

**Sound Insulation Test Report,
Produced in Compliance with Approved Document E,
Guidance to the Building Regulations.**

Test Reference Number: DRUK/SIT/MAP/GLH/0189
Date of Test: 1st September 2025
Date of Report: 12th September 2025
Test Location: Green Lane
Heywood
Oldham
OL10 1NQ

Report Prepared for: Challenger Group
11 Lee Lane
Horwich
Bolton
BL6 7AF

Test Conducted by: Mark Pickering
Report Prepared by: Debbie Griffin
Report Authorised by: Robert Smith

Test Organisation: Druk Limited
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1.0 **Summary**

Druk Limited was commissioned by Mr. Graham Cunningham of Challenger Group in Bolton to conduct sound insulation tests to establish whether the airborne and impact sound insulation performance, as appropriate, of the tested walls and floors, separating the flats within the Green Lane development in Heywood, complied with the sound insulation performance requirements contained within Approved Document E (ADE).

As the Green Lane development is a new build development, it would fall within "Purpose built dwelling houses and flats" category detailed in Approved Document E.

The results of the sound insulation tests have demonstrated that the airborne and impact sound insulation performance, as appropriate, of the tested walls and floors separating the flats within the Green Lane development in Heywood, complied with the sound insulation performance requirements contained within ADE and so may be regarded as having 'passed' the tests.

Report prepared by:



Debbie Griffin

Report authorised by:



Robert Smith

2.0 Introduction

Druk Limited was commissioned by Mr. Graham Cunningham of Challenger Group in Bolton to conduct sound insulation tests, in accordance with the requirements of the Building Regulations Approved Document E (ADE) 2003 edition (including the 2004, 2010, 2013 and 2015 amendments), guidance to the Building Regulations 2010. The tests were conducted to establish whether the airborne and impact sound insulation performance, as appropriate, of the tested walls and floors, separating the flats within the Green Lane development in Heywood, complied with the sound insulation performance requirements contained within Approved Document E (ADE).

3.0 Sound Insulation Performance Standards

3.1 Approved Document E, 2003 Edition

Approved Document E (ADE) “Resistance to the Passage of Sound”, 2003 edition, (amended in 2004, 2013 and 2015) provides guidance as to how the requirements of the Building Regulations 2010, as they relate to sound insulation, may be met. The Approved Document details specific sound insulation performance requirements that are required for separating elements, walls and floors, in a number of situations, namely: dwelling houses and flats whether ‘purpose built’ or ‘formed by material change of use’ and rooms for residential purposes which may be either ‘purpose built’ or ‘formed by material change of use’. The specific sound insulation performance requirements that should be achieved by either ‘purpose built’ separating elements or those formed by ‘material change of use’ are detailed in Tables 0.1a and 0.1b of Section 0 in Approved Document E.

3.2 Requirements for the Tested Elements

As the development within Green Lane is a new build development, it would fall within “Purpose built dwelling houses and flats” category detailed in Approved Document E. As such, the sound insulation performance of the separating walls and floors should comply with the criteria emboldened in the table below.

Sound Insulation Performance Criteria

Rooms for Residential Purposes		
Situation	Airborne sound insulation, $D_{nT,w} + C_{tr}$ dB (Minimum Value)	Impact sound insulation, $L'_{nT,w}$ dB (Maximum Value)
Purpose Built		
Walls	45	-
Floors and stairs	45	62

With respect to airborne sound insulation, the quoted performance standard is a minimum requirement, therefore the obtained test result should exceed, or as a minimum equal, the requirement.

For impact sound insulation the quoted performance standard is a maximum level, therefore the obtained test result should not exceed this performance standard.

4.0 Sound Test Details

4.1 Description of the Tested Flats

The Green Lane Development in Heywood comprises forty flats arranged over the ground to fourth floors of the new development. The new building is of timber frame construction with timber separating floors.

The dwellings are not believed to fall within the 'historic' building category as defined within ADE

4.2 Test Details

The sound insulation tests were conducted between 11:15 and 16:30 hours on the 1st September 2025.

All the measurements were made by Mr. Mark Pickering of Druk Limited, 87 St Albans Road, Halifax West Yorkshire. Druk Limited is a UKAS accredited testing laboratory No. 4507, for the purposes of pre-completion sound insulation testing, to demonstrate compliance with the requirements of Approved Document E (2003 edition incorporating the 2004, 2010, 2013 and 2015 amendments), accreditation number 4507.

The sound insulation tests and all measurements made in connection with the tests were undertaken in accordance with the suggested procedures detailed in BS EN ISO 140 parts 4 and 7:1998: 'Field Measurements of Airborne Sound Insulation Between Rooms' and 'Field Measurements of Impact Sound Insulation Between Rooms', respectively. The results of the tests were analysed in accordance with the requirements of BS EN ISO 717 parts 1 and 2:1997: 'Rating of Sound Insulation in Buildings and of Building Elements – Airborne Sound Insulation' and 'Rating of Sound Insulation in Buildings and of Building Elements – Impact Sound Insulation', respectively.

In addition all the procedures contained in Annex B of Approved Document E, guidance to the Building Regulations, were followed.

4.3 Equipment

The equipment, detailed in the table overleaf, was used throughout the sound insulation tests.

All the equipment used is calibrated by a UKAS accredited calibration laboratory and the calibration certificates are available on request.

With reference to the impact sound insulation test, the correct tapping machine hammer drop heights were checked and set, as necessary, before the tests.

The sound level meter was calibrated before and on completion of the tests, with no significant deviation being observed.

Sound Insulation Testing Equipment

Equipment Description	Manufacturer	Type Number	Serial Number	Date of Calibration	Calibration Certificate Numbers
Sound Level Meter	Rion	NA28	301364	26 th and 29 th January 2024	06587/2, 06587/3 & 06587/4
Acoustic Calibrator	CEL	110/1	116290	30 th January 2025	07065/1
Tapping Machine	Norsonic	211A	29704	4 th August 2025	07304/1
Noise Sources	Yamaha	DXR 10 mk2	BECZ01046	-	
Pink Noise Sources	Neutrik/Mini Instruments	MR2	G2L-RABCO - G0	-	

* Please note, in the case of a tapping machine the calibration is more correctly referred to as a verification of performance with reference to the requirements detailed in ISO 140 part 7

4.4 Testing Procedures

The field testing of separating elements for airborne sound insulation involves the generation and measurement of a controlled 'level' of noise in one of the pair of rooms (the source room) under test and measuring the resulting noise level in the other room (the receiving room), separated by the element that is under test. In both rooms a minimum of ten individual and randomly selected measurement positions are used, such that a representative assessment of the noise level within the entire volume of the two rooms is made. In both rooms, spatial and temporal averaging of the noise levels is carried out, in each of the ten measurement positions, by manually rotating the microphone through a complete circular path.

Once the source and receiving room noise measurements have been made, corrections are applied to the measured noise levels to account for the effects of both extraneous background noise and the effects of acoustic absorption within the receiving room. With reference to the acoustic absorption of the receiving room, this is determined from measurements of the reverberation time.

Measurements of reverberation time are made within the receiving rooms only; the measurements are made by generating a continuous wide band 'pink' noise signal, for a predetermined time period, after which the signal is turned off and the noise decay within the room is timed. The reverberation time is established by using one noise source position and measuring up to 18 separate decays in a number of randomly selected microphone positions, with multiple measurements being made in each of the measurement positions.

The corrected source and receiving room noise measurements are used to calculate the Standardised Level Differences (D_{nT}) for the individual third octave bands between 100 – 3150Hz; these are then compared with reference values to determine the

Weighted Standardised Level Difference ($D_{nT,w}$). In addition, a spectrum adaptation term, the C_{tr} , is calculated which is then added to the Weighted Standardised Level Difference in order to obtain the single figure 'rating' that is compared with the sound insulation performance requirements detailed in ADE.

Impact sound insulation measurements apply to separating floor structures only, they are intended to provide an indication of the floor's ability to attenuate impact noise such as footfalls. The impact sound insulation is evaluated using a tapping machine which comprises five, 500 gramme, hammers that fall through 40mm at a rate of ten impacts per second.

The resulting noise, from the operation of the tapping machine, is measured in the receiving room only. The obtained noise levels from the receiving room are corrected for extraneous background noise and the effects of acoustic absorption using the method described above, finally allowing the Standardised Impact Sound Pressure Level (L'_{nT}) to be calculated for the individual third octave bands between 100 – 3150Hz. The L'_{nT} values are then compared with reference values to determine the Weighted Standardised Impact Sound Pressure Level ($L'_{nT,w}$) which is compared with the sound insulation performance requirements detailed in ADE.

At the time of the sound insulation tests all the rooms were complete, unoccupied and unfurnished.

4.5 Test Procedure Deviations

There were no deviations from the test procedure specified in BS EN ISO 140 parts 4 and 7:1998 and the guidance contained within ADE.

4.6 Sampling Frequency

As the development comprises forty self-contained flats, in accordance with the sampling regime detailed within Section 1 of ADE, four sets of tests to separating walls and floors should ideally be conducted.

In addition, the results presented in this report relate to the sample of elements presented at the time of testing by the client.

4.7 Arrangement of the Tested Elements

The source and receiving room are as detailed in the tables overleaf.

Airborne Sound Insulation Test - Walls

Source Room	Volume, m ³	Receiving Room	Volume, m ³
Flat 25 Living room/kitchen	61	Flat 24 Living room/kitchen	61
Flat 25 Bedroom	32	Flat 24 Bedroom	32
Flat 32 Living room/kitchen	61	Flat 31 Living room/kitchen	61
Flat 31 Bedroom	32	Flat 30 Bedroom	32
Flat 22 Living room/kitchen	61	Flat 12 Living room/kitchen	61
Flat 22 Bedroom	32	Flat 23 Bedroom	32
Flat 9 Bedroom	32	Flat 10 Bedroom	32
Flat 9 Living room/kitchen	61	Flat 8 Living room/kitchen	61

Airborne Sound Insulation Test - Floors

Source Room	Volume, m ³	Receiving Room	Volume, m ³
Flat 24 Bedroom	32	Flat 36 Bedroom	32
Flat 25 Bedroom	32	Flat 36 Bedroom	32
Flat 32 Living room/kitchen	61	Flat 38 Living room/kitchen	61
Flat 32 Bedroom	32	Flat 38 Bedroom	32
Flat 22 Living room/kitchen	61	Flat 33 Living room/kitchen	61
Flat 22 Bedroom	32	Flat 32 Bedroom	32
Flat 9 Living room/kitchen	61	Flat 20 Living room/kitchen	61

Impact Sound Insulation Test - Floors

Source Room	Volume, m ³	Receiving Room	Volume, m ³
Flat 36 Bedroom	32	Flat 24 Bedroom	32
Flat 36 Bedroom	32	Flat 25 Bedroom	32
Flat 38 Living room/kitchen	61	Flat 32 Living room/kitchen	61
Flat 38 Bedroom	32	Flat 32 Bedroom	32
Flat 33 Living room/kitchen	61	Flat 22 Living room/kitchen	61
Flat 32 Bedroom	32	Flat 22 Bedroom	32
Flat 20 Living room/kitchen	61	Flat 9 Living room/kitchen	61

4.8 Background Noise

The tabular presentation of both the D_{nT} and L'_{nT} values on the test certificates included in the Appendices may be accompanied by the presence of either a single asterisk '*' or a double asterisk '**' alongside each of the frequency values. The presence of the asterisks denote that the D_{nT} or L'_{nT} values have been 'background' noise corrected as per the requirements of Section 6.6 and 5.6 of BS EN ISO 140 parts 4 and 7:1998 respectively. The presence of a single asterisk indicates that the measured 'signal' level has been corrected according to equation 8 or 5, of BS EN ISO 140 parts 4 and 7:1998 respectively, whereas the presence of a double asterisk indicates that the 1.3dB correction has been applied.

