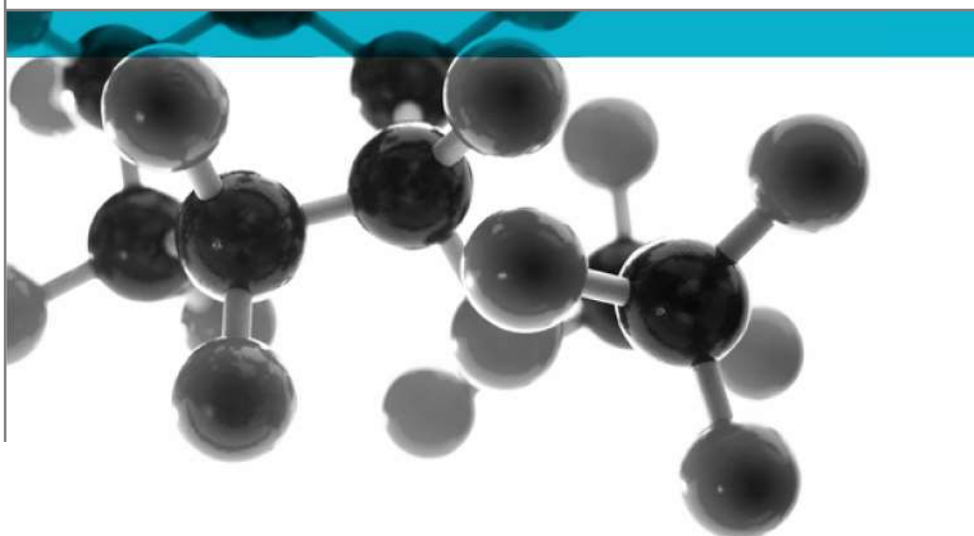


# BS EN ISO 10140-2:2010



**Test of: Single leaf doorset**

**Acoustics - Laboratory measurement of sound insulation of building elements. Measurement of airborne sound insulation**

A Report To:  
Jiangsu Sainty Bancom Wood Co. Ltd  
No. 6 North 2nd Road  
Hongze Industrial Zone  
Jiangsu  
223100, China

Document Reference:  
WYC403032/01

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## Summary of Performance

The following performance was achieved from the specimens tested. Full details of the testing and specimen construction are described in the report.

Test No.	Product Name	Product Type	Caulked	Test Result ( $R_w$ (C;C <sub>tr</sub> ))
1	Prolite Doorset	Single leaf doorset	no	31 (0;-2) dB
2	Prolite Doorset	Single leaf doorset	yes	32 (0;-3) dB

## 1 Introduction

The doorset was constructed at Exova according to the sponsor's specification, and was delivered to the smoke leakage laboratory on 20<sup>th</sup> August 2018. The specimen was installed into a timber stud partition within the test chamber by Exova.

### Test Details

The specimen was tested to BS EN ISO 10140-2:2010 Acoustics - Laboratory measurement of sound insulation of building elements. Measurement of airborne sound insulation

Testing was conducted at Exova, Chiltern House, Stocking Lane, Hughenden Valley, Buckinghamshire. HP14 4ND on the 14 September 2018.

For details of the testing, please see Section 3, Methodology.

### Supporting Construction Description

The partition consisted of two wall leaves separated by a 400mm air gap. Each wall leaf was constructed of nominal 45mm x 90mm softwood studs at 600mm centres with three layers of 15mm plasterboard on each face. The stud wall cavities were filled with 100mm thick Rockwool insulation.

## 2 Test Specimen Details

<b>Product Name</b>	Prolite Doorset
<b>Product Type</b>	Single leaf doorset
<b>Material Type</b>	Timber
<b>Overall Dimensions</b>	990mm wide x 2170mm high x 40mm deep
<b>Leaf Dimensions</b>	920mm wide x 2135mm high x 44mm deep
<b>Variations between Tests</b>	<p>2 tests were conducted on this product with variations in:</p> <ul style="list-style-type: none"> <li>• Caulked</li> </ul> <p>Refer to Summary of Results &amp; Test Data Sheets in Appendix 1 for details of the variations.</p>

## Door Leaf

		Material/type	Dimensions (mm)	Density (kg/m <sup>3</sup> )
<b>Core</b>		Albasia*	36 thick (3 layers of 12)*	160-350*
<b>Facings</b>		Plywood – Poplar / Beech*	4 thick	450-500*
<b>Lippings</b>		Sapele	6 thick	640**
<b>Adhesive</b>	<b>Core</b>	WBP Melamine*	-	-
	<b>Facings</b>	WBP Melamine*	-	-
	<b>Lippings</b>	PU	-	-

