



# Technical Report

*Laboratory measurement of sound insulation of doorsets in accordance with  
BS EN ISO 10140-2:2010*

<b>Report:</b>	SAUER/AFDSL1415042014
<b>Prepared for:</b>	Sauerland and Acoustic & Fire Door Solutions Ltd
<b>Date:</b>	14 <sup>th</sup> & 15 <sup>th</sup> April 2014
<b>Conducted by:</b>	Dunstan Ferris, Technical Consultant

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## 1.0 Testing & Technical Services centre

Our dedicated Testing and Technical Services Centre hosts an indicative fire test furnace, many cycling rigs, air and smoke leakage testing equipment, environmental chambers, as well as a state of the art, purpose-built acoustic transmission suite. The facilities are supported by experienced technicians and technical consultants who are equipped with extensive and diverse knowledge of regulations, products and processes related to acoustic, smoke and fire containment. The facilities are available for a range of activities including experimental work, testing prototypes, new development or redevelopment projects.

Our Technical and Testing Services team work closely with you throughout the whole process; from the construction of the test specimens to the submission of a final test report. And with well over 30 years' accumulated knowledge and industry experience; we're well equipped to guide you through the maze of current regulations to ensure that your products receive certification quickly and cost-effectively.

We are committed to offering a professional service that offers complete confidentiality so you can be confident that any testing will be treated with the utmost discretion.

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## 2.1 Purpose of test

To determine the sound reduction index of various doorsets in accordance with BS EN ISO 10140-2:2010. Laboratory measurement of sound insulation of building elements -- Part 2: Measurement of airborne sound insulation.

The results from these measurements are presented in tables and graphs within this document. The results are given in 1/3<sup>rd</sup> octave bands over the frequency range 100Hz to 3150Hz.

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**Dunstan Ferris**, Technical Consultant  
For and on behalf of Lorient Testing & Technical Facilities

## 2.2 Testing details

- < The doorsets were supplied by **Sauerland and Acoustic & Fire Door Solutions Ltd** and installed by **Lorient Testing & Technical Services**.
- < The measurements recorded were made between **14<sup>th</sup> & 15<sup>th</sup> April 2014**.
- < Recorded by **Dunstan Ferris, Lorient Testing & Technical Services**, Unit 19, Wentworth Road, Newton Abbot, Devon, TQ12 FRR.

## 2.3 Instrumentation used

Instrument type	Make/model	Serial No.
Sound Level Meter	B&K Type 2270	2746609
Acoustic Calibrator	B&K Type 4231	2734238
Microphone (Source room)	B&K Type 4189	2748682
Microphone (Receiver room)	B&K Type 4189	2643376
Pre-amplifier (Source room)	B&K Type ZC0032	15937
Pre-amplifier (Receiver room)	B&K Type 2669	2709246
Omnipower Speaker	B&K Type 4292-L	007012
Power Amplifier	B&K Typer 2734	012010

## 2.4 Test specimen

<b>Door type:</b>	Double Leaf Doorsets - Trisound S3K, S3D and S4G manufactured in accordance with the relevant AFDS Ltd Method Statements.
<b>Frame dimensions:</b>	1990mm wide x 2190mm high x 90mm
<b>Leaf dimensions:</b>	940mm wide x 2127mm high

## 2.5 Test procedure

### Airborne sound insulation test

- < An OmniPower speaker was placed in the corner of the source room at speaker position one and speaker position two.
- < The sound level meter was calibrated prior to testing.
- < Five measurements were taken in the source room, at fixed positions at speaker position one and speaker position two.
- < Five measurements were taken in the receive room, at fixed positions at speaker position one and speaker position two.
- < Background measurements were taken at each third octave frequency between 100Hz and 3150Hz.
- < 6 reverberation measurements were taken in the receive room, in accordance with BS EN ISO 3382-2:2008 interrupted, engineering method.
- < Calculations, including C&Ctr, were carried out in accordance with BS EN ISO717-1
- < The sound reduction index was calculated using the following formula from BS EN ISO 10140-2:2010:

$$R_w = L_1 - L_2 + 10 \log \left( \frac{S}{A} \right) \text{ dB}$$

**Where:**

L1 is the logarithmic average of the source room measurements.

L2 is the logarithmic average of the receive room measurements.

S is the area of the test specimen.

A is the equivalent absorption area, where  $A = \frac{0.16V}{T}$

V = The volume of the receive room.

T = The reverberation time measured in seconds.

1. Logarithmic average of 5 Measurements at speaker position one and speaker position two. (L1 & L2)
2. L1 – L2 (L1 level minus L2 level).
3. Area of test specimen (S) divided by equivalent sound absorption area (A).
4. Weighted final result  $R_w$ dB

## 2.6 Limitations and parameters

*The test fulfilled all criteria required of ISO 10140-2, including;*

- < Sound level meter (microphone) was located as required.
- < Sound source (loudspeaker) was located as required.
- < T20 Reverberation time measurements were used and could be represented by a straight line.
- < Background noise measurements were more than 10 dB below L2 measurements.
- < Temperature was reported within  $\pm 0.1$ deg C.
- < Barometric pressure was reported to within  $\pm 0.01$  Mbar ( $\pm 1$  Pa).
- < Humidity was reported to within  $\pm 1\%$ .
- <  $R_{max}$  of the test chambers was measured to be  $R_w$  80 dB
- < Source room volume : 68.40m<sup>3</sup>.
- < Receiving room volume : 50.00m<sup>3</sup>.

## 2.7 Personnel present

<b>Dunstan Ferris</b>	Lorient Polyproducts
<b>Martin Hooley</b>	Lorient Polyproducts
<b>Chris Gough</b>	Door consulting

## 3.0 Results summary and Data

Test No.	Product Identification	Results $R_w$
<b>140414 001</b>	57mm S3D pair of doors in a hardwood frame. Fully-caulked.	$R_w$ 39 dB
<b>140414 002</b>	57mm S3D pair of doors in a hardwood frame. LAS1212 to jamb and head stops. LP1504DS to jambs and head (interrupted at hinges). Two rows of LP1004DS at meeting stile (bypassing latch). LAS4014si threshold plate. LAS8001si to the bottom of both doors.	$R_w$ 39 dB
<b>140414 003</b>	57mm S3D pair of doors in a hardwood frame. LAS1212 to jamb and head stops. LP1504DS to jambs and head (interrupted at hinges). Two rows of LP1004DS at meeting stile (bypassing latch). LAS4014si threshold plate. LAS8001si to the bottom of both doors. Doors conditioned.	$R_w$ 39 dB
<b>140414 004</b>	54mm S3K pair of doors in a hardwood frame. Fully-caulked.	$R_w$ 40 dB
<b>140414 005</b>	54mm S3K pair of doors in a hardwood frame. Fully-caulked. Doors conditioned.	$R_w$ 41 dB
<b>140414 006</b>	54mm S3K pair of doors in a hardwood frame. LAS1212 to jamb and head stops. LP1504DS to jambs and head (interrupted at hinges). Two rows of LP1004DS at meeting stile (bypassing latch). LAS4014si threshold plate. LAS8001si to the bottom of both doors.	$R_w$ 39 dB
<b>140414 007</b>	54mm S3K pair of doors in a hardwood frame. LAS1212 to jamb and head stops. LP1504DS to jambs and head (interrupted at hinges). Two rows of LP1004DS at meeting stile (bypassing latch). LAS4014si threshold plate. LAS8001si to the bottom of both doors. Doors conditioned.	$R_w$ 40 dB



Test No.	Product Identification	Results $R_w$
140414 008	54mm S3K pair of doors in a hardwood frame. LAS1212 to jamb and head stops. LP1504DS to jambs and head (interrupted at hinges). Two rows of LP1004DS at meeting stile (bypassing latch). LAS4014si threshold plate. LAS8001si to the bottom of both doors. Seals adjusted	$R_w$ 40 dB
140415 001	54mm S4G pair of doors in a hardwood frame. Fully-caulked.	$R_w$ 41 dB
140415 002	54mm S4G pair of doors in a hardwood frame. Fully-caulked. Doors conditioned.	$R_w$ 41 dB
140415 003	54mm S4G pair of doors in a hardwood frame. LAS1212 to jamb and head stops. LP1504DS to jambs and head (interrupted at hinges). Two rows of LP1004DS at meeting stile (bypassing latch). LAS4014si threshold plate. LAS8001si to the bottom of both doors.	$R_w$ 38 dB
140415 004	54mm S4G pair of doors in a hardwood frame. LAS1212 to jamb and head stops. LP1504DS to jambs and head (interrupted at hinges). Two rows of LP1004DS at meeting stile (bypassing latch). LAS4014si threshold plate. LAS8001si to the bottom of both doors. Adjustment made to meeting stile due to misalignment.	$R_w$ 40 dB
140415 005	54mm S4G pair of doors in a hardwood frame. LAS1212 to jamb and head stops. LAS1011 to jambs and head (interrupted at hinges). Two rows of LAS1011 at meeting stile (bypassing latch). LAS4014si threshold plate. LAS8001si to the bottom of both doors.	$R_w$ 40 dB



# Acoustic performance of doorsets – tested in accordance with BS EN ISO 10140-2: 2010

57mm S3D pair of doors in a hardwood frame. Fully-caulked.

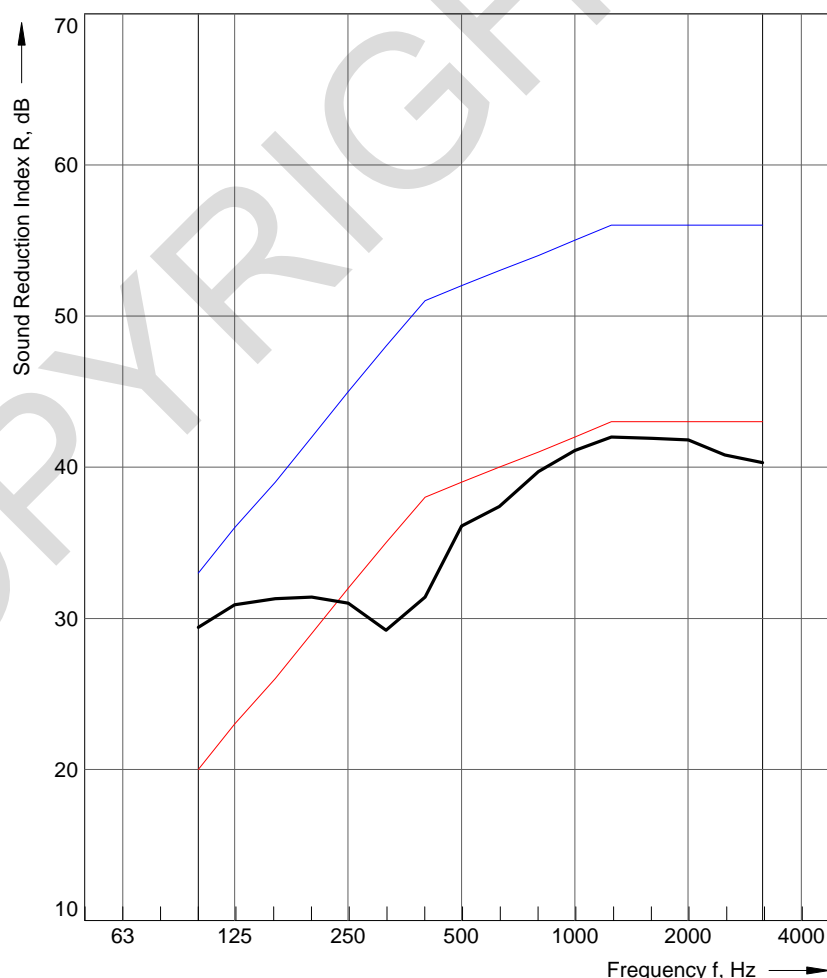
Test Date: 14/04/2014  
Test Number: 140414 001

Test specimen installed by: Lorient Testing & Technical Services  
Test room temperature: 18.3°C  
Test room static pressure: 1035hpa  
Test room relative humidity: 49%

Area S of test element: 4.40m<sup>2</sup>  
Source room volume: 68.40m<sup>3</sup>  
Receiving room volume: 50.00m<sup>3</sup>  
Sample mass per unit area: 35.31kg/m<sup>2</sup>

— Sound reduction index (R) dB  
— Curve of reference values (EN ISO 717-1:1996)

