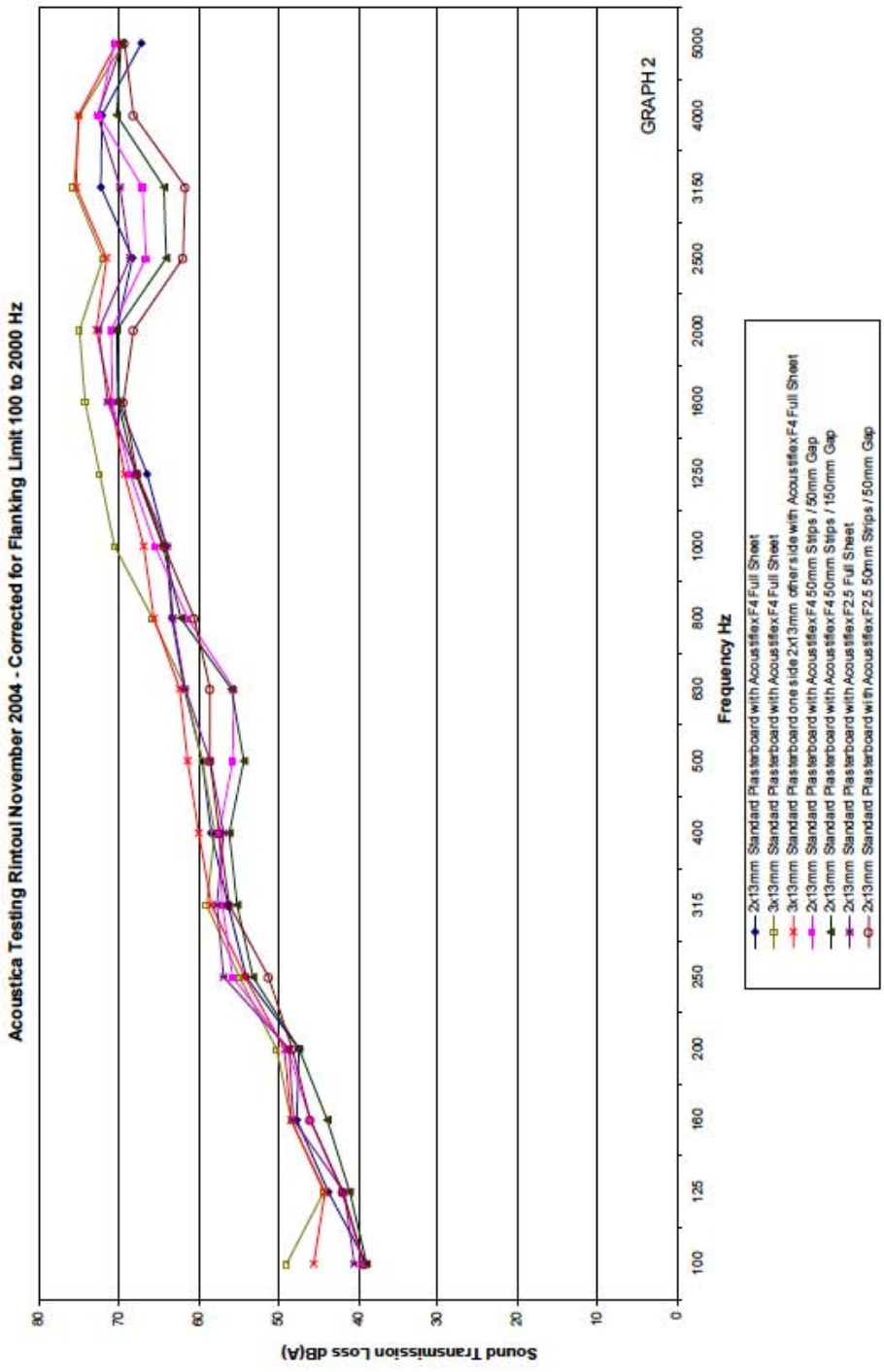
The complete list of tests and results are contained in the Result Summary.

3 Correction of Results

The results of all the Sound Transmission Loss measurements made under this program were graphed on the one sheet. This revealed that there was compression of the highest performances between 100 and 2000 Hz, this is shown on Graph 1. The acoustic limit for the single opening of the acoustic laboratory had been reached. These results are reported.

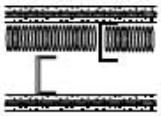
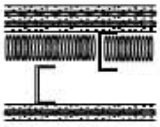
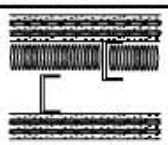
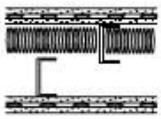
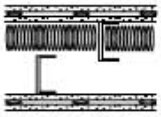
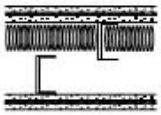
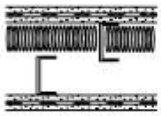
Appropriate corrections have been applied to the walls based on the performance of a number of walls that have been tested in the source room and then subsequently tested across the isolation gap at Rintoul or then tested at National Acoustic Laboratories. The corrected values are shown in Graph 2, however this still shows that there is some small limitation up to 2000Hz. The corrected values are also given in this report for comparison purposes.


Acoustica Testing Rintoul November 2004 - Measured
Sound Transmission Loss dB(A)
Frequency Hz
SUSPECTED FLANKING OF SOURCE ROOM OPENING
2x13mm Standard Plasterboard with Acoustiflex F4 Full Sheet
3x13mm Standard Plasterboard with Acoustiflex F4 Full Sheet
3x13mm Standard Plasterboard one side 2x13mm other side with Acoustiflex F4 Full Sheet
2x13mm Standard Plasterboard with Acoustiflex F4 50mm Strips / 50mm Gap
2x13mm Standard Plasterboard with Acoustiflex F4 50mm Strips / 150mm Gap
2x13mm Standard Plasterboard with Acoustiflex F2.5 Full Sheet
2x13mm Standard Plasterboard with Acoustiflex F2.5 50mm Strips / 50mm Gap


Acoustica Testing Rintoul November 2004 - Corrected for Flanking Limit 100 to 2000 Hz
GRAPH 2
Sound Transmission Loss dB(A)
Frequency Hz
2x13mm Standard Plasterboard with AcoustiflexF4 Full Sheet
3x13mm Standard Plasterboard with AcoustiflexF4 Full Sheet
3x13mm Standard Plasterboard one side 2x13mm other side with AcoustiflexF4 Full Sheet
2x13mm Standard Plasterboard with AcoustiflexF450mm Strips / 50mm Gap
2x13mm Standard Plasterboard with AcoustiflexF450mm Strips / 150mm Gap
2x13mm Standard Plasterboard with AcoustiflexF2.5 Full Sheet
2x13mm Standard Plasterboard with AcoustiflexF2.5 50mm Strips / 50mm Gap

4 Result Summary

Schedule of Test Configurations and Result Summary

Test No.	Reference	Wall Width (mm)	Source Room Lining	Steel Framing	Cavity / Infill	Receive Room Lining	Measured Results			Corrected Results		
							Rw	Ctr	Rw + Ctr	Rw	Ctr	Rw + Ctr
1		148	2 layers of 13mm Standard Plasterboard with Full Sheet of Acoustiflex F4 4kg/m2 In Between	64mm Staggered Studs In 90mm Track	70mm 20 kg/m2 Polyester	2 layers of 13mm Standard Plasterboard with Full Sheet of Acoustiflex F4 4kg/m2 In Between	60	-6	54	62	-7	55
2		164	3 layers of 13mm Standard Plasterboard with Full Sheet of Acoustiflex F4 4kg/m2 In Between	64mm Staggered Studs In 90mm Track	70mm 20 kg/m2 Polyester	2 layers of 13mm Standard Plasterboard with Full Sheet of Acoustiflex F4 4kg/m2 In Between	62	-6	56	64	-6	58
3		180	3 layers of 13mm Standard Plasterboard with Full Sheet of Acoustiflex F4 4kg/m2 In Between Each	64mm Staggered Studs In 90mm Track	70mm 20 kg/m2 Polyester	3 layers of 13mm Standard Plasterboard with Full Sheet of Acoustiflex F4 4kg/m2 In Between Each	62	-6	56	64	-5	59
4		148	2 layers of 13mm Standard Plasterboard with 50mm Strips and 50mm Gap of Acoustiflex F4 4kg/m2 In Between	64mm Staggered Studs In 90mm Track	70mm 20 kg/m2 Polyester	2 layers of 13mm Standard Plasterboard with 50mm Strips and 50mm Gap of Acoustiflex F4 4kg/m2 In Between	60	-7	53	61	-6	55
5		148	2 layers of 13mm Standard Plasterboard with 50mm Strips and 150mm Gap of Acoustiflex F4 4kg/m2 In Between	64mm Staggered Studs In 90mm Track	70mm 20 kg/m2 Polyester	2 layers of 13mm Standard Plasterboard with 50mm Strips and 150mm Gap of Acoustiflex F4 4kg/m2 In Between	59	-6	53	60	-6	54
6		146	2 layers of 13mm Standard Plasterboard with Full Sheet of Acoustiflex F2.5 2.5kg/m2 In Between	64mm Staggered Studs In 90mm Track	70mm 20 kg/m2 Polyester	2 layers of 13mm Standard Plasterboard with Full Sheet of Acoustiflex F2.5 2.5kg/m2 In Between	61	-7	54	63	-7	56
7		146	2 layers of 13mm Standard Plasterboard with 50mm Strips and 50mm Gap of Acoustiflex F2.5 2.5kg/m2 In Between	64mm Staggered Studs In 90mm Track	70mm 20 kg/m2 Polyester	2 layers of 13mm Standard Plasterboard with 50mm Strips and 50mm Gap of Acoustiflex F2.5 2.5kg/m2 In Between	59	-6	53	61	-6	55

5 Test Procedure

The tests were carried out on a 5.2m² (2.165m high x 2.4m wide) sample installed in Rintoul's acoustic development laboratory located at their plant at Seven Hills. The test facilities comprise a source room constructed of plasterboard, which is connected via a transmitting port to a floating receiving room also constructed of plasterboard. The test aperture is comprised of a timber and steel reveal on both the source and receiving sides. The laboratory is capable of Sound Transmission Class 71 from the source room to the receiving room.

The measurements were carried out in general accordance with Australian Standard AS 1191-2002 *Acoustics - Method for Laboratory Measurement of Air Borne Sound Transmission Loss of Building Partitions*. R_w results were calculated using the procedure in Australian Standard AS1276 (1999) *Acoustics – Rating of sound insulation in buildings and of building elements Part 1: Airborne sound insulation*. Differences between the test method used and the Standard are due to the size of the test samples and room volumes.

