

BRE Test Report

Strongdor Ltd

**Sound Insulation Testing of steel door systems in accordance with
BS EN ISO 10140-1:2021 & BS EN ISO 10140-2: 2021**

Prepared for: Strongdor Ltd
Date: 7th September 2022
Report Number: P123624-1001 Issue 1

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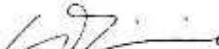
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1 Introduction

BRE Acoustics was commissioned by Strongdor Ltd to carry out airborne sound insulation measurements in the BRE horizontal transmission suite within Hall D, Building 14, BRE, Garston, Watford, Hertfordshire, WD25 9XX.

This report details the testing outlined in BRE proposal P123624.

2 Testing details

2.1 Test dates and personnel

The measurements detailed in this report were made by Mr M Coleman of BRE Acoustics on the 17th, 18th, 22nd & 23rd August 2022.

2.2 Test methods and applicable standards

Measurement of airborne and sound insulation was made in accordance with BS EN ISO 10140-1:2021 and BS EN ISO 10140-2:2021. Single number quantities were calculated in accordance with BS EN ISO 717-1: 2020.

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

2.3 Test element installation

The filler wall construction was installed by BRE.

The single and double door systems were installed by Strongdor Ltd.



2.4 Instrumentation

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

Instrument number	Equipment description	Manufacturer	Type	Serial Number	Calibrate date
3110	Calibrator	B&K	4231	2175848	01/2023
5165	Microphones	GRAS	40AE	37071 / 117036	11/2022
5167/5168	Microphone Preamplifier	GRAS	26CA	13085 / 13142	11/2022
5165	Real Time Analyser	NOR	850	8501142	11/2022
6206/6207	Loudspeaker (Source)	B&K	4292	008003/020005	N/A
3214/3216	Loudspeaker (Receive)	NOR	270H	26257 / 26258	N/A
3225	Rotating Boom (Source)	NOR	212NA	10417	N/A
5169	Rotating Boom (Receive)	NOR	265	29412	N/A

Table 1 Equipment list

The gain of the real time analyser was adjusted to give a reading 113.9 dB at 1 kHz using the Bruel & Kjaer Type 4231 calibrator. All equipment is calibrated in accordance with BRE procedures, using reference equipment calibrated by a UKAS accredited laboratory.

2.5 Construction details with test numbers and sound insulation test results

Test number, construction details and weighted sound reduction index (R_w), can be seen in **Table 2**, below.

Test number	Test element	Construction details	R_w (C; Ctr) (dB)
L122-013	Drywall partition	Filler wall construction: Twin frame cavity wall clad with two layers 15 mm sound reducing board, cavity fully filled with 500 mm open cell foam. (In-fill wall construction)	66 (-2; -7)
L122-014	Single door	63 mm steel door/frame – 488S seal	24 (-1; -1)
L122-015	Single door	63 mm steel door/frame – 388S seal	33 (-1; -3)
L122-016	Single door	63 mm steel door/frame – 388S seal & 1772S on perimeter	36 (-2; -5)
L122-017	Single door	63 mm steel door/frame – 388S seal & 1772S perimeters & threshold	37 (-2; -6)
L122-018	Single door	63 mm steel door/frame – 388S seal & 1772S perimeter, threshold & 488S at bottom of leaf	38 (-2; -6)
L122-019	Single door	As L122-018 with taped up seals (INDICATIVE)	41 (-3; -7) *
L122-020	Single door	44 mm steel door/frame – taped up seals (INDICATIVE)	34 (-1; -2) *
L122-021	Single door	44 mm steel door/frame – 388S perimeter seal & 488S astragal	36 (-1; -3)