Frequency f Hz	R 1/3 Octave dB
50	
63	
80	
100	29.4
125	30.9
160	31.3
200	31.4
250	31.0
315	29.2
400	31.4
500	36.1
630	37.4
800	39.7
1000	41.1
1250	42.0
1600	41.9
2000	41.8
2500	40.8
3150	40.3
4000	
5000	



Rating according to ISO 717-1

$R_w (C; C_{tr}) = 39 (-1; -3) \text{ dB}$

$C_{50-3150} = \text{N/A dB}; C_{50-5000} = \text{N/A dB}; C_{100-5000} = \text{N/A dB};$

Evaluation based on laboratory measurement results obtained in one-third-octave bands by an engineering method

$C_{tr,50-3150} = \text{N/A dB}; C_{tr,50-5000} = \text{N/A dB}; C_{tr,100-5000} = \text{N/A dB};$



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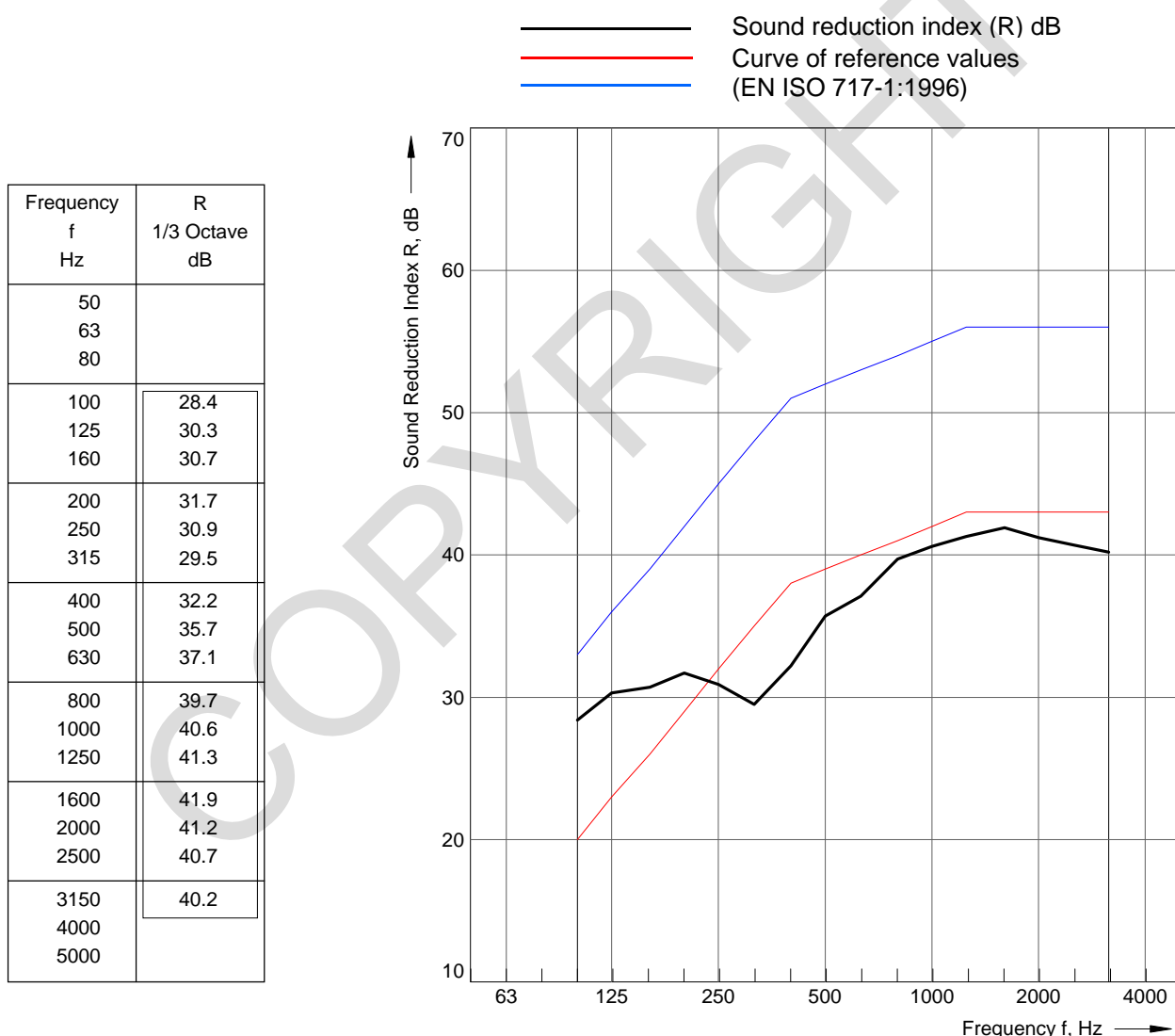
## Acoustic performance of doorsets – tested in accordance with BS EN ISO 10140-2: 2010

57mm S3D pair of doors in a hardwood frame. LAS1212 to jamb and head stops. LP1504DS to jambs and head (interrupted at hinges). Two rows of LP1004DS at meeting stile (bypassing latch). LAS4014si threshold plate. LAS8001si to the bottom of both doors.

**Test Date:** 14/04/2014  
**Test Number:** 140414 002

**Test specimen installed by:** Lorient Testing & Technical Services  
**Test room temperature:** 18.6°C  
**Test room static pressure:** 1035hpa  
**Test room relative humidity:** 49%

**Area S of test element:** 4.40m<sup>2</sup>  
**Source room volume:** 68.40m<sup>3</sup>  
**Receiving room volume:** 50.00m<sup>3</sup>  
**Sample mass per unit area:** 35.31kg/m<sup>2</sup>



Rating according to ISO 717-1

$R_w (C; C_{tr}) = 39 (-1; -3) \text{ dB}$

Evaluation based on laboratory measurement results obtained in one-third-octave bands by an engineering method

$C_{50-3150} = \text{N/A dB}; C_{50-5000} = \text{N/A dB}; C_{100-5000} = \text{N/A dB};$

$C_{tr,50-3150} = \text{N/A dB}; C_{tr,50-5000} = \text{N/A dB}; C_{tr,100-5000} = \text{N/A dB};$



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## Acoustic performance of doorsets – tested in accordance with BS EN ISO 10140-2: 2010

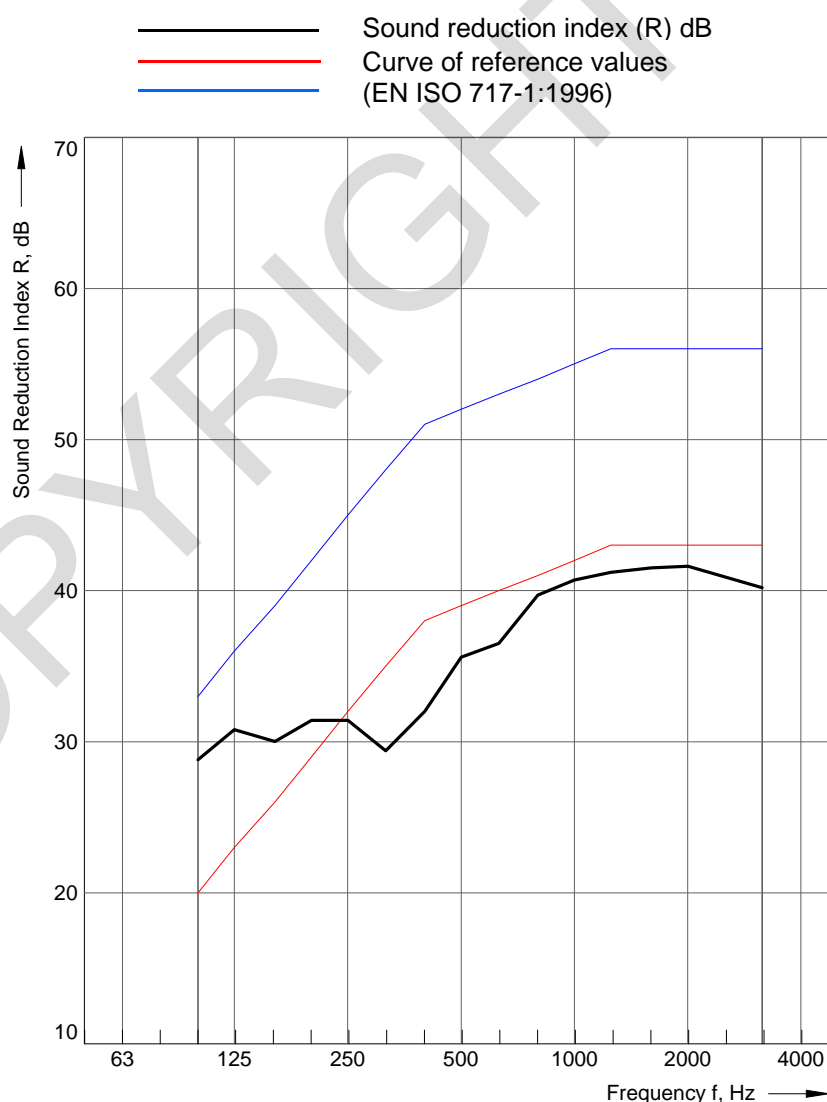
57mm S3D pair of doors in a hardwood frame. LAS1212 to jamb and head stops. LP1504DS to jambs and head (interrupted at hinges). Two rows of LP1004DS at meeting stile (bypassing latch). LAS4014si threshold plate. LAS8001si to the bottom of both doors.

**Test Date:** 14/04/2014  
**Test Number:** 140414 003

**Test specimen installed by:** Lorient Testing & Technical Services  
**Test room temperature:** 18.6°C  
**Test room static pressure:** 1035hpa  
**Test room relative humidity:** 48%

**Area S of test element:** 4.40m<sup>2</sup>  
**Source room volume:** 68.40m<sup>3</sup>  
**Receiving room volume:** 50.00m<sup>3</sup>  
**Sample mass per unit area:** 35.31kg/m<sup>2</sup>

Frequency f Hz	R 1/3 Octave dB
50	
63	
80	
100	28.8
125	30.8
160	30.0
200	31.4
250	31.4
315	29.4
400	32.0
500	35.6
630	36.5
800	39.7
1000	40.7
1250	41.2
1600	41.5
2000	41.6
2500	40.9
3150	40.2
4000	
5000	



Rating according to ISO 717-1

$R_w (C; C_{tr}) = 39 (-1; -3) \text{ dB}$

Evaluation based on laboratory measurement results obtained in one-third-octave bands by an engineering method

$C_{50-3150} = \text{N/A dB}; C_{50-5000} = \text{N/A dB}; C_{100-5000} = \text{N/A dB};$

$C_{tr,50-3150} = \text{N/A dB}; C_{tr,50-5000} = \text{N/A dB}; C_{tr,100-5000} = \text{N/A dB};$



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# Acoustic performance of doorsets – tested in accordance with BS EN ISO 10140-2: 2010

54mm S3K pair of doors in a hardwood frame. Fully-caulked.