Pink noise was amplified and reproduced by a loudspeaker in the Send room. The loudspeaker was located in the corner of the room opposite the partition being tested. Determination of the space average sound field in the source and receiving rooms was carried out using a Type 1 Precision Sound Level Meter and measuring the average Sound Pressure Level in each room. The sound field in both source and receive rooms was sampled for 64 seconds using a continuous traverse to obtain a space-time average, as described in the Standard.

Three discrete microphone positions were used to sample reverberation time. At each position, two reverberation decays were recorded for each of two speaker locations. Interrupted pink noise was used for reverberation time. The microphone positions were at least 1.7m apart and at least 1.2m from any room surface. Microphone height was approximately 1.2-1.4m. The three microphone positions were not in a line and were not in any plane parallel to a room surface.

A field check of the calibration of the Sound Analyser was performed before and after the testing. No drift was observed.

The equipment used comprised the following: -

- Svantek Svan 949 Sound and Vibration Analyser.
- Bruel & Kjaer Type 4230 Sound Level Calibrator.
- PKA sound source with portable CD player and Jade 100W powered stage monitor.
- Portable laptop PC with sound card, running Windows 2000, for analysing data.

Room Volume of Source and Receiving Rooms

The room volumes are small, as the facility is a development laboratory. Using the formula given in AS 1191, the room is suitable for measurements of 200 Hz and above. In accordance with the Standard, the source and receiving room vary in volume by more than 10% and the ratio of room dimensions are in accordance with Appendix A.3.1.3 of the Standard. The sound field within both rooms has been calibrated and has been found to be uniformly distributed, even down to 100 Hz. Quadratic diffusers located on the wall and ceiling surfaces achieve sound diffusion within the room.

Measurements of standard plasterboard acoustic walls made in the Rintoul facilities compare very favourably with measurements of the same wall systems made in laboratories with 200 cubic metre source and receiving rooms. It is considered that the accuracy above 200 Hz is extremely good.

6 Calculation Criteria

The data from the 16 bands is compared to standard R_w contours. The highest standard contour that fits the data, subject to the following rules, gives the rating.

For R_w calculation;

- Frequency bands assessed from 100Hz 3150Hz.
- The test data is allowed to be below the standard contour, provided the total of the deficiencies is no more than 32 dB.

The R_w results are calculated using the procedure in Australian Standard AS1276 (1999) *Acoustics - Rating of sound insulation in buildings and of building elements Part 1: Airborne sound insulation*.

Discussion Of Corrections

Spectrum Adaptation Term (C_{tr})

This is the value, in decibels, to be added to the single-number rating (e.g. R_w) to take account of the characteristics of particular sound spectra. The spectrum is based on the characteristics of road traffic noise, however is also applicable to other types of noise source such as living activities (radio, music, tv), aircraft and rail noise, disco music, industrial noise etc.

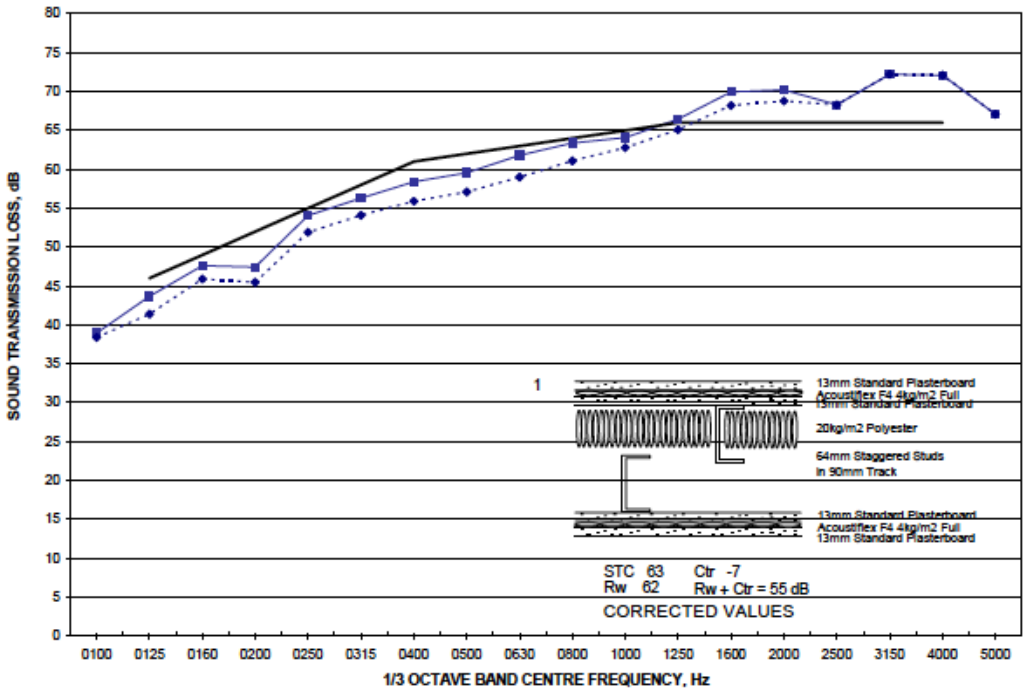
- C_{tr} adaptation term is based on the difference between the A-weighted levels in the source room and receiving room for road traffic noise.

7 Results

Calculation Sheet and Graphs Test 1 to Test 7

Acoustica - Rintoul Laboratory, Seven Hills - Nov '04

Test 1 - 2x13mm Standard Plasterboard with Acoustiflex F4 Full Sheet



Title: Acoustica - Rintoul Laboratory, Seven Hills - Nov '04 **Reference:**

Type:

Description of sample: Test 1 - 2x13mm Standard Plasterboard with Acoustiflex F4 Full Sheet

Typical Frame Construction - 64mm staggered studs in 90mm track with 70mm 20kg/m2 polyester insulation in cavity. Clad with a number of layers of 13mm Standard Plasterboard CD and Acoustiflex in between plasterboard sheets.

Configuration:

Test date: Day 1 Month November Year 2004

Test Data:

Rintoul correction (100-200Hz only): 4 -2 2

Description	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000
	Octave Band Centre Frequency (Hz)																				
Source level (SPL dB)				90.2	93.9	93.0	89.6	92.3	93.9	93.2	93.9	94.8	96.1	95.9	96.3	95.0	97.1	90.3	84.9	80.1	75.2
Source level (SPL dB)				90.6	94.1	92.8	89.2	92.1	94.1	93.2	94.3	95.1	96.4	96.3	96.5	95.3	97.2	90.2	84.9	80.0	74.8
Average Source level (SPL dB)				90.4	94.0	92.9	89.4	92.2	94.0	93.2	94.1	95.0	96.3	96.1	96.4	95.2	97.2	90.3	84.9	80.1	75.0
Receive level (SPL dB)				58.1	51.7	51.3	47.7	44.0	42.0	39.2	38.2	37.0	35.9	34.0	32.1	27.6	29.2	23.0	15.0	12.7	12.7
Receive level (SPL dB)				58.5	52.2	51.4	47.2	43.8	41.6	39.5	39.0	37.5	36.4	34.3	32.4	28.0	29.4	22.8	15.2	12.4	12.2
Average Receive level (SPL dB)				58.3	52.0	51.4	47.5	43.9	41.8	39.4	38.6	37.3	36.2	34.2	32.3	27.8	29.3	22.9	15.1	12.6	12.5
Ambient (SPL dB)				25.2	19.3	17.2	12.7	14.8	13.6	13.8	10.3	9.5	10.2	8.6	9.0	8.6	9.0	9.3	9.6	10.4	10.8
Ambient correction (dB)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	1.5	4.0	4.0
Level difference				36.1	40.2	43.7	41.9	48.3	51.9	54.0	55.7	57.8	60.2	61.9	64.2	67.5	67.9	67.5	71.4	71.4	66.5
Rm volume 22.57 RT60				1.18	0.91	1.15	1.59	1.59	1.15	1.08	0.96	0.92	0.86	0.86	0.86	0.83	0.87	0.85	0.84	0.83	0.80
Test area 5.196 Rm cor				2.3	1.2	2.2	3.6	3.6	2.2	1.9	1.4	1.2	0.9	0.9	0.9	0.7	0.9	0.8	0.8	0.7	0.6
Measured Transmission loss				38.4	41.4	45.9	45.5	51.9	54.1	55.9	57.1	59.0	61.1	62.8	65.1	68.2	68.8	68.3	72.2	72.1	67.1
Corrected Transmission loss				**39.0**	**43.7**	**47.6**	**47.4**	**54.1**	**56.3**	**58.4**	**59.6**	**61.8**	**63.4**	**64.1**	**66.5**	**70.0**	**70.2**	**68.3**	**72.2**	**72.1**	**67.1**
Deficiencies -30				-8	-3	-2	-6	-2	-3	-4	-3	-2	-2	-2	-1						

Results: Corrected

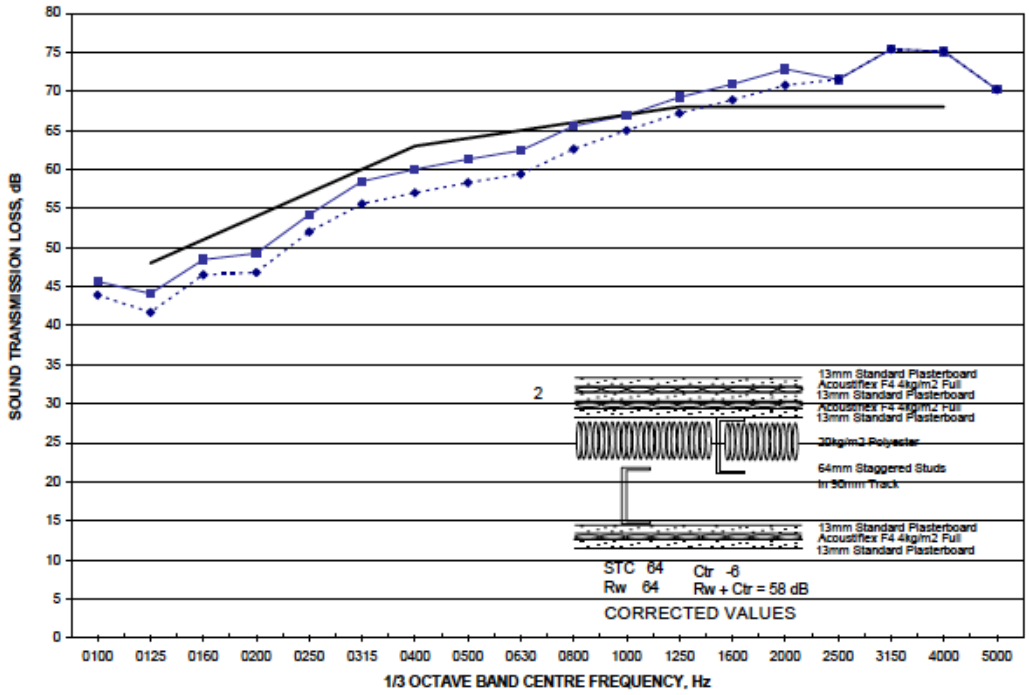
STC 63 (limited by 200 Hz frequency band)

Rw 62 (limited by 100 Hz frequency band) **Rw + Ctr = 55 dB**

Ctr -7 (limited by 100 Hz frequency band)

Acoustica - Rintoul Laboratory, Seven Hills - Nov '04

Test 2 - 3x13mm Standard Plasterboard one side 2x13mm other side with Acoustiflex F4 Full Sheet



Title: Acoustica - Rintoul Laboratory, Seven Hills - Nov '04 **Reference:**

Type:

Description of sample: Test 2 - 3x13mm Standard Plasterboard one side 2x13mm other side with Acoustiflex F4 Full Sheet Typical Frame Construction - 64mm staggered studs in 90mm track with 70mm 20kg/m2 polyester insulation in cavity. Clad with a number of layers of 13mm Standard Plasterboard CD and Acoustiflex in between plasterboard sheets.