At the time of the sound insulation test, the principal contributor to the background noise climate were noise from road traffic.

4.9 Separating Wall Construction

The following information was supplied by the client.

Twin independent stud construction comprising two 38 x 89 timber stud frames with 60mm of mineral fibre in each stud frame. Both stud frames were lined with one layer of 9mm sheathing board and both room faces of the stud walls received two layers of 12.5mm GTEC board.

The wall construction accords to a type 4 wall construction as detailed in Section 2 of ADE.

4.10 Separating Floor Construction

The following information was supplied by the client.

A Dry Screen Panel 28F flooring was laid over the 18mm OSB board that was in turn fixed to the timber joists with 100mm of mineral fibre placed in between the joists. A new ceiling comprising two layers of 12.5mm Fireboard plasterboard was fixed to the joists via resilient bars and a new cosmetic ceiling comprising one layer of 15mm plasterboard fixed to an MF grid hung from the joists was provided below.

The floor construction is similar to a type 3 floor construction as detailed in Section 3 of ADE.

4.11 Flanking Wall Construction

The flanking walls comprised the inner plasterboard lining of the external timber frame walls.

5.0 Results

The results of the sound insulation tests are reproduced in the tables overleaf, graphical presentation of the results are contained within Appendices 2, 3 and 4.

Airborne Sound Insulation Test Results - Walls

Test N°	Source room	Receiving room	Measured performance $D_{nT,w} + C_{tr}$ dB	ADE Minimum performance $D_{nT,w} + C_{tr}$ dB	ADE, 'Pass' or 'Fail'
1.1	Flat 25 Living room/kitchen	Flat 24 Living room/kitchen	59	45	Pass
1.2	Flat 25 Bedroom	Flat 24 Bedroom	55	45	Pass
1.3	Flat 32 Living room/kitchen	Flat 31 Living room/kitchen	59	45	Pass
1.4	Flat 31 Bedroom	Flat 30 Bedroom	55	45	Pass
1.5	Flat 22 Living room/kitchen	Flat 12 Living room/kitchen	60	45	Pass
1.6	Flat 22 Bedroom	Flat 23 Bedroom	57	45	Pass
1.7	Flat 9 Bedroom	Flat 10 Bedroom	51	45	Pass
1.8	Flat 9 Living room/kitchen	Flat 8 Living room/kitchen	52	45	Pass

Airborne Sound Insulation Test Results - Floors

Test N°	Source room	Receiving room	Measured performance $D_{nT,w} + C_{tr}$ dB	ADE Minimum performance $D_{nT,w} + C_{tr}$ dB	ADE, 'Pass' or 'Fail'
2.1	Flat 24 Bedroom	Flat 36 Bedroom	53	45	Pass
2.2	Flat 25 Bedroom	Flat 36 Bedroom	54	45	Pass
2.3	Flat 32 Living room/kitchen	Flat 38 Living room/kitchen	49	45	Pass
2.4	Flat 32 Bedroom	Flat 38 Bedroom	59	45	Pass
2.5	Flat 22 Living room/kitchen	Flat 33 Living room/kitchen	46	45	Pass
2.6	Flat 22 Bedroom	Flat 32 Bedroom	53	45	Pass
2.7	Flat 9 Living room/kitchen	Flat 20 Living room/kitchen	55	45	Pass

Impact Sound Insulation Test Results - Floors

Test N°	Source room	Receiving room	Measured performance $L'_{nT,w}$ dB	ADE Maximum performance $L'_{nT,w}$ dB	ADE, 'Pass' or 'Fail'
3.1	Flat 36 Bedroom	Flat 24 Bedroom	51	62	Pass
3.2	Flat 36 Bedroom	Flat 25 Bedroom	51	62	Pass
3.3	Flat 38 Living room/kitchen	Flat 32 Living room/kitchen	50	62	Pass
3.4	Flat 38 Bedroom	Flat 32 Bedroom	52	62	Pass
3.5	Flat 33 Living room/kitchen	Flat 22 Living room/kitchen	50	62	Pass
3.6	Flat 32 Bedroom	Flat 22 Bedroom	51	62	Pass
3.7	Flat 20 Living room/kitchen	Flat 9 Living room/kitchen	51	62	Pass

6.0 Discussion

The results of the sound insulation tests have demonstrated that the airborne and impact sound insulation performance, as appropriate, of the tested walls and floors separating the flats within the Green Lane development in Heywood, complied with the sound insulation performance requirements contained within ADE and so may be regarded as having passed the tests.

Appendix 1: Photograph**Photograph 1:** Front Elevation of the development at Green Lane, Heywood

Appendix 2: Airborne Sound Insulation Result Certificates – Walls

Calculation of the Standardised Level Difference According to ISO 140-4

Field Measurements of Airborne Sound Insulation Between Rooms

Client: Challenger Group Ltd
Test Location: Green Lane, Heywood, OL10 1NQ
Transmission Direction: Horizontal via Wall

Date of Test: 1st September 2025

Description of test arrangement and direction of measurement :
 Flat 25 Living Room/Kitchen to Apt 24 Living Room/Kitchen

Wall Construction (notional)
 Floor Type 4

Source Room

Volume, m³: 61

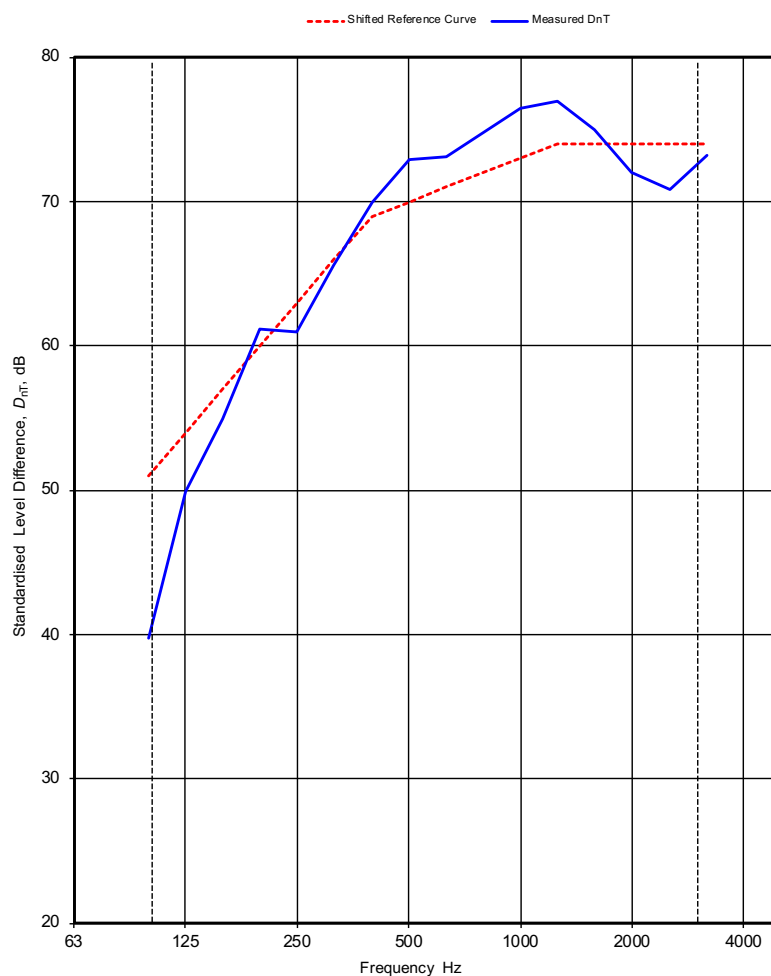
Receiver Room

Volume, m³: 61

Frequency, Hz	D_{nT} dB
50	
63	
80	
100	39.8
125	49.9
160	55.0
200	61.2
250	61.0
315	65.6
400	70.0
500	72.9
630	73.1
800	74.8
1000	76.5
1250	77.0
1600	75.0
2000	72.0
2500	70.8
3150	73.2
4000	
5000	

* background adjusted measurement

** background corrected measurement



Rating According to ISO 717-1

$D_{nT,w} (C:C_{tr}) = 70 \quad (-4 \quad -11) \text{ dB}$

Overall Result,
 $D_{nT,w} + C_{tr}, \text{dB} =$
59

Evaluation based on field measurement results obtained by an engineering method

Test Certificate N°: 189.1.1

Test Institute: **Druk** Ltd, 87 St Albans Road
 Halifax HX3 0ND

Date of Certificate: 04.09.2025

Tester Name: M Pickering

Calculation of the Standardised Level Difference According to ISO 140-4

Field Measurements of Airborne Sound Insulation Between Rooms

Client:Challenger Group Ltd

Test Location:Green Lane, Heywood

Transmission Direction:Horizontal via Wall

Date of Test:1st September 2025

Description of test arrangement and direction of measurement :Flat 25 Bedroom to Flat 24 Bedroom

Wall Construction (notional)
Wall Type 4

Source Room

Volume, m³:32

Receiver Room

Volume, m³:32

Frequency, Hz	D _{nT} dB
50	
63	
80	
100	35.1
125	49.1
160	49.3
200	58.1
250	60.5
315	65.5
400	70.1
500	73.9
630	71.9
800	73.1
1000	73.3
1250	73.6
1600	72.6
2000	71.3
2500	71.2
3150	74.5
4000	
5000	