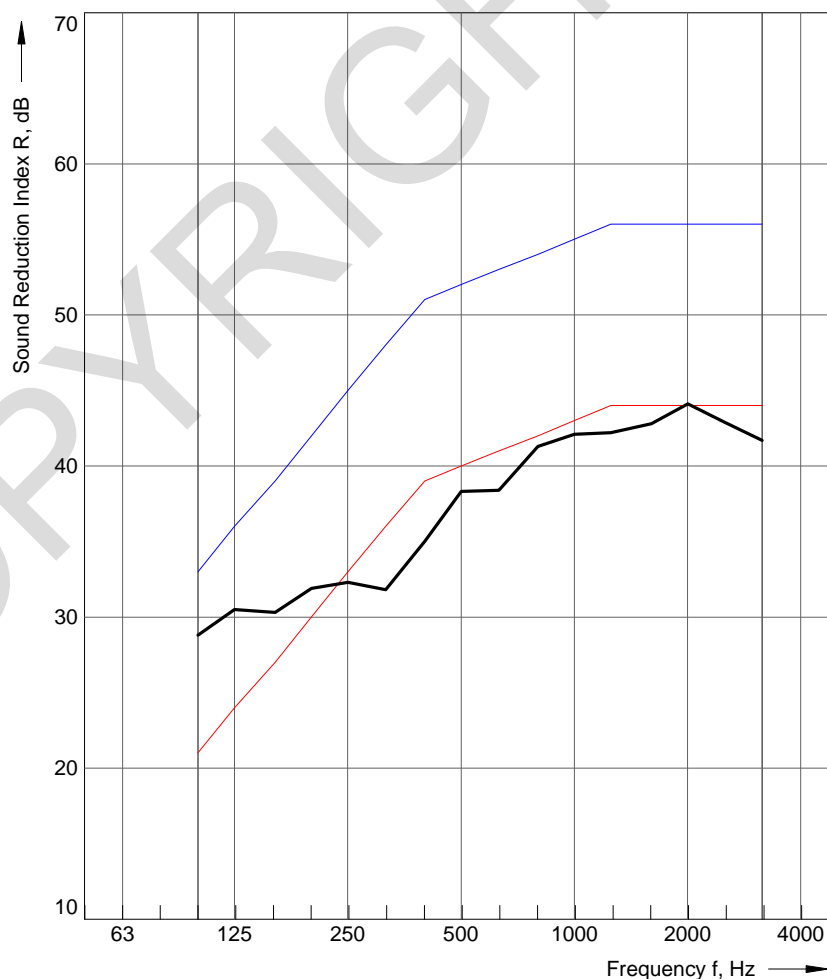
Test Date: 14/04/2014  
Test Number: 140414 004

Test specimen installed by: Lorient Testing & Technical Services  
Test room temperature: 18.6°C  
Test room static pressure: 1035hpa  
Test room relative humidity: 48%

Area S of test element: 4.40m<sup>2</sup>  
Source room volume: 68.40m<sup>3</sup>  
Receiving room volume: 50.00m<sup>3</sup>  
Sample mass per unit area: 33.26kg/m<sup>2</sup>

— Sound reduction index (R) dB  
— Curve of reference values (EN ISO 717-1:1996)

Frequency f Hz	R 1/3 Octave dB
50	
63	
80	
100	28.8
125	30.5
160	30.3
200	31.9
250	32.3
315	31.8
400	35.0
500	38.3
630	38.4
800	41.3
1000	42.1
1250	42.2
1600	42.8
2000	44.1
2500	42.9
3150	41.7
4000	
5000	



Rating according to ISO 717-1

$R_w (C; C_{tr}) = 40 (0; -2) \text{ dB}$

Evaluation based on laboratory measurement results obtained in one-third-octave bands by an engineering method

$C_{50-3150} = \text{N/A dB}; C_{50-5000} = \text{N/A dB}; C_{100-5000} = \text{N/A dB};$

$C_{tr,50-3150} = \text{N/A dB}; C_{tr,50-5000} = \text{N/A dB}; C_{tr,100-5000} = \text{N/A dB};$



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# Acoustic performance of doorsets – tested in accordance with BS EN ISO 10140-2: 2010

54mm S3K pair of doors in a hardwood frame. Fully-caulked.  
Doors conditioned.

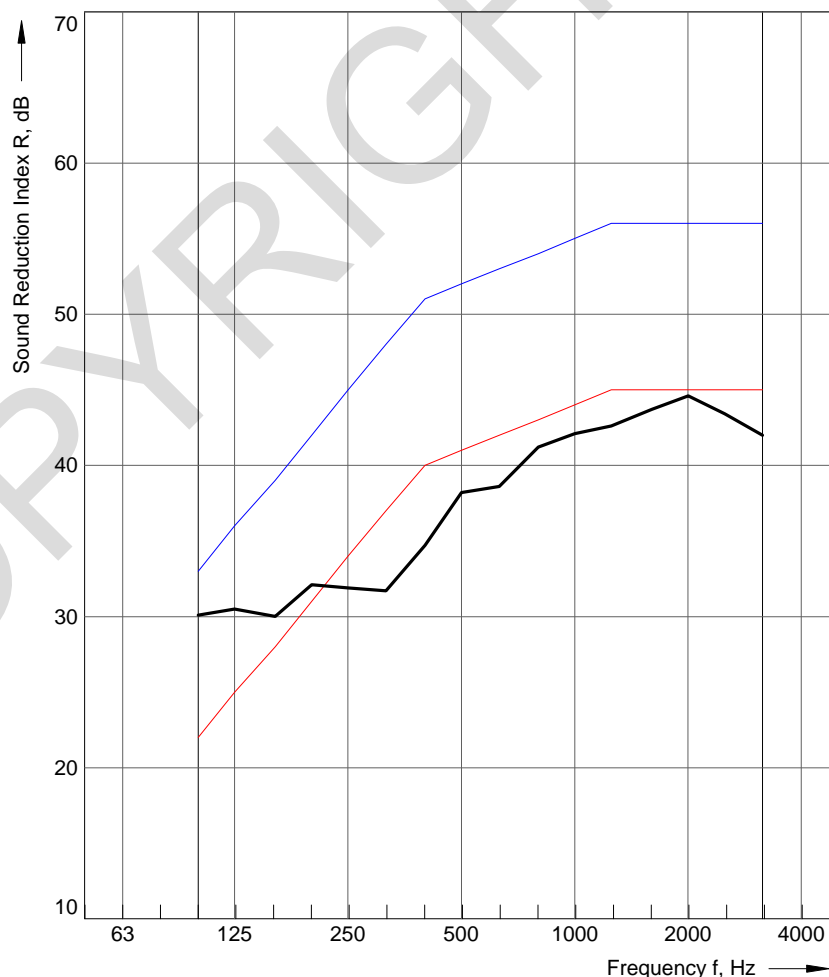
Test Date: 14/04/2014  
Test Number: 140414 005

Test specimen installed by: Lorient Testing & Technical Services  
Test room temperature: 19.0°C  
Test room static pressure: 1035hpa  
Test room relative humidity: 40%

Area S of test element: 4.40m<sup>2</sup>  
Source room volume: 68.40m<sup>3</sup>  
Receiving room volume: 50.00m<sup>3</sup>  
Sample mass per unit area: 33.26kg/m<sup>2</sup>

— Sound reduction index (R) dB  
— Curve of reference values (EN ISO 717-1:1996)

Frequency f Hz	R 1/3 Octave dB
50	
63	
80	
100	30.1
125	30.5
160	30.0
200	32.1
250	31.9
315	31.7
400	34.7
500	38.2
630	38.6
800	41.2
1000	42.1
1250	42.6
1600	43.7
2000	44.6
2500	43.4
3150	42.0
4000	
5000	



Rating according to ISO 717-1

$R_w (C; C_{tr}) = 41 (-1; -3) \text{ dB}$

$C_{50-3150} = \text{N/A dB}; C_{50-5000} = \text{N/A dB}; C_{100-5000} = \text{N/A dB};$

Evaluation based on laboratory measurement results obtained in one-third-octave bands by an engineering method

$C_{tr,50-3150} = \text{N/A dB}; C_{tr,50-5000} = \text{N/A dB}; C_{tr,100-5000} = \text{N/A dB};$



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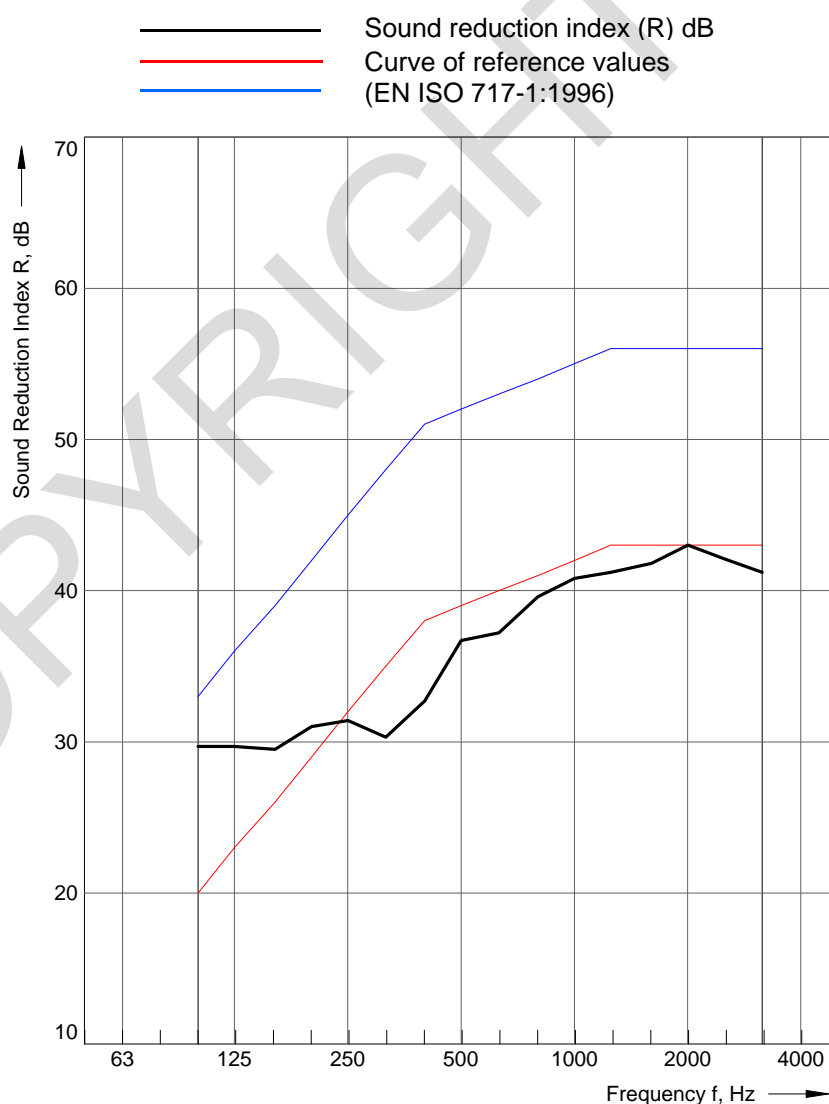
54mm S3K pair of doors in a hardwood frame. LAS1212 to jamb and head stops. LP1504DS to jambs and head (interrupted at hinges). Two rows of LP1004DS at meeting stile (bypassing latch). LAS4014si threshold plate. LAS8001si to the bottom of both doors.

**Test Date:** 14/04/2014  
**Test Number:** 140414 006

**Test specimen installed by:** Lorient Testing & Technical Services  
**Test room temperature:** 19.2°C  
**Test room static pressure:** 1035hpa  
**Test room relative humidity:** 40%

**Area S of test element:** 4.40m<sup>2</sup>  
**Source room volume:** 68.40m<sup>3</sup>  
**Receiving room volume:** 50.00m<sup>3</sup>  
**Sample mass per unit area:** 33.26kg/m<sup>2</sup>

Frequency f Hz	R 1/3 Octave dB
50	
63	
80	
100	29.7
125	29.7
160	29.5
200	31.0
250	31.4
315	30.3
400	32.7
500	36.7
630	37.2
800	39.6
1000	40.8
1250	41.2
1600	41.8
2000	43.0
2500	42.1
3150	41.2
4000	
5000	



Rating according to ISO 717-1

$R_w (C; C_{tr}) = 39 (0; -3) \text{ dB}$

Evaluation based on laboratory measurement results obtained in one-third-octave bands by an engineering method

$C_{50-3150} = \text{N/A dB}; C_{50-5000} = \text{N/A dB}; C_{100-5000} = \text{N/A dB};$   
 $C_{tr,50-3150} = \text{N/A dB}; C_{tr,50-5000} = \text{N/A dB}; C_{tr,100-5000} = \text{N/A dB};$



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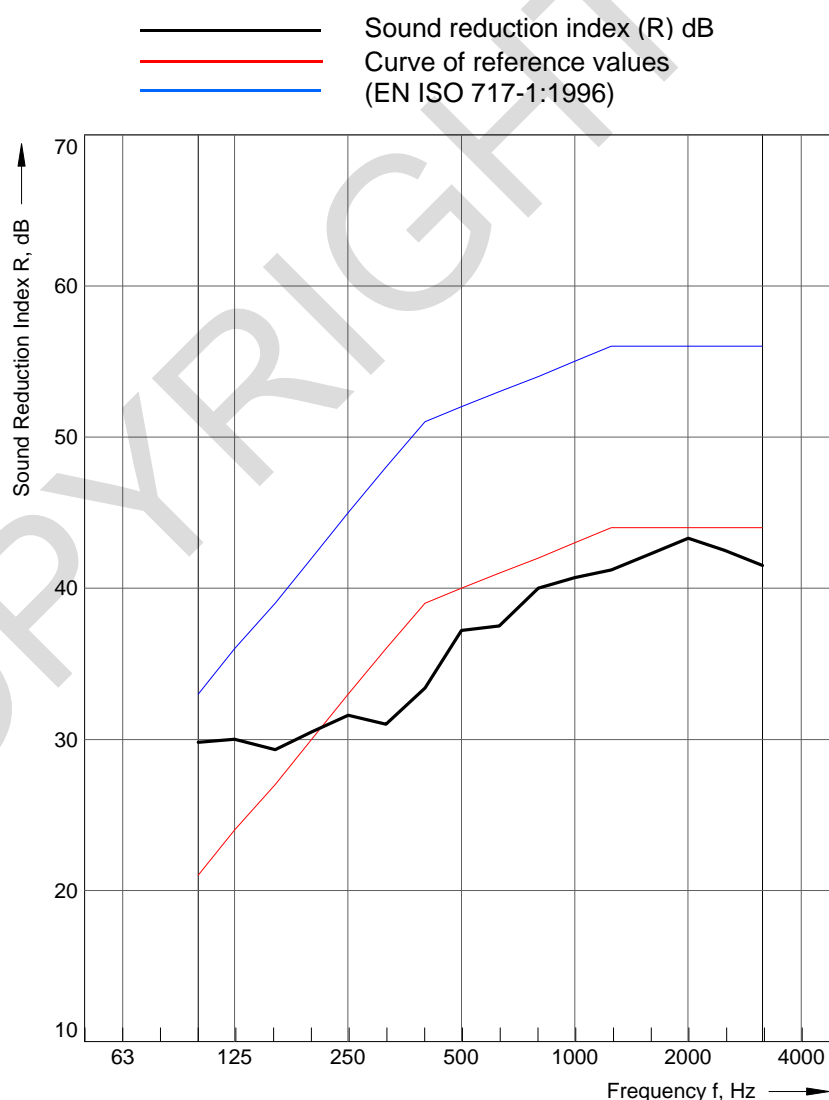
54mm S3K pair of doors in a hardwood frame. LAS1212 to jamb and head stops. LP1504DS to jambs and head (interrupted at hinges). Two rows of LP1004DS at meeting stile (bypassing latch). LAS4014si threshold plate. LAS8001si to the bottom of both doors.

