

TFI Report 462062-04

Impact Sound Insulation

Customer
Unifloor BV
Munsterstraat 24
7418 EV Deventer
NETHERLANDS

Product
floor underlay
Redupax

This report includes 2 pages and 1 annex(es)

Responsible at TFI

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Aachen, 02.12.2016

Dr. Ernst Schröder

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1 Transaction

Test order	Sound insulation according to EN ISO 10140:2010
Order date	04.11.2016
Your reference	F. Vousten
Product designation	Redupax 9mm, PVC click MDF 9.5mm
TFI sample number	16-11-0067, 16-11-0064

2 Product Specification / Construction

Description	Underlayer
Material	pure natural wood*
Thickness	9 mm*

Thickness: Material (from top to bottom):

9.5 mm* PVC click MDF (16-11-0064)

9 mm* Redupax (16-11-0067)

* customer information



PVC click MDF (16-11-0064)



Redupax (16-11-0067)

3 Results

Without weight

Impact sound insulation [ΔL_w] 22 dB ($\Delta L_{i,in} = 11$ dB)

With weight

Impact sound insulation [ΔL_w] 22 dB ($\Delta L_{i,in} = 11$ dB)

4 Annexes

Impact sound insulation TS 462062-04^a

The annexes marked ^a are based on tests accredited in accordance with EN ISO/IEC 17025.

Annex TS - Impact Sound Insulation

1 Transaction

Product designation	Redupax 9mm, PVC click MDF 9.5mm
TFI sample number	16-11-0067, 16-11-0064
Testing period	04.11.2016

2 Test Method / Requirements

EN ISO 10140-1:2014	Acoustics - Laboratory measurement of sound insulation of building elements - Part 1: Application rules for certain products
EN ISO 10140-2:2010	Acoustics - Laboratory measurement of sound insulation of building elements - Part 2: Measurement of airborne sound insulation
EN ISO 10140-3:2015	Acoustics - Laboratory measurement of sound insulation of building elements - Part 3: Measurement of impact sound reduction
EN ISO 10140-4:2010	Acoustics - Laboratory measurement of sound insulation of building elements - Part 4: Measurement procedures and requirements
EN ISO 10140-5:2014	Acoustics - Laboratory measurement of sound insulation of building elements - Part 5: Requirements for test facilities and equipment
EN ISO 717-1:2013	Acoustics - Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation
EN ISO 717-2:2013	Acoustics - Rating of sound insulation in buildings and of building elements - Part 2: Impact sound reduction

3 Remarks

Measured with weight and without weight

4 Measuring Operation

Measurement of the impact sound pressure level:	Using with 4 tapping machine position. (The single results of the one-third-octave-bands were averaged on an energy basis)
Test surface:	~10m ²
Category:	II
Connection with the floor:	loose laid
Damage to the sample:	None

5 Laboratories

Test rooms:	Laboratories of the TFI Aachen GmbH, Hauptstrasse133, 52477 Alsdorf, Germany
Sending room (1.04):	$V = 52.4 \text{ m}^3$ (with diffusers)
Receiving room (0.01):	$4.05 \text{ m} \times 3.95 \text{ m} \times 3.33 \text{ m} + 2.00 \text{ m} \times 0.98 \text{ m} \times 0.18 \text{ m}$; $V = 53.6 \text{ m}^3$ (cuboid room, with diffusers)
Reference floor:	$4.27 \text{ m} \times 4.46 \text{ m}$; $S = 19.04 \text{ m}^2$ 14 cm concrete slab floor with an area-related mass of $m' \sim 322 \text{ kg/m}^2$
Flanking walls:	Lime sand brick walls with light wall facings (facing shell $d = 12 \text{ cm}$) with an average area-related mass of $m' \sim 330 \text{ kg/m}^2$

Without weight:

Weighted normalized impact sound pressure level	$L_{n,0,w}$	=	74	dB
Weighted normalized impact sound pressure level	$L_{n,w}$	=	51	dB
Weighted normalized impact sound pressure level	$L_{n,r,w}$	=	56	dB

With weight:

Weighted normalized impact sound pressure level	$L_{n,0,w}$	=	74	dB
Weighted normalized impact sound pressure level	$L_{n,w}$	=	51	dB
Weighted normalized impact sound pressure level	$L_{n,r,w}$	=	56	dB

6 Measuring Devices

Real time analyser:	CESVA INSTRUMENTS, TYP: SC310, SN: T237102
Microphone:	CESVA INSTRUMENTS, TYP: C130, SN: 13523
Microphone amplifier:	CESVA INSTRUMENTS, TYP: PA13, SN: 4162
Calibrator:	CESVA INSTRUMENTS, TYP: CB006, SN 49649
Tapping machine:	NORSONIC, Type 211, SN: 502 (standard tapping machine with 3 feet and 5 hammers according to ISO 10140)

7 Evaluation

The impact sound pressure level generated by the standard tapping machine is measured in the receiving room under a bare heavy floor with and without a floor covering. The impact sound reduction is determined on the basis of the measured values as follows:

$$\Delta L = L_{n,0} - L_n \text{ (dB)}$$

$L_{n,0}$ Impact sound pressure level without a floor covering (dB)

L_n Impact sound pressure level with a floor covering (dB)

For the evaluation of the weighted reduction in impact sound pressure level ΔL_w , the relevant reference curve is shifted in increments of 1 dB towards the measured curve until the sum of unfavourable deviations is as large as possible, but not more than 32 dB.

The linear impact sound level ΔL_{lin} is determined according to the following equation:

$$\Delta L_{lin} = L_{n,r,0,w} + C_{l,r,0} - (L_{n,r,w} + C_{l,r}) = \Delta L_w + C_{l,\Delta}$$

$L_{n,r,w}$	is the calculated weighted normalized impact sound pressure level of the reference floor with the floor covering under test
$L_{n,r,0,w}$	78 dB, calculated from $L_{n,r,0}$ according to Section 4.3.1 of DIN EN ISO 717-2: 2013
$C_{l,r}$	Spectrum adaptation term for the reference floor with the floor covering to be tested
$C_{l,r,0}$	-11 dB, spectrum adaptation term for the reference floor with $L_{n,r,0}$ determined according to Annex A, Section A.2.1 of DIN EN ISO 717-2:2013

8 Note

The results are based on measurements performed under laboratory conditions with artificial excitation (standard procedure). The test results are applicable in due consideration of the national provisions and the local circumstances and/or constructions.

Impact sound insulation according ISO 10140-1

Laboratory measurements of the reduction of transmitted impact noise by floor coverings on a heavyweight reference floor

Product name Redupax 9mm, PVC click MDF 9.5mm Testing period 04.11.2016

TFI sample number 16-11-0067, 16-11-0064

Construction PVC click MDF 9.5mm (16-11-0064)
(from top to bottom) Redupax 9mm (16-11-0067)

