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Technical Report

Ref Number ***C/21231/R01***

Date ***07 June 2010***

Project

The Laboratory Determination of The Airborne Sound Transmission of Various Single and Double Door Sets

Prepared for

Norsound Ltd
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By

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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 single and double 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 Appendix 3.

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.

.....
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For and on behalf of
Sound Research Laboratories Limited
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Email: gthomson@soundresearch.co.uk

.....
Trevor Hickman
Deputy Technical Manager

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Contents

2.0 Details of Measurements

2.1 Location

Sound Research Laboratories Ltd
Holbrook House
Little Waldingfield
Sudbury
Suffolk
CO10 OTH

2.2 Test Dates

18 May 2010

2.3 Instrumentation and Apparatus Used

Make	Description	Type
E D I	Microphone Multiplexer	
	Microphone Power Supply Unit	
Norwegian Electronics	Real Time Analyser	830
	Rotating Microphone Boom	231
Brüel & Kjaer	12mm Condenser Microphones	4166
	Windshields	UA0237
	Pre Amplifiers	2639, 2669C
	Microphone Calibrator	4231
	Omnipower Sound Source	4296
Larson Davis	12mm Condenser Microphone	2560
SRL	Voltage controller	
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

T Palmer	Doortech 2000
D Jones	Norseal

3.0 Description of Test

3.1 Description of Sample

Various single and double door sets (within the same aperture size) were tested.

See Appendices 3 and 4 for individual test details and Appendix 5 for drawings. When cross referencing the detail in Appendix 4 use the SRL test number.

Sampling plan:	Enough for test only
Sample condition:	New
Details supplied by:	Norsound Ltd
Sample installed by:	Norsound Ltd

3.2 Sample Delivery date

16 May 2010

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 Appendix 3 and summarised in Appendix 4.

_____ *End of Text* _____

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

L_1 is the equivalent Sound Pressure level in the source room in dB

L_2 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:

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

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.

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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, ± 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

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Appendix 3 – Test Results

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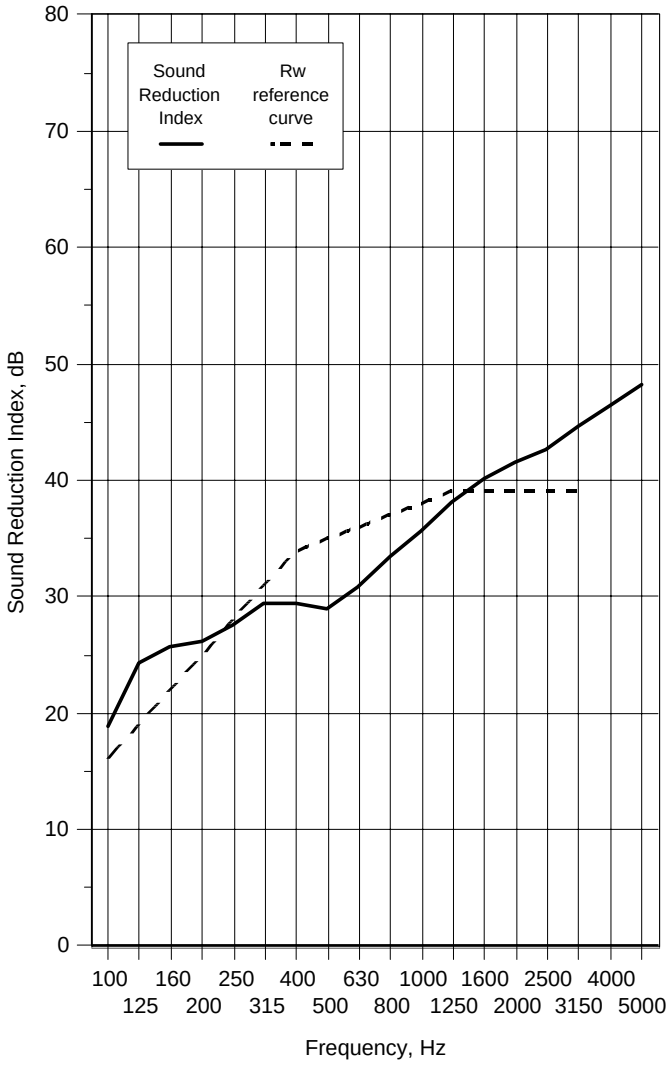
Data Sheet 1

Test Number :	2	**Air temperature:**	14.5 °C
Client:	Norseal	**Air humidity:**	54 %
Test Date:	18/05/2010	**Receiving room volume**	300 m3
Sample height:	2.13 m	**Source room volume:**	115 m3
Sample width:	1.01 m	**Sample weight:**	28.5 kg/m2
Product Identification:	54mm Safeguard door in an MDF frame Fully caulked		

Freq f Hz	Sound Reduction Index, dB 1/3 Oct	1/1 Oct
50+	25.6	18.9
63+	18.9	
80+	16.4	
100	18.9	21.9
125	24.3	
160	25.7	
200	26.1	27.5
250	27.6	
315	29.5	
400	29.4	29.7
500	29.0	
630	30.9	
800	33.5	35.4
1000	35.7	
1250	38.2	
1600	40.1	41.3
2000	41.5	
2500	42.6	
3150	44.6	46.2
4000	46.4	
5000	48.2	
6300+	50.3	50.4
8000+	50.9 *	
10000+	50.1 *	
Average 100-3150	32.4	



Rating according to BS EN ISO 717-1:1997

Rw(C;Ctr)= **35 (-1;-4)** 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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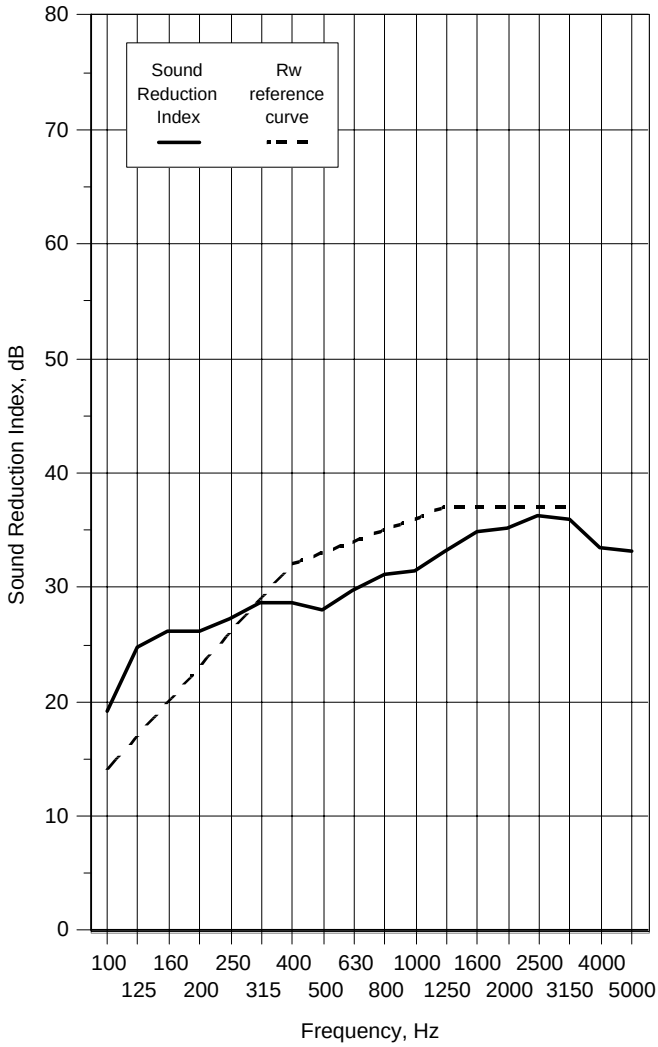
Data Sheet 2