\*as stated by sponsor, not checked by laboratory

\*\*nominal density, not checked by laboratory

## Door Frame

		Material/type	Dimensions (mm)	Density (kg/m <sup>3</sup> )
<b>Head &amp; jambs</b>		European Redwood	70 x 32	510**
<b>Stops</b>		European Redwood	20 x 12	510**
<b>Threshold</b>		<i>Temporary MDF threshold for testing purposes only</i>	90 x 10	-
<b>Joints</b>		Butt jointed and screwed	-	-

\*as stated by sponsor, not checked by laboratory

\*\*nominal density, not checked by laboratory

Hardware

	Make/type	Size (mm)	Fixing details (dimensions in mm)
<b>Hinges</b>	3No. Royde and Tucker (Ref. Hi-Load 101) <i>1mm intumescent interdans behind hinge blades</i>	100 x 35 blade size	5No. 5 x 30 screws per blade
<b>Latch</b>	Eurospec 'Standard' tubular latch <i>1mm intumescent interdans behind fore end</i>	28 x 56	2No. 3.5 x 25 screws
<b>Latch keep</b>	Eurospec 'Standard' tubular latch keep <i>1mm intumescent interdans around body</i>	38 x 56	2No. 3.5 x 20 screws
<b>Handles</b>	Zoo handle	100 x 110 footprint	4No. 3 x 25 screws
<b>Closer</b>	Rutland closer	235 x 55 footprint	5No. 4 x 50 screws

\* As stated by sponsor, not checked by laboratory

Perimeter Sealing details

		Make/type	Size (mm)	Location
<b>Door Edges</b>		None present	-	-
<b>Frame reveal</b>	<b>Head and jambs</b>	Pryoplex intumescent brush seal	15 x 4	On rebate platform
	<b>Threshold</b>	Norsound NOR810	920 length	In recess at bottom of leaf
<b>Seal continuity</b>		Brush seal interrupted by hardware	-	-

\* As stated by sponsor, not checked by laboratory

Glazing

	Material/type/reference/size (mm)	Location (dimensions in mm)
<b>Glass type &amp; configuration</b>	Pyroshield	-
<b>Overall size</b>	703 wide x 863 high	-
<b>Sight size</b>	685 wide x 840 high	-
<b>Cassettes</b>	Sapele 20 x 20	On internal and external faces of glass perimeter
<b>Cassette fixings</b>	22No. 4 x 40 screws	Nominal 50 from corners, and at 150 centres
<b>Gaskets</b>	Lorient 36/6 glazing system*	Around perimeter of glass

\* As stated by sponsor, not checked by laboratory



### 3 Methodology

#### Airborne Sound Insulation Test

- The loudspeakers were placed in the corners of the source room
- The sound level meter was calibrated prior to testing.
- 5 measurements were taken in the source room, at fixed positions.
- 5 measurements were taken in the receive room at fixed positions.
- Background measurements were taking at each third octave frequency between 50Hz and 5000Hz.
- 6 Reverberation measurements were taken in the receive room, in accordance with BS EN ISO 3382-2:2008 interrupted, engineering method.
- Calculations, including C & C<sub>tr</sub>, were carried out in accordance with BS EN ISO 717-1
- The sound reduction index was calculated using the following formula from BS EN ISO 10140-2:2010:

$$R_w = L1 - L2 + 10Log\left(\frac{S}{A}\right) dB$$

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  $A = \frac{0.16V}{T}$

Where:

V = The volume of the receive room  
 T = the reverberation time measured in seconds

1. Logarithmic average of 5 Measurements (L1 & L2)
2. Deduction of L1s from L2s
3. Area of test specimen (S) divided by equivalent sound absorption area (A)
4. Weighted Final Result R<sub>w</sub> dB

#### Test Equipment

Equipment	Equipment reference number
Bruel & Kjar Sound Level Meter (Type 2270)	ACT-009
Bruel & Kjar Microphones (Type 4189)	ACT-010
Bruel & Kjar Calibrator (Type 4231)	ACT-011
Amplifiers	ACT-007 & ACT-049
Noise Generators	ACT-008 & ACT-009
Loudspeakers (EV ZX1-90PA)	ACT-006, ACT-021, ACT-022
Graphic Equaliser (DBX Dual Channel)	ACT-023



