

# The Building Test Centre

## Fire Acoustics Structures

The Building Test Centre  
British Gypsum  
East Leake  
Loughborough  
Leics. LE12 6NP  
Tel (0115) 945 1564  
Fax (0115) 945 1562  
Email [btc.testing@saint-gobain.com](mailto:btc.testing@saint-gobain.com)  
Website [www.btconline.co.uk](http://www.btconline.co.uk)

Report Number **BTC 19956A**

An acoustic test report covering laboratory sound insulation testing to BS EN ISO 10140-2:2010 on a Hadleys 60mm Shaftwall partition with various board types.

Test dates: 8<sup>th</sup> and 9<sup>th</sup> May 2017

Report issued date: 16<sup>th</sup> May 2017

[www.btconline.co.uk](http://www.btconline.co.uk)

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**  
Downing Street  
Smethwick  
West Midlands  
B66 2PA

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**

BTC 19956A: Page 1 of 42



0296

# The Building Test Centre

Fire Acoustics Structures

The Building Test Centre  
British Gypsum  
East Leake  
Loughborough  
Leics. LE12 6NP  
Tel (0115) 945 1564  
Fax (0115) 945 1562  
Email [btc.testing@saint-gobain.com](mailto:btc.testing@saint-gobain.com)  
Website [www.btconline.co.uk](http://www.btconline.co.uk)

## TABLE OF CONTENTS

<b>FOREWORD</b> .....	<b>3</b>
<b>REPORT AUTHORISATION</b> .....	<b>3</b>
<b>TEST REPORT AMENDMENTS</b> .....	<b>4</b>
<b>TEST CONSTRUCTION</b> .....	<b>5</b>
<b>H19956AA</b> .....	<b>5</b>
<b>H19956BA</b> .....	<b>6</b>
<b>H19956CA</b> .....	<b>6</b>
<b>H19956DA</b> .....	<b>6</b>
<b>H19956EA</b> .....	<b>6</b>
<b>H19956FA</b> .....	<b>6</b>
<b>H19956GA</b> .....	<b>7</b>
<b>H19956HA</b> .....	<b>7</b>
<b>H19956IA</b> .....	<b>8</b>
<b>H19956JA</b> .....	<b>9</b>
<b>TEST MATERIALS</b> .....	<b>15</b>
<b>Plasterboards</b> .....	<b>15</b>
<b>Insulation</b> .....	<b>16</b>
<b>Metal Components</b> .....	<b>16</b>
<b>Fasteners</b> .....	<b>17</b>
<b>Miscellaneous Components</b> .....	<b>17</b>
<b>TEST RESULTS</b> .....	<b>18</b>
<b>TEST PROCEDURE</b> .....	<b>20</b>
<b>LIMITATIONS</b> .....	<b>20</b>
<b>APPENDIX A - TEST DATA</b> .....	<b>21</b>
<b>APPENDIX B - TEST METHOD AND CONDITIONS</b> .....	<b>41</b>

Customer: Hadley Group/Hadley Industries FZE (Dubai)

BTC 19956A: Page 2 of 42



0296

# The Building Test Centre

## Fire Acoustics Structures

The Building Test Centre  
British Gypsum  
East Leake  
Loughborough  
Leics. LE12 6NP  
Tel (0115) 945 1564  
Fax (0115) 945 1562  
Email [btc.testing@saint-gobain.com](mailto:btc.testing@saint-gobain.com)  
Website [www.btconline.co.uk](http://www.btconline.co.uk)

### FOREWORD

The test sponsor was Hadley Group/Hadley Industries FZE (Dubai).

Mr Chris Hobbs of CMH Design and Consultancy Services Limited witnessed the tests and was acting on behalf of the test sponsor/customer.

The test specimens were installed by Mr Chris Hobbs of CMH Design and Consultancy Services Limited and Mr Tony Harding of AllTone between the 8<sup>th</sup> and 9<sup>th</sup> May 2017.

The Building Test Centre played no role in the design or selection of the materials comprising the test specimen.

### REPORT AUTHORISATION

Report Author

**Jack Marriott**  
BSc (Hons)  
*Scientist*

Authorised by

**James Stonell**  
MIOA  
*Scientist*

The Building Test Centre will not discuss the content of this report without written permission from the test sponsor. The Building Test Centre retains ownership of the test report content but authorises the test sponsor to reproduce the report as necessary in its entirety only.

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**

BTC 19956A: Page 3 of 42



0296

### TEST REPORT AMENDMENTS

Page	Amendments	Date

Report Amendments Author
<b>Name</b> <i>Role</i>

Amendments Authorised by
<b>Name</b> <i>Role</i>



### **TEST CONSTRUCTION**

#### **H19956AA**

The test specimen was constructed in an aperture having an overall opening of 2400mm (high) x 3600mm (wide).

Hadley 62mm Deep Channel Track was fixed to the head of the aperture using 25mm Drywall Screws spaced at 600mm centres.

Hadley 62mm Track was fixed to the base of the aperture using 25mm Drywall Screws spaced at 600mm centres.

Hadley 62mm Track was positioned between the head and base tracks at each end of the aperture and fixed using 25mm Drywall Screws spaced at 600mm centres.

Hadley 60mm 'I' Studs were positioned between the head and base tracks at 600mm centres.

A single layer of 19mm Gyproc Core Board was inserted between the studs on the Source Room side with a horizontal joint at 1200mm. Two 122mm Gyproc Core Board fire stops were positioned fully into the web of the head channel and behind the vertical flanges of the studs and held in place with two 35mm Drywall Screws.

Partition brackets were fixed between the Gyproc Core Board and the stud flanges at 600mm centres using 13mm Wafer Head Jack Point Screws.

Steel Angle was placed in the horizontal board joint. Two beads of Acoustic Sealant were applied to the back of a 122mm fire stop and was fixed to the Steel Angle using three 35mm Jack Point Screws.

The junction between the back of the board and the stud was sealed with Acoustic Sealant.

A single layer of 25mm Isover APR 1200 insulation was placed in the stud cavity behind the 19mm Gyproc Core Board.

The receiving room side was clad with a single layer of 15mm Gyproc FireLine which were screw fixed around the perimeter of the boards and at the intermediate stud positions at 300mm centres using 25mm Drywall Screws.

All joints and screw heads on the receiving room side were taped and the perimeter of both sides was taped and sealed with Acoustic Sealant.

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**

### H19956BA

Same frame construction as H19956AA except receiving room side was clad with a double layer of 15mm Gyproc FireLine.

The inner layer of boards was fixed around the perimeter and the intermediate stud positions at 300mm centres using 25mm Drywall screws.

The outer layer of boards was fixed around the perimeter and the intermediate stud positions at 300mm centres using 40mm Drywall screws.

### H19956CA

Same construction as H19956AA except 25mm Isover APR 1200 insulation was removed.

### H19956DA

Same construction as H19956BA except 25mm Isover APR 1200 insulation was removed.

### H19956EA

Same construction as H19956BA except 25mm Isover APR 1200 insulation was removed and an extra layer of boards were added to make a triple layer of 15mm Gyproc FireLine on the receiving room side.

The inner layer of boards was fixed around the perimeter and the intermediate stud positions at 300mm centres using 25mm Drywall screws.

The middle layer of boards was fixed around the perimeter and the intermediate stud positions at 300mm centres using 40mm Drywall screws.

The outer layer of boards was fixed around the perimeter and the intermediate stud positions at 300mm centres using 60mm Drywall screws.

### H19956FA

Hadley 62mm Deep Channel Track was fixed to the head of the aperture using 25mm Drywall Screws spaced at 600mm centres.

Hadley 62mm Track was fixed to the base of the aperture using 25mm Drywall Screws spaced at 600mm centres.

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**

# The Building Test Centre

## Fire Acoustics Structures

The Building Test Centre  
British Gypsum  
East Leake  
Loughborough  
Leics. LE12 6NP  
Tel (0115) 945 1564  
Fax (0115) 945 1562  
Email [btc.testing@saint-gobain.com](mailto:btc.testing@saint-gobain.com)  
Website [www.btconline.co.uk](http://www.btconline.co.uk)

Hadley 62mm Track was positioned between the head and base tracks at each end of the aperture and fixed using 25mm Drywall Screws spaced at 600mm centres.

Hadley 60mm 'I' Studs were positioned between the head and base tracks at 600mm centres.

A single layer of 19mm Knauf Core Board was inserted between the studs on the Source Room side with a horizontal joint at 1200mm. Two 122mm Knauf Core Board fire stops were positioned fully into the web of the head channel and behind the vertical flanges of the studs and held in place with two 35mm Drywall Screws.

Partition brackets were fixed between the Knauf Core Board and the stud flanges at 600mm centres using 13mm Wafer Head Jack Point Screws.

Steel Angle was placed in the horizontal board joint. Two beads of Acoustic Sealant were applied to the back of a 122mm fire stop and was fixed to the Steel Angle using three 35mm Jack Point Screws.

The junction between the back of the board and the stud was sealed with Acoustic Sealant.

A single layer of 25mm Isover APR 1200 insulation was placed in the stud cavity behind the 19mm Knauf Core Board.

The receiving room side was clad with a single layer of 15mm Knauf Fire Panel which were screw fixed around the perimeter of the boards and at the intermediate stud positions at 300mm centres using 25mm Drywall Screws.

All joints and screw heads on the receiving room side were taped and the perimeter of both sides was taped and sealed with Acoustic Sealant.

### H19956GA

Same construction as H19956FA except 25mm Isover APR 1200 insulation was removed.

### H19956HA

Same frame construction as H19956GA except receiving room side was clad with a double layer of 15mm Knauf Fire Panel.

The inner layer of boards was fixed around the perimeter and the intermediate stud positions at 300mm centres using 25mm Drywall screws.

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**



The outer layer of boards was fixed around the perimeter and the intermediate stud positions at 300mm centres using 40mm Drywall screws.

### H19956IA

The test specimen was constructed in an aperture having an overall opening of 2400mm (high) x 3600mm (wide).

Hadley 62mm Deep Channel Track was fixed to the head of the aperture using 25mm Drywall Screws spaced at 600mm centres.

Hadley 62mm Track was fixed to the base of the aperture using 25mm Drywall Screws spaced at 600mm centres.

Hadley 62mm Track was positioned between the head and base tracks at each end of the aperture and fixed using 25mm Drywall Screws spaced at 600mm centres.

Hadley 60mm 'I' Studs were positioned between the head and base tracks at 600mm centres.

A single layer of 25mm Siniat GTEC Fire Core Board was inserted between the studs on the Source Room side with a horizontal joint at 1200mm. Two 122mm Siniat GTEC 15mm Fire Board fire stops were positioned fully into the web of the head channel and behind the vertical flanges of the studs and held in place with two 35mm Drywall Screws.

Partition brackets were fixed between the Siniat GTEC Fire Core Board and the stud flanges at 600mm centres using 13mm Wafer Head Jack Point Screws.

Steel Angle was placed in the horizontal board joint. Two beads of Acoustic Sealant were applied to the back of a 122mm 25mm Siniat GTEC Fire Core Board fire stop and was fixed to the Steel Angle using three 35mm Jack Point Screws.

The junction between the back of the board and the stud was sealed with Acoustic Sealant.

The receiving room side was clad with a double layer of 15mm Siniat GTEC Fire Board.

The inner layer of boards was fixed around the perimeter and the intermediate stud positions at 300mm centres using 25mm Drywall screws.

The outer layer of boards was fixed around the perimeter and the intermediate stud positions at 300mm centres using 40mm Drywall screws.

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**



# The Building Test Centre

## Fire Acoustics Structures

The Building Test Centre  
British Gypsum  
East Leake  
Loughborough  
Leics. LE12 6NP  
Tel (0115) 945 1564  
Fax (0115) 945 1562  
Email [btc.testing@saint-gobain.com](mailto:btc.testing@saint-gobain.com)  
Website [www.btconline.co.uk](http://www.btconline.co.uk)

All joints and screw heads on the receiving room side were taped and the perimeter of both sides was taped and sealed with Acoustic Sealant.

### H19956JA

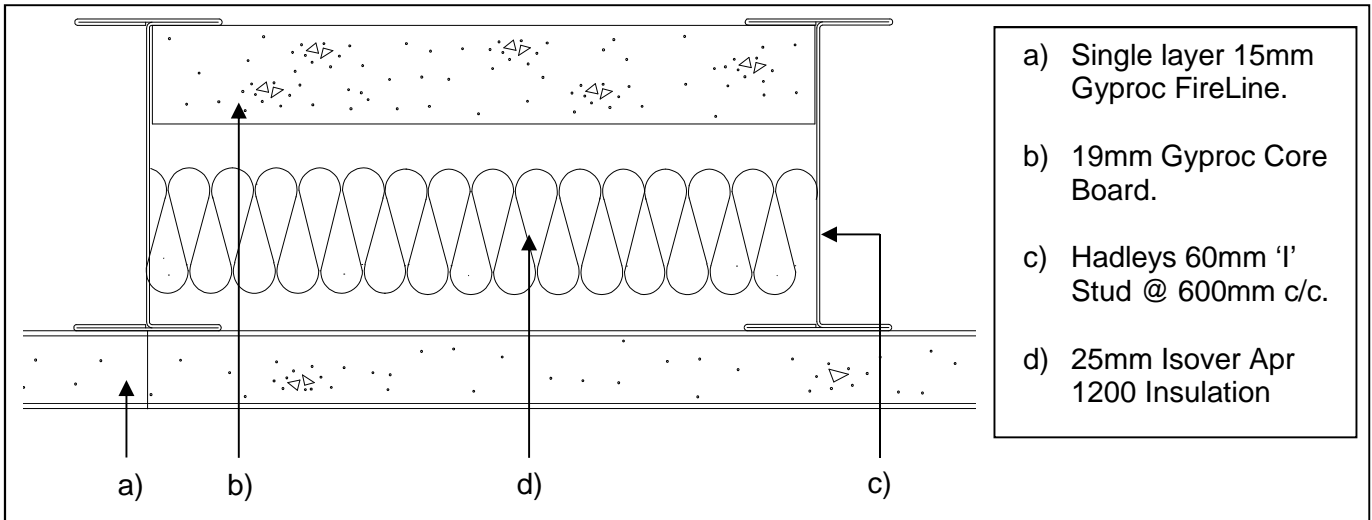
Same frame construction as H19956IA except receiving room side was clad with a single layer of 15mm Knauf Fire Panel which were fixed around the perimeter and the intermediate stud positions at 300mm centres using 25mm Drywall screws.

