

**ACOUSTIC PERFORMANCE AND STC  
RATING OF A PARTITION WALL WITH  
DOUBLE SOCKETS AND POLYSEAM  
PUTTY PADS**

**AUCKLAND UNISERVICES LIMITED**  
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**THE UNIVERSITY OF AUCKLAND**

**Report prepared for:**

Firestop Centre  
Unit J – 657 Great South Road  
Penrose, Auckland 1061  
New Zealand

&

Polyseam Ltd  
15 St Andrews Road  
Huddersfield  
West Yorkshire  
HD1 6SB  
UK

Date: 1<sup>st</sup> October 2018

**Report prepared by:**

Dr Michael Kingan  
Acoustics Testing Service  
**The University of Auckland**

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**Acoustic performance and STC rating of a  
partition wall with double sockets and  
Polyseam Putty Pads**

Prepared for: Firestop Centre  
Unit J – 657 Great South Road  
Penrose, Auckland 1061


&

Polyseam Ltd  
15 St Andrews Road  
Huddersfield  
West Yorkshire  
HD1 6SB  
UK

Prepared by: Acoustics Testing Services  
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THE UNIVERSITY OF AUCKLAND

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AUCKLAND**

Dr Michael Kingan



## Opinion

A test report entitled "The laboratory airborne sound insulation of a twin leaf stud wall with and without double sockets with Polyseam Putty Pads" (issue date: 20<sup>th</sup> October 2008. Issued by: BRE Acoustics. Report #: 248796) was supplied for the purposes of calculating an STC rating. This report is included as an attachment to this opinion. The report describes acoustic testing to determine sound transmission loss performance of a wall system with and without two double electrical sockets with Putty Pads installed in each side of the wall, which was conducted in the BRE horizontal transmission suite located in Hertfordshire in the UK for a client identified as "Polyseam Limited". The report contains detailed descriptions, drawings and photographs of the wall and insert.

In my opinion, the laboratory tests described in the test report were conducted in accordance with "BE EN ISO 140-3:1995 Airborne Sound Insulation of Building Elements". The one-third octave band sound transmission loss data from the laboratory test contained in the test report was used to calculate an **STC rating of 68 dB for the wall without the sockets installed** and an **STC rating of 68 dB for the wall with the two double electrical sockets with Putty Pads installed on each side**. Note that two tests were conducted with the electric sockets installed in the wall. In the first, the Putty Pads were fitted inside the socket boxes whilst in the second the Putty Pads were fitted behind the socket boxes. Both tests produced the same STC rating of 68 dB. These calculations were performed using the calculation method described in ASTM E413-16.

bre

**The laboratory airborne  
sound insulation of a  
twin leaf stud wall with  
and without double  
sockets with Polyseam  
Putty Pads**

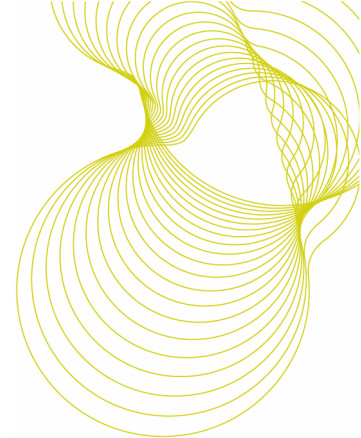
Prepared for:  
Polyseam Limited  
Shaw Park  
Silver Street  
Huddersfield  
HD5 9AF

20 October 2008

Test report number 248796



0578



### Tested by

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Name Dr R Hall  
Position Principal Consultant  
Date 20 October 2008  
Signature

### Prepared by

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Name Dr R Hall  
Position Principal Consultant  
Date 20 October 2008  
Signature

### Checked by

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Name Ms G Pantazopoulou  
Position Senior Consultant  
Date 20 October 2008  
Signature

### Approved on behalf of BRE

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Date 20 October 2008  
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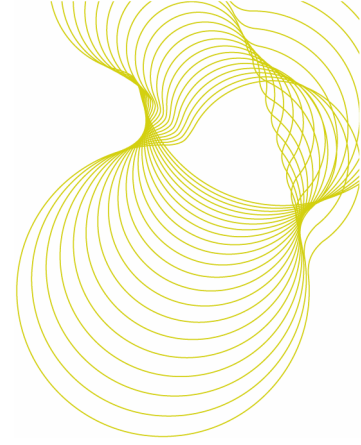
BRE is not UKAS accredited to make opinions and interpretation. Any opinions and interpretations included as part of this report are clearly marked as such.



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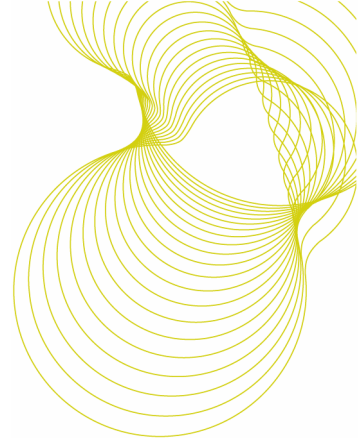
This report is made on behalf of BRE. By receiving the report and action on it, the client – or any third party relying on it – accepts that no individual is personally liable in contract, tort or breach of statutory duty (including negligence).



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## **1 Introduction**

BRE Acoustics was commissioned to produce this report on behalf of Polyseam Limited. It contains the results of airborne sound insulation measurements in the BRE horizontal transmission suite (Building 9), BRE, Garston, Watford, Hertfordshire, WD25 9XX. The measurement data contained in the report were first published in BRE Report number 248426.

This report details the testing outlined in BRE proposal 8053 - 123417.