Test Number :	3	**Air temperature:**	14.5 °C
Client:	Norseal	**Air humidity:**	54 %
Test Date:	18/05/2010	**Receiving room volume**	300 m3
Sample height:	2.13 m	**Source room volume:**	115 m3
Sample width:	1.01 m	**Sample weight:**	28.5 kg/m2
Product Identification:	54mm Safeguard door in an MDF frame Head and Jambs: 710 Threshold: 810S + 625 threshold strip		

Freq f Hz	Sound Reduction Index, dB 1/3 Oct	1/1 Oct
50+	22.1	
63+	19.2	19.2
80+	17.5	
100	19.2	
125	24.7	22.3
160	26.2	
200	26.2	
250	27.3	27.3
315	28.6	
400	28.6	
500	28.0	28.7
630	29.8	
800	31.2	
1000	31.5	31.9
1250	33.1	
1600	34.8	
2000	35.2	35.3
2500	36.2	
3150	35.9	
4000	33.5	34.0
5000	33.1	
6300+	37.2	
8000+	38.3	38.0
10000+	38.8	
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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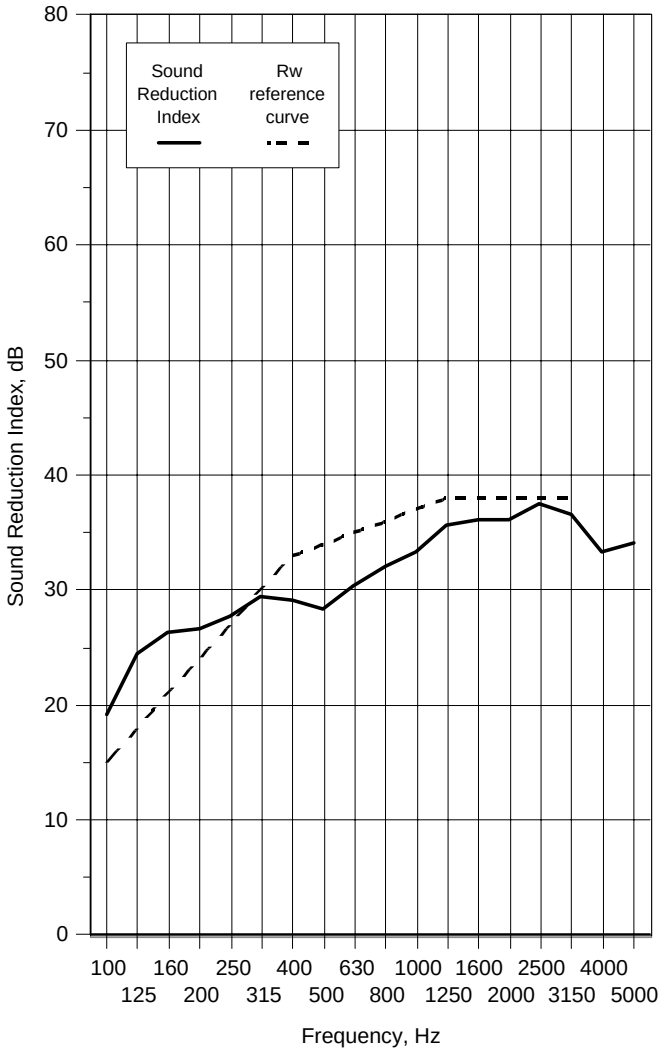
Data Sheet 3

Test Number :	4	**Air temperature:**	14.5 °C
Client:	Norseal	**Air humidity:**	54 %
Test Date:	18/05/2010	**Receiving room volume**	300 m3
Sample height:	2.13 m	**Source room volume:**	115 m3
Sample width:	1.01 m	**Sample weight:**	28.5 kg/m2
Product Identification:	54mm Safeguard door in an MDF frame Head and Jambs: 710 Threshold: 810S + 625 threshold strip + DT1 pads added		

Freq f Hz	Sound Reduction Index, dB 1/3 Oct	1/1 Oct
50+	23.8	
63+	17.5	18.4
80+	16.8	
100	19.2	
125	24.5	22.3
160	26.4	
200	26.6	
250	27.7	27.7
315	29.4	
400	29.1	
500	28.4	29.2
630	30.3	
800	32.0	
1000	33.3	33.4
1250	35.7	
1600	36.1	
2000	36.1	36.5
2500	37.5	
3150	36.6	
4000	33.3	34.5
5000	34.1	
6300+	37.4	
8000+	38.3	38.3
10000+	39.3	
Average 100-3150	30.6	