Installed by customer

Without weight

Receiving room

Volume 53,6 m³

Air temperature 20,7 °C

Relative air humidity 62,7 %

Static pressure 99,8 kPa

Source room

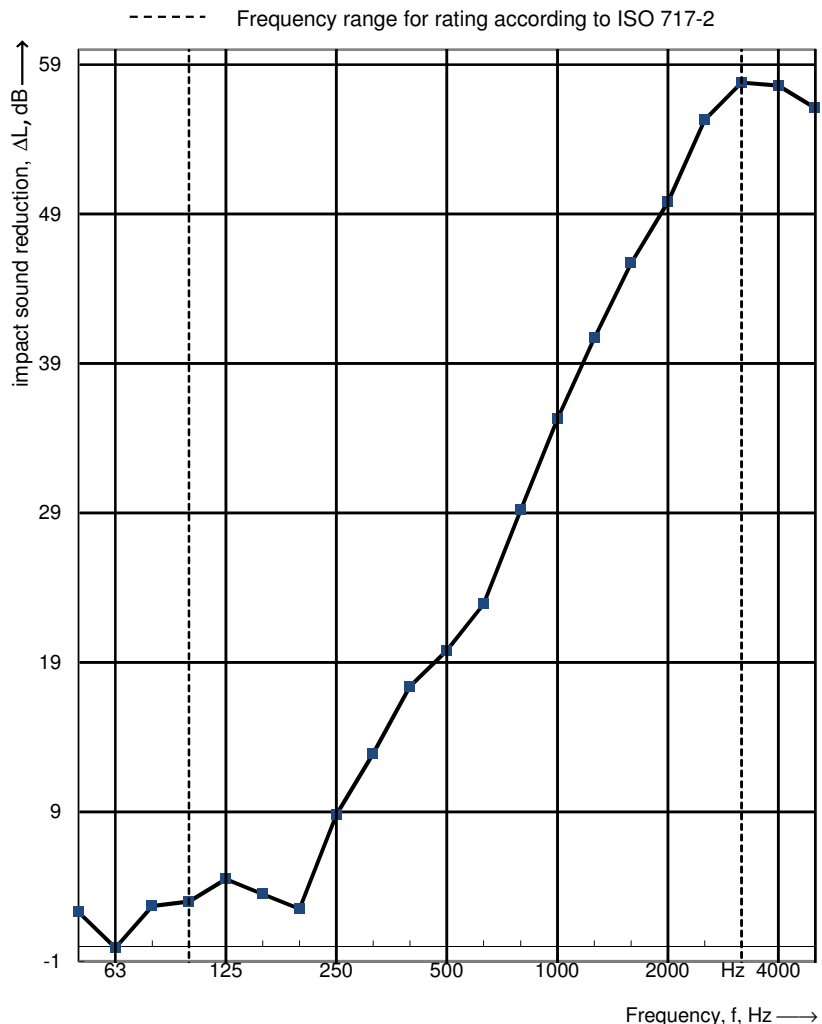
Volume 52,4 m³

Air temperature 21,5 °C

Relative air humidity 38,6 %

Type of reference floor: Massiv

Frequency f [Hz]	L _{n,0} 1/3 oct. [dB]	ΔL 1/3 oct. [dB]
50	62,9	2,3
63	63,1	-0,1
80	61,7	2,7
100	59,9	3,0
125	65,9	4,5
160	61,6	3,5
200	61,7	2,5
250	69,0	8,8
315	64,2	12,9
400	65,8	17,4
500	65,1	19,8
630	64,8	22,9
800	66,3	29,2
1000	66,0	35,3
1250	66,9	40,7
1600	67,9	45,7
2000	68,0	49,8
2500	67,8	55,3
3150	68,3	57,8 ¹
4000	67,3	57,6 ¹
5000	64,3	56,1 ¹

¹ correction basic noise

Rating according to ISO 717-2

 $\Delta L_w = 22$ dB $\Delta L_{lin} = 11$ dB $C_{l,\Delta} = -11$ dB $C_{l,r} = 0$ dB

The results are based on a test performed with an artificial source under laboratory conditions (engineering method) with the specified reference floor.