* background adjusted measurement

** background corrected measurement

Standardised Level Difference, D_{nT}, dB

Frequency Hz

Shifted Reference Curve

Measured DnT

Rating According to ISO 717-1

D_{nT,w} (C:C_{tr}) = 69 (-7 -14) dB

Overall Result, D_{nT,w} + C_{tr}, dB = 55

Evaluation based on field measurement results obtained by an engineering method

Test Certificate N°:189.1.2

Test Institute:Druck Ltd, 87 St Albans Road
Halifax HX3 0ND

Date of Certificate:04.09.2025

Tester Name:M Pickering

Druck Limited, 87 St Albans Road, Halifax, HX3 0ND

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Calculation of the Standardised Level Difference According to ISO 140-4

Field Measurements of Airborne Sound Insulation Between Rooms

Client:Challenger Group Ltd

Test Location:Green Lane, Heywood

Transmission Direction:Horizontal via Wall

Date of Test:1st September 2025

Description of test arrangement and direction of measurement :Flat 32 Living room/Kitchen to Flat 31 Living room/Kitchen

Wall Construction (notional)
Wall Type 4

Source Room

Volume, m³:61

Receiver Room

Volume, m³:61

Frequency, Hz	D _{nT} dB	
50		
63		
80		
100	40.3	*
125	52.8	*
160	55.0	
200	62.6	**
250	63.9	*
315	61.4	
400	63.7	
500	70.2	**
630	69.7	**
800	71.6	**
1000	74.2	**
1250	75.1	**
1600	73.5	**
2000	72.8	**
2500	73.1	**
3150	75.8	**
4000		
5000		

* background adjusted measurement

** background corrected measurement

Shifted Reference Curve

Measured DnT

Frequency, Hz	Measured DnT, dB	Shifted Reference Curve, dB
100	40.3	50.8
125	52.8	55.0
160	55.0	58.0
200	62.6	61.0
250	63.9	64.0
315	61.4	67.0
400	63.7	69.0
500	70.2	70.0
630	69.7	71.0
800	71.6	72.0
1000	74.2	73.0
1250	75.1	73.5
1600	73.5	73.5
2000	72.8	73.5
2500	73.1	73.5
3150	75.8	73.5

Rating According to ISO 717-1

D_{nT,w} (C:C_{tr}) = 70 (-4 -11) dB

Overall Result, D_{nT,w} + C_{tr}, dB = 59

Evaluation based on field measurement results obtained by an engineering method

Test Certificate N^o:189.1.3

Test Institute: **Druk** Ltd, 87 St Albans Road
Halifax HX3 0ND

Date of Certificate:04.09.2025

Tester Name: M Pickering

DRUK Limited, 87 St Albans Road, Halifax, HX3 0ND

☎ 07917 727 901

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Calculation of the Standardised Level Difference According to ISO 140-4

Field Measurements of Airborne Sound Insulation Between Rooms

Client:Challenger Group Ltd

Test Location:Green Lane, Heywood,

Transmission Direction:Horizontal via Wall

Date of Test:1st September 2025

Description of test arrangement and direction of measurement :Flat 31 Bedroom to Flat 30 Bedroom

Wall Construction (notional)
Wall Type 4

Source Room
Volume, m³:32

Receiver Room
Volume, m³:32

Frequency, Hz	D _{nT} dB
50	
63	
80	
100	35.1
125	49.1
160	49.3
200	58.1
250	60.5
315	65.5
400	70.1
500	73.9
630	71.9
800	73.1
1000	73.3
1250	73.6
1600	72.6
2000	71.3
2500	71.2
3150	74.5
4000	
5000	

* background adjusted measurement

** background corrected measurement

Shifted Reference Curve

Measured DnT

Rating According to ISO 717-1

D_{nT,w} (C:C_{tr}) = 69 (-7 -14) dB

Overall Result,
D_{nT,w} + C_{tr}, dB = 55

Evaluation based on field measurement results obtained by an engineering method

Test Certificate N°:189.1.4

Test Institute:Druck Ltd, 87 St Albans Road
Halifax HX3 0ND

Date of Certificate:04.09.2025

Tester Name:M Pickering

Druck Limited, 87 St Albans Road, Halifax, HX3 0ND

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Calculation of the Standardised Level Difference According to ISO 140-4

Field Measurements of Airborne Sound Insulation Between Rooms

Client: Challenger Group Ltd
Test Location: Green Lane, Heywood
Transmission Direction: Horizontal via Wall

Date of Test: 1st September 2025

Description of test arrangement and direction of measurement :
 Flat 22 Living Room/Kitchen to Flat 12 Living Room/Kitchen

Wall Construction (notional)
 Wall Type 4

Source Room

Volume, m³: 61

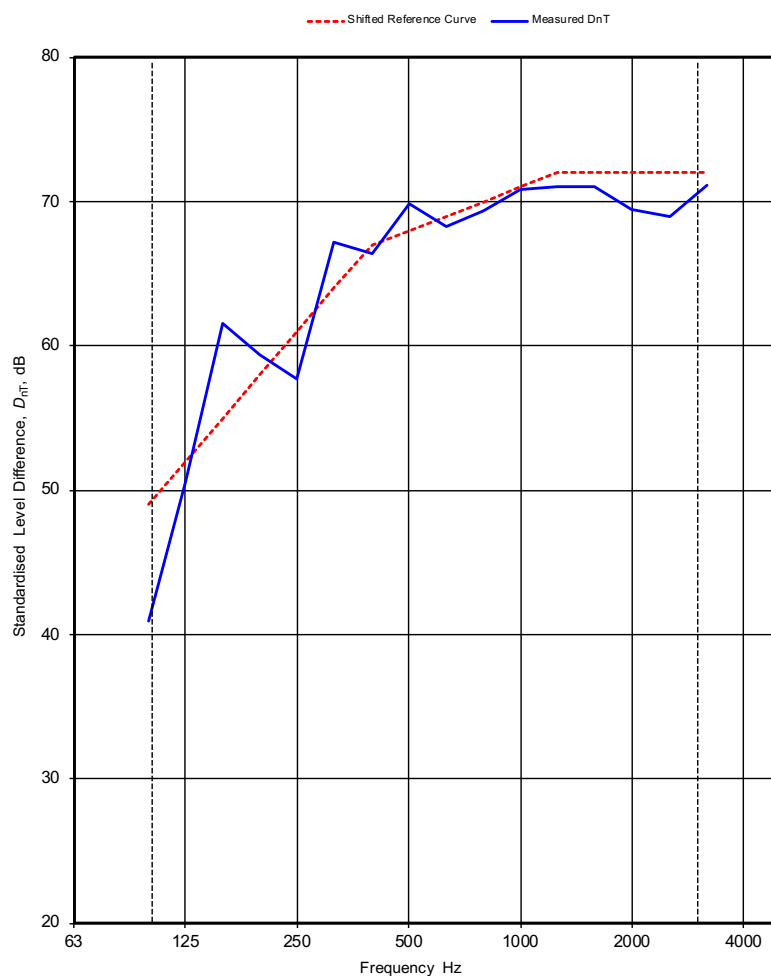
Receiver Room

Volume, m³: 61

Frequency, Hz	D_{nT} dB
50	
63	
80	
100	40.9
125	50.6 *
160	61.6 **
200	59.4 **
250	57.7 **
315	67.2 **
400	66.4 **
500	69.9 **
630	68.3 **
800	69.4 **
1000	70.8 **
1250	71.0 **
1600	71.0 **
2000	69.5 **
2500	69.0 **
3150	71.1 **
4000	
5000	

* background adjusted measurement

** background corrected measurement



Rating According to ISO 717-1

$D_{nT,w} (C:C_{tr}) = 68 \quad (-2 \quad -8) \text{ dB}$

Overall Result,
 $D_{nT,w} + C_{tr}, \text{dB} =$
60

Evaluation based on field measurement results obtained by an engineering method

Test Certificate N°: 189.1.5

Test Institute: **Druk** Ltd, 87 St Albans Road
 Halifax HX3 0ND

Date of Certificate: 04.09.2025

Tester Name: M Pickering

Calculation of the Standardised Level Difference According to ISO 140-4

Field Measurements of Airborne Sound Insulation Between Rooms

Client: Challenger Group Ltd
Test Location: Green Lane, Heywood
Transmission Direction: Horizontal via Wall

Date of Test: 1st September 2025

Description of test arrangement and direction of measurement :
 Flat 22 Bedroom to Flat 23 Bedroom

Wall Construction (notional)

Wall Type 4

Source Room

Volume, m³: 32

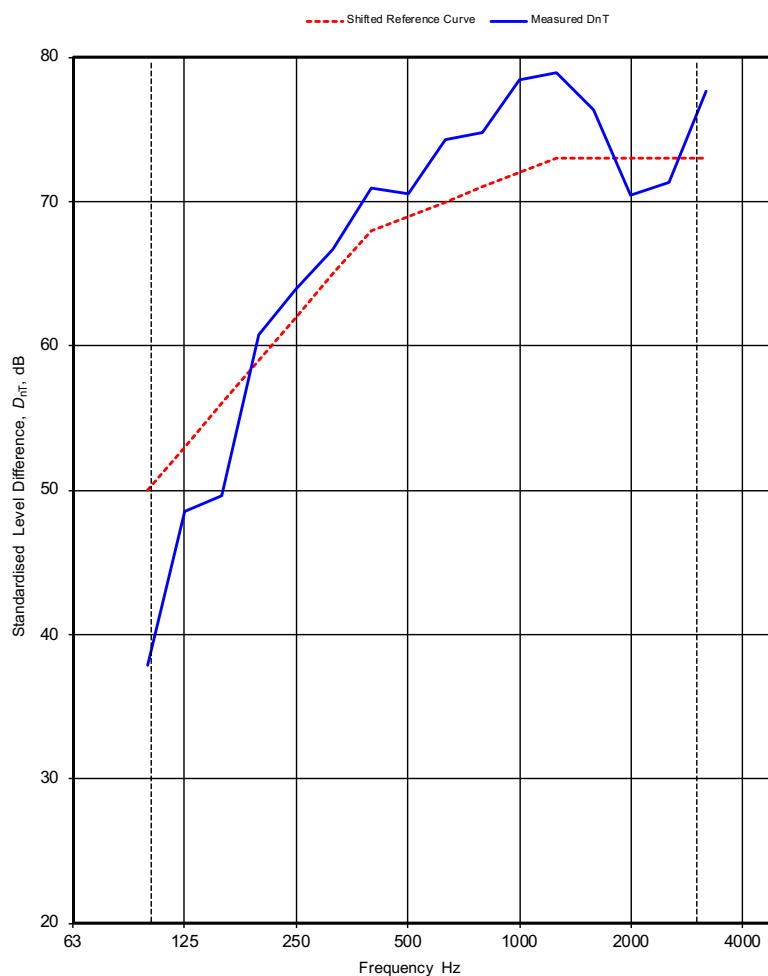
Receiver Room

Volume, m³: 32

Frequency, Hz	D_{nT} dB
50	
63	
80	
100	37.9
125	48.5
160	49.6
200	60.8
250	63.9
315	66.7
400	70.9
500	70.6
630	74.3
800	74.8
1000	78.4
1250	78.9
1600	76.4
2000	70.5
2500	71.3
3150	77.7
4000	
5000	