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**

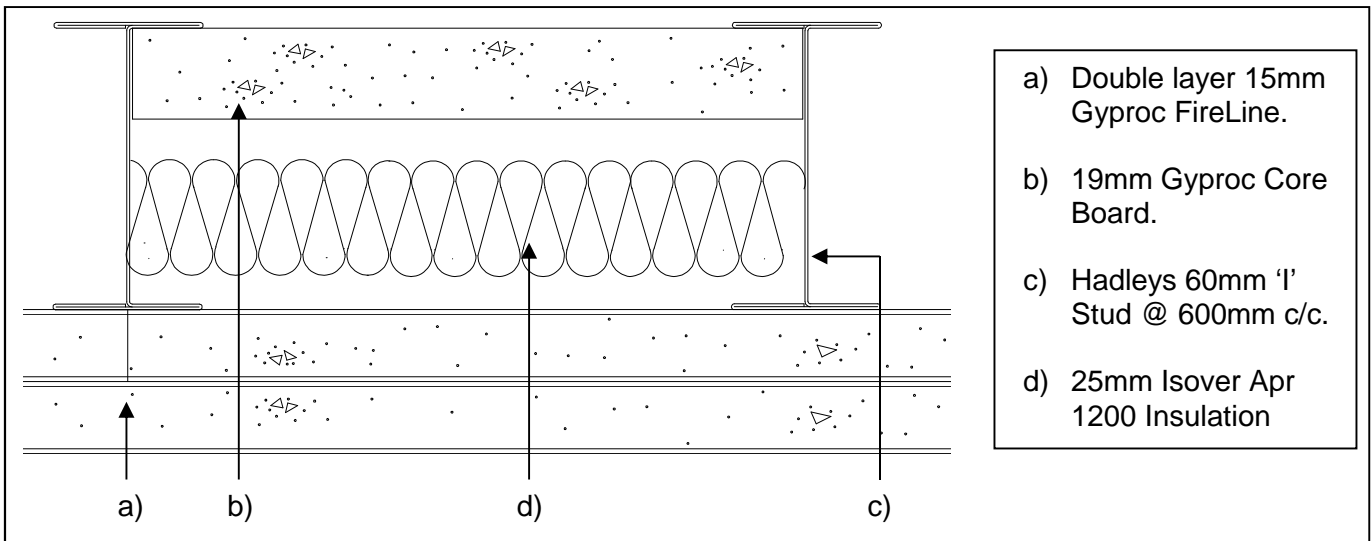
BTC 19956A: Page 9 of 42



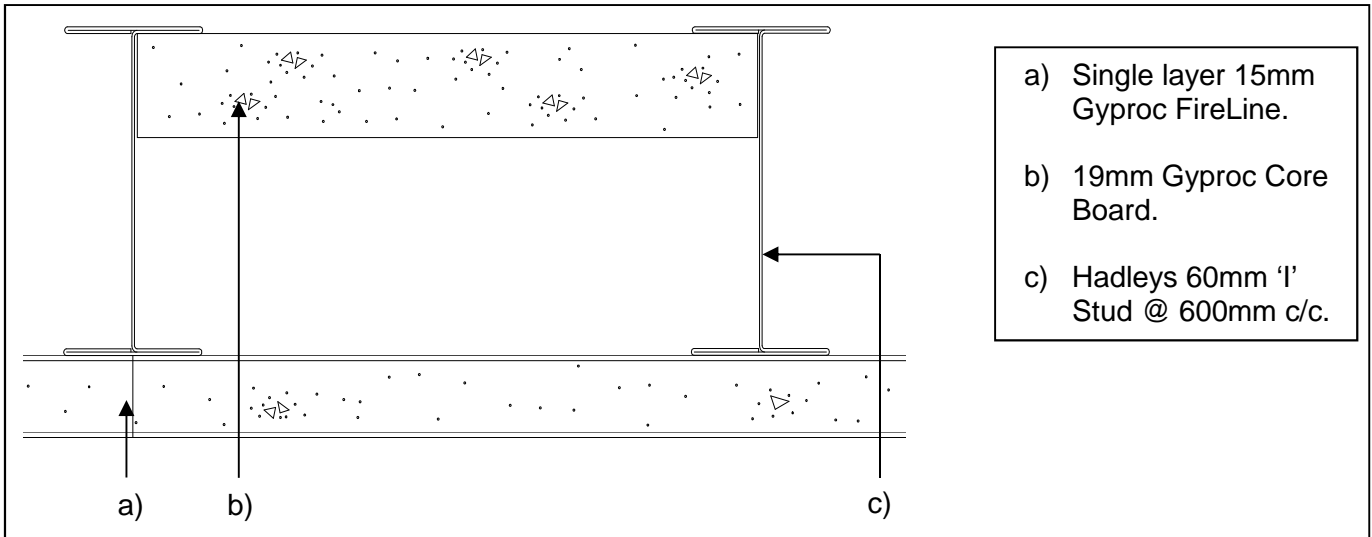
0296



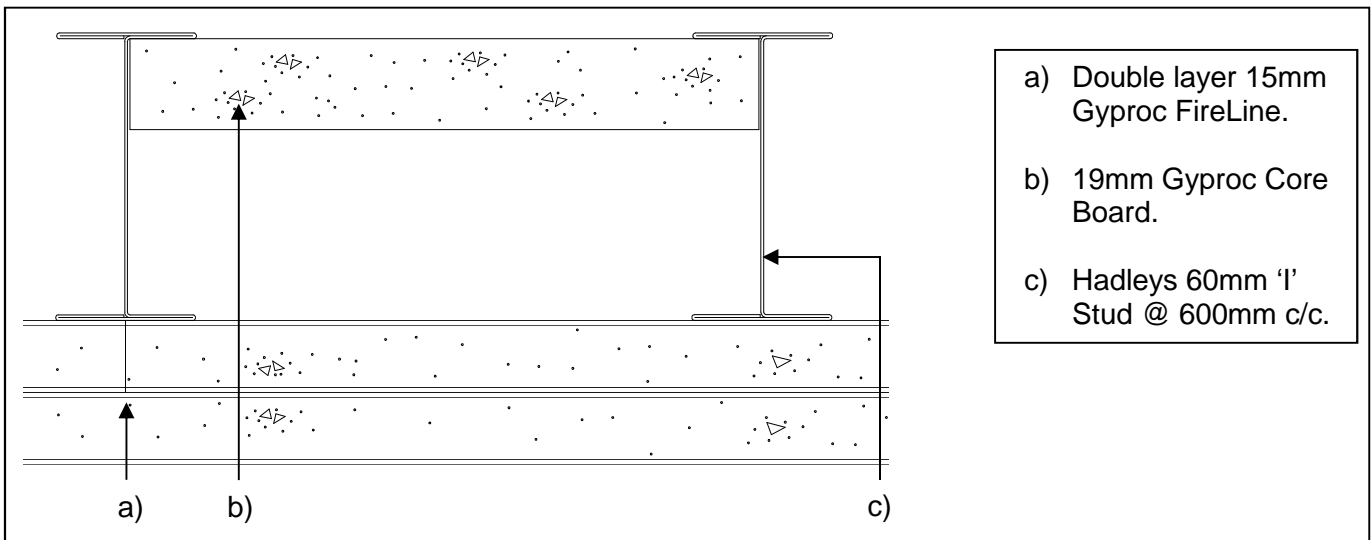
**Figure 1:** Horizontal cross section view of specimen H19956AA



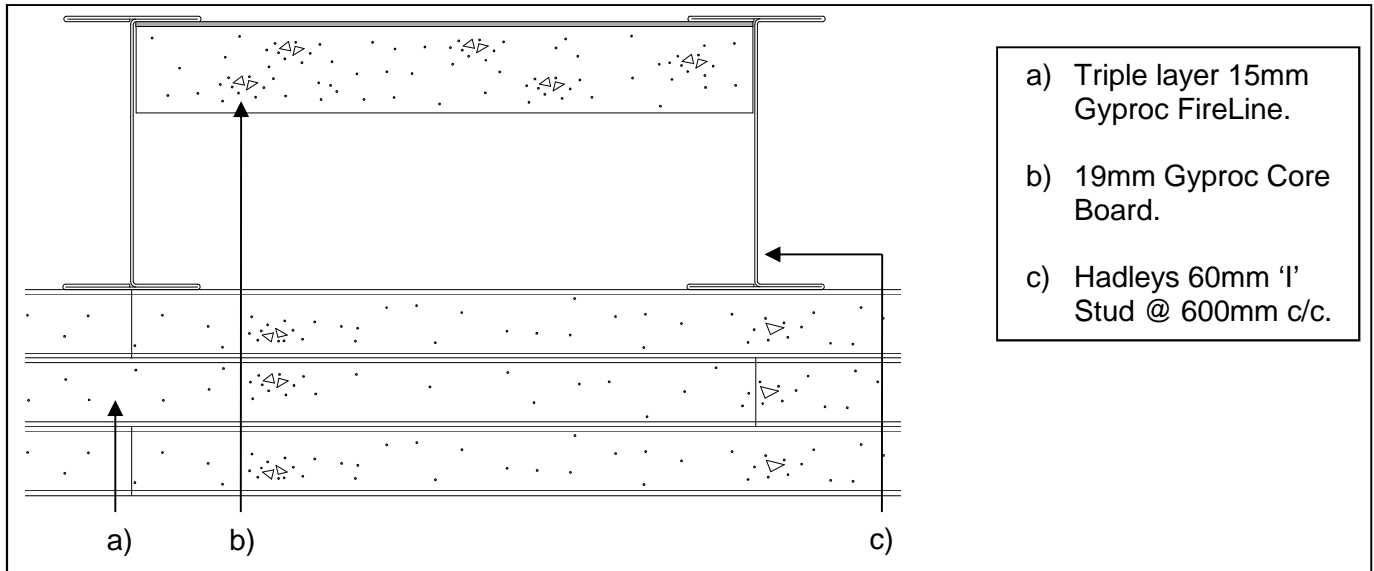
**Figure 2:** Horizontal cross section view of specimen H19956BA



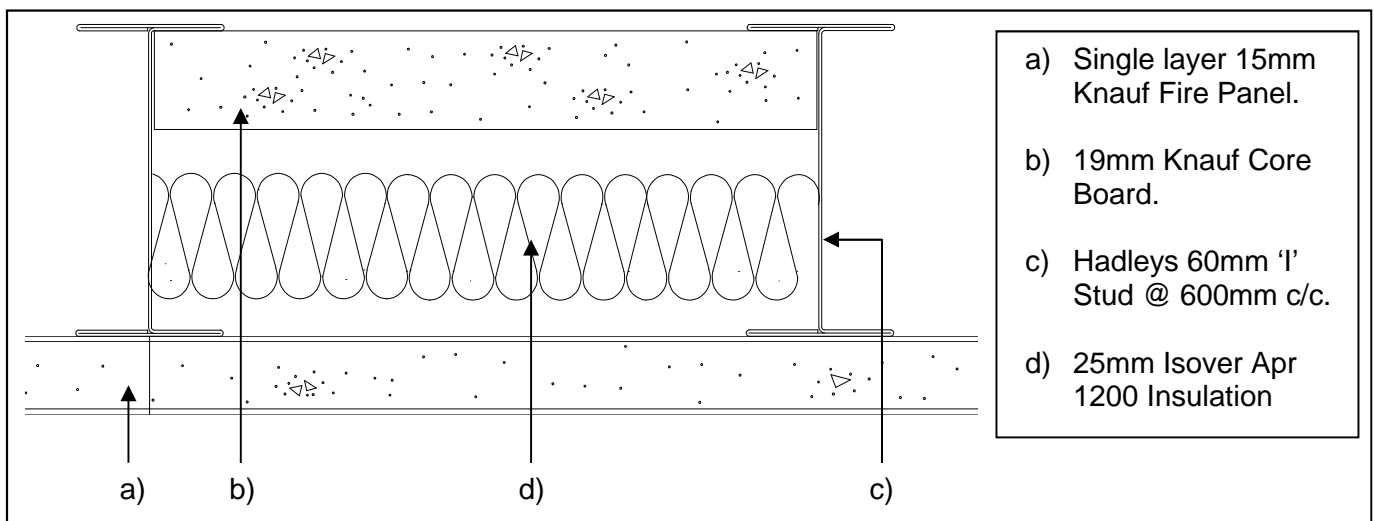
**Figure 3:** Horizontal cross section view of specimen H19956CA



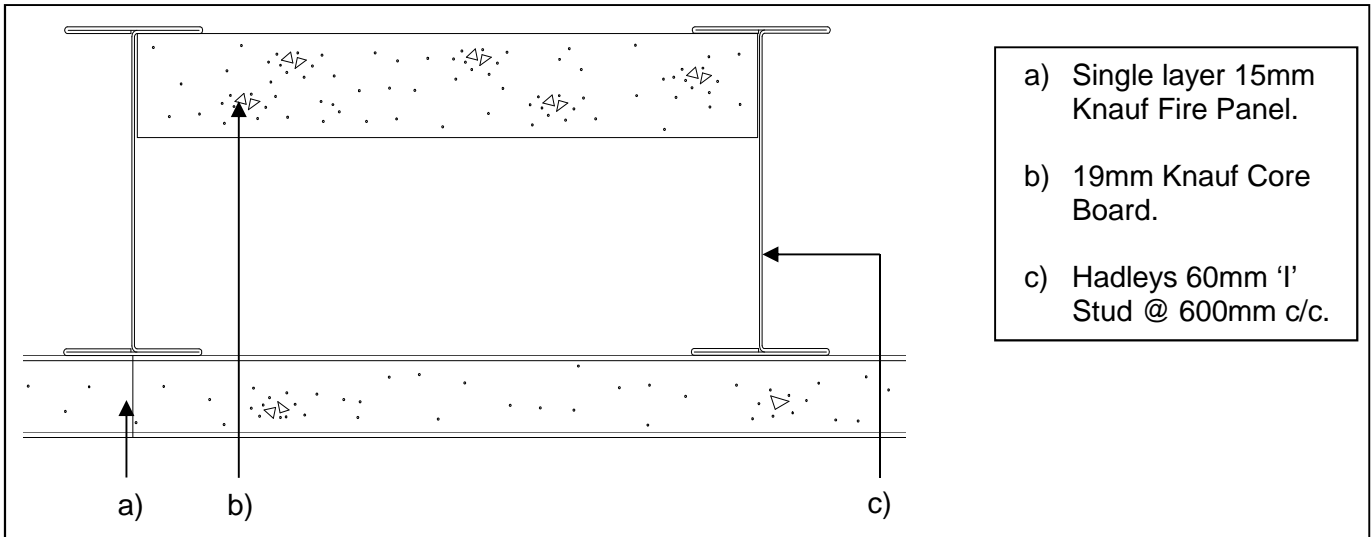
**Figure 4:** Horizontal cross section view of specimen H19956DA



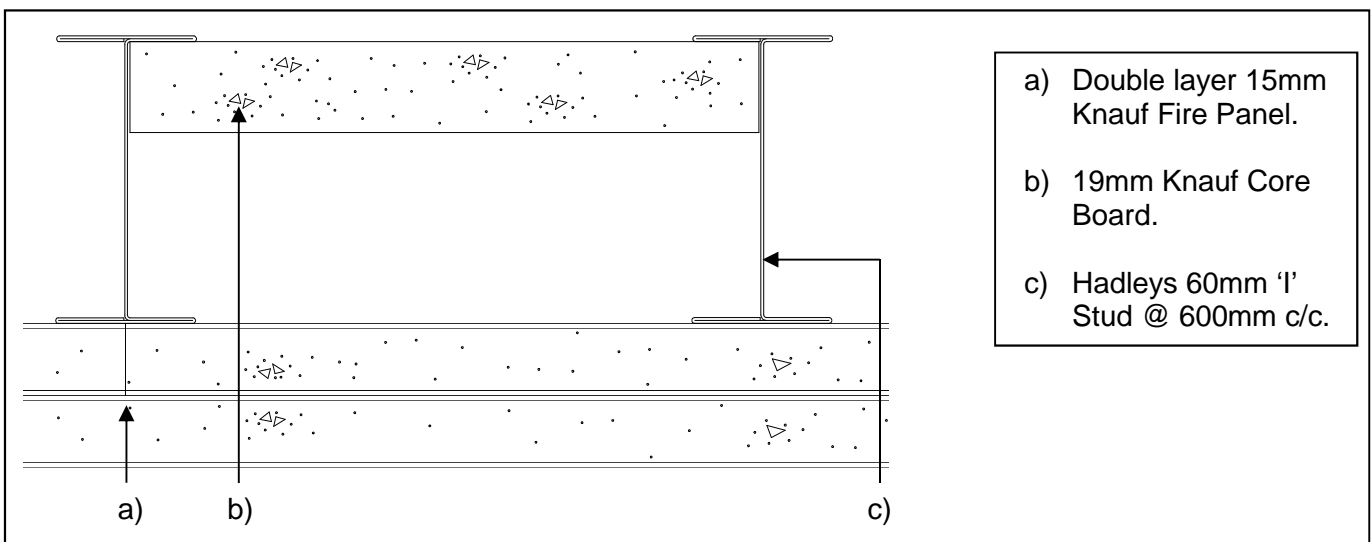
**Figure 5:** Horizontal cross section view of specimen H19956EA



**Figure 6:** Horizontal cross section view of specimen H19956FA



**Figure 7:** Horizontal cross section view of specimen H19956GA

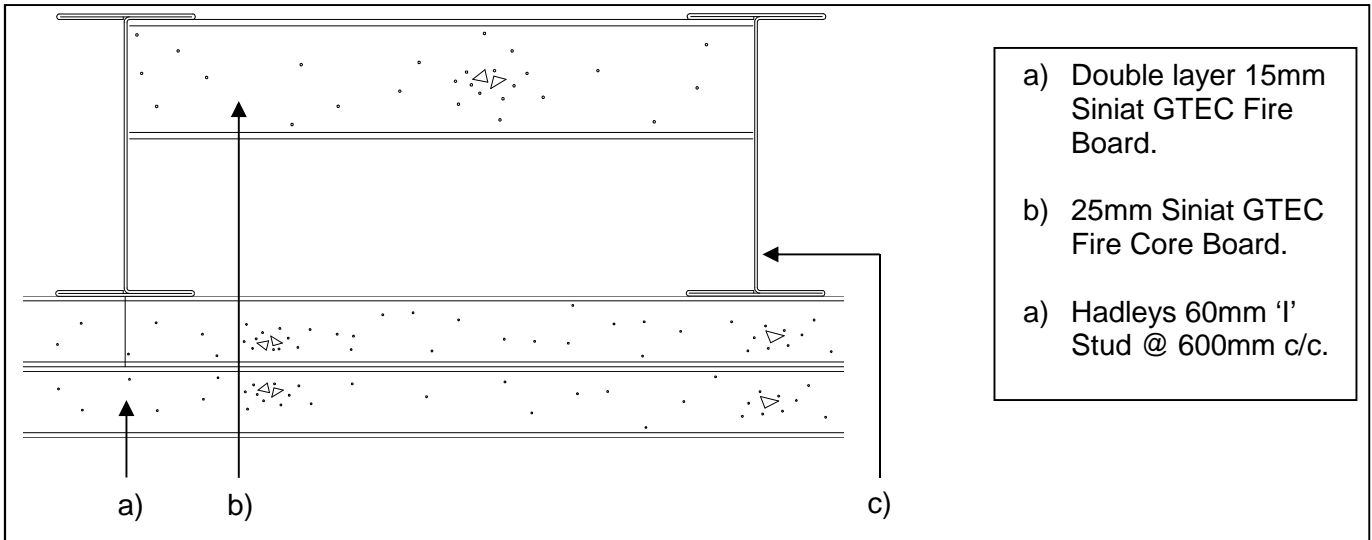


**Figure 8:** Horizontal cross section view of specimen H19956HA

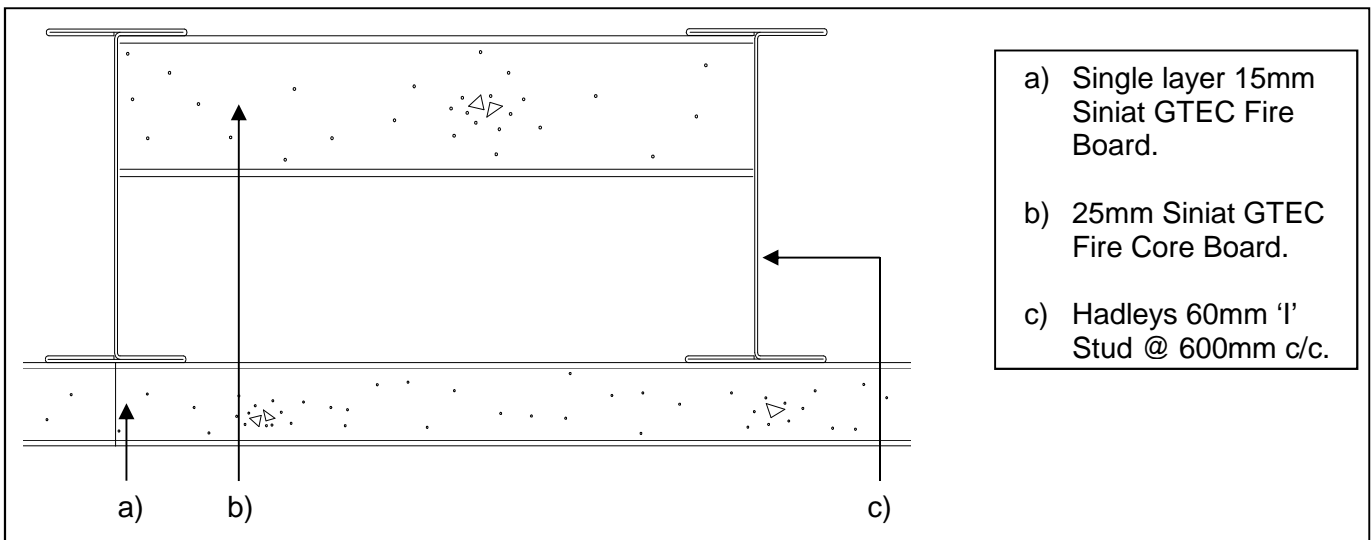
# The Building Test Centre

## Fire Acoustics Structures

The Building Test Centre  
British Gypsum  
East Leake  
Loughborough  
Leics. LE12 6NP  
Tel (0115) 945 1564  
Fax (0115) 945 1562  
Email [btc.testing@saint-gobain.com](mailto:btc.testing@saint-gobain.com)  
Website [www.btconline.co.uk](http://www.btconline.co.uk)



**Figure 9:** Horizontal cross section view of specimen H19956IA



**Figure 10:** Horizontal cross section view of specimen H19956JA

*The descriptions of individual components making up the test specimen were provided by the customer and were checked for accuracy wherever possible.*

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**

### TEST MATERIALS

#### Plasterboards

- i) Nominally 3000mm (long) x 600mm (wide) x 19mm (thick) Gyproc Core Board supplied by Hadley Group/Hadley Industries FZE (Dubai).

