

TFI Report 481091-08

Impact Sound Insulation

Customer

Unifloor Underlay Systems
Arnsbergstraat 4
7418 EZ Deventer
NETHERLANDS

Product

floor covering with underlay
LVT 2,0 mm glue, Jumpax Basic 7,0 mm, Heatblok 6,0 mm

This report includes 2 pages and 1 annex(es)
This report is a correction of report no. 481091-01.

Responsible at TFI

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Aachen, 09.07.2018

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- Head of the testing laboratory -

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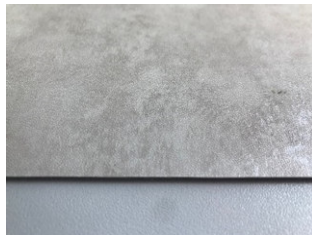
1 Transaction

Test order	impact sound insulation according to EN ISO 10140
Order date	14 June 2018
Your reference	F. Vousten
Product designation	LVT 2,0 mm glue, Jumpax Basic 7,0 mm, Heatblok 6,0 mm
TFI sample number	18-06-0212, 18-06-0210, 18-06-0211

2 Product Specification

Construction (from top to bottom)

Product designation	TFI sample number
LVT 2,0 mm glue	18-06-0212
Jumpax Basic 7,0 mm	18-06-0210
Heatblock 6,0 mm	18-06-0211



18-06-0212



18-06-0210



18-06-0211

3 Results

Impact sound insulation	$\Delta L_w = 22 \text{ dB}$	$\Delta L_{jin} = 10 \text{ dB}$
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4 Annexes

Impact sound insulation	TS 481091-08 ^a
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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	LVT 2,0 mm glue, Jumpax Basic 7,0 mm, Heatblok 6,0 mm
TFI sample number	18-06-0212, 18-06-0210, 18-06-0211
Testing period	14 June 2018

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
EN ISO 12999-1: 2014	Acoustics - Determination and application of measurement uncertainties in building acoustics - Part 1: Sound insulation

3 Remarks

None

4 Measuring Operation

Measurement of the impact sound pressure level:	Using 4 fixed microphone positions, with 1 tapping machine position for each microphone position (The single results of the one-third-octave-bands were averaged on an energy basis)
Test surface:	approx. 10 m ²
Category:	II
Connection with the floor:	loose laid

Damage to the sample: None
 Corrections: None, since
 - background noise corrections not relevant
 - airborne sound corrections not relevant

5 Laboratories

Test rooms: Laboratories of the TFI Aachen GmbH, Hauptstrasse133, 52477 Alsdorf, Germany
 Sending room (1.04): $V = 52.1 \text{ m}^3$ (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 $m' \sim 330 \text{ kg/m}^2$

6 Measuring Devices

Real time analyser: Norsonic Nor140, SN: 1406926
 Microphone: Norsonic Type 1209/21134
 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

TS 481091-08

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

Annex TS – Impact sound insulation

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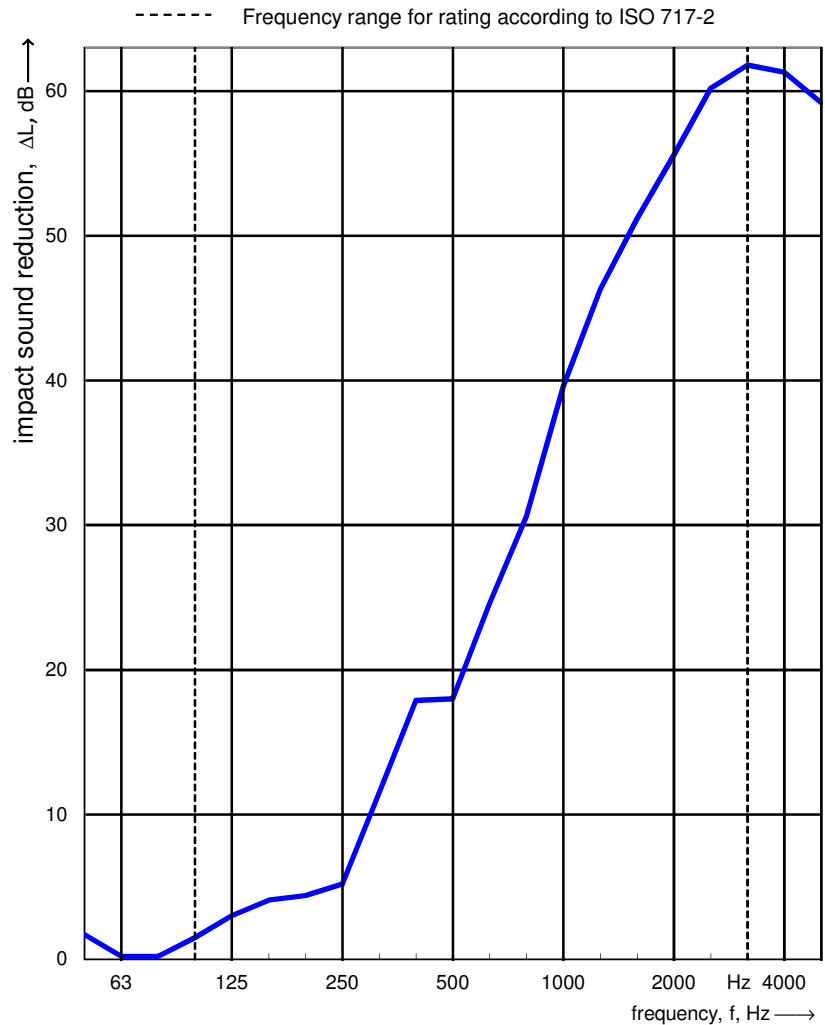
TFI sample number: 18-06-0212, 18-06-0210, 18-06-0211 Testing period: 14.06.2018
 Product name: LVT 2,0 mm glue, Jumpax Basic 7,0 mm, Heatblok 6,0 mm