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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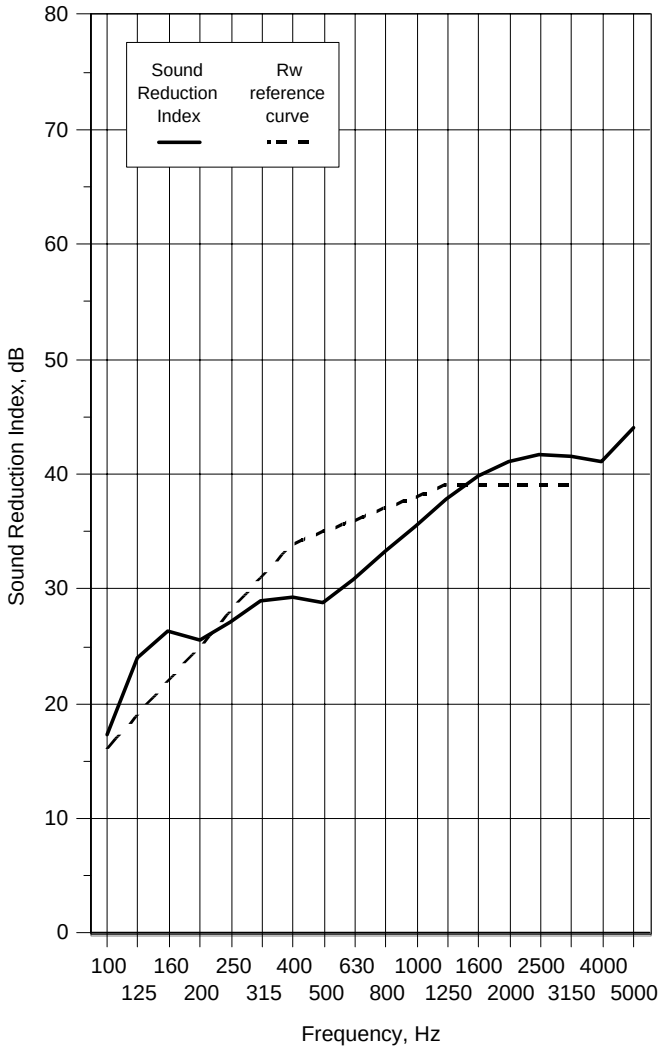
Data Sheet 4

Test Number :	6	**Air temperature:**	14.5 °C
Client:	Norseal	**Air humidity:**	54 %
Test Date:	18/05/2010	**Receiving room volume**	300 m3
Sample height:	2.13 m	**Source room volume:**	115 m3
Sample width:	1.01 m	**Sample weight:**	28.5 kg/m2
Product Identification:	54mm Safeguard door in an MDF frame Head and Jambs: 710 + 720 Threshold: 810S + 625 threshold strip + DT1 pads added		

Freq f Hz	Sound Reduction Index, dB 1/3 Oct	1/1 Oct
50+	26.3	
63+	18.9	19.7
80+	17.7	
100	17.3	
125	24.0	20.8
160	26.3	
200	25.6	
250	27.1	27.0
315	28.9	
400	29.3	
500	28.8	29.6
630	30.8	
800	33.3	
1000	35.5	35.2
1250	37.9	
1600	39.8	
2000	41.1	40.8
2500	41.7	
3150	41.6	
4000	41.1	42.1
5000	44.0	
6300+	47.8	
8000+	48.4	47.8
10000+	47.3 *	
Average 100-3150	31.8	



Rating according to BS EN ISO 717-1:1997

Rw(C;Ctr)= **35 (-1;-4)** 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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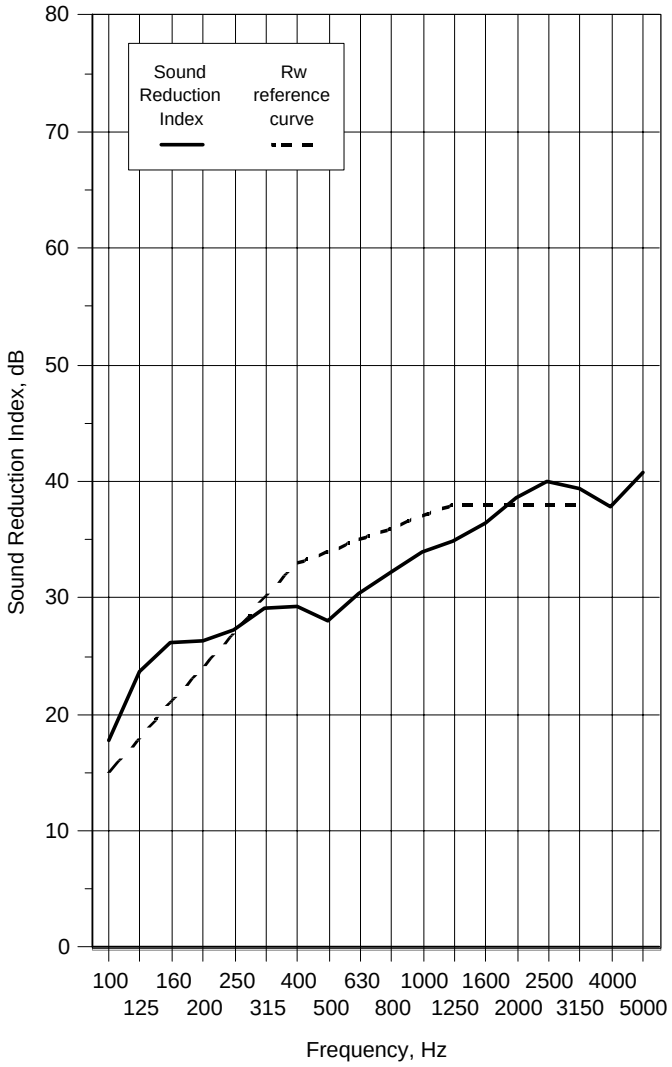
Data Sheet 5

Test Number :	7	**Air temperature:**	14.5 °C
Client:	Norseal	**Air humidity:**	54 %
Test Date:	18/05/2010	**Receiving room volume**	300 m3
Sample height:	2.13 m	**Source room volume:**	115 m3
Sample width:	1.01 m	**Sample weight:**	28.5 kg/m2
Product Identification:	54mm Safeguard door in an MDF frame Head and Jambs: 710 + 720 with 710 seal removed from hinge blades Threshold: 810S + 625 threshold strip + DT1 pads added		

Freq f Hz	Sound Reduction Index, dB 1/3 Oct	1/1 Oct
50+	25.2	
63+	17.3	18.6
80+	17.1	
100	17.8	
125	23.7	21.1
160	26.1	
200	26.3	
250	27.2	27.4
315	29.1	
400	29.3	
500	28.1	29.2
630	30.4	
800	32.3	
1000	33.9	33.6
1250	34.9	
1600	36.5	
2000	38.6	38.2
2500	40.0	
3150	39.4	
4000	37.9	39.2
5000	40.7	
6300+	44.5	
8000+	45.3	44.8
10000+	44.7	
Average 100-3150	30.9	



