



Technical Report



INVESTOR IN PEOPLE

Report Number C/09/5L/20855/R02b

Date 9 October 2009

Project

**The Laboratory Determination of
Airborne Sound Transmission of
Various Door Sets**

Prepared for

**DGS
The Director General's House
Rockstone Place
Southampton
SO15 2EP**

By

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0444

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1.0 Summary

Tests have been done in SRL's Laboratory at Holbrook House, Sudbury, Suffolk, to determine the sound reduction index of various door sets in accordance with BS EN ISO 140-3:1995.

From these measurements the required results have been derived and are presented in both tabular and graphic form in Data Sheets 1 to 20.

The results are given in 1/3rd octave bands over the frequency range 50Hz to 10kHz, which is beyond that required by the test standard. Measurements outside the standard frequency range are not UKAS accredited.



.....
Allen Smalls
Quality Manager



.....
Trevor Hickman
Deputy Technical Manager

For and on behalf of
Sound Research Laboratories Ltd

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2.0 Details of Measurements

2.1 Location

Sound Research Laboratories Ltd
Holbrook House
Little Waldingfield
Sudbury
Suffolk
CO10 0TH

2.2 Test Date

13 August 2009

2.3 Instrumentation and Apparatus Used

Make	Description	Type
E D I	Microphone Multiplexer Microphone Power Supply Unit	
Norwegian Electronics	Real Time Analyser Rotating Microphone Boom	830 231
Brüel & Kjaer	12mm Condenser Microphones Windshields Pre Amplifiers Microphone Calibrator Omnipower Sound Source	4166 UA0237 2639, 2669C 4231 4296
Larson Davis	12mm Condenser Microphone	2560
Celestion	Loudspeakers	100w
Douglas Curtis	Rotating Microphone Boom	
Thermo Hygro	Temperature & Humidity Probe	

TOA	Graphic Equalizer	E-1231
QSC Audio	Power Amplifier	RMX 1450

2.4 References

BS EN ISO 140-3:1995	Laboratory measurement of airborne sound insulation of building elements
BS EN ISO 717-1:1997	Rating of sound insulation in buildings and of building elements. Airborne Sound Insulation.

2.5 Personnel Present

Mark Thorne	DGS
Keith Sutcliffe	DGS
David Sutcliffe	DGS

3.0 Description of Test

3.1 Description of Sample

Various single and pairs of doors tested.

Pairs tested in same door frame as singles.

See drawings 1, 2 and 3 for general door and seal details.

See data sheets for individual test details.

Door frame fixed to perimeter with screws and sealed to aperture with mastic and mineral wool.

Sampling plan: Enough for test

Sample condition: New

Details supplied by DGS

Sample installed by DGS

3.2 Sample Delivery date

12 August 2009

3.3 Test Procedures

The sample was mounted/located and tested in accordance with the relevant standard. The method and procedure is described in Appendix 1. The measurement uncertainty is given in Appendix 2.

4.0 Results

The results of the measurements and subsequent analysis are given in Data Sheets 1 to 20 and summarised below.

Results relate only to the items tested.

SRL Test No.	Description in Brief	R _w (C;C _{tr})
2	Single Strebord 44mm Perimeter seals: DGS Twin Flipper & DGS Intumescent/Side Flipper Threshold seal: DGS Top 37 Automatic Threshold Seal	30 (0;-1)
3	Single Strebord 44mm. Fully Caulked	32 (-1;-2)
4	Single Strebord 44mm - Retest Perimeter seals: DGS Twin Flipper & DGS Intumescent/Side Flipper Threshold seal: DGS Top 37 Automatic Threshold Seal	30 (0;-1)
5	Single Strebord 44mm Perimeter seals: DGS Corner Seal & DGS Intumescent/Side Flipper Threshold seal: DGS Top 37 Automatic Threshold Seal	29 (0;-1)
6	Single Strebord 44mm - Retest Perimeter seals: DGS Corner Seal & DGS Intumescent/Side Flipper Threshold seal: DGS Top 37 Automatic Threshold Seal	30 (-1;-2)
7	Single Strebord 44mm with 25% 15mm Pyrostop Perimeter seals: DGS Corner Seal & DGS Intumescent/Side Flipper Threshold seal: DGS Top 37 Automatic Threshold Seal	32 (-1;-2)
8	Single Halspan Prima 44mm Perimeter seals: DGS Corner Seal & DGS Intumescent/Side Flipper Threshold seal: DGS Top 37 Automatic Threshold Seal	32 (-1;-2)
9	Single Halspan Prima 44mm with 25% 15mm Pyrostop Perimeter seals: DGS Corner Seal & DGS Intumescent/Side Flipper Threshold seal: DGS Top 37 Automatic Threshold Seal	35 (-1;-2)
10	Single Flamebreak 44mm Perimeter seals: DGS Corner Seal & DGS Intumescent/Side Flipper Threshold seal: DGS Top 37 Automatic Threshold Seal	30 (-1;-3)

11	Single Flamebreak 44mm with 25% 15mm Pyrostop Perimeter seals: DGS Corner Seal & DGS Intumescent/Side Flipper Threshold seal: DGS Top 37 Automatic Threshold Seal	33 (-1;-3)
12	Single Strebord 44mm Perimeter seals: DGS Corner Seal & DGS Intumescent/Side Flipper Threshold seal: DGS Top 37 Automatic Threshold Seal	29 (-1;-2)
13	Single Strebord 44mm with 25% 15mm Pyrostop Perimeter seals: DGS Corner Seal & DGS Intumescent/Side Flipper Threshold seal: DGS Top 37 Automatic Threshold Seal	34 (-1;-3)
14	Single Premdor 44mm Perimeter seals: DGS Corner Seal & DGS Intumescent/Side Flipper Threshold Seal: DGS Top 37 Automatic Threshold Seal	29 (0;-1)
15	Single Jeld-wen 44mm (threshold seal not set up correctly) Perimeter seals: DGS Corner Seal & DGS Intumescent/Side Flipper Threshold seal: DGS Top 37 Automatic Threshold Seal	24 (0;-1)
16	Single Jeld-wen 44mm Perimeter seals: DGS Corner Seal & DGS Intumescent/Side Flipper Threshold seal: DGS Top 37 Automatic Threshold Seal	28 (0;-1)
17	Single Jeld-wen 44mm - Retest Perimeter seals: DGS Corner Seal & DGS Intumescent/Side Flipper Threshold seal: DGS Top 37 Automatic Threshold Seal	28 (0;-1)
18	Pair Strebord 44mm with 25% 15mm Pyrostop Perimeter seals: DGS Corner Seal & DGS Intumescent/Side Flipper Threshold seal: DGS Top 37 Automatic Threshold Seal Meeting stile Seal: DGS Astragal Seal & DGS Intumescent/Twin Seal	35 (-1;-3)
19	Pair Halspan Prima 44mm with 25% 15mm Pyrostop Perimeter seals: DGS Corner Seal & DGS Intumescent/Side Flipper Threshold seal: DGS Top 37 Automatic Threshold Seal Meeting stile Seal: DGS Astragal Seal & DGS Intumescent/Twin Seal	35 (-1;-3)

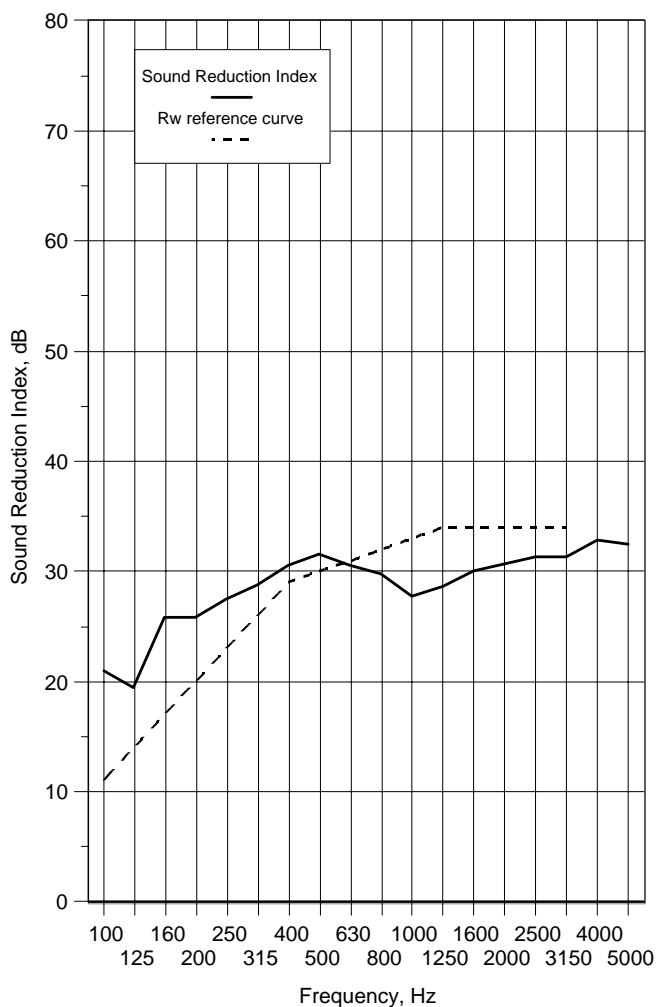
20	Pair Flamebreak 44mm with 25% 15mm Pyrostop Perimeter seals: DGS Corner Seal & DGS Intumescent/Side Flipper Threshold seal: DGS Top 37 Automatic Threshold Seal Meeting stile Seal: DGS Astragal Seal & DGS Intumescent/Twin Seal	33 (-1;-3)
21	Pair Strebord 44mm with 25% 15mm Pyrostop Perimeter seals: DGS Corner Seal & DGS Intumescent Threshold seal: DGS Top 37 Automatic Threshold Seal Meeting stile Seal: DGS Astragal Seal & DGS Intumescent/Twin Seal	35 (-1;-3)

————— *End of Text* —————

Data Sheet 1

Test Number :	2	Air temperature:	20.4 °C
Client:	DGS	Air humidity:	65 %
Test Date:	13/08/2009	Receiving room volume:	300 m3
Sample height:	2.102 m	Source room volume:	115 m3
Sample width:	1.03 m	Sample weight:	25 kg/m2
Product	Single Strebord 44mm		
Identification:	Perimeter seals : DGS Twin Flipper & DGS Intumescent / Side Flipper		
	Threshold seal : DGS Top 37 Automatic Threshold Seal		

Freq f Hz	Sound Reduction Index, dB	
	1/3 Oct	1/1 Oct
50+	21.6	20.6
63+	23.0	
80+	18.5	
100	21.0	21.4
125	19.5	
160	25.8	
200	25.9	27.3
250	27.5	
315	28.8	
400	30.6	30.9
500	31.6	
630	30.6	
800	29.8	28.7
1000	27.8	
1250	28.7	
1600	30.1	30.7
2000	30.7	
2500	31.3	
3150	31.3	32.2
4000	32.8	
5000	32.5	
6300+	33.4	36.1
8000+	36.9	
10000+	41.0	
Average 100-3150	28.2	