## 4 Parameters & Limitations

### Parameters



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

- Sound level meter (microphone) was located as required
- Sound sources (loudspeakers) were located as required
- Reverberation Time readings were greater than 20dB but not so large that the observed decay cannot be represented by a straight line.
- Background noise measurements were 10dB below L2 measurements.
- Temperature was reported to within  $\pm 0.1^{\circ}\text{C}$
- Barometric pressure was reported to within  $\pm 0.01$  Mbar ( $\pm 1$  Pa)
- Humidity was reported to within  $\pm 1\%$
- Frequencies 50Hz, 63Hz and 80Hz are outside of our UKAS accreditation, and are for reference only. These frequencies do not affect the overall  $R_w$  figure.
- $R'_{\text{max}}$  of the test chambers was measured to be 65dB
- The test chambers are two cuboid rooms 5.49m wide and a ceiling height of 2.58m, volumes of chambers for testing are reported with the individual test data

### Limitations

- The results only relate to the behaviour of the specimen submitted for test, as described in the Technical Specification (Section 2), and under the particular conditions of test.
- The results are not intended to be the sole criteria for assessing the acoustic performance of the element in use nor do they necessarily reflect the actual behaviour once installed on site.
- The specification and interpretation of test methods are the subject of ongoing development and refinement. Changes in associated legislation may also occur. For these reasons it is recommended that the relevance of test reports over 5 years old should be considered by the user. EXOVA will be able to offer a review of the procedures adopted for a particular test to ensure that they are consistent with current practices.
- The results are solely for use by the sponsor and the stated purpose.
- The sponsor cannot rely on information provided without consent from EXOVA.
- Any recommendations are specific to the assignment and the sponsor.
- Extracts from the report are not permitted.

## 5 Authorisation

	Issued by:	Authorised by:
<b>Signature:</b>		
<b>Name:</b>	Martin Durham	Lee Grant-Riach
<b>Title:</b>	Laboratory Manager	Lead Technical Officer
<b>Date of Issue</b>	22 <sup>nd</sup> November 2018	

**Appendix 1 – Summary of Results & Test Data Sheets (2 Pages)**

<b>Product Name</b>	Prolite Doorset
<b>Product Type</b>	Single leaf doorset

<b>Data Sheet Ref.</b>	<b>Variations</b>		<b>Test Result R<sub>w</sub> (C;C<sub>tr</sub>)</b>
WYC403032/P002	Caulked	no	31 (0;-2) dB
WYC403032/P003	Caulked	yes	32 (0;-3) dB





Laboratory measurement to  
BS EN ISO 10140-2 -  
Airborne Sound Insulation of  
Building Elements



1762

<b>Sponsor:</b>	<b>Jiangsu Sainty Bancom Wood Co. Ltd</b>
<b>Product Name/Desc.</b>	<b>Prolite Doorset</b>
<b>Product Type</b>	Single leaf doorset
<b>Material Type</b>	Timber
<b>Variations:</b>	
<b>Caulked</b>	no

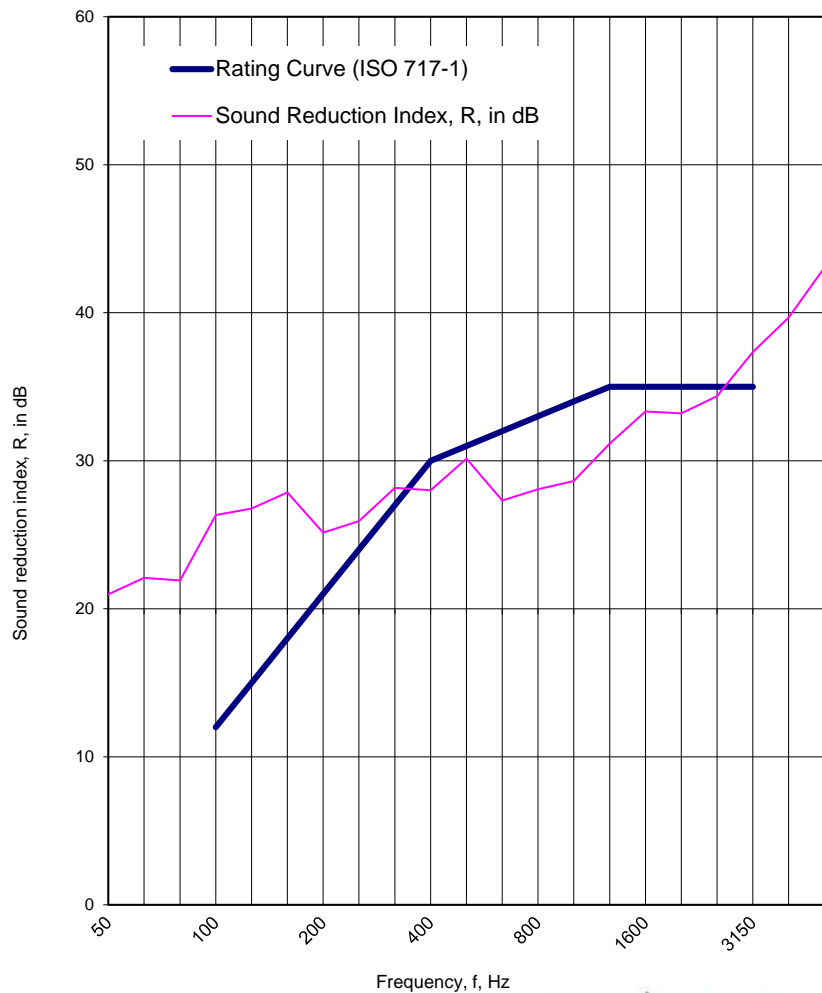
*For detailed technical specification, please refer to Section 2 of the report*