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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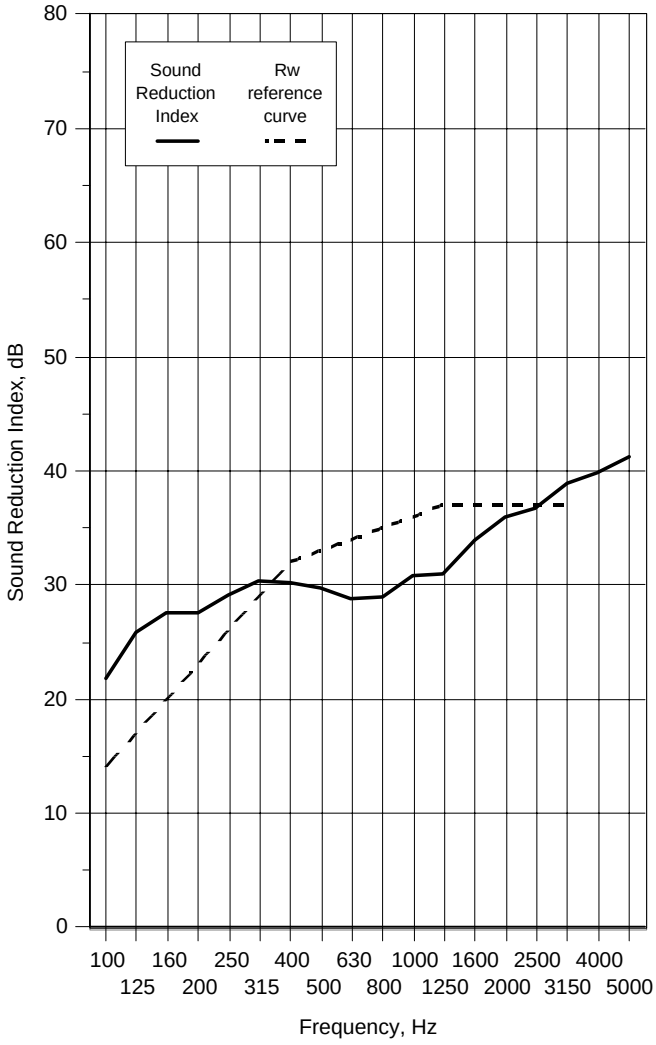
Data Sheet 7

Test Number :	9	**Air temperature:**	14.5 °C
Client:	Norseal	**Air humidity:**	54 %
Test Date:	18/05/2010	**Receiving room volume**	300 m3
Sample height:	2.13 m	**Source room volume:**	115 m3
Sample width:	1.01 m	**Sample weight:**	26.1 kg/m2
Product Identification:	44mm Safeguard door in an MDF frame Head and Jambs: 710 Threshold: 810S + 625 threshold strip + DT1 pads added		

Freq f Hz	Sound Reduction Index, dB 1/3 Oct	1/1 Oct
50+	18.6	
63+	20.4	19.8
80+	20.5	
100	21.8	
125	25.8	24.4
160	27.5	
200	27.6	
250	29.1	28.9
315	30.4	
400	30.2	
500	29.8	29.6
630	28.8	
800	29.0	
1000	30.8	30.2
1250	31.0	
1600	33.9	
2000	35.9	35.4
2500	36.8	
3150	38.9	
4000	39.9	39.9
5000	41.3	
6300+	42.7	
8000+	43.4	43.3
10000+	43.9	
Average 100-3150	30.5	



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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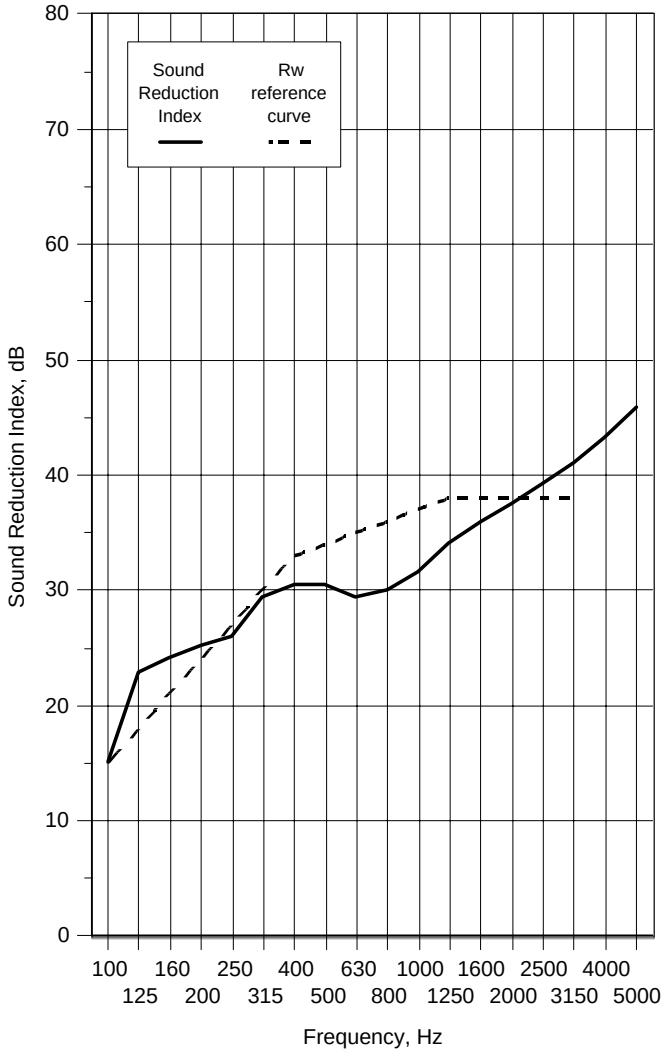
Data Sheet 8

Test Number :	13	**Air temperature:**	14.8 °C
Client:	Norseal	**Air humidity:**	55 %
Test Date:	18/05/2010	**Receiving room volume**	300 m3
Sample height:	2.13 m	**Source room volume:**	115 m3
Sample width:	1.01 m	**Sample weight:**	28.2 kg/m2
Product Identification:	44mm Plytex door in an MDF frame Fully caulked		

Freq f Hz	Sound Reduction Index, dB 1/3 Oct	1/1 Oct
50+	27.0	
63+	20.3	19.5
80+	16.5	
100	15.1	
125	22.9	18.8
160	24.2	
200	25.2	
250	26.0	26.5
315	29.5	
400	30.6	
500	30.6	30.2
630	29.4	
800	30.0	
1000	31.6	31.6
1250	34.1	
1600	36.0	
2000	37.5	37.4
2500	39.2	
3150	41.1	
4000	43.2	43.0
5000	45.9	
6300+	48.4	
8000+	49.1	48.9
10000+	49.1 *	
Average 100-3150	30.2	