**Test Date:** 14/04/2014  
**Test Number:** 140414 007

**Test specimen installed by:** Lorient Testing & Technical Services  
**Test room temperature:** 19.3°C  
**Test room static pressure:** 1035hpa  
**Test room relative humidity:** 40%

**Area S of test element:** 4.40m<sup>2</sup>  
**Source room volume:** 68.40m<sup>3</sup>  
**Receiving room volume:** 50.00m<sup>3</sup>  
**Sample mass per unit area:** 33.26kg/m<sup>2</sup>

Frequency f Hz	R 1/3 Octave dB
50	
63	
80	
100	29.8
125	30.0
160	29.3
200	30.5
250	31.6
315	31.0
400	33.4
500	37.2
630	37.5
800	40.0
1000	40.7
1250	41.2
1600	42.3
2000	43.3
2500	42.5
3150	41.5
4000	
5000	



Rating according to ISO 717-1

$R_w (C; C_{tr}) = 40 (-1; -3) \text{ dB}$

Evaluation based on laboratory measurement results obtained in one-third-octave bands by an engineering method

$C_{50-3150} = \text{N/A dB}; C_{50-5000} = \text{N/A dB}; C_{100-5000} = \text{N/A dB};$   
 $C_{tr,50-3150} = \text{N/A dB}; C_{tr,50-5000} = \text{N/A dB}; C_{tr,100-5000} = \text{N/A dB};$



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## Acoustic performance of doorsets – tested in accordance with BS EN ISO 10140-2: 2010

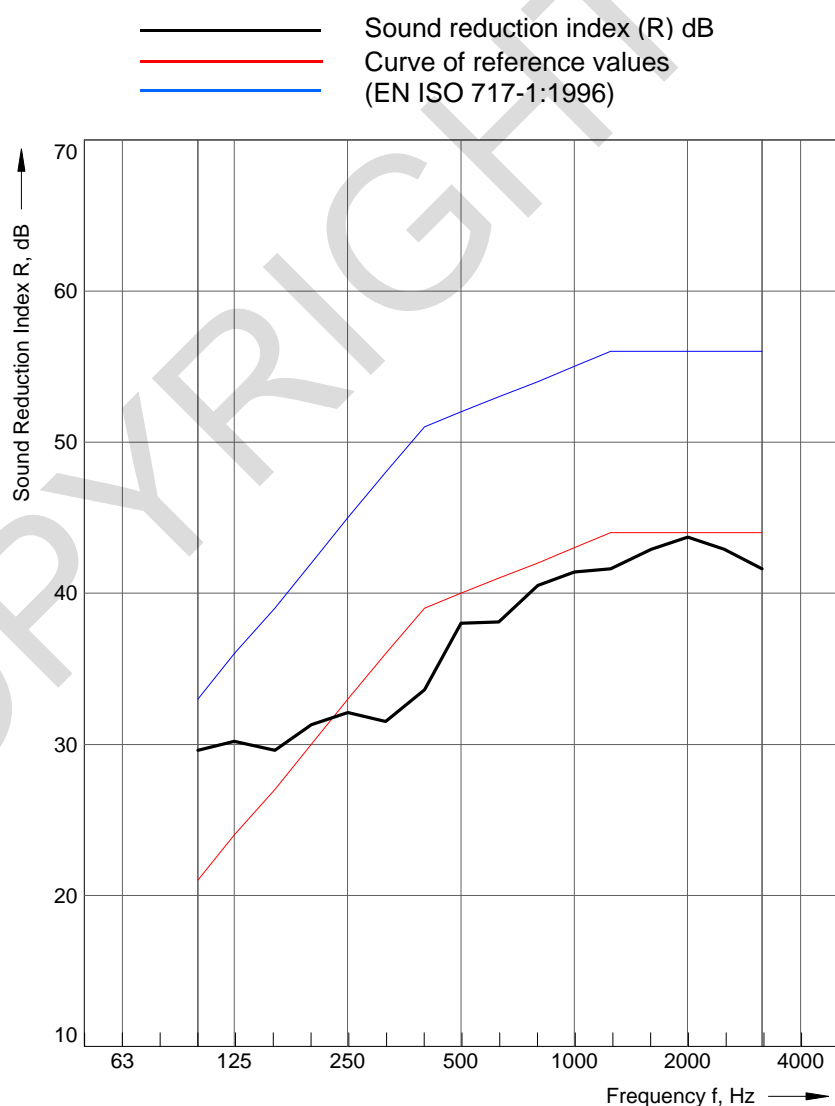
54mm S3K pair of doors in a hardwood frame. LAS1212 to jamb and head stops. LP1504DS to jambs and head (interrupted at hinges). Two rows of LP1004DS at meeting stile (bypassing latch). LAS4014si threshold plate. LAS8001si to the bottom of both doors.

**Test Date:** 14/04/2014  
**Test Number:** 140414 008

**Test specimen installed by:** Lorient Testing & Technical Services  
**Test room temperature:** 19.7°C  
**Test room static pressure:** 1035hpa  
**Test room relative humidity:** 41%

**Area S of test element:** 4.40m<sup>2</sup>  
**Source room volume:** 68.40m<sup>3</sup>  
**Receiving room volume:** 50.00m<sup>3</sup>  
**Sample mass per unit area:** 33.26kg/m<sup>2</sup>

Frequency f Hz	R 1/3 Octave dB
50	
63	
80	
100	29.6
125	30.2
160	29.6
200	31.3
250	32.1
315	31.5
400	33.6
500	38.0
630	38.1
800	40.5
1000	41.4
1250	41.6
1600	42.9
2000	43.7
2500	42.9
3150	41.6
4000	
5000	



Rating according to ISO 717-1

$R_w (C; C_{tr}) = 40 (-1; -3) \text{ dB}$

Evaluation based on laboratory measurement results obtained in one-third-octave bands by an engineering method

$C_{50-3150} = \text{N/A dB}; C_{50-5000} = \text{N/A dB}; C_{100-5000} = \text{N/A dB};$

$C_{tr,50-3150} = \text{N/A dB}; C_{tr,50-5000} = \text{N/A dB}; C_{tr,100-5000} = \text{N/A dB};$



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# Acoustic performance of doorsets – tested in accordance with BS EN ISO 10140-2: 2010

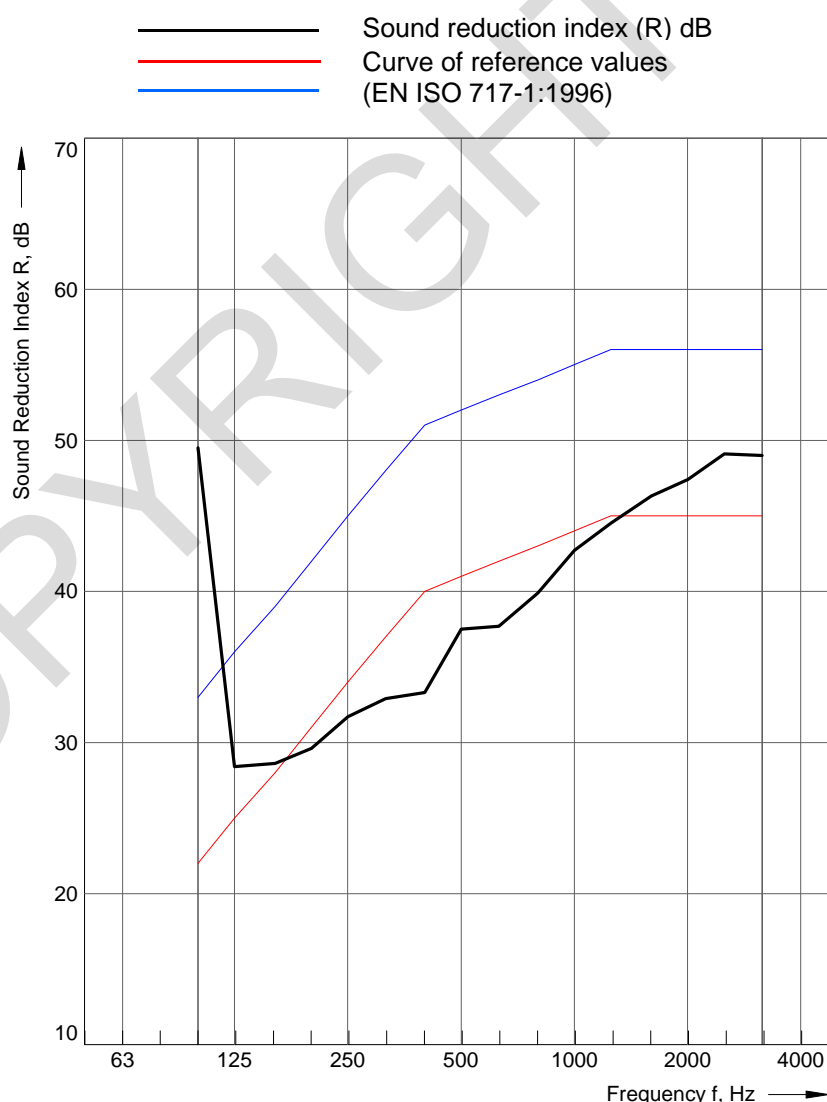
54mm S4G pair of doors in a hardwood frame. Fully-caulked.

