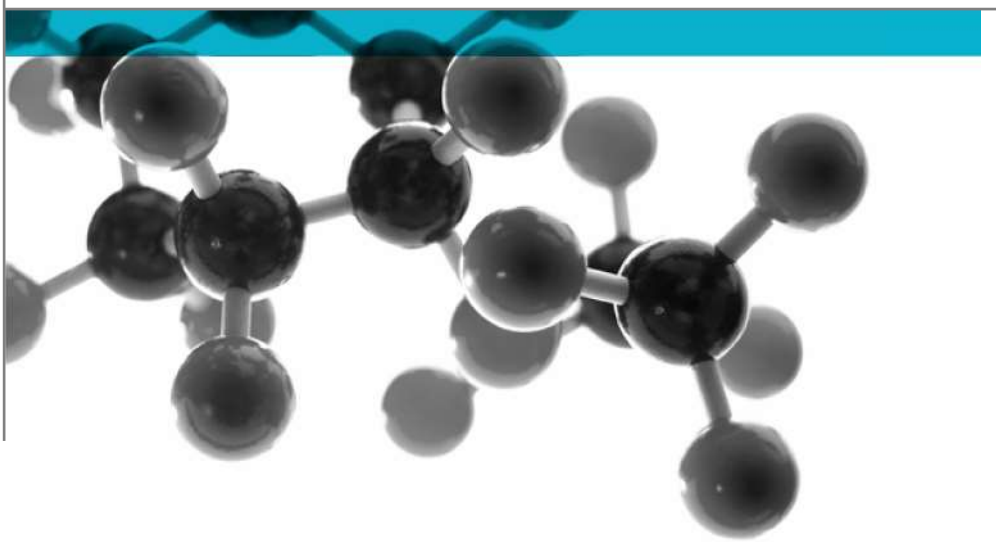
BS EN ISO 10140-2:2010



Test of: Monoblok MDF Single leaf doorset

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

Date: 03/07/2019

Copy: 1

Issue No.: 1

A Report To:
Yildiz Entegre Romania
No.1 Yildiz Street
Oarja
Arges County
Romania
Zip 117545

Document Reference:
WYC412492

Contents

Page No.

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	Caulked	Test Result (R_w (C;C_{tr}))
1	Monoblok MDF	Single leaf doorset	Yes	34 (-1;-2) dB
2	Monoblok MDF	Single leaf doorset	No	30 (-1;-1) dB

1 Introduction

The test specimen was supplied by the sponsor and delivered to WARRINGTONFIRE on 19 March 2019. 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 22 March 2019.

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

Supporting Construction Description

The partition consisted of two wall leaves separated by a 400mm 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 Rockwool 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	82.4	5.49	6.03	2.49
Receive room	69.6	5.49	5.09	2.49

2 Test Specimen Details

Product Name	Monoblok MDF
Product Manufacturer	Yildiz Entegre Romania
Product Type	Single leaf doorset
Material Type	Timber
Overall Dimensions	852mm wide x 2010mm high x 206mm deep
Leaf Dimensions	800mm wide x 1980mm high x 36mm deep

Door Leaf

	Material/type	**Dimensions (mm)**	**Density (kg/m³)**
Core	Monoblok MDF (Manufacturer Yildiz Entegre)*	800 x 1980*	620*
Decorative Facings	Melamine paper (Manufacturer Yildiz Entegre)*	0.10 thick*	-
Adhesive	Pollyuretone*	-	-

* As stated by sponsor, not checked by laboratory

Door Frame

	Material/type	**Dimensions (mm)**	**Density (kg/m³)**
Head & jambs	Melamine faced Monoblok MDF (Manufacturer Yildiz Entegre)	206 x 40	640*
Rebate	Single type	40 x 10*	-
Joints	Screwed Joint Fixed by 2No. 5 x 70 screws in each corner*	-	-

* As stated by sponsor, not checked by laboratory

Hardware

	Make/type	Size (mm)	Fixing details (dimensions in mm)
Hinges	3No. Varidor hinges (Ref. Lux Yuvali Okka)*	100 x 30 blade size	3No. 6 x 40 screws
Locking mechanism	Varidor (DAF KILIT Locks & Handles CO.Inc)*	240 x 23 (overall size)	2No. 3 x 18 screws
Keep	Kale Kilit*	200 long	3No. 3 x 18 screws
Handles	Houfele (Ref. 903.78.784)*	120 x 52 (Footprint size)	3No. 3 x 18 screws

* As stated by sponsor, not checked by laboratory

Perimeter Sealing details

	Make/type	Size (mm)	Location
Threshold	Marble*	175 x 780*	-
Frame reveal	Silicone seal, USKA Kauçuk /Istanbul, model D*	9 x 9	Fitted within upstand of stop
Seal continuity	Seals uninterupted by hardware	-	-