Rating according to BS EN ISO 717-1:1997

Rw(C;Ctr)= **34 (-2;-5)** 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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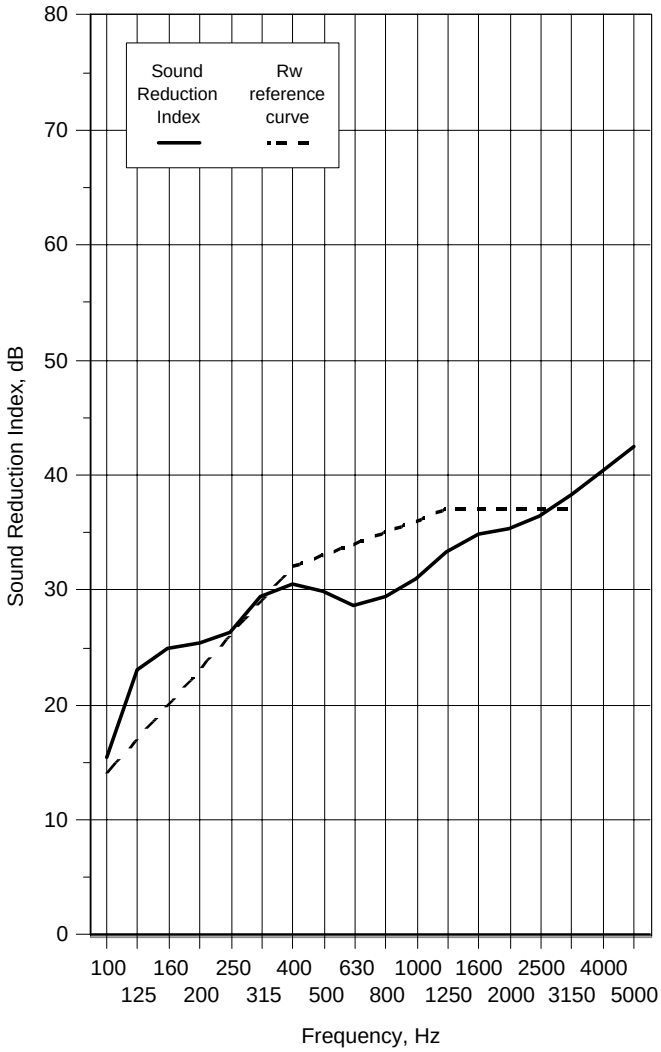
Data Sheet 9

Test Number :	14	**Air temperature:**	14.8 °C
Client:	Norseal	**Air humidity:**	55 %
Test Date:	18/05/2010	**Receiving room volume**	300 m3
Sample height:	2.13 m	**Source room volume:**	115 m3
Sample width:	1.01 m	**Sample weight:**	28.2 kg/m2
Product Identification:	44mm Plytex door in an MDF frame Head and Jambs: 710 Threshold: 2 x 720 + 625 threshold strip		

Freq f Hz	Sound Reduction Index, dB 1/3 Oct	1/1 Oct
50+	26.6	18.8
63+	19.6	
80+	15.8	
100	15.5	19.2
125	23.1	
160	24.9	
200	25.4	26.8
250	26.4	
315	29.5	
400	30.5	29.6
500	29.9	
630	28.7	
800	29.4	30.9
1000	31.0	
1250	33.3	
1600	34.9	35.5
2000	35.4	
2500	36.4	
3150	38.3	40.0
4000	40.3	
5000	42.5	
6300+	44.9	45.2
8000+	45.1	
10000+	45.5	
Average 100-3150	29.5	



Rating according to BS EN ISO 717-1:1997

Rw(C;Ctr)= **33 (-1;-4)** 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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Appendix 4 – Test Details

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Doortech 2000

Norsound Acoustic Testing - SRL May 2010 - AS TESTED

54mm SAFEGUARD

Item No.	NORSOUND Test Ref.	SRL Test No.	Dwg. Ref: Sk/AHP/09051 0/	Door Configuration	Door Type	Height	Width	Tcks.	Head	Hanging Jamb	Closing Jamb	Threshold	Meeting Stiles	GLAZING	Fully Caulked	Measured Performance Rw.	% Efficiency	NOTES
SAFEGUARD 54 - Flush - Single Leaf - Single Action																		
1	1	2	T001	Single leaf	SAFEGUARD 54	2040	926	54	FULLY CAULKED				n/a	NIL	YES	Rw.35dB	Reference	
2	2	3	T001	Single leaf	SAFEGUARD 54	2040	926	54	NOR710	NOR710	NOR710	NOR810S + 625	n/a	NIL	NO	Rw.33dB		
3	3	4	T001	Single leaf	SAFEGUARD 54	2040	926	54	NOR710	NOR710	NOR710	NOR810S + 625 + DT1 pads	n/a	NIL	NO	Rw.34dB		DT1 pads added
5	5	6	T002	Single leaf	SAFEGUARD 54	2040	926	54	NOR710 + 720	NOR710 + 720	NOR710 + 720	NOR810S + 625 + DT1 pads	n/a	NIL	NO	Rw.35dB		NORSOUND 710 seal fitted to hinge blades to align with blades of 720 seal.
6	6	7	T002	Single leaf	SAFEGUARD 54	2040	926	54	NOR710 + 720	NOR710 + 720	NOR710 + 720	NOR810S + 625 + DT1 pads	n/a	NIL	NO	Rw.34dB		710 seals removed from hinge blades.

