

Acoustic Test

Sponsor:

Mulcol International
Arnesteinweg 18
4338 PD Middelburg
The Netherlands

CONFIDENTIAL

Report: BMT/MTZ/F13079/01/AR2

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.

Page 1 of 8

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation. This document is confidential and remains the property of Chiltern International Fire Ltd. The legal validity of this report can only be claimed on the presentation of the complete report.



Contents

1	Introduction	3
2	Test Specimens	3
3	Detailed Specimen Description	3
4	Methodology	4
5	Results.....	5
6	Limitations & Parameters	5
7	Authorisation.....	5
	Appendix 1 – Test Data.....	6
	Appendix 2 – Drawings and Photographs (5 Pages).....	8

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® Multisealant A 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® Multisealant A
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

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

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

5 Results

 $R_w (C; C_{tr})$

MTZ/F13079/01/P005/AR2	Twin partition wall Mulcol® Multisealant A. Seal is 12mm deep x 30mm wide x 1200mm long inside cassette. Batch No-20019715.	62 (-1;-5) dB
------------------------	---	---------------

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	8 th December 2016	

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

Appendix 1 - Test Data

MTZ/F13079/01/AR2/P005	Twin partition wall Mulcol® Multisealant A. Seal is 12mm deep x 30mm wide x 1200mm long inside cassette. Batch No-20019715.
------------------------	---