Configuration:

Test date: Day 1 Month Novembe Year 2004

Rintoul correction (100-200Hz only): 4 -2 2

Test Data:

Description	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000
				Octave Band Centre Frequency (Hz)																	
Source level (SPL dB)				94.3	97.8	96.8	91.6	94.6	96.6	96.4	96.6	98.0	99.2	99.5	99.9	98.6	100.4	93.5	88.0	83.1	78.0
Source level (SPL dB)				94.0	98.2	95.9	91.5	94.2	96.6	96.2	96.4	97.9	99.3	99.6	100.2	99.1	100.4	92.7	87.6	82.9	77.6
Average Source level (SPL dB)				94.2	98.0	96.4	91.6	94.4	96.6	96.3	96.5	98.0	99.3	99.6	100.1	98.9	100.4	93.1	87.8	83.0	77.8
Receive level (SPL dB)				56.5	54.9	54.0	48.6	45.8	43.4	41.4	39.7	39.8	37.6	35.4	33.6	30.4	30.5	23.0	15.0	12.8	12.4
Receive level (SPL dB)				56.5	54.9	54.1	48.2	45.0	43.2	41.7	39.8	40.2	37.7	35.4	33.7	30.4	30.5	23.1	16.0	13.6	12.7
Average Receive level (SPL dB)				56.5	54.9	54.1	48.4	45.4	43.3	41.6	39.8	40.0	37.7	35.4	33.7	30.4	30.5	23.1	15.5	13.2	12.6
Ambient (SPL dB)				25.2	19.3	17.2	12.7	14.8	13.6	13.8	10.3	9.5	10.2	8.6	9.0	8.6	9.0	9.3	9.6	10.4	10.8
Ambient correction (dB)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.5	4.0	4.0
Level difference				41.7	40.9	44.8	43.0	48.8	53.2	55.0	56.9	58.2	61.6	64.1	66.3	68.2	69.9	70.7	74.5	74.3	69.6
Rm volume 22.57 RT60				1.17	0.85	1.04	1.68	1.47	1.22	1.11	0.97	0.91	0.87	0.87	0.85	0.83	0.86	0.85	0.86	0.84	0.81
Test area 5.196 Rm cor				2.2	0.8	1.7	3.8	3.2	2.4	2	1.4	1.2	1	0.9	0.9	0.7	0.9	0.8	0.9	0.8	0.6
Measured Transmission loss				43.9	41.7	46.5	46.8	52.0	55.6	57.0	58.3	59.4	62.6	65.0	67.2	68.9	70.8	71.5	75.4	75.1	70.2
Corrected Transmission loss				**45.6**	**44.11**	**48.4**	**49.3**	**54.2**	**58.5**	**60.0**	**61.3**	**62.4**	**65.6**	**66.9**	**69.2**	**70.9**	**72.8**	**71.5**	**75.4**	**75.1**	**70.2**
Deficiencies -26				-2	-4	-3	-5	-3	-2	-3	-3	-3	0	0							

Results: Corrected

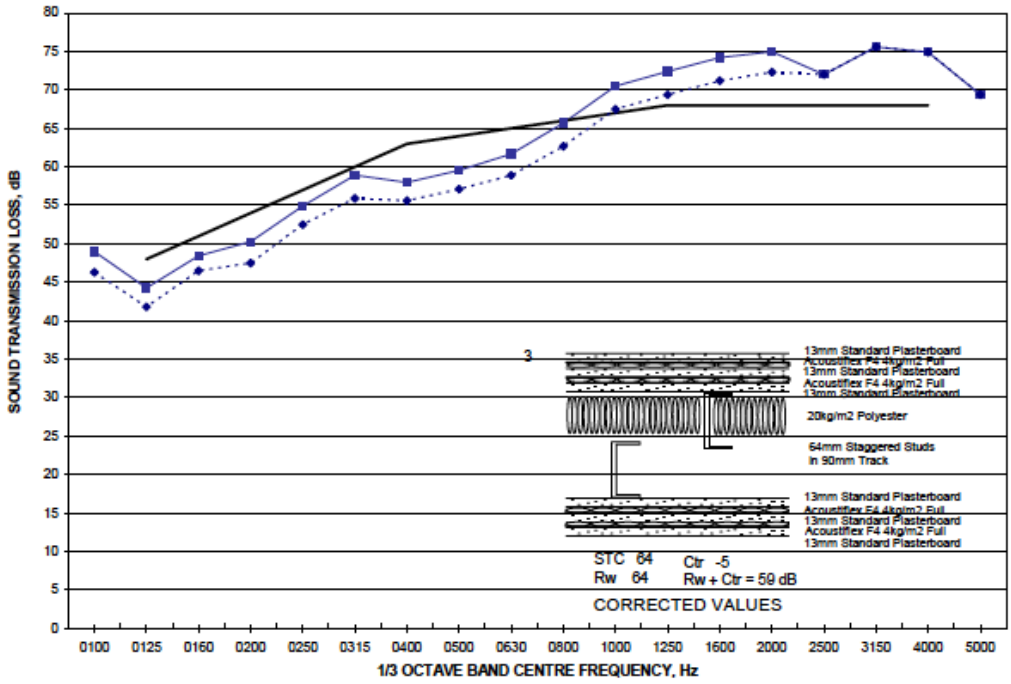
STC 64 (limited by 200 Hz frequency band)

Rw 64 (limited by 200 Hz frequency band) **Rw + Ctr = 58 dB**

Ctr -6 (limited by 125 Hz frequency band)

Acoustica - Rintoul Laboratory, Seven Hills - Nov '04

Test 3 - 3x13mm Standard Plasterboard with Acoustiflex F4 Full Sheet



Title: Acoustica - Rintoul Laboratory, Seven Hills - Nov '04 **Reference:**

Type:

Description of sample: Test 3 - 3x13mm Standard Plasterboard with Acoustiflex F4 Full Sheet

Typical Frame Construction - 64mm staggered studs in 90mm track with 70mm 20kg/m2 polyester insulation in cavity. Clad with a number of layers of 13mm Standard Plasterboard CD and Acoustiflex in between plasterboard sheets.

Configuration:

Test date: Day 2 Month November Year 2004

Rintoul correction (100-200Hz only)

Test Data:

Description	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000
				4	-2	2	Octave Band Centre Frequency (Hz)														
Source level (SPL dB)				94.1	97.7	96.4	91.5	93.6	96.3	95.5	96.1	97.8	98.7	99.3	99.7	98.9	100.1	92.5	87.3	82.6	77.2
Source level (SPL dB)				94.2	97.8	96.4	91.4	94.0	96.3	96.0	96.1	97.7	99.2	99.3	99.8	98.9	100.0	92.4	87.2	82.5	77.3
Average Source level (SPL dB)				94.2	97.8	96.4	91.5	93.8	96.3	95.8	96.1	97.8	99.0	99.3	99.8	98.9	100.1	92.5	87.3	82.6	77.3
Receive level (SPL dB)				53.8	54.8	53.8	47.1	43.7	42.2	41.4	40.1	39.8	36.8	32.7	31.3	28.4	28.7	21.7	14.2	12.6	12.5
Receive level (SPL dB)				53.9	54.5	53.1	47.0	43.9	42.5	41.4	40.2	40.0	36.8	32.8	31.3	28.5	28.6	21.7	14.1	12.2	12.1
Average Receive level (SPL dB)				53.9	54.7	53.5	47.1	43.8	42.4	41.4	40.2	39.9	36.8	32.8	31.3	28.5	28.7	21.7	14.2	12.4	12.3
Ambient (SPL dB)				25.2	19.3	17.2	12.7	14.8	13.6	13.8	10.3	9.5	10.2	8.6	9.0	8.6	9.0	9.3	9.6	10.4	10.8
Ambient correction (dB)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.8	4.0	4.0
Level difference				44.3	40.9	44.6	44.4	49.9	54.1	54.1	56.0	58.0	61.9	66.6	68.4	70.5	71.4	71.1	74.9	74.0	68.7
Rm volume 22.57 RT60				1.10	0.85	1.10	1.42	1.28	1.05	0.99	0.90	0.87	0.83	0.86	0.88	0.83	0.85	0.85	0.82	0.85	0.81
Test area 5.196 Rm cor				2	0.9	1.9	3.1	2.6	1.8	1.5	1.1	0.9	0.8	0.9	1	0.7	0.9	0.9	0.7	0.9	0.7
Measured Transmission loss				46.3	41.8	46.5	47.5	52.5	55.9	55.6	57.1	58.9	62.7	67.5	69.4	71.2	72.3	72.0	75.6	74.9	69.4
Corrected Transmission loss				49.0	44.25	48.4	50.3	54.9	58.9	58.0	59.6	61.7	65.7	70.5	72.4	74.2	75.0	72.0	75.6	74.9	69.4
Deficiencies -26					-4	-3	-4	-2	-1	-5	-4	-3	0								