Rating according to BS EN ISO 717-1:1997

Rw(C;Ctr)= **30 (0;-1) dB**

Notes : * designates measurement corrected for background

designates limit of measurement due to background

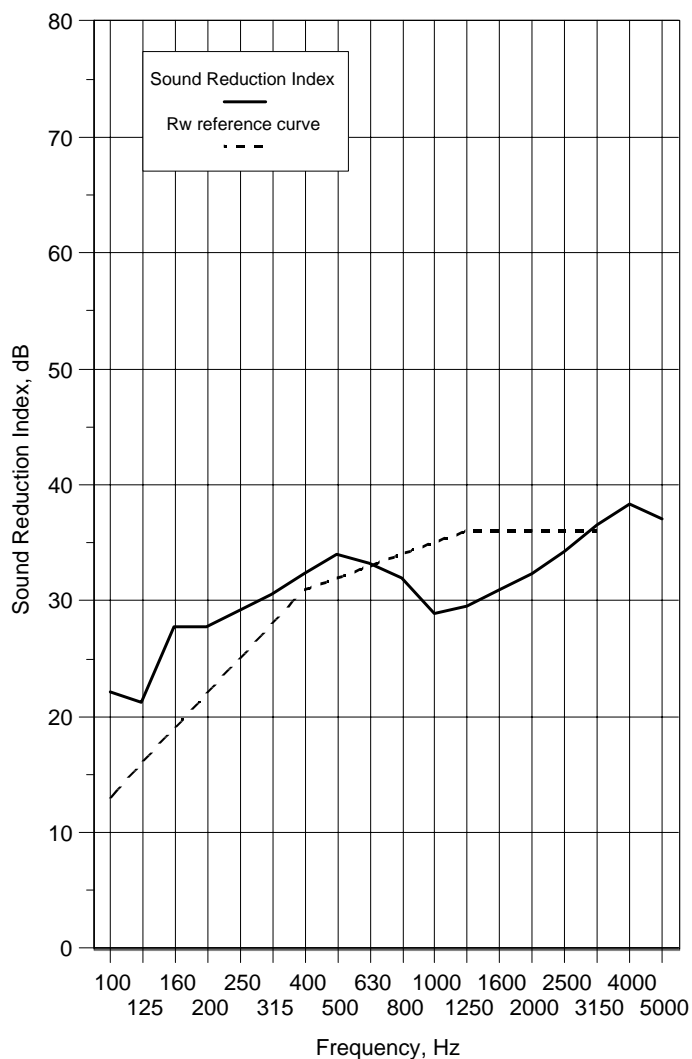
+ designates frequency beyond standard and not UKAS accredited

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Data Sheet 2

Test Number :	3	Air temperature:	20.4 °C
Client:	DGS	Air humidity:	65 %
Test Date:	13/08/2009	Receiving room volume:	300 m3
Sample height:	2.102 m	Source room volume:	115 m3
Sample width:	1.03 m	Sample weight:	25 kg/m2
Product	Single Strebord 44mm		
Identification:	Fully caulked		

Freq f Hz	Sound Reduction Index, dB	
	1/3 Oct	1/1 Oct
50+	20.9	20.8
63+	23.3	
80+	19.2	
100	22.1	22.9
125	21.2	
160	27.7	
200	27.8	29.0
250	29.1	
315	30.6	
400	32.3	33.1
500	34.0	
630	33.3	
800	31.9	29.9
1000	28.9	
1250	29.5	
1600	30.9	32.3
2000	32.3	
2500	34.3	
3150	36.5	37.2
4000	38.3	
5000	37.1	
6300+	38.6	40.9
8000+	41.9	
10000+	44.1	
Average 100-3150	30.2	



Rating according to BS EN ISO 717-1:1997

Rw(C;Ctr)= **32 (-1;-2)** dB

Notes : * designates measurement corrected for background

designates limit of measurement due to background

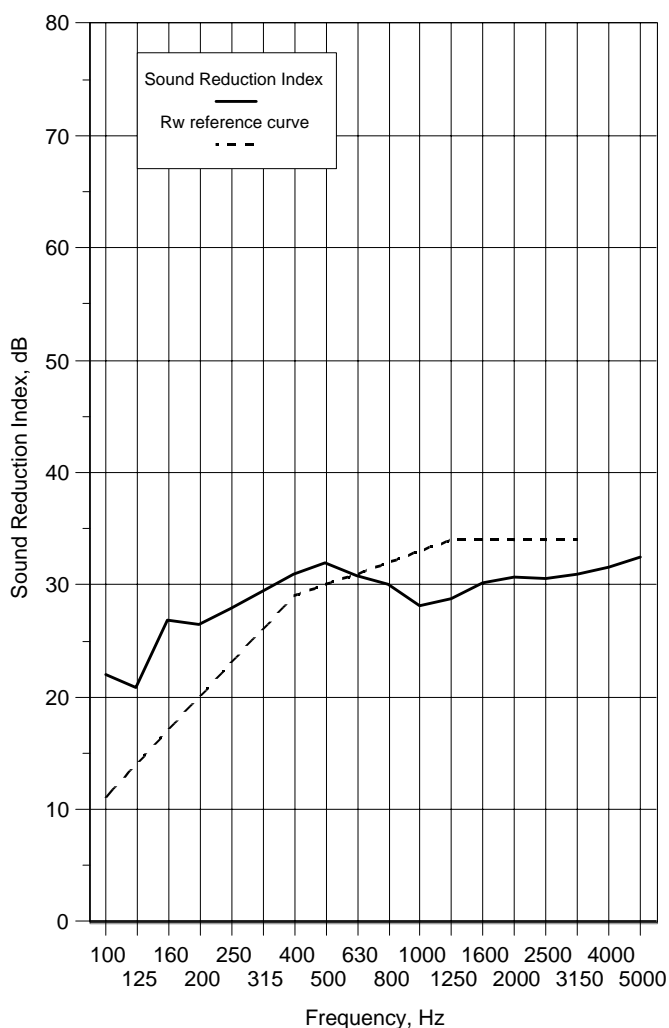
+ designates frequency beyond standard and not UKAS accredited

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Data Sheet 3

Test Number :	4	Air temperature:	20.4 °C
Client:	DGS	Air humidity:	6 %
Test Date:	13/08/2009	Receiving room volume:	300 m ³
Sample height:	2.102 m	Source room volume:	115 m ³
Sample width:	1.03 m	Sample weight:	25 kg/m ²
Product	Single Strebord 44mm - Retest		
Identification:	Perimeter seals : DGS Twin Flipper & DGS Intumescent / Side Flipper		
	Threshold seal : DGS Top 37 Automatic Threshold Seal		

Freq f Hz	Sound Reduction Index, dB	
	1/3 Oct	1/1 Oct
50+	21.5	20.9
63+	23.1	
80+	19.1	
100	22.0	22.6
125	20.9	
160	26.9	
200	26.5	27.8
250	27.9	
315	29.4	
400	30.9	31.2
500	32.0	
630	30.8	
800	30.1	28.9
1000	28.1	
1250	28.8	
1600	30.2	30.5
2000	30.7	
2500	30.6	
3150	30.9	31.6
4000	31.6	
5000	32.5	
6300+	35.7	38.3
8000+	39.4	
10000+	42.3	
Average 100-3150	28.5	



Rating according to BS EN ISO 717-1:1997

Rw(C;Ctr)= **30 (0;-1) dB**

Notes : * designates measurement corrected for background

designates limit of measurement due to background

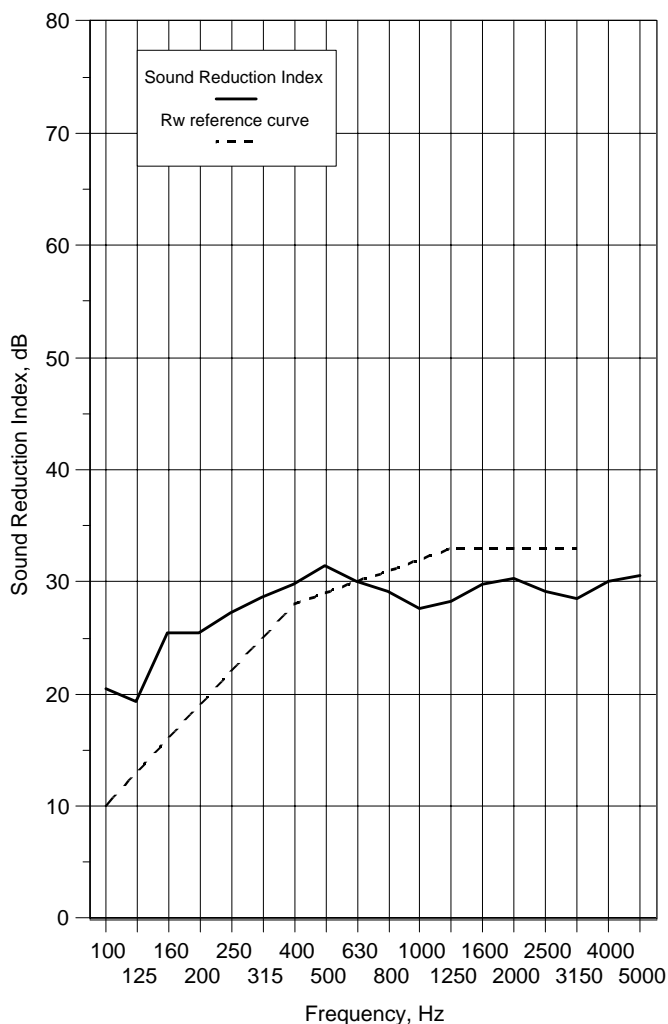
+ designates frequency beyond standard and not UKAS accredited

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Data Sheet 4

Test Number :	5	Air temperature:	20.4 °C
Client:	DGS	Air humidity:	63 %
Test Date:	13/08/2009	Receiving room volume:	300 m3
Sample height:	2.102 m	Source room volume:	115 m3
Sample width:	1.03 m	Sample weight:	25 kg/m2
Product	Single Strebord 44mm		
Identification:	Perimeter seals : DGS Corner Seal & DGS Intumescent / Side Flipper		
	Threshold seal : DGS Top 37 Automatic Threshold Seal		

Freq f Hz	Sound Reduction Index, dB	
	1/3 Oct	1/1 Oct
50+	20.2	19.8
63+	21.6	
80+	18.2	
100	20.5	21.0
125	19.3	
160	25.5	
200	25.5	26.9
250	27.2	
315	28.6	
400	29.8	30.4
500	31.4	
630	30.1	
800	29.2	28.3
1000	27.6	
1250	28.2	
1600	29.8	29.7
2000	30.3	
2500	29.1	
3150	28.5	29.6
4000	30.1	
5000	30.6	
6300+	33.0	35.6
8000+	36.3	
10000+	40.2	
Average 100-3150	27.5	