* background adjusted measurement

** background corrected measurement



Rating According to ISO 717-1

$D_{nT,w} (C:C_{tr}) = 69 \quad (-5 \quad -12) \text{ dB}$

Overall Result,
 $D_{nT,w} + C_{tr}, \text{ dB} =$
57

Evaluation based on field measurement results obtained by an engineering method

Test Certificate N°: 189.1.6

Test Institute: **Druk** Ltd, 87 St Albans Road
 Halifax HX3 0ND

Date of Certificate: 04.09.2025

Tester Name: M Pickering

Calculation of the Standardised Level Difference According to ISO 140-4

Field Measurements of Airborne Sound Insulation Between Rooms

Client: Challenger Group Ltd
Test Location: Green Lane, Heywood
Transmission Direction: Horizontal via Wall

Date of Test: 1st September 2025

Description of test arrangement and direction of measurement :
 Flat 9 Bedroom to Flat 10 Bedroom

Wall Construction (notional)

Wall Type 4

Source Room

Volume, m³: 32

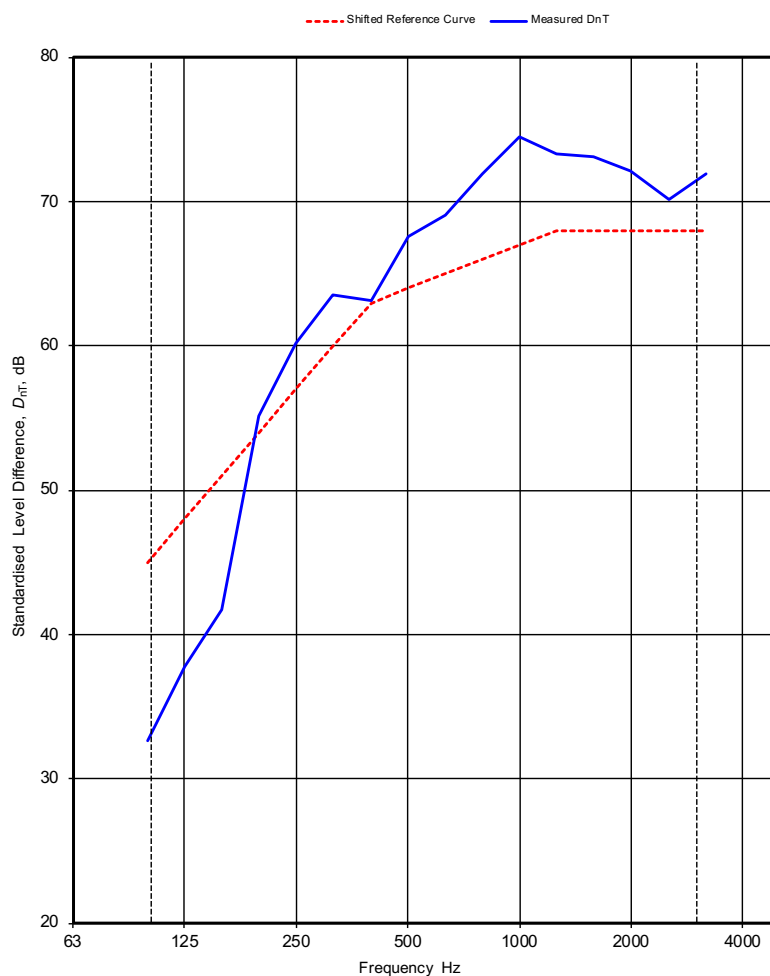
Receiver Room

Volume, m³: 32

Frequency, Hz	D_{nT} dB
50	
63	
80	
100	32.6
125	37.8
160	41.7
200	55.2
250	60.2
315	63.5 *
400	63.1 **
500	67.6 **
630	69.1 **
800	71.9 **
1000	74.5 **
1250	73.3 **
1600	73.1 **
2000	72.1 **
2500	70.2 **
3150	71.9 **
4000	
5000	

* background adjusted measurement

** background corrected measurement



Rating According to ISO 717-1

$D_{nT,w} (C:C_{tr}) = 64 \quad (-6 \quad -13) \text{ dB}$

Overall Result,
 $D_{nT,w} + C_{tr}, \text{ dB} =$
51

Evaluation based on field measurement results obtained by an engineering method

Test Certificate N°: 189.1.7

Test Institute: **Druk** Ltd, 87 St Albans Road
 Halifax HX3 0ND

Date of Certificate: 4.09.2025

Tester Name: M Pickering

Calculation of the Standardised Level Difference According to ISO 140-4

Field Measurements of Airborne Sound Insulation Between Rooms

Client: Challenger Group Ltd
Test Location: Green Lane, Heywood
Transmission Direction: Horizontal via Wall

Date of Test: 1st September 2025

Description of test arrangement and direction of measurement :

Flat 9 Living Room/Kitchen to Flat 8 Living Room/Kitchen

Wall Construction (notional)

Wall Type 4

Source Room

Volume, m³: 61

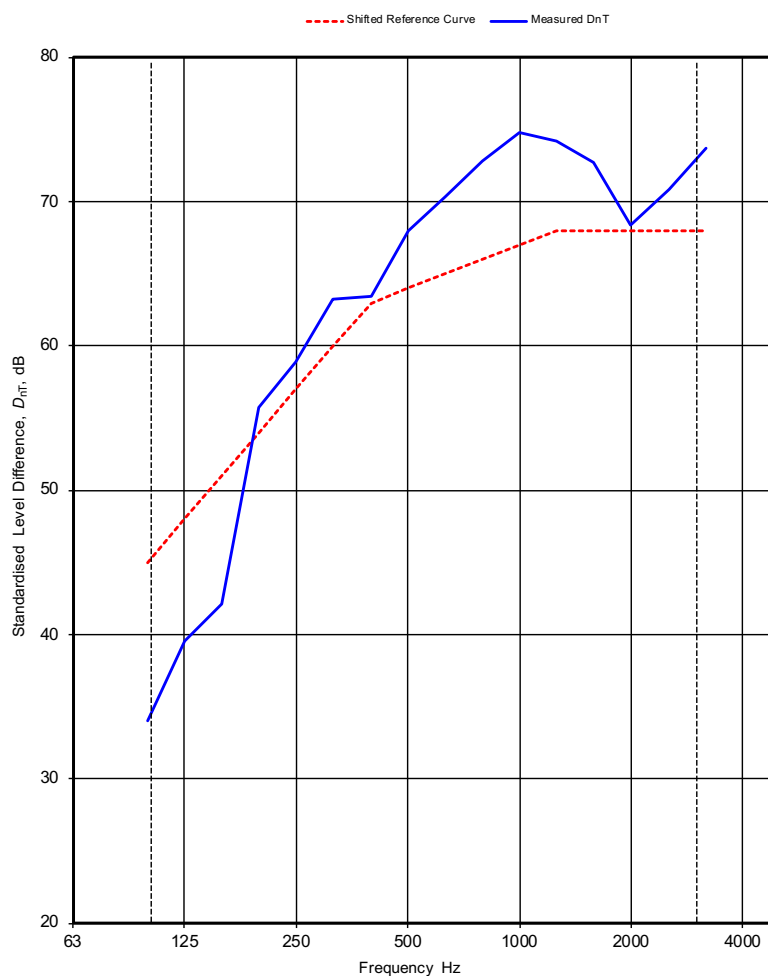
Receiver Room

Volume, m³: 61

Frequency, Hz	D_{nT} dB
50	
63	
80	
100	34.0
125	39.6
160	42.1
200	55.7
250	58.9
315	63.2
400	63.4
500	68.0
630	70.4
800	72.8
1000	74.8
1250	74.2
1600	72.7
2000	68.4
2500	70.8
3150	73.7
4000	
5000	

* background adjusted measurement

** background corrected measurement



Rating According to ISO 717-1

$D_{nT,w} (C:C_{tr}) = 64 \quad (-5 \quad -12) \text{ dB}$

Overall Result,
 $D_{nT,w} + C_{tr}, \text{ dB} =$
52

Evaluation based on field measurement results obtained by an engineering method

Test Certificate N°: 189.1.8

Test Institute: **Druk** Ltd, 87 St Albans Road
 Halifax HX3 0ND

Date of Certificate: 04.09.2025

Tester Name: M Pickering

Appendix 3: Airborne Sound Insulation Result Certificates – Floors

Calculation of the Standardised Level Difference According to ISO 140-4

Field Measurements of Airborne Sound Insulation Between Rooms

Client: Challenger Group Ltd
Test Location: Green Lane, Heywood
Transmission Direction: Vertical via Floor

Date of Test: 1st September 2025

Description of test arrangement and direction of measurement :
 Flat 24 Bedroom to Flat 36 Bedroom