Surface density: 16.6kg/m<sup>2</sup>  
Average thickness: 18.8mm  
Board Code: 18 103 17 03:00

- ii) Nominally 2400mm (long) x 1200mm (wide) x 15mm (thick) Gyproc FireLine supplied by Hadley Group/Hadley Industries FZE (Dubai).

Surface density: 12.8kg/m<sup>2</sup>  
Average thickness: 15.4mm  
Board Code: 18 107 17 19:56  
18 107 17 19:56  
18 107 17 19:56

- iii) Nominally 3000mm (long) x 600mm (wide) x 19mm (thick) Knauf Core Board supplied by Hadley Group/Hadley Industries FZE (Dubai).

Surface density: 15.2kg/m<sup>2</sup>  
Average thickness: 19.0mm  
Board Code: 27/12/16 1 13:26  
27/12/16 1 13:26  
27/12/16 1 13:26

- iv) Nominally 2400mm (long) x 1200mm (wide) x 15mm (thick) Knauf Fire Panel supplied by Hadley Group/Hadley Industries FZE (Dubai).

Surface density: 11.9kg/m<sup>2</sup>  
Average thickness: 14.9mm  
Board Code: 14/04/17 1 19:36  
14/04/17 1 19:37  
14/04/17 1 19:37

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**

# The Building Test Centre

## Fire Acoustics Structures

The Building Test Centre  
British Gypsum  
East Leake  
Loughborough  
Leics. LE12 6NP  
Tel (0115) 945 1564  
Fax (0115) 945 1562  
Email [btc.testing@saint-gobain.com](mailto:btc.testing@saint-gobain.com)  
Website [www.btconline.co.uk](http://www.btconline.co.uk)

- v) Nominally 3000mm (long) x 600mm (wide) x 25mm (thick) Siniat GTEC Fire Core Board supplied by Hadley Group/Hadley Industries FZE (Dubai).

Surface density:	20.7kg/m <sup>2</sup>
Average thickness:	24.8mm
Board Code:	18.03.16 23:53 01/3

- vi) Nominally 2700mm (long) x 1200mm (wide) x 15mm (thick) Siniat GTEC Fire Board supplied by Hadley Group/Hadley Industries FZE (Dubai).

Surface density:	13.0kg/m <sup>2</sup>
Average thickness:	15.1mm
Board Code:	27353 22:44 27353 22:44

The surface densities were calculated using the actual weight and size of a selection of the boards used in the test specimen.

### Insulation

- i) Nominally 25mm thick Isover APR 1200 insulation supplied by Hadley Group/Hadley Industries FZE (Dubai).

Average area	24.00m <sup>2</sup>
Average weight	10.60kg
Density	17.67kg/m <sup>3</sup>

The density was calculated using the actual weight and size of the insulation used in the test specimen.

### Metal Components

- i) Nominally 0.5mm thick Hadleys 60mm 'I' Stud.
- ii) Nominally 0.5mm thick Hadleys 62mm Track.
- iii) Nominally 0.5mm thick Hadleys 62mm Deep Track.
- iv) 25mm x 25mm Steel Angle.
- v) Nominally 1mm thick Partition Bracket.

All metal components supplied by Hadley Group/Hadley Industries FZE (Dubai).

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**





# The Building Test Centre

## Fire Acoustics Structures

The Building Test Centre  
British Gypsum  
East Leake  
Loughborough  
Leics. LE12 6NP  
Tel (0115) 945 1564  
Fax (0115) 945 1562  
Email [btc.testing@saint-gobain.com](mailto:btc.testing@saint-gobain.com)  
Website [www.btconline.co.uk](http://www.btconline.co.uk)

### Fasteners

- i) 13mm Jack Point Wafer Head Screws.
- ii) 25mm Drywall Screws.
- iii) 35mm Drywall Screws.
- iv) 40mm Drywall Screws.
- v) 60mm Drywall Screws.

All fasteners supplied by The Building Test Centre.

### Miscellaneous Components

- i) Gyproc Sealant supplied by The Building Test Centre.
- ii) Joint tape supplied by The Building Test Centre.

Where measurements could not be taken, then weight and dimensions were provided by the customer or the manufacturer e.g. from material labelling. Material information was recorded according to procedure AP070 vs 1.0.

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**

BTC 19956A: Page 17 of 42



0296

# The Building Test Centre

## Fire Acoustics Structures

The Building Test Centre  
 British Gypsum  
 East Leake  
 Loughborough  
 Leics. LE12 6NP  
 Tel (0115) 945 1564  
 Fax (0115) 945 1562  
 Email [btc.testing@saint-gobain.com](mailto:btc.testing@saint-gobain.com)  
 Website [www.btconline.co.uk](http://www.btconline.co.uk)

### TEST RESULTS

Test Code	Description	Weighted Airborne Sound Reduction Index $R_w$ (C; Ctr)
H19956AA	Hadleys 60mm 'I' Stud partition, clad with a single layer of 19mm Gyproc Core Board inside the 'I' studs on the source room side, with a single layer of 15mm Gyproc FireLine on the external face of the framework on the receiving room side and 25mm Isover APR 1200 insulation in the cavity.	44 (-4;-11) dB
H19956BA	Hadleys 60mm 'I' Stud partition, clad with a single layer of 19mm Gyproc Core Board inside the 'I' studs on the source room side, with a double layer of 15mm Gyproc FireLine on the external face of the framework on the receiving room side and 25mm Isover APR 1200 insulation in the cavity.	47 (-4;-11) dB
H19956CA	Hadleys 60mm 'I' Stud partition, clad with a single layer of 19mm Gyproc Core Board inside the 'I' studs on the source room side, with a single layer of 15mm Gyproc FireLine on the external face of the framework on the receiving room side.	39 (-3;-8) dB
H19956DA	Hadleys 60mm 'I' Stud partition, clad with a single layer of 19mm Gyproc Core Board inside the 'I' studs on the source room side, with a double layer of 15mm Gyproc FireLine on the external face of the framework on the receiving room side.	42 (-3;-9) dB
H19956EA	Hadleys 60mm 'I' Stud partition, clad with a single layer of 19mm Gyproc Core Board inside the 'I' studs on the source room side, with a triple layer of 15mm Gyproc FireLine on the external face of the framework on the receiving room side.	44 (-4;-10) dB

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**

BTC 19956A: Page 18 of 42



0296

# The Building Test Centre

## Fire Acoustics Structures

The Building Test Centre  
 British Gypsum  
 East Leake  
 Loughborough  
 Leics. LE12 6NP  
 Tel (0115) 945 1564  
 Fax (0115) 945 1562  
 Email [btc.testing@saint-gobain.com](mailto:btc.testing@saint-gobain.com)  
 Website [www.btconline.co.uk](http://www.btconline.co.uk)

H19956FA	Hadleys 60mm 'I' Stud partition, clad with a single layer of 19mm Knauf Core Board inside the 'I' studs on the source room side, with a single layer of 15mm Knauf Fire Panel on the external face of the framework on the receiving room side and 25mm Isover APR 1200 insulation in the cavity.	43 (-3;-10) dB
H19956GA	Hadleys 60mm 'I' Stud partition, clad with a single layer of 19mm Knauf Core Board inside the 'I' studs on the source room side, with a single layer of 15mm Knauf Fire Panel on the external face of the framework on the receiving room side.	39 (-2;-7) dB
H19956HA	Hadleys 60mm 'I' Stud partition, clad with a single layer of 19mm Knauf Core Board inside the 'I' studs on the source room side, with a double layer of 15mm Knauf Fire Panel on the external face of the framework on the receiving room side.	42 (-3;-9) dB
H19956IA	Hadleys 60mm 'I' Stud partition, clad with a single layer of 25mm Siniat GTEC Fire Core Board inside the 'I' studs on the source room side, with a double layer of 15mm Siniat GTEC Fire Board on the external face of the framework on the receiving room side.	44 (-4;-10) dB
H19956JA	Hadleys 60mm 'I' Stud partition, clad with a single layer of 25mm Siniat GTEC Fire Core Board inside the 'I' studs on the source room side, with a single layer of 15mm Siniat GTEC Fire Board on the external face of the framework on the receiving room side.	41 (-2;-7) dB

For full data see Appendix A of this report.

Test conducted in accordance with BS EN ISO 10140-2:2010 except for Clause A.2 in BS EN ISO 10140-4:2010 where minimum distances for measurements at frequencies under 100Hz cannot be met.

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**



# The Building Test Centre

## Fire Acoustics Structures

The Building Test Centre  
British Gypsum  
East Leake  
Loughborough  
Leics. LE12 6NP  
Tel (0115) 945 1564  
Fax (0115) 945 1562  
Email [btc.testing@saint-gobain.com](mailto:btc.testing@saint-gobain.com)  
Website [www.btconline.co.uk](http://www.btconline.co.uk)

Rated in accordance with BS EN ISO 717-1: 2013.

No visible damage of the test specimens occurred during tests.

Testing to BS EN ISO 10140-2:2010 conforms to the requirements of BS EN ISO 140-3:1995 (withdrawn).

Where the uncertainty of measured values is stated, (e.g. temperature, relative humidity and static pressure) the reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor  $k=2$ , providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

### **TEST PROCEDURE**

The test specimen (3.6 m x 2.4 m) was constructed in a wall dividing two reverberant rooms of approximately 98m<sup>3</sup> and 62m<sup>3</sup>. The accuracy of the test method conforms to BS EN 20140-2:1993, the test procedure used is detailed in the test data in Appendix A of this report. Broad-band white noise was used to measure the level differences and broad-band pink noise was used to measure the reverberation times. Third octave band pass filters were used in real time mode. See appendix B for further information.

### **LIMITATIONS**

The results only relate to the behaviour of the element of construction under the particular conditions of test; they are not intended to be the sole criteria for assessing the potential acoustic performance of the element in use nor do they reflect the actual behaviour.

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**

BTC 19956A: Page 20 of 42

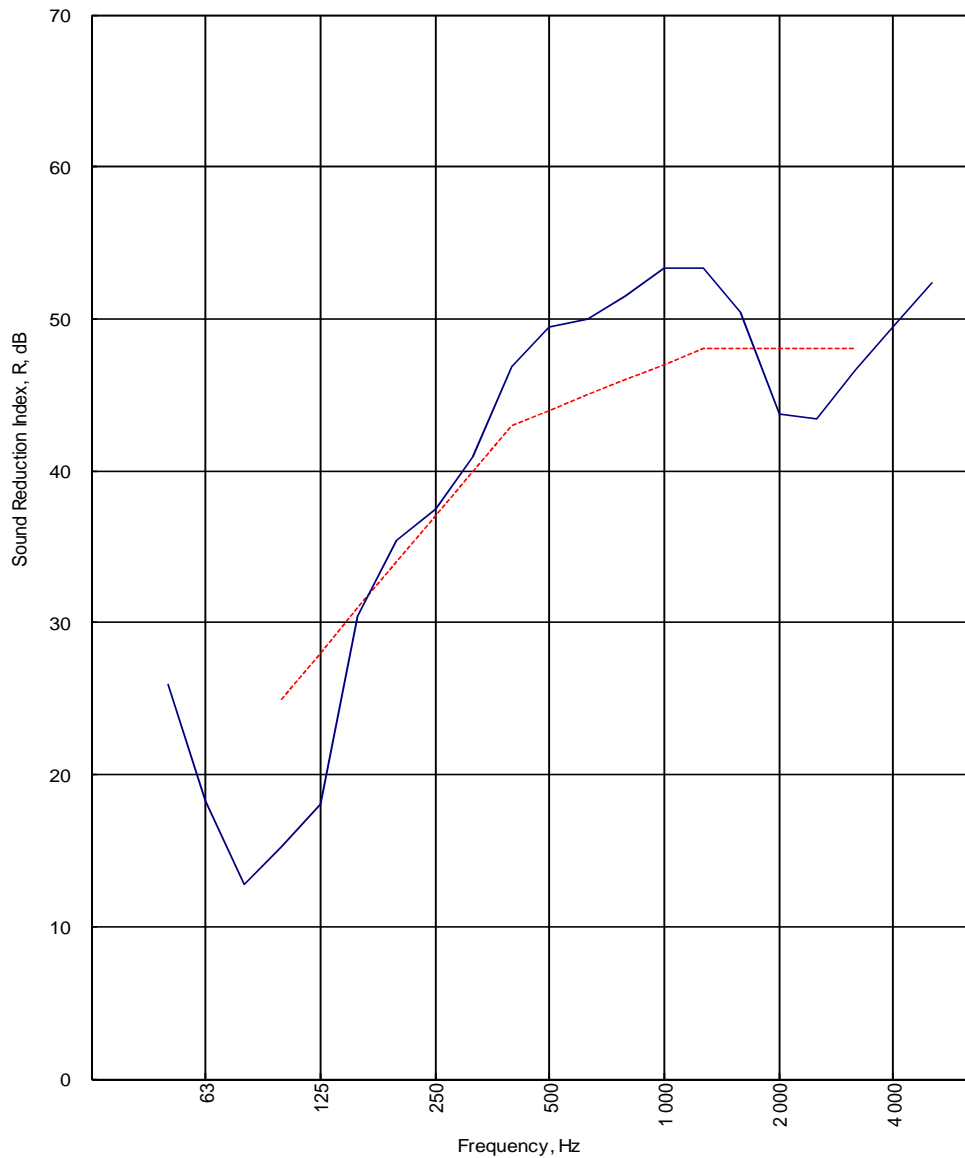


0296

## APPENDIX A - TEST DATA

Test Code: <b>H19956AA</b>
Test Date: <b>08/05/17</b>

Freq. Hz	R dB
50	25.9
63	18.3
80	12.8
100	15.3
125	18.1
160	30.5
200	35.4
250	37.5
315	40.9
400	46.9
500	49.4
630	50.0
800	51.5
1 000	53.3
1 250	53.3
1 600	50.4
2 000	43.7
2 500	43.4
3 150	46.7
4 000	49.4
5 000	52.4



----- Curve of reference values (ISO 717-1)

Rating according to BS EN ISO 717-1:2013	<b>R<sub>w</sub> (C;C<sub>tr</sub>) = 44 (-4;-11) dB</b>		
	<b>Max dev. 9.9 dB at 125 Hz</b>		
Evaluation based on laboratory measurement results obtained by an engineering method:	C <sub>50-3150</sub> = <b>-5 dB</b>	C <sub>50-5000</sub> = <b>-4 dB</b>	C <sub>100-5000</sub> = <b>-3 dB</b>
	C <sub>tr,50-3150</sub> = <b>-14 dB</b>	C <sub>tr,50-5000</sub> = <b>-14 dB</b>	C <sub>tr,100-5000</sub> = <b>-11 dB</b>