Rating according to BS EN ISO 717-1:1997

Rw(C;Ctr)= **29 (0;-1) dB**

Notes :* designates measurement corrected for background

designates limit of measurement due to background

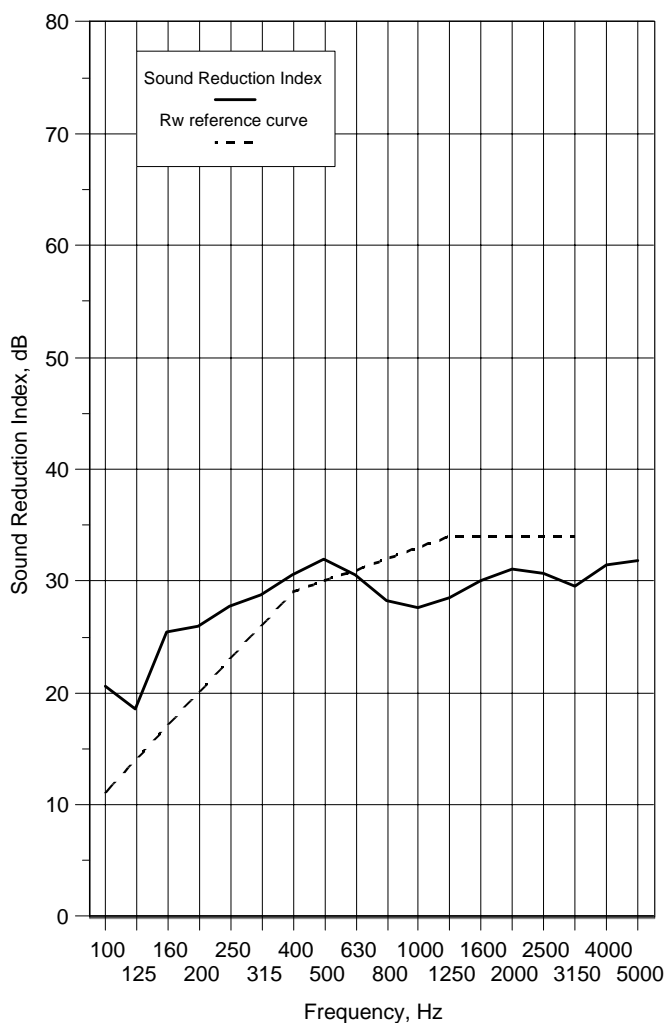
+ designates frequency beyond standard and not UKAS accredited

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Data Sheet 5

Test Number :	6	Air temperature:	20.3 °C
Client:	DGS	Air humidity:	60 %
Test Date:	13/08/2009	Receiving room volume:	300 m3
Sample height:	2.102 m	Source room volume:	115 m3
Sample width:	1.03 m	Sample weight:	25 kg/m2
Product	Single Strebord 44mm - retest		
Identification:	Perimeter seals : DGS Corner Seal & DGS Intumescent / Side Flipper		
	Threshold seal : DGS Top 37 Automatic Threshold Seal		

Freq f Hz	Sound Reduction Index, dB	
	1/3 Oct	1/1 Oct
50+	21.0	20.3
63+	22.4	
80+	18.5	
100	20.6	20.8
125	18.6	
160	25.5	
200	26.0	27.4
250	27.8	
315	28.8	
400	30.5	30.9
500	31.9	
630	30.6	
800	28.3	28.1
1000	27.6	
1250	28.5	
1600	30.0	30.6
2000	31.1	
2500	30.7	
3150	29.6	30.8
4000	31.4	
5000	31.8	
6300+	34.4	37.0
8000+	38.3	
10000+	40.9	
Average 100-3150	27.9	



Rating according to BS EN ISO 717-1:1997

Rw(C;Ctr)= **30 (-1;-2)** dB

Notes :* designates measurement corrected for background

designates limit of measurement due to background

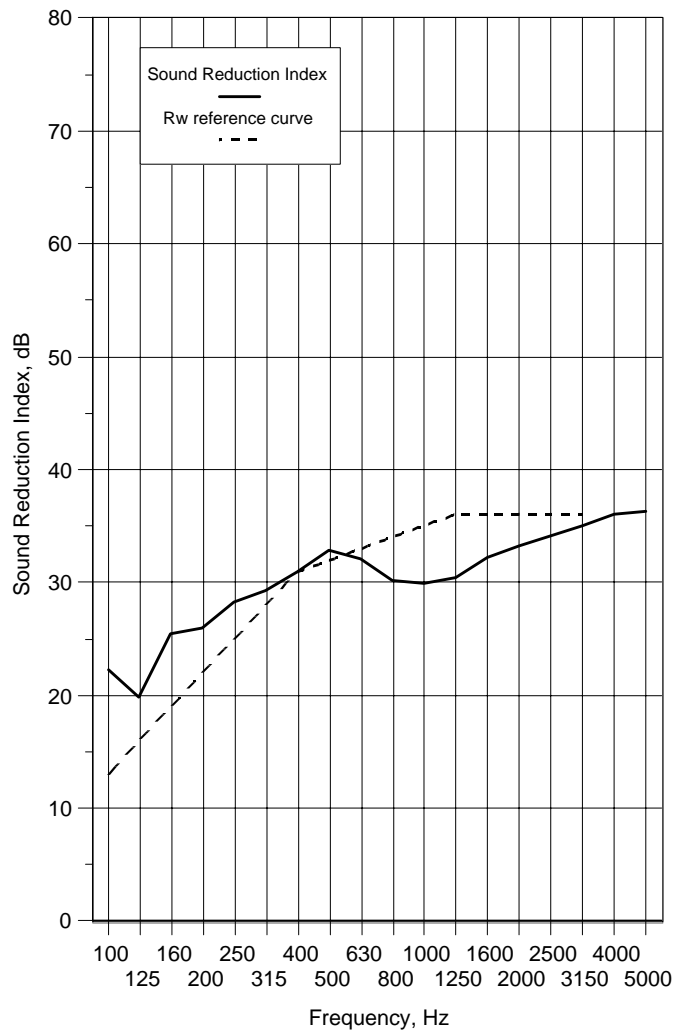
+ designates frequency beyond standard and not UKAS accredited

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Data Sheet 6

Test Number :	7	Air temperature:	20.3 °C
Client:	DGS	Air humidity:	60 %
Test Date:	13/08/2009	Receiving room volume:	300 m3
Sample height:	2.102 m	Source room volume:	115 m3
Sample width:	1.03 m	Sample weight:	29.1 kg/m2
Product	Single Strebord 44mm with 25% 15mm Pyrostop		
Identification:	Perimeter seals : DGS Corner Seal & DGS Intumescent / Side Flipper		
	Threshold seal : DGS Top 37 Automatic Threshold Seal		

Freq f Hz	Sound Reduction Index, dB	
	1/3 Oct	1/1 Oct
50+	29.4	24.3
63+	26.9	
80+	20.9	
100	22.3	22.0
125	19.9	
160	25.5	
200	26.0	27.7
250	28.3	
315	29.3	
400	31.0	31.9
500	32.8	
630	32.1	
800	30.2	30.2
1000	29.9	
1250	30.4	
1600	32.2	33.1
2000	33.3	
2500	34.1	
3150	35.0	35.8
4000	36.1	
5000	36.3	
6300+	38.4	40.3
8000+	41.0	
10000+	42.8	
Average 100-3150	29.5	



Rating according to BS EN ISO 717-1:1997

Rw(C;Ctr)= **32 (-1;-2)** dB

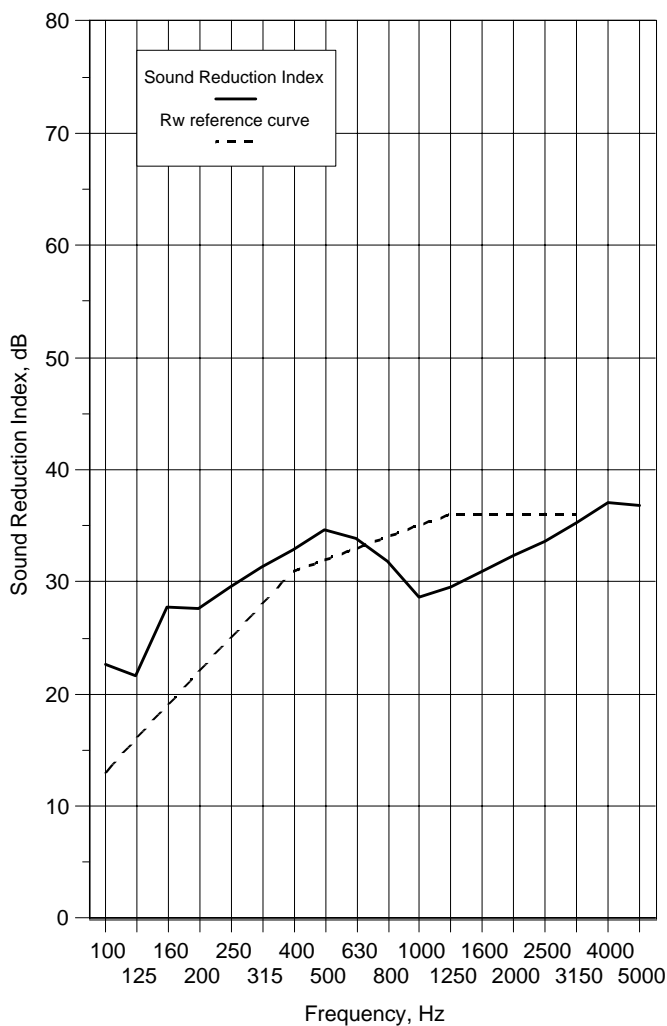
Notes : * designates measurement corrected for background
 # designates limit of measurement due to background
 + designates frequency beyond standard and not UKAS accredited

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Data Sheet 7

Test Number :	8	Air temperature:	20.5 °C
Client:	DGS	Air humidity:	61 %
Test Date:	13/08/2009	Receiving room volume:	300 m ³
Sample height:	2.102 m	Source room volume:	115 m ³
Sample width:	1.03 m	Sample weight:	26.8 kg/m ²
Product	Single Halspan Prima 44mm		
Identification:	Perimeter seals : DGS Corner Seal & DGS Intumescent / Side Flipper		
	Threshold seal : DGS Top 37 Automatic Threshold Seal		

Freq f Hz	Sound Reduction Index, dB	
	1/3 Oct	1/1 Oct
50+	22.7	21.7
63+	23.2	
80+	20.0	
100	22.7	23.3
125	21.6	
160	27.8	
200	27.6	29.2
250	29.6	
315	31.3	
400	32.9	33.7
500	34.6	
630	33.9	
800	31.8	29.8
1000	28.6	
1250	29.6	
1600	31.0	32.2
2000	32.3	
2500	33.6	
3150	35.3	36.3
4000	37.1	
5000	36.8	
6300+	38.4	40.5
8000+	41.1	
10000+	43.1	
Average 100-3150	30.3	