Results: Corrected

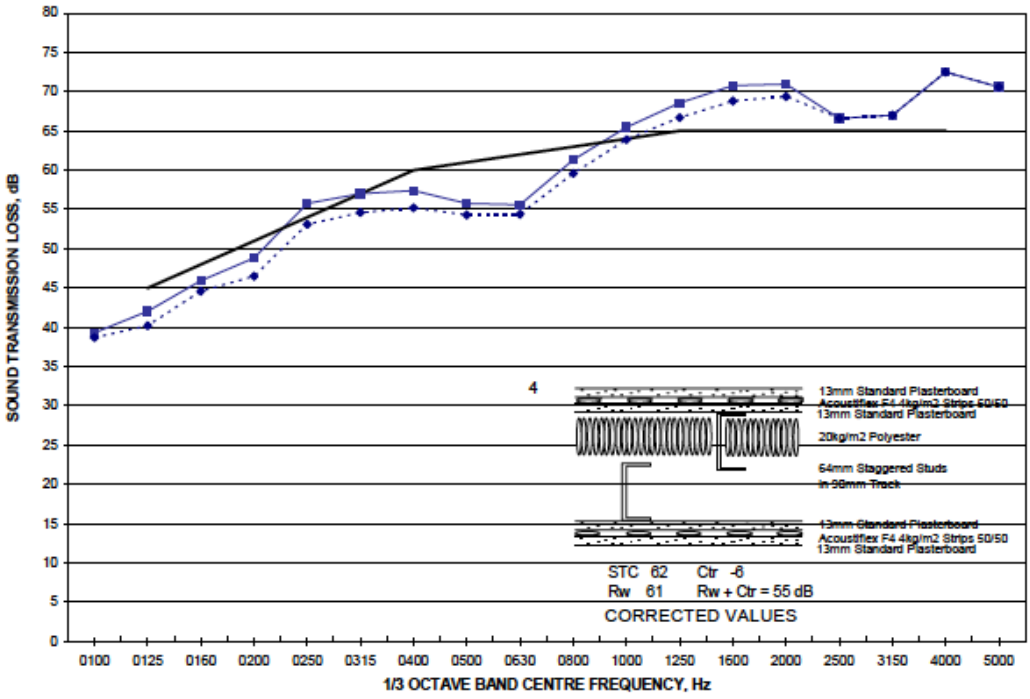
STC 64 (limited by 400 Hz frequency band)

Rw 64 (limited by 400 Hz frequency band) **Rw + Ctr = 59 dB**

Ctr -5 (limited by 125 Hz frequency band)

Acoustica - Rintoul Laboratory, Seven Hills - Nov '04

Test 4 - 2x13mm Standard Plasterboard with Acoustiflex F4 50mm Strips / 50mm Gap



Title: Acoustica - Rintoul Laboratory, Seven Hills - Nov '04 **Reference:**

Type:

Description of sample: Test 4 - 2x13mm Standard Plasterboard with Acoustiflex F4 50mm Strips / 50mm Gap

Typical Frame Construction - 64mm staggered studs in 90mm track with 70mm 20kg/m2 polyester insulation in cavity. Clad with a number of layers of 13mm Standard Plasterboard CD and Acoustiflex in between plasterboard sheets.

Configuration:

Test date: Day 2 Month Novembe Year 2004

Rintoul correction (100-200Hz only) 4 -2 2

Test Data:

Description	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000
				Octave Band Centre Frequency (Hz)																	
Source level (SPL dB)				94.6	97.6	96.3	92.2	94.9	96.8	96.5	97.0	98.3	99.7	99.8	100.3	99.3	100.6	93.4	88.3	83.4	78.3
Source level (SPL dB)				93.9	97.4	96.3	91.8	94.6	96.8	96.0	96.8	98.1	99.6	100.0	100.3	99.6	100.4	92.7	87.7	83.2	77.8
Average Source level (SPL dB)				94.3	97.5	96.3	92.0	94.8	96.8	96.3	96.9	98.2	99.7	99.9	100.3	99.5	100.5	93.1	88.0	83.3	78.1
Receive level (SPL dB)				62.1	56.8	55.4	49.5	45.0	44.4	43.2	43.8	44.8	41.0	36.8	34.6	31.2	32.1	27.7	22.3	14.1	12.5
Receive level (SPL dB)				62.1	56.4	55.4	49.5	45.0	44.2	43.0	43.8	44.8	40.8	36.7	34.5	31.3	32.1	27.7	22.3	14.1	12.5
Average Receive level (SPL dB)				62.1	56.6	55.4	49.5	45.0	44.3	43.1	43.8	44.8	40.9	36.8	34.6	31.3	32.1	27.7	22.3	14.1	12.5
Ambient (SPL dB)				25.2	19.3	17.2	12.7	14.8	13.6	13.8	10.3	9.5	10.2	8.6	9.0	8.6	9.0	9.3	9.6	10.4	10.8
Ambient correction (dB)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	2.4	4.0
Level difference				36.2	38.8	42.9	42.7	49.9	52.4	53.3	53.2	53.5	58.7	63.0	65.7	68.1	68.5	65.8	66.2	71.7	69.8
Rm volume 22.57 RT60				1.25	0.96	1.03	1.69	1.46	1.15	1.07	0.90	0.86	0.86	0.87	0.87	0.82	0.86	0.85	0.84	0.85	0.84
Test area 5.196 Rm cor				2.5	1.4	1.7	3.8	3.2	2.2	1.9	1.1	0.9	0.9	0.9	1	0.7	0.9	0.8	0.8	0.8	0.8
Measured Transmission loss				38.7	40.2	44.6	46.5	53.1	54.6	55.2	54.3	54.4	59.6	63.9	66.7	68.8	69.4	66.6	67.0	72.5	70.6
Corrected Transmission loss				**39.3**	**42.03**	**45.9**	**48.8**	**55.8**	**57.0**	**57.4**	**55.8**	**55.6**	**61.3**	**65.5**	**68.6**	**70.8**	**71.0**	**66.6**	**67.0**	**72.5**	**70.6**
Deficiencies -31				-7	-4	-3	-3		-1	-4	-6	-7	-3	0							

Results: Corrected

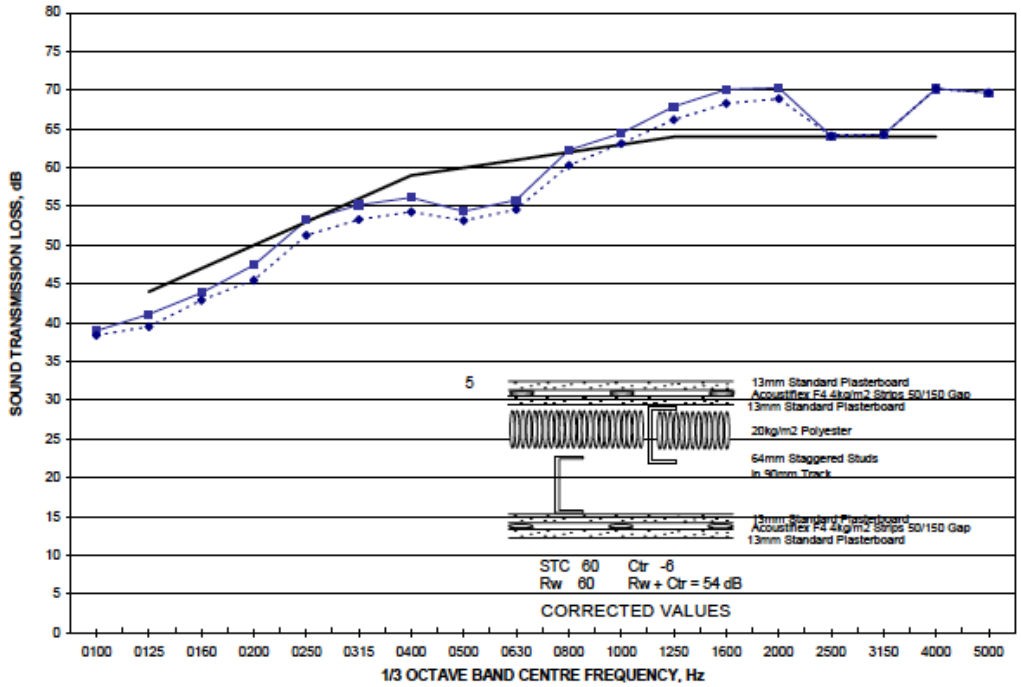
STC 62 (limited by 630 Hz frequency band)

Rw 61 (limited by 100 Hz frequency band) **Rw + Ctr = 55 dB**

Ctr -6 (limited by 100 Hz frequency band)

Acoustica - Rintoul Laboratory, Seven Hills - Nov '04

Test 5 -2x13mm Standard Plasterboard with Acoustiflex F4 50mm Strips / 150mm Gap



Title: Acoustica - Rintoul Laboratory, Seven Hills - Nov '04 **Reference:**

Type:

Description of sample: Test 5 -2x13mm Standard Plasterboard with Acoustiflex F4 50mm Strips / 150mm Gap

Typical Frame Construction - 64mm staggered studs in 90mm track with 70mm 20kg/m2 polyester insulation in cavity. Clad with a number of layers of 13mm Standard Plasterboard CD and Acoustiflex in between plasterboard sheets.

Configuration:

Test date: Day 2 Month November Year 2004

Rintoul correction (100-200Hz only) 4 -2 2

Test Data: Octave Band Centre Frequency (Hz)

Description	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000
Source level (SPL dB)				93.9	97.9	96.6	91.6	94.4	96.6	96.7	96.3	98.0	99.5	99.5	100.1	99.1	100.3	93.0	87.9	83.0	77.8
Source level (SPL dB)				94.4	97.9	96.4	91.6	93.8	96.5	96.0	96.4	98.0	99.5	99.8	100.1	99.4	100.1	92.5	87.5	82.8	77.6
Average Source level (SPL dB)				94.2	97.9	96.5	91.6	94.1	96.6	96.4	96.4	98.0	99.5	99.7	100.1	99.3	100.2	92.8	87.7	82.9	77.7
Receive level (SPL dB)				62.1	57.5	57.1	49.5	45.9	45.7	44.2	44.3	44.4	40.3	37.4	35.0	31.6	32.3	29.6	24.5	15.4	12.9
Receive level (SPL dB)				62.5	57.5	57.2	49.2	46.0	45.3	44.2	44.1	44.5	40.4	37.4	35.0	31.6	32.2	29.5	24.3	15.0	12.5
Average Receive level (SPL dB)				62.3	57.5	57.2	49.4	46.0	45.5	44.2	44.2	44.5	40.4	37.4	35.0	31.6	32.3	29.6	24.4	15.2	12.7
Ambient (SPL dB)				25.2	19.3	17.2	12.7	14.8	13.6	13.8	10.3	9.5	10.2	8.6	9.0	8.6	9.0	9.3	9.6	10.4	10.8
Ambient correction (dB)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.7	4.0
Level difference				35.9	38.4	41.5	42.1	48.5	50.9	52.5	52.0	53.6	59.2	62.1	65.1	67.5	68.0	63.4	63.5	69.3	68.9
Rm volume 22.57 RT60				1.25	0.90	0.97	1.54	1.34	1.22	1.06	0.92	0.89	0.91	0.88	0.90	0.84	0.85	0.83	0.84	0.86	0.83
Test area 5.196 Rm cor				2.5	1.1	1.4	3.4	2.8	2.4	1.8	1.2	1	1.1	1	1.1	0.8	0.9	0.7	0.8	0.9	0.8
Measured Transmission loss				38.4	39.5	42.9	45.5	51.3	53.3	54.3	53.2	54.6	60.3	63.1	66.2	68.3	68.9	64.1	64.3	70.2	69.7
Corrected Transmission loss				**39.0**	**41.1**	**43.9**	**47.4**	**53.2**	**55.2**	**56.2**	**54.4**	**55.8**	**62.3**	**64.4**	**67.9**	**70.1**	**70.3**	**64.1**	**64.3**	**70.2**	**69.7**
Deficiencies -24				-5	-3	-3	-3	0	-1	-3	-6	-5	0					0	0		