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**

BTC 19956A: Page 21 of 42



0296

**LABORATORY AIRBORNE SOUND INSULATION TEST - BS EN ISO 10140-2:2010**

Test Code: **H19956AA**

Test Date: **08/05/17**

Specimen Area, S =	<b>8.64</b> m <sup>2</sup>	Room Volume, m <sup>3</sup> :	<b>98</b>	Room T2	<b>60.33</b>	Room T1	
		Temperature, deg.C:	<b>17.2</b>		<b>17.4</b>		<b>± 0.3</b>
		Rel. Humidity, %RH:	<b>44.6</b>		<b>42.5</b>		<b>± 1.6</b>
		Static Pressure, Pa:	<b>102300</b>		<b>102300</b>		<b>± 65</b>

Freq Hz	Test Room T2 to Test Room T1						R dB	U.Dev. dB	R 1/1Oct dB
	Source dB	Rec. (uc) dB	Bgrnd dB	Rec. (corr) dB	Rev.time Sec	Corr. dB			
50	59.4	31.5	21.6	<b>31.0</b>	0.63	-2.5	<b>25.9</b>		
63	64.4	45.1	12.0	45.1	0.89	-1.0	<b>18.3</b>		16.3
80	73.3	58.5	6.9	58.5	0.71	-2.0	<b>12.8</b>		
100	78.9	62.1	4.0	62.1	0.80	-1.5	<b>15.3</b>	9.7	
125	100.3	80.7	3.1	80.7	0.80	-1.5	<b>18.1</b>	9.9	18.2
160	85.7	55.2	5.8	55.2	1.13	0.0	<b>30.5</b>	0.5	
200	90.3	56.2	14.8	56.2	1.50	1.3	<b>35.4</b>		
250	91.9	56.3	3.7	56.3	1.73	1.9	<b>37.5</b>		37.4
315	92.3	52.8	4.7	52.8	1.54	1.4	<b>40.9</b>		
400	91.2	45.7	15.8	45.7	1.53	1.4	<b>46.9</b>		
500	89.9	42.2	4.6	42.2	1.65	1.7	<b>49.4</b>		48.5
630	88.4	39.8	6.0	39.8	1.53	1.4	<b>50.0</b>		
800	89.1	39.1	4.7	39.1	1.59	1.5	<b>51.5</b>		
1 000	88.9	37.1	13.2	37.1	1.59	1.5	<b>53.3</b>		52.6
1 250	89.8	37.9	5.4	37.9	1.56	1.4	<b>53.3</b>		
1 600	92.3	43.4	4.6	43.4	1.59	1.5	<b>50.4</b>		
2 000	94.1	51.8	3.9	51.8	1.55	1.4	<b>43.7</b>	4.3	44.9
2 500	92.6	50.0	3.3	50.0	1.34	0.8	<b>43.4</b>	4.6	
3 150	91.5	45.2	4.2	45.2	1.22	0.4	<b>46.7</b>	1.3	
4 000	92.1	42.9	7.9	42.9	1.18	0.2	<b>49.4</b>		48.9
5 000	96.4	44.1	11.5	44.1	1.14	0.1	<b>52.4</b>		
6 300									
8 000									
10 000									

<b>Single Figure Ratings</b>	<b>Rw</b>	<b>C</b>	<b>Ctr</b>	<b>Total U. Dev., dB</b>	<b>30.3</b>
<b>BS EN ISO 717-1: 2013</b>	<b>dB</b>	<b>dB</b>	<b>dB</b>		
	<b>44</b>	<b>-4</b>	<b>-11</b>		
	<b>(100-5000)</b>	<b>-3</b>	<b>-11</b>		
<b>Background Corrected</b>	<b>(50-3150)</b>	<b>-5</b>	<b>-14</b>		
	<b>(50-5000)</b>	<b>-4</b>	<b>-14</b>		

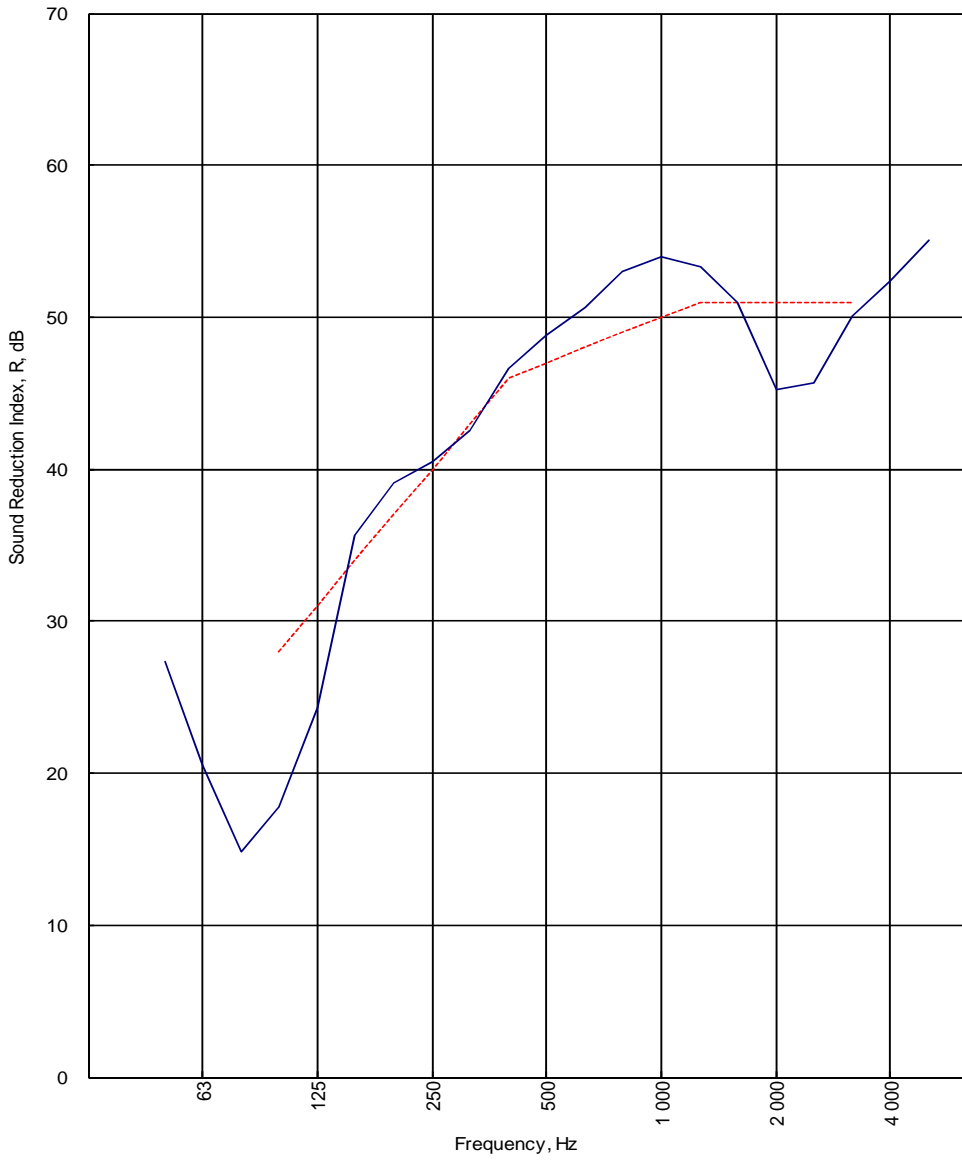
Procedure: AP 047 vs 1.0  
Worksheet: 140\_3\_1.XLS

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**



Test Code:  
**H19956BA**  
 Test Date:  
**08/05/17**

Freq. Hz	R dB
50	27.3
63	20.6
80	14.8
100	17.7
125	24.3
160	35.7
200	39.1
250	40.5
315	42.6
400	46.7
500	48.8
630	50.6
800	53.0
1 000	54.0
1 250	53.3
1 600	51.0
2 000	45.2
2 500	45.7
3 150	50.1
4 000	52.4
5 000	55.1



----- Curve of reference values (ISO 717-1)

Rating according to BS EN ISO 717-1:2013	<b>R<sub>w</sub> (C;Ctr) = 47 (-4;-11) dB</b>		
	<b>Max dev. 10.3 dB at 100 Hz</b>		
Evaluation based on laboratory measurement results obtained by an engineering method:	C <sub>50-3150</sub> = <b>-5 dB</b>	C <sub>50-5000</sub> = <b>-4 dB</b>	C <sub>100-5000</sub> = <b>-3 dB</b>
	C <sub>tr,50-3150</sub> = <b>-14 dB</b>	C <sub>tr,50-5000</sub> = <b>-14 dB</b>	C <sub>tr,100-5000</sub> = <b>-11 dB</b>

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**



**LABORATORY AIRBORNE SOUND INSULATION TEST - BS EN ISO 10140-2:2010**

Test Code: **H19956BA**

Test Date: **08/05/17**

Specimen Area, S =	<b>8.64</b> m <sup>2</sup>	Room Volume, m <sup>3</sup> :	<b>98</b>	Room T2	<b>60.21</b>	Room T1	
		Temperature, deg.C:	<b>17.1</b>		<b>16.9</b>		<b>± 0.3</b>
		Rel. Humidity, %RH:	<b>45.6</b>		<b>45.7</b>		<b>± 1.6</b>
		Static Pressure, Pa:	<b>102200</b>		<b>102200</b>		<b>± 65</b>

Freq Hz	Test Room T2 to Test Room T1						R dB	U.Dev. dB	R 1/1Oct dB
	Source dB	Rec. (uc) dB	Bgrnd dB	Rec. (corr) dB	Rev.time Sec	Corr. dB			
50	60.8	30.9	21.7	<b>30.3</b>	<b>0.53</b>	-3.2	<b>27.3</b>		
63	64.0	42.5	13.6	42.5	<b>0.91</b>	-0.9	<b>20.6</b>		18.4
80	73.9	56.9	7.8	56.9	0.67	-2.2	<b>14.8</b>		
100	78.6	59.7	4.5	59.7	0.85	-1.2	<b>17.7</b>	10.3	
125	99.5	74.9	4.6	74.9	1.05	-0.3	<b>24.3</b>	6.7	21.6
160	85.5	50.6	6.8	50.6	1.34	0.8	<b>35.7</b>		
200	90.1	52.8	14.9	52.8	1.67	1.8	<b>39.1</b>		
250	92.0	53.6	4.3	53.6	1.79	2.1	<b>40.5</b>		40.5
315	92.1	51.0	5.2	51.0	1.58	1.5	<b>42.6</b>	0.4	
400	91.1	45.8	14.7	45.8	1.53	1.4	<b>46.7</b>		
500	89.7	42.3	5.0	42.3	1.53	1.4	<b>48.8</b>		48.4
630	88.5	39.0	5.5	39.0	1.45	1.1	<b>50.6</b>		
800	89.0	37.5	4.2	37.5	1.58	1.5	<b>53.0</b>		
1 000	88.9	36.1	12.9	36.1	1.47	1.2	<b>54.0</b>		53.4
1 250	89.7	37.7	3.4	37.7	1.50	1.3	<b>53.3</b>		
1 600	92.4	42.8	3.2	42.8	1.53	1.4	<b>51.0</b>		
2 000	94.2	50.2	3.8	50.2	1.46	1.2	<b>45.2</b>	5.8	46.6
2 500	92.7	47.6	2.9	47.6	1.28	0.6	<b>45.7</b>	5.3	
3 150	91.7	42.1	4.2	42.1	1.25	0.5	<b>50.1</b>	0.9	
4 000	92.3	40.1	7.7	40.1	1.18	0.2	<b>52.4</b>		52.1
5 000	96.5	41.4	12.0	41.4	1.12	0.0	<b>55.1</b>		
6 300									
8 000									
10 000									

<b>Single Figure Ratings</b>	<b>Rw</b>	<b>C</b>	<b>Ctr</b>	<b>Total U. Dev., dB</b>	<b>29.4</b>
<b>BS EN ISO 717-1: 2013</b>	<b>dB</b>	<b>dB</b>	<b>dB</b>		
	<b>47</b>	<b>-4</b>	<b>-11</b>		
	<b>(100-5000)</b>	<b>-3</b>	<b>-11</b>		
<b>Background Corrected</b>	<b>(50-3150)</b>	<b>-5</b>	<b>-14</b>		
<b>RT's &gt; factor 1.5 apart</b>	<b>(50-5000)</b>	<b>-4</b>	<b>-14</b>		
				Procedure: AP047 vs 1.0	
				Worksheet: 140_3_1.XLS	

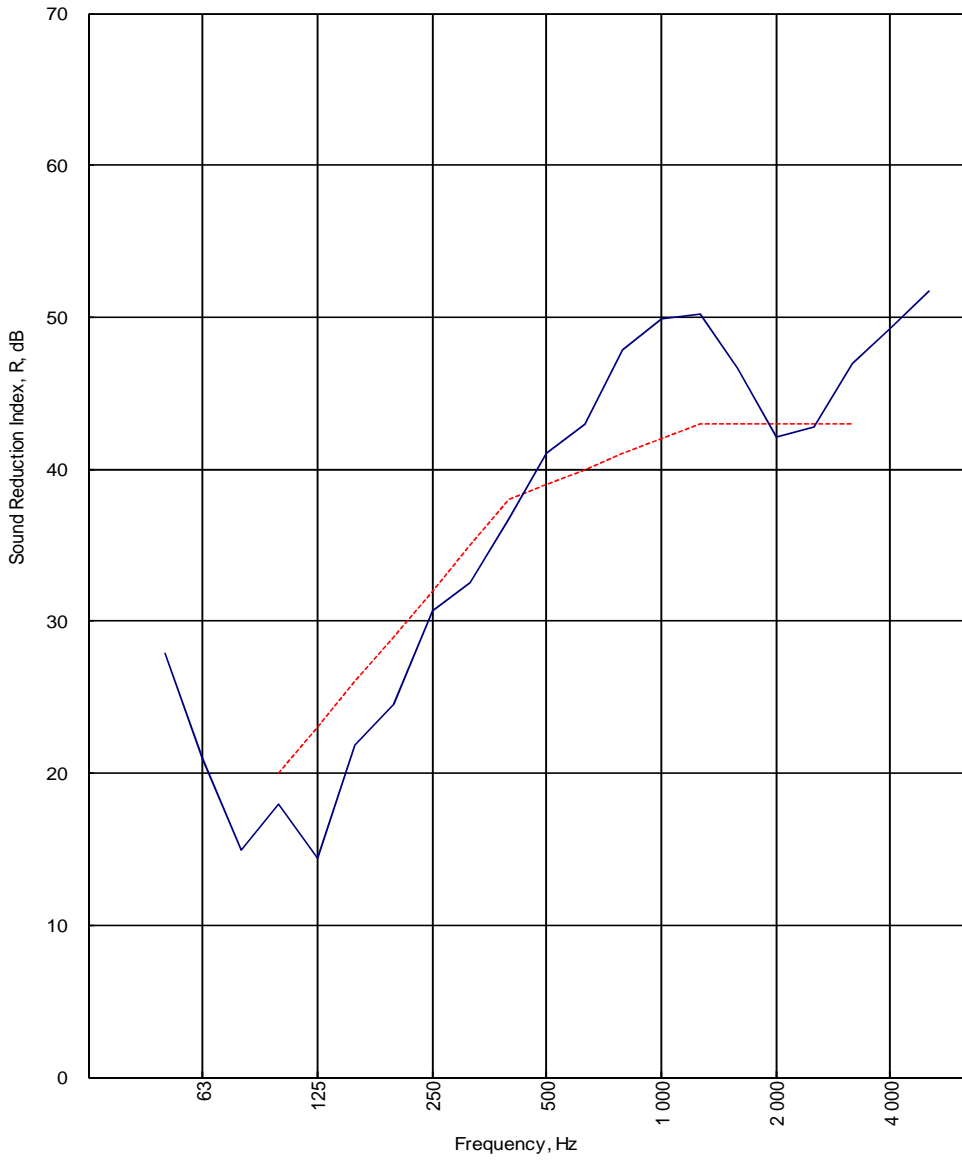
Customer: **Hadley Group/Hadley Industries FZE (Dubai)**





Test Code:  
**H19956CA**  
 Test Date:  
**08/05/17**

Freq. Hz	R dB
50	27.9
63	21.0
80	14.9
100	18.0
125	14.4
160	21.8
200	24.5
250	30.7
315	32.5
400	36.7
500	41.0
630	43.0
800	47.8
1 000	49.9
1 250	50.2
1 600	46.6
2 000	42.1
2 500	42.8
3 150	47.0
4 000	49.2
5 000	51.7



----- Curve of reference values (ISO 717-1)

Rating according to BS EN ISO 717-1:2013	<b>R<sub>w</sub> (C;Ctr) = 39 (-3;-8) dB</b>		
	<b>Max dev. 8.6 dB at 125 Hz</b>		
Evaluation based on laboratory measurement results obtained by an engineering method:	C <sub>50-3150</sub> = <b>-3 dB</b>	C <sub>50-5000</sub> = <b>-2 dB</b>	C <sub>100-5000</sub> = <b>-2 dB</b>
	C <sub>tr,50-3150</sub> = <b>-9 dB</b>	C <sub>tr,50-5000</sub> = <b>-9 dB</b>	C <sub>tr,100-5000</sub> = <b>-8 dB</b>

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**



**LABORATORY AIRBORNE SOUND INSULATION TEST - BS EN ISO 10140-2:2010**

Test Code: **H19956CA**

Test Date: **08/05/17**

Specimen Area, S =	<b>8.64</b> m <sup>2</sup>	Room Volume, m <sup>3</sup> :	<b>98</b>	Room T2	Room T1
		Temperature, deg.C:	<b>18.2</b>	<b>18.4</b>	<b>± 0.3</b>
		Rel. Humidity, %RH:	<b>43.1</b>	<b>45.2</b>	<b>± 1.6</b>
		Static Pressure, Pa:	<b>102300</b>	<b>102300</b>	<b>± 65</b>