Floor Construction (notional)
 Floor Type 3

Source Room

Volume, m³: 32

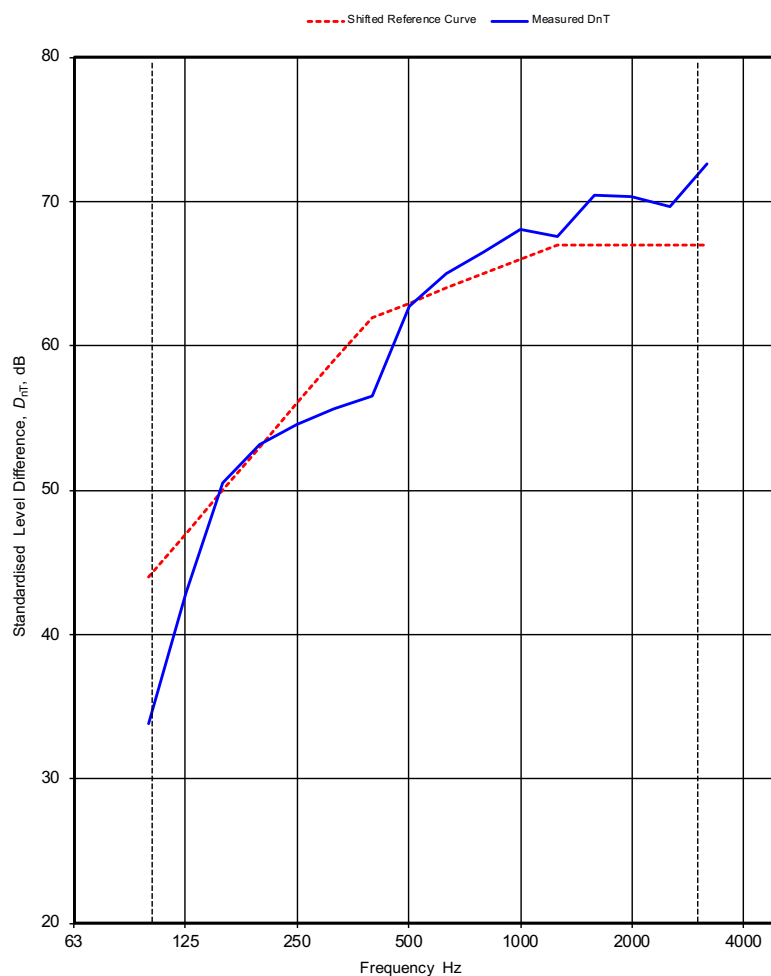
Receiver Room

Volume, m³: 32

Frequency, Hz	D_{nT} dB
50	
63	
80	
100	33.8
125	42.8
160	50.5
200	53.2
250	54.6
315	55.6
400	56.5
500	62.8
630	65.0 *
800	66.5 *
1000	68.1 **
1250	67.6 **
1600	70.5 **
2000	70.4 **
2500	69.7 **
3150	72.6 **
4000	
5000	

* background adjusted measurement

** background corrected measurement



Rating According to ISO 717-1

$D_{nT,w} (C:C_{tr}) = 63 \quad (-3 \quad -10) \text{ dB}$

Overall Result,
 $D_{nT,w} + C_{tr}, \text{dB} =$
53

Evaluation based on field measurement results obtained by an engineering method

Test Certificate N°: 189.2.1

Test Institute: **Druk** Ltd, 87 St Albans Road
 Halifax HX3 0ND

Date of Certificate: 04.09.2025

Tester Name: M Pickering

Calculation of the Standardised Level Difference According to ISO 140-4

Field Measurements of Airborne Sound Insulation Between Rooms

Client: Challenger Group Ltd
Test Location: Green Lane, Heywood
Transmission Direction: Vertical via Floor

Date of Test: 1st September 2025

Description of test arrangement and direction of measurement :
 Flat 25 Bedroom to Flat 36 Bedroom

Floor Construction (notional)

Floor Type 3

Source Room

Volume, m³: 32

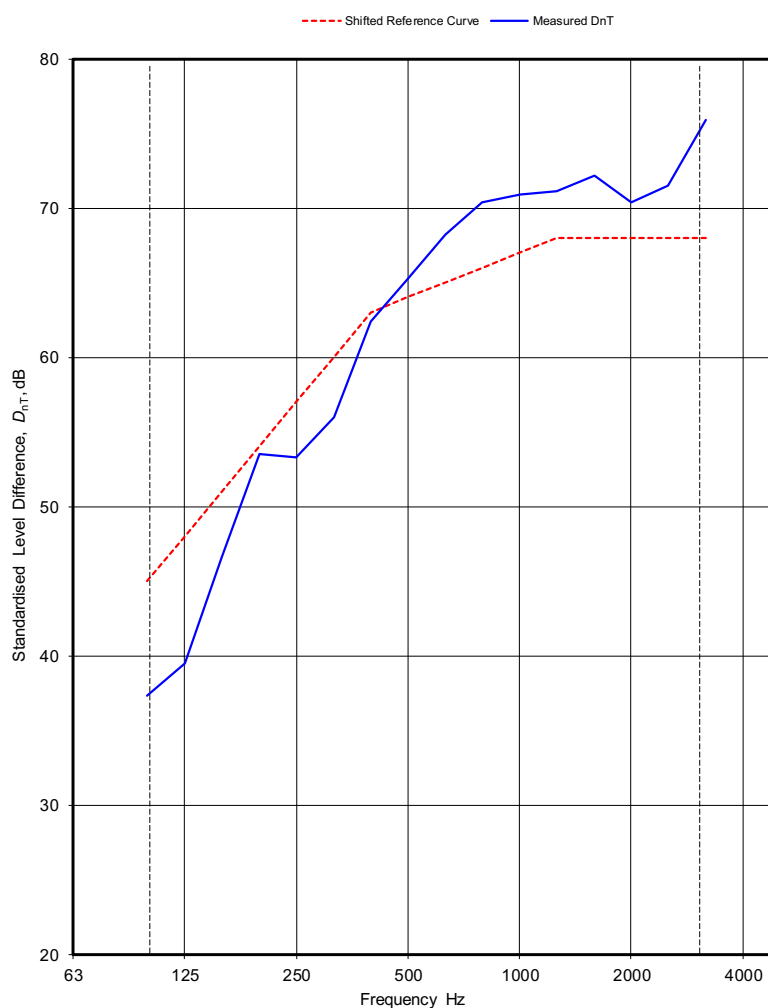
Receiver Room

Volume, m³: 32

Frequency, Hz	D_{nT} dB
50	
63	
80	
100	37.3
125	39.5
160	46.6
200	53.5
250	53.3
315	56.0
400	62.4
500	65.2
630	68.2
800	70.4
1000	70.9
1250	71.1
1600	72.2
2000	70.4
2500	71.5
3150	75.9
4000	
5000	

* background adjusted measurement

** background corrected measurement



Rating According to ISO 717-1

$D_{nT,w} (C : C_{tr}) = 64 \quad (-3 \quad -10) \text{ dB}$

Overall Result,
 $D_{nT,w} + C_{tr}, \text{dB} =$
54

Evaluation based on field measurement results obtained by an engineering method

Test Certificate N°: 189.2.2

Test Institute: Druk Ltd, 87 St Albans Road
 Halifax HX3 0ND

Date of Certificate: 04.09.2025

Tester Name: M Pickering

Calculation of the Standardised Level Difference According to ISO 140-4

Field Measurements of Airborne Sound Insulation Between Rooms

Client: Challenger Group Ltd
Test Location: Green Lane, Heywood
Transmission Direction: Vertical via Floor

Date of Test: 1st September 2025

Description of test arrangement and direction of measurement :

Flat 32 Living room/Kitchen to Flat 38 Living room/Kitchen

Floor Construction (notional)

Floor Type 3

Source Room

Volume, m³: 61

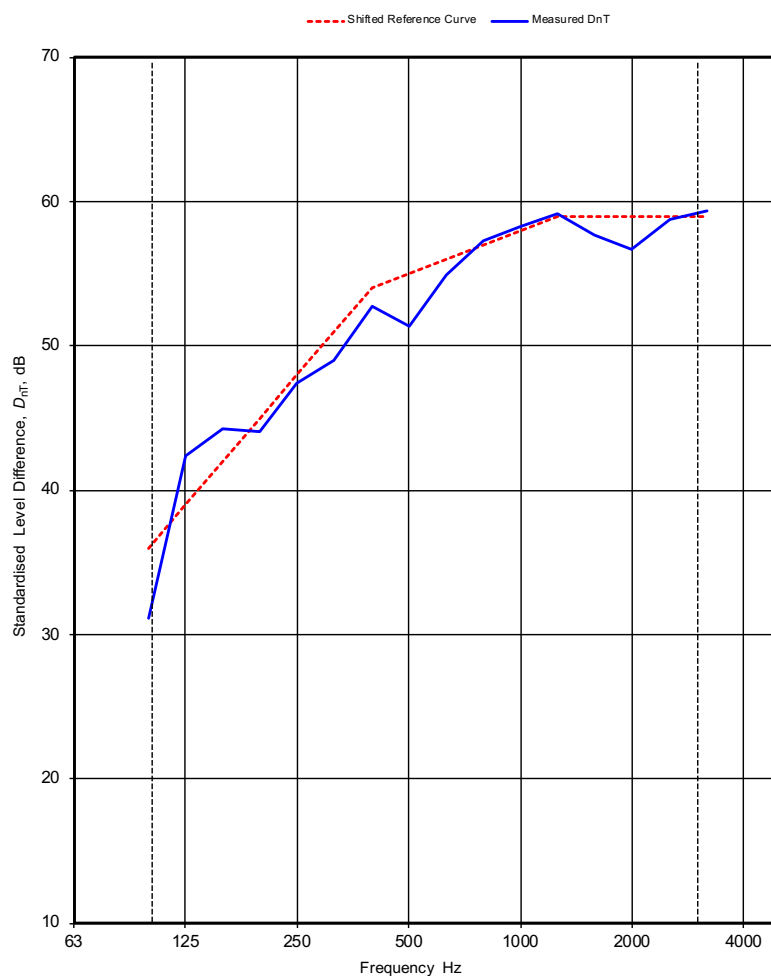
Receiver Room

Volume, m³: 61

Frequency, Hz	D_{nT} dB
50	
63	
80	
100	31.1
125	42.4
160	44.3
200	44.1
250	47.4
315	49.0
400	52.8
500	51.4
630	54.9
800	57.3
1000	58.3
1250	59.2
1600	57.7
2000	56.7
2500	58.8
3150	59.4
4000	
5000	

* background adjusted measurement

** background corrected measurement



Rating According to ISO 717-1

$D_{nT,w} (C : C_{tr}) = 55 \quad (-1 \quad -6) \text{ dB}$

Overall Result,
 $D_{nT,w} + C_{tr}, \text{dB} =$
49

Evaluation based on field measurement results obtained by an engineering method

Test Certificate N°: 189.2.3

Test Institute: **Druk** Ltd, 87 St Albans Road
 Halifax HX3 0ND

Date of Certificate: 04.09.2025

Tester Name: M Pickering

Calculation of the Standardised Level Difference According to ISO 140-4

Field Measurements of Airborne Sound Insulation Between Rooms

Client: Challenger Group Ltd
Test Location: Green Lane, Heywood
Transmission Direction: Vertical via Floor

Date of Test: 1st September 2025

Description of test arrangement and direction of measurement :
 Flat 32 Bedroom to Flat 38 Bedroom