## **2 Testing details**

### **2.1 Test dates and personnel**

The measurements detailed in this report were made on 14 October 2008, 15 October 2008 and 16 October 2008 by Dr R Hall of BRE Acoustics.

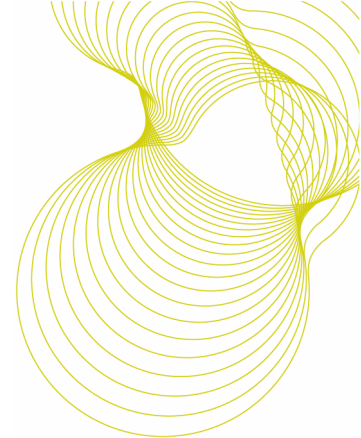
### **2.2 Test method and applicable standards**

Measurement of airborne sound insulation was made in accordance with BS EN ISO 140-3:1995. Single number quantities were calculated in accordance with BS EN ISO 717-1:1997.

BRE Acoustics holds UKAS accreditation for the measurement of sound insulation in the field and the laboratory. The measurements were conducted using the procedures accredited by UKAS.

### **2.3 Test element installation**

The stud wall was installed by BRE. The socket boxes and Polyseam Putty Pads were installed by Stampol Limited, 45 Bevoir Road, Leytonstone, E11 1DE.



## 2.4 Instrumentation

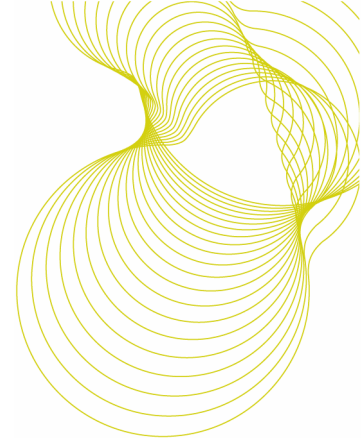
The equipment used to conduct the tests is identified in Table 1.

**Table 1** Equipment list

Equipment description	Manufacturer	Type	UKAS identification number
Microphone Calibrator	NOR	1253	01/008
Microphone	GRAS	40AE	02/304, 02/305
Microphone Preamplifier	GRAS	26CA	04/304, 04/305
Microphone Adapter	NOR	1449	06/107, 06/108
Graphic Equaliser	Phonic	PEQ3300	10/002
Amplifier	NOR	260H	11/013
Real Time Analyser	NOR	840	13/003
Microphone Rotating Boom	NOR	212NA	14/004, 14/005
Loudspeaker	B&K	4224	11/006

The gain of the real time analyser was adjusted to give a reading of 124.0 dB at 250 kHz using the NOR type 1253 calibrator.

All equipment is calibrated in accordance with BRE procedures, using reference equipment calibrated by a UKAS accredited laboratory.

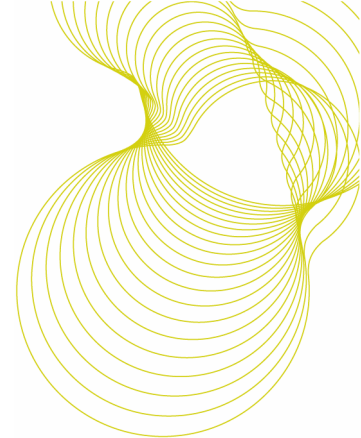


## 2.5 Test numbers

Table 2 lists each test element along with its corresponding test number. The construction details for each test element can be found from Table 3 by referring to the test number.

**Table 2** Test numbers

<b>Test number</b>	<b>Test element</b>	<b>Source room volume (m<sup>3</sup>)</b>	<b>Receive room volume (m<sup>3</sup>)</b>	<b>Common area (m<sup>2</sup>)</b>
L108-078	Wall	130	115	9.8
L108-079	Wall	130	115	9.8
L108-080	Wall	130	115	9.8



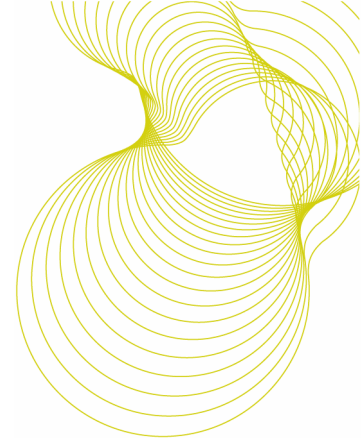
## 2.6 Construction details with test numbers

The construction details are shown in Table 3. When construction details are provided by a third party, they are checked by BRE where possible.

**Table 3** Construction details

Test element	Test number	Construction details
Wall	L108-078	<ul style="list-style-type: none"> <li>• Twin leaf timber stud (100 mm x 50 mm) filler wall with four layers of wallboard (combination of 12.5 mm cement particle board, 14.5 kg/m<sup>2</sup>, and 15 mm plasterboard, 12.5 kg/m<sup>2</sup>)</li> <li>• Filler wall completely filled with glass wool (10 kg/m<sup>3</sup>)</li> <li>• Aperture in filler wall (1.75 m wide x 2.08 m high) filled with twin leaf timber stud (100 mm x 50 mm) wall with two layers of 15 mm plasterboard (total 26 kg/m kg/m<sup>2</sup>) on each side of wall</li> <li>• 100 mm glass wool (10 kg/m<sup>2</sup>) between studs in each leaf</li> </ul>
	L108-079	<ul style="list-style-type: none"> <li>• As test L108-078 but with two double electrical sockets with Putty pads installed in each side of wall</li> <li>• Putty pads fitted inside socket boxes</li> </ul>
	L108-080	<ul style="list-style-type: none"> <li>• As test L108-078 but with two double sockets with Putty pads installed in each side of wall</li> <li>• Putty pads fitted behind socket boxes (on cavity side of wall leaves)</li> </ul>