Rating according to BS EN ISO 717-1:1997

Rw(C;Ctr)= **32 (-1;-2)** dB

Notes : * designates measurement corrected for background

designates limit of measurement due to background

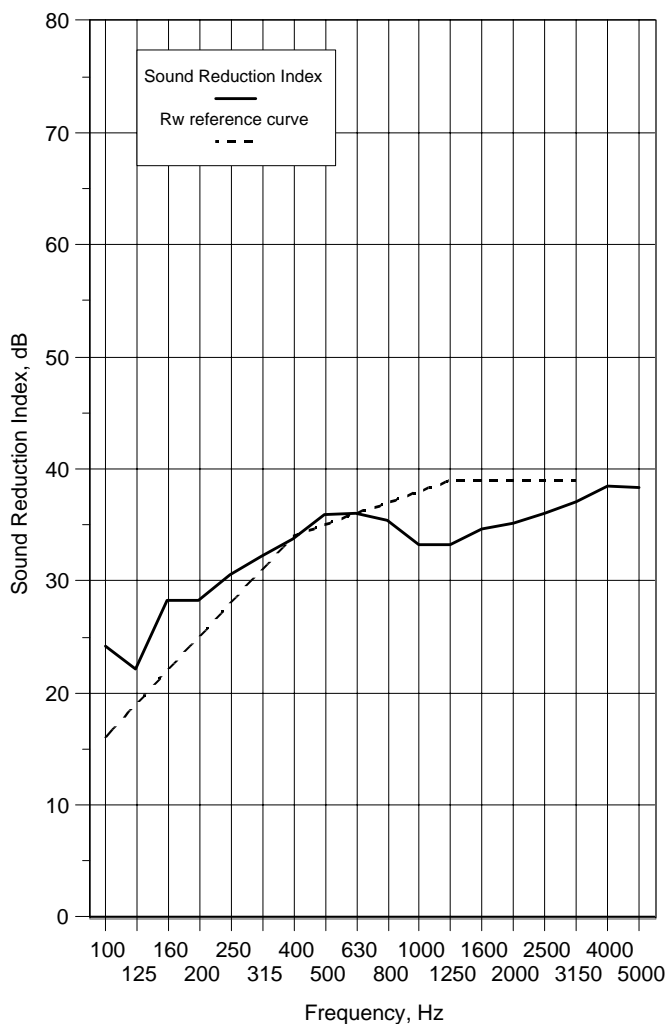
+ designates frequency beyond standard and not UKAS accredited

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Data Sheet 8

Test Number :	9	Air temperature:	20.6 °C
Client:	DGS	Air humidity:	62 %
Test Date:	13/08/2009	Receiving room volume:	300 m ³
Sample height:	2.102 m	Source room volume:	115 m ³
Sample width:	1.03 m	Sample weight:	28.7 kg/m ²
Product	Single Halspan Prima 44mm with 25% 15mm Pyrostop		
Identification:	Perimeter seals : DGS Corner Seal & DGS Intumescent / Side Flipper		
	Threshold seal : DGS Top 37 Automatic Threshold Seal		

Freq f Hz	Sound Reduction Index, dB	
	1/3 Oct	1/1 Oct
50+	29.7	25.6
63+	27.7	
80+	22.6	
100	24.2	24.1
125	22.1	
160	28.3	
200	28.2	30.0
250	30.6	
315	32.2	
400	33.7	35.1
500	35.9	
630	36.1	
800	35.4	33.8
1000	33.2	
1250	33.2	
1600	34.6	35.2
2000	35.1	
2500	36.1	
3150	37.1	37.9
4000	38.5	
5000	38.4	
6300+	39.8	41.5
8000+	41.7	
10000+	43.9	
Average 100-3150	32.3	



Rating according to BS EN ISO 717-1:1997

Rw(C;Ctr)= **35 (-1;-2) dB**

Notes : * designates measurement corrected for background

designates limit of measurement due to background

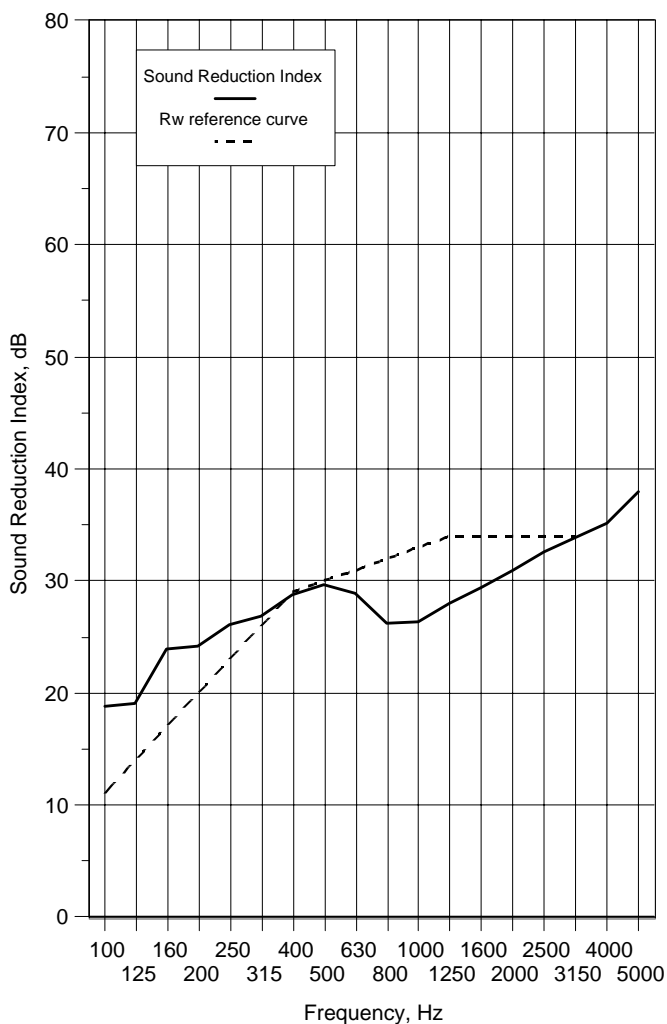
+ designates frequency beyond standard and not UKAS accredited

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Data Sheet 9

Test Number :	10	Air temperature:	20.8 °C
Client:	DGS	Air humidity:	62 %
Test Date:	13/08/2009	Receiving room volume:	300 m3
Sample height:	2.102 m	Source room volume:	115 m3
Sample width:	1.03 m	Sample weight:	19.7 kg/m2
Product	Single Flamebreak 44mm		
Identification:	Perimeter seals : DGS Corner Seal & DGS Intumescent / Side Flipper		
	Threshold seal : DGS Top 37 Automatic Threshold Seal		

Freq f Hz	Sound Reduction Index, dB	
	1/3 Oct	1/1 Oct
50+	18.7	18.0
63+	19.4	
80+	16.5	
100	18.8	20.1
125	19.1	
160	23.9	
200	24.2	25.6
250	26.1	
315	26.9	
400	28.8	29.1
500	29.7	
630	28.9	
800	26.2	26.7
1000	26.3	
1250	28.0	
1600	29.4	30.8
2000	30.9	
2500	32.6	
3150	33.9	35.4
4000	35.1	
5000	38.0	
6300+	40.3	41.1
8000+	41.5	
10000+	41.6	
Average 100-3150	27.1	



Rating according to BS EN ISO 717-1:1997

Rw(C;Ctr)= **30 (-1;-3) dB**

Notes : * designates measurement corrected for background

designates limit of measurement due to background

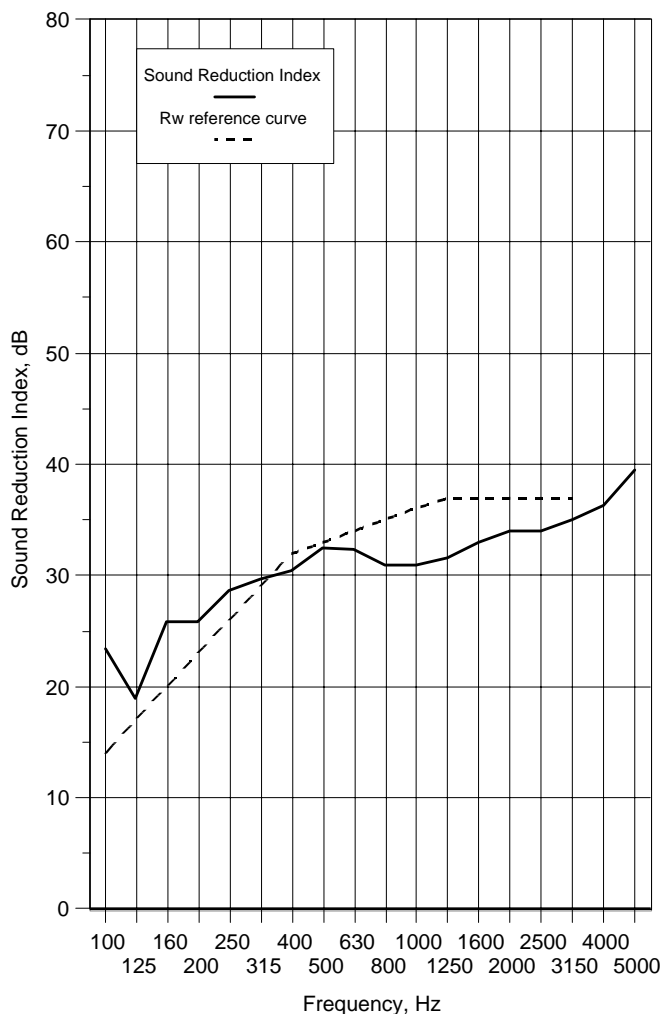
+ designates frequency beyond standard and not UKAS accredited

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Data Sheet 10

Test Number :	11	Air temperature:	20.8 °C
Client:	DGS	Air humidity:	62 %
Test Date:	13/08/2009	Receiving room volume:	300 m3
Sample height:	2.102 m	Source room volume:	115 m3
Sample width:	1.03 m	Sample weight:	23.5 kg/m2
Product	Single Flamebreak 44mm with 25% 15mm Pyrostop		
Identification:	Perimeter seals : DGS Corner Seal & DGS Intumescent / Side Flipper		
	Threshold seal : DGS Top 37 Automatic Threshold Seal		

Freq f Hz	Sound Reduction Index, dB	
	1/3 Oct	1/1 Oct
50+	28.0	24.3
63+	27.0	
80+	21.3	
100	23.4	21.8
125	19.0	
160	25.8	
200	25.9	27.7
250	28.6	
315	29.7	
400	30.4	31.6
500	32.5	
630	32.3	
800	30.9	31.1
1000	30.9	
1250	31.6	
1600	33.0	33.7
2000	34.0	
2500	34.0	
3150	35.0	36.6
4000	36.3	
5000	39.5	
6300+	41.9	42.3
8000+	42.6	
10000+	42.4	
Average 100-3150	29.8	