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® Multisealant A

Ref. No.: MTZ/F13079/01/AR2/P005

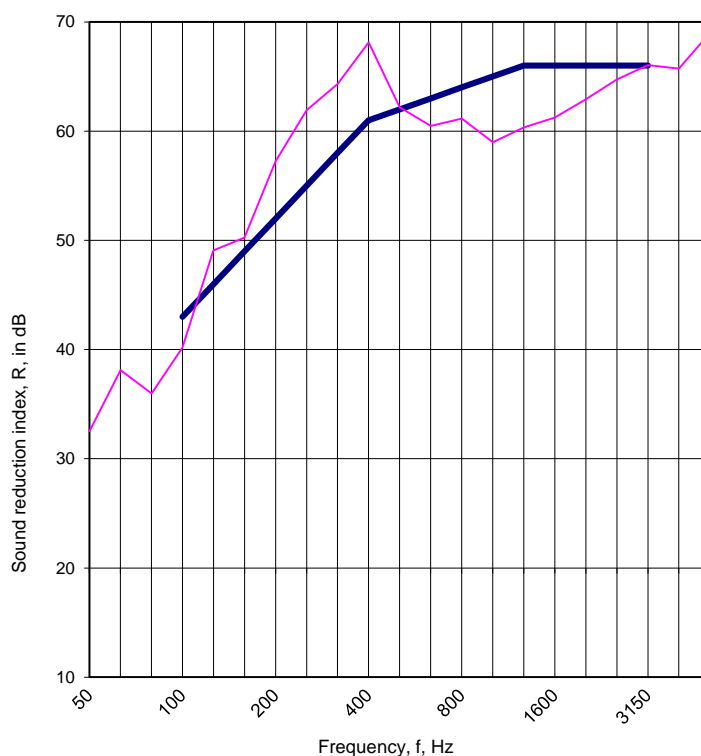
Date of Test: 04/02/2014

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

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

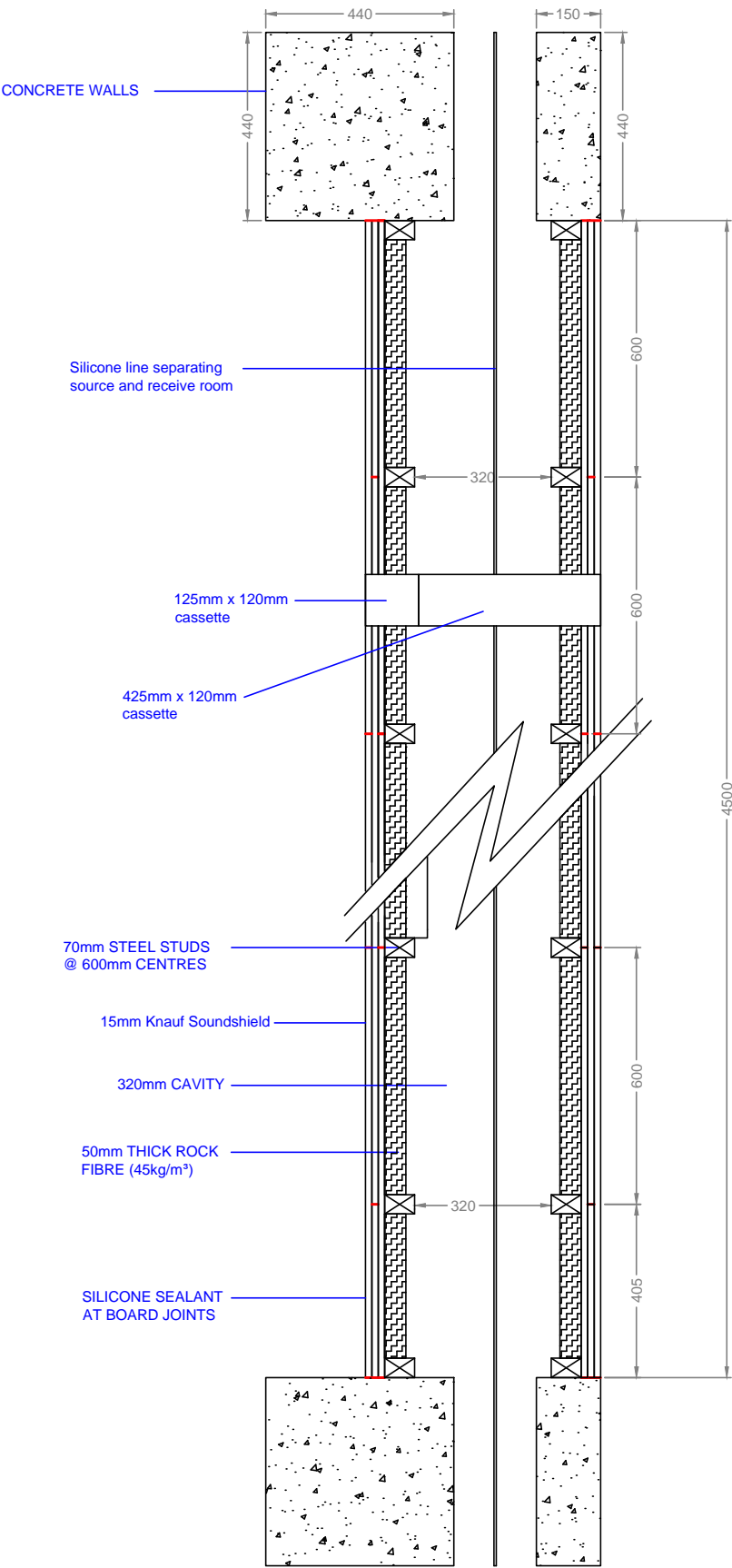
Report for: Mulcol International
Report Ref: BMT/MTZ/F13079/01/AR2

Page 7 of 8

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)

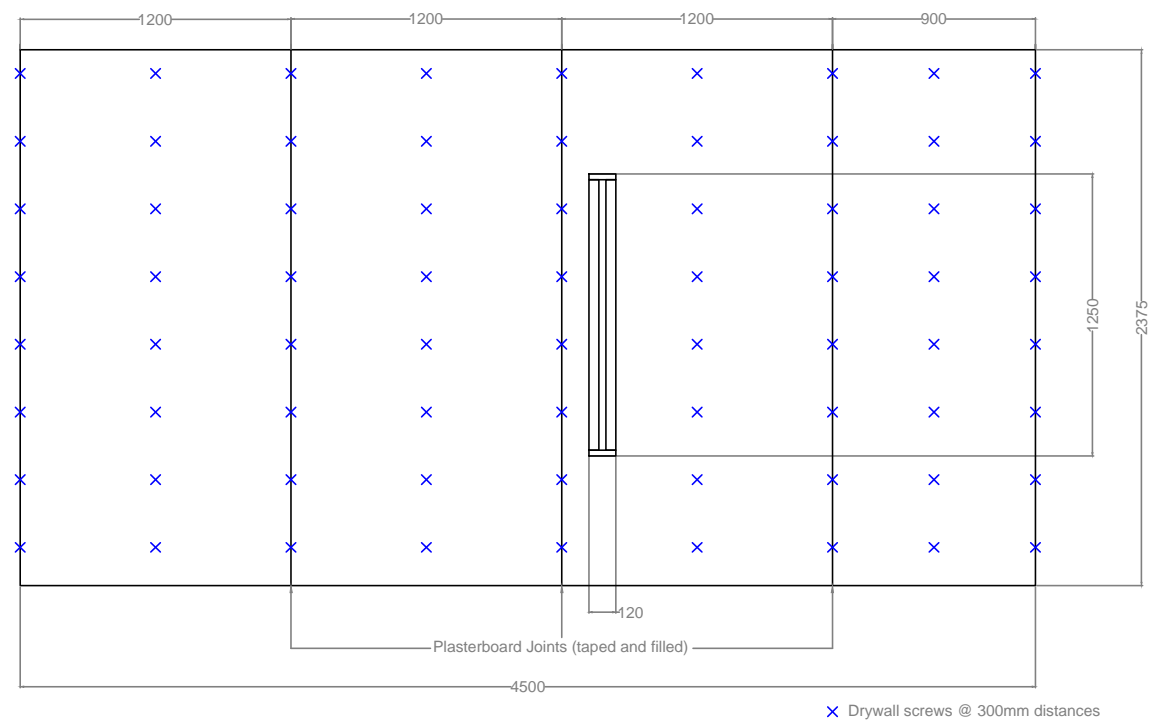


BMTRADA

Chiltern House, Stocking Lane, Hughenden Valley
High Wycombe, Buckinghamshire, HP14 4ND, UK.
Tel: +44 (0)1494 569800 Fax: +44 (0)1494 564895