* As stated by sponsor, not checked by laboratory

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

- 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 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
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-049
Noise Generators	ACT-008
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	3rd July 2019	

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

Product Name	Monoblok MDF
Product Type	Single leaf doorset

Data Sheet Ref.	**Variations**		**Test Result R_w (C;C_{tr})**
WYC412492/P001	Caulked	Yes	34 (-1;-2) dB
WYC412492/P002	Caulked	No	30 (-1;-1) dB

warringtonfire
Proud to be part of element

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

1762

Sponsor:	**Yildiz Entegre Romania**
Product Name/Desc.	**Monoblok MDF**
Product Type	Single leaf doorset
Material Type	Timber
Variations:	
Caulked	Yes

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

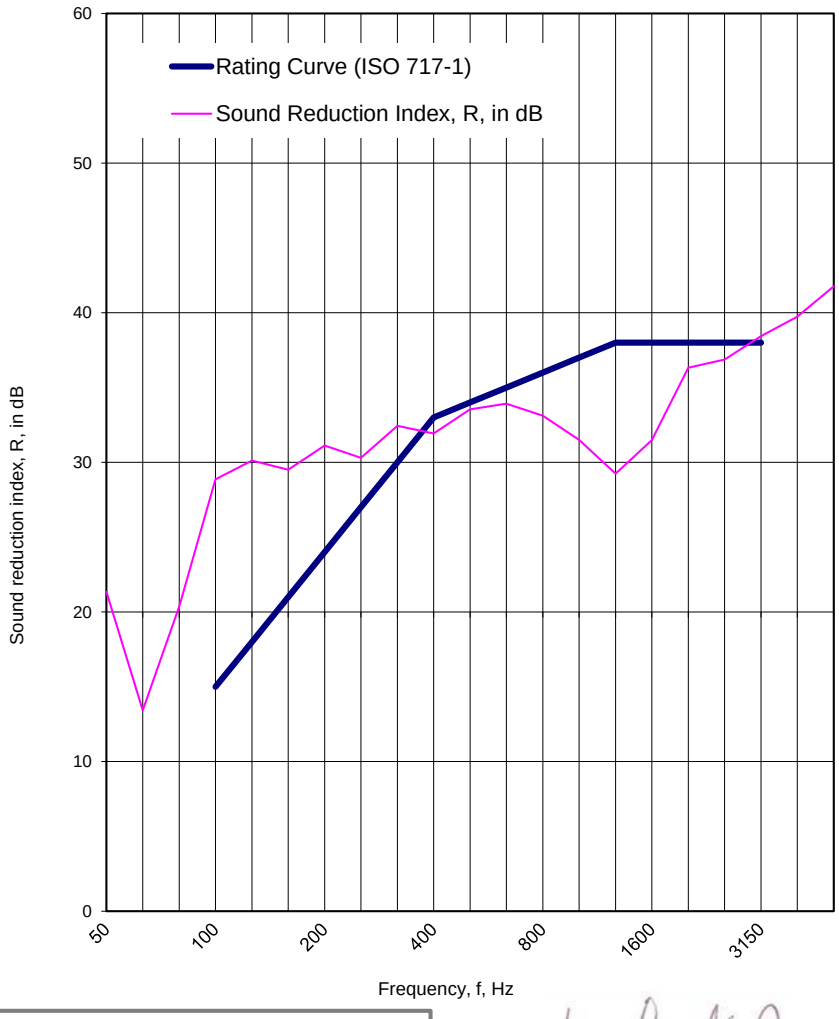
Data sheet Ref. WYC412492/P001

Date of Test: 22/03/2019

Source Room Volume:		82.40	m^3
Receive Room Volume:		69.60	m^3
Specimen Installed By:		Warringtonfire	
Area of Specimen (S):		1.72	m^2
	Sour.	Rec.	
Temp. in Test Rooms:	17.1	17.2	°C
Static Pressure:	10102.0	10100.0	Pa
Humidity in Test Rooms:	49.9	48.9	%

f, Hz		*R* ,dB
50+		21.4
63+		13.4
80+		20.4
100		28.9
125		30.1
160		29.5
200		31.1
250		30.3
315		32.4
400		31.9
500		33.5
630		33.9
800		33.1
1000		31.5
1250		29.2
1600		31.5
2000		36.3
2500		36.9
3150		38.4
4000		39.7
5000		41.8
AAD		-29.1

Frequency range for rating in accordance with ISO 717-1



R_w =	**34 dB**	$C_{(50-3150)}$ =	-1 dB	$C_{tr\ (50-3150)}$ =	-4 dB
R_w+C =	**33 dB**	$C_{(50-5000)}$ =	0 dB	$C_{tr\ (50-5000)}$ =	-4 dB
R_w+C_{tr} =	**32 dB**	$C_{(100-5000)}$ =	0 dB	$C_{tr\ (100-5000)}$ =	-2 dB