Floor Construction (notional)
 Floor Type 3

Source Room

Volume, m³: 32

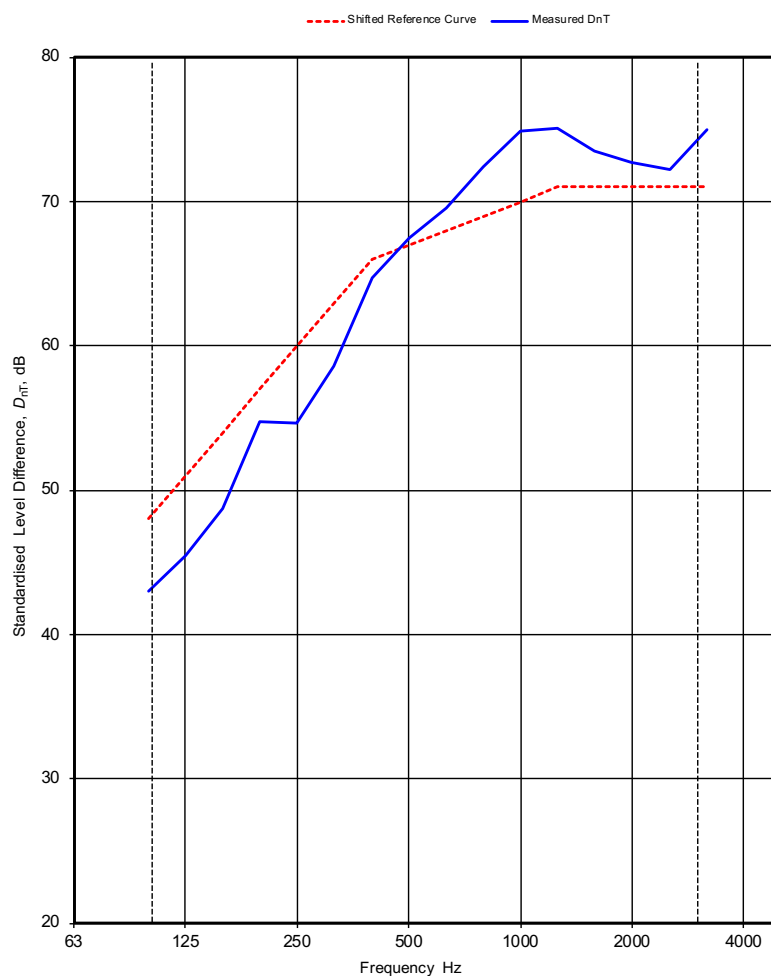
Receiver Room

Volume, m³: 32

Frequency, Hz	D_{nT} dB
50	
63	
80	
100	43.0
125	45.5
160	48.7
200	54.8
250	54.7
315	58.6
400	64.7
500	67.5
630	69.6
800	72.4
1000	74.9
1250	75.1
1600	73.5
2000	72.7
2500	72.2
3150	75.0
4000	
5000	

* background adjusted measurement

** background corrected measurement



Rating According to ISO 717-1

$D_{nT,w} (C:C_{tr}) = 67 \quad (-3 \quad -8) \text{ dB}$

Overall Result,
 $D_{nT,w} + C_{tr}, \text{dB} =$
59

Evaluation based on field measurement results obtained by an engineering method

Test Certificate N°: 189.2.4

Test Institute: **Druk** Ltd, 87 St Albans Road
 Halifax HX3 0ND

Date of Certificate: 04.09.2025

Tester Name: M Pickering

Calculation of the Standardised Level Difference According to ISO 140-4

Field Measurements of Airborne Sound Insulation Between Rooms

Client: Challenger Group Ltd
Test Location: Green Lane, Heywood
Transmission Direction: Vertical via Floor

Date of Test: 1st September 2025

Description of test arrangement and direction of measurement :
 Flat 22 Living Room/Kitchen to Flat 33 Living Room/Kitchen

Floor Construction (notional)

Floor Type 3

Source Room

Volume, m³: 61

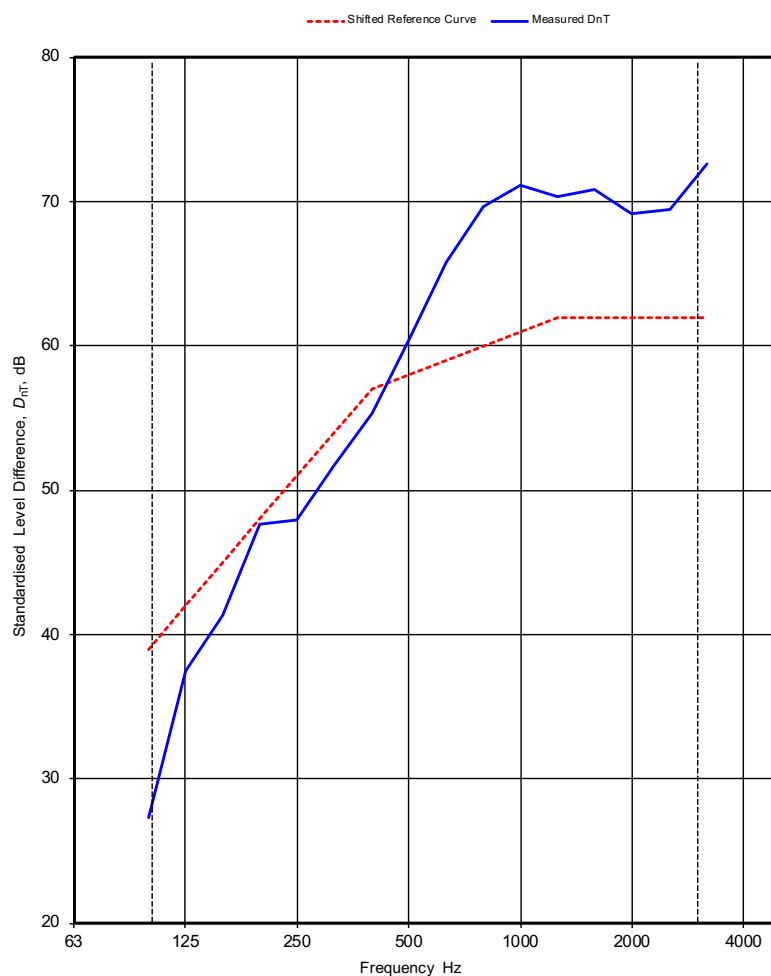
Receiver Room

Volume, m³: 61

Frequency, Hz	D_{nT} dB
50	
63	
80	
100	27.3
125	37.5
160	41.3
200	47.7
250	47.9
315	51.7
400	55.4
500	60.5
630	65.8 **
800	69.7 **
1000	71.1 **
1250	70.4 **
1600	70.8 **
2000	69.2 **
2500	69.5 **
3150	72.6 **
4000	
5000	

* background adjusted measurement

** background corrected measurement



Rating According to ISO 717-1

$D_{nT,w} (C : C_{tr}) = 58 \quad (-4 \quad -12) \text{ dB}$

Overall Result,
 $D_{nT,w} + C_{tr}, \text{dB} =$
46

Evaluation based on field measurement results obtained by an engineering method

Test Certificate N°: 189.2.5

Test Institute: **Druk** Ltd, 87 St Albans Road
 Halifax HX3 0ND

Date of Certificate: 04.09.2025

Tester Name: M Pickering

Calculation of the Standardised Level Difference According to ISO 140-4

Field Measurements of Airborne Sound Insulation Between Rooms

Client:Challenger Group Ltd

Test Location:Green Lane, Heywood

Transmission Direction:Vertical via Floor

Date of Test:1st September 2025

Description of test arrangement and direction of measurement :Flat 22 Bedroom to Flat 32 Bedroom

Floor Construction (notional)
Floor Type 3

Source Room

Volume, m³:32

Receiver Room

Volume, m³:32

Frequency, Hz	D _{nT} dB
50	
63	
80	
100	35.4
125	42.2
160	41.4
200	49.6
250	52.9
315	54.2
400	56.8
500	60.6
630	64.3
800	66.9
1000	69.0
1250	72.3
1600	72.5
2000	71.1
2500	71.5
3150	75.5
4000	
5000	

* background adjusted measurement

** background corrected measurement

Standardised Level Difference, D_{nT}, dB

Frequency Hz

Shifted Reference Curve

Measured DnT

Rating According to ISO 717-1

D_{nT,w} (C:C_{tr}) = 61 (-2 -8) dB

Overall Result, D_{nT,w} + C_{tr}, dB = 53

Evaluation based on field measurement results obtained by an engineering method

Test Certificate N°:189.2.6

Test Institute:Druck Ltd, 87 St Albans Road
Halifax HX3 0ND

Date of Certificate:04.09.2025

Tester Name:M Pickering

Calculation of the Standardised Level Difference According to ISO 140-4

Field Measurements of Airborne Sound Insulation Between Rooms

Client:Challenger Group Ltd

Test Location:Green Lane, Heywood

Transmission Direction:Vertical via Floor

Date of Test:1st September 2025

Description of test arrangement and direction of measurement :Flat 9 Living Room/Kitchen to Flat 20 Living Room/Kitchen

Floor Construction (notional)
Floor Type 3

Source Room

Volume, m³:61

Receiver Room

Volume, m³:61

Frequency, Hz	D _{nT} dB
50	
63	
80	
100	39.8
125	41.9
160	45.2
200	49.9
250	52.6
315	53.5
400	54.1
500	60.6*
630	65.1**
800	68.6**
1000	65.5*
1250	69.6**
1600	71.8**
2000	68.8**
2500	70.9**
3150	74.2**
4000	
5000	

* background adjusted measurement

** background corrected measurement

Standardised Level Difference, D_{nT}, dB

Frequency Hz

Shifted Reference Curve

Measured DnT

Rating According to ISO 717-1

D_{nT,w} (C:C_{tr}) = 62 (-2 -7) dB

Overall Result, D_{nT,w} + C_{tr}, dB = 55

Evaluation based on field measurement results obtained by an engineering method

Test Certificate N°:189.2.7

Test Institute:Druck Ltd, 87 St Albans Road
Halifax HX3 0ND

Date of Certificate:04.09.2025

Tester Name:M Pickering

Druck Limited, 87 St Albans Road, Halifax, HX3 0ND

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Appendix 4: Impact Sound Insulation Result Certificates – Floors

Calculation of the Standardised Impact Sound Pressure Level to ISO 140-7

Field Measurements of Impact sound insulation of floors

Client: Challenger Group Ltd
Test Location: Green Lane, Heywood
Transmission Direction: Vertical via Floor

Date of Test: 1st September 2025

Description of test arrangement and direction of measurement :
 Flat 36 Bedroom to Flat 24 Bedroom

