

Acoustic Test

Sponsor:

Mulcol International
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CONFIDENTIAL

Report: BMT/MTZ/F13079/01/AR3

Report on the testing of Linear Seals for acoustic performance to BS EN ISO 10140-2:2010

Issue date: December 2016



The details of the sponsor of the original test report BMT/MTZ/F13079/01 are held on file by BM TRADA. This report is additional to that issued originally as BMT/MTZ/F13079/01 and dated 30 April 2014. The original report shall remain valid and is not replaced by the additional report.

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1 Introduction

The specimen was supplied by the client and delivered to BM TRADA on 4 February 2014. The specimen was installed into a timber stud partition within the test chamber by BM TRADA.

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 BM TRADA, Chiltern House, Stocking Lane, Hughenden Valley, Buckinghamshire. HP14 4ND on the 4 February 2014.

For details of the testing, please see section 4, Methodology.

2 Test Specimens

The specimen was identified as Mulcol® Multimastic SP inside a timber cassette. The overall cassette dimensions were 120mm wide x 1250mm high x 545mm deep and the seal dimensions were 12mm deep x 30mm wide inside the cassette. The cassette was fitted into a partition wall.

The partition consisted of two wall leaves separated by a 320mm air gap. Each wall leaf was constructed of nominal 25mm x 70mm softwood studs at 600mm centres with three layers of 15mm plasterboard on each face. The cavities of each stud wall were filled with 50mm thick Knauf Earthwool insulation.

3 Detailed Specimen Description

Product Name	Mulcol® Multimastic SP
Product Type	Fire rated acrylic sealant
Product Dimensions	12mm deep x 30mm wide x 1200mm long
Backing Material	None present
Test Aperture (each face)	120mm wide x 1250mm high
Cassette Material Type	Softwood timber members fixed to MDF end caps. These were fixed with 8No. 5 x 60 woodscrews on each face.
Overall Cassette Dimensions	The overall dimensions were 120mm wide x 545mm deep x 1250mm long. This consisted of 2 parts: Part 1 – Cassette A contained the product in a 120mm wide x 125mm deep x 1250mm long cassette. Part 2 - Cassette B was an extension (at the clients request) to Cassette A, enabling the specimen (as a whole) to span the depth of the partition wall. This measured 120mm wide x 420mm deep x 1250mm long cassette. Part 1 and 2 were butt jointed and fixed with an intumescent mastic. See Appendix 2, Drawings and Photographs for details.
Cassettes Density	400-600 kg/m ³ **

** Nominal density not tested by laboratory

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4 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
- The sound reduction index was calculated using the following formula from BS EN ISO 10140-2:2010:

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

Where:

L1 is the logarithmic average of the source room measurements

L2 is the logarithmic average of the receive room measurements

S is the area of the test specimen

A is the equivalent absorption area, where $A = \frac{0.16V}{T}$

Where:

V = The volume of the receive room

T = the reverberation time measured in seconds

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

Test Equipment

Equipment	Equipment reference number
Brüel & Kjær Sound Level Meter (Type 2270)	ACT-009
Brüel & Kjær Microphones (Type 4189)	ACT-010 & ACT-016
Brüel & Kjær 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

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5 Results

 $R_w (C; C_{tr})$

MTZ/F13079/01/P005/AR3	Twin partition wall Mulcol® Multimastic SP. Seal is 12mm deep x 30mm wide x 1200mm long inside cassette. Batch No-20019715.	62 (-1;-5) dB
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The results only relate to the performance of the samples under the particular conditions of test.



Full test results for each test are presented in Appendix 1.

6 Limitations & Parameters

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

- Sound level meter (microphone) was located as required
- Sound sources (loudspeakers) were located as required
- Reverberation Time readings were greater than 20dB but not so large that the observed decay cannot be represented by a straight line.
- Background noise measurements were 10dB below L2 measurements.
- Temperature was reported to within $\pm 0.1^\circ\text{C}$
- Barometric pressure was reported to within ± 0.01 Mbar (± 1 Pa)
- Humidity was reported to within $\pm 1\%$
- Frequencies 50Hz, 63Hz and 80Hz are outside of our UKAS accreditation, and are for reference only. These frequencies do not affect the 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

7 Authorisation

	Issued by:	Checked by:
Signature:		
Name:	Martin Durham	Lee Grant-Riach
Title:	Lead Technical Officer	Senior Technical Officer
Date of Issue	19 th December 2016	

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Appendix 1 - Test Data

MTZ/F13079/01/AR2/P005	Twin partition wall Mulcol® Multimastic SP. Seal is 12mm deep x 30mm wide x 1200mm long inside cassette. Batch No-20019715.
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Test Specimen Name: Twin partition wall