Results: Corrected

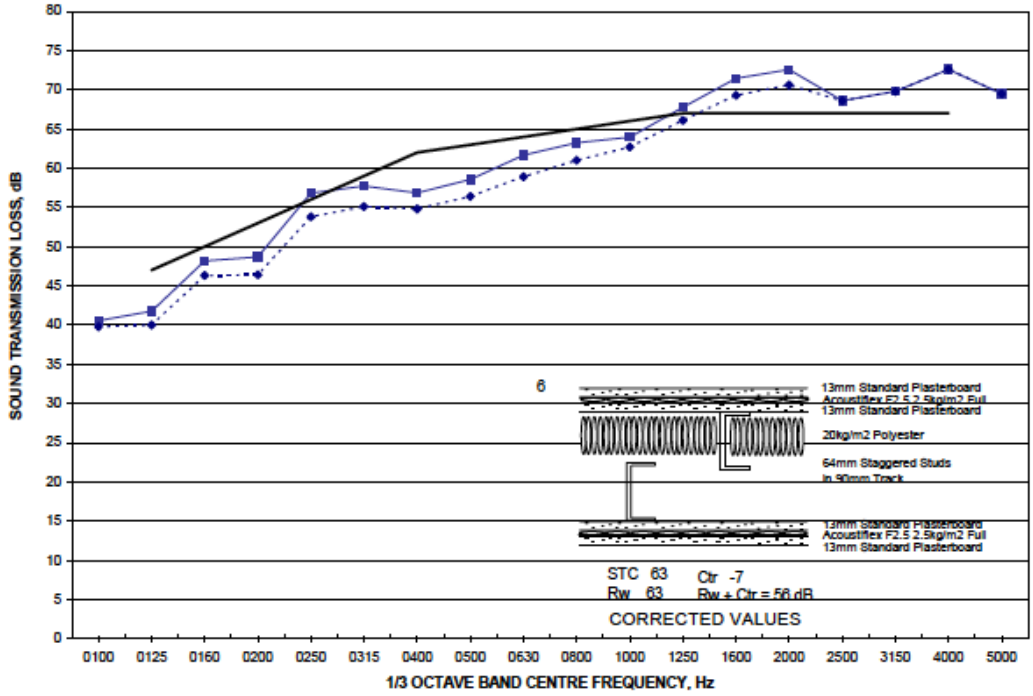
STC 60 (limited by 500 Hz frequency band)

Rw 60 (limited by 500 Hz frequency band) **Rw + Ctr = 54 dB**

Ctr -6 (limited by 100 Hz frequency band)

Acoustica - Rintoul Laboratory, Seven Hills - Nov '04

Test 6 - 2x13mm Standard Plasterboard with Acoustiflex F2.5 Full Sheet



Title: Acoustica - Rintoul Laboratory, Seven Hills - Nov '04 **Reference:**

Type:

Description of sample: Test 6 - 2x13mm Standard Plasterboard with Acoustiflex F2.5 Full Sheet

Typical Frame Construction - 64mm staggered studs in 90mm track with 70mm 20kg/m2 polyester insulation in cavity. Clad with a number of layers of 13mm Standard Plasterboard CD and Acoustiflex in between plasterboard sheets.

Configuration:

Test date: Day 2 Month November Year 2004

Rintoul correction (100-200Hz only)

Test Data:

Description	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000
				4	-2	2	Octave Band Centre Frequency (Hz)														
Source level (SPL dB)				94.5	97.7	97.1	92.1	94.8	97.0	96.5	96.8	98.2	99.6	99.6	100.0	99.1	100.5	93.0	87.8	83.0	77.8
Source level (SPL dB)				94.0	97.2	96.7	91.6	94.3	96.3	96.2	96.8	98.1	99.2	99.4	100.0	99.4	100.1	92.3	87.4	82.8	77.4
Average Source level (SPL dB)				94.3	97.5	96.9	91.9	94.6	96.7	96.4	96.8	98.2	99.4	99.5	100.0	99.3	100.3	92.7	87.6	82.9	77.6
Receive level (SPL dB)				60.8	56.6	54.6	49.5	44.7	44.2	43.7	41.7	40.5	39.5	37.6	34.8	30.6	30.8	25.3	19.3	13.9	12.9
Receive level (SPL dB)				60.8	56.5	55.1	49.6	44.5	44.2	43.5	41.6	40.6	39.4	37.7	34.9	30.6	30.8	25.3	19.2	13.4	12.5
Average Receive level (SPL dB)				60.8	56.6	54.9	49.6	44.6	44.2	43.6	41.7	40.6	39.5	37.7	34.9	30.6	30.8	25.3	19.3	13.7	12.7
Ambient (SPL dB)				25.2	19.3	17.2	12.7	14.8	13.6	13.8	10.3	9.5	10.2	8.6	9.0	8.6	9.0	9.3	9.6	10.4	10.8
Ambient correction (dB)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	2.6	4.0
Level difference				37.5	39.1	44.5	42.6	50.1	52.8	52.8	55.1	57.7	60.1	62.0	65.2	68.5	69.7	67.8	69.0	71.7	68.9
Rm volume 22.57 RT60				1.18	0.85	1.05	1.69	1.65	1.19	1.11	0.95	0.92	0.87	0.83	0.85	0.85	0.87	0.85	0.83	0.85	0.81
Test area 5.196 Rm cor				2.3	0.9	1.8	3.8	3.7	2.3	2	1.3	1.2	0.9	0.7	0.9	0.8	0.9	0.8	0.8	0.9	0.6
Measured Transmission loss				39.8	40	46.3	46.4	53.8	55.1	54.8	56.4	58.9	61.0	62.7	66.1	69.3	70.6	68.6	69.8	72.6	69.5
Corrected Transmission loss				**40.6**	**41.76**	**48.2**	**48.7**	**56.8**	**57.7**	**56.8**	**58.6**	**61.7**	**63.2**	**63.9**	**67.8**	**71.5**	**72.6**	**68.6**	**69.8**	**72.6**	**69.5**
Deficiencies -27				-6	-5	-2	-4		-1	-5	-4	-2	-2	-2							

Results: Corrected

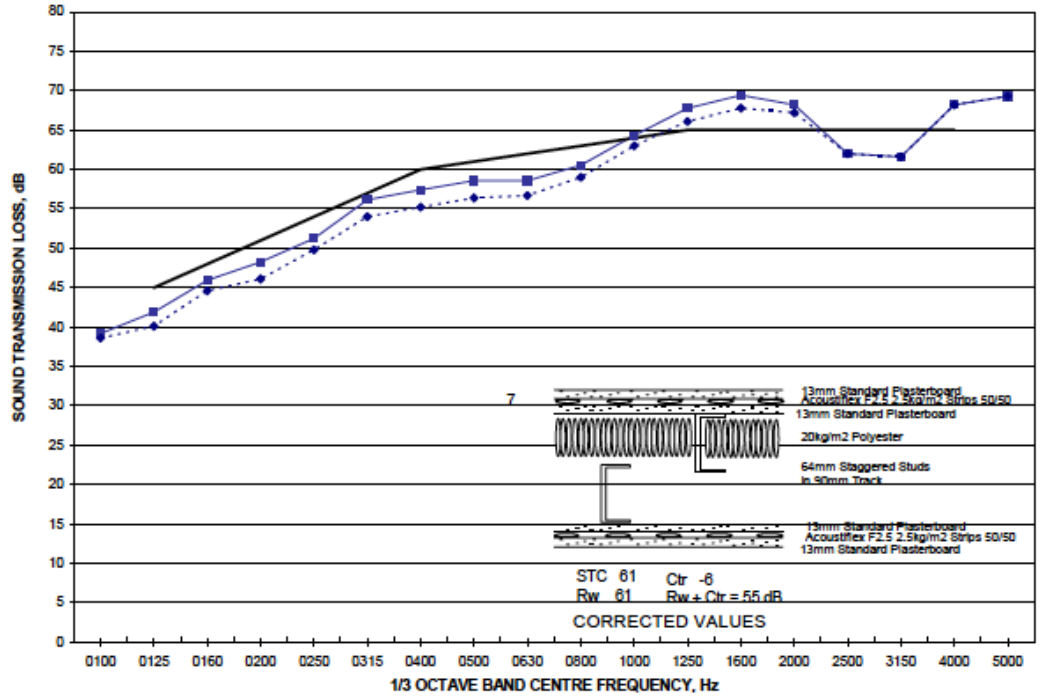
STC 63 (limited by 125 Hz frequency band)

Rw 63 (limited by 100 Hz frequency band) **Rw + Ctr = 56 dB**

Ctr -7 (limited by 100 Hz frequency band)

Acoustica - Rintoul Laboratory, Seven Hills - Nov '04

Test 7 - 2x13mm Standard Plasterboard with Acoustiflex F2.5 50mm Strips / 50mm Gap



Title: Acoustica - Rintoul Laboratory, Seven Hills - Nov '04 **Reference:**

Type:

Description of sample: Test 7 - 2x13mm Standard Plasterboard with Acoustiflex F2.5 50mm Strips / 50mm Gap

Typical Frame Construction - 64mm staggered studs in 90mm track with 70mm 20kg/m2 polyester insulation in cavity. Clad with a number of layers of 13mm Standard Plasterboard CD and Acoustiflex in between plasterboard sheets.

