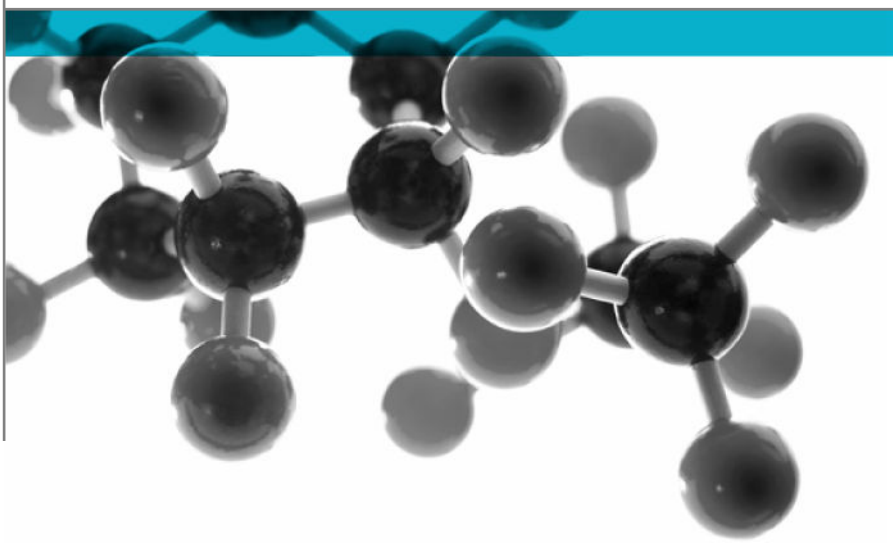
warringtonfire
Proud to be part of element

BS EN ISO 10140-2:2010



Test of: Fire Stopping Product

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

Date: 25/08/2020

Copy: 1

Issue No.: 1

A Report To:
Dana Lim A/S
Københavnsvej 220
DK-4600 Køge
Denmark

Document Reference:
BMT/MTP/F14022/AR5

The details of the sponsor of test report BMT/MTP/F14022 are held on file by Warringtonfire. This report is additional to that issued as BMT/MTP/F14022 and dated 1st September 2014. The original report shall remain valid and is not replaced by the additional report.

This report in issued in accordance with our terms and conditions, a copy of which is available on request.
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Registered Office: Warringtonfire Testing and Certification Limited, 10 Lower Grosvenor Place, London, United Kingdom, SW1W 0EN. Reg No. 11371436

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Summary of Performance

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

Test No.	Product Name	Product Type	Test Notes	Test Result Specimen Only R_w (C;C_{tr})	Test Result Specimen and Partition R_w (C;C_{tr})	Test Results Specimen, Partition and D_{new}
1	FireGuard A565	Fire Stopping Product	FireGuard A565 Sealant on source room side of wall, 15mm deep x 60mm wide x 2000mm high, with 55mm deep Stonewool (60kg/m³) backing, see appendix 4 for details.	51 (-1;-6) dB	63 (-1;-7) dB	61 (-1;-6) dB
2	FireGuard A565	Fire Stopping Product	FireGuard A565 Sealant on source room side of wall, 25mm deep x 60mm wide x 2000mm high, with 55mm deep Stonewool (60kg/m³) backing, see appendix 4 for details.	51 (-1;-6) dB	63 (-1;-7) dB	61 (-1;-6) dB

1 Introduction

The test specimen was supplied by the sponsor and delivered to WARRINGTONFIRE on 28th January 2014. The specimen was installed into a timber stud partition within the test chamber by Warringtonfire.

Test Details

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

Testing was conducted at Warringtonfire, Chiltern House, Stocking Lane, Hughenden Valley, Buckinghamshire. HP14 4ND on the 28 January 2014.

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

Supporting Construction Description

The partition consisted of two wall leaves separated by a 150mm air gap. Each wall leaf was constructed of nominal 45mm x 90mm softwood studs at 600mm centres with three layers of 15mm plasterboard on each face. The stud wall cavities were filled with 100mm thick Stonewool insulation.

Laboratory Construction Details

The laboratory consists of a source room and a receive room that are completely separated by a 50mm gap filled with mineral wool. Intersections of the floor, wall and ceiling planes are all perpendicular. The rooms have opposite openings for the installation of the test specimen formed by masonry piers and lintels. The depth of the piers is greater in the source room than the receive room.

The walls are of timber frame construction, approx. 190mm thick, symmetrical through the thickness. Studs are 90mm deep at 600mm centres with mineral wool insulation between them. Resilient bars approx. 20mm deep are fixed to the studwork. Two layers of 15mm gypsum board are fixed to the bars on both the inner and outer face.

The ceilings consist of 150mm deep timber joists with mineral wool insulation installed between joists. Resilient bars approx. 20mm deep are fixed to the lower edge of the joists. Two layers of 15mm gypsum board are fixed to the bars on the inner face only.

The floors are assembled from sound absorbing boards on a rubber underlay.