Test number	Test element	Construction details	R_w (C; Ctr) (dB)
L122-022	Single door	44 mm steel door/frame – 388S perimeter seal, 488S astragal & 1772S perimeter	39 (-2; -5)
L122-023	Single door	44 mm steel door/frame with 6.4 mm laminated single glazed vision panel (254 mm x 1524 mm) – 388S perimeter seal, 488S astragal & 1772S perimeter	40 (-1; -4)
L122-024	Single door	44 mm steel door/frame with 9 mm single glazed vision panel (254 mm x 1524 mm) – 388S perimeter seal, 488S astragal & 1772S perimeter	40 (-1; -4)
L122-025	Single door	44 mm steel door/frame with double glazed (9/6/9 mm) vision panel (254 mm x 1524 mm) – 388S perimeter seal, 488S astragal & 1772S perimeter	39 (-1; -3)
L122-026	Single door	44 mm steel door/frame with double glazed (9/6/9 mm) vision panel (254 mm x 1524 mm) – 388S perimeter seal & 488S astragal – “Standard Security Door”	37 (-1; -2)
L122-027	Single door	44 mm Rockwool insulated steel door/frame with 9 mm Firelite glazed vision panel (457 mm x 457 mm) – 388S perimeter seal & 488S astragal	34 (-3; -4)
L122-028	Single door	44 mm Rockwool insulated steel door/frame with 9 mm Firelite glazed vision panel (457 mm x 457 mm) – 388S perimeter seal & 488S astragal & 1772S perimeter	35 (-3; -5)
L122-029	Single door	As L122-028 with vision panel corners taped (INDICATIVE)	35 (-3; -5) *
L122-030	Single door	44 mm Rockwool insulated steel door/frame with double glazed (9/6/9 mm) vision panel (457 mm x 457 mm) – 388S perimeter seal & 488S astragal & 1772S perimeter	34 (-2; -4)
L122-031	Single door	44 mm Rockwool insulated steel door/frame with double glazed (9/6/9 mm) vision panel (457 mm x 457 mm) – 388S perimeter seal & 488S astragal & 1772S perimeter and glass perimeter	35 (-3; -4)
L122-032	Single door	44 mm Honeycomb steel door/frame – 388S perimeter, 488S astragal and 1772S perimeter	36 (-1; -3)
L122-033	Single door	44 mm Honeycomb steel door/frame – 388S perimeter and 488S astragal	36 (0; -3)
L122-034	Single door	44 mm Honeycomb steel door/frame – 1772S perimeter seal	34 (0; -2)
L122-035	Single door	44 mm Honeycomb steel door/frame – 1772S perimeter seal & astragal	35 (-1; -3)
L122-036	Single door	44 mm Honeycomb steel door/frame – 1773S perimeter seal	35 (-1; -3)
L122-037	Double door	44 mm Honeycomb double steel door/frame – 388S perimeter and 488S astragals	32 (-2; -3)
L122-038	Double door	44 mm Honeycomb double steel door/frame – 388S perimeter, 488S astragals & 1772S on perimeter	32 (-1; -3)
L122-039	Double door	44 mm Rockwool double steel door/frame – 388S perimeter and 488S astragals	35 (-2; -4)



Test number	Test element	Construction details	R_w (C; Ctr) (dB)
L122-040	Double door	44 mm Rockwool double steel door/frame – 388S perimeter, 488S astragals & 1772S perimeter	36 (-2; -4)
L122-041	Double door	As L122-041 - with taped up seals (INDICATIVE)	36 (-2; -4) *
L122-042	Double door	44 mm Rockwool double steel door/frame with 9 mm Firelite glazed vision panel on active leaf (457 mm x 457 mm) – 388S perimeter & 488S astragals	32 (-1; -3)
L122-043	Double door	44 mm Rockwool double steel door/frame with 9 mm Firelite glazed vision panel on active leaf (457 mm x 457 mm) – 388S perimeter, 488S astragals & 1772S perimeter seal	34 (-2; -4)
L122-044	Double door	44 mm Rockwool double steel door/frame with 9 mm Firelite glazed vision panel on active leaf (254 mm x 1524 mm) – 388S perimeter, 488S astragals & 1772S perimeter seal	36 (-2; -4)
L122-045	Double door	44 mm Rockwool double steel door/frame with 9 mm Firelite glazed vision panel on active leaf (254 mm x 1524 mm) – 388S perimeter & 488S astragals	34 (-1; -3)
L122-046	Double door	44 mm Rockwool double steel door/frame with mixed 9 mm & 6.4 lam Firelite glazed vision panels on both doors (254 mm x 1524 mm) – 388S perimeter & 488S astragals	35 (-2; -3)
L122-047	Double door	44 mm Rockwool double steel door/frame with 6.4 laminate glazed vision panels on both doors (254 mm x 1524 mm) – 388S perimeter & 488S astragals	36 (-2; -4)
L122-048	Double door	44 mm Rockwool double steel door/frame with 6.4 laminate glazed vision panels on both doors (254 mm x 1524 mm) – 388S perimeter, 488S astragals & 1772S on perimeter	36 (-2; -4)
L122-049	Double door	44 mm Rockwool double steel door/frame with 6.4 laminate glazed vision panels on both doors (457 mm x 457 mm) – 388S perimeter, 488S astragals & 1772S on perimeter	37 (-3; -4)
L122-050	Double door	44 mm Rockwool double steel door/frame with 6.4 laminate glazed vision panels on both doors (457 mm x 457 mm) – 388S perimeter & 488S astragals	36 (-2; -4)
L122-051	Double door	63 mm double steel door/frame – 388S perimeter & 488S astragals	32 (-2; -1)
L122-052	Double door	63 mm double steel door/frame – 388S perimeter, 488S astragals & 1772S perimeter	39 (-2; -5)

Table 2 Construction details with test numbers and sound insulation test results.

* Non-UKAS accredited test – indicative for information purposes only