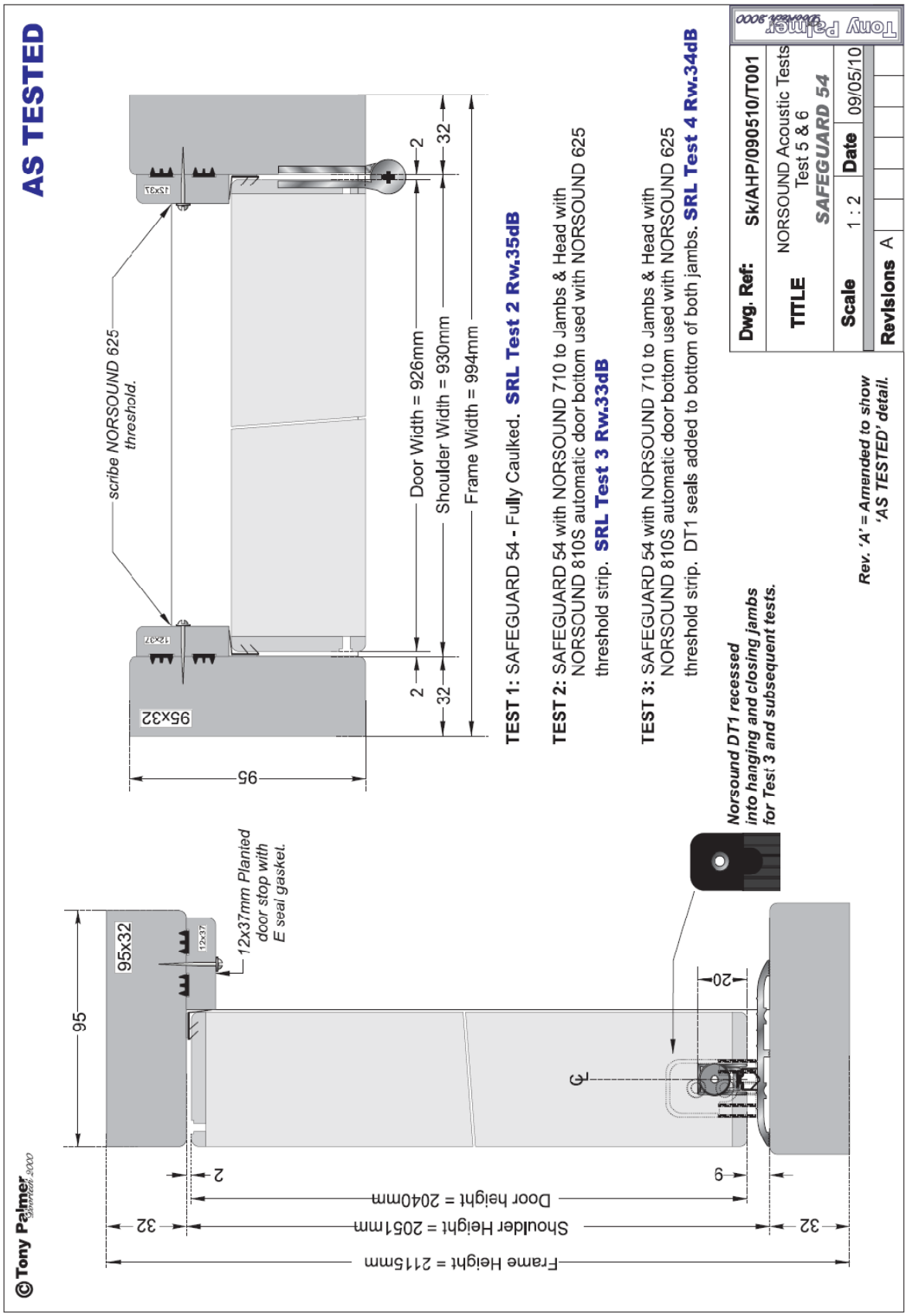
44mm SAFEGUARD

Item No.	NORSOUND Test Ref.	SRL Test No.	Dwg. Ref: Sk/AHP/09051 0/	Door Configuration	Door Type	Height	Width	Tcks.	Head	Hanging Jamb	Closing Jamb	Threshold	Meeting Stiles	GLAZING	Fully Caulked	Measured Performance Rw.	% Efficiency	NOTES
SAFEGUARD 44 - Flush - Single Leaf - Single Action																		
7	7	8	T003	Single leaf	SAFEGUARD 44	2040	926	44	FULLY CAULKED				n/a	NIL	YES	Rw.35dB	Reference	
8	8	9	T003	Single leaf	SAFEGUARD 44	2040	926	44	NOR710	NOR710	NOR710	NOR810S + 625 + DT1 pads	n/a	NIL	NO	Rw.33dB		

44mm PLYTEX

Item No.	NORSOUND Test Ref.	SRL Test No.	Dwg. Ref: Sk/AHP/09051 0/	Door Configuration	Door Type	Height	Width	Tcks.	Head	Hanging Jamb	Closing Jamb	Threshold	Meeting Stiles	GLAZING	Fully Caulked	Measured Performance Rw.	% Efficiency	NOTES
PLYTEX 44mm - Flush - Single Leaf - Single Action																		
14	11	13	T004	Single leaf	PLYTEX 44	2040	926	44	FULLY CAULKED				n/a	NIL	YES	Rw.34dB	Reference	
15	12	14	T004	Single leaf	PLYTEX 44	2040	926	44	NOR710	NOR710	NOR710	2xNOR720 + 625	n/a	NIL	NO	Rw.33dB		

Appendix 5 – Drawings


AS TESTED
scribe NORSOUND 625 threshold.
95x32
12x32
12x37
95
96
2
32
Door Width = 926mm
Shoulder Width = 930mm
Frame Width = 994mm
TEST 1: SAFEGUARD 54 - Fully Caulked. SRL Test 2 Rw.35dB
TEST 2: SAFEGUARD 54 with NORSOUND 710 to Jambs & Head with NORSOUND 810S automatic door bottom used with NORSOUND 625 threshold strip. SRL Test 3 Rw.33dB
TEST 3: SAFEGUARD 54 with NORSOUND 710 to Jambs & Head with NORSOUND 810S automatic door bottom used with NORSOUND 625 threshold strip. DT1 seals added to bottom of both jambs. SRL Test 4 Rw.34dB
Norsound DT1 recessed into hanging and closing jambs for Test 3 and subsequent tests.
12x37mm Planted door stop with E seal gasket.
20
9
Frame Height = 2115mm
Shoulder Height = 2051mm
Door height = 2040mm
Rev. 'A' = Amended to show 'AS TESTED' detail.
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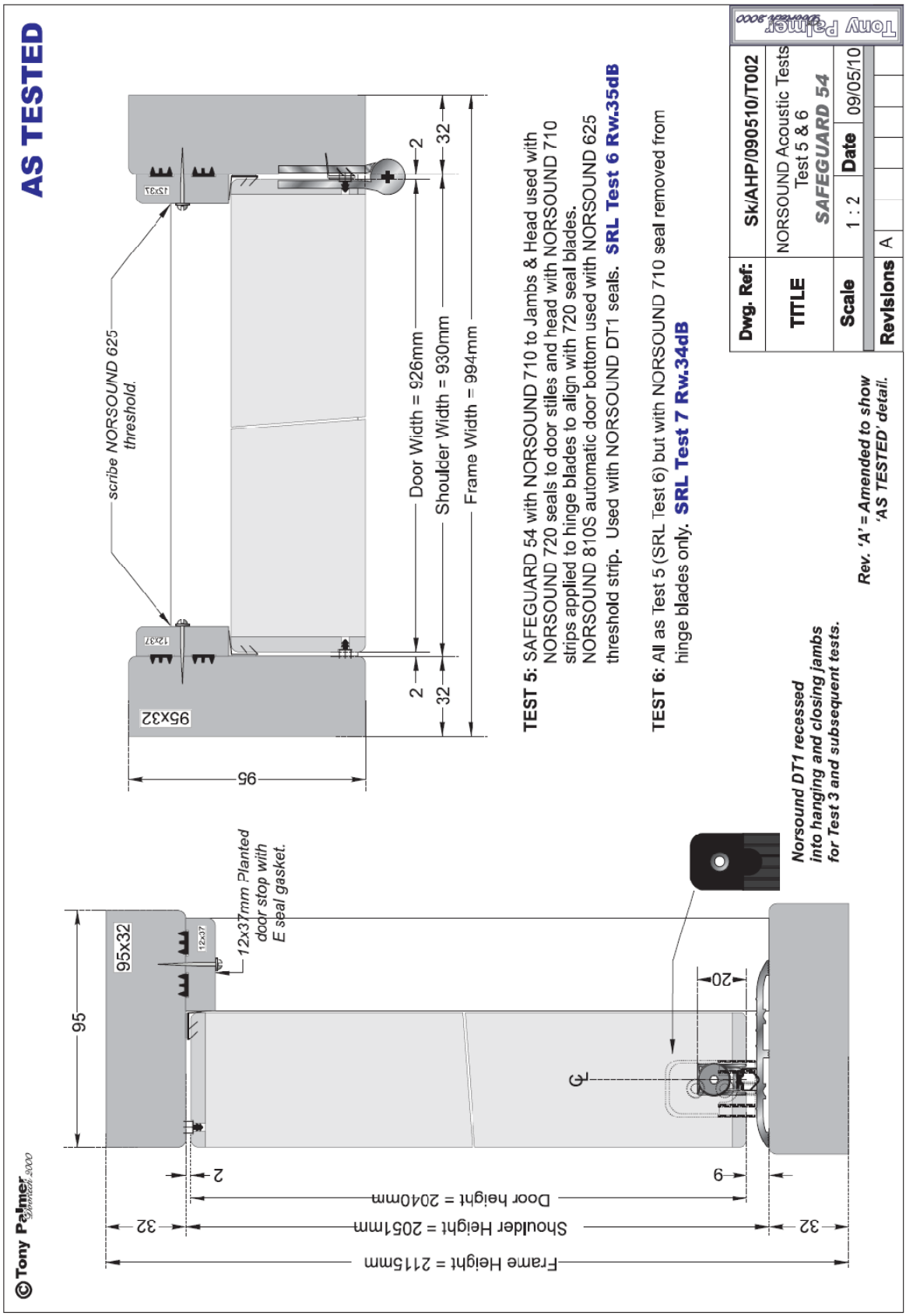
Dwg. Ref: SK/AHP/090510/T001
TITLE NORSOUND Acoustic Tests Test 5 & 6 SAFEGUARD 54
Scale 1 : 2
Date 09/05/10
Revisions A