The laboratory airborne sound insulation of a twin leaf stud wall with and without double sockets with Polyseam Putty Pads



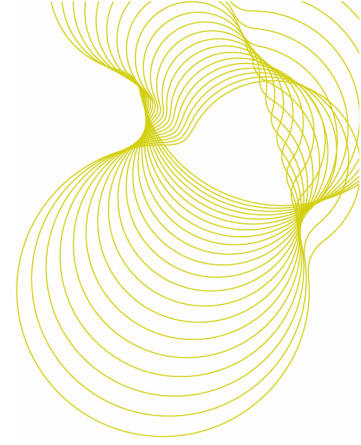
## 2.7 Sound insulation test results

The single number quantities for the sound insulation tests are shown in Table 4. The UKAS test result sheets are included in the appendices.

**Table 4** Test results

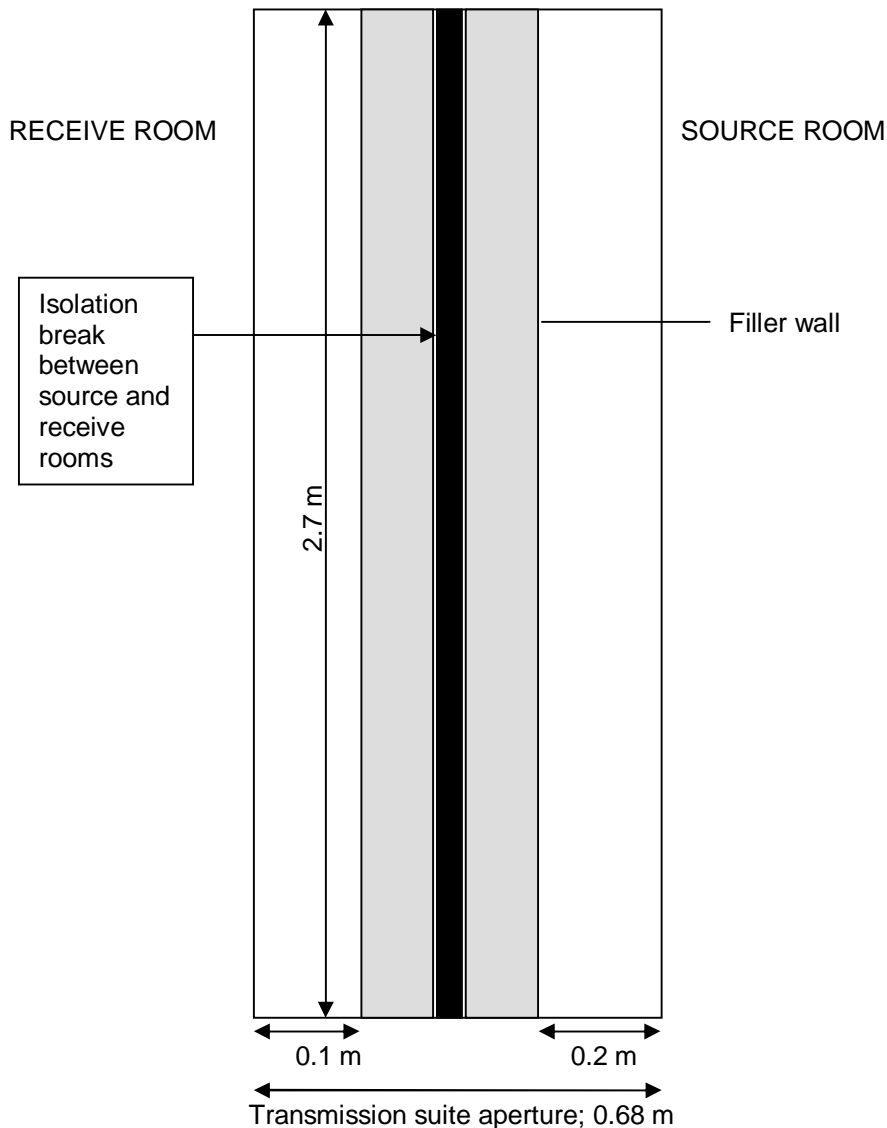
Test number	$R_w (C; C_{tr})$ (dB)
L108-078	67 (-2;-7)
L108-079	67 (-2;-7)
L108-080	67 (-2;-7)

For all the tests, measurements were made in individual 1/3 octave frequency bands from 500 Hz to 5,000 Hz.



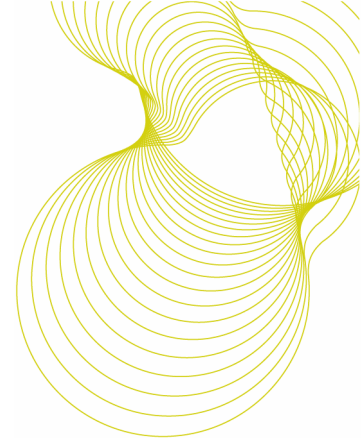
## 2.8 Plans

The position of the twin leaf filler wall in the transmission suite aperture is indicated in Figure 1.



**Figure 1** Section through elevation showing the position of the twin leaf stud filler wall in the transmission suite aperture. One leaf of the wall was on the source room side of the acoustic break and the other leaf on the receive room side of the acoustic break.