Configuration:

Day Month Year

Test date: 3 November 2004

Rintoul correction (100-200Hz only)

Test Data: 4 -2 2

Description	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000
	Octave Band Centre Frequency (Hz)																				
Source level (SPL dB)				93.8	97.8	97.3	92.4	94.2	96.8	96.4	97.2	98.3	99.5	100.0	100.5	99.0	100.7	93.3	88.0	82.8	77.5
Source level (SPL dB)				93.6	97.6	96.7	92.2	94.2	96.7	96.4	96.9	98.2	99.4	100.0	100.5	99.0	100.6	93.0	87.6	82.6	77.3
Average Source level (SPL dB)				93.7	97.7	97.0	92.3	94.2	96.8	96.4	97.1	98.3	99.5	100.0	100.5	99.0	100.7	93.2	87.8	82.7	77.4
Receive level (SPL dB)				60.8	56.7	56.6	49.9	47.1	44.9	42.7	42.1	42.7	41.3	37.9	35.3	32.0	34.2	32.0	27.0	16.3	12.2
Receive level (SPL dB)				61.4	57.0	56.5	50.2	47.1	44.6	42.6	42.5	42.8	41.6	38.0	35.3	32.0	34.2	32.0	27.1	16.4	12.4
Average Receive level (SPL dB)				61.1	56.9	56.6	50.1	47.1	44.8	42.7	42.3	42.8	41.5	38.0	35.3	32.0	34.2	32.0	27.1	16.4	12.3
Ambient (SPL dB)				25.2	19.3	17.2	12.7	14.8	13.6	13.8	10.3	9.5	10.2	8.6	9.0	8.6	9.0	9.3	9.6	10.4	10.8
Ambient correction (dB)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.3	4.0
Level difference				36.6	39.1	42.7	42.5	47.1	51.9	53.7	55.1	55.6	58.2	62.1	65.2	67.0	66.5	61.3	61.1	67.8	69.3
Rm volume 22.57 RT60				1.11	0.89	1.08	1.61	1.30	1.14	0.99	0.95	0.91	0.85	0.87	0.86	0.84	0.82	0.81	0.79	0.77	0.70
Test area 5.196 Rm cor				2	1	1.9	3.6	2.7	2.1	1.5	1.3	1.1	0.8	0.9	0.9	0.8	0.7	0.7	0.5	0.4	0
Measured Transmission loss				38.6	40.1	44.6	46.1	49.8	54.0	55.2	56.4	56.7	59.0	63.0	66.1	67.8	67.2	62.0	61.6	68.2	69.3
Corrected Transmission loss				**39.2**	**41.9**	**45.9**	**48.3**	**51.3**	**56.2**	**57.4**	**58.6**	**58.6**	**60.5**	**64.3**	**67.8**	**69.4**	**68.2**	**62.0**	**61.6**	**68.2**	**69.3**
Deficiencies -28				-6	-3	-2	-3	-3	-1	-3	-2	-3	-2	0				-3	-3		

Results: Corrected

STC 61 (limited by 125 Hz frequency band)

Rw 61 (limited by 100 Hz frequency band) **Rw + Ctr = 55 dB**

Ctr -6 (limited by 100 Hz frequency band)

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Airborne Sound Transmission Results
Acoustica 'Quietwave'
Rintoul Laboratory
Seven Hills

Project 206 078

August 2006

File : *206 078 R02 Rintoul Testing Results August 2006*

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Contents

1 Introduction

This report provides the results of Sound Transmission Loss tests for Acoustica. The tests were carried out in a half-size acoustic laboratory to determine the performance of Acoustica Quietwave with various types of plasterboard.

Test numbers 1 and 2 were performed on Thursday 10th August 2006 and test 3 was performed on Friday 11th August 2006.

The results listed in this report are based on measurements and analysis performed by PKA Acoustic Consulting.

2 Test Specimen Descriptions

The tests were of steel stud plasterboard walls using Acoustica Quietwave visco-elastic captive membrane. For each test a 70mm single steel stud frame was used with 50mm 14kg/m^3 Sheffield glasswool as cavity infill. The stud frame was installed on the source side of the laboratory 100mm from the face of the studs to the isolation joint.

Test One

The frame was clad each side with 13mm 10.5 kg/m^2 CSR Fyrchek plasterboard screw fixed and sealed with CSR pre-mixed all purpose compound. 1mm 2.5 kg/m^2 Acoustica Quietwave was stapled to the face of the plasterboard each side, completely covering the plasterboard. Another layer of 13mm 10.5 kg/m^2 CSR Fyrchek plasterboard was screw fixed to each side and sealed with CSR pre-mixed all purpose compound.

Test Two

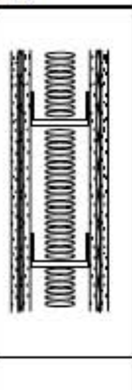
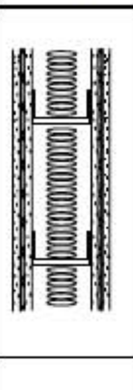
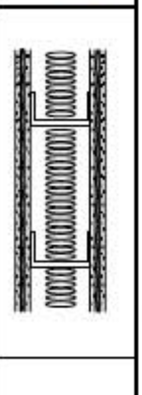
The frame was clad each side with 13mm 8.5 kg/m^2 CSR CD plasterboard screw fixed and sealed with CSR pre-mixed all purpose compound. 1mm 2.5 kg/m^2 Acoustica Quietwave was stapled to the face of the plasterboard each side, completely covering the plasterboard. Another layer of 13mm 8.5 kg/m^2 CSR CD plasterboard was screw fixed to each side and sealed with CSR pre-mixed all purpose compound.

Test Three

The frame was clad each side with 6.5mm 4.25 kg/m^2 CSR Flexible plasterboard screw fixed and sealed with CSR pre-mixed all purpose compound. 1mm 2.5 kg/m^2 Acoustica Quietwave was stapled to the face of the plasterboard each side, completely covering the plasterboard. Another layer of 6.5mm 4.25 kg/m^2 CSR Flexible plasterboard was screw fixed to each side and sealed with CSR pre-mixed all purpose compound.

3 Result Summary

Schedule of Test Configurations and Result Summary

Test No.	Reference	Source Room Lining	Source Room Framing	Cavity / Infill	Receive Room Lining	Rw	Ctr	Rw + Ctr
1		2x13mm Fyrchek with 1mm 2.5kg/m^2 Quietwave between Fyrchek	70mm Steel Studs	50mm 14kg/m^3 glasswool	2x13mm Fyrchek with 1mm 2.5kg/m^2 Quietwave between Fyrchek	58	-7	51
2		2x13mm CD plasterboard with 1mm 2.5kg/m2 Quietwave between plasterboard	70mm Steel Studs	50mm 14kg/m3 glasswool	2x13mm CD plasterboard with 1mm 2.5kg/m2 Quietwave between plasterboard	54	-6	48
3		2x6.5mm Flexible plasterboard with 1mm 2.5kg/m2 Quietwave between plasterboard	70mm Steel Studs	50mm 14kg/m3 glasswool	2x6.5mm Flexible plasterboard with 1mm 2.5kg/m2 Quietwave between plasterboard	50	-9	41

4 Test Procedure

The tests were carried out on a 5.2m² (2.165m high x 2.4m wide) sample installed in Rintoul's acoustic development laboratory located at their plant at Seven Hills. The test facilities comprise a source room constructed of plasterboard, which is connected via a transmitting port to a floating receiving room also constructed of plasterboard. The test aperture is comprised of a timber and steel reveal on both the source and receiving sides. The laboratory is capable of Sound Transmission Class 71 from the source room to the receiving room.

The measurements were carried out in general accordance with Australian Standard AS 1191-2002 *Acoustics - Method for Laboratory Measurement of Air Borne Sound Transmission Loss of Building Partitions*. R_w results were calculated using the procedure in Australian Standard AS1276 (1999) *Acoustics – Rating of sound insulation in buildings and of building elements Part 1: Airborne sound insulation*. Differences between the test method used and the Standard are due to the size of the test samples and room volumes.

Pink noise was amplified and reproduced by two loudspeakers in the Send room. The loudspeakers were located in the corners of the room opposite the partition being tested. Determination of the space average sound field in the source and receiving rooms was carried out using a Type 1 Precision Sound Level Meter and measuring the average Sound Pressure Level in each room. The sound field in both source and receive rooms was sampled for 64 seconds using a continuous traverse to obtain a space-time average, as described in the Standard.

Three discrete microphone positions were used to sample reverberation time. At each position, two reverberation decays were recorded for each of two speaker locations. Interrupted pink noise was used for reverberation time. The microphone positions were at least 1.7m apart and at least 1.2m from any room surface. Microphone height was approximately 1.2-1.4m. The three microphone positions were not in a line and were not in any plane parallel to a room surface.

A field check of the calibration of the Sound Analyser was performed before and after the testing. No drift was observed.

The equipment used comprised the following: -

- Svantek Svan 949 Real Time Sound Analyser.
- Bruel & Kjaer Type 4230 Sound Level Calibrator.
- PKA sound source with portable CD player, 2x50W RMS amplifier, and two separate speakers.
- Portable laptop PC for analysing data on site.

4.1 Room Volume of Source and Receiving Rooms

The room volumes are small, as the facility is a development laboratory. Using the formula given in AS 1191, the room is suitable for measurements of 200 Hz and above. In accordance with the Standard, the source and receiving room vary in volume by more than 10% and the ratio of room dimensions are in accordance with Appendix A.3.1.3 of the Standard. The sound field within both rooms has been calibrated and has been found to be uniformly distributed, even down to 100 Hz. Quadratic diffusers located on the wall and ceiling surfaces achieve sound diffusion within the room.

Measurements of standard plasterboard acoustic walls made in the Rintoul facilities compare very favourably with measurements of the same wall systems made in laboratories with 200 cubic metre source and receiving rooms. It is considered that the accuracy above 200 Hz is extremely good.

4.2 Plasterboard Coincidence dip

The surrounds to the sample holder are constructed of of heavyweight timber and steel. As a result when plasterboard is tested the coincidence dip (200Hz to 4000Hz) is gentle. When comparisons are made to tests at say National Acoustic Laboratories where the sample holder is steel and concrete it will be noticed that the NAL results produce a savage coincidence dip. Actual on site conditions will vary therefore results on site will be somewhere between the two laboratories.

5 Calculation Criteria

The data from the 16 bands is compared to standard R_w contours. The highest standard contour that fits the data, subject to the following rules, gives the rating.

For R_w calculation;

- Frequency bands assessed from 100Hz 3150Hz.
- The test data is allowed to be below the standard contour, provided the total of the deficiencies is no more than 32 dB.

The R_w results are calculated using the procedure in Australian Standard AS1276 (1999) *Acoustics - Rating of sound insulation in buildings and of building elements Part 1: Airborne sound insulation*.