Dimensions:

	Volume	Width	Length	Height
	m^3	m	m	m
Source room	86	5.49	6.29	2.49
Receive room	63	5.49	4.61	2.49

2 Test Specimen Details

Certificate Ref.	Test Identification
BMT/MTP/F14022/AR5/P001	FireGuard A565 Sealant on source room side of wall, 15mm deep x 60mm wide x 2000mm high, with 55mm deep Stonewool (60kg/m³) backing, see appendix 4 for details.
BMT/MTP/F14022/AR5/P002	FireGuard A565 Sealant on source room side of wall, 25mm deep x 60mm wide x 2000mm high, with 55mm deep Stonewool (60kg/m³) backing, see appendix 4 for details.

3 Methodology

Airborne Sound Insulation Test

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

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

Where:

$L1$ is the logarithmic average of the source room measurements
$L2$ is the logarithmic average of the receive room measurements
S is the area of the test specimen
A is the equivalent absorption area, where $A = \frac{0.16V}{T}$

Where:

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

1. Logarithmic average of 5 Measurements ($L1$ & $L2$)
2. Deduction of $L1$s from $L2$s
3. Area of test specimen (S) divided by equivalent sound absorption area (A)
4. Weighted Final Result R_w dB

Test Equipment

Equipment	Equipment reference number
Bruel & Kjaer Sound Level Meter (Type 2270)	ACT-009
Bruel & Kjaer Microphones (Type 4189)	ACT-010 & ACT-016
Bruel & Kjaer Calibrator (Type 4231)	ACT-011
Amplifiers	ACT-007 & ACT-020
Noise Generators	ACT-008 & ACT-009
Loudspeakers (EV ZX1-90PA)	ACT-006, ACT-021, ACT-022
Graphic Equaliser (DBX Dual Channel)	ACT-023

4 Parameters & Limitations

Parameters

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

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

Limitations

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

5 Authorisation

	Issued by:	Authorised by:
Signature:		
Name:	Jamie Nelson	Lee Grant-Riach
Title:	Technical Officer	Lead Technical Officer
Date of Issue	25/08/2020	25/08/2020

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

Product Name	FireGuard A565
Product Type	Fire Stopping Product

Data Sheet Ref.	**Variations**		**Test Result R_w (C;C_{tr})**
BMT/MTP/F14022/ AR5/P001	Test Notes	FireGuard A565 Sealant on source room side of wall, 15mm deep x 60mm wide x 2000mm high, with 55mm deep Stonewool (60kg/m³) backing, see appendix 4 for details.	51 (-1;-6) dB
BMT/MTP/F14022/ AR5/P002	Test Notes	FireGuard A565 Sealant on source room side of wall, 25mm deep x 60mm wide x 2000mm high, with 55mm deep Stonewool (60kg/m³) backing, see appendix 4 for details.	51 (-1;-6) dB

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

1762

Sponsor:	**Dana Lim A/S**
Product Name/Desc.	**FireGuard A565**
Product Type	Fire Stopping Product
Material Type	Sealant
Variations:	
Test Notes	FireGuard A565 Sealant on source room side of wall, 15mm deep x 60mm wide x 2000mm high, with 55mm deep Stonewool (60kg/m³) backing, see appendix 4 for details.