Rating according to BS EN ISO 717-1:1997

Rw(C;Ctr)= **33 (-1;-3)** dB

Notes : * designates measurement corrected for background

designates limit of measurement due to background

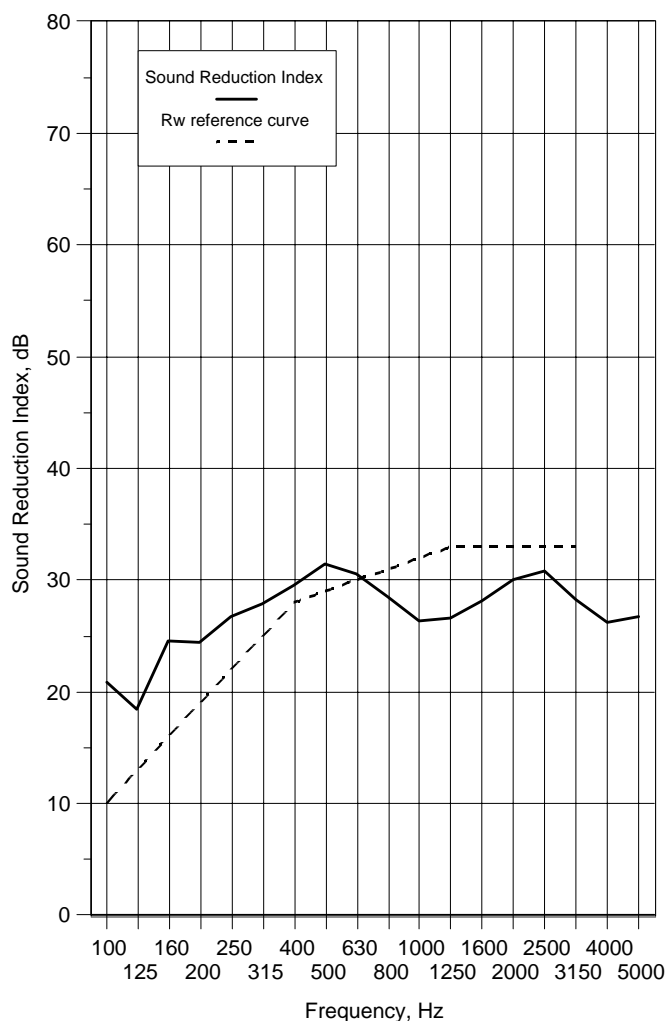
+ designates frequency beyond standard and not UKAS accredited

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Data Sheet 11

Test Number :	12	Air temperature:	21 °C
Client:	DGS	Air humidity:	61 %
Test Date:	13/08/2009	Receiving room volume:	300 m3
Sample height:	2.102 m	Source room volume:	115 m3
Sample width:	1.03 m	Sample weight:	25 kg/m2
Product	Single Strebord 44mm		
Identification:	Perimeter seals : DGS Corner Seal & DGS Intumescent / Side Flipper		
	Threshold seal : DGS Top 37 Automatic Threshold Seal		

Freq f Hz	Sound Reduction Index, dB	
	1/3 Oct	1/1 Oct
50+	20.4	19.4
63+	21.6	
80+	17.4	
100	20.8	20.6
125	18.5	
160	24.6	
200	24.4	26.1
250	26.7	
315	27.9	
400	29.6	30.4
500	31.5	
630	30.5	
800	28.5	27.0
1000	26.3	
1250	26.6	
1600	28.1	29.5
2000	30.1	
2500	30.8	
3150	28.2	27.0
4000	26.2	
5000	26.7	
6300+	28.4	30.9
8000+	32.0	
10000+	34.4	
Average 100-3150	27.1	



Rating according to BS EN ISO 717-1:1997

Rw(C;Ctr)= **29 (-1;-2)** dB

Notes :* designates measurement corrected for background

designates limit of measurement due to background

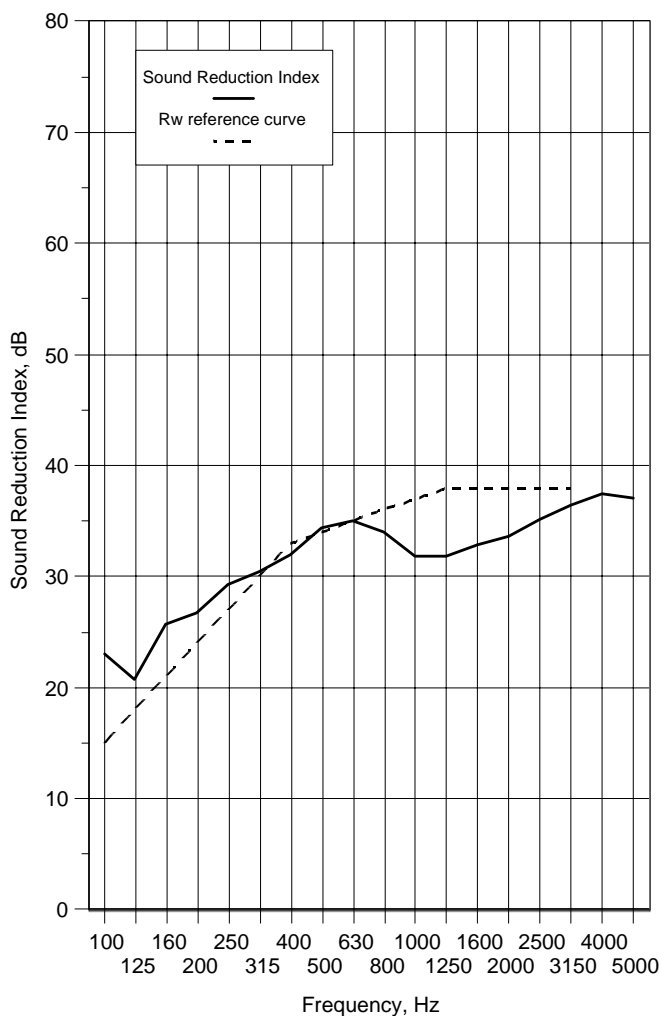
+ designates frequency beyond standard and not UKAS accredited

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Data Sheet 12

Test Number :	13	Air temperature:	21 °C
Client:	DGS	Air humidity:	60 %
Test Date:	13/08/2009	Receiving room volume:	300 m ³
Sample height:	2.102 m	Source room volume:	115 m ³
Sample width:	1.03 m	Sample weight:	29.1 kg/m ²
Product	Single Strebord 44mm with 25% 15mm Pyrostop		
Identification:	Perimeter seals : DGS Corner Seal & DGS Intumescent / Side Flipper		
	Threshold seal : DGS Top 37 Automatic Threshold Seal		

Freq f Hz	Sound Reduction Index, dB	
	1/3 Oct	1/1 Oct
50+	28.7	24.4
63+	26.9	
80+	21.2	
100	23.0	22.6
125	20.7	
160	25.7	
200	26.7	28.5
250	29.3	
315	30.4	
400	32.0	33.6
500	34.4	
630	35.0	
800	34.0	32.4
1000	31.8	
1250	31.8	
1600	32.9	33.8
2000	33.6	
2500	35.1	
3150	36.4	37.0
4000	37.5	
5000	37.1	
6300+	39.2	40.7
8000+	40.6	
10000+	43.0	
Average 100-3150	30.8	



Rating according to BS EN ISO 717-1:1997

Rw(C;Ctr) = **34 (-1;-3)** dB

Notes : * designates measurement corrected for background

designates limit of measurement due to background

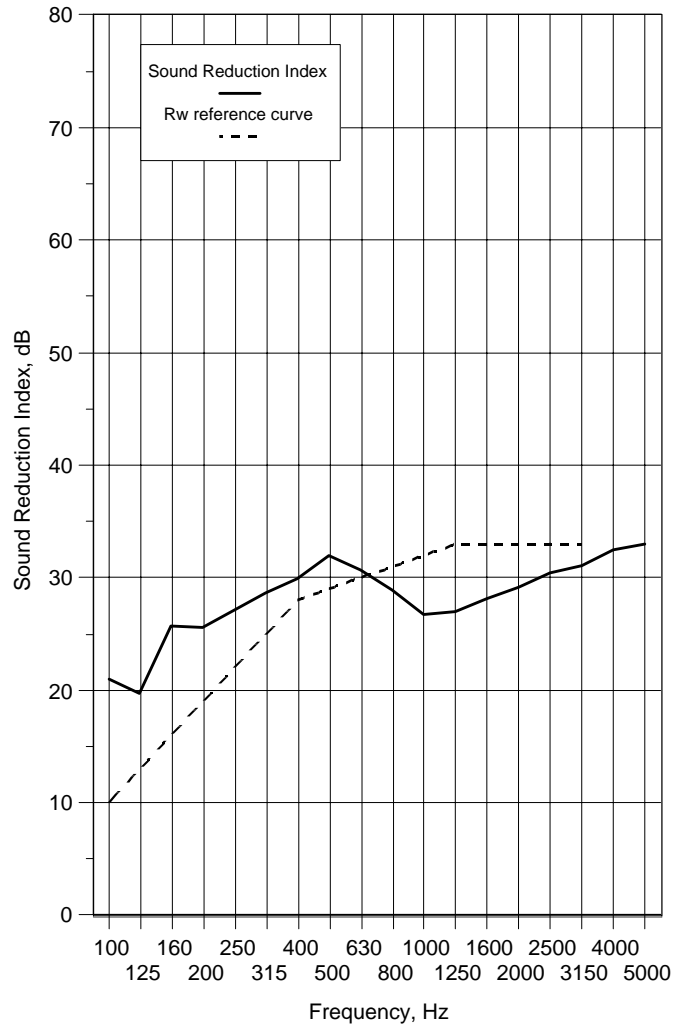
+ designates frequency beyond standard and not UKAS accredited

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Data Sheet 13

Test Number :	14	Air temperature:	21 °C
Client:	DGS	Air humidity:	59 %
Test Date:	13/08/2009	Receiving room volume:	300 m3
Sample height:	2.102 m	Source room volume:	115 m3
Sample width:	1.03 m	Sample weight:	23 kg/m2
Product	Single Premdor 44mm		
Identification:	Perimeter seals : DGS Corner Seal & DGS Intumescent / Side Flipper		
	Threshold seal : DGS Top 37 Automatic Threshold Seal		

Freq f Hz	Sound Reduction Index, dB	
	1/3 Oct	1/1 Oct
50+	20.5	20.2
63+	22.3	
80+	18.5	
100	21.0	21.5
125	19.7	
160	25.7	26.9
200	25.6	
250	27.1	
315	28.6	30.8
400	29.9	
500	32.0	
630	30.7	27.4
800	28.9	
1000	26.7	
1250	27.0	29.1
1600	28.1	
2000	29.1	
2500	30.4	32.1
3150	31.1	
4000	32.5	
5000	33.0	37.3
6300+	35.5	
8000+	37.7	
10000+	39.7	
Average 100-3150	27.6	