Client: Mulcol International

Test Specimen Installed By: Client

Area of Specimen (S): 14.20

Temperature in Test Rooms: 19.1 °C

Static Pressure: 982500.0 Pa

Humidity in Test Rooms: 51.1 %

Test Specimen Description: Mulcol® Multimastic SP

Ref. No.: MTZ/F13079/01/AR3/P005

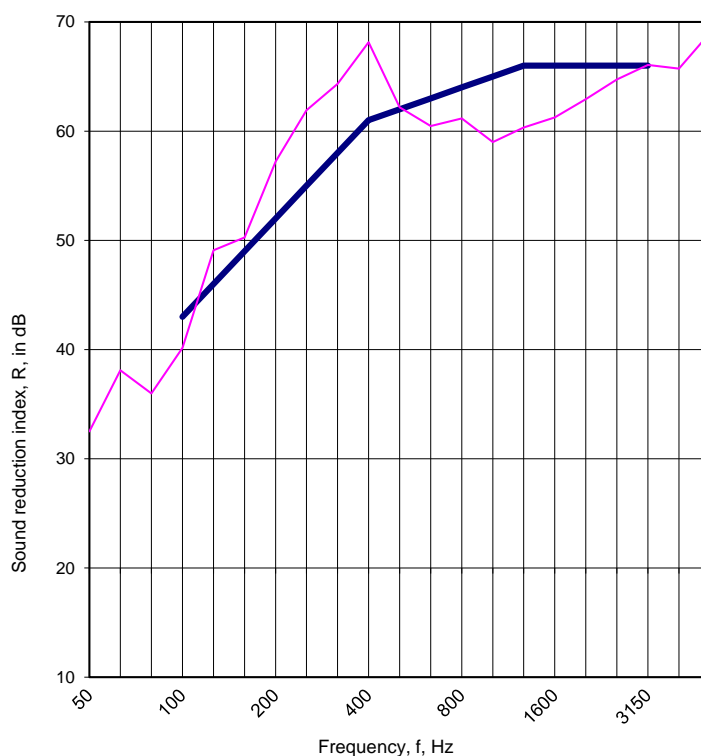
Date of Test: 04/02/2014

Source Room Volume: 86.00 m³

Receive Room Volume: 63.00 m³

f, Hz	R, dB
50 ⁺	32.5
63 ⁺	38.1
80 ⁺	36.0
100	40.2
125	49.1
160	50.3
200	57.2
250	61.9
315	64.3
400	≥ 68.1
500	62.2
600	60.5
800	61.2
1000	59.0
1250	60.3
1600	61.2
2000	62.9
2500	64.7
3150	≥ 66.1
4000	≥ 65.7
5000	≥ 69.0
AAD	-29.0

Frequency range for rating in accordance with ISO 717-1



— Rating Curve (ISO 717-1) — Sound Reduction Index, R, in dB

$R_w = 62$ dB
 $R_w + C = 61$ dB
 $R_w + C_{tr} = 57$ dB

$C_{(50-3150)} = -2$ dB $C_{tr(50-3150)} = -10$ dB
 $C_{(50-5000)} = -1$ dB $C_{tr(50-5000)} = -10$ dB
 $C_{(100-5000)} = 0$ dB $C_{tr(100-5000)} = -5$ dB