**Data sheet Ref. WYC403032/01/P002**  
**Date of Test: 14/09/2018**

<b>Source Room Volume:</b>	82.40 m <sup>3</sup>
<b>Receive Room Volume:</b>	69.60 m <sup>3</sup>
<b>Specimen Installed By:</b>	Exova
<b>Area of Specimen (S):</b>	2.20 m <sup>2</sup>
<b>Temp. in Test Rooms:</b>	<u>Sour.</u> 20.1 <u>Rec.</u> 20.2 °C
<b>Static Pressure:</b>	100200.0    100210.0 Pa
<b>Humidity in Test Rooms:</b>	56.2    55.6 %

f, Hz	R, dB
50 <sup>+</sup>	21.0
63 <sup>+</sup>	22.1
80 <sup>+</sup>	21.9
100	26.3
125	26.8
160	27.9
200	25.1
250	25.9
315	28.2
400	28.0
500	30.1
630	27.3
800	28.1
1000	28.6
1250	31.2
1600	33.3
2000	33.2
2500	34.4
3150	37.3
4000	39.7
5000	43.1
AAD	-25.8

↑  
Frequency range for rating in accordance with ISO 717-1  
↓



<b>R<sub>w</sub> = 31 dB</b>	C <sub>(50 - 3150)</sub> = 0 dB	C <sub>tr (50 - 3150)</sub> = -2 dB
<b>R<sub>w</sub>+C = 31 dB</b>	C <sub>(50 - 5000)</sub> = 1 dB	C <sub>tr (50 - 5000)</sub> = -2 dB
<b>R<sub>w</sub>+C<sub>tr</sub> = 29 dB</b>	C <sub>(100 - 5000)</sub> = 1 dB	C <sub>tr (100 - 5000)</sub> = -2 dB

**Lee Grant-Riach**  
Lead Technical Officer

<sup>+</sup> indicates that the frequency is outside of our UKAS accreditation and is for information only

The legal validity of this report can only be claimed on presentation of the complete report

Report for: Jiangsu Sainty Bancom Wood Co. Ltd

Report Ref: WYC403032/01



Laboratory measurement to  
BS EN ISO 10140-2 -  
Airborne Sound Insulation of  
Building Elements



1762

<b>Sponsor:</b>	<b>Jiangsu Sainty Bancom Wood Co. Ltd</b>
<b>Product Name/Desc.</b>	<b>Prolite Doorset</b>
<b>Product Type</b>	Single leaf doorset
<b>Material Type</b>	Timber
<b>Variations:</b>	
<b>Caulked</b>	yes