The laboratory airborne sound insulation of a twin leaf stud wall with and without double sockets with Polyseam Putty Pads



## 2.9 Photographs



**Figure 2** Sockets in wall

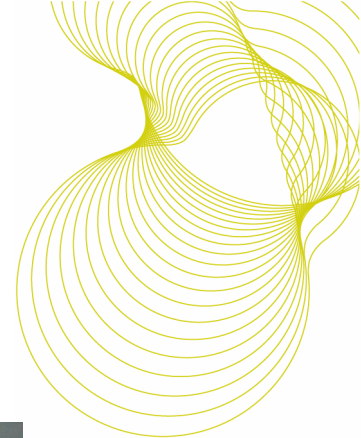
In the source room the sockets were installed 500 mm above the base of the laboratory aperture and separated by a horizontal distance of 500 mm. In the receive room the sockets were installed at the same height but were off-set from the sockets in the source room by 150 mm. All dimensions are approximate.



**Figure 3** Switch box before installation of Putty Pad



The laboratory airborne sound insulation of a twin leaf stud wall with and without double sockets with Polyseam Putty Pads

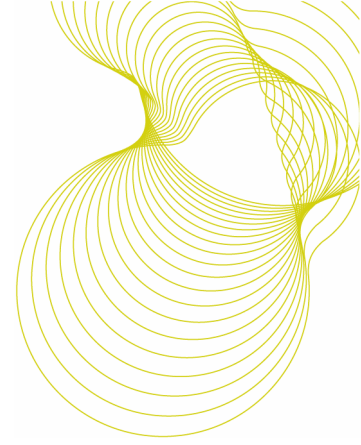


**Figure 4** Putty Pad installed inside switch box



**Figure 5** Putty Pad installed outside switch box





### **3 Appendices**

#### **3.1 UKAS test result sheets**

Page number	Test number
13	L108-078
15	L108-079
17	L108-080

The laboratory airborne sound insulation of a twin leaf stud wall with and without double sockets with Polyseam Putty Pads



0578

**Laboratory measurement of airborne sound insulation of building elements**  
**Sound reduction index according to BS EN ISO 140-3:1995**  
**BRE horizontal transmission suite (B9 051-053)**

**Client:** Polyseam Limited

**Test date:** 14/10/2008

**Test number:** L108-078

**Test element:** Wall

**Test element area:** 9.8 m<sup>2</sup>

**Description:**

Twin leaf timber stud (100 mm x 50 mm) filler wall with four layers of wallboard (combination of 12.5 mm cement particle board, 14.5 kg/m<sup>2</sup>)  
 Filler wall completely filled with glass wool (10 kg/m<sup>3</sup>)

Aperture in filler wall (1.75 m wide x 2.08 m high) filled with twin leaf timber stud (100 mm x 50 mm) wall with two layers of 15 mm plaster  
 100 mm glass wool (10 kg/m<sup>2</sup>) between studs in each leaf

**Source room volume:** 130 m<sup>3</sup>

**Air temperature:** 16 °C

**Receive room volume:** 115 m<sup>3</sup>

**Air relative humidity:** 75 %

Frequency (Hz)	Reverberation time (s)	Background level (dB)	Source level (dB)	Receive level (dB)	R (dB)
50	2.04	19.9	84.7	55.5	29.6
63	2.24	17.2	89.4	57.8	32.4
80	1.87	16.7	91.8	54.0	37.8
100	1.48	18.8	90.3	42.6	46.7
125	2.14	14.7	91.4	46.4	45.7
160	1.74	9.6	91.8	41.7	49.7
200	1.88	8.2	91.4	37.7	53.7
250	1.80	8.6	94.0	35.8	58.0
315	1.77	5.8	94.1	32.7	61.2
400	1.71	4.8	93.3	28.6	64.3
500	1.72	11.1	108.1	43.4	64.3
630	1.62	20.1	108.5	41.3	66.5
800	1.57	16.5	106.2	35.6	69.7
1,000	1.58	12.6	103.7	29.4	73.6
1,250	1.57	15.3	106.8	27.7	78.3
1,600	1.60	6.4	108.2	31.1	76.5
2,000	1.64	4.7	105.9	27.7	77.6
2,500	1.60	5.1	104.2	22.2	81.3
3,150	1.55	5.4	102.2	18.8	82.6
4,000	1.42	6.2	99.1	10.9	87.0
5,000	1.32	6.5	96.4	7.5	87.3

+ Receiving room level adjusted for background

\* Receiving room level within 6 dB of background

Rating according to BS EN ISO 717-1:1997

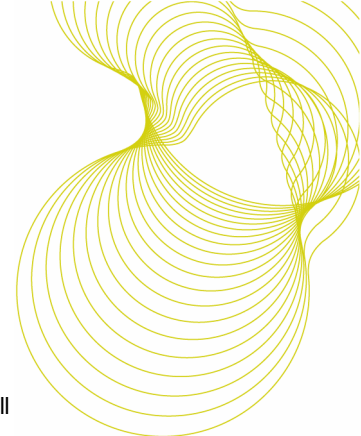
**R<sub>w</sub> (C; C<sub>tr</sub>) = 67 (-2; -7) dB**  
 C<sub>50-3150</sub> = -5 dB      C<sub>50-5000</sub> = -4 dB      C<sub>100-5000</sub> = -1 dB  
 C<sub>tr,50-3150</sub> = -16 dB      C<sub>tr,50-5000</sub> = -16 dB      C<sub>tr,100-5000</sub> = -7 dB

Evaluation based on laboratory measurement results obtained by an engineering method

Based on the data provided in BS EN 20140-2:1993 it is estimated that the measurement uncertainty should not exceed ±1 dB for the single-number quantity (R<sub>w</sub>) and should not exceed the values in Table A1 of BS EN 20140-2:1993 for the data in the individual third octaves (R)