Lee Grant-Riach
Technical Officer

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

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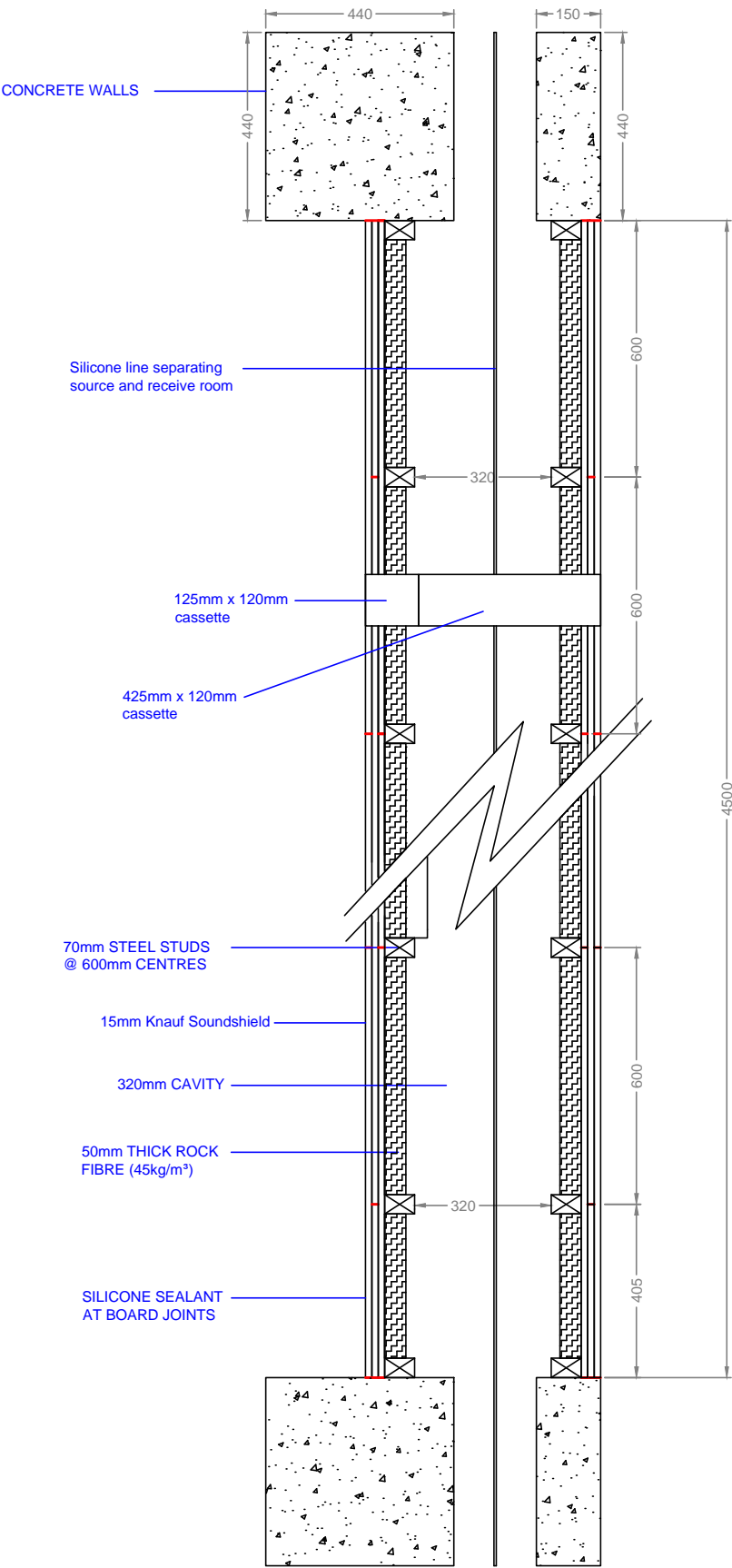
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Appendix 2 – Drawings and Photographs (5 Pages)

List of Drawings

Figures	Drawing Reference
Figure 1	Schematic drawing showing horizontal cross section of test wall
Figure 2	Schematic drawing showing source room section of test wall
Figure 3	Schematic drawing showing horizontal cross section of cassette
Photograph A	Photograph of Cassette A and Cassette B as separate units
Photograph B	Photograph of Cassette A and Cassette B fixed to form single specimen (as used in test)