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/AR2	Appendix 2	

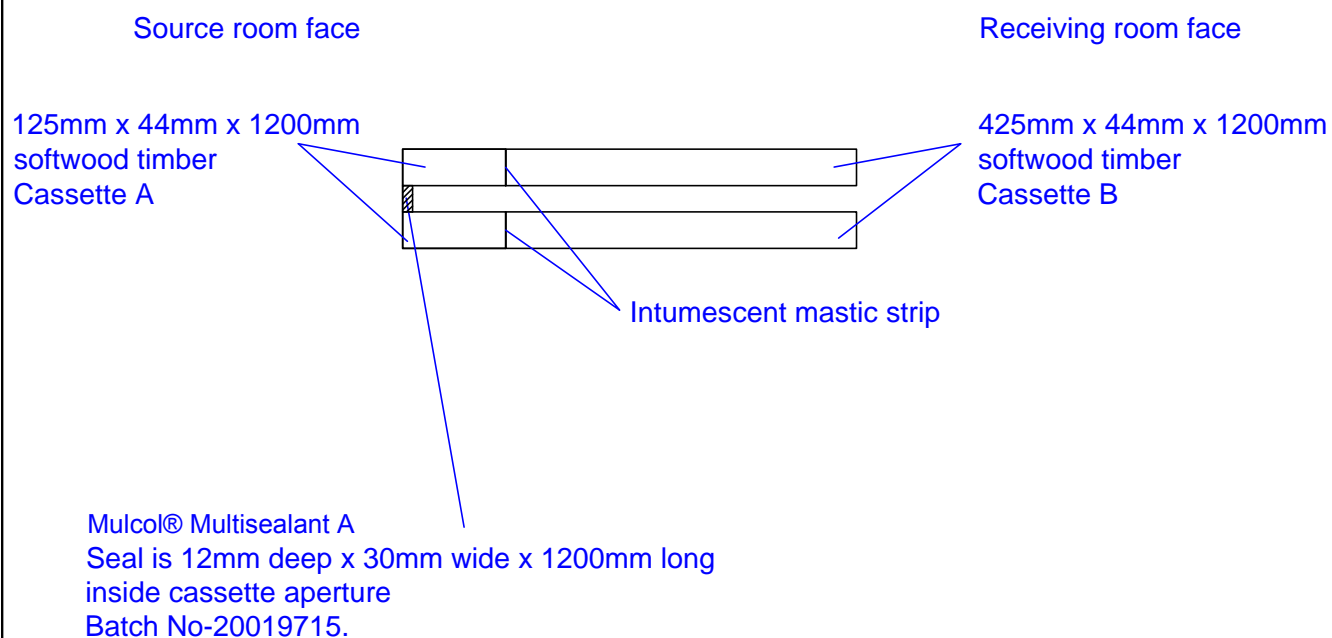


BMTRADA

Chiltern House, Stocking Lane, Hughenden Valley
High Wycombe, Buckinghamshire, HP14 4ND, UK.
Tel: +44 (0)1494 569800 Fax: +44 (0)1494 564895

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
Project No. BMT/MTZ/F13079/01/AR2	Appendix 2	



BMTRADA

Chiltern House, Stocking Lane, Hughenden Valley
High Wycombe, Buckinghamshire, HP14 4ND, UK.
Tel: +44 (0)1494 569800 Fax: +44 (0)1494 564895

Schematic drawing showing horizontal cross
section of cassette

Date Drawn
27/02/2014

Drawn By
ATM

Scale Not to Scale
All dimensions in mm
unless otherwise stated

Project No.

BMT/MTZ/F13079/01/AR2

Appendix 2

Photograph A



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

Photograph B

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

BM TRADA provides independent certification, testing, inspection, training and technical services around the world. We help customers large and small to prove their business and product credentials and to improve performance and compliance. With an international presence across many industry sectors, we offer a special focus and long history of technical excellence in supply chain certification, product certification and testing, and technical services to the timber, building, fire and furniture industries.



testing@bmtrada.com



bmtradagroup.com



+44 (0) 1494 569800