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The laboratory airborne sound insulation of a twin leaf stud wall with and without double sockets with Polyseam Putty Pads



**Laboratory measurement of airborne sound insulation of building elements**  
**Sound reduction index according to BS EN ISO 140-3:1995**  
**BRE horizontal transmission suite (B9 051-053)**

**Client:** Polyseam Limited

**Test date:** 14/10/2008

**Test number:** L108-078

**Test element:** Wall

0578

**Test element area:** 9.8 m<sup>2</sup>

**Description:**

Twin leaf timber stud (100 mm x 50 mm) filler wall with four layers of wallboard (combination of 12.5 mm cement particle board, 14.5 kg/m<sup>2</sup>)  
 Filler wall completely filled with glass wool (10 kg/m<sup>3</sup>)  
 Aperture in filler wall (1.75 m wide x 2.08 m high) filled with twin leaf timber stud (100 mm x 50 mm) wall with two layers of 15 mm plaster  
 100 mm glass wool (10 kg/m<sup>2</sup>) between studs in each leaf

**Source room volume:** 130 m<sup>3</sup>

**Air temperature:** 16 °C

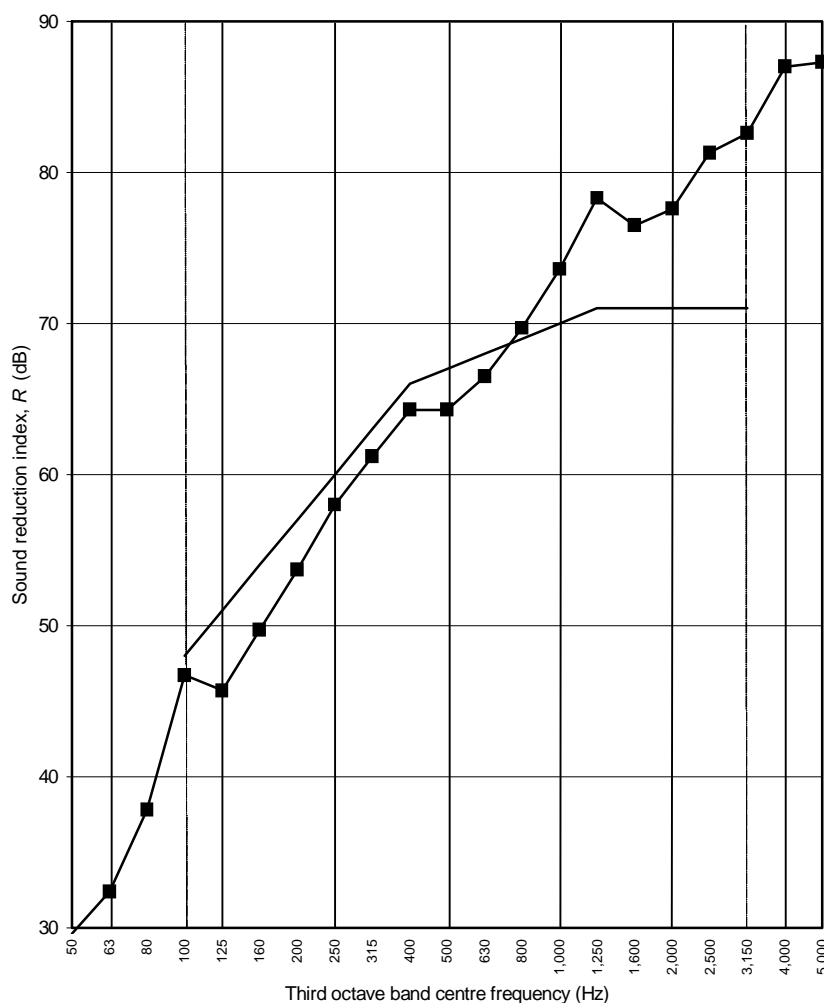
**Receive room volume:** 115 m<sup>3</sup>

**Air relative humidity:** 75 %

Frequency (Hz)	R One-third octave (dB)
50	29.6
63	32.4
80	37.8
100	46.7
125	45.7
160	49.7
200	53.7
250	58.0
315	61.2
400	64.3
500	64.3
630	66.5
800	69.7
1,000	73.6
1,250	78.3
1,600	76.5
2,000	77.6
2,500	81.3
3,150	82.6
4,000	87.0
5,000	87.3

+ Receiving room level adjusted for background

\* Receiving room level within 6 dB of background



Rating according to BS EN ISO 717-1:1997

**R<sub>w</sub> (C; C<sub>tr</sub>) = 67 (-2;-7) dB**

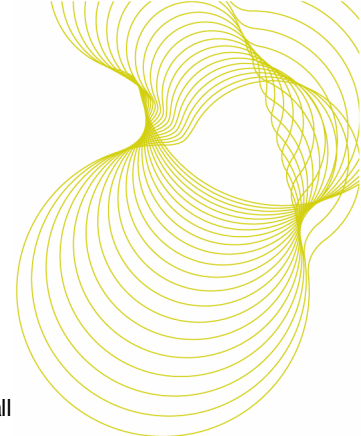
C <sub>50-3150</sub> = -5 dB	C <sub>50-5000</sub> = -4 dB	C <sub>100-5000</sub> = -1 dB
C <sub>tr,50-3150</sub> = -16 dB	C <sub>tr,50-5000</sub> = -16 dB	C <sub>tr,100-5000</sub> = -7 dB

Evaluation based on laboratory measurement results obtained by an engineering method

Based on the data provided in BS EN 20140-2:1993 it is estimated that the measurement uncertainty should not exceed ±1 dB for the single-number quantity (R<sub>w</sub>) and should not exceed the values in Table A1 of BS EN 20140-2:1993 for the data in the individual third octaves (R)