Rating according to BS EN ISO 717-1:1997

Rw(C;Ctr)= **29 (0;-1)** dB

Notes : * designates measurement corrected for background

designates limit of measurement due to background

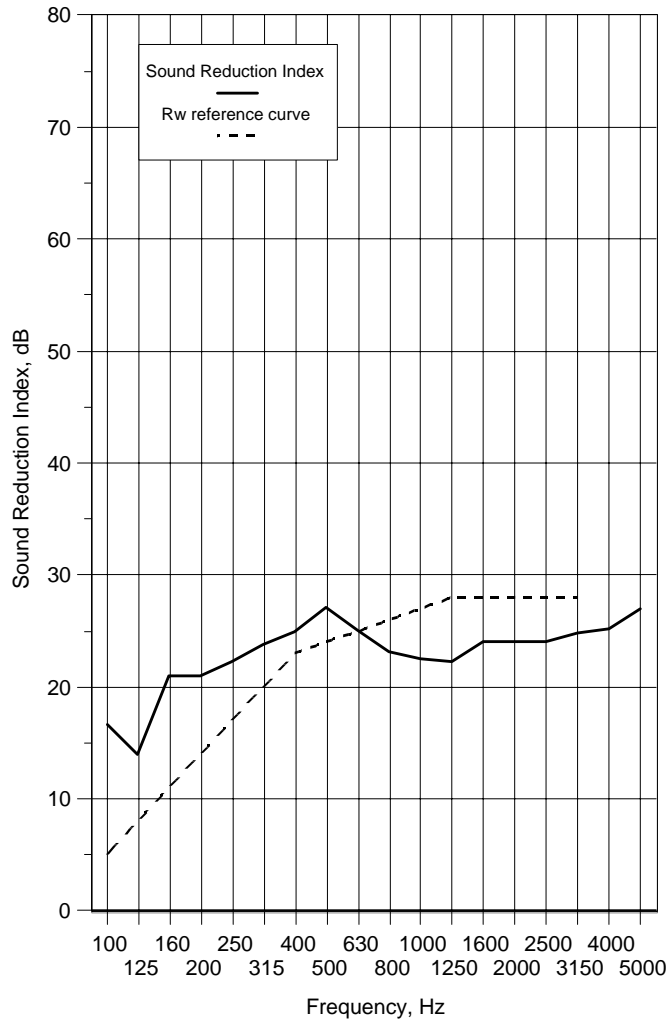
+ designates frequency beyond standard and not UKAS accredited

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Data Sheet 14

Test Number :	15	Air temperature:	21 °C
Client:	DGS	Air humidity:	59 %
Test Date:	13/08/2009	Receiving room volume:	300 m3
Sample height:	2.102 m	Source room volume:	115 m3
Sample width:	1.03 m	Sample weight:	19.2 kg/m2
Product	Single Jeld-wen 44mm (threshold seal not set up correctly)		
Identification:	Perimeter seals : DGS Corner Seal & DGS Intumescent / Side Flipper		
	Threshold seal : DGS Top 37 Automatic Threshold Seal		

Freq f Hz	Sound Reduction Index, dB	
	1/3 Oct	1/1 Oct
50+	18.1	16.5
63+	18.4	
80+	14.3	
100	16.6	16.4
125	14.0	
160	21.0	22.2
200	21.0	
250	22.3	
315	23.8	25.6
400	25.0	
500	27.1	22.7
630	25.1	
800	23.2	
1000	22.5	24.1
1250	22.3	
1600	24.1	
2000	24.1	25.6
2500	24.0	
3150	24.8	
4000	25.2	27.2
5000	27.0	
6300+	26.8	
8000+	25.8	27.2
10000+	29.9	
Average 100-3150	22.6	



Rating according to BS EN ISO 717-1:1997

Rw(C;Ctr)= **24 (0;-1) dB**

Notes : * designates measurement corrected for background

designates limit of measurement due to background

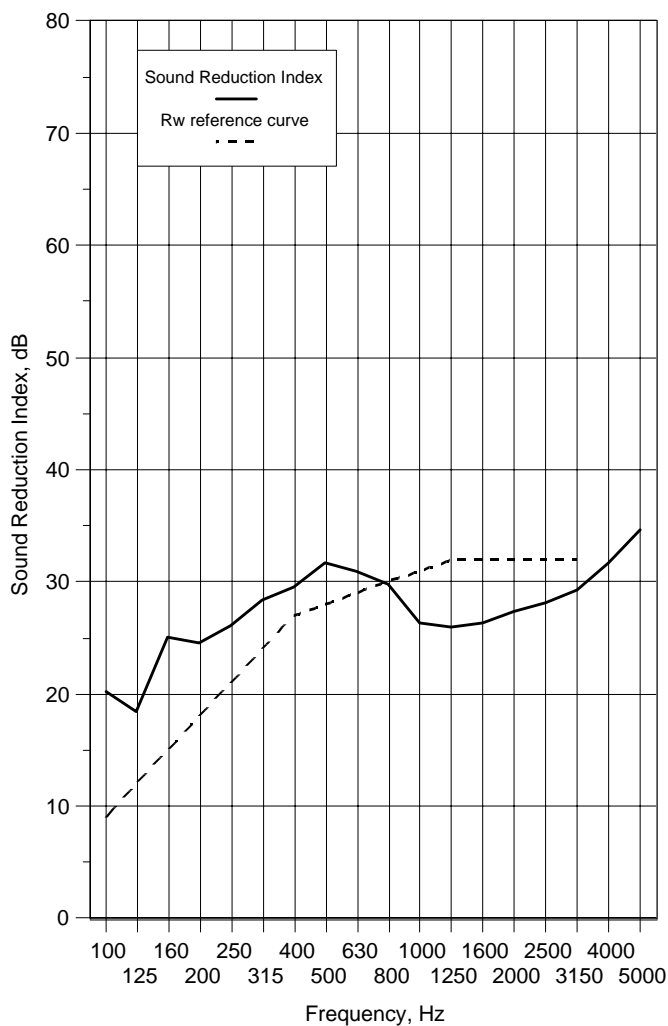
+ designates frequency beyond standard and not UKAS accredited

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Data Sheet 15

Test Number :	16	Air temperature:	21 °C
Client:	DGS	Air humidity:	59 %
Test Date:	13/08/2009	Receiving room volume:	300 m3
Sample height:	2.102 m	Source room volume:	115 m3
Sample width:	1.03 m	Sample weight:	19.2 kg/m2
Product	Single Jeld-wen 44mm		
Identification:	Perimeter seals : DGS Corner Seal & DGS Intumescent / Side Flipper		
	Threshold seal : DGS Top 37 Automatic Threshold Seal		

Freq f Hz	Sound Reduction Index, dB	
	1/3 Oct	1/1 Oct
50+	20.3	19.4
63+	21.3	
80+	17.6	
100	20.2	20.5
125	18.5	
160	25.1	
200	24.5	26.1
250	26.1	
315	28.4	
400	29.6	30.6
500	31.7	
630	30.9	
800	29.8	27.1
1000	26.3	
1250	26.0	
1600	26.4	27.2
2000	27.4	
2500	28.1	
3150	29.3	31.4
4000	31.7	
5000	34.7	
6300+	37.3	38.3
8000+	38.1	
10000+	39.8	
Average 100-3150	26.8	



Rating according to BS EN ISO 717-1:1997

Rw(C;Ctr)= **28 (0;-1)** dB

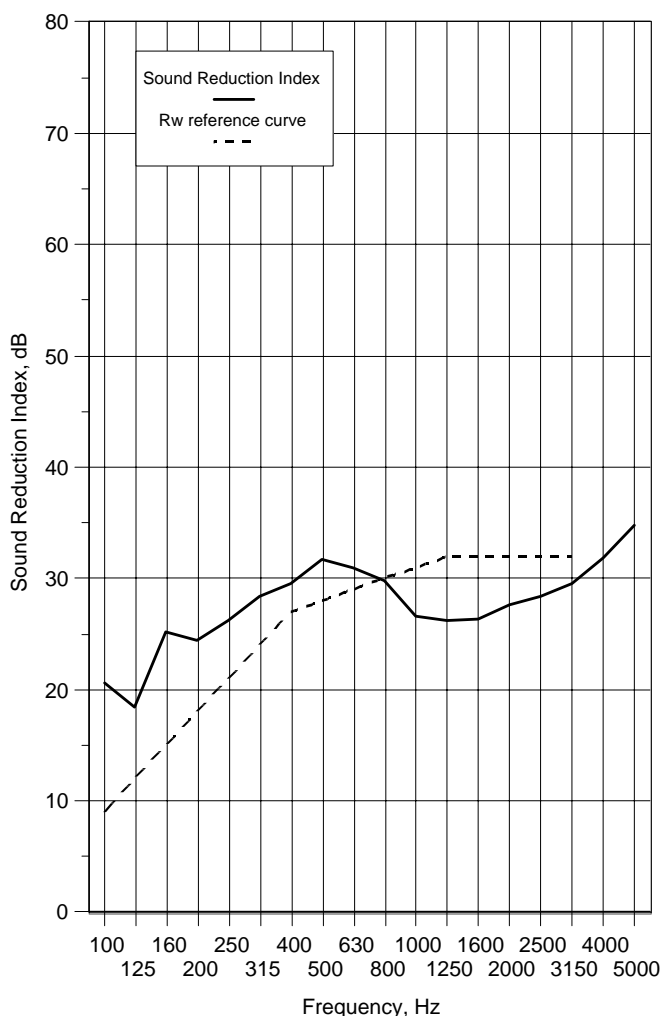
Notes : * designates measurement corrected for background
 # designates limit of measurement due to background
 + designates frequency beyond standard and not UKAS accredited

v.1.6

Data Sheet 16

Test Number :	17	Air temperature:	21 °C
Client:	DGS	Air humidity:	59 %
Test Date:	13/08/2009	Receiving room volume:	300 m3
Sample height:	2.102 m	Source room volume:	115 m3
Sample width:	1.03 m	Sample weight:	19.2 kg/m2
Product	Single Jeld-wen 44mm - retest		
Identification:	Perimeter seals : DGS Corner Seal & DGS Intumescent / Side Flipper		
	Threshold seal : DGS Top 37 Automatic Threshold Seal		

Freq f Hz	Sound Reduction Index, dB	
	1/3 Oct	1/1 Oct
50+	20.4	19.5
63+	21.0	
80+	17.8	
100	20.6	20.7
125	18.5	
160	25.2	
200	24.4	26.0
250	26.2	
315	28.4	
400	29.6	30.6
500	31.7	
630	30.9	
800	29.8	27.3
1000	26.6	
1250	26.2	
1600	26.4	27.4
2000	27.6	
2500	28.4	
3150	29.5	31.5
4000	31.8	
5000	34.8	
6300+	37.5	38.6
8000+	38.5	
10000+	40.3	
Average 100-3150	26.9	



Rating according to BS EN ISO 717-1:1997

Rw(C;Ctr)= **28 (0;-1) dB**

Notes : * designates measurement corrected for background

designates limit of measurement due to background

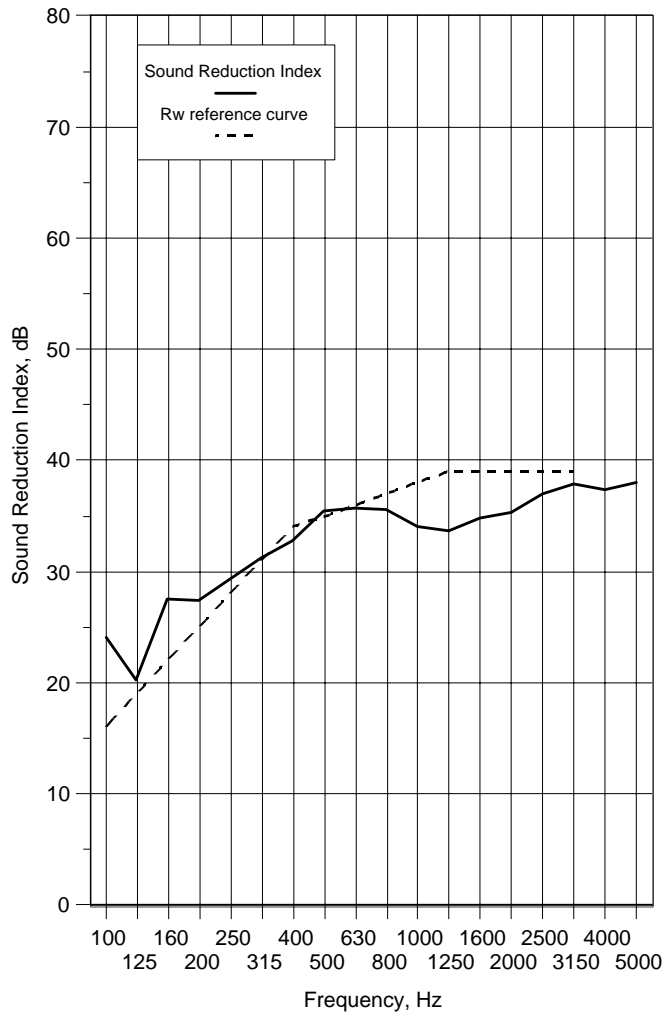
+ designates frequency beyond standard and not UKAS accredited