Discussion of Corrections

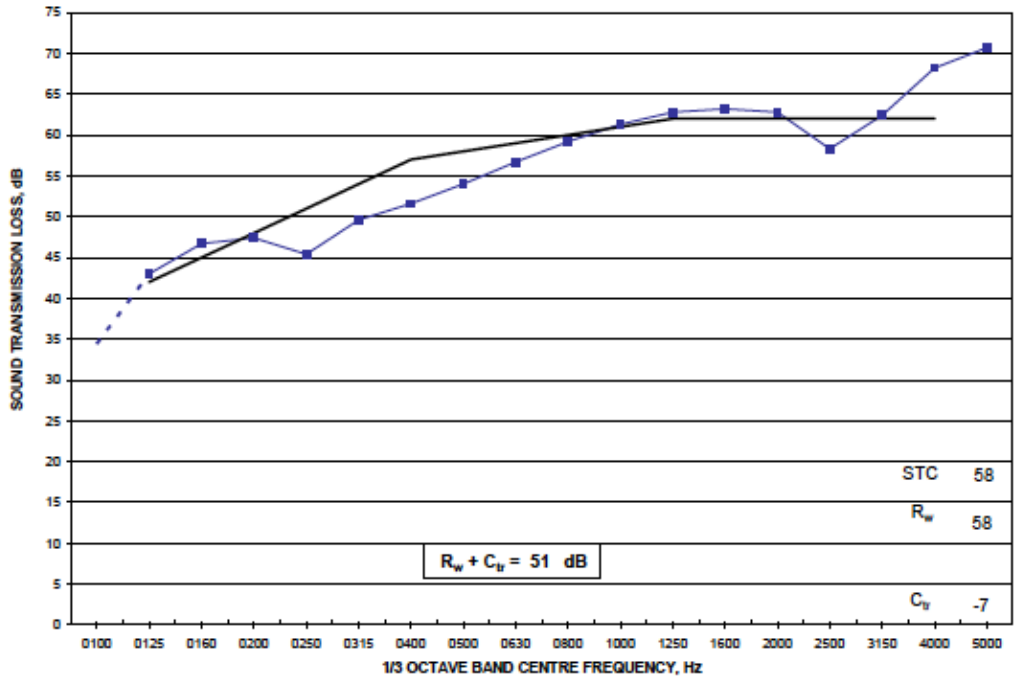
Spectrum Adaptation Term (C_{tr})

This is the value, in decibels, to be added to the single-number rating (e.g. R_w) to take account of the characteristics of particular sound spectra. The spectrum is based on the characteristics of road traffic noise, however is also applicable to other types of noise source such as living activities (radio, music, tv), aircraft and rail noise, disco music, industrial noise etc.

- C_{tr} adaptation term is based on the difference between the A-weighted levels in the source room and receiving room for road traffic noise.

6 Result Calculation Sheets

Acoustica - Rintoul Test Program August 2006



Title: Acoustica - Rintoul Test Program August 2006 **Reference:**

Type:

Description of sample:

TEST 1 - 70mm single steel stud frame with 50mm 14kg/m3 glasswool as cavity infill. The frame was clad each side with 13mm 10.5 kg/m2 CSR Fyrchek plasterboard screw fixed and sealed with CSR pre-mixed all purpose compound. 1mm 2.5 kg/m2 Acoustica Quietwave was stapled to the face of the plasterboard each side, completely covering the plasterboard. Another layer of 13mm 10.5 kg/m2 CSR Fyrchek plasterboard was screw fixed to each side and sealed with CSR pre-mixed all purpose compound.

Configuration:

	Day	Month	Year
Test date:	10	August	2006

Rintoul correction (100-200Hz only)

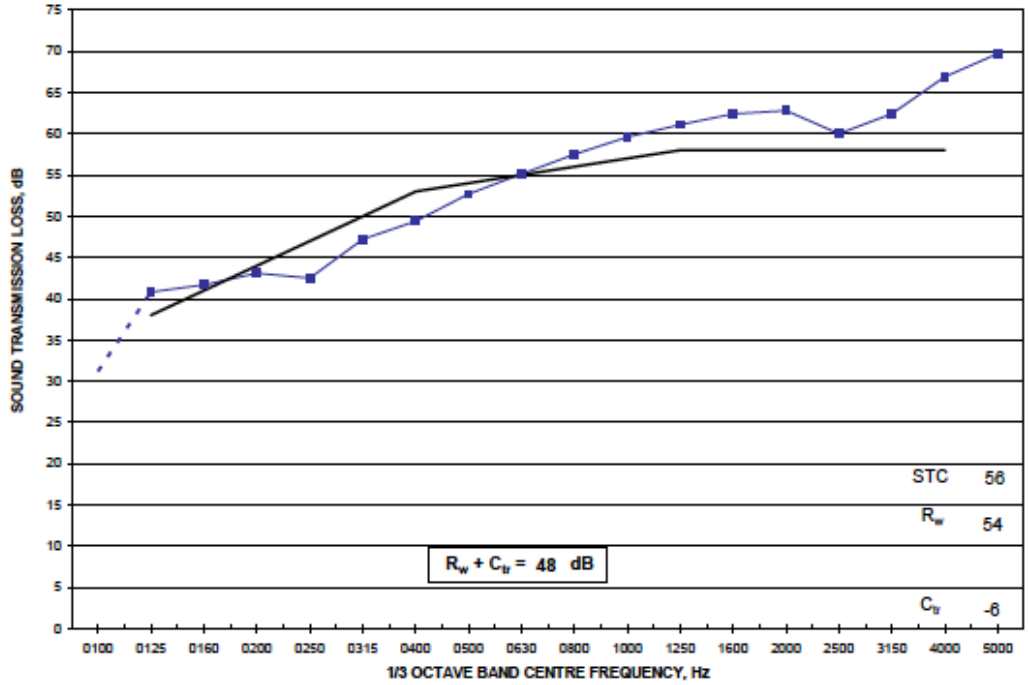
Test Data:

Description	50	63	80	4	-2	2	Octave Band Centre Frequency (Hz)													
				100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000
Source level (SPL dB)				71.3	87.5	89.8	89.2	87.9	90.0	90.6	89.8	90.9	91.9	92.0	91.7	91.1	89.6	87.4	87.2	85.4	85.4
Source level (SPL dB)				71.7	87.9	90.0	89.5	88.3	89.9	90.6	89.9	90.9	92.0	91.8	91.6	91.0	89.6	87.4	87.2	85.3	85.2
Average Source level (SPL dB)				71.5	87.7	89.9	89.4	88.1	90.0	90.6	89.9	90.9	92.0	91.9	91.7	91.1	89.6	87.4	87.2	85.4	85.3
Receive level (SPL dB)				43.0	43.3	46.2	44.1	44.5	42.6	41.3	37.4	35.4	33.9	31.8	29.9	28.7	27.8	29.7	25.5	18.6	16.7
Receive level (SPL dB)				43.1	42.8	46.5	44.5	44.0	42.9	41.5	37.4	35.2	33.7	31.7	30.0	28.8	27.9	29.8	25.6	19.0	17.2
Average Receive level (SPL dB)				43.1	43.1	46.4	44.3	44.3	42.8	41.4	37.4	35.3	33.8	31.8	30.0	28.8	27.9	29.8	25.6	18.8	17.0
Ambient (SPL dB)				26.5	22.7	18.6	16.9	15.5	13.0	13.4	10.4	8.7	10.9	9.3	13.1	10.7	13.6	10.5	10.9	11.7	12.6
Ambient correction (dB)				0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.2	1.0	2.1
Level difference				32.5	42.2	45.6	45.1	43.4	47.4	49.3	52.4	55.5	58.0	60.2	61.9	62.5	62.0	57.8	61.9	67.8	70.8
Rm volume 22.57			RT60	1.09	0.84	0.90	1.18	1.12	1.16	1.19	1.00	0.91	0.93	0.89	0.87	0.82	0.84	0.79	0.78	0.77	0.69
Test area 5.196			Rm cor	1.9	0.8	1.1	2.3	2	2.2	2.3	1.6	1.2	1.2	1.1	0.9	0.7	0.8	0.5	0.5	0.4	-0.1
Transmission loss				34.4	43	46.7	47.4	45.4	49.6	51.6	54.0	56.7	59.2	61.3	62.8	63.2	62.8	58.3	62.4	68.2	70.7
Deficiencies -27				-8			-1	-6	-4	-5	-4	-2	-1	0				-4	0		

Results:

STC	58	(limited by 250 Hz frequency band)	
Rw	58	(limited by 100 Hz frequency band)	Rw + Ctr = 51 dB
Ctr	-7	(limited by 100 Hz frequency band)	

Acoustica - Rintoul Test Program August 2006



Title: Acoustica - Rintoul Test Program August 2006 **Reference:**

Type:

Description of sample:

TEST 2 - 70mm single steel stud frame with 50mm 14kg/m3 glasswool as cavity infill. The frame was clad each side with 13mm 8.5 kg/m2 CSR CD plasterboard screw fixed and sealed with CSR pre-mixed all purpose compound. 1mm 2.5 kg/m2 Acoustica Quietwave was stapled to the face of the plasterboard each side, completely covering the plasterboard. Another layer of 13mm 8.5 kg/m2 CSR CD plasterboard was screw fixed to each side and sealed with CSR pre-mixed all purpose compound.

Configuration:

	Day	Month	Year
Test date:	10	August	2006

Rintoul correction (100-200Hz only) 4 -2 2

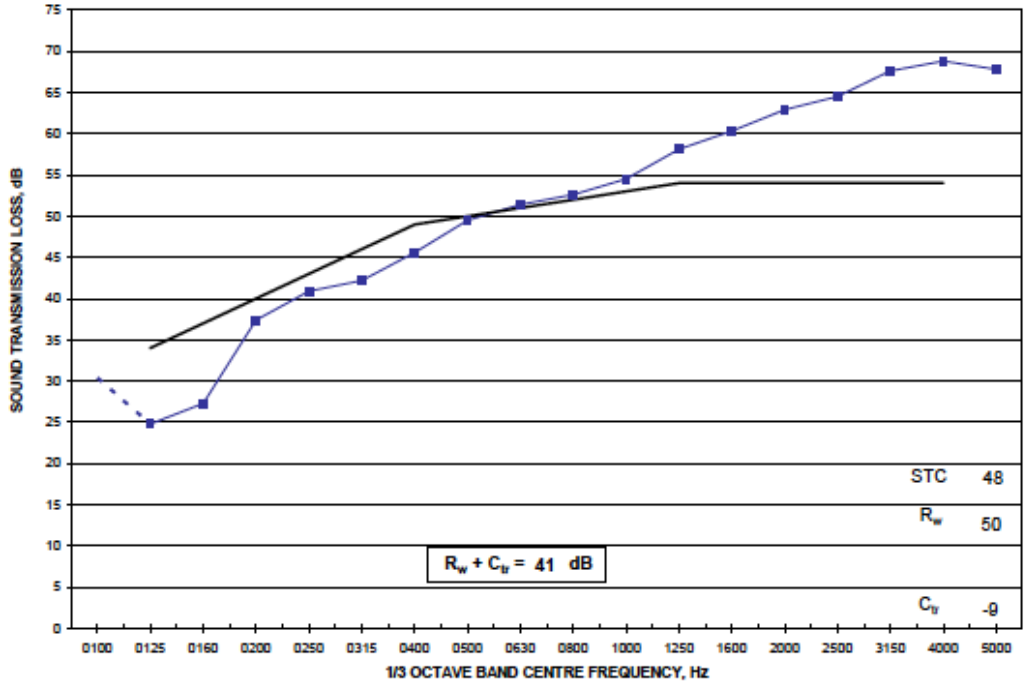
Test Data:

Description	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000
				Octave Band Centre Frequency (Hz)																	
Source level (SPL dB)				72.5	87.3	89.6	89.6	88.7	90.1	90.6	89.8	90.4	91.9	91.4	91.6	91.3	89.5	86.9	86.9	85.4	85.0
Source level (SPL dB)				72.5	87.1	89.4	89.7	88.4	89.8	90.4	90.0	90.6	92.0	91.7	91.6	91.4	89.5	87.0	87.0	85.5	85.1
Average Source level (SPL dB)				72.5	87.2	89.5	89.7	88.6	90.0	90.5	89.9	90.5	92.0	91.6	91.6	91.4	89.5	87.0	87.0	85.5	85.1
Receive level (SPL dB)				47.9	45.0	50.6	48.4	49.2	44.7	43.3	38.4	36.6	35.6	32.7	31.4	29.9	27.8	27.6	25.1	19.5	17.1
Receive level (SPL dB)				47.8	45.1	50.0	48.7	49.2	44.8	43.3	38.3	36.7	35.6	32.6	31.4	30.0	27.8	27.7	25.2	19.8	17.4
Average Receive level (SPL dB)				47.9	45.1	50.3	48.6	49.2	44.8	43.3	38.4	36.7	35.6	32.7	31.4	30.0	27.8	27.7	25.2	19.7	17.3
Ambient (SPL dB)				26.5	22.7	18.6	16.9	15.5	13.0	13.4	10.4	8.7	10.9	9.3	13.1	10.7	13.6	10.5	10.9	11.7	12.6
Ambient correction (dB)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.2	0.8	1.9
Level difference				28.7	40.3	41.0	41.2	39.5	45.4	47.3	51.4	53.8	56.3	58.7	60.3	61.5	61.9	59.4	62.0	66.7	69.8
Rm volume 22.57 RT60				1.24	0.79	0.82	1.09	1.40	1.06	1.12	0.95	0.94	0.93	0.87	0.84	0.86	0.85	0.80	0.77	0.74	0.69
Test area 5.196 Rm cor				2.5	0.5	0.7	1.9	3	1.8	2.1	1.3	1.3	1.2	0.9	0.8	0.9	0.9	0.6	0.4	0.2	-0.1
Transmission loss				31.2	40.8	41.7	43.1	42.5	47.2	49.4	52.7	55.1	57.5	59.6	61.1	62.4	62.8	60.0	62.4	66.9	69.7
Deficiencies -26				-9		-1	-3	-6	-5	-6	-3	-2	0					0			

Results:

STC	**56**		
Rw	**54**	(limited by 250 Hz frequency band)	
		(limited by 100 Hz frequency band)	**Rw + Ctr = 48 dB**
Ctr	**-6**	(limited by 100 Hz frequency band)	

Acoustica - Rintoul Test Program August 2006



Title: Acoustica - Rintoul Test Program August 2006 **Reference:**

Type:

Description of sample:

TEST 3 - 70mm single steel stud frame with 50mm 14kg/m3 glasswool as cavity infill. The frame was clad each side with 6.5mm 4.25 kg/m2 CSR Flexible plasterboard screw fixed and sealed with CSR pre-mixed all purpose compound. 1mm 2.5 kg/m2 Acoustica Quietwave was stapled to the face of the plasterboard each side, completely covering the plasterboard. Another layer of 6.5mm 4.25 kg/m2 CSR Flexible plasterboard was screw fixed to each side and sealed with CSR pre-mixed all purpose compound.

Configuration:

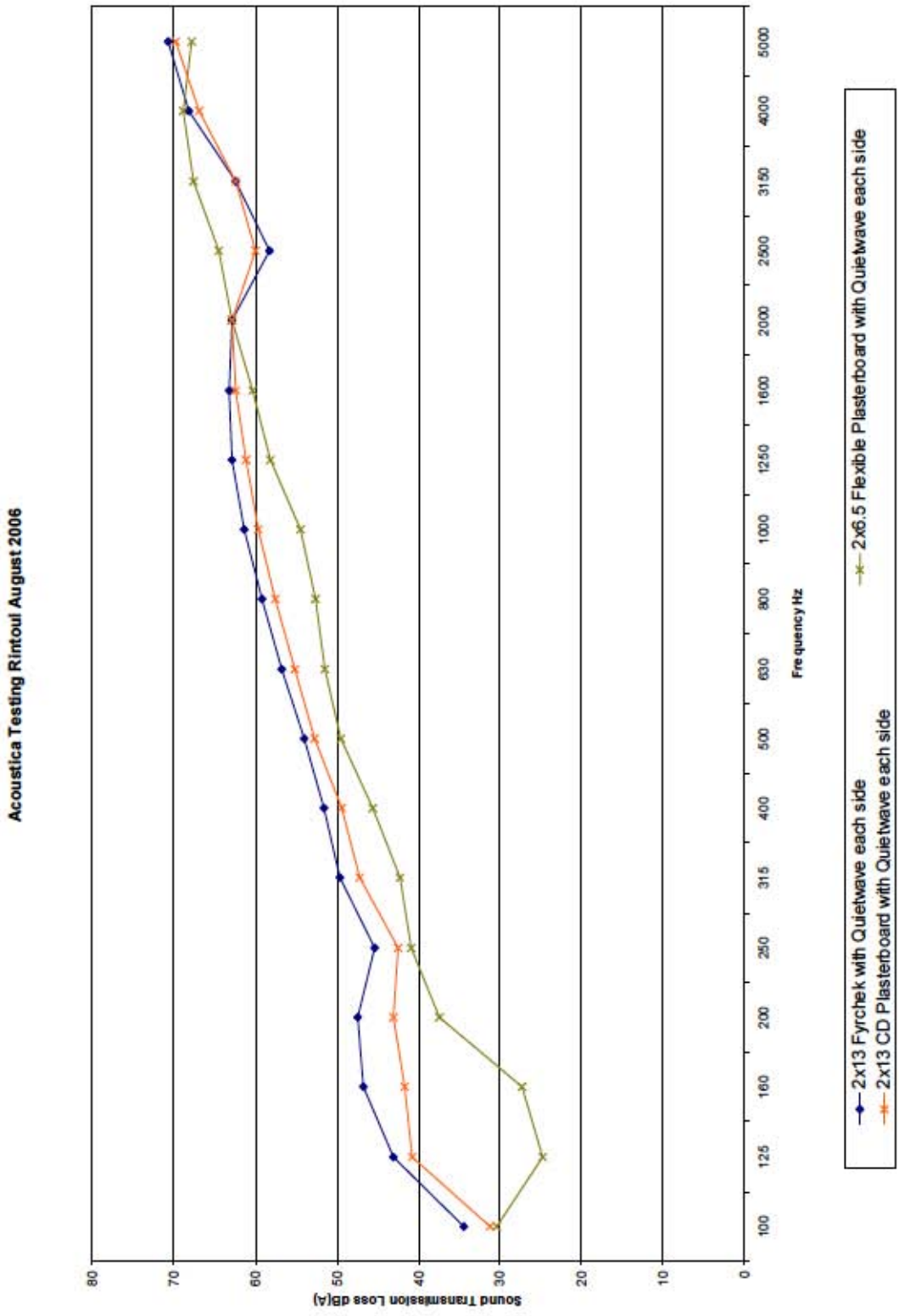
	Day	Month	Year
Test date:	10	August	2006

Rintoul correction (100-200Hz only)

Test Data:				4	-2	2	Octave Band Centre Frequency (Hz)													
Description	**50**	**63**	**80**	**100**	**125**	**160**	**200**	**250**	**315**	**400**	**500**	**630**	**800**	**1000**	**1250**	**1600**	**2000**	**2500**	**3150**	**4000**	**5000**
Source level (SPL dB)				74.1	87.5	89.4	89.6	88.6	91.2	91.7	90.9	92.0	93.1	93.0	92.8	92.2	90.6	88.1	87.9	86.6	86.0
Source level (SPL dB)				74.4	87.6	89.0	89.9	89.6	91.6	91.8	90.7	91.8	92.9	92.7	92.6	91.9	90.3	87.8	87.9	86.4	85.9
Average Source level (SPL dB)				74.3	87.6	89.2	89.8	89.1	91.4	91.8	90.8	91.9	93.0	92.9	92.7	92.1	90.5	88.0	87.9	86.5	86.0
Receive level (SPL dB)				50.7	60.4	64.4	54.2	50.5	50.5	47.8	42.9	41.8	41.4	39.1	35.3	32.5	28.5	24.3	21.1	19.0	19.1
Receive level (SPL dB)				50.1	59.7	64.5	54.6	50.1	50.5	47.8	42.9	42.0	41.1	39.0	35.2	32.4	28.3	24.1	20.7	18.6	18.8
Average Receive level (SPL dB)				50.4	60.1	64.5	54.4	50.3	50.5	47.8	42.9	41.9	41.3	39.1	35.3	32.5	28.4	24.2	20.9	18.8	19.0
Ambient (SPL dB)				26.5	22.7	18.6	16.9	15.5	13.0	13.4	10.4	8.7	10.9	9.3	13.1	10.7	13.6	10.5	10.9	11.7	12.6
Ambient correction (dB)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.9	1.1
Level difference				27.9	25.1	27.0	35.4	38.1	40.7	43.9	48.0	50.2	51.7	53.9	57.5	59.7	62.2	64.0	67.2	68.5	68.0
Rm volume 22.57 RT60				1.23	0.66	0.76	1.11	1.35	0.99	1.04	0.98	0.92	0.86	0.80	0.80	0.80	0.82	0.79	0.77	0.75	0.67
Test area 5.196 Rm cor				2.5	-0.3	0.3	2	2.8	1.5	1.7	1.5	1.2	0.9	0.6	0.6	0.6	0.7	0.5	0.4	0.3	-0.2
Transmission loss				30.4	24.8	27.3	37.4	40.9	42.2	45.6	49.5	51.4	52.6	54.5	58.1	60.3	62.9	64.5	67.6	68.8	67.8
Deficiencies -19				-2	-7	-8	-1	0	-2	-1											

Results:

STC	**48**		
Rw	**50**	(limited by 160 Hz frequency band)	**Rw + Ctr = 41 dB**
Ctr	**-9**	(limited by 125 Hz frequency band)	


Acoustica Testing Rintoul August 2006
Sound Transmission Loss dB(A)
80
70
60
50
40
30
20
10
0
Frequency Hz
100
125
160
200
250
315
400
500
630
800
1000
1250
1600
2000
2500
3150
4000
5000
2x13 Fyrchek with Quietwave each side
2x13 CD Plasterboard with Quietwave each side
2x6.5 Flexible Plasterboard with Quietwave each side

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