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The laboratory airborne sound insulation of a twin leaf stud wall with and without double sockets with Polyseam Putty Pads



**Laboratory measurement of airborne sound insulation of building elements**  
**Sound reduction index according to BS EN ISO 140-3:1995**  
**BRE horizontal transmission suite (B9 051-053)**

**Client:** Polyseam Limited

**Test date:** 15/10/2008

**Test number:** L108-079

**Test element:** Wall

0578

**Test element area:** 9.8 m<sup>2</sup>

**Description:**

As test L108-078 but with two double electrical sockets with Putty pads installed in each side of wall  
 Putty pads fitted inside socket boxes

**Source room volume:** 130 m<sup>3</sup>

**Air temperature:** 16 °C

**Receive room volume:** 115 m<sup>3</sup>

**Air relative humidity:** 79 %

Frequency (Hz)	Reverberation time (s)	Background level (dB)	Source level (dB)	Receive level (dB)	R (dB)
50	1.97	27.3	84.6	54.1	30.7
63	2.29	19.1	89.2	56.9	33.2
80	1.67	18.4	91.8	53.0	38.3
100	1.43	20.4	90.1	42.8	46.1
125	2.00	16.4	91.4	46.5	45.1
160	1.75	15.8	92.3	42.4	49.6
200	1.86	4.3	94.1	39.8	54.3
250	1.79	5.0	94.2	36.3	57.6
315	1.74	7.9	93.3	32.0	60.9
400	1.66	5.6	92.0	27.4	64.1
500	1.67	13.5	108.7	42.6	65.6
630	1.62	20.3	106.7	38.6	67.4
800	1.59	16.7	104.3	33.9	69.7
1,000	1.62	9.2	102.3	28.1	73.6
1,250	1.58	10.9	104.8	26.1	78.0
1,600	1.60	4.9	106.3	29.1	76.5
2,000	1.61	4.3	104.0	25.7	77.7
2,500	1.60	4.6	102.8	20.3	81.8
3,150	1.54	5.2	101.2	17.5	82.9
4,000	1.45	5.8	98.7	10.7	86.9
5,000	1.32	6.2	96.9	7.8	87.6

+ Receiving room level adjusted for background

\* Receiving room level within 6 dB of background

Rating according to BS EN ISO 717-1:1997

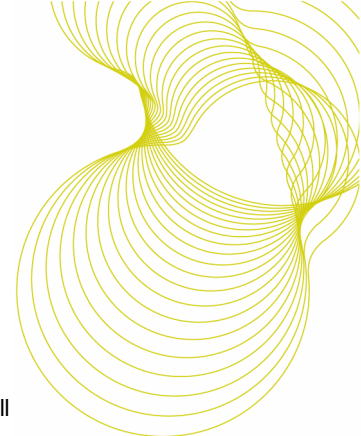
**$R_w(C; C_{tr}) = 67 (-2; -7) \text{ dB}$**      $C_{50-3150} = -5 \text{ dB}$      $C_{50-5000} = -4 \text{ dB}$      $C_{100-5000} = -1 \text{ dB}$   
 $C_{tr,50-3150} = -16 \text{ dB}$      $C_{tr,50-5000} = -16 \text{ dB}$      $C_{tr,100-5000} = -7 \text{ dB}$

Evaluation based on laboratory measurement results obtained by an engineering method

Based on the data provided in BS EN 20140-2:1993 it is estimated that the measurement uncertainty should not exceed ±1 dB for the single-number quantity ( $R_w$ ) and should not exceed the values in Table A1 of BS EN 20140-2:1993 for the data in the individual third octaves (R)

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The laboratory airborne sound insulation of a twin leaf stud wall with and without double sockets with Polyseam Putty Pads



**Laboratory measurement of airborne sound insulation of building elements**  
**Sound reduction index according to BS EN ISO 140-3:1995**  
**BRE horizontal transmission suite (B9 051-053)**

**Client:** Polyseam Limited  
**Test date:** 15/10/2008      **Test number:** L108-079      **Test element:** Wall

0578

**Test element area:** 9.8 m<sup>2</sup>

**Description:**

As test L108-078 but with two double electrical sockets with Putty pads installed in each side of wall  
 Putty pads fitted inside socket boxes