Freq Hz	Test Room T2 to Test Room T1						R dB	U.Dev. dB	R 1/1Oct dB
	Source dB	Rec. (uc) dB	Bgrnd dB	Rec. (corr) dB	Rev.time Sec	Corr. dB			
50	61.0	31.5	22.1	<b>31.0</b>	0.69	-2.1	<b>27.9</b>		
63	66.5	44.8	18.1	44.8	<b>0.95</b>	-0.7	<b>21.0</b>		18.5
80	75.0	57.5	12.9	57.5	<b>0.61</b>	-2.6	<b>14.9</b>		
100	80.0	60.6	7.4	60.6	0.81	-1.4	<b>18.0</b>	2.0	
125	99.8	84.4	5.0	84.4	0.88	-1.0	<b>14.4</b>	8.6	17.1
160	85.4	63.3	7.7	63.3	1.05	-0.3	<b>21.8</b>	4.2	
200	90.0	66.6	15.7	66.6	1.44	1.1	<b>24.5</b>	4.5	
250	92.5	63.5	4.5	63.5	1.66	1.7	<b>30.7</b>	1.3	27.8
315	92.3	61.5	5.5	61.5	1.64	1.7	<b>32.5</b>	2.5	
400	91.0	56.0	16.5	56.0	1.64	1.7	<b>36.7</b>	1.3	
500	89.8	50.0	5.5	50.0	1.47	1.2	<b>41.0</b>		39.4
630	88.5	46.9	6.0	46.9	1.55	1.4	<b>43.0</b>		
800	89.2	42.8	4.5	42.8	1.56	1.4	<b>47.8</b>		
1 000	89.1	40.6	13.1	40.6	1.54	1.4	<b>49.9</b>		49.2
1 250	89.8	41.1	3.7	41.1	1.57	1.5	<b>50.2</b>		
1 600	92.4	47.2	3.5	47.2	1.55	1.4	<b>46.6</b>		
2 000	94.3	53.6	3.8	53.6	1.56	1.4	<b>42.1</b>	0.9	43.4
2 500	92.7	50.7	3.1	50.7	1.35	0.8	<b>42.8</b>	0.2	
3 150	91.8	45.3	4.3	45.3	1.26	0.5	<b>47.0</b>		
4 000	92.3	43.6	8.1	43.6	1.24	0.5	<b>49.2</b>		48.9
5 000	96.5	44.9	12.0	44.9	1.15	0.1	<b>51.7</b>		
6 300									
8 000									
10 000									

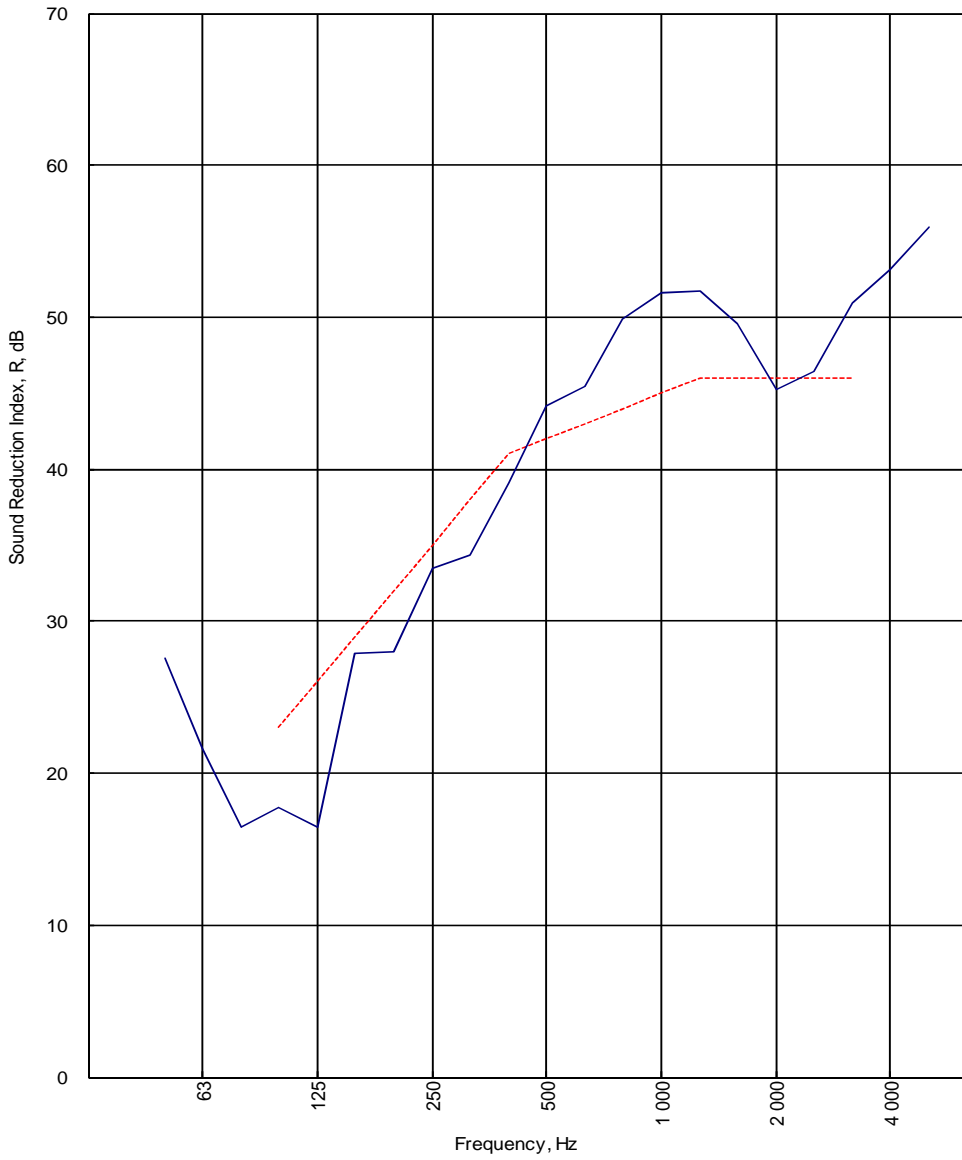
<b>Single Figure Ratings</b>	<b>Rw</b>	<b>C</b>	<b>Ctr</b>	<b>Total U. Dev., dB</b>	<b>25.5</b>
<b>BS EN ISO 717-1: 2013</b>	<b>dB</b>	<b>dB</b>	<b>dB</b>		
	<b>39</b>	<b>-3</b>	<b>-8</b>		
	<b>(100-5000)</b>	<b>-2</b>	<b>-8</b>		
<b>Background Corrected</b>	<b>(50-3150)</b>	<b>-3</b>	<b>-9</b>		
<b>RT's &gt; factor 1.5 apart</b>	<b>(50-5000)</b>	<b>-2</b>	<b>-9</b>		
				Procedure: AP 047 vs 1.0	
				Worksheet: 140_3_1.XLS	

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**



Test Code:  
**H19956DA**  
 Test Date:  
**08/05/17**

Freq. Hz	R dB
50	27.6
63	21.6
80	16.5
100	17.7
125	16.4
160	27.9
200	28.0
250	33.5
315	34.4
400	39.1
500	44.2
630	45.5
800	49.9
1 000	51.6
1 250	51.7
1 600	49.6
2 000	45.2
2 500	46.4
3 150	51.0
4 000	53.1
5 000	55.9



----- Curve of reference values (ISO 717-1)

Rating according to BS EN ISO 717-1:2013	<b>R<sub>w</sub> (C;C<sub>tr</sub>) = 42 (-3;-9) dB</b>		
Evaluation based on laboratory measurement results obtained by an engineering method:	<b>Max dev. 9.6 dB at 125 Hz</b>		
	C <sub>50-3150</sub> = <b>-4 dB</b>	C <sub>50-5000</sub> = <b>-3 dB</b>	C <sub>100-5000</sub> = <b>-2 dB</b>
	C <sub>tr,50-3150</sub> = <b>-11 dB</b>	C <sub>tr,50-5000</sub> = <b>-11 dB</b>	C <sub>tr,100-5000</sub> = <b>-9 dB</b>

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**



**LABORATORY AIRBORNE SOUND INSULATION TEST - BS EN ISO 10140-2:2010**

Test Code: **H19956DA**

Test Date: **08/05/17**

Specimen Area, S =	<b>8.64</b> m <sup>2</sup>	Room Volume, m <sup>3</sup> :	<b>98</b>	Room T2	<b>60.21</b>	Room T1	
		Temperature, deg.C:	<b>18.3</b>		<b>18.2</b>		<b>± 0.3</b>
		Rel. Humidity, %RH:	<b>43.4</b>		<b>45.9</b>		<b>± 1.6</b>
		Static Pressure, Pa:	<b>102300</b>		<b>102300</b>		<b>± 65</b>

Freq Hz	Test Room T2 to Test Room T1						R dB	U.Dev. dB	R 1/1Oct dB
	Source dB	Rec. (uc) dB	Bgrnd dB	Rec. (corr) dB	Rev.time Sec	Corr. dB			
50	59.9	30.7	22.4	<b>30.0</b>	0.66	-2.3	<b>27.6</b>		
63	65.8	43.3	21.5	43.3	0.91	-0.9	<b>21.6</b>		19.9
80	73.7	54.7	14.2	54.7	0.62	-2.5	<b>16.5</b>		
100	79.7	60.9	8.9	60.9	0.86	-1.1	<b>17.7</b>	5.3	
125	78.7	61.3	4.7	61.3	0.88	-1.0	<b>16.4</b>	9.6	18.6
160	84.6	56.9	5.8	56.9	1.17	0.2	<b>27.9</b>	1.1	
200	90.0	63.3	15.5	63.3	1.49	1.3	<b>28.0</b>	4.0	
250	92.4	60.8	5.3	60.8	1.71	1.9	<b>33.5</b>	1.5	31.0
315	92.3	59.3	5.6	59.3	1.53	1.4	<b>34.4</b>	3.6	
400	91.1	53.3	15.3	53.3	1.50	1.3	<b>39.1</b>	1.9	
500	89.8	46.9	5.8	46.9	1.51	1.3	<b>44.2</b>		42.0
630	88.5	44.2	6.4	44.2	1.48	1.2	<b>45.5</b>		
800	89.2	40.8	4.4	40.8	1.56	1.5	<b>49.9</b>		
1 000	89.0	38.8	12.7	38.8	1.53	1.4	<b>51.6</b>		51.0
1 250	89.8	39.7	4.0	39.7	1.62	1.6	<b>51.7</b>		
1 600	92.4	44.3	3.8	44.3	1.57	1.5	<b>49.6</b>		
2 000	94.2	50.2	4.0	50.2	1.48	1.2	<b>45.2</b>	0.8	46.7
2 500	92.7	47.1	3.2	47.1	1.33	0.8	<b>46.4</b>		
3 150	91.7	41.3	4.4	41.3	1.28	0.6	<b>51.0</b>		
4 000	92.4	39.7	8.1	39.7	1.23	0.4	<b>53.1</b>		52.9
5 000	96.6	41.0	12.3	41.0	1.19	0.3	<b>55.9</b>		
6 300									
8 000									
10 000									

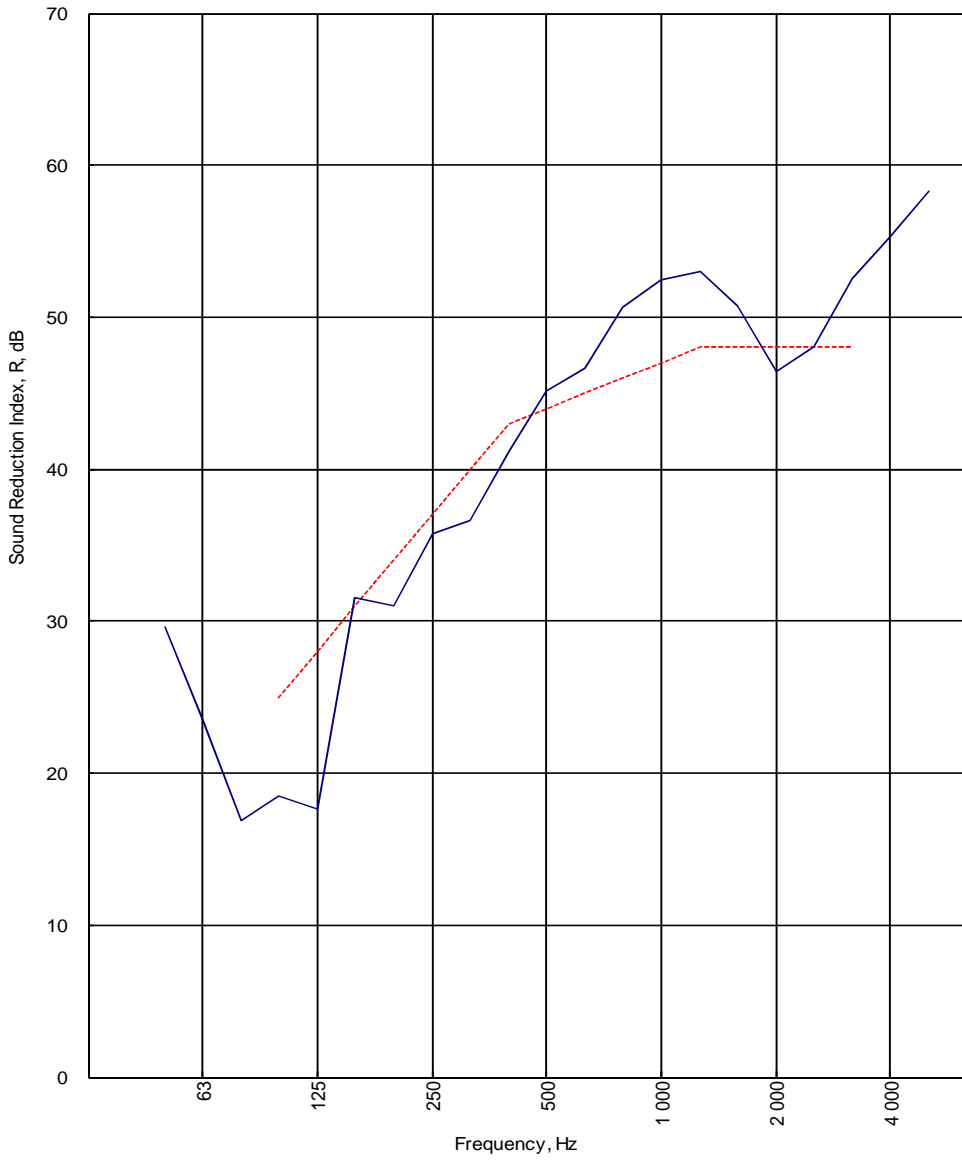
<b>Single Figure Ratings</b>	<b>Rw</b>	<b>C</b>	<b>Ctr</b>	<b>Total U. Dev., dB</b>	<b>27.8</b>
<b>BS EN ISO 717-1: 2013</b>	<b>dB</b>	<b>dB</b>	<b>dB</b>		
	<b>42</b>	<b>-3</b>	<b>-9</b>		
	<b>(100-5000)</b>	<b>-2</b>	<b>-9</b>		
<b>Background Corrected</b>	<b>(50-3150)</b>	<b>-4</b>	<b>-11</b>		
	<b>(50-5000)</b>	<b>-3</b>	<b>-11</b>		
				Procedure: AP 047 vs 1.0	
				Worksheet: 140_3_1.XLS	

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**



Test Code:  
**H19956EA**  
 Test Date:  
**08/05/17**

Freq. Hz	R dB
50	29.6
63	23.6
80	16.9
100	18.5
125	17.6
160	31.5
200	31.0
250	35.8
315	36.6
400	41.2
500	45.1
630	46.7
800	50.6
1 000	52.5
1 250	53.0
1 600	50.7
2 000	46.4
2 500	48.0
3 150	52.6
4 000	55.3
5 000	58.3



----- Curve of reference values (ISO 717-1)

Rating according to BS EN ISO 717-1:2013	<b>R<sub>w</sub> (C;Ctr) = 44 (-4;-10) dB</b>		
Evaluation based on laboratory measurement results obtained by an engineering method:	<b>Max dev. 10.4 dB at 125 Hz</b>		
	C <sub>50-3150</sub> = <b>-4 dB</b>	C <sub>50-5000</sub> = <b>-3 dB</b>	C <sub>100-5000</sub> = <b>-3 dB</b>
	C <sub>tr,50-3150</sub> = <b>-12 dB</b>	C <sub>tr,50-5000</sub> = <b>-12 dB</b>	C <sub>tr,100-5000</sub> = <b>-10 dB</b>

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**



**LABORATORY AIRBORNE SOUND INSULATION TEST - BS EN ISO 10140-2:2010**

Test Code: **H19956EA**

Test Date: **08/05/17**

Specimen Area, S =	<b>8.64</b> m <sup>2</sup>	Room Volume, m <sup>3</sup> :	<b>98</b>	Room T2	<b>60.08</b>	Room T1	
		Temperature, deg.C:	<b>18</b>		<b>18.1</b>		<b>± 0.3</b>
		Rel. Humidity, %RH:	<b>44.6</b>		<b>46.8</b>		<b>± 1.6</b>
		Static Pressure, Pa:	<b>102300</b>		<b>102300</b>		<b>± 65</b>