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

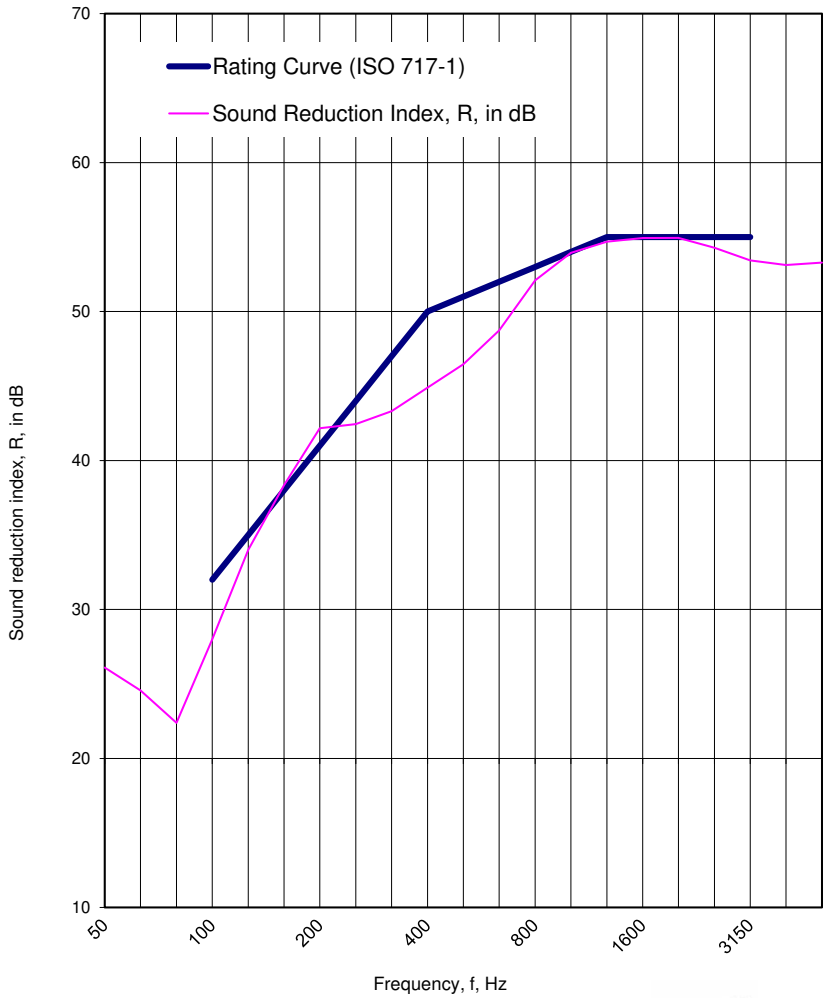
Data sheet Ref. BMT/MTP/F14022/AR5/P001

Date of Test: 28/01/2014

	Sour.	Rec.	
Source Room Volume:		86.00	m^3
Receive Room Volume:		63.00	m^3
Specimen Installed By:		Client	
Area of Specimen (S):		1.00	m^2
Temp. in Test Rooms:	17.1	17.1	°C
Static Pressure:	100900.0	100900.0	Pa
Humidity in Test Rooms:	52.3	52.3	%

f, Hz		*R* ,dB
50+		26.1
63+		24.6
80+		22.4
100		28.0
125		34.0
160		38.4
200		42.2
250		42.4
315		43.3
400		44.9
500		46.5
630		48.7
800		52.1
1000		53.9
1250		54.7
1600		54.9
2000		54.9
2500	≥	54.3
3150	≥	53.4
4000	≥	53.1
5000	≥	53.3
AAD		-26.9

Frequency range for rating in accordance with ISO 717-1



R_w =	51 dB	$C_{(50-3150)}$ =	-3 dB	$C_{tr\ (50-3150)}$ =	-11 dB
R_w+C =	50 dB	$C_{(50-5000)}$ =	-2 dB	$C_{tr\ (50-5000)}$ =	-11 dB
R_w+C_{tr} =	45 dB	$C_{(100-5000)}$ =	-1 dB	$C_{tr\ (100-5000)}$ =	-6 dB

Jamie Nelson
Technical Officer

≥ indicates that the measurement at this frequency was corrected for background noise

+ indicates that the frequency is outside of our UKAS accreditation and is for information only

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

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

1762

Sponsor:	**Dana Lim A/S**
Product Name/Desc.	**FireGuard A565**
Product Type	Fire Stopping Product
Material Type	Sealant
Variations:	
Test Notes	
	FireGuard A565 Sealant on source room side of wall, 25mm deep x 60mm wide x 2000mm high, with 55mm deep Stonewool (60kg/m³) backing, see appendix 4 for details.

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

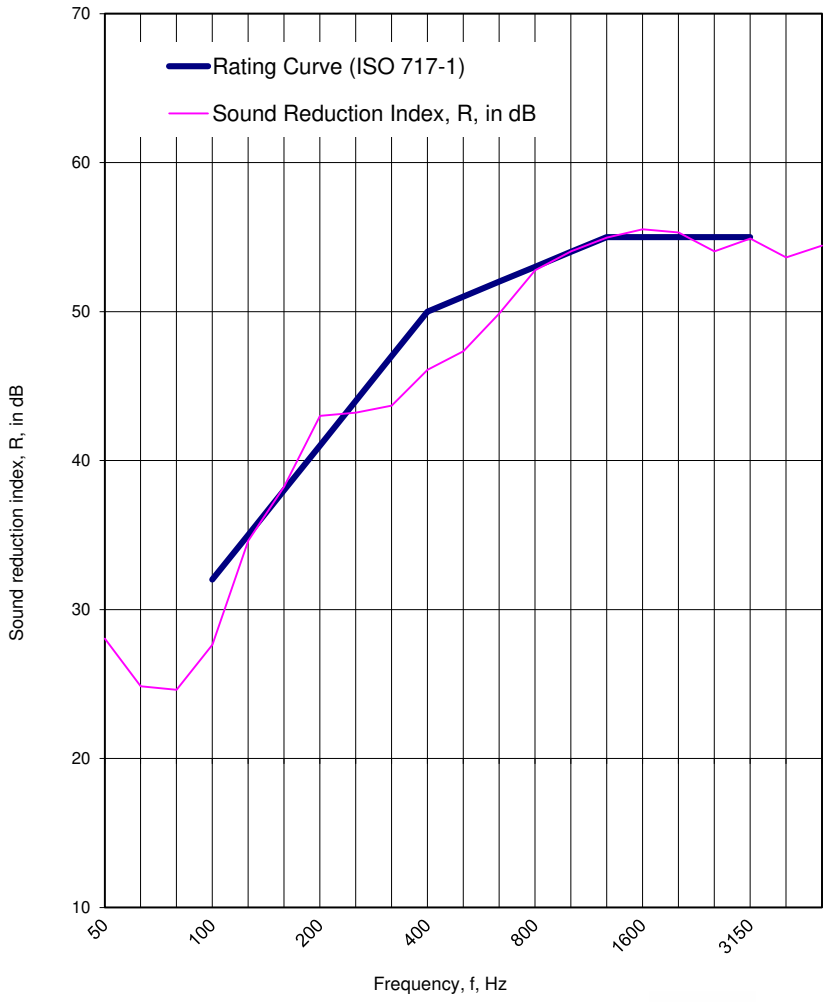
Data sheet Ref. BMT/MTP/F14022/AR5/P002

Date of Test: 28/01/2014

	Sour.	Rec.	
Source Room Volume:		86.00	m^3
Receive Room Volume:		63.00	m^3
Specimen Installed By:		Client	
Area of Specimen (S):		1.00	m^2
Temp. in Test Rooms:	17.1	17.1	°C
Static Pressure:	100900.0	100900.0	Pa
Humidity in Test Rooms:	52.3	52.3	%

f, Hz		*R*, dB
50+		28.1
63+		24.8
80+		24.6
100		27.6
125		34.6
160		38.2
200		43.0
250		43.2
315		43.7
400		46.1
500		47.3
630		49.9
800		52.8
1000		54.0
1250		55.0
1600		55.5
2000		55.3
2500	≥	54.0
3150	≥	54.9
4000	≥	53.6
5000	≥	54.4
AAD		-19.9