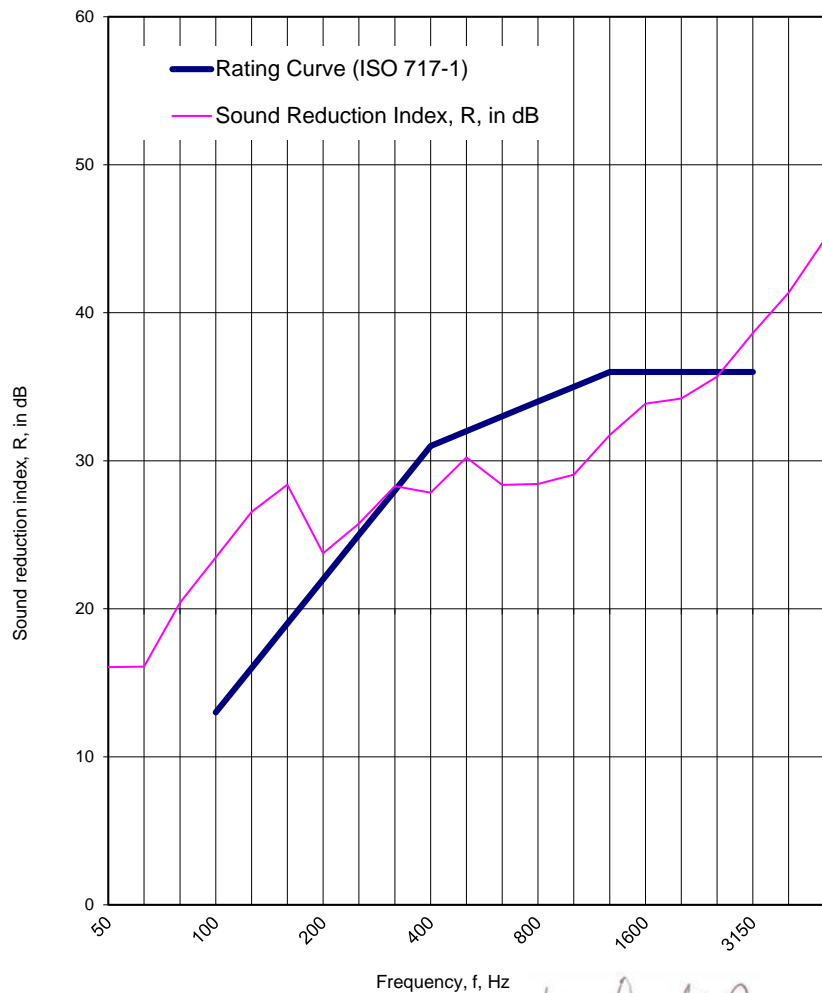
*For detailed technical specification, please refer to Section 2 of the report*

Data sheet Ref. WYC403032/01/P003  
Date of Test: 14/09/2018

<b>Source Room Volume:</b>	82.40 m <sup>3</sup>
<b>Receive Room Volume:</b>	69.60 m <sup>3</sup>
<b>Specimen Installed By:</b>	Exova
<b>Area of Specimen (S):</b>	2.20 m <sup>2</sup>
<b>Temp. in Test Rooms:</b>	<u>Sour.</u> 20.1 <u>Rec.</u> 20.2 °C
<b>Static Pressure:</b>	100200.0    100210.0 Pa
<b>Humidity in Test Rooms:</b>	56.2    55.6 %

f, Hz	R, dB
50 <sup>+</sup>	16.1
63 <sup>+</sup>	16.1
80 <sup>+</sup>	20.4
100	23.5
125	26.5
160	28.4
200	23.7
250	25.8
315	28.3
400	27.8
500	30.2
630	28.4
800	28.4
1000	29.1
1250	31.7
1600	33.9
2000	34.2
2500	35.7
3150	38.6
4000	41.4
5000	44.9
AAD	-29.6

↑  
Frequency range for rating in accordance with ISO 717-1  
↓



<b>R<sub>w</sub> = 32 dB</b>	C <sub>(50-3150)</sub> = -1 dB	C <sub>tr(50-3150)</sub> = -4 dB
<b>R<sub>w</sub>+C = 32 dB</b>	C <sub>(50-5000)</sub> = 0 dB	C <sub>tr(50-5000)</sub> = -4 dB
<b>R<sub>w</sub>+C<sub>tr</sub> = 29 dB</b>	C <sub>(100-5000)</sub> = 0 dB	C <sub>tr(100-5000)</sub> = -3 dB

**Lee Grant-Riach**  
Lead Technical Officer

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Report for: Jiangsu Sainty Bancom Wood Co. Ltd