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Data Sheet 17

Test Number :	18	Air temperature:	21 °C
Client:	DGS	Air humidity:	59 %
Test Date:	13/08/2009	Receiving room volume:	300 m3
Sample height:	2.102 m	Source room volume:	115 m3
Sample width:	1.03 m	Sample weight:	29.1 kg/m2
Product	Pair Strebord 44mm with 25% 15mm Pyrostop		
Identification:	Perimeter seals : DGS Corner Seal & DGS Intumescent / Side Flipper		
	Threshold seal : DGS Top 37 Automatic Threshold Seal		
	Meeting stile seal : DGS Astragal Seal & DGS Intumescent / Twin Seal		

Freq f Hz	Sound Reduction Index, dB	
	1/3 Oct	1/1 Oct
50+	28.4	24.9
63+	26.8	
80+	22.1	
100	24.1	23.0
125	20.2	
160	27.5	
200	27.4	29.0
250	29.3	
315	31.3	
400	32.8	34.5
500	35.5	
630	35.7	
800	35.6	34.4
1000	34.0	
1250	33.7	
1600	34.8	35.6
2000	35.3	
2500	37.0	
3150	37.9	37.7
4000	37.4	
5000	38.0	
6300+	39.8	41.0
8000+	40.9	
10000+	42.9	
Average 100-3150	32.0	



Rating according to BS EN ISO 717-1:1997

Rw(C;Ctr)= **35 (-1;-3)** dB

Notes : * designates measurement corrected for background

designates limit of measurement due to background

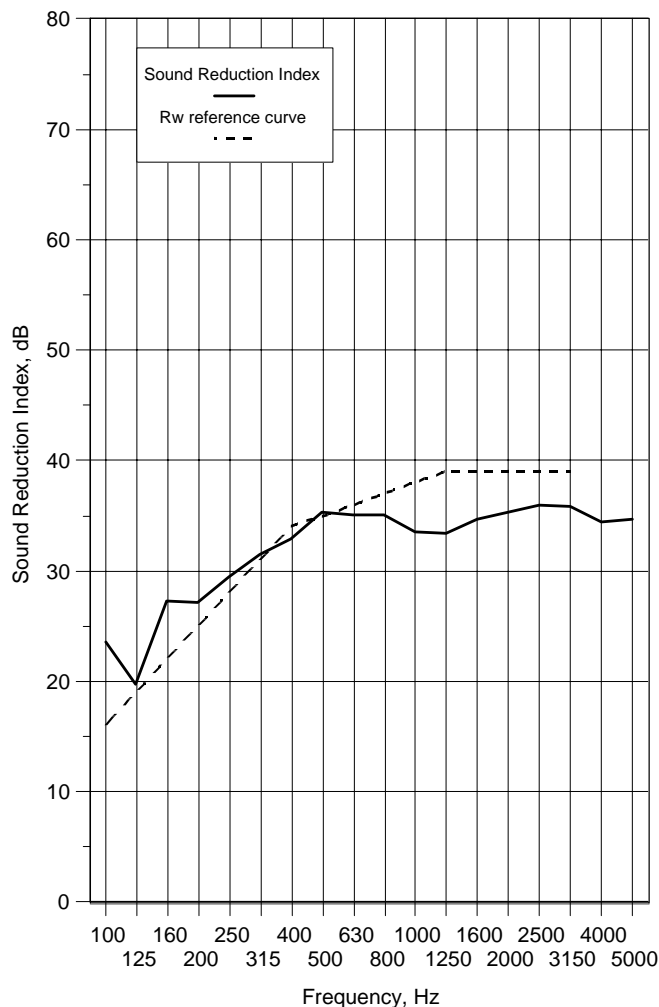
+ designates frequency beyond standard and not UKAS accredited

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Data Sheet 18

Test Number :	19	Air temperature:	21 °C
Client:	DGS	Air humidity:	59 %
Test Date:	13/08/2009	Receiving room volume:	300 m3
Sample height:	2.102 m	Source room volume:	115 m3
Sample width:	1.03 m	Sample weight:	30.3 kg/m2
Product	Pair Halspan Prima 44mm with 25% 15mm Pyrostop		
Identification:	Perimeter seals : DGS Corner Seal & DGS Intumescent / Side Flipper		
	Threshold seal : DGS Top 37 Automatic Threshold Seal		
	Meeting stile seal : DGS Astragal Seal & DGS Intumescent / Twin Seal		

Freq f Hz	Sound Reduction Index, dB	
	1/3 Oct	1/1 Oct
50+	28.7	23.8
63+	26.3	
80+	20.6	
100	23.6	22.6
125	19.8	
160	27.3	29.0
200	27.1	
250	29.4	
315	31.5	34.3
400	32.9	
500	35.3	
630	35.1	33.9
800	35.1	
1000	33.5	
1250	33.4	35.3
1600	34.7	
2000	35.3	
2500	36.0	35.0
3150	35.9	
4000	34.5	
5000	34.7	39.5
6300+	37.7	
8000+	40.0	
10000+	41.6	
Average 100-3150	31.6	



Rating according to BS EN ISO 717-1:1997

Rw(C;Ctr)= **35 (-1;-3)** dB

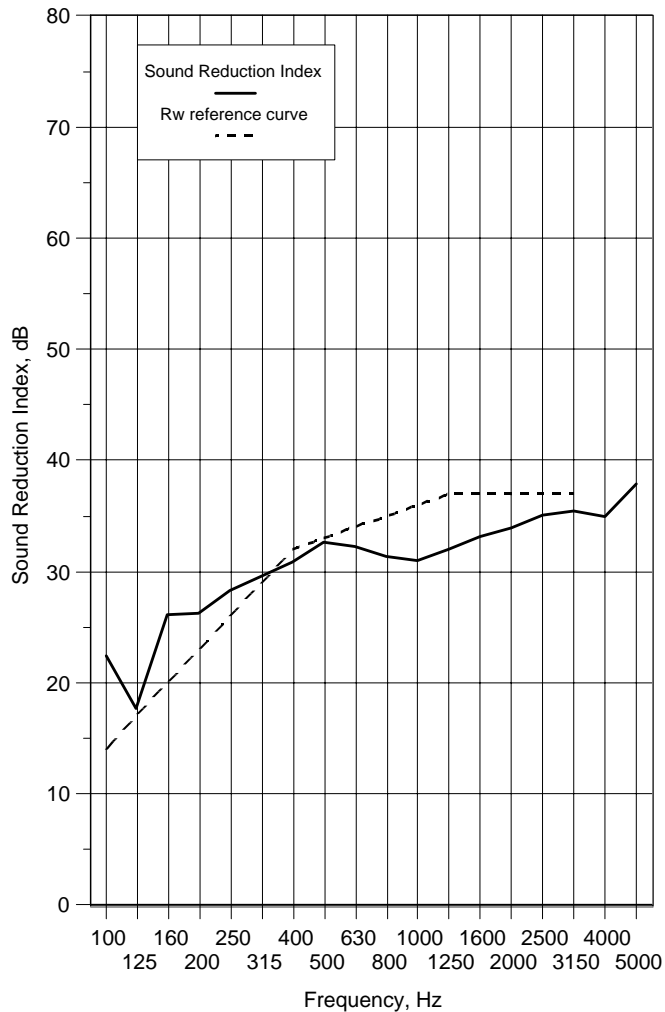
Notes : * designates measurement corrected for background
 # designates limit of measurement due to background
 + designates frequency beyond standard and not UKAS accredited

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Data Sheet 19

Test Number :	20	Air temperature:	21 °C
Client:	DGS	Air humidity:	59 %
Test Date:	13/08/2009	Receiving room volume:	300 m3
Sample height:	2.102 m	Source room volume:	115 m3
Sample width:	1.03 m	Sample weight:	23.8 kg/m2
Product	Pair Flamebreak 44mm with 25% 15mm Pyrostop		
Identification:	Perimeter seals : DGS Corner Seal & DGS Intumescent / Side Flipper		
	Threshold seal : DGS Top 37 Automatic Threshold Seal		
	Meeting stile seal : DGS Astragal Seal & DGS Intumescent / Twin Seal		

Freq f Hz	Sound Reduction Index, dB	
	1/3 Oct	1/1 Oct
50+	27.4	22.9
63+	26.3	
80+	19.6	
100	22.4	20.8
125	17.7	
160	26.1	
200	26.3	27.9
250	28.3	
315	29.6	
400	30.9	31.9
500	32.7	
630	32.3	
800	31.4	31.5
1000	31.0	
1250	32.0	
1600	33.1	33.9
2000	33.9	
2500	35.1	
3150	35.4	35.9
4000	35.0	
5000	37.9	
6300+	40.7	40.9
8000+	40.8	
10000+	41.3	
Average 100-3150	29.9	



Rating according to BS EN ISO 717-1:1997

Rw(C;Ctr)= **33 (-1;-3)** dB

Notes : * designates measurement corrected for background

designates limit of measurement due to background

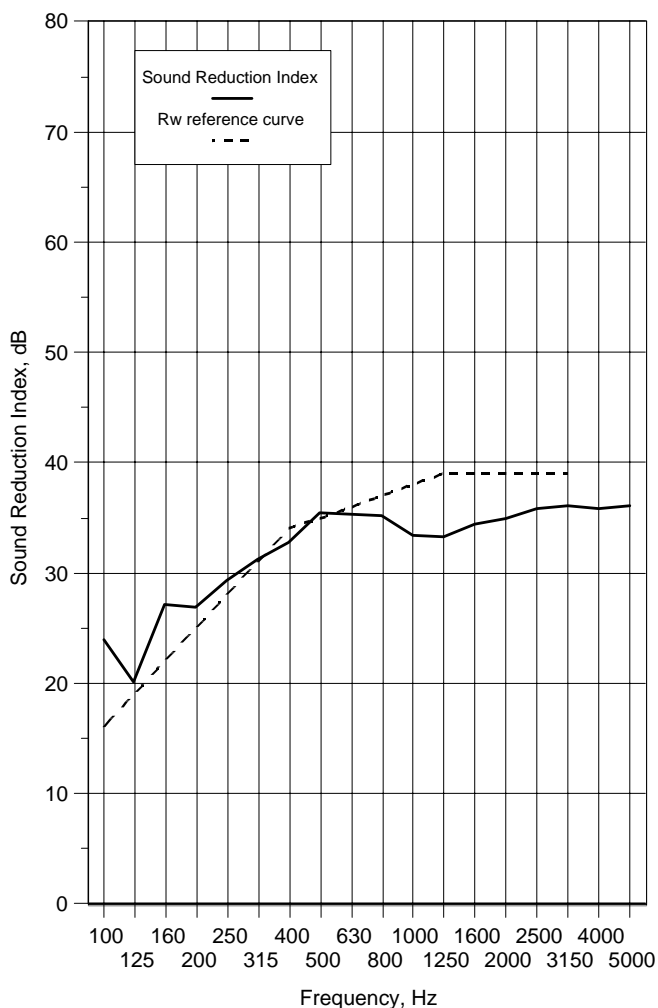
+ designates frequency beyond standard and not UKAS accredited