Frequency range for rating in accordance with ISO 717-1



R_w =	51 dB	$C_{(50-3150)}$ =	-2 dB	$C_{tr\ (50-3150)}$ =	-10 dB
R_w+C =	50 dB	$C_{(50-5000)}$ =	-1 dB	$C_{tr\ (50-5000)}$ =	-10 dB
R_w+C_{tr} =	45 dB	$C_{(100-5000)}$ =	0 dB	$C_{tr\ (100-5000)}$ =	-6 dB

Jamie Nelson
Technical Officer

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Appendix 2 – Summary of Results & Test Data Sheets, Specimen and Partition (2 Pages)

Product Name	FireGuard A565
Product Type	Fire Stopping Product

Data Sheet Ref.	**Variations**		**Test Result R_w (C;C_{tr})**
BMT/MTP/F14022/ AR5/P001	Test Notes	FireGuard A565 Sealant on source room side of wall, 15mm deep x 60mm wide x 2000mm high, with 55mm deep Stonewool (60kg/m³) backing, see appendix 4 for details.	63 (-1;-7) dB
BMT/MTP/F14022/ AR5/P002	Test Notes	FireGuard A565 Sealant on source room side of wall, 25mm deep x 60mm wide x 2000mm high, with 55mm deep Stonewool (60kg/m³) backing, see appendix 4 for details.	63 (-1;-7) dB

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

1762

Sponsor:	**Dana Lim A/S**
Product Name/Desc.	**FireGuard A565**
Product Type	Fire Stopping Product
Material Type	Sealant
Variations:	
Test Notes	
	FireGuard A565 Sealant on source room side of wall, 15mm deep x 60mm wide x 2000mm high, with 55mm deep Stonewool (60kg/m³) backing, see appendix 4 for details.

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

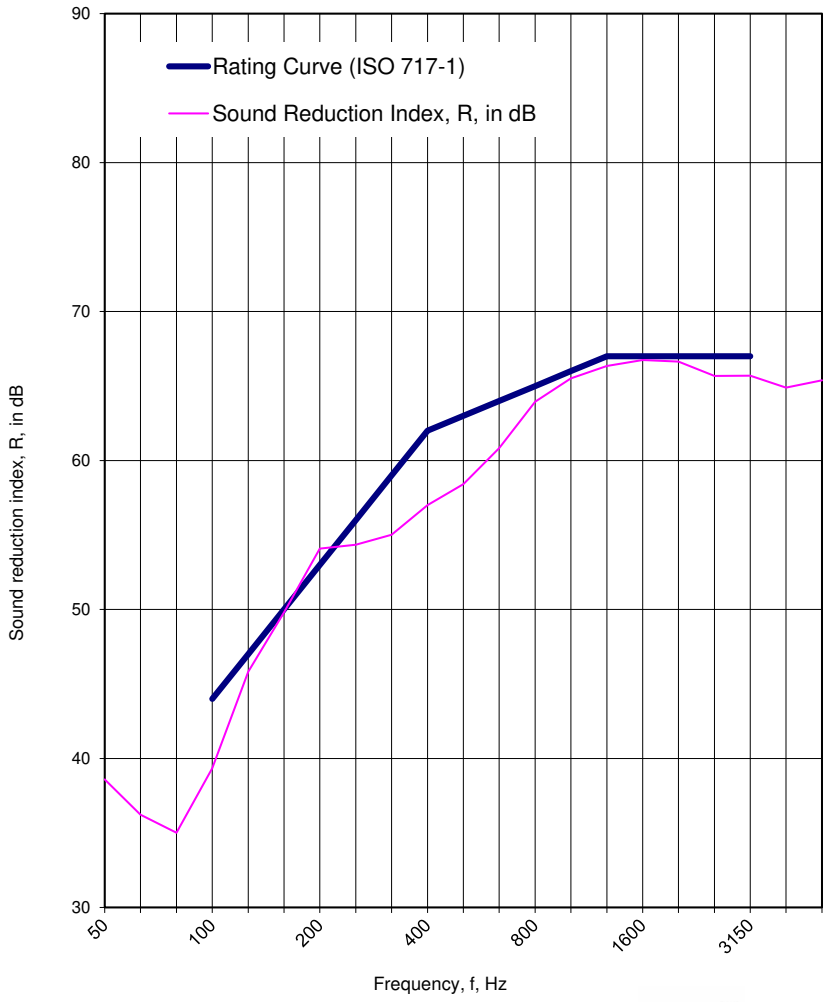
Data sheet Ref. BMT/MTP/F14022/AR5/P001

Date of Test: 28/01/2014

	Sour.	Rec.	
Source Room Volume:		86.00	m^3
Receive Room Volume:		63.00	m^3
Specimen Installed By:		Client	
Area of Specimen (S):		14.20	m^2
Temp. in Test Rooms:	17.1	17.1	°C
Static Pressure:	100900.0	100900.0	Pa
Humidity in Test Rooms:	52.3	52.3	%