Report Ref: BMT/WYC403032/01

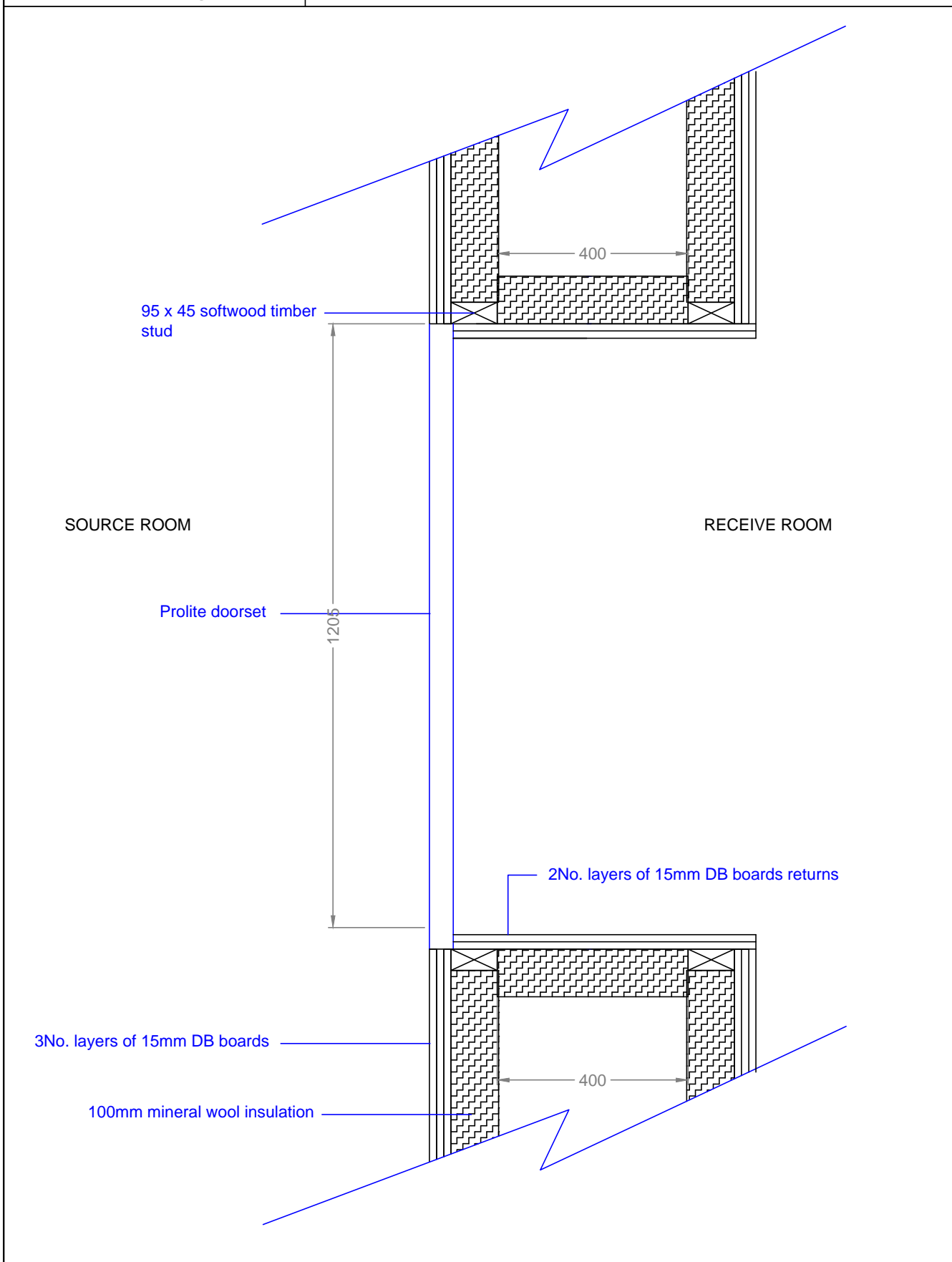
Appendix 2 – Test Set Up Drawing (1 page)

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Document No.: WYC403032/01  
Author: Martin Durham  
Sponsor: Jiangsu Sainy Bancom  
Wood Co. Ltd

Page No.: 11 of 11  
Issue Date: 22/11/2018  
Issue No.: 1





**Exova**

Chiltern House, Stocking Lane, Hughenden Valley  
 High Wycombe, Buckinghamshire, HP14 4ND, UK.  
 Tel: +44 (0)1494 569800 Fax: +44 (0)1494 564895

Schematic drawing showing horizontal cross section of test set up

Date Drawn  
 22/11/18

Drawn By  
 LGR

Scale Not to Scale  
 All dimensions in mm  
 unless otherwise stated

Project No.  
 WYC 403032/01