Lee Grant-Riach
Lead Technical Officer

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

warringtonfire
Proud to be part of element

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

1762

Sponsor:	**Yildiz Entegre Romania**
Product Name/Desc.	**Monoblok MDF**
Product Type	Single leaf doorset
Material Type	Timber
Variations:	
Caulked	No

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

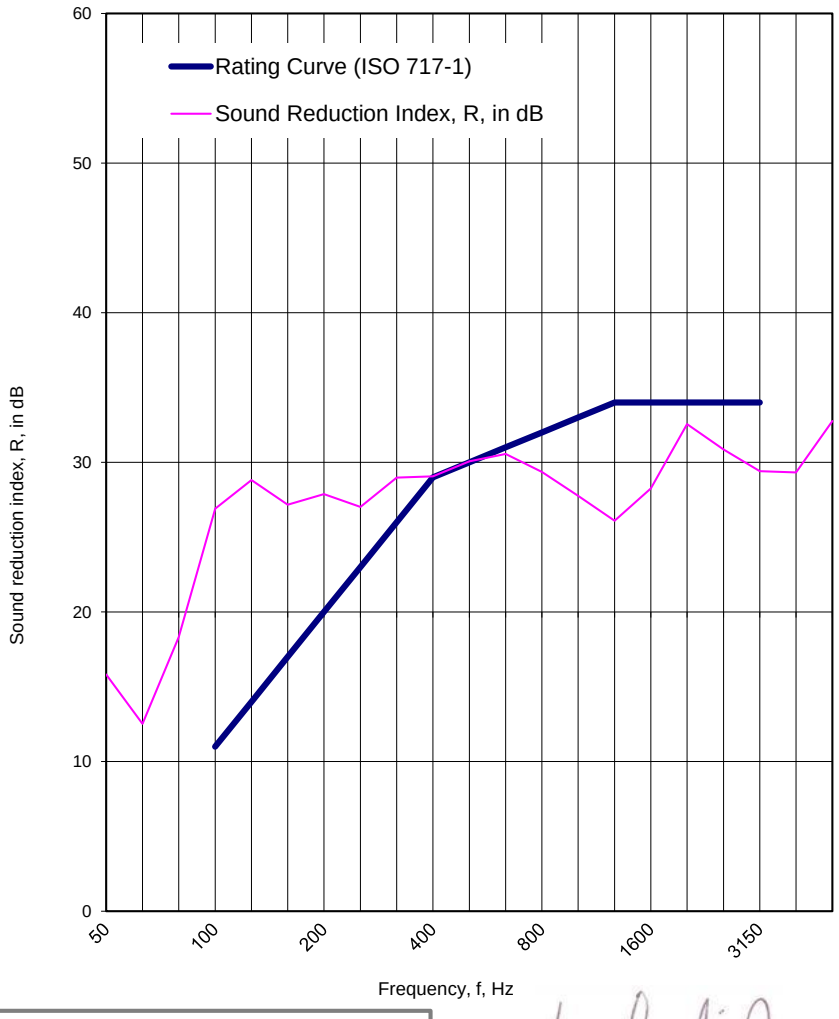
Data sheet Ref. WYC412492/P002

Date of Test: 22/03/2019

Source Room Volume:			82.40 m^3
Receive Room Volume:			69.60 m^3
Specimen Installed By:			Warringtonfire
Area of Specimen (S):			1.72 m^2
	Sour.	Rec.	
Temp. in Test Rooms:	17.1	17.2	°C
Static Pressure:	10102.0	10100.0	Pa
Humidity in Test Rooms:	49.9	48.9	%

f, Hz		*R* ,dB
50+		15.8
63+		12.5
80+		18.3
100		26.9
125		28.8
160		27.2
200		27.9
250		27.0
315		29.0
400		29.1
500		30.1
630		30.6
800		29.4
1000		27.8
1250		26.1
1600		28.3
2000		32.6
2500		30.9
3150		29.4
4000		29.3
5000		32.8
AAD		-31.1

Frequency range for rating in accordance with ISO 717-1



R_w =	**30 dB**	$C_{(50-3150)}$ =	-1 dB	$C_{tr\ (50-3150)}$ =	-3 dB
R_w+C =	**29 dB**	$C_{(50-5000)}$ =	0 dB	$C_{tr\ (50-5000)}$ =	-3 dB
R_w+C_{tr} =	**29 dB**	$C_{(100-5000)}$ =	0 dB	$C_{tr\ (100-5000)}$ =	-2 dB

Lee Grant-Riach
Lead Technical Officer

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