f, Hz		*R* ,dB
50+		38.6
63+		36.2
80+		35.0
100		39.3
125		45.8
160		49.8
200		54.1
250		54.3
315		55.0
400		57.0
500		58.4
630		60.8
800		63.9
1000		65.5
1250		66.3
1600		66.7
2000		66.6
2500	≥	65.7
3150	≥	65.7
4000	≥	64.9
5000	≥	65.4
AAD		-29.8

Frequency range for rating in accordance with ISO 717-1



R_w =	63 dB	$C_{(50-3150)}$ =	-3 dB	$C_{tr\ (50-3150)}$ =	-11 dB
R_w+C =	62 dB	$C_{(50-5000)}$ =	-2 dB	$C_{tr\ (50-5000)}$ =	-11 dB
R_w+C_{tr} =	56 dB	$C_{(100-5000)}$ =	-1 dB	$C_{tr\ (100-5000)}$ =	-7 dB

Jamie Nelson
Technical Officer

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

1762

Sponsor:	**Dana Lim A/S**
Product Name/Desc.	**FireGuard A565**
Product Type	Fire Stopping Product
Material Type	Sealant
Variations:	
Test Notes	
	FireGuard A565 Sealant on source room side of wall, 25mm deep x 60mm wide x 2000mm high, with 55mm deep Stonewool (60kg/m³) backing, see appendix 4 for details.

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

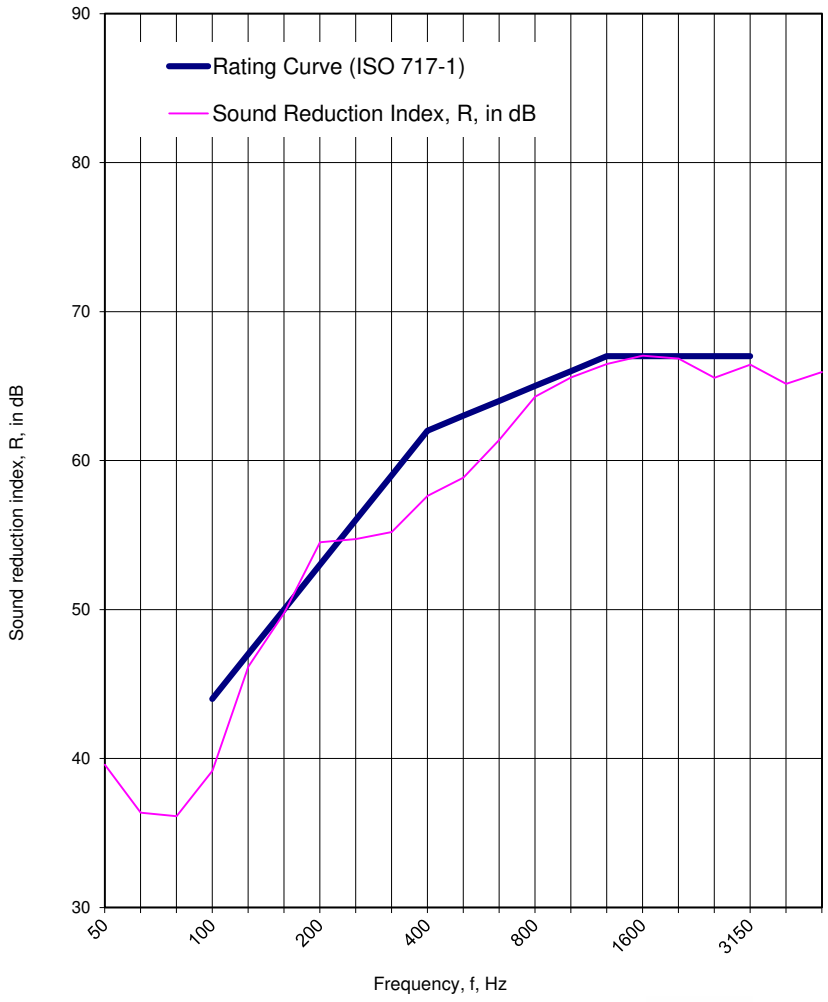
Data sheet Ref. BMT/MTP/F14022/AR5/P002

Date of Test: 28/01/2014

	Sour.	Rec.	
Source Room Volume:		86.00	m^3
Receive Room Volume:		63.00	m^3
Specimen Installed By:		Client	
Area of Specimen (S):		14.20	m^2
Temp. in Test Rooms:	17.1	17.1	°C
Static Pressure:	100900.0	100900.0	Pa
Humidity in Test Rooms:	52.3	52.3	%

f, Hz		*R*, dB
50+		39.6
63+		36.4
80+		36.1
100		39.2
125		46.2
160		49.8
200		54.5
250		54.7
315		55.2
400		57.6
500		58.9
630		61.4
800		64.3
1000		65.6
1250		66.5
1600		67.0
2000		66.8
2500	≥	65.6
3150	≥	66.4
4000	≥	65.2
5000	≥	65.9
AAD		-25.9