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Data Sheet 20

Test Number :	21	Air temperature:	21 °C
Client:	DGS	Air humidity:	59 %
Test Date:	13/08/2009	Receiving room volume:	300 m3
Sample height:	2.102 m	Source room volume:	115 m3
Sample width:	1.03 m	Sample weight:	30.3 kg/m2
Product	Pair Strebord 44mm with 25% 15mm Pyrostop		
Identification:	Perimeter seals : DGS Corner Seal & DGS Intumescent		
	Threshold seal : DGS Top 37 Automatic Threshold Seal		
	Meeting stile seal : DGS Astragal Seal & DGS Intumescent		

Freq f Hz	Sound Reduction Index, dB	
	1/3 Oct	1/1 Oct
50+	27.9	24.5
63+	26.5	
80+	21.7	
100	23.9	22.8
125	20.1	
160	27.2	28.8
200	26.9	
250	29.3	
315	31.2	34.3
400	32.8	
500	35.4	
630	35.3	33.9
800	35.2	
1000	33.4	
1250	33.3	35.1
1600	34.5	
2000	34.9	
2500	35.9	36.0
3150	36.1	
4000	35.8	
5000	36.1	40.0
6300+	38.4	
8000+	40.4	
10000+	42.1	
Average 100-3150	31.6	



Rating according to BS EN ISO 717-1:1997

Rw(C;Ctr)= **35 (-1;-3)** dB

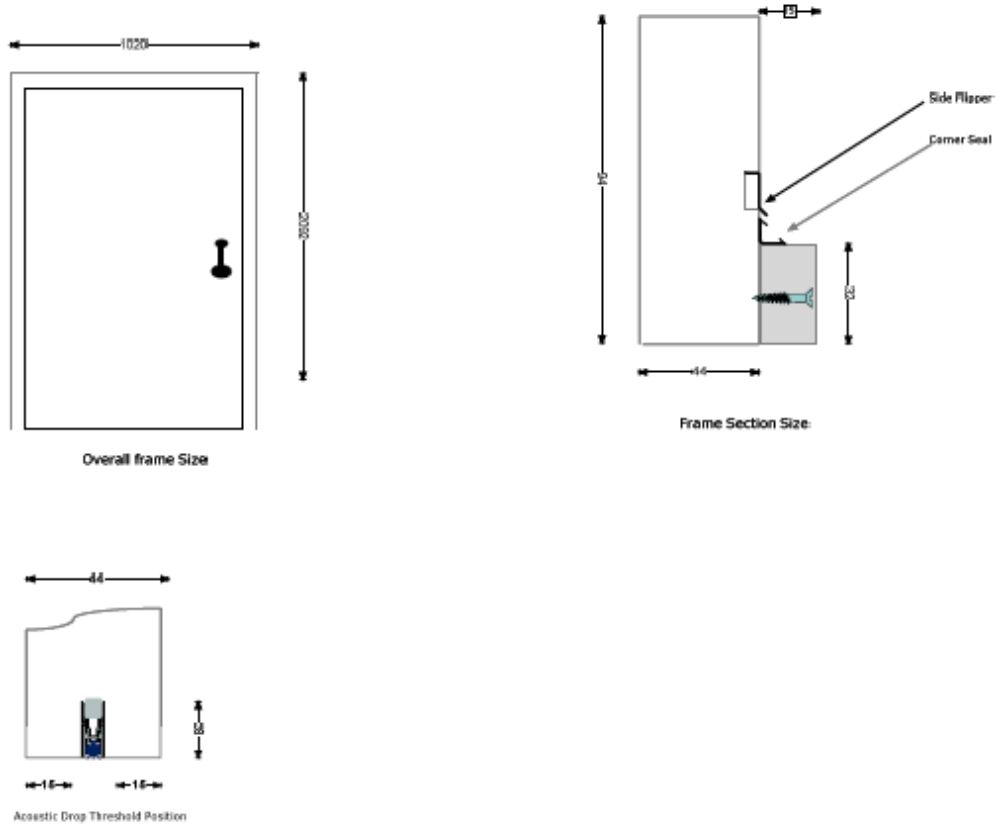
Notes : * designates measurement corrected for background

designates limit of measurement due to background

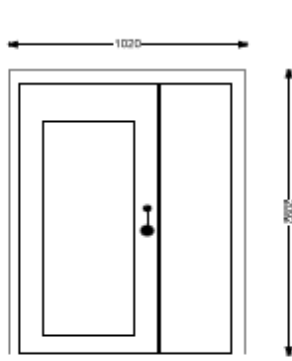
+ designates frequency beyond standard and not UKAS accredited

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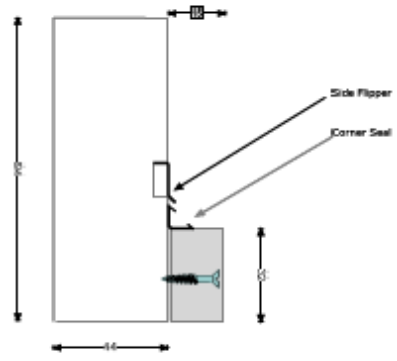
Drawing 1 - Single Doors



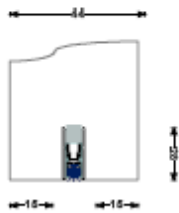
Drawing 2 - Pairs of Doors



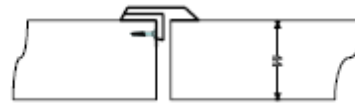
Overall frame Size



Frame Section Size

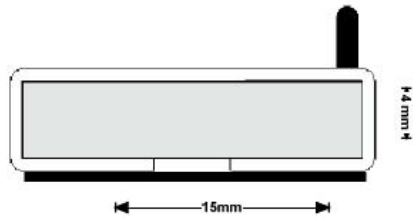


Acoustic Drop Threshold Position

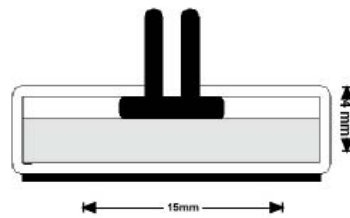


Hanging Edge Seal

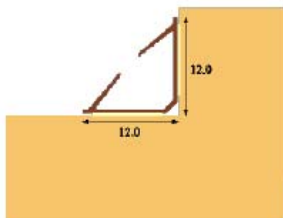
Drawing 3 - Seals



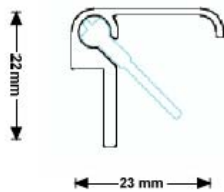
DGS Side Flipper



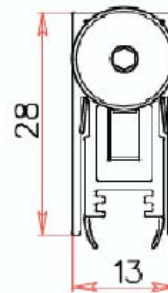
DGS Twin Flipper



DGS Corner Seal



DGS Acoustic Astragal Seal



DGS Top 37 Automatic Drop Threshold Seal

Appendix 1

Test Procedure

Measurement of Sound Transmission in accordance with BS EN ISO 140-3 : 1995 - TP15

In the laboratory, airborne sound transmission is determined from the difference in sound pressure levels measured across a test sample installed between two reverberant rooms. The difference in measured sound pressure levels is corrected for the amount of absorption in the receiving room. The test is done under conditions which restrict the transmission of sound by paths other than directly through the sample. The source sound field is randomly incident on the sample.

The test sample is located and sealed in an aperture within the brick dividing wall between the two rectangular reverberant (i.e. acoustically "live") room, both of which are constructed from 215mm brick with reinforced concrete floors and roofs. The brick wall has dimensions of 4.8m wide x 3.1m high and 550mm nominal thickness and forms the whole of the common area between the two rooms.

One of the rooms is used as the receiving room and has a volume of 300 cubic metres. It is isolated from the surrounding structure and the adjoining room by the use of resilient mountings and seals ensuring good acoustic isolation. The adjoining source room has a volume of 115 cubic metres.

Broad band noise is produced in the source room from an electronic generator, power amplifier and loudspeaker. The resulting sound pressure levels in both rooms are sampled using a microphone mounted on an oscillating boom and connected to a real time analyser. The signal is filtered into one third octave band widths, integrated and averaged. The value obtained at each frequency is known as the average sound pressure level for either the source or the receiving room. The change in level across the test sample is termed the sound pressure level difference, i.e.

$$D = L_1 - L_2$$

where

D is the equivalent Sound Pressure level difference in dB

L₁ is the equivalent Sound Pressure level in the source room in dB

L₂ is the equivalent Sound Pressure level in the receiving room in dB

The Sound Reduction Index (R) also known by the American terminology Sound Transmission Loss, is defined as the number of decibels by which sound energy randomly incident on the test sample, is reduced in transmitting through it and is given by the formula:

$$R = D + 10 \log_{10} \frac{S}{A} \dots \dots \text{in decibels}$$

where

S is the area of the sample

A is the total absorption in the receiving room

both dimensions being in consistent units

The Sound Reduction Index is an expression of the laboratory sound transmission performance of a particular element or construction. It is a function of the mass, thickness, sealing method of mounting etc. and is independent of the overall area of the sample.

However, when an example of this construction is installed on site, the sound insulation obtained will depend upon its surface area, as well as the absorption in the receiving room. The larger the area the greater the sound energy transmitted. Also, the overall sound insulation is affected by the sound transmission through other building elements, some of which may have an inferior performance to the sample tested. In practice, therefore, the potential sound reduction index of a construction is not fully realised on site. Furthermore, the sound reduction index of a particular sample of that construction can only be measured accurately in a laboratory, because only under such controlled conditions can the sound transmission path be limited to the sample under test.

R_w , C and C_{tr} have been calculated in accordance with the relevant section of BS EN ISO 717-1 :1997 from the results of laboratory tests carried out in accordance with BS EN ISO 140-3 : 1995.

Appendix 2

Measurement Uncertainty BS EN ISO 140-3:1995 - TP15

The following values of uncertainty are based on a standard uncertainty multiplied by a coverage factor of $k = 2$, which provides a level of confidence of approximately 95%.

Frequency, Hz	Uncertainty, \pm dB
100	2.6
125	2.4
160	2.1
200	2.1
250	1.5
315	1.5
400	1.2
500	1.2
800	1.0
1000	1.0
1250	1.0
1600	1.0
2000	1.0
2500	1.0
3150	1.0