Floor Construction (notional)
 Floor Type 3

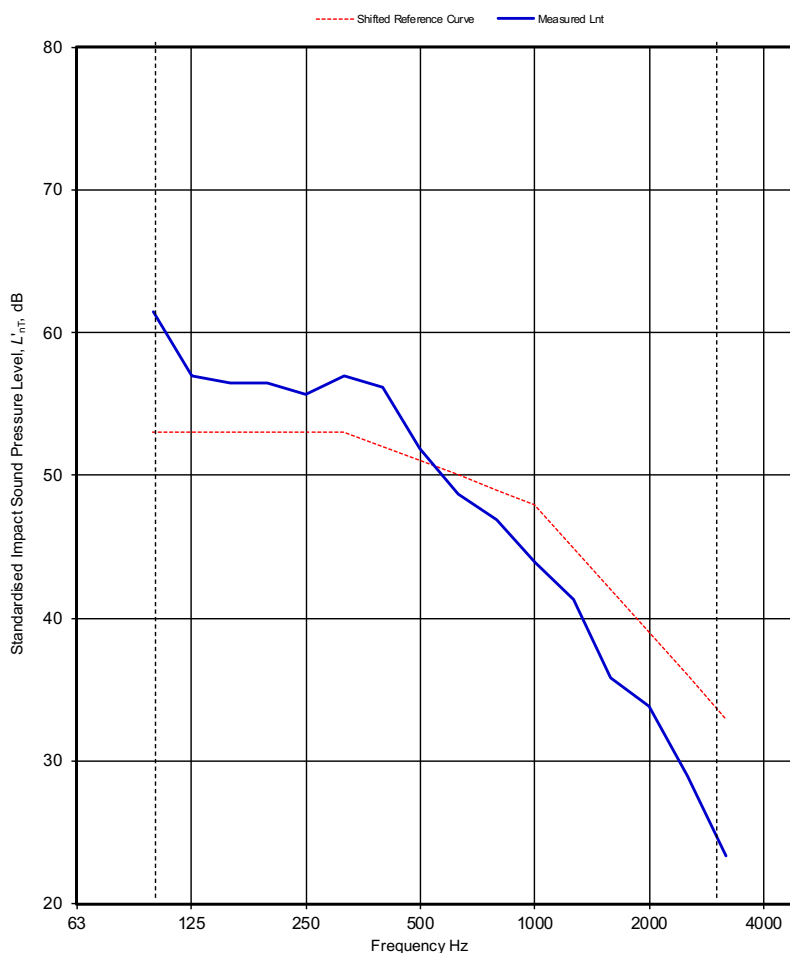
Source Room
Volume, m³: 32

Receiver Room
Volume, m³: 32

Frequency, Hz	L'_{nT} dB
50	
63	
80	
100	61.5
125	57.0
160	56.5
200	56.5
250	55.7
315	57.0
400	56.2
500	51.9
630	48.7
800	46.9
1000	43.9
1250	41.3
1600	35.8
2000	33.8
2500	28.9
3150	23.4 *
4000	
5000	

* background adjusted measurement

** background corrected measurement



Rating According to ISO 717-2

$L'_{nT,w} =$ **51**

Evaluation based on field measurement results obtained by an engineering method

Test Certificate N°: 189.3.1

Test Institute: **Druk** Ltd, 87 St Albans Road
 Halifax HX3 0ND

Date of Certificate: 04.09.2025

Tester Name: M Pickering

Calculation of the Standardised Impact Sound Pressure Level to ISO 140-7

Field Measurements of Impact sound insulation of floors

Client: Challenger Group Ltd
Test Location: Green Lane, Heywood
Transmission Direction: Vertical via Floor

Date of Test: 1st September 2025

Description of test arrangement and direction of measurement :
 Flat 36 Bedroom to Flat 25 Bedroom

Floor Construction (notional)
 Floor Type 3

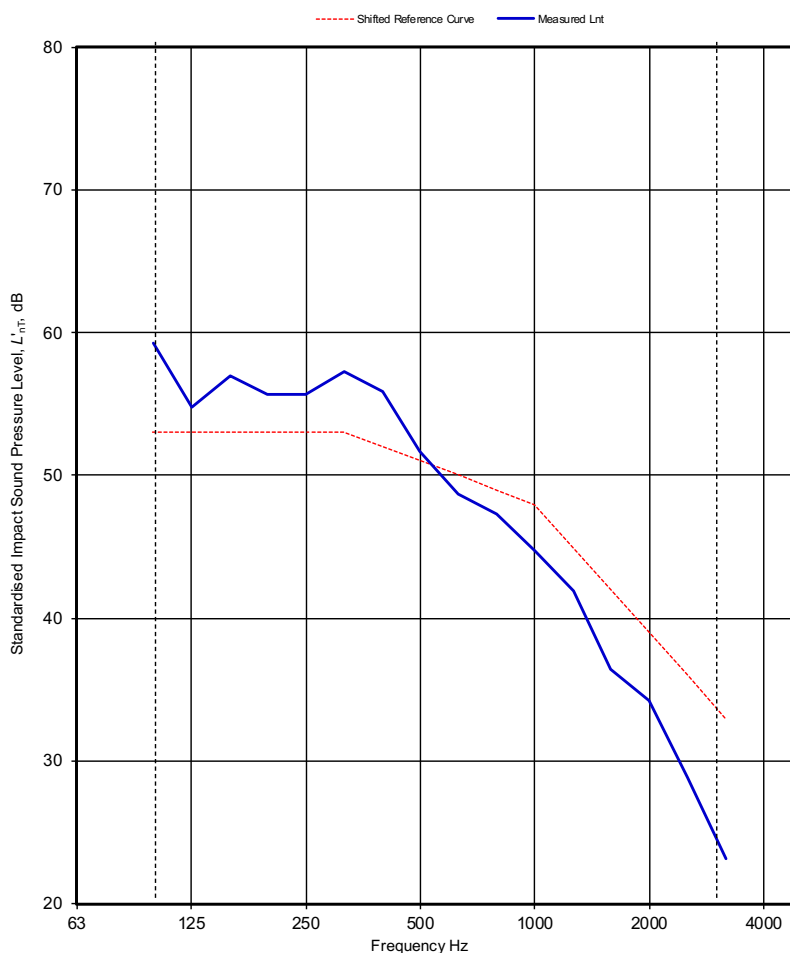
Source Room
Volume, m³: 32

Receiver Room
Volume, m³: 32

Frequency, Hz	L'_{nT} dB
50	
63	
80	
100	59.3
125	54.8
160	57.0
200	55.7
250	55.7
315	57.3
400	55.9
500	51.7
630	48.7
800	47.3
1000	44.7
1250	41.9
1600	36.4
2000	34.2
2500	28.8
3150	23.2
4000	
5000	

* background adjusted measurement

** background corrected measurement



Rating According to ISO 717-2

$L'_{nT,w} =$ **51**

Evaluation based on field measurement results obtained by an engineering method

Test Certificate N°: 189.3.2

Test Institute: **Druk** Ltd, 87 St Albans Road
 Halifax HX3 0ND

Date of Certificate: 04.09.2025

Tester Name: M Pickering

Calculation of the Standardised Impact Sound Pressure Level to ISO 140-7

Field Measurements of Impact sound insulation of floors

Client: Challenger Group Ltd
Test Location: Green Lane, Heywood
Transmission Direction: Vertical via Floor

Date of Test: 1st September 2025

Description of test arrangement and direction of measurement :
 Flat 38 Living Room/Kitchen to Flat 32 Living Room/Kitchen

Floor Construction (notional)
 Floor Type 3

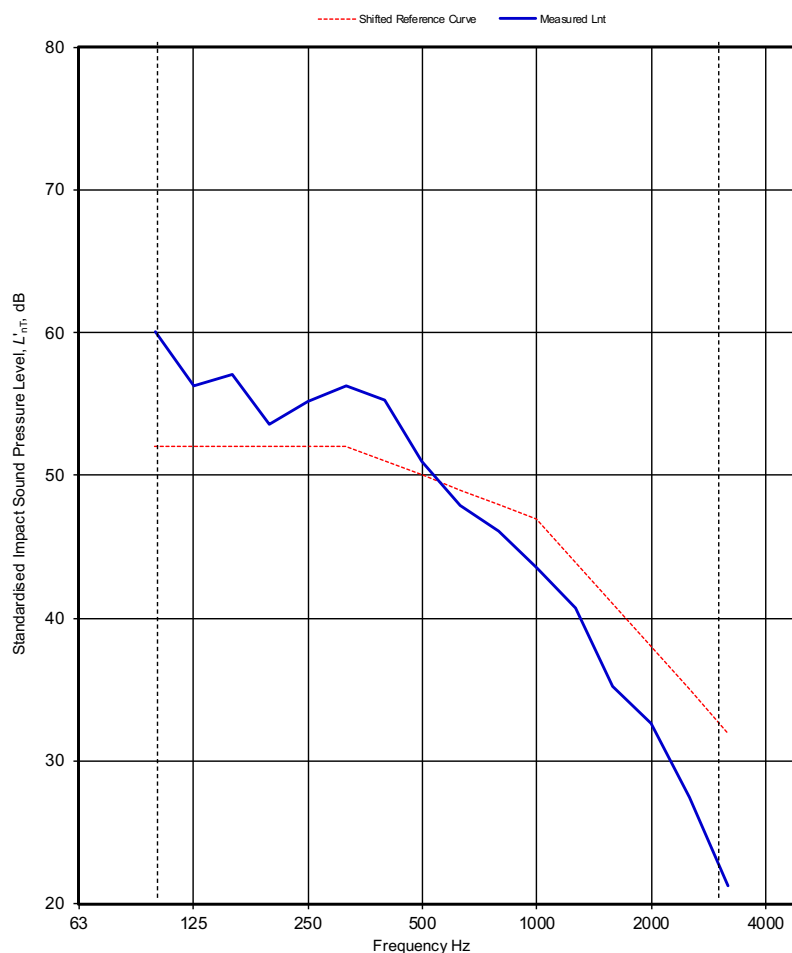
Source Room
Volume, m³: 61

Receiver Room
Volume, m³: 61

Frequency, Hz	L'_{nT} dB
50	
63	
80	
100	60.1
125	56.3
160	57.1
200	53.6
250	55.2
315	56.3
400	55.3
500	51.0
630	47.9
800	46.1
1000	43.5
1250	40.7
1600	35.2
2000	32.6
2500	27.4
3150	21.3
4000	
5000	