Frequency range for rating in accordance with ISO 717-1



R_w =	63 dB	$C_{(50-3150)}$ =	-2 dB	$C_{tr\ (50-3150)}$ =	-11 dB
R_w+C =	62 dB	$C_{(50-5000)}$ =	-2 dB	$C_{tr\ (50-5000)}$ =	-11 dB
R_w+C_{tr} =	56 dB	$C_{(100-5000)}$ =	-1 dB	$C_{tr\ (100-5000)}$ =	-7 dB

Jamie Nelson
Technical Officer

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Report for: Dana Lim A/S
Report Ref: BMT/MTP/F14022/AR5

Appendix 3 – Summary of Results & Test Data Sheets, Specimen, Partition and Dnew (2 Pages)

Product Name	FireGuard A565
Product Type	Fire Stopping Product

Data Sheet Ref.	**Variations**		**Test Result R_w (C;C_{tr})**
BMT/MTP/F14022/ AR5/P001	Test Notes	FireGuard A565 Sealant on source room side of wall, 15mm deep x 60mm wide x 2000mm high, with 55mm deep Stonewool (60kg/m³) backing, see appendix 4 for details.	61 (-1;-6) dB
BMT/MTP/F14022/ AR5/P002	Test Notes	FireGuard A565 Sealant on source room side of wall, 25mm deep x 60mm wide x 2000mm high, with 55mm deep Stonewool (60kg/m³) backing, see appendix 4 for details.	61 (-1;-6) dB

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

1762

Ref. No.: BMT/MTP/F14022/AR5//P001

Sponsor: Dana Lim A/S
Date of Test: 28/01/2014

Test Specimen Installed By: Client

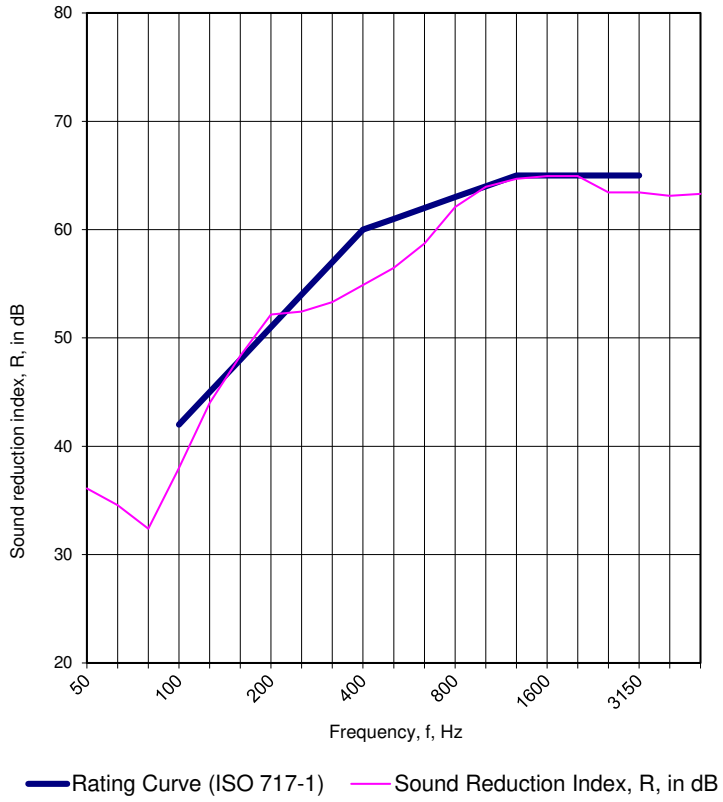
Source Room Volume: 86.00 m^3
Receive Room Volume: 63.00 m^3

Temperature in Test Rooms: 17.1 °C
Static Pressure: 10090.0 Pa
Humidity in Test Rooms: 52.3 %

Test Specimen Description: FireGuard A565 Sealant on source room side of wall, 15mm deep x 60mm wide x 2000mm high, with 55mm deep Stonewool (60kg/m³) backing, see appendix 4 for details.

f, Hz		*R* ,dB
50+		36.1
63+		34.6
80+		32.4
100		38.0
125		44.0
160		48.4
200		52.2
250		52.4
315		53.3
400		54.9
500		56.5
630		58.7
800		62.1
1000		63.9
1250		64.7
1600		64.9
2000		64.9
2500	≥	63.4
3150	≥	63.4
4000	≥	63.1
5000	≥	63.3
AAD		-27.7

Frequency range for rating in accordance with ISO 717-1



$D_{n,e,w}$ =	61 dB
$D_{n,e,w}+C$ =	60 dB
$D_{n,e,w}+C_{tr}$ =	55 dB

$C_{(50-3150)}$ =	-3 dB	$C_{tr\ (50-3150)}$ =	-11 dB
$C_{(50-5000)}$ =	-2 dB	$C_{tr\ (50-5000)}$ =	-11 dB
$C_{(100-5000)}$ =	-1 dB	$C_{tr\ (100-5000)}$ =	-6 dB