Impact sound insulation according ISO 10140-1

Laboratory measurements of the reduction of transmitted impact noise by floor coverings on a heavyweight reference floor

Product name Redupax 9mm, PVC click MDF 9.5mm Testing period 04.11.2016

TFI sample number 16-11-0067, 16-11-0064

Construction (from top to bottom) PVC click MDF 9.5mm (16-11-0064)
Redupax 9mm (16-11-0067)

Installed by customer

With weight 5 x 13,2 kg

Receiving room

Volume 53,6 m³

Air temperature 20,7 °C

Relative air humidity 62,7 %

Static pressure 99,8 kPa

Source room

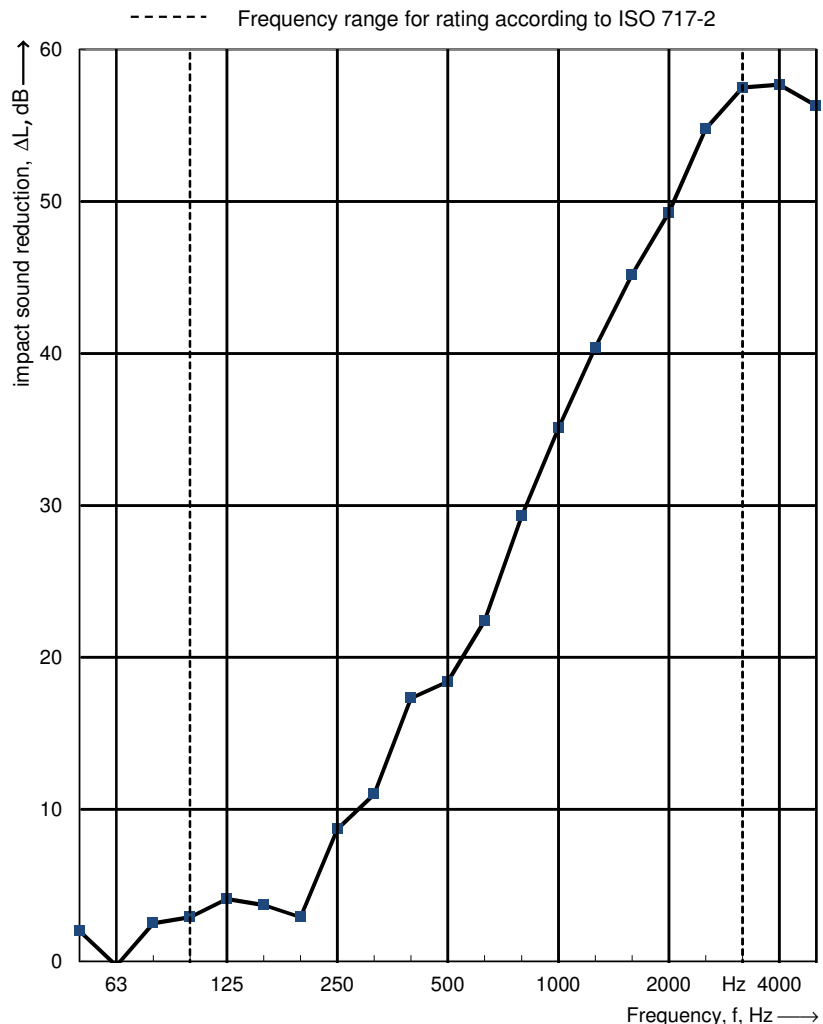
Volume 52,4 m³

Air temperature 21,5 °C

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Type of reference floor: Massiv

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50	62,9	2,0
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80	61,7	2,5
100	59,9	2,9
125	65,9	4,1
160	61,6	3,7
200	61,7	2,9
250	69,0	8,7
315	64,2	11,0
400	65,8	17,3
500	65,1	18,4
630	64,8	22,4
800	66,3	29,3
1000	66,0	35,1
1250	66,9	40,4
1600	67,9	45,2
2000	68,0	49,3
2500	67,8	54,8
3150	68,3	57,5 ¹
4000	67,3	57,7 ¹
5000	64,3	56,3 ¹

¹ correction basic noise

Rating according to ISO 717-2

 $\Delta L_w = 22$ dB $\Delta L_{in} = 10$ dB $C_{L,\Delta} = -11$ dB $C_{l,r} = 0$ dB

The results are based on a test performed with an artificial source under laboratory conditions (engineering method) with the specified reference floor.