AS TESTED
scribe NORSOUND 625 threshold.
95x32
95
Door Width = 926mm
Shoulder Width = 930mm
Frame Width = 994mm
2
32
TEST 5: SAFEGUARD 54 with NORSOUND 710 to Jambs & Head used with NORSOUND 720 seals to door stiles and head with NORSOUND 710 strips applied to hinge blades to align with 720 seal blades. NORSOUND 810S automatic door bottom used with NORSOUND 625 threshold strip. Used with NORSOUND DT1 seals. SRL Test 6 Rw.35dB
TEST 6: All as Test 5 (SRL Test 6) but with NORSOUND 710 seal removed from hinge blades only. SRL Test 7 Rw.34dB
Rev. 'A' = Amended to show 'AS TESTED' detail.
Norsound DT1 recessed into hanging and closing jambs for Test 3 and subsequent tests.
12x37mm Planted door stop with E seal gasket.
20
9
Door height = 2040mm
Shoulder Height = 2051mm
Frame Height = 2115mm
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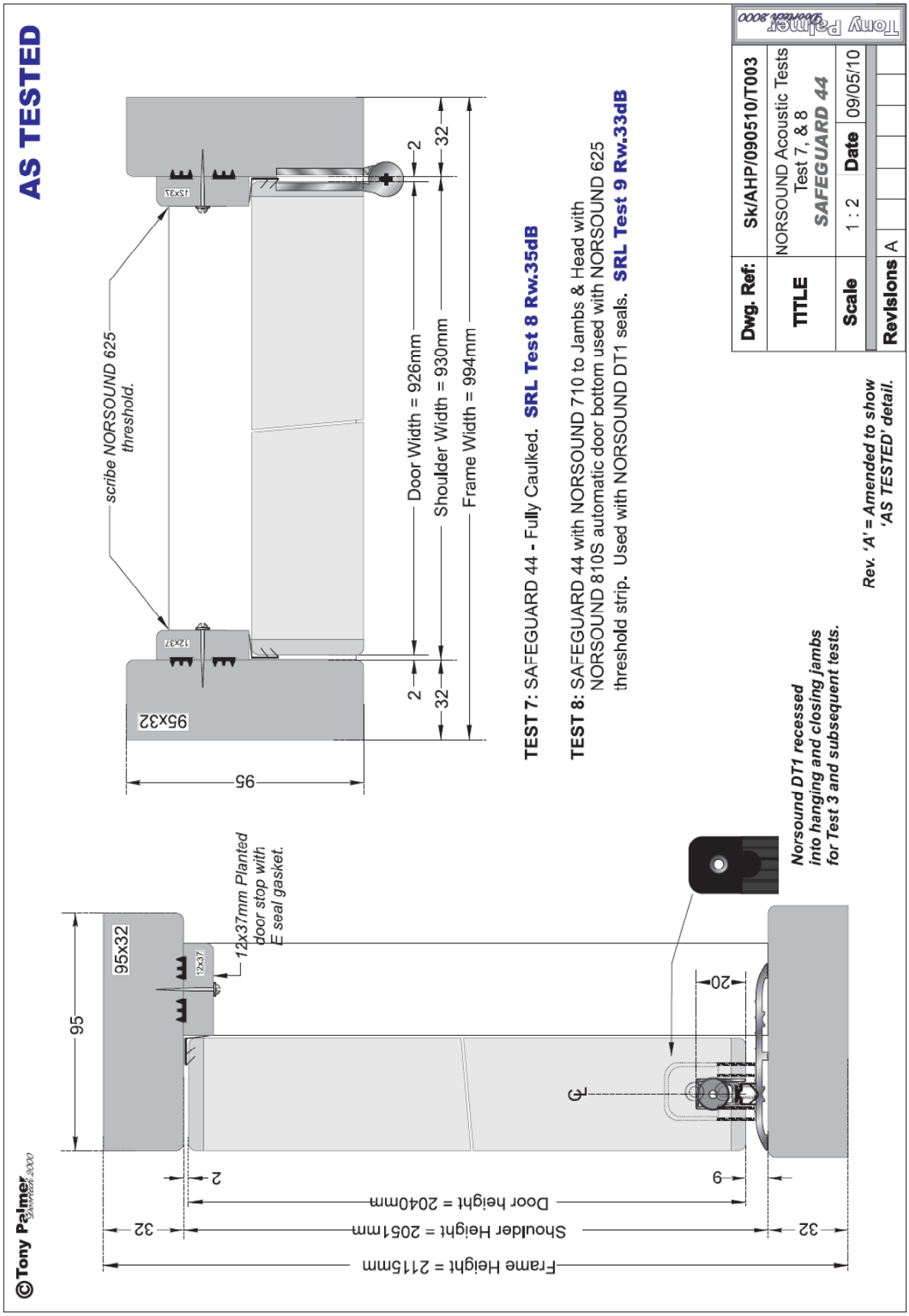
Dwg. Ref: Sk/AHP/090510/T002
TITLE NORSOUND Acoustic Tests Test 5 & 6 SAFEGUARD 54
Scale 1 : 2
Date 09/05/10
Revisions A