Jamie Nelson
Technical Officer

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

1762

Ref. No.: BMT/MTP/F14022/AR5//P002

Sponsor: Dana Lim A/S
Date of Test: 28/01/2014

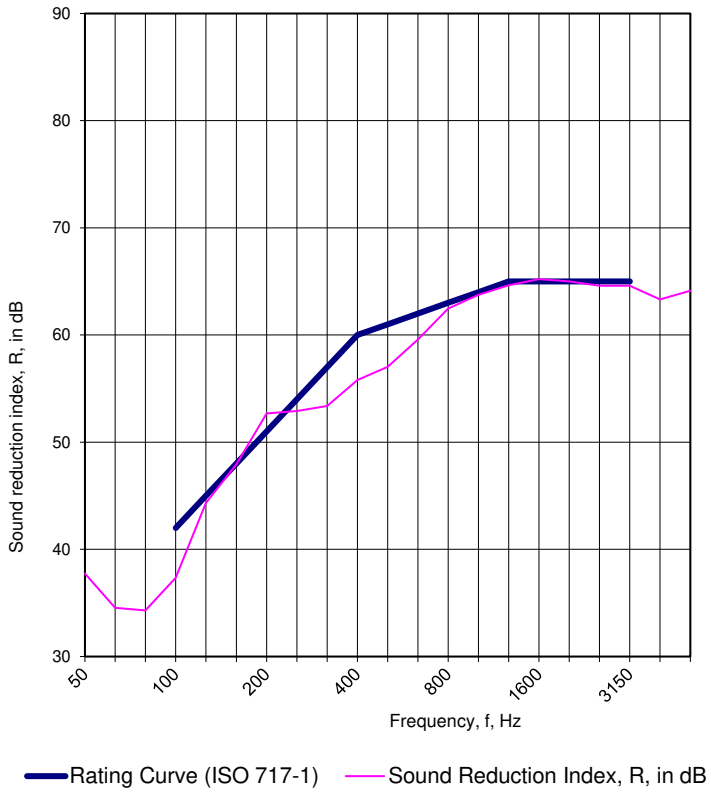
Test Specimen Installed By: Client

Source Room Volume: 88.80 m^3
Receive Room Volume: 67.50 m^3

Temperature in Test Rooms: 17.1 °C
Static Pressure: 10090.0 Pa
Humidity in Test Rooms: 52.3 %
Test Specimen Description: FireGuard A565 Sealant on source room side of wall, 25mm deep x 60mm wide x 2000mm high, with 55mm deep Stonewool (60kg/m^3) backing, see appendix 4 for details.

f, Hz		R ,dB
50+		37.8
63+		34.5
80+		34.3
100		37.3
125		44.3
160		47.9
200		52.7
250		52.9
315		53.4
400		55.8
500		57.0
630		59.6
800		62.5
1000		63.7
1250		64.7
1600		65.2
2000		65.0
2500	≥	64.6
3150	≥	64.6
4000	≥	63.3
5000	≥	64.1
AAD		-22.6

Frequency range for rating in accordance with ISO 717-1



$D_{n,e,w}$ =	61 dB
$D_{n,e,w}+C$ =	60 dB
$D_{n,e,w}+C_{tr}$ =	55 dB

$C_{(50-3150)}$ =	-2 dB	$C_{tr\ (50-3150)}$ =	-10 dB
$C_{(50-5000)}$ =	-1 dB	$C_{tr\ (50-5000)}$ =	-11 dB
$C_{(100-5000)}$ =	-1 dB	$C_{tr\ (100-5000)}$ =	-7 dB

Jamie Nelson
Technical Officer

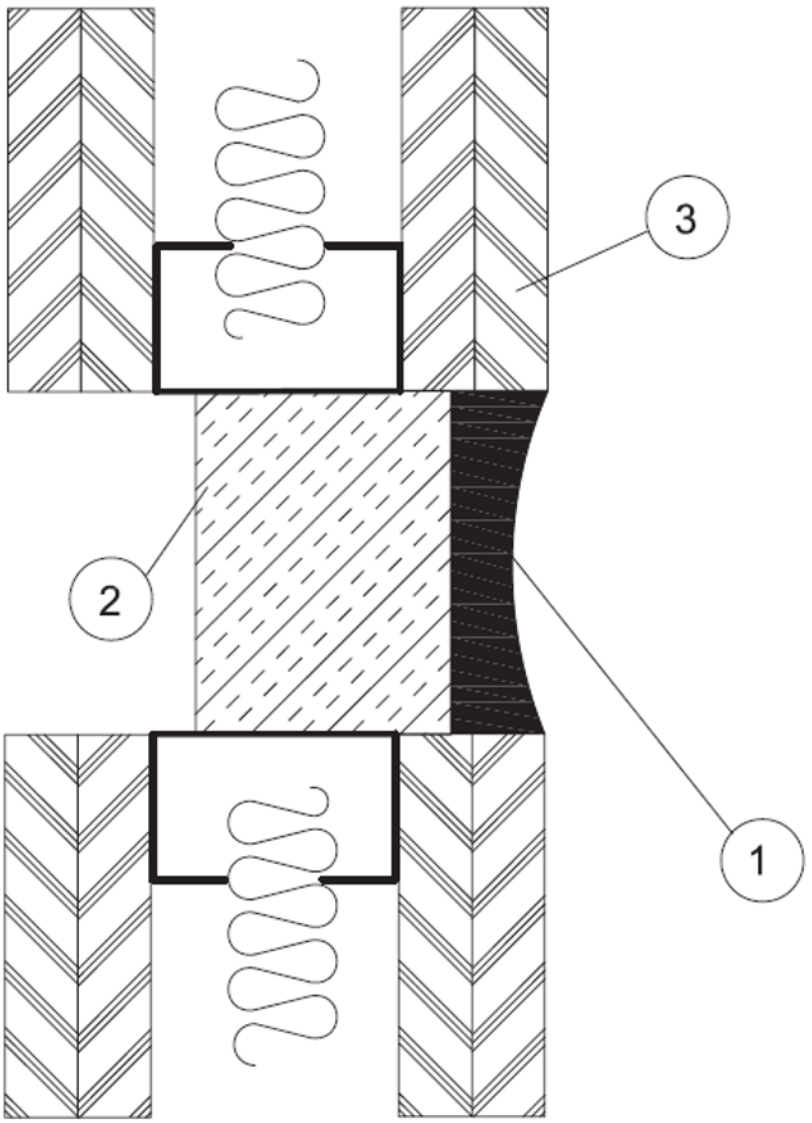
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The legal validity of this report can only be claimed on presentation of the complete report