Freq Hz	Test Room T2 to Test Room T1						R dB	U.Dev. dB	R 1/1Oct dB
	Source dB	Rec. (uc) dB	Bgrnd dB	Rec. (corr) dB	Rev.time Sec	Corr. dB			
50	61.4	29.7	21.7	<b>29.0</b>	<b>0.59</b>	-2.8	<b>29.6</b>		
63	65.4	40.9	21.1	40.9	<b>0.91</b>	-0.9	<b>23.6</b>		20.6
80	73.0	53.8	13.3	53.8	0.66	-2.3	<b>16.9</b>		
100	78.9	58.9	8.1	58.9	0.79	-1.5	<b>18.5</b>	6.5	
125	99.5	81.1	5.7	81.1	0.92	-0.8	<b>17.6</b>	10.4	19.7
160	85.4	54.1	6.4	54.1	1.17	0.2	<b>31.5</b>		
200	90.1	60.3	14.2	60.3	1.47	1.2	<b>31.0</b>	3.0	
250	92.4	58.4	5.8	58.4	1.68	1.8	<b>35.8</b>	1.2	33.7
315	91.9	57.0	5.8	57.0	1.66	1.7	<b>36.6</b>	3.4	
400	91.0	51.1	15.7	51.1	1.51	1.3	<b>41.2</b>	1.8	
500	89.8	45.8	6.0	45.8	1.44	1.1	<b>45.1</b>		43.7
630	88.6	43.0	6.5	43.0	1.43	1.1	<b>46.7</b>		
800	89.1	39.8	4.8	39.8	1.50	1.3	<b>50.6</b>		
1 000	88.9	37.9	12.8	37.9	1.57	1.5	<b>52.5</b>		51.9
1 250	89.8	38.4	3.9	38.4	1.59	1.6	<b>53.0</b>		
1 600	92.3	43.1	4.0	43.1	1.56	1.5	<b>50.7</b>		
2 000	94.1	49.0	4.1	49.0	1.50	1.3	<b>46.4</b>	1.6	48.0
2 500	92.7	45.7	3.1	45.7	1.39	1.0	<b>48.0</b>		
3 150	91.6	39.6	4.2	39.6	1.27	0.6	<b>52.6</b>		
4 000	92.3	37.4	8.0	37.4	1.23	0.4	<b>55.3</b>		54.8
5 000	96.6	38.6	12.1	38.6	1.18	0.3	<b>58.3</b>		
6 300									
8 000									
10 000									

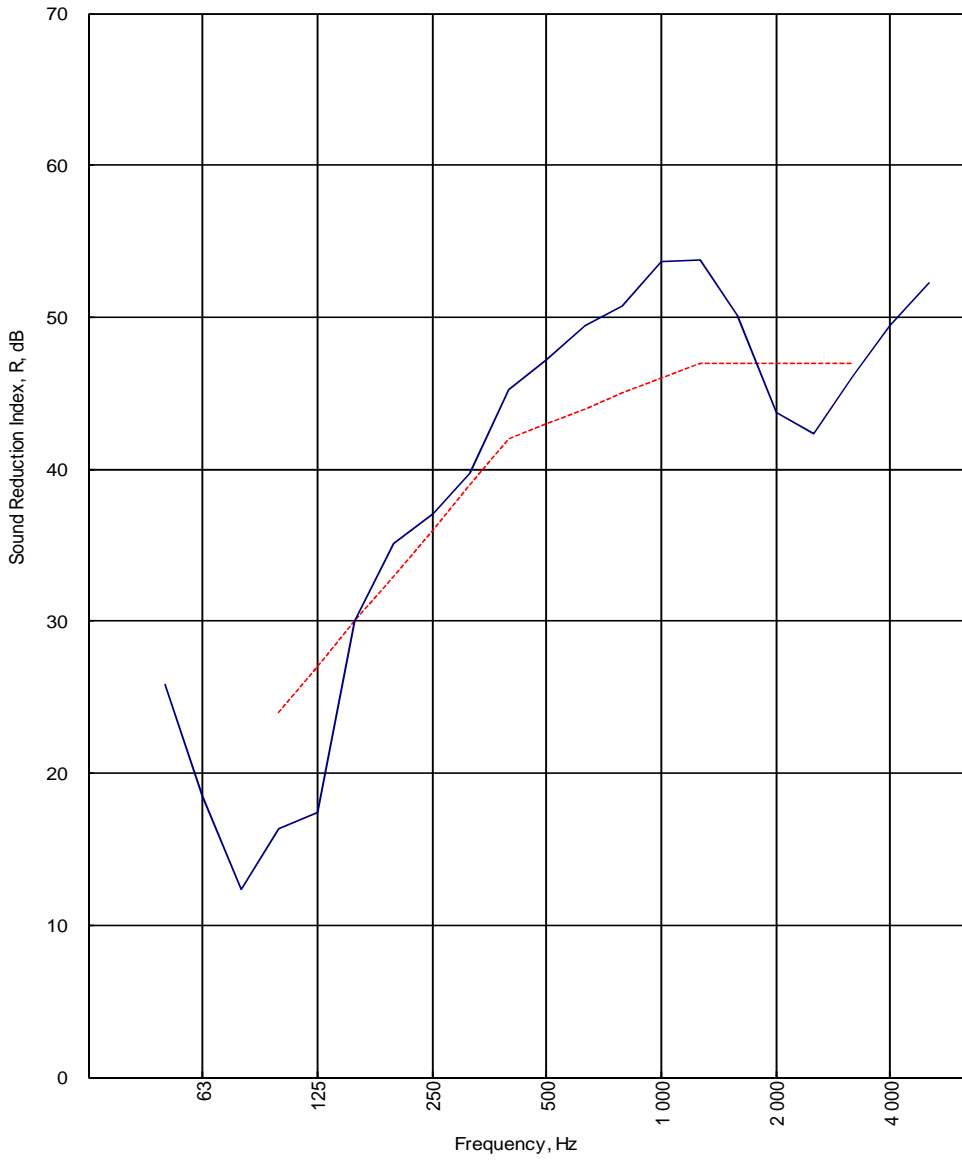
<b>Single Figure Ratings</b>	<b>Rw</b>	<b>C</b>	<b>Ctr</b>	<b>Total U. Dev., dB</b>	<b>27.9</b>
<b>BS EN ISO 717-1: 2013</b>	<b>dB</b>	<b>dB</b>	<b>dB</b>		
	<b>44</b>	<b>-4</b>	<b>-10</b>		
	<b>(100-5000)</b>	<b>-3</b>	<b>-10</b>		
<b>Background Corrected</b>	<b>(50-3150)</b>	<b>-4</b>	<b>-12</b>		
<b>RT's &gt; factor 1.5 apart</b>	<b>(50-5000)</b>	<b>-3</b>	<b>-12</b>		
				Procedure: AP 047 vs 1.0	
				Worksheet: 140_3_1.XLS	

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**



Test Code:  
**H19956FA**  
 Test Date:  
**09/05/17**

Freq. Hz	R dB
50	25.8
63	18.5
80	12.3
100	16.3
125	17.4
160	30.0
200	35.1
250	37.1
315	39.7
400	45.3
500	47.2
630	49.5
800	50.8
1 000	53.7
1 250	53.8
1 600	50.1
2 000	43.7
2 500	42.3
3 150	46.1
4 000	49.5
5 000	52.3



----- Curve of reference values (ISO 717-1)

Rating according to BS EN ISO 717-1:2013	<b>R<sub>w</sub> (C;C<sub>tr</sub>) = 43 (-3;-10) dB</b>		
	<b>Max dev. 9.6 dB at 125 Hz</b>		
Evaluation based on laboratory measurement results obtained by an engineering method:	C <sub>50-3150</sub> = <b>-5 dB</b>	C <sub>50-5000</sub> = <b>-4 dB</b>	C <sub>100-5000</sub> = <b>-2 dB</b>
	C <sub>tr,50-3150</sub> = <b>-13 dB</b>	C <sub>tr,50-5000</sub> = <b>-13 dB</b>	C <sub>tr,100-5000</sub> = <b>-10 dB</b>

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**



**LABORATORY AIRBORNE SOUND INSULATION TEST - BS EN ISO 10140-2:2010**

Test Code: **H19956FA**

Test Date: **09/05/17**

Specimen Area, S =	<b>8.64</b> m <sup>2</sup>	Room Volume, m <sup>3</sup> :	<b>98</b>	Room T2	<b>60.33</b>	Room T1	
		Temperature, deg.C:	<b>17.5</b>		<b>17.8</b>		<b>± 0.3</b>
		Rel. Humidity, %RH:	<b>43.1</b>		<b>41.2</b>		<b>± 1.6</b>
		Static Pressure, Pa:	<b>101900</b>		<b>101900</b>		<b>± 65</b>

Freq Hz	Test Room T2 to Test Room T1						R dB	U.Dev. dB	R 1/1Oct dB
	Source dB	Rec. (uc) dB	Bgrnd dB	Rec. (corr) dB	Rev.time Sec	Corr. dB			
50	61.0	32.7	20.5	<b>32.4</b>	<b>0.59</b>	-2.8	<b>25.8</b>		
63	65.3	45.9	15.3	45.9	<b>0.90</b>	-0.9	<b>18.5</b>		16.0
80	74.1	59.2	6.2	59.2	0.61	-2.6	<b>12.3</b>		
100	79.3	61.4	6.1	61.4	0.77	-1.6	<b>16.3</b>	7.7	
125	99.5	80.7	4.2	80.7	0.81	-1.4	<b>17.4</b>	9.6	18.5
160	85.4	55.3	4.9	55.3	1.09	-0.1	<b>30.0</b>		
200	90.2	56.5	13.0	56.5	1.53	1.4	<b>35.1</b>		
250	92.3	56.8	3.7	56.8	1.60	1.6	<b>37.1</b>		36.9
315	92.1	53.8	4.7	53.8	1.53	1.4	<b>39.7</b>		
400	91.0	47.0	16.3	47.0	1.50	1.3	<b>45.3</b>		
500	89.9	43.7	5.5	43.7	1.42	1.0	<b>47.2</b>		47.0
630	88.5	40.5	6.4	40.5	1.59	1.5	<b>49.5</b>		
800	89.1	39.7	4.3	39.7	1.56	1.4	<b>50.8</b>		
1 000	88.9	36.8	13.2	36.8	1.63	1.6	<b>53.7</b>		52.5
1 250	89.7	37.5	4.0	37.5	1.62	1.6	<b>53.8</b>		
1 600	92.2	43.6	4.2	43.6	1.58	1.5	<b>50.1</b>		
2 000	94.1	51.7	4.0	51.7	1.51	1.3	<b>43.7</b>	3.3	44.3
2 500	92.6	51.0	3.1	51.0	1.31	0.7	<b>42.3</b>	4.7	
3 150	91.5	45.8	4.2	45.8	1.22	0.4	<b>46.1</b>	0.9	
4 000	92.1	42.9	8.1	42.9	1.21	0.3	<b>49.5</b>		48.6
5 000	96.3	44.0	10.8	44.0	1.11	0.0	<b>52.3</b>		
6 300									
8 000									
10 000									

<b>Single Figure Ratings</b>	<b>Rw</b>	<b>C</b>	<b>Ctr</b>	<b>Total U. Dev., dB</b>	<b>26.2</b>
<b>BS EN ISO 717-1: 2013</b>	<b>dB</b>	<b>dB</b>	<b>dB</b>		
	<b>43</b>	<b>-3</b>	<b>-10</b>		
	<b>(100-5000)</b>	<b>-2</b>	<b>-10</b>		
<b>Background Corrected</b>	<b>(50-3150)</b>	<b>-5</b>	<b>-13</b>		
<b>RT's &gt; factor 1.5 apart</b>	<b>(50-5000)</b>	<b>-4</b>	<b>-13</b>		
				Procedure: AP 047 vs 1.0	
				Worksheet: 140_3_1.XLS	

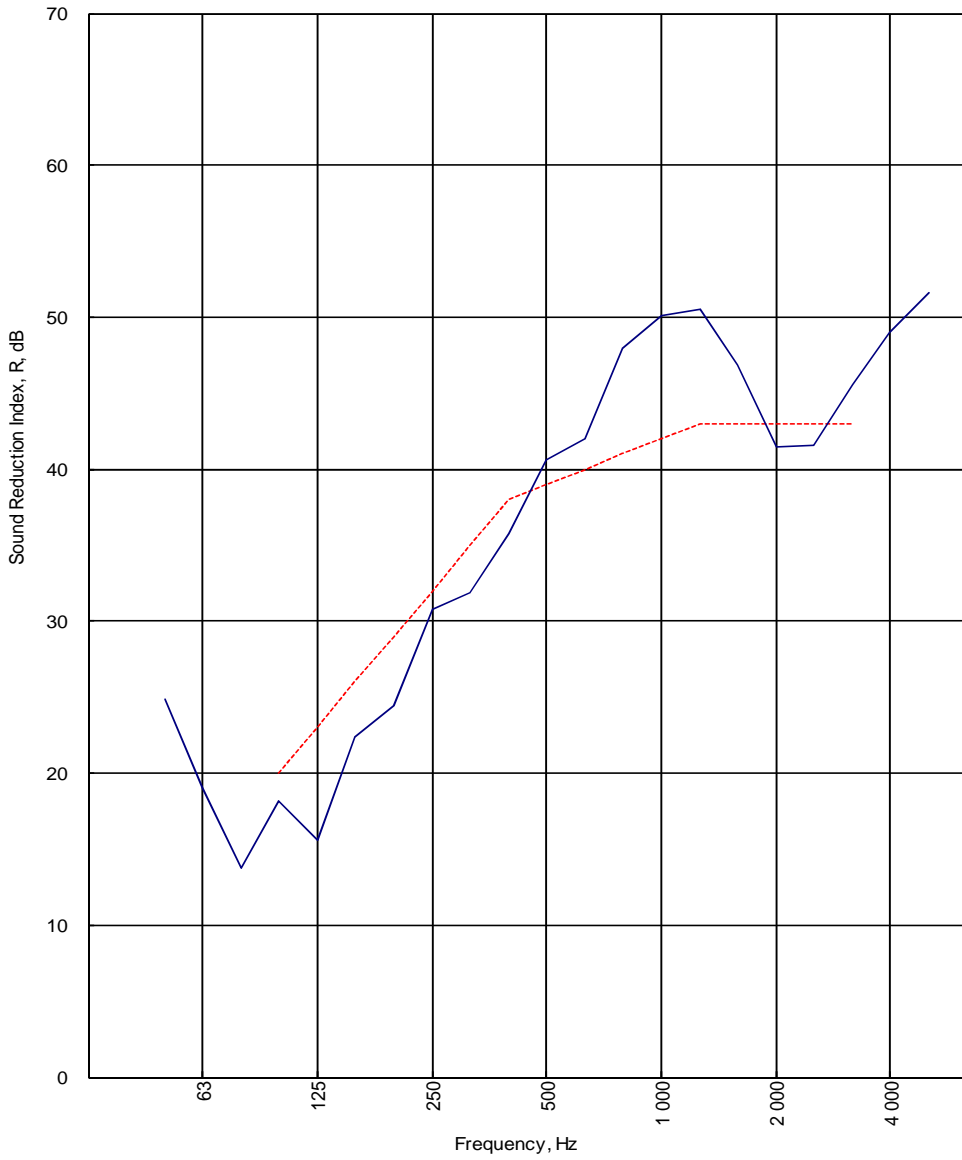
Customer: **Hadley Group/Hadley Industries FZE (Dubai)**





Test Code:  
**H19956GA**  
 Test Date:  
**09/05/17**

Freq. Hz	R dB
50	24.9
63	19.0
80	13.7
100	18.2
125	15.6
160	22.4
200	24.4
250	30.8
315	31.9
400	35.8
500	40.6
630	42.0
800	47.9
1 000	50.1
1 250	50.5
1 600	46.9
2 000	41.5
2 500	41.6
3 150	45.6
4 000	49.0
5 000	51.6



----- Curve of reference values (ISO 717-1)

Rating according to BS EN ISO 717-1:2013	<b>R<sub>w</sub> (C;Ctr) = 39 (-2;-7) dB</b>		
	<b>Max dev. 7.4 dB at 125 Hz</b>		
Evaluation based on laboratory measurement results obtained by an engineering method:	C <sub>50-3150</sub> = <b>-3 dB</b>	C <sub>50-5000</sub> = <b>-2 dB</b>	C <sub>100-5000</sub> = <b>-1 dB</b>
	C <sub>tr,50-3150</sub> = <b>-9 dB</b>	C <sub>tr,50-5000</sub> = <b>-9 dB</b>	C <sub>tr,100-5000</sub> = <b>-7 dB</b>

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**



**LABORATORY AIRBORNE SOUND INSULATION TEST - BS EN ISO 10140-2:2010**

Test Code: **H19956GA**

Test Date: **09/05/17**

Specimen Area, S =	<b>8.64</b> m <sup>2</sup>	Room Volume, m <sup>3</sup> :	<b>98</b>	Room T2	<b>60.33</b>	Room T1	
		Temperature, deg.C:	<b>17.6</b>		<b>17.7</b>		<b>± 0.3</b>
		Rel. Humidity, %RH:	<b>43.2</b>		<b>42.6</b>		<b>± 1.6</b>
		Static Pressure, Pa:	<b>101900</b>		<b>101900</b>		<b>± 65</b>