Test Date: 15/04/2014  
Test Number: 140415 001

Test specimen installed by: Lorient Testing & Technical Services  
Test room temperature: 18.5°C  
Test room static pressure: 1036hpa  
Test room relative humidity: 49%

Area S of test element: 4.40m<sup>2</sup>  
Source room volume: 68.40m<sup>3</sup>  
Receiving room volume: 50.00m<sup>3</sup>  
Sample mass per unit area: 33.81kg/m<sup>2</sup>

Frequency f Hz	R 1/3 Octave dB
50	
63	
80	
100	49.5
125	28.4
160	28.6
200	29.6
250	31.7
315	32.9
400	33.3
500	37.5
630	37.7
800	39.9
1000	42.7
1250	44.5
1600	46.3
2000	47.4
2500	49.1
3150	49.0
4000	
5000	



Rating according to ISO 717-1

$R_w (C; C_{tr}) = 41 (-1; -4) \text{ dB}$

Evaluation based on laboratory measurement results obtained in one-third-octave bands by an engineering method

$C_{50-3150} = \text{N/A dB}; C_{50-5000} = \text{N/A dB}; C_{100-5000} = \text{N/A dB};$   
 $C_{tr,50-3150} = \text{N/A dB}; C_{tr,50-5000} = \text{N/A dB}; C_{tr,100-5000} = \text{N/A dB};$



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# Acoustic performance of doorsets – tested in accordance with BS EN ISO 10140-2: 2010

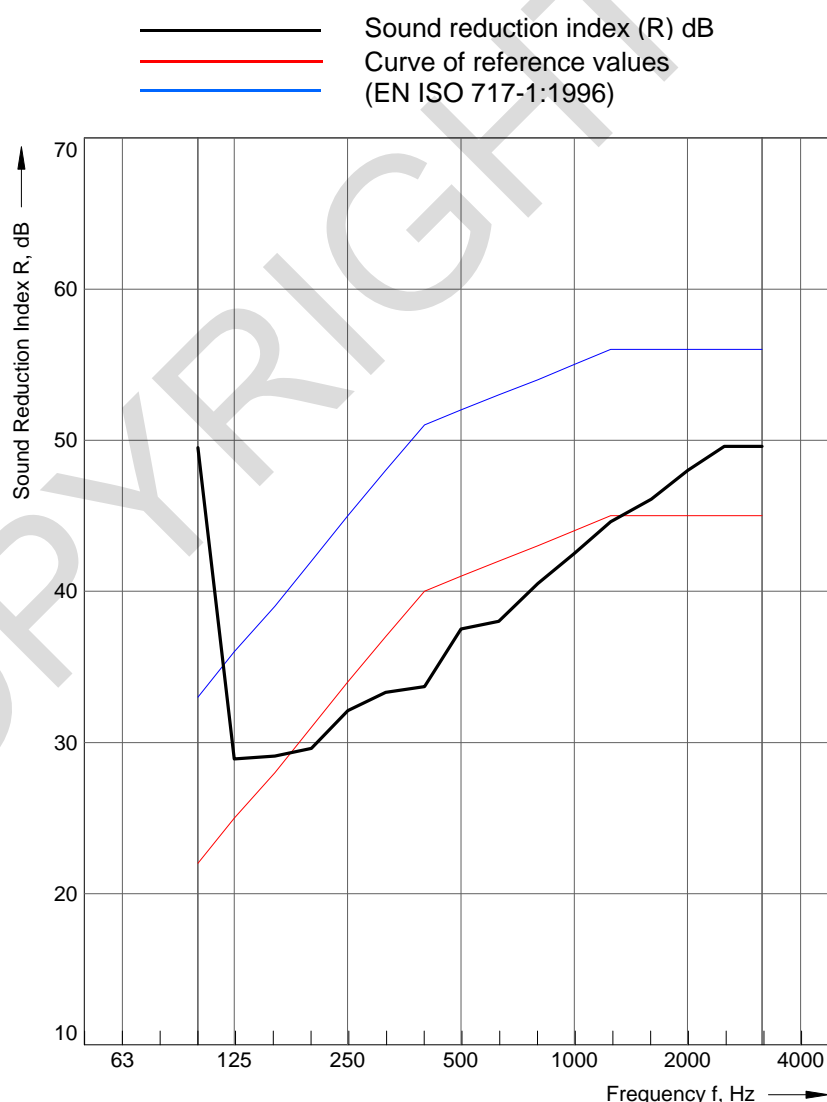
54mm S4G pair of doors in a hardwood frame. Fully-caulked.  
Doors conditioned.

Test Date: 15/04/2014  
Test Number: 140415 002

Test specimen installed by: Lorient Testing & Technical Services  
Test room temperature: 18.6°C  
Test room static pressure: 1036hpa  
Test room relative humidity: 49%

Area S of test element: 4.40m<sup>2</sup>  
Source room volume: 68.40m<sup>3</sup>  
Receiving room volume: 50.00m<sup>3</sup>  
Sample mass per unit area: 33.81kg/m<sup>2</sup>

Frequency f Hz	R 1/3 Octave dB
50	
63	
80	
100	49.5
125	28.9
160	29.1
200	29.6
250	32.1
315	33.3
400	33.7
500	37.5
630	38.0
800	40.5
1000	42.5
1250	44.6
1600	46.1
2000	48.0
2500	49.6
3150	49.6
4000	
5000	



Rating according to ISO 717-1

$R_w (C; C_{tr}) = 41 (-1; -3) \text{ dB}$

Evaluation based on laboratory measurement results obtained in one-third-octave bands by an engineering method

$C_{50-3150} = \text{N/A dB}; C_{50-5000} = \text{N/A dB}; C_{100-5000} = \text{N/A dB};$   
 $C_{tr,50-3150} = \text{N/A dB}; C_{tr,50-5000} = \text{N/A dB}; C_{tr,100-5000} = \text{N/A dB};$



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## Acoustic performance of doorsets – tested in accordance with BS EN ISO 10140-2: 2010

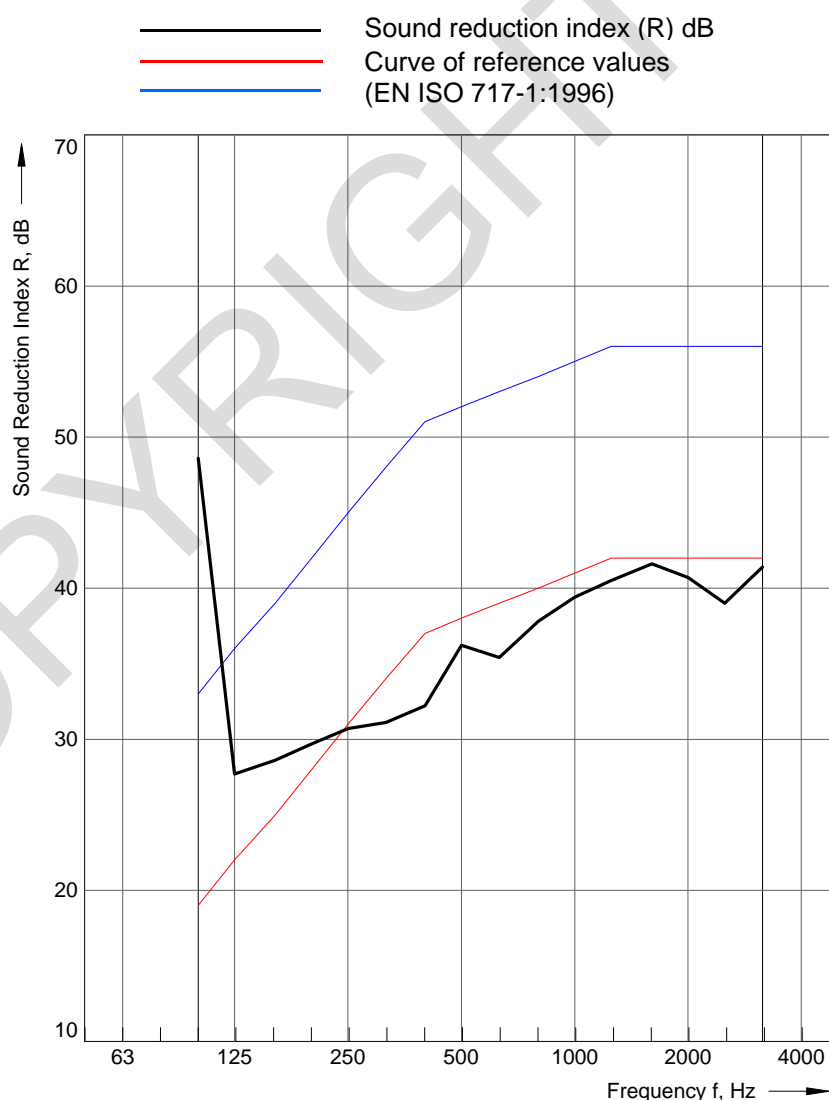
54mm S4G pair of doors in a hardwood frame. LAS1212 to jamb and head stops. LP1504DS to jambs and head (interrupted at hinges). Two rows of LP1004DS at meeting stile (bypassing latch). LAS4014si threshold plate. LAS8001si to the bottom of both doors.

**Test Date:** 15/04/2014  
**Test Number:** 140415 003

**Test specimen installed by:** Lorient Testing & Technical Services  
**Test room temperature:** 18.8°C  
**Test room static pressure:** 1037hpa  
**Test room relative humidity:** 39%

**Area S of test element:** 4.40m<sup>2</sup>  
**Source room volume:** 68.40m<sup>3</sup>  
**Receiving room volume:** 50.00m<sup>3</sup>  
**Sample mass per unit area:** 33.81kg/m<sup>2</sup>

Frequency f Hz	R 1/3 Octave dB
50	
63	
80	
100	48.6
125	27.7
160	28.6
200	29.7
250	30.7
315	31.1
400	32.2
500	36.2
630	35.4
800	37.8
1000	39.4
1250	40.5
1600	41.6
2000	40.7
2500	39.0
3150	41.4
4000	
5000	



Rating according to ISO 717-1

$R_w (C; C_{tr}) = 38 (0; -2) \text{ dB}$

Evaluation based on laboratory measurement results obtained in one-third-octave bands by an engineering method

$C_{50-3150} = \text{N/A dB}; C_{50-5000} = \text{N/A dB}; C_{100-5000} = \text{N/A dB};$

$C_{tr,50-3150} = \text{N/A dB}; C_{tr,50-5000} = \text{N/A dB}; C_{tr,100-5000} = \text{N/A dB};$



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## Acoustic performance of doorsets – tested in accordance with BS EN ISO 10140-2: 2010

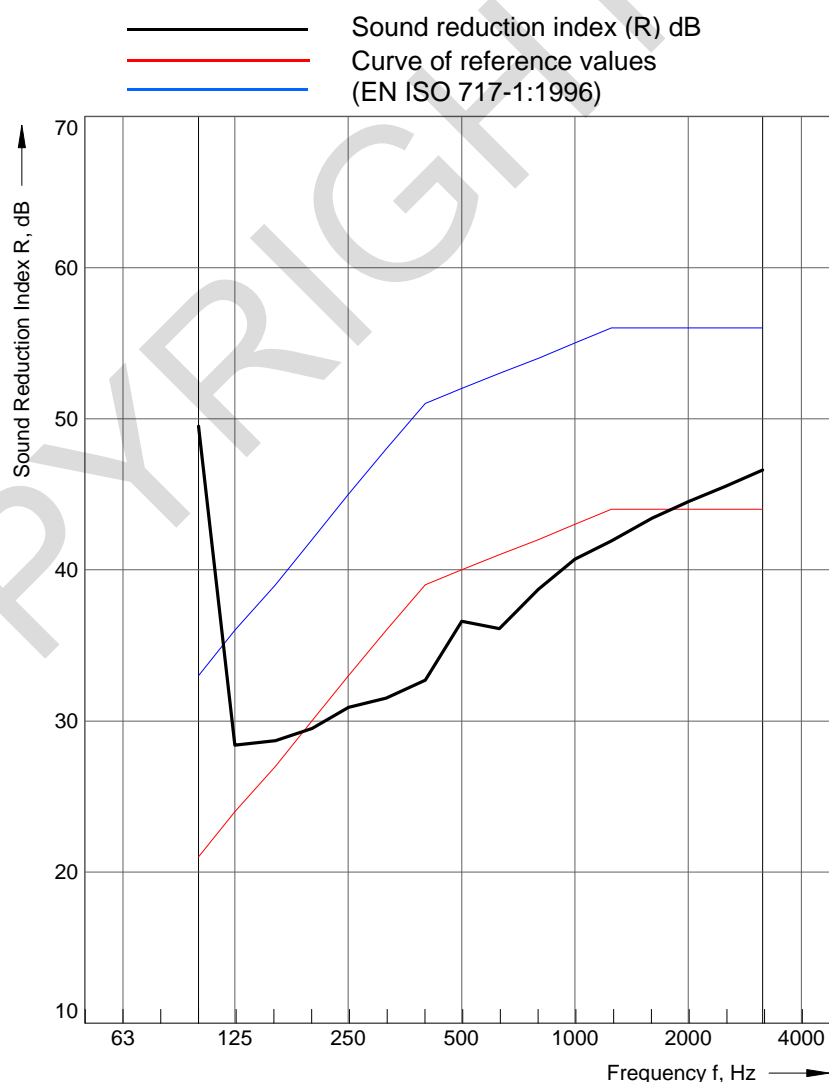
54mm S4G pair of doors in a hardwood frame. LAS1212 to jamb and head stops. LP1504DS to jambs and head (interrupted at hinges). Two rows of LP1004DS at meeting stile (bypassing latch). LAS4014si threshold plate. LAS8001si to the bottom of both doors. Adjustment made to meeting stile due to misalignment.