Appendix 4 – Client Drawings (2 Pages)

FireGuard A565 SEALANT TESTED TO EN 10140-2:2010 THROUGH A FLEXIBLE CONSTRUCTION

ACOUSTIC TEST RESULTS	
Partition & Sealant Result	63 Rw dB
Sealant Result	51 Rw dB
Sealant Result	61 Dnew dB



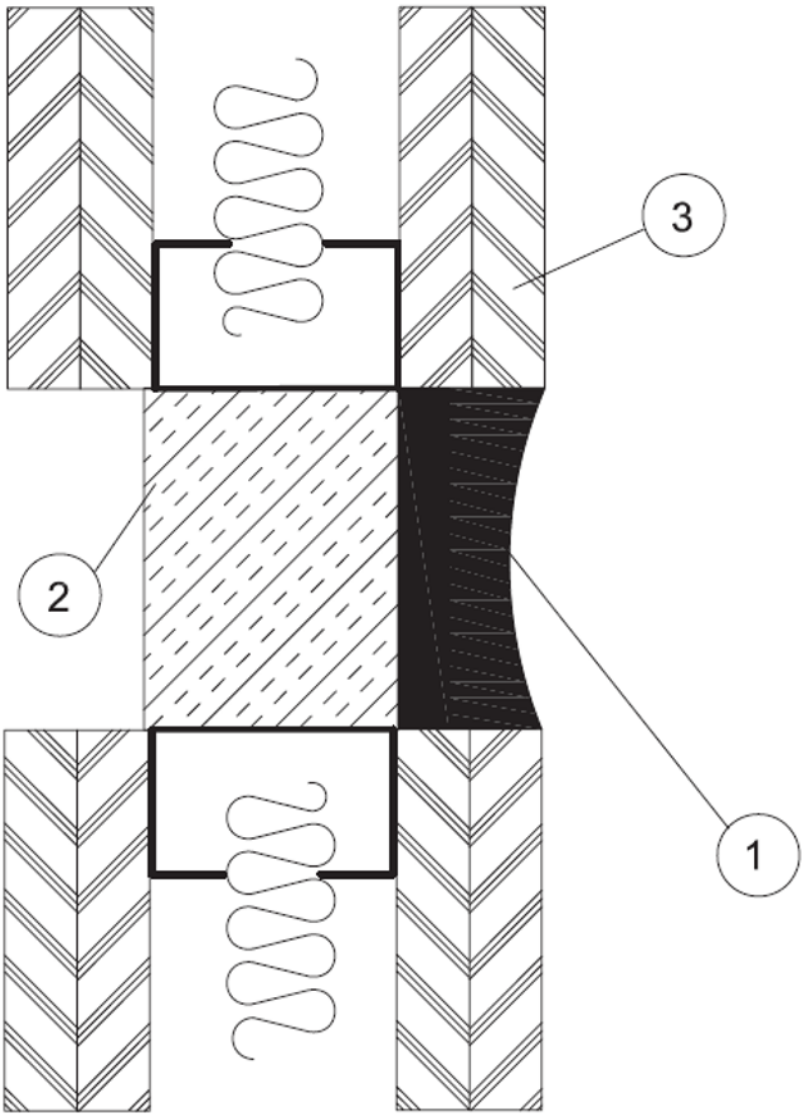
1 - FireGuard A565 sealant to one side of wall 15mm depth

2 – 55mm depth stone wool 60kg density

3 – Constructing element rated to 65dB

FireGuard A565 SEALANT TESTED TO EN 10140-2:2010 THROUGH A FLEXIBLE CONSTRUCTION

ACOUSTIC TEST RESULTS	
Partition & Sealant Result	63 Rw dB
Sealant Result	51 Rw dB
Sealant Result	61 Dnew dB



1 - FireGuard A565 sealant to one side of wall 25mm depth

2 – 55mm depth stone wool 60kg density

3 – Constructing element rated to 65dB