* background adjusted measurement

** background corrected measurement



Rating According to ISO 717-2

$L'_{nT,w} =$ **50**

Evaluation based on field measurement results obtained by an engineering method

Test Certificate N°: 189.3.3

Test Institute: **Druk** Ltd, 87 St Albans Road
 Halifax HX3 0ND

Date of Certificate: 04.09.2025

Tester Name: M Pickering

Calculation of the Standardised Impact Sound Pressure Level to ISO 140-7

Field Measurements of Impact sound insulation of floors

Client: Challenger Group Ltd
Test Location: Green Lane, Heywood
Transmission Direction: Vertical via Floor

Date of Test: 1st September 2025

Description of test arrangement and direction of measurement :
 Flat 38 Bedroom to Flat 32 Bedroom

Floor Construction (notional)
 Floor Type 3

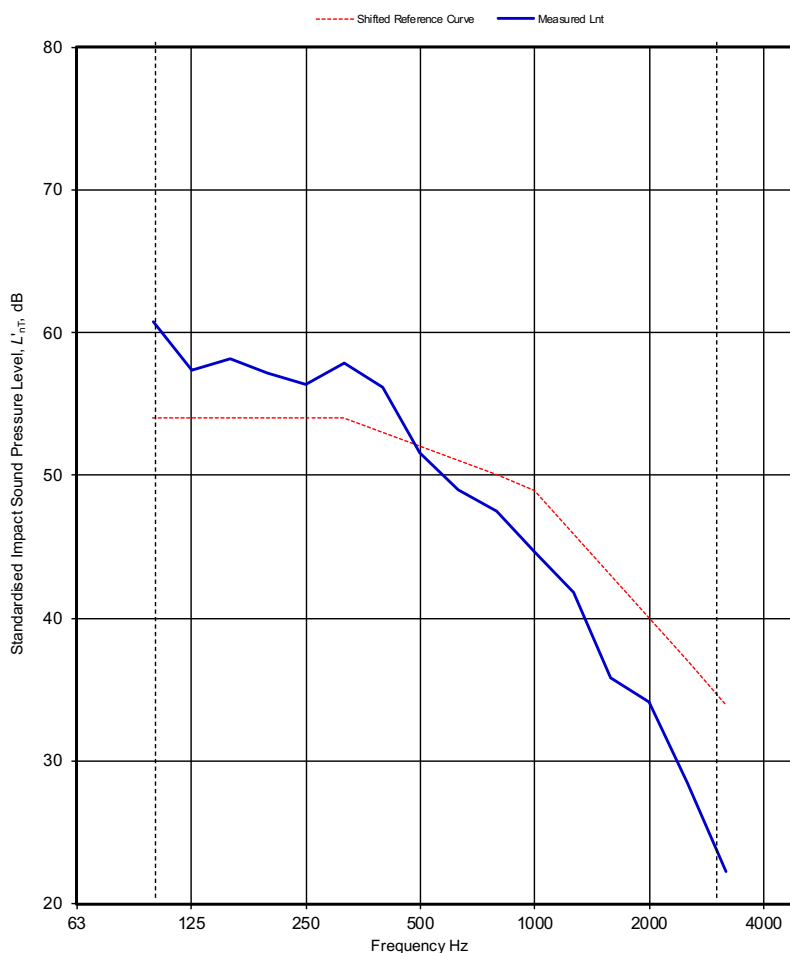
Source Room
Volume, m³: 32

Receiver Room
Volume, m³: 32

Frequency, Hz	L'_{nT} dB
50	
63	
80	
100	60.8
125	57.4
160	58.2
200	57.2
250	56.4
315	57.9
400	56.2
500	51.6
630	49.0
800	47.5
1000	44.6
1250	41.8
1600	35.8 *
2000	34.1 *
2500	28.4 **
3150	22.3 **
4000	
5000	

* background adjusted measurement

** background corrected measurement



Rating According to ISO 717-2

$L'_{nT,w} =$ **52**

Evaluation based on field measurement results obtained by an engineering method

Test Certificate N°: 189.3.4

Test Institute: **Druk** Ltd, 87 St Albans Road
 Halifax HX3 0ND

Date of Certificate: 04.09.2025

Tester Name: M Pickering

Calculation of the Standardised Impact Sound Pressure Level to ISO 140-7

Field Measurements of Impact sound insulation of floors

Client: Challenger Group Ltd
Test Location: Green Lane, Heywood
Transmission Direction: Vertical via Floor

Date of Test: 1st September 2025

Description of test arrangement and direction of measurement :
 Flat 33 Living Room/Kitchen to Flat 22 Living Room/Kitchen

Floor Construction (notional)
 Floor Type 3

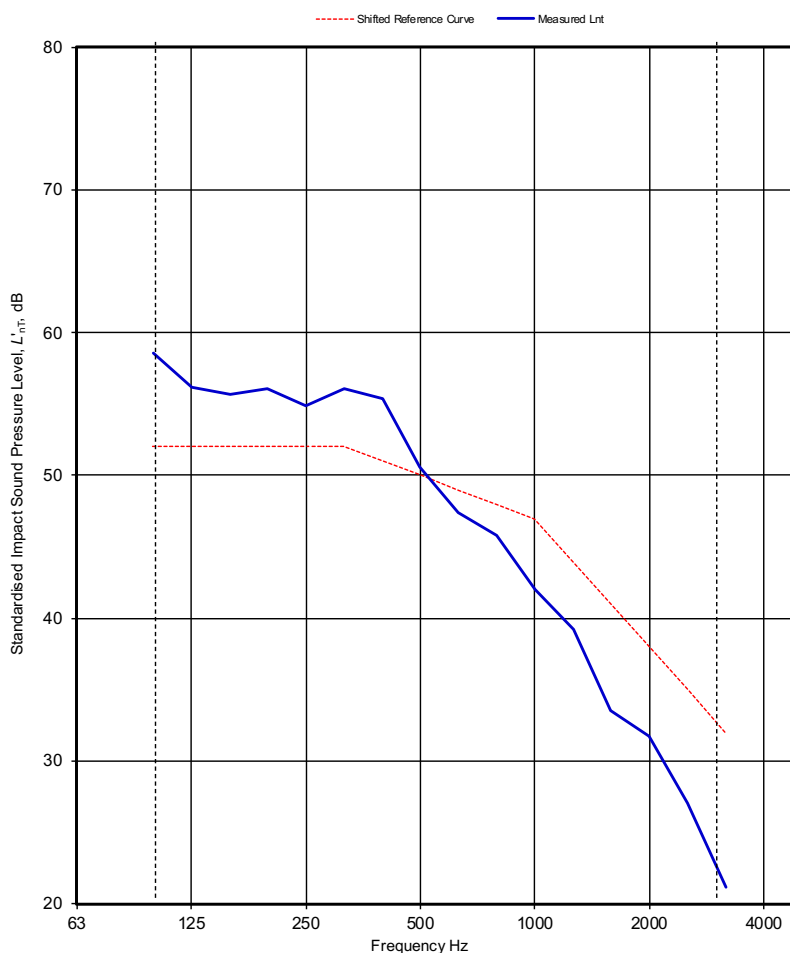
Source Room
Volume, m³: 61

Receiver Room
Volume, m³: 61

Frequency, Hz	L'_{nT} dB
50	
63	
80	
100	58.6
125	56.2
160	55.7
200	56.1
250	54.9
315	56.1
400	55.4
500	50.6
630	47.4
800	45.8
1000	42.0
1250	39.2
1600	33.5
2000	31.7
2500	27.0
3150	21.2
4000	
5000	

* background adjusted measurement

** background corrected measurement



Rating According to ISO 717-2

$L'_{nT,w} =$ **50**

Evaluation based on field measurement results obtained by an engineering method

Test Certificate N°: 189.3.5

Test Institute: **Druk** Ltd, 87 St Albans Road
 Halifax HX3 0ND

Date of Certificate: 04.09.2025

Tester Name: M Pickering

Calculation of the Standardised Impact Sound Pressure Level to ISO 140-7

Field Measurements of Impact sound insulation of floors

Client:

Challenger Group Ltd

Test Location:

Green Lane, Heywood

Transmission Direction:

Vertical via Floor

Date of Test:

1st September 2025

Description of test arrangement and direction of measurement :
Flat 32 Bedroom to Flat 22 Bedroom

Floor Construction (notional)
Floor Type 3

Source Room

Volume, m³:

32

Receiver Room

Volume, m³:

32

Frequency, Hz	L' _{nT} dB
50	
63	
80	
100	59.8
125	56.5
160	56.2
200	55.8
250	55.5
315	56.9
400	55.9
500	51.9
630	48.6
800	47.3
1000	44.8
1250	41.8
1600	35.7
2000	34.3
2500	31.4
3150	27.2
4000	
5000	

* background adjusted measurement

** background corrected measurement

Standardised Impact Sound Pressure Level L'_{nT}, dB

Frequency Hz

Shifted Reference Curve

Measured Lnt

Rating According to ISO 717-2

L'_{nT,w} =

51

Evaluation based on field measurement results obtained by an engineering method

Test Certificate N°:

189.3.6

Test Institute:

Druk Ltd, 87 St Albans Road
Halifax HX3 0ND

Date of Certificate:

04.09.2025

Tester Name:

M Pickering

Calculation of the Standardised Impact Sound Pressure Level to ISO 140-7

Field Measurements of Impact sound insulation of floors

Client:Challenger Group Ltd

Test Location:Green Lane, Heywood

Transmission Direction:Vertical via Floor

Date of Test:1st September 2025

Description of test arrangement and direction of measurement :Flat 20 Living Room/Kitchen to Flat 9 Living Room/Kitchen

Floor Construction (notional)
Floor Type 3

Source Room

Volume, m³:61

Receiver Room

Volume, m³:61

Frequency, Hz	L'_{nT} dB
50	
63	
80	
100	59.1
125	57.4
160	56.6
200	55.8
250	55.2
315	56.5
400	56.0
500	51.0
630	47.9
800	46.5
1000	43.3
1250	40.5
1600	35.2
2000	33.0
2500	28.2
3150	21.4 *
4000	
5000	

* background adjusted measurement

** background corrected measurement

Standardised Impact Sound Pressure Level L'_{nT}, dB

Frequency Hz

Shifted Reference Curve

Measured Lnt

Rating According to ISO 717-2

L'_{nT,w} =

51

Evaluation based on field measurement results obtained by an engineering method

Test Certificate N°:189.3.7

Test Institute:Druk Ltd, 87 St Albans Road
Halifax HX3 0ND

Date of Certificate:04.09.2025

Tester Name:M Pickering

Druck Limited, 87 St Albans Road, Halifax, HX3 0ND

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