Installed by: customer
 Construction: LVT 2,0 mm glue (18-06-0212)
 (from top to bottom) Jumpax Basic 7,0 mm (18-06-0210)
 Heatblock 6,0 mm (18-06-0211)

Receiving room:	Volume: 53,6 m ³	Air temperature: 20,5 °C	Relative air humidity: 72,5 %	Static pressure: 99,9 kPa
Source room:	Volume: 52,1 m ³	Air temperature: 20,5 °C	Relative air humidity: 55,6 %	Type of reference floor: Heavyweight

Frequency f [Hz]	L _{n,0} 1/3 oct. [dB]	ΔL 1/3 oct. [dB]
50	58,9	1,7
63	58,9	0,2
80	56,6	0,2
100	59,4	1,5
125	63,5	3,0
160	59,3	4,1
200	63,0	4,4
250	68,6	5,2
315	64,7	11,5
400	64,5	17,9
500	65,9	18,0
630	65,3	24,6
800	66,5	30,6
1000	66,8	39,6
1250	67,8	46,3
1600	68,1	51,2
2000	68,3	55,6
2500	67,6	60,2
3150	68,1	61,8 ¹
4000	66,9	61,3 ¹
5000	63,3	59,2 ¹

¹ too high



Evaluation according to ISO 717-2

ΔL_w = 22 dB

C_{i,Δ} = -12 dB

C_{i,r} = 1 dB

ΔL_{jin} = 10 dB

The results are based on measurements, which were performed under laboratory conditions with artificial excitation (standard procedure).



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

Annex TS – Impact sound insulation

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Evaluation according to ISO 717-2

 $\Delta L_w = 22 \text{ dB}$ $C_{l,\Delta} = -12 \text{ dB}$ $C_{l,r} = 1 \text{ dB}$

The results are based on measurements, which were performed under laboratory conditions with artificial excitation (standard procedure).

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

Frequency [Hz]	ΔL [dB]	$L_{n,0}$ [dB]	L_n [dB]	$L_{n,r}$ [dB]
50	1,7	58,9	57,2	
63	0,2	58,9	58,7	
80	0,2	56,6	56,4	
100	1,5	59,4	57,9	65,5
125	3,0	63,5	60,5	64,5
160	4,1	59,3	55,2	63,9
200	4,4	63,0	58,6	64,1
250	5,2	68,6	63,4	63,8
315	11,5	64,7	53,2	58,0
400	17,9	64,5	46,6	52,1
500	18,0	65,9	47,9	52,5
630	24,6	65,3	40,7	46,4
800	30,6	66,5	35,9	40,9
1000	39,6	66,8	27,2	32,4
1250	46,3	67,8	21,5	25,7
1600	51,2	68,1	16,9	20,8
2000	55,6	68,3	12,7	16,4
2500	60,2	67,6	7,4	11,8
3150	61,8	68,1	6,3	10,2
4000	61,3	66,9	5,6	
5000	59,2	63,3	4,1	

Receiving room:

Volume: 53,6 m³

Air temperature: 20,5 °C

Relative air humidity: 72,50 %

Static pressure: 99,9 kPa

Senderraum:

Volume: 52,1 m³

Air temperature: 20,5 °C

Relative air humidity: 55,6 %

Type of reference floor: Heavyweight