**Source room volume:** 130 m<sup>3</sup>

**Air temperature:** 16 °C

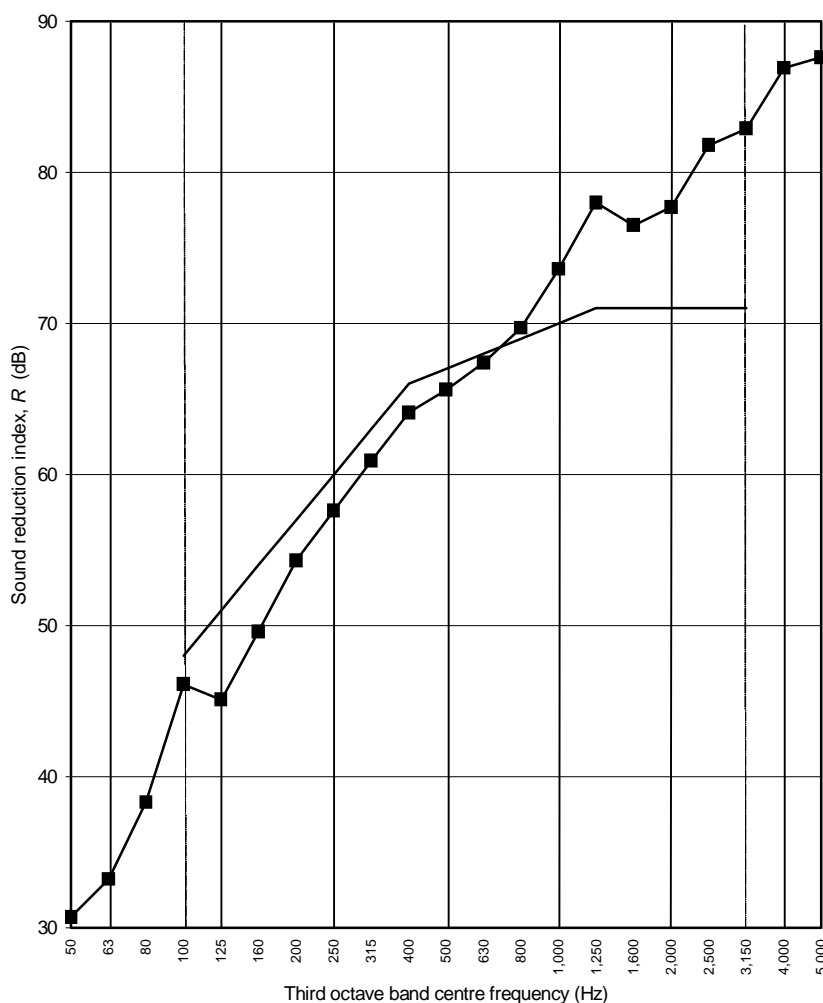
**Receive room volume:** 115 m<sup>3</sup>

**Air relative humidity:** 79 %

Frequency (Hz)	R One-third octave (dB)
50	30.7
63	33.2
80	38.3
100	46.1
125	45.1
160	49.6
200	54.3
250	57.6
315	60.9
400	64.1
500	65.6
630	67.4
800	69.7
1,000	73.6
1,250	78.0
1,600	76.5
2,000	77.7
2,500	81.8
3,150	82.9 +
4,000	86.9 +
5,000	87.6 *

+ Receiving room level adjusted for background

\* Receiving room level within 6 dB of background



Rating according to BS EN ISO 717-1:1997

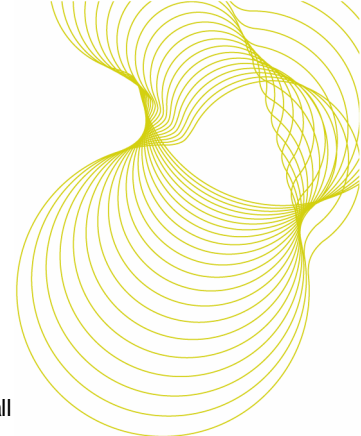
**R<sub>w</sub> (C; C<sub>tr</sub>) = 67 (-2; -7) dB**      C<sub>50-3150</sub> = -5 dB      C<sub>50-5000</sub> = -4 dB      C<sub>100-5000</sub> = -1 dB  
 C<sub>tr,50-3150</sub> = -16 dB      C<sub>tr,50-5000</sub> = -16 dB      C<sub>tr,100-5000</sub> = -7 dB

Evaluation based on laboratory measurement results obtained by an engineering method

Based on the data provided in BS EN 20140-2:1993 it is estimated that the measurement uncertainty should not exceed ±1 dB for the single-number quantity (R<sub>w</sub>) and should not exceed the values in Table A1 of BS EN 20140-2:1993 for the data in the individual third octaves (R)

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The laboratory airborne sound insulation of a twin leaf stud wall with and without double sockets with Polyseam Putty Pads



**Laboratory measurement of airborne sound insulation of building elements**  
**Sound reduction index according to BS EN ISO 140-3:1995**  
**BRE horizontal transmission suite (B9 051-053)**

**Client:** Polyseam Limited  
**Test date:** 16/10/2008      **Test number:** L108-080      **Test element:** Wall

0578

**Test element area:** 9.8 m<sup>2</sup>

**Description:**

As test L108-078 but with two double sockets with Putty pads installed in each side of wall  
 Putty pads fitted behind socket boxes (on cavity side of wall leaves)

**Source room volume:** 130 m<sup>3</sup>      **Air temperature:** 15 °C  
**Receive room volume:** 115 m<sup>3</sup>      **Air relative humidity:** 67 %

Frequency (Hz)	Reverberation time (s)	Background level (dB)	Source level (dB)	Receive level (dB)	R (dB)
50	2.31	23.0	87.3	57.0	31.3
63	2.21	20.1	90.0	58.3	32.4
80	1.77	17.6	92.1	53.2	38.6
100	1.46	20.1	89.8	42.7	45.9
125	2.09	16.6	90.9	46.8	44.6
160	1.86	17.7	91.9	42.2	49.7
200	1.87	4.5	93.6	39.7	53.9
250	1.81	3.9	94.0	36.5	57.4
315	1.65	6.4	93.4	32.1	60.7
400	1.67	4.8	92.3	27.8	64.0
500	1.69	11.4	110.9	45.4	65.1
630	1.64	16.0	108.7	41.1	66.9
800	1.63	13.1	106.3	36.0	69.6
1,000	1.61	11.4	103.7	29.7	73.3
1,250	1.55	13.9	106.8	28.2	77.7
1,600	1.59	6.4	107.7	31.7	75.3
2,000	1.58	4.4	105.4	28.1	76.5
2,500	1.58	4.7	103.9	22.5	80.7
3,150	1.54	5.3	101.6	18.7	82.0
4,000	1.42	5.9	98.4	11.2	86.0
5,000	1.27	6.3	95.5	7.6	86.2