**Test Date:** 15/04/2014  
**Test Number:** 140415 004

**Test specimen installed by:** Lorient Testing & Technical Services  
**Test room temperature:** 19.3°C  
**Test room static pressure:** 1037hpa  
**Test room relative humidity:** 36%

**Area S of test element:** 4.40m<sup>2</sup>  
**Source room volume:** 68.40m<sup>3</sup>  
**Receiving room volume:** 50.00m<sup>3</sup>  
**Sample mass per unit area:** 33.81kg/m<sup>2</sup>

Frequency f Hz	R 1/3 Octave dB
50	
63	
80	
100	49.5
125	28.4
160	28.7
200	29.5
250	30.9
315	31.5
400	32.7
500	36.6
630	36.1
800	38.7
1000	40.7
1250	41.9
1600	43.4
2000	44.5
2500	45.5
3150	46.6
4000	
5000	



Rating according to ISO 717-1

$$R_w (C; C_{tr}) = 40 (-1; -3) \text{ dB}$$

Evaluation based on laboratory measurement results obtained in one-third-octave bands by an engineering method

$C_{50-3150} = \text{N/A dB}; C_{50-5000} = \text{N/A dB}; C_{100-5000} = \text{N/A dB};$

$C_{tr,50-3150} = \text{N/A dB}; C_{tr,50-5000} = \text{N/A dB}; C_{tr,100-5000} = \text{N/A dB};$



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## Acoustic performance of doorsets – tested in accordance with BS EN ISO 10140-2: 2010

54mm S4G pair of doors in a hardwood frame. LAS1212 to jamb and head stops. LAS1011 to jambs and head (interrupted at hinges). Two rows of LAS1011 at meeting stile (bypassing latch). LAS4014si threshold plate. LAS8001si to the bottom of both doors.

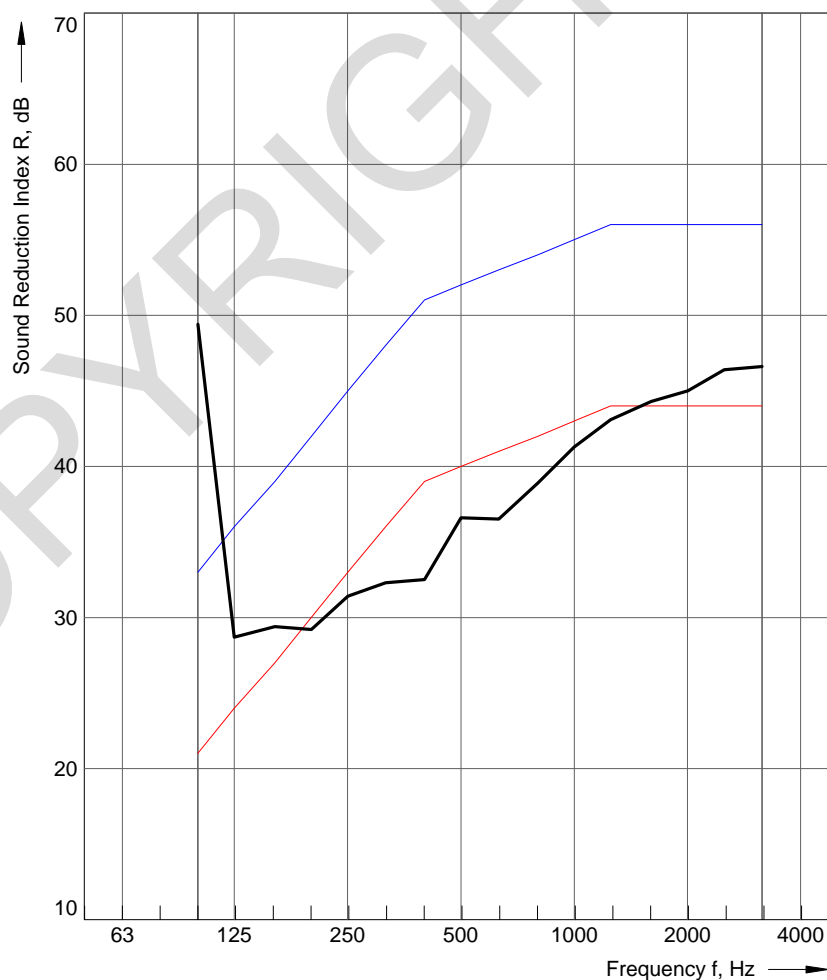
**Test Date:** 15/04/2014  
**Test Number:** 140415 005

**Test specimen installed by:** Lorient Testing & Technical Services  
**Test room temperature:** 19.5°C  
**Test room static pressure:** 1037hpa  
**Test room relative humidity:** 35%

**Area S of test element:** 4.40m<sup>2</sup>  
**Source room volume:** 68.40m<sup>3</sup>  
**Receiving room volume:** 50.00m<sup>3</sup>  
**Sample mass per unit area:** 33.81kg/m<sup>2</sup>

— Sound reduction index (R) dB  
— Curve of reference values (EN ISO 717-1:1996)

Frequency f Hz	R 1/3 Octave dB
50	
63	
80	
100	49.4
125	28.7
160	29.4
200	29.2
250	31.4
315	32.3
400	32.5
500	36.6
630	36.5
800	38.9
1000	41.3
1250	43.1
1600	44.3
2000	45.0
2500	46.4
3150	46.6
4000	
5000	



Rating according to ISO 717-1

$R_w (C; C_{tr}) = 40 (-1; -3) \text{ dB}$

Evaluation based on laboratory measurement results obtained in one-third-octave bands by an engineering method

$C_{50-3150} = \text{N/A dB}; C_{50-5000} = \text{N/A dB}; C_{100-5000} = \text{N/A dB};$   
 $C_{tr,50-3150} = \text{N/A dB}; C_{tr,50-5000} = \text{N/A dB}; C_{tr,100-5000} = \text{N/A dB};$



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## 5.0 Photos of test samples

### S3D pair of doors - Fully-caulked





## Two rows of LP1004DS to meeting stile



**LP1504DS fitted to Jambs and head. LAS1212 to jamb and head stops. LAS4014si to threshold with LAS8001si to bottom of both doors**



### S3K pair of doors - Fully-caulked



Qualifying Fire Door Notwithstanding

BSI EN ISO 14001:2004  
Certificate No. 0475 547500

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## S4G pair of doors - Fully-caulked



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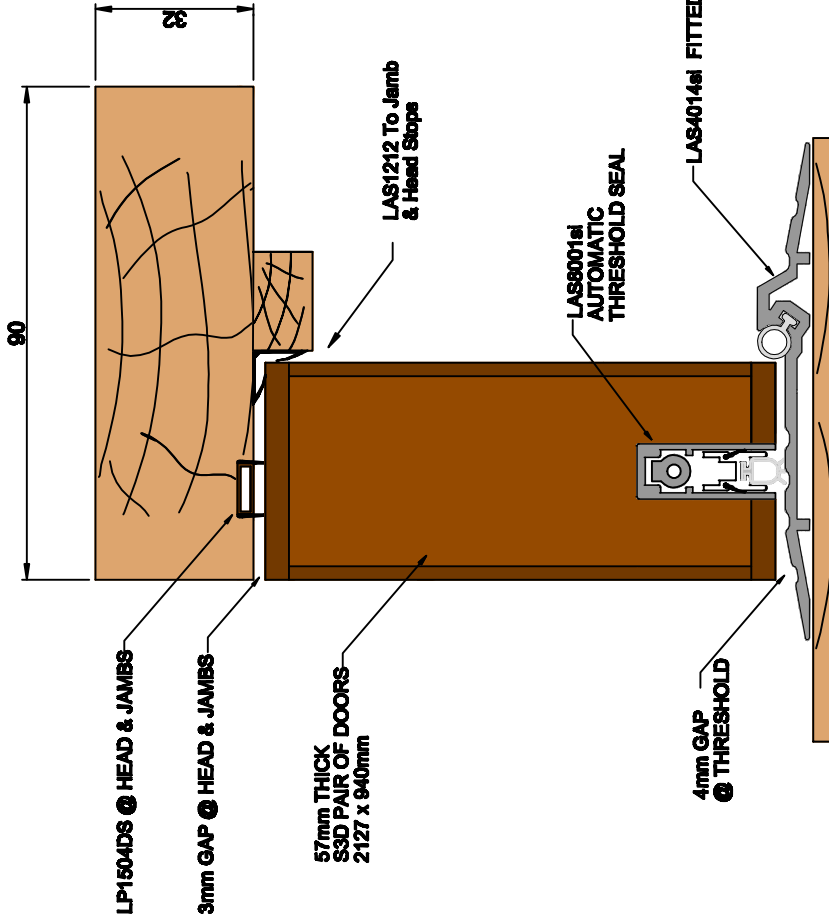
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TEST : 140414 002

57mm ( S3D) Sauerland Pairs - Hardwood Frame, Planted Stop  
 2127 x 940mm  
 LAS1212 to jamb and head stops.  
 LP1504DS to jambs and head ( interrupted at hinges) .  
 Two rows of LP1004DS at meeting stile ( outer fine bypassing latch) .  
 LAS4014sl threshold plate.LAS8001sl to the bottom of both doors.

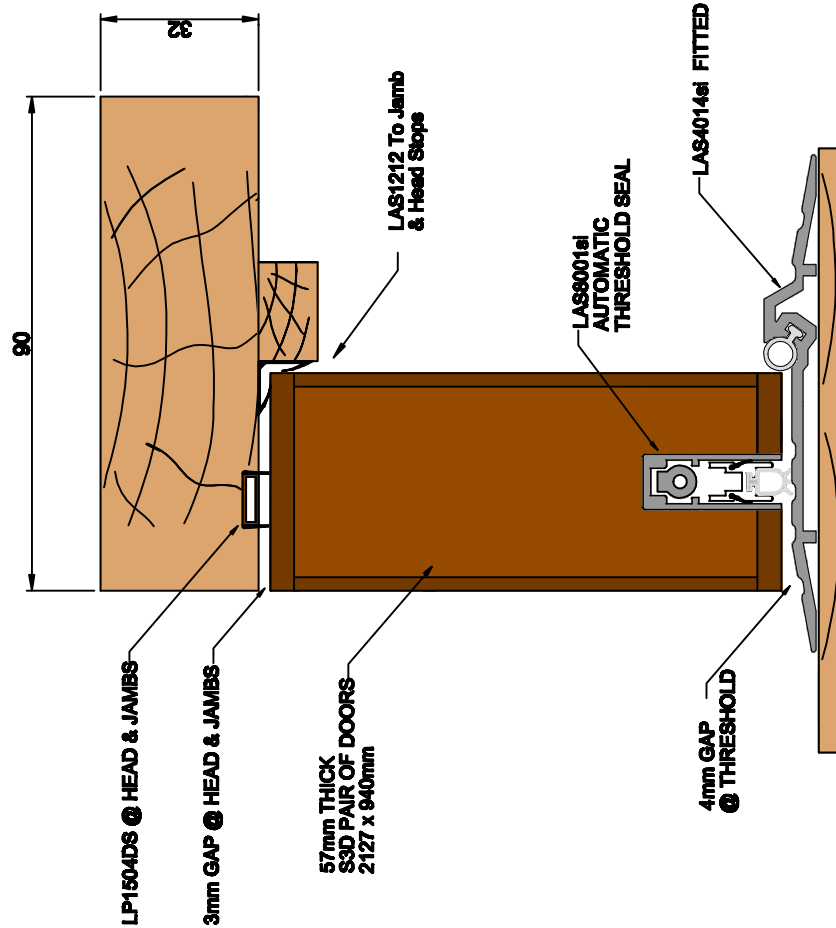


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Testing & Technical Services

		SCALE	NTS	TITLE:	
		DRAWN	MNH	SAUERLAND PAIRS	
		DATE	01/05/14	DRAWING NO:  002	
01	FIRST ISSUE	CHECKED	DF		
REV	DESCRIPTION	APPROVED	DF		