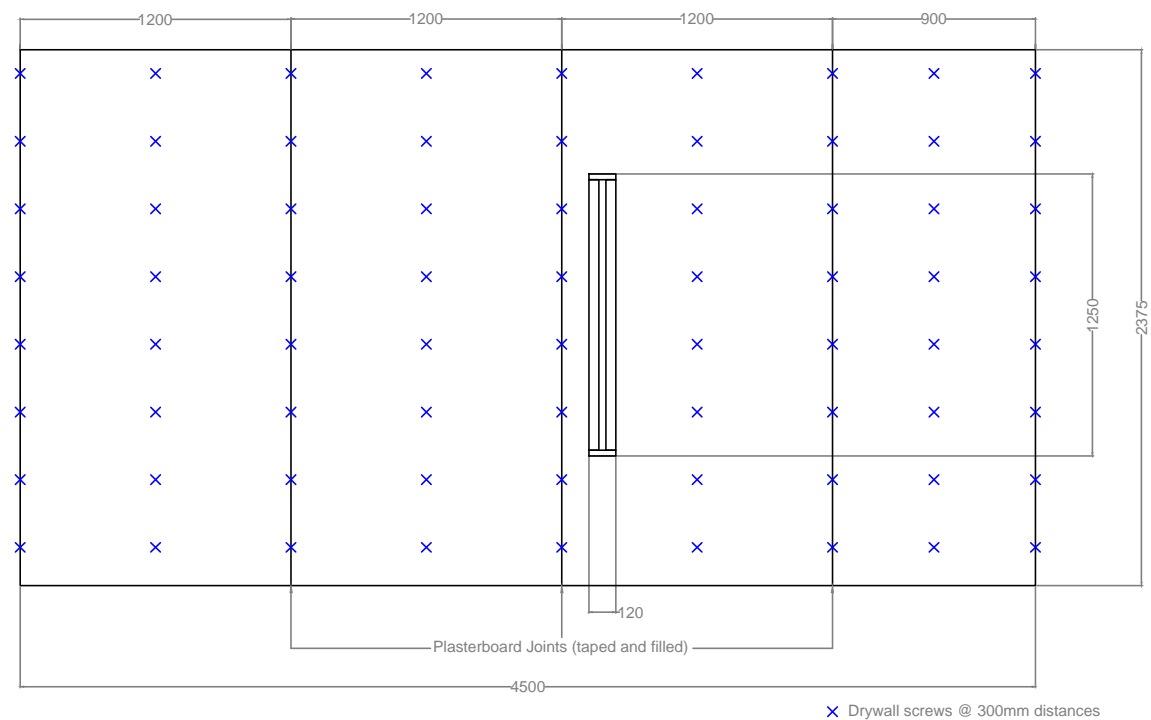


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Schematic drawing showing horizontal cross section of test wall

Date Drawn 14/02/2014	Drawn By ATM	Scale Not to Scale All dimensions in mm unless otherwise stated
Project No. BMT/MTZ/F13079/01/AR3	Appendix 2	

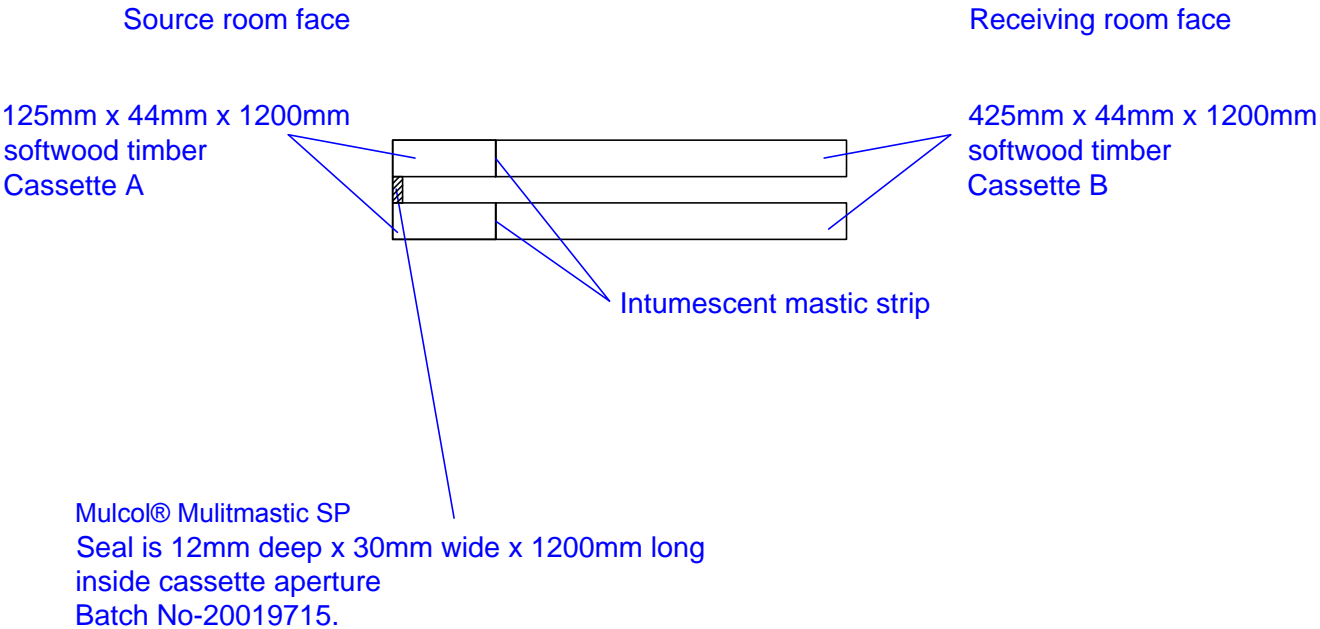


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Schematic drawing showing source room
section of test wall

Date Drawn 14/02/2014	Drawn By ATM	Scale Not to Scale All dimensions in mm unless otherwise stated
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Photograph A



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Photograph B



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