Freq Hz	Test Room T2 to Test Room T1						R dB	U.Dev. dB	R 1/1Oct dB
	Source dB	Rec. (uc) dB	Bgrnd dB	Rec. (corr) dB	Rev.time Sec	Corr. dB			
50	60.8	33.2	20.2	<b>33.0</b>	0.57	-2.9	<b>24.9</b>		
63	65.8	45.5	16.7	45.5	0.83	-1.3	<b>19.0</b>		17.1
80	73.3	56.8	8.8	56.8	0.59	-2.8	<b>13.7</b>		
100	79.3	60.0	6.8	60.0	0.86	-1.1	<b>18.2</b>	1.8	
125	99.9	83.2	3.6	83.2	0.86	-1.1	<b>15.6</b>	7.4	17.9
160	84.9	62.7	6.3	62.7	1.17	0.2	<b>22.4</b>	3.6	
200	90.0	67.0	15.5	67.0	1.54	1.4	<b>24.4</b>	4.6	
250	92.3	63.0	4.5	63.0	1.57	1.5	<b>30.8</b>	1.2	27.7
315	92.3	61.8	5.1	61.8	1.55	1.4	<b>31.9</b>	3.1	
400	91.1	56.6	14.5	56.6	1.49	1.3	<b>35.8</b>	2.2	
500	89.8	50.5	6.1	50.5	1.49	1.3	<b>40.6</b>		38.6
630	88.5	47.8	5.9	47.8	1.52	1.3	<b>42.0</b>		
800	88.9	42.6	4.3	42.6	1.61	1.6	<b>47.9</b>		
1 000	88.9	40.3	12.6	40.3	1.58	1.5	<b>50.1</b>		49.3
1 250	89.7	40.6	4.0	40.6	1.53	1.4	<b>50.5</b>		
1 600	92.3	46.9	3.5	46.9	1.57	1.5	<b>46.9</b>		
2 000	94.1	53.9	3.6	53.9	1.50	1.3	<b>41.5</b>	1.5	42.7
2 500	92.6	51.7	3.1	51.7	1.31	0.7	<b>41.6</b>	1.4	
3 150	91.5	46.3	4.2	46.3	1.22	0.4	<b>45.6</b>		
4 000	92.1	43.3	8.0	43.3	1.18	0.2	<b>49.0</b>		48.0
5 000	96.4	44.7	10.7	44.7	1.10	-0.1	<b>51.6</b>		
6 300									
8 000									
10 000									

<b>Single Figure Ratings</b>	<b>Rw</b>	<b>C</b>	<b>Ctr</b>	<b>Total U. Dev., dB</b>	<b>26.8</b>
<b>BS EN ISO 717-1: 2013</b>	<b>dB</b>	<b>dB</b>	<b>dB</b>		
	<b>39</b>	<b>-2</b>	<b>-7</b>		
	<b>(100-5000)</b>	<b>-1</b>	<b>-7</b>		
<b>Background Corrected</b>	<b>(50-3150)</b>	<b>-3</b>	<b>-9</b>		
	<b>(50-5000)</b>	<b>-2</b>	<b>-9</b>		

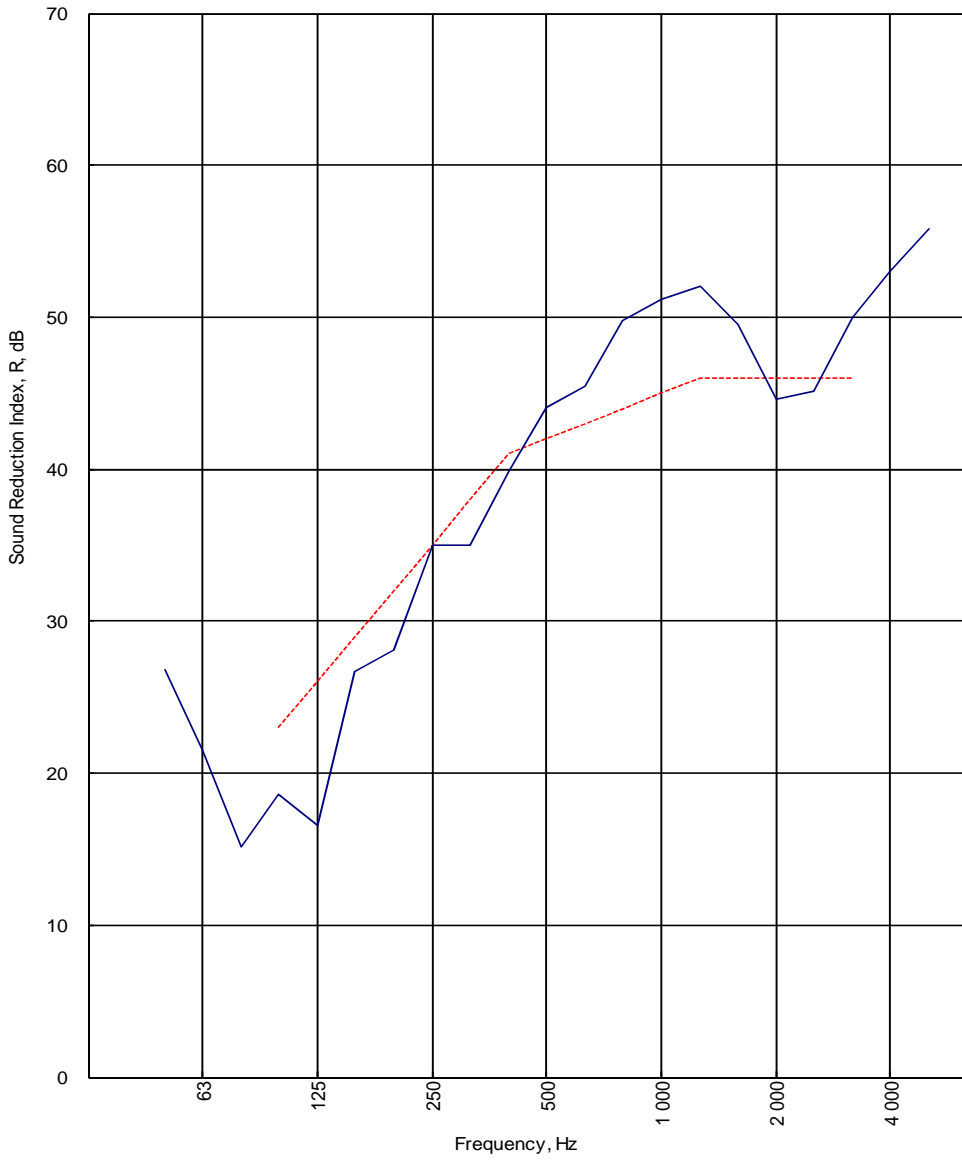
Procedure: AP 047 vs 1.0  
Worksheet: 140\_3\_1.XLS

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**



Test Code:  
**H19956HA**  
 Test Date:  
**09/05/17**

Freq. Hz	R dB
50	26.8
63	21.5
80	15.2
100	18.6
125	16.6
160	26.7
200	28.1
250	35.0
315	35.0
400	39.9
500	44.1
630	45.5
800	49.8
1 000	51.2
1 250	52.0
1 600	49.6
2 000	44.6
2 500	45.1
3 150	50.0
4 000	53.0
5 000	55.8



----- Curve of reference values (ISO 717-1)

Rating according to BS EN ISO 717-1:2013	<b>R<sub>w</sub> (C;Ctr) = 42 (-3;-9) dB</b>		
Evaluation based on laboratory measurement results obtained by an engineering method:	<b>Max dev. 9.4 dB at 125 Hz</b>		
	C <sub>50-3150</sub> = <b>-4 dB</b>	C <sub>50-5000</sub> = <b>-3 dB</b>	C <sub>100-5000</sub> = <b>-2 dB</b>
	C <sub>tr,50-3150</sub> = <b>-11 dB</b>	C <sub>tr,50-5000</sub> = <b>-11 dB</b>	C <sub>tr,100-5000</sub> = <b>-9 dB</b>

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**



**LABORATORY AIRBORNE SOUND INSULATION TEST - BS EN ISO 10140-2:2010**

Test Code: **H19956HA**

Test Date: **09/05/17**

Specimen Area, S =	<b>8.64</b> m <sup>2</sup>	Room Volume, m <sup>3</sup> :	<b>98</b>	Room T2	<b>60.21</b>	Room T1	
		Temperature, deg.C:	<b>17.6</b>		<b>17.6</b>		<b>± 0.3</b>
		Rel. Humidity, %RH:	<b>43.7</b>		<b>43.2</b>		<b>± 1.6</b>
		Static Pressure, Pa:	<b>101800</b>		<b>101800</b>		<b>± 65</b>

Freq Hz	Test Room T2 to Test Room T1						R dB	U.Dev. dB	R 1/1Oct dB
	Source dB	Rec. (uc) dB	Bgrnd dB	Rec. (corr) dB	Rev.time Sec	Corr. dB			
50	60.2	31.1	20.2	<b>30.7</b>	0.60	-2.7	<b>26.8</b>		
63	65.1	42.5	18.2	42.5	0.87	-1.1	<b>21.5</b>		18.8
80	73.8	56.6	6.0	56.6	0.70	-2.0	<b>15.2</b>		
100	79.0	59.5	7.5	59.5	0.90	-0.9	<b>18.6</b>	4.4	
125	99.6	82.4	2.9	82.4	0.98	-0.6	<b>16.6</b>	9.4	19.0
160	85.1	58.7	5.9	58.7	1.20	0.3	<b>26.7</b>	2.3	
200	90.3	63.3	16.2	63.3	1.44	1.1	<b>28.1</b>	3.9	
250	92.2	58.8	4.4	58.8	1.63	1.6	<b>35.0</b>		31.4
315	91.9	58.9	5.5	58.9	1.76	2.0	<b>35.0</b>	3.0	
400	91.1	52.7	14.8	52.7	1.57	1.5	<b>39.9</b>	1.1	
500	89.8	46.9	5.4	46.9	1.48	1.2	<b>44.1</b>		42.5
630	88.5	44.5	5.7	44.5	1.57	1.5	<b>45.5</b>		
800	89.0	40.5	4.0	40.5	1.49	1.3	<b>49.8</b>		
1 000	88.9	38.9	12.2	38.9	1.46	1.2	<b>51.2</b>		50.9
1 250	89.6	38.9	4.2	38.9	1.50	1.3	<b>52.0</b>		
1 600	92.2	44.2	3.7	44.2	1.60	1.6	<b>49.6</b>		
2 000	94.0	50.7	3.7	50.7	1.51	1.3	<b>44.6</b>	1.4	45.9
2 500	92.6	48.2	3.2	48.2	1.30	0.7	<b>45.1</b>	0.9	
3 150	91.6	42.2	4.2	42.2	1.27	0.6	<b>50.0</b>		
4 000	92.1	39.3	7.9	39.3	1.18	0.2	<b>53.0</b>		52.3
5 000	96.4	40.7	10.8	40.7	1.13	0.1	<b>55.8</b>		
6 300									
8 000									
10 000									

<b>Single Figure Ratings</b>	<b>Rw</b>	<b>C</b>	<b>Ctr</b>	<b>Total U. Dev., dB</b>	<b>26.4</b>
<b>BS EN ISO 717-1: 2013</b>	<b>dB</b>	<b>dB</b>	<b>dB</b>		
	<b>42</b>	<b>-3</b>	<b>-9</b>		
	<b>(100-5000)</b>	<b>-2</b>	<b>-9</b>		
<b>Background Corrected</b>	<b>(50-3150)</b>	<b>-4</b>	<b>-11</b>		
	<b>(50-5000)</b>	<b>-3</b>	<b>-11</b>		

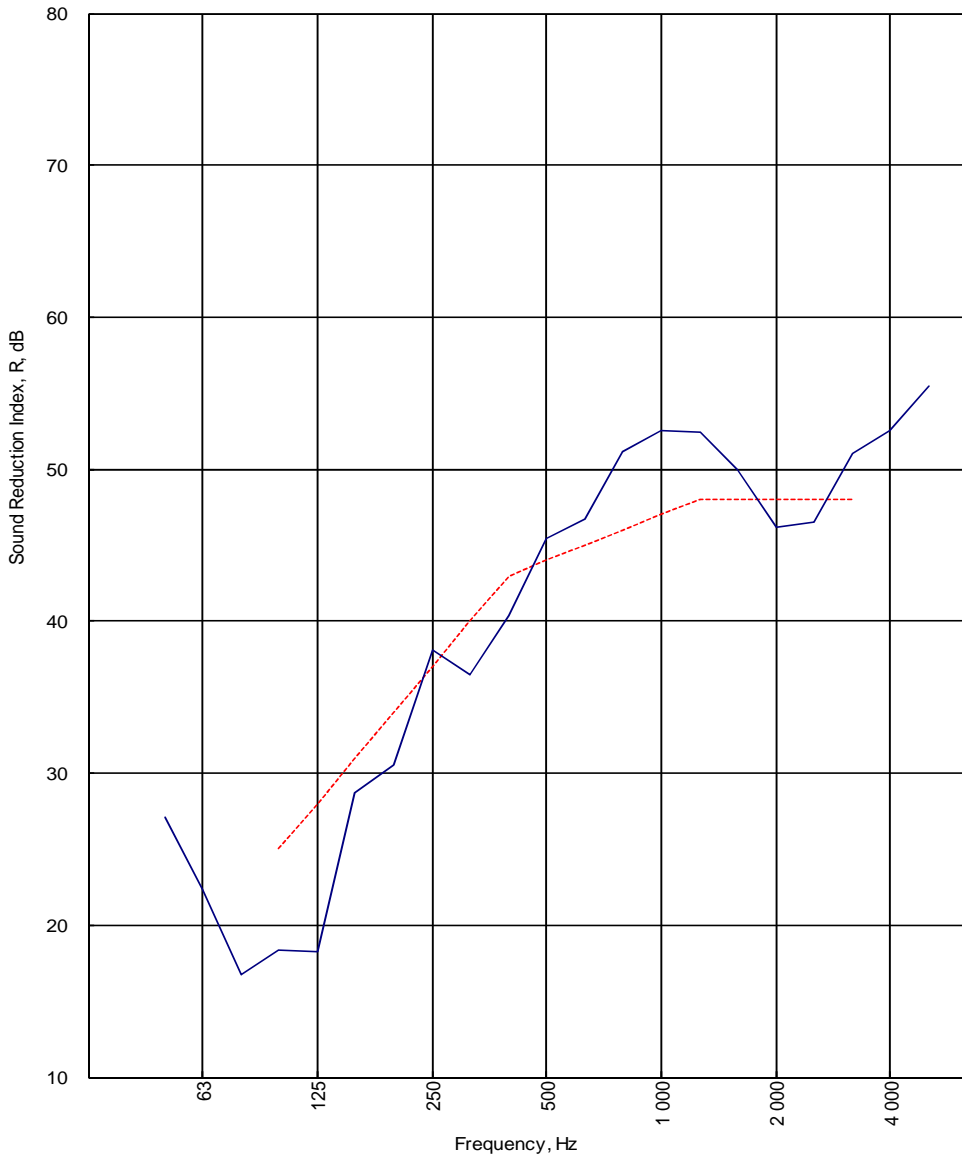
Procedure: AP 047vs 1.0  
Worksheet: 140\_3\_1.XLS

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**



Test Code:  
H199561A  
Test Date:  
09/05/17

Freq. Hz	R dB
50	27.1
63	22.3
80	16.7
100	18.4
125	18.3
160	28.7
200	30.6
250	38.1
315	36.5
400	40.4
500	45.4
630	46.7
800	51.2
1 000	52.6
1 250	52.4
1 600	50.0
2 000	46.2
2 500	46.5
3 150	51.0
4 000	52.6
5 000	55.5



----- Curve of reference values (ISO 717-1)

Rating according to BS EN ISO 717-1:2013	<b>R<sub>w</sub> (C;Ctr) = 44 (-4;-10) dB</b>		
Evaluation based on laboratory measurement results obtained by an engineering method:	<b>Max dev. 9.7 dB at 125 Hz</b>		
	C <sub>50-3150</sub> = <b>-4 dB</b>	C <sub>50-5000</sub> = <b>-3 dB</b>	C <sub>100-5000</sub> = <b>-3 dB</b>
	C <sub>tr,50-3150</sub> = <b>-12 dB</b>	C <sub>tr,50-5000</sub> = <b>-12 dB</b>	C <sub>tr,100-5000</sub> = <b>-10 dB</b>

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**



**LABORATORY AIRBORNE SOUND INSULATION TEST - BS EN ISO 10140-2:2010**

Test Code: **H19956IA**

Test Date: **09/05/17**

Specimen Area, S =	<b>8.64</b> m <sup>2</sup>	Room Volume, m <sup>3</sup> :	<b>98</b>	Room T2	<b>60.21</b>	Room T1	
		Temperature, deg.C:	<b>16.5</b>		<b>16.4</b>		<b>± 0.3</b>
		Rel. Humidity, %RH:	<b>40.7</b>		<b>40.7</b>		<b>± 1.6</b>
		Static Pressure, Pa:	<b>101600</b>		<b>101600</b>		<b>± 65</b>