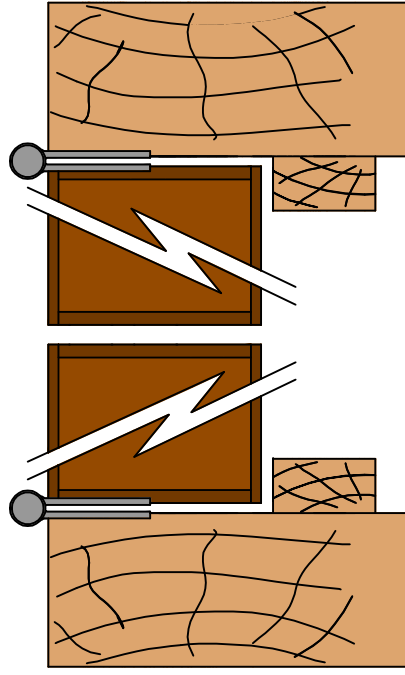
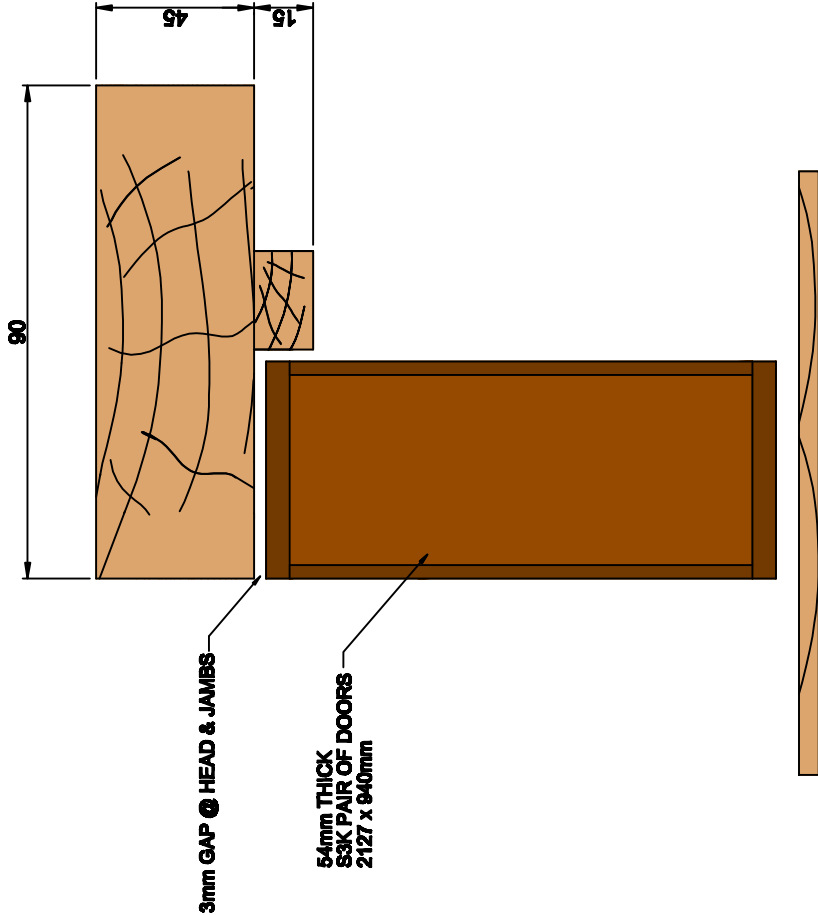
**TEST : 140414 003**

57mm (S3D) Sauerland Pairs - Hardwood Frame, Planted Stop  
2127 x 940mm  
LAS1212 to jamb and head stops.  
LP1504DS to jambs and head (interrupted at hinges)  
Two rows of LP1004DS at meeting stile (outer fins bypassing leister)  
LAS4014sl threshold plate.LAS8001sl to the bottom of both doors.  
Doors conditioned.

[illegible]





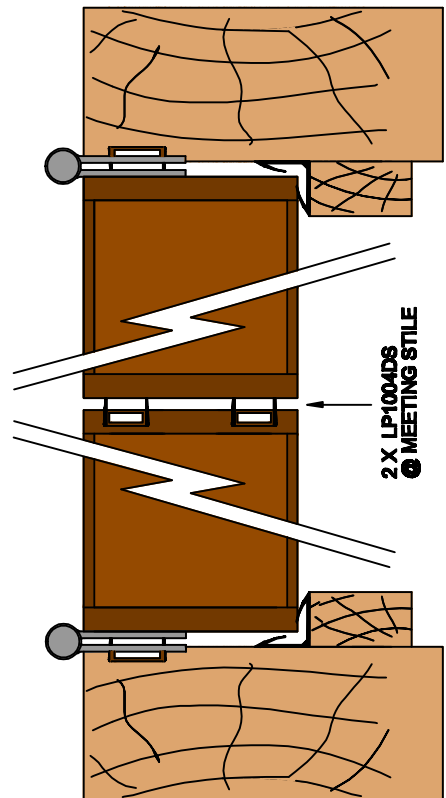
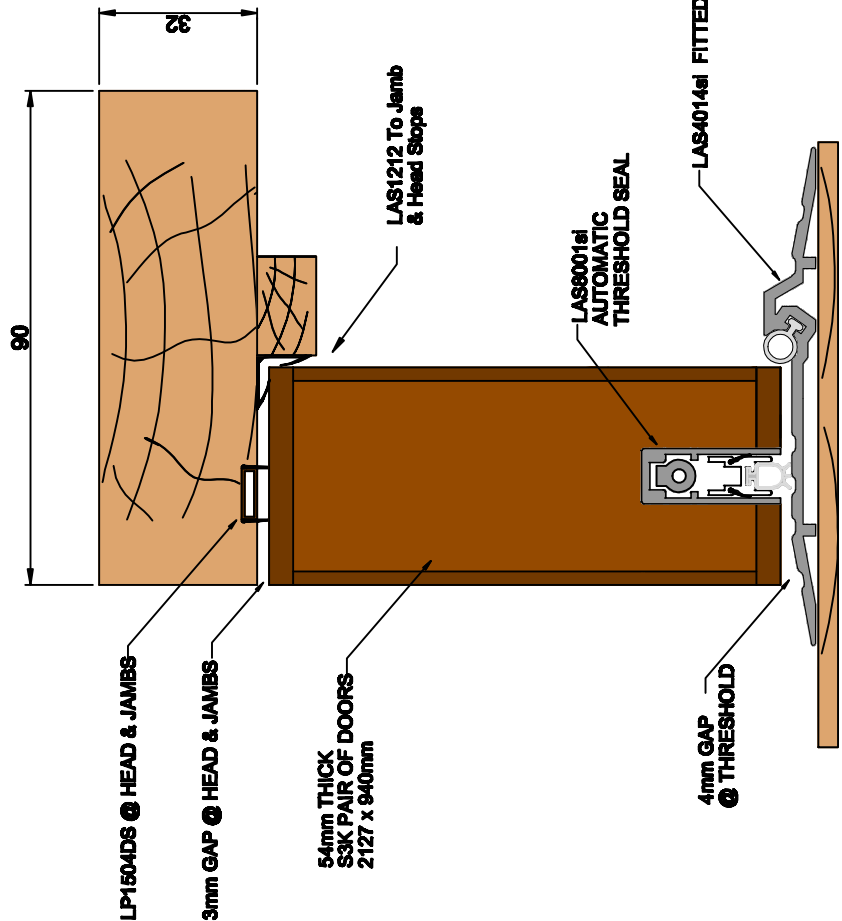


TEST : 140414 005

FULLY CAULKED

54mm (S3K) Sauerland Pairs - Hardwood Frame, Planted Stop  
2127 x 940mm  
Doors conditioned.

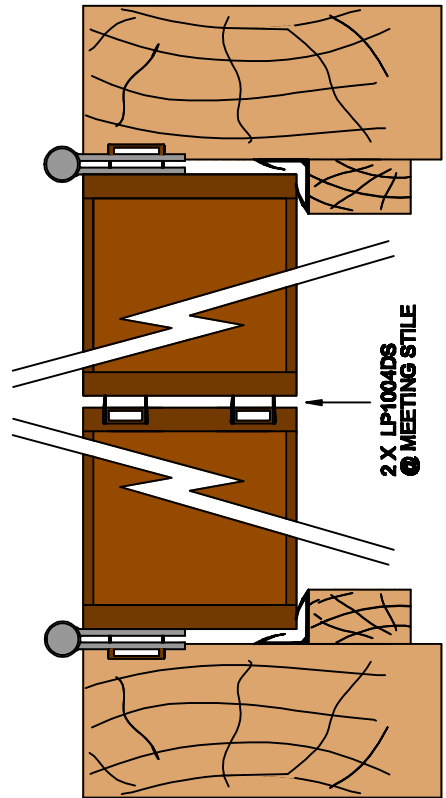
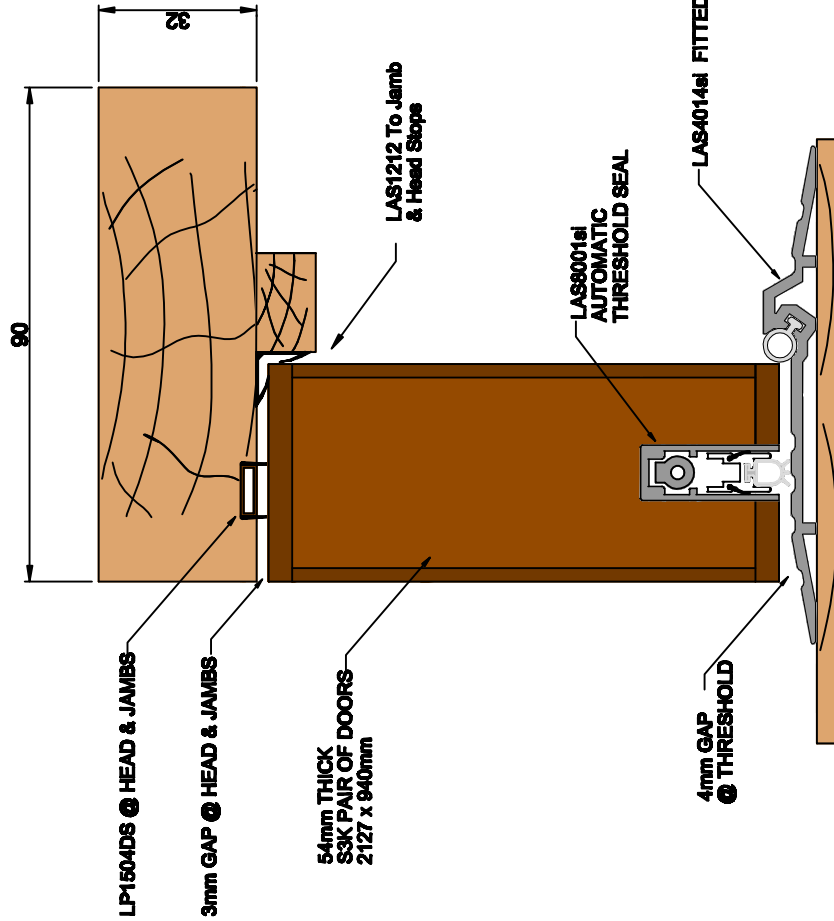
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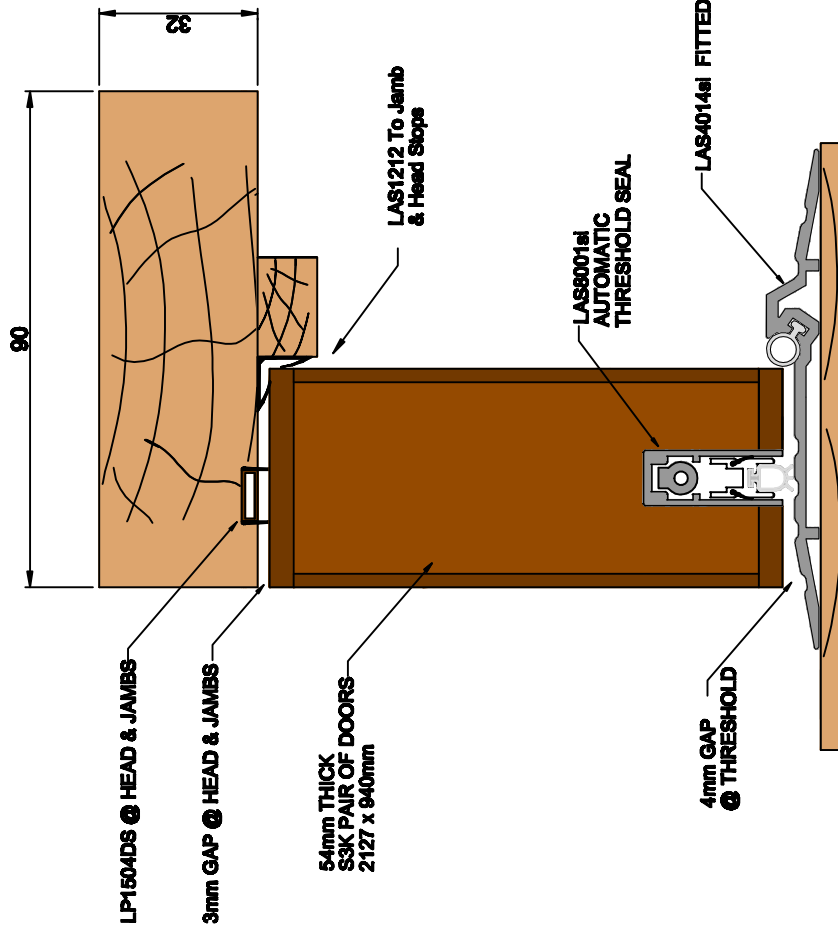
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54mm (S3K) Sauerland Pairs - Hardwood Frame, Planted Stop  
 2127 x 940mm  
 LAS1212 to jamb and head stops.  
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 Two rows of LP1004DS at meeting stile (outer fine bypassing later) .  
 LAS4014sl threshold plate LAS8001sl to the bottom of both doors.  
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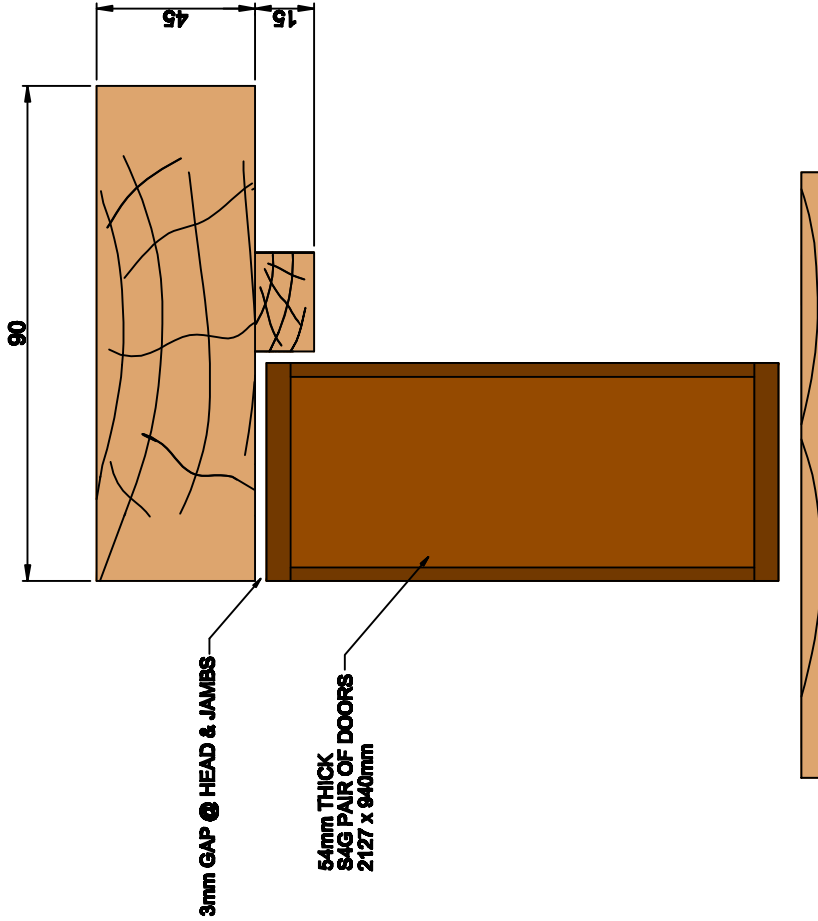
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**TEST: 140414 008**