+ Receiving room level adjusted for background

\* Receiving room level within 6 dB of background

Rating according to BS EN ISO 717-1:1997

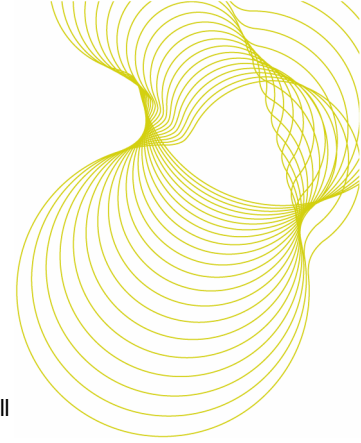
**$R_w(C; C_{tr}) = 67 (-2; -7) \text{ dB}$**        $C_{50-3150} = -5 \text{ dB}$        $C_{50-5000} = -4 \text{ dB}$        $C_{100-5000} = -1 \text{ dB}$   
 $C_{tr,50-3150} = -16 \text{ dB}$        $C_{tr,50-5000} = -16 \text{ dB}$        $C_{tr,100-5000} = -7 \text{ dB}$

Evaluation based on laboratory measurement results obtained by an engineering method

Based on the data provided in BS EN 20140-2:1993 it is estimated that the measurement uncertainty should not exceed  $\pm 1 \text{ dB}$  for the single-number quantity ( $R_w$ ) and should not exceed the values in Table A1 of BS EN 20140-2:1993 for the data in the individual third octaves (R)

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**Air temperature:** 15 °C

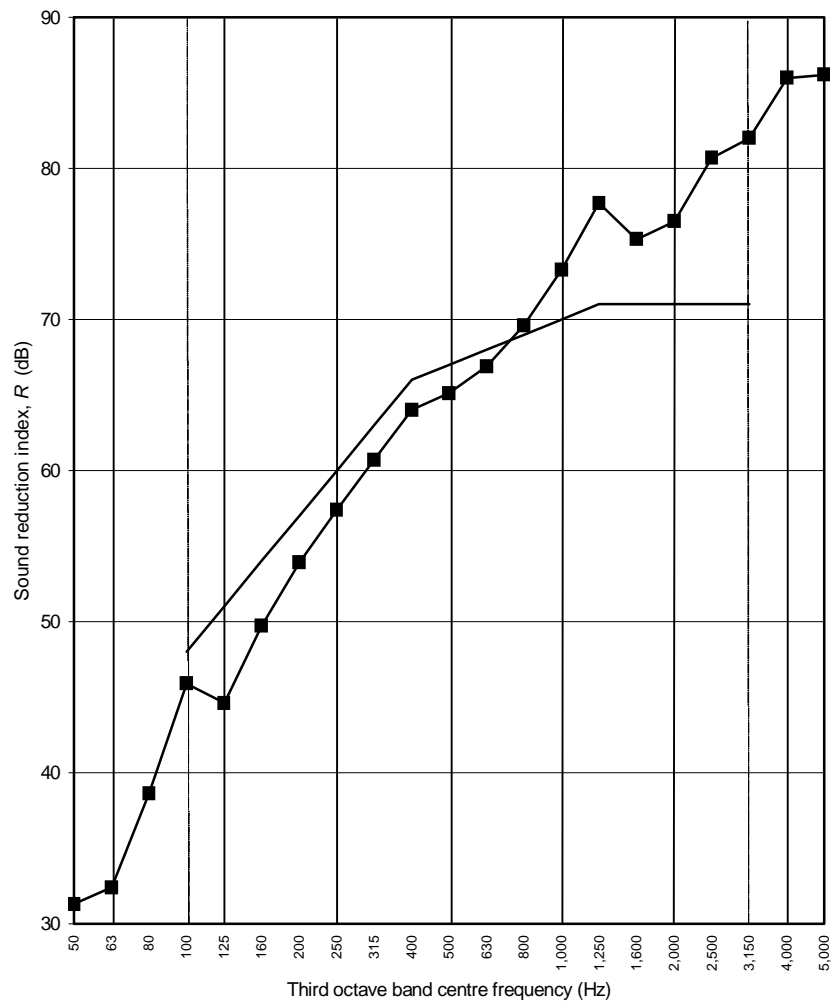
**Receive room volume:** 115 m<sup>3</sup>

**Air relative humidity:** 67 %

Frequency (Hz)	R One-third octave (dB)
50	31.3
63	32.4
80	38.6
100	45.9
125	44.6
160	49.7
200	53.9
250	57.4
315	60.7
400	64.0
500	65.1
630	66.9
800	69.6
1,000	73.3
1,250	77.7
1,600	75.3
2,000	76.5
2,500	80.7
3,150	82.0
4,000	86.0
5,000	86.2

+ Receiving room level adjusted for background

\* Receiving room level within 6 dB of background



Rating according to BS EN ISO 717-1:1997

**R<sub>w</sub> (C; C<sub>tr</sub>) = 67 (-2; -7) dB**      C<sub>50-3150</sub> = -5 dB      C<sub>50-5000</sub> = -4 dB      C<sub>100-5000</sub> = -1 dB  
 C<sub>tr,50-3150</sub> = -16 dB      C<sub>tr,50-5000</sub> = -16 dB      C<sub>tr,100-5000</sub> = -7 dB

Evaluation based on laboratory measurement results obtained by an engineering method

Based on the data provided in BS EN 20140-2:1993 it is estimated that the measurement uncertainty should not exceed ±1 dB for the single-number quantity (R<sub>w</sub>) and should not exceed the values in Table A1 of BS EN 20140-2:1993 for the data in the individual third octaves (R)

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