AS TESTED
TEST 7: SAFEGUARD 44 - Fully Caulked. SRL Test 8 Rw.35dB
TEST 8: SAFEGUARD 44 with NORSOUND 710 to Jambs & Head with NORSOUND 810S automatic door bottom used with NORSOUND 625 threshold strip. Used with NORSOUND DT1 seals. SRL Test 9 Rw.33dB
scribe NORSOUND 625 threshold.
95x32
12x37
Door Width = 926mm
Shoulder Width = 930mm
Frame Width = 994mm
2
32
95
12x37mm Planted door stop with E seal gasket.
Norsound DT1 recessed into hanging and closing jambs for Test 3 and subsequent tests.
Frame Height = 2115mm
Shoulder Height = 2051mm
Door height = 2040mm
20
9
Rev. 'A' = Amended to show 'AS TESTED' detail.
Dwg. Ref: Sk/AHP/090510/T003
TITLE NORSOUND Acoustic Tests Test 7, & 8 SAFEGUARD 44
Scale 1 : 2
Date 09/05/10
Revisions A
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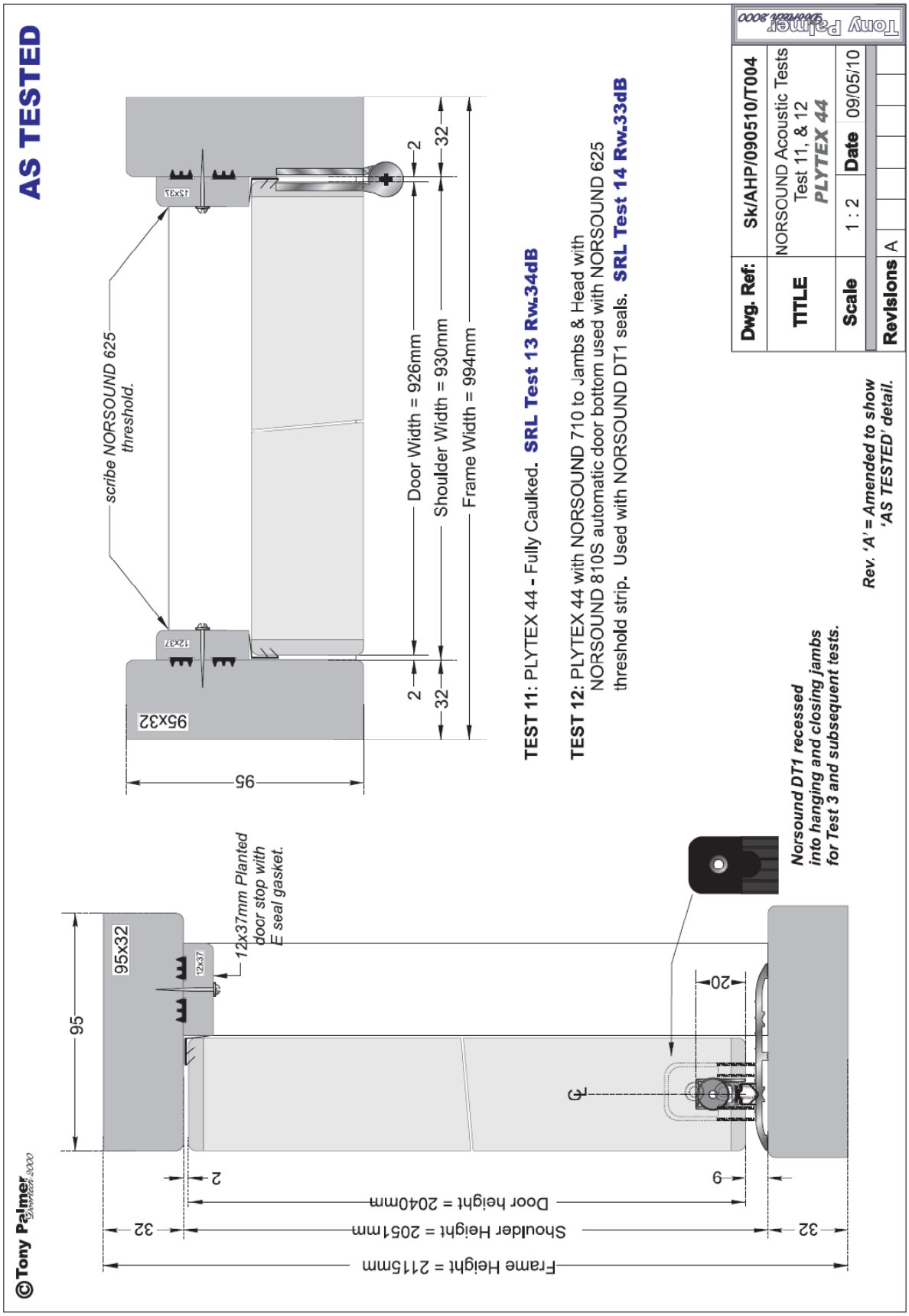
AS TESTED
95x32
12x37
95
2
32
Door Width = 926mm
Shoulder Width = 930mm
Frame Width = 994mm
scribe NORSOUND 625 threshold.
TEST 11: PLYTEX 44 - Fully Caulked. SRL Test 13 Rw.34dB
TEST 12: PLYTEX 44 with NORSOUND 710 to Jambs & Head with NORSOUND 810S automatic door bottom used with NORSOUND 625 threshold strip. Used with NORSOUND DT1 seals. SRL Test 14 Rw.33dB
Rev. 'A' = Amended to show 'AS TESTED' detail.
Norsound DT1 recessed into hanging and closing jambs for Test 3 and subsequent tests.
12x37mm Planted door stop with E seal gasket.
20
9
Frame Height = 2115mm
Shoulder Height = 2051mm
Door height = 2040mm
©Tony Palmer
Dwg. Ref: Sk/AHP/090510/T004
TITLE NORSOUND Acoustic Tests Test 11, & 12 PLYTEX 44
Scale 1 : 2
Date 09/05/10
Revisions A
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