54mm (S3K) Sauerland Pairs - Hardwood Frame, Planted Stop  
2127 x 940mm  
LAS1212 to jamb and head stops.  
LP1504DS to jamb and head (interrupted at hinges)  
Two rows of LP1004DS at meeting stile (outer line bypassing latch)  
LAS4014sl threshold plate.LAS8001sl to the bottom of both doors.  
Seals adjusted.

[illegible]



TEST : 140415 001

FULLY CAULKED

54mm (S4G) Sauerland Pairs - Hardwood Frame, Planted Stop  
2127 x 940mm

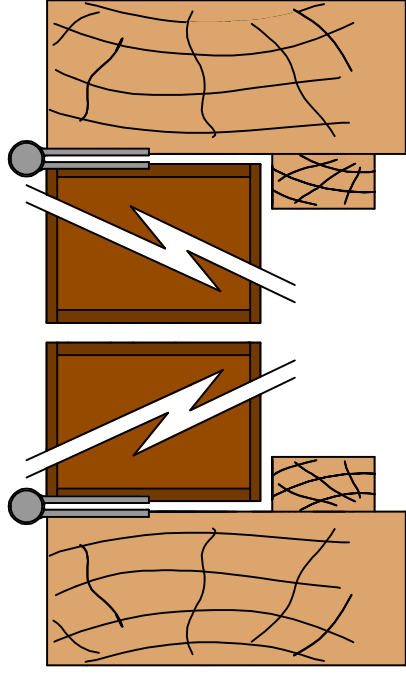
			SCALE	NTS	TITLE: SAUERLAND PAIRS	
			DRAWN	MNH		
			DATE	01/05/14	DRAWING NO: 009	
01	FIRST ISSUE	xx/xx/xxxx	CHECKED	DF		
REV	DESCRIPTION	DATE	APPROVED	DF		



Discovery House  
Unit 19 Wentworth Road  
Heatnfield Industrial Estate  
Newton Abbot  
Devon TQ12 6TL  
Tel: 01626 834252  
Fax: 01626 833166  
E : [testing@lorientuk.com](mailto:testing@lorientuk.com)  
[www.lorientuk.com](http://www.lorientuk.com)

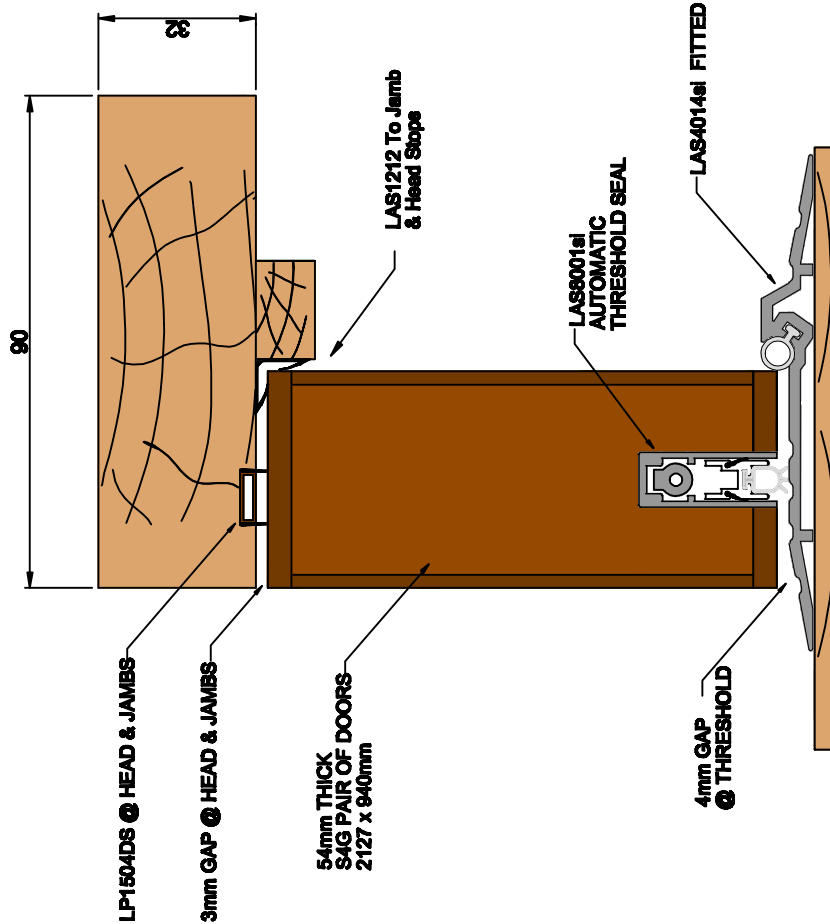
Testing & Technical Services

NO PART OF THIS DRAWING MAY BE REPRODUCED WITHOUT THE WRITTEN CONSENT OF LORIENT POLYPRODUCTS LTD.



**54mm (S4G) Sauerland Pairs - Hardwood Frame, Planted Stop  
2127 x 940mm  
Doors conditioned.**



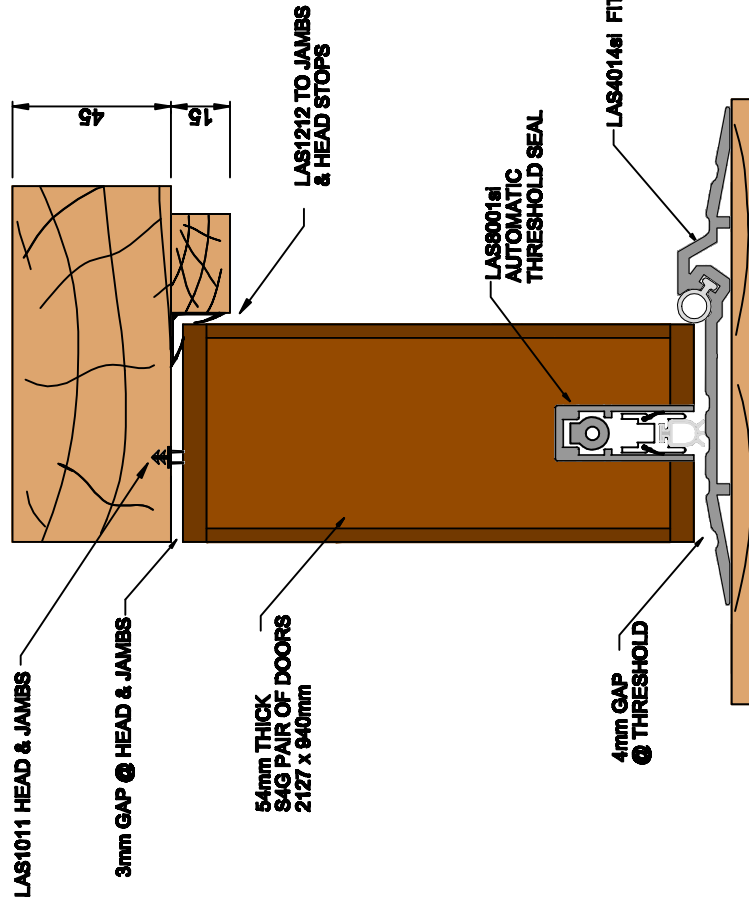


**TEST : 140415 0003**

54mm (S4G) Sauerland Pairs - Hardwood Frame, Planted Stop  
2127 x 940mm  
LAS1212 to lamb and head stops.  
LP1504DS to lambs and head (interrupted at hinges)  
Two rows of LP1004DS at meeting stile (outer fins bypassing latch)  
LAS10041sl threshold plate LAS8001sl to the bottom of both doors.

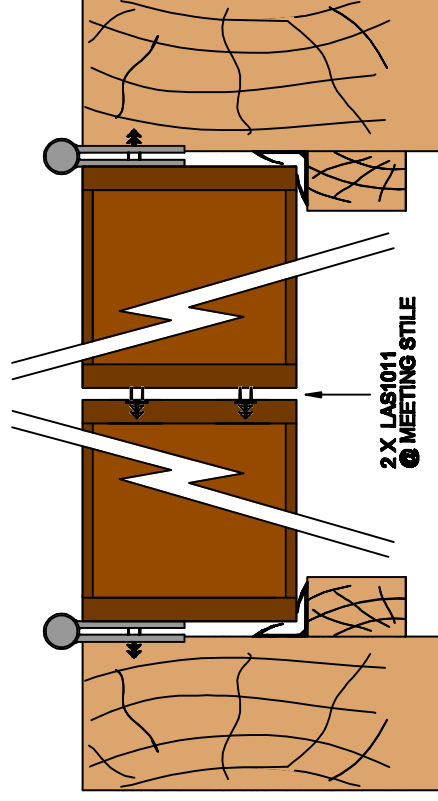
[illegible]





**TEST : 140415 005**

54mm (S4G) Sauerland Pairs - Hardwood Frame, Planted Stop  
2127 x 840mm  
LAS1212 to jamb and head stops.  
LAS1011 to jambs and head (interrupted at hinges)  
Two rows of LAS1011 at meeting stile (cutter fins bypassing leitch)  
LAS1014el threshold plate LAS8001stle to the bottom of both doors.  
Two rows of LAS1011 to the bottom of both doors.



# LOBIENT

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[www.lorientuk.com](http://www.lorientuk.com)

## Testing & Technical Services

[illegible]