Freq Hz	Test Room T2 to Test Room T1						R dB	U.Dev. dB	R 1/1Oct dB
	Source dB	Rec. (uc) dB	Bgrnd dB	Rec. (corr) dB	Rev.time Sec	Corr. dB			
50	60.3	30.7	21.8	<b>30.1</b>	<b>0.55</b>	-3.1	<b>27.1</b>		
63	65.5	42.2	18.3	42.2	<b>0.88</b>	-1.0	<b>22.3</b>		20.1
80	74.5	55.0	7.3	55.0	<b>0.58</b>	-2.8	<b>16.7</b>		
100	79.3	59.3	5.7	59.3	0.77	-1.6	<b>18.4</b>	6.6	
125	100.3	80.9	3.7	80.9	0.86	-1.1	<b>18.3</b>	9.7	19.9
160	85.3	56.9	5.7	56.9	1.19	0.3	<b>28.7</b>	2.3	
200	90.4	61.1	17.4	61.1	1.51	1.3	<b>30.6</b>	3.4	
250	92.0	56.0	4.6	56.0	1.80	2.1	<b>38.1</b>		33.8
315	92.0	57.1	5.7	57.1	1.62	1.6	<b>36.5</b>	3.5	
400	91.0	52.0	14.7	52.0	1.54	1.4	<b>40.4</b>	2.6	
500	89.8	45.8	5.7	45.8	1.55	1.4	<b>45.4</b>		43.3
630	88.4	43.1	6.3	43.1	1.55	1.4	<b>46.7</b>		
800	89.3	39.6	4.3	39.6	1.56	1.5	<b>51.2</b>		
1 000	89.1	37.7	12.3	37.7	1.48	1.2	<b>52.6</b>		52.0
1 250	89.8	38.9	4.3	38.9	1.56	1.5	<b>52.4</b>		
1 600	92.4	43.8	4.0	43.8	1.55	1.4	<b>50.0</b>		
2 000	94.2	49.3	3.5	49.3	1.51	1.3	<b>46.2</b>	1.8	47.3
2 500	92.7	46.8	3.2	46.8	1.28	0.6	<b>46.5</b>	1.5	
3 150	91.6	41.1	4.3	41.1	1.24	0.5	<b>51.0</b>		
4 000	92.1	39.6	8.0	39.6	1.14	0.1	<b>52.6</b>		52.7
5 000	96.3	40.7	11.0	40.7	1.08	-0.1	<b>55.5</b>		
6 300									
8 000									
10 000									

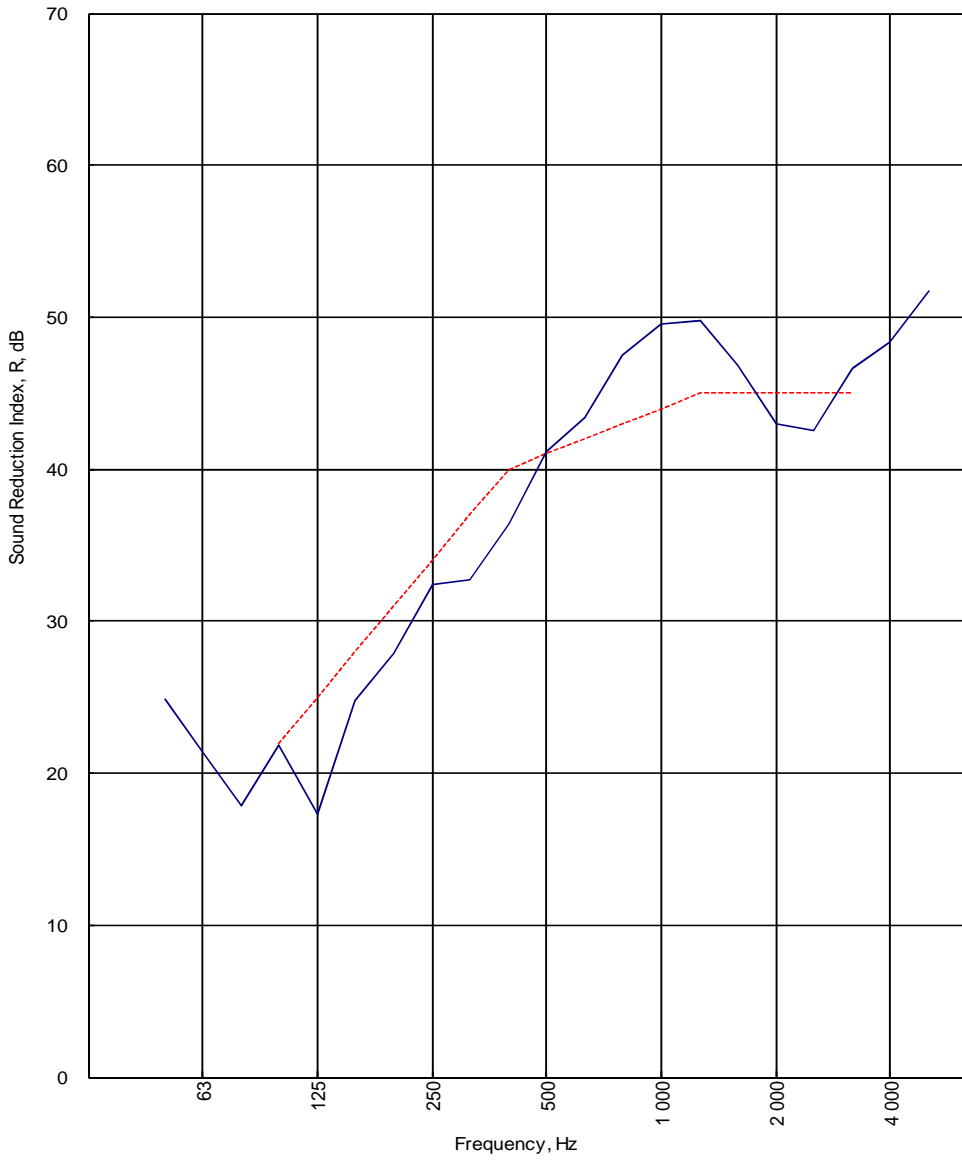
<b>Single Figure Ratings</b>	<b>Rw</b>	<b>C</b>	<b>Ctr</b>	<b>Total U. Dev., dB</b>	<b>31.4</b>
<b>BS EN ISO 717-1: 2013</b>	<b>dB</b>	<b>dB</b>	<b>dB</b>		
	<b>44</b>	<b>-4</b>	<b>-10</b>		
	<b>(100-5000)</b>	<b>-3</b>	<b>-10</b>		
<b>Background Corrected</b>	<b>(50-3150)</b>	<b>-4</b>	<b>-12</b>		
<b>RT's &gt; factor 1.5 apart</b>	<b>(50-5000)</b>	<b>-3</b>	<b>-12</b>		
				Procedure: AP 047 vs 1.0	
				Worksheet: 140_3_1.XLS	

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**



Test Code:  
**H19956JA**  
 Test Date:  
**09/05/17**

Freq. Hz	R dB
50	24.9
63	21.4
80	17.9
100	21.8
125	17.3
160	24.7
200	27.9
250	32.4
315	32.7
400	36.4
500	41.1
630	43.4
800	47.5
1 000	49.6
1 250	49.8
1 600	46.9
2 000	43.0
2 500	42.6
3 150	46.6
4 000	48.4
5 000	51.7



----- Curve of reference values (ISO 717-1)

Rating according to BS EN ISO 717-1:2013	<b>R<sub>w</sub> (C;Ctr) = 41 (-2;-7) dB</b>		
	<b>Max dev. 7.7 dB at 125 Hz</b>		
Evaluation based on laboratory measurement results obtained by an engineering method:	C <sub>50-3150</sub> = <b>-3 dB</b>	C <sub>50-5000</sub> = <b>-2 dB</b>	C <sub>100-5000</sub> = <b>-2 dB</b>
	C <sub>tr,50-3150</sub> = <b>-9 dB</b>	C <sub>tr,50-5000</sub> = <b>-9 dB</b>	C <sub>tr,100-5000</sub> = <b>-7 dB</b>

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**



**LABORATORY AIRBORNE SOUND INSULATION TEST - BS EN ISO 10140-2:2010**

Test Code: **H19956JA**

Test Date: **09/05/17**

Specimen Area, S =	<b>8.64</b> m <sup>2</sup>	Room Volume, m <sup>3</sup> :	<b>98</b>	Room T2	<b>60.33</b>	Room T1	
		Temperature, deg.C:	<b>18</b>		<b>17.9</b>		<b>± 0.3</b>
		Rel. Humidity, %RH:	<b>38.5</b>		<b>40.8</b>		<b>± 1.6</b>
		Static Pressure, Pa:	<b>101500</b>		<b>101500</b>		<b>± 65</b>

Freq Hz	Test Room T2 to Test Room T1						R dB	U.Dev. dB	R 1/1Oct dB
	Source dB	Rec. (uc) dB	Bgrnd dB	Rec. (corr) dB	Rev.time Sec	Corr. dB			
50	59.9	32.5	22.0	<b>32.1</b>	<b>0.57</b>	-2.9	<b>24.9</b>		
63	66.6	44.3	19.9	44.3	<b>0.91</b>	-0.9	<b>21.4</b>		20.5
80	76.0	56.6	8.4	56.6	0.80	-1.5	<b>17.9</b>		
100	80.6	57.8	14.8	57.8	0.89	-1.0	<b>21.8</b>	0.2	
125	100.1	82.0	6.5	82.0	0.92	-0.8	<b>17.3</b>	7.7	20.2
160	85.5	60.9	6.7	60.9	1.14	0.1	<b>24.7</b>	3.3	
200	90.5	64.0	17.1	64.0	1.55	1.4	<b>27.9</b>	3.1	
250	92.3	61.5	5.6	61.5	1.62	1.6	<b>32.4</b>	1.6	30.4
315	92.0	60.8	7.3	60.8	1.59	1.5	<b>32.7</b>	4.3	
400	91.0	55.9	15.8	55.9	1.52	1.3	<b>36.4</b>	3.6	
500	90.0	50.0	7.7	50.0	1.44	1.1	<b>41.1</b>		39.3
630	88.5	46.4	6.8	46.4	1.51	1.3	<b>43.4</b>		
800	89.2	43.1	4.9	43.1	1.55	1.4	<b>47.5</b>		
1 000	89.0	40.9	13.1	40.9	1.59	1.5	<b>49.6</b>		48.8
1 250	89.8	41.6	3.7	41.6	1.60	1.6	<b>49.8</b>		
1 600	92.3	46.8	3.7	46.8	1.56	1.4	<b>46.9</b>		
2 000	94.3	52.5	3.6	52.5	1.46	1.2	<b>43.0</b>	2.0	43.8
2 500	92.7	50.9	3.1	50.9	1.33	0.8	<b>42.6</b>	2.4	
3 150	91.6	45.5	4.2	45.5	1.24	0.5	<b>46.6</b>		
4 000	92.1	44.0	8.0	44.0	1.21	0.3	<b>48.4</b>		48.4
5 000	96.4	44.6	10.9	44.6	1.09	-0.1	<b>51.7</b>		
6 300									
8 000									
10 000									

<b>Single Figure Ratings</b>	<b>Rw</b>	<b>C</b>	<b>Ctr</b>	<b>Total U. Dev., dB</b>	<b>28.2</b>
<b>BS EN ISO 717-1: 2013</b>	<b>dB</b>	<b>dB</b>	<b>dB</b>		
	<b>41</b>	<b>-2</b>	<b>-7</b>		
	<b>(100-5000)</b>	<b>-2</b>	<b>-7</b>		
<b>Background Corrected</b>	<b>(50-3150)</b>	<b>-3</b>	<b>-9</b>		
<b>RT's &gt; factor 1.5 apart</b>	<b>(50-5000)</b>	<b>-2</b>	<b>-9</b>		
				Procedure: AP 047 vs 1.0	
				Worksheet: 140_3_1.XLS	

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**





## **APPENDIX B - TEST METHOD AND CONDITIONS**

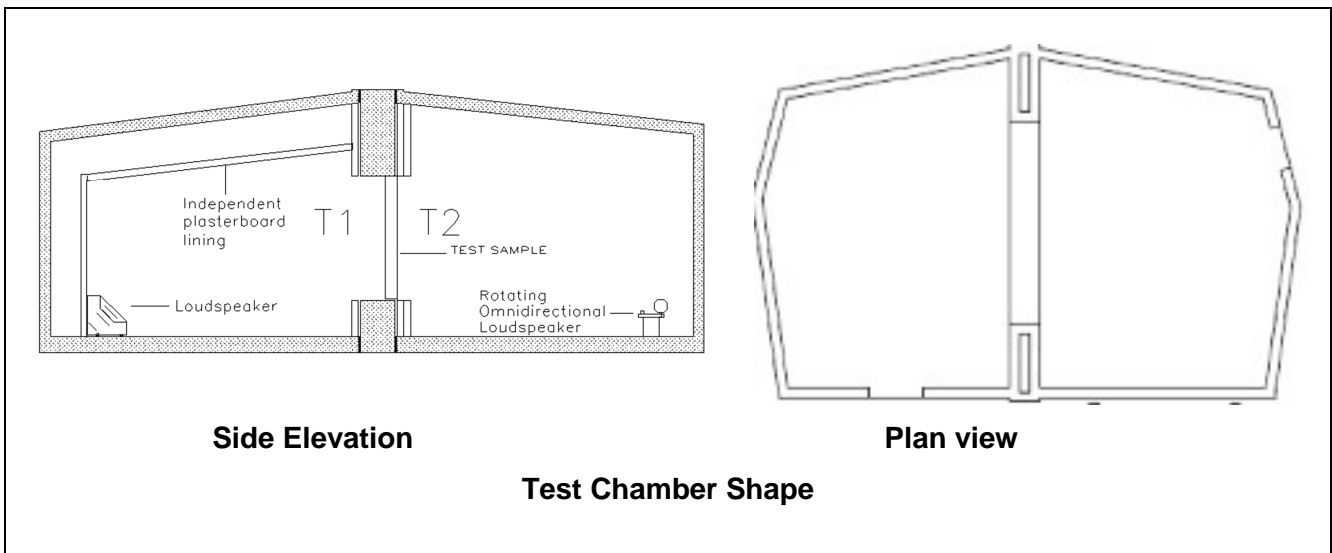
### Method

The average sound pressure level in each 1/3 octave band is measured using a rotating microphone boom, positioned such that the minimum distance between microphone and sound source is 1m and between microphone and room boundaries is 0.7m. The rotating microphone has a sweep radius of at least 1m and is inclined in relation to the boundaries at an angle of at least 30° to the horizontal. The microphone has a traverse time of 32 seconds, and the sound pressure levels are averaged over 64 seconds which is equivalent to two complete sweeps of the microphone boom.

The equivalent absorption area of the receiving room is determined by producing the arithmetic average of twelve reverberation times and applying this to the Sabine formula.

### Test Chamber Layout

The test suite is constructed to be as independent from the surround building as is physically possible in order to minimise flanking transmission paths.

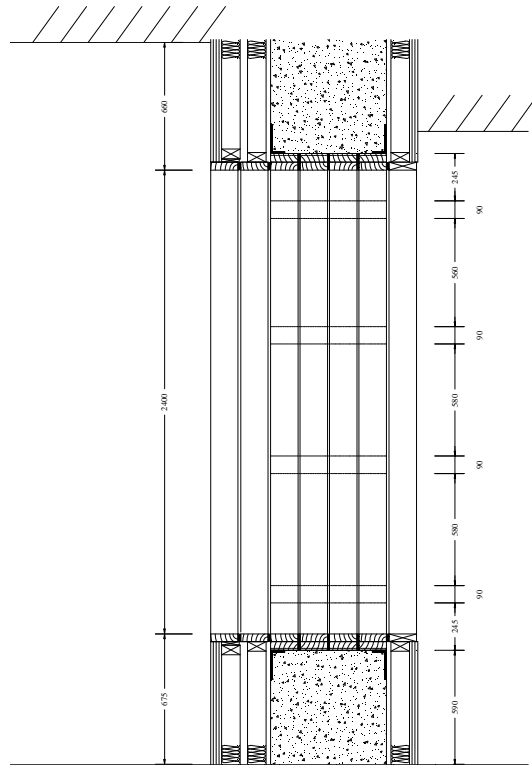


The source room (T2) contains two perspex diffusers of approximately 900mm x 1220mm. Panel absorbers are used to ensure reverberation times in source room (T2) are between one and two seconds at all frequencies at and above 100 Hz. An omni-directional loudspeaker sound source is placed near a back corner of the source room (T2), rotating at 1 rpm and at least 0.7m from any room boundary. A stationary loudspeaker sound source is placed in the corner of the receiving room (T1) opposite the test specimen.

## Mounting

The BTC has a solid concrete frame which has been additionally lined to give improved reduction of flanking transmission. This is in order to ensure that, as far as possible, lab limits will not restrict the real performance measurement of just the test specimen.

Recommendations for installation position within the niche are given in our Installation Guidance Document. Details of actual installation position are held by the BTC in the Test Report folder.



**Cross section of test aperture**

## Lab Limits

The laboratory limit for measurement due to flanking is (combined BTC 11709A, BTC13562EA, BTC 15829A and BTC 19792A).

Freq Hz	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000
R'max	45.0	46.9	58.5	62.4	62.9	67.7	71.2	77.2	84.2	92.0	97.7	101.5	103.8	97.6	102.4	104.8	101.8	102.9	98.7	96.4	96.3

## Uncertainties for test

The uncertainties values for test are taken from ISO 12999-1 situation B situ standard deviation.

Freq Hz	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000
Standard Uncertainty	4.0	3.6	3.2	2.8	2.4	2.0	1.8	1.6	1.4	1.2	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.3	1.6	1.9	2.2

Descriptor	Rw	Rw + C (100-3150)	Rw + Ctr (100-3150)	Rw + C (100-5000)	Rw + Ctr (100-5000)	Rw + C (50-3150)	Rw + Ctr (50-3150)	Rw + C (50-5000)	Rw + Ctr (50-5000)
Standard Uncertainty	0.9	0.9	1.1	1.1	1.1	1.0	1.3	1.1	1.0

Customer: **Hadley Group/Hadley Industries FZE (Dubai)**

BTC 19956A: Page 42 of 42



0296