

**Customer**

Unifloor Underlay Systems  
 Arnsbergstraat 4  
 7418 Deventer  
 NL

**Laboratory Test Report**

**A-2019-298**

Test Object:



**Description:** (for a construction from top to bottom)

Description	Thickness [mm]	Weight [g/m <sup>2</sup> ]
Amtico Signature 2,8 mm (glued)	2,8 mm*	-
Jumpax HD 10 mm	10 mm*	-
PE-foil	-	-

\* customer information

Aachen, 15.10.2019

Dr. Ing. A. Siebel

**Annexes:**

Test method:

Evaluation:

<b>SA</b> - sound absorption in reverberation rooms DIN EN ISO 354:2003-12 (1 pages)	<input type="checkbox"/>	$\alpha_w$ according to DIN EN ISO 11654:1997-07 (1 p.)	<input type="checkbox"/>
		<b>DL<math>\alpha</math></b> according to DIN EN 1793-1:2017-07 (1 p.)	<input type="checkbox"/>
		<b>NRC</b> according to ASTM C 423:2017 (1 p.)	<input type="checkbox"/>
<b>TS</b> - impact sound DIN EN ISO 10140-1 / DIN EN ISO 10140-3 (2 pages)	<input checked="" type="checkbox"/>	<b><math>\Delta L_w</math></b> according to DIN EN ISO 717-2:2013-06 (1 p.)	<input checked="" type="checkbox"/>
		$L_{n,w}$ according to DIN EN ISO 717-1:2013-06 (1 p.)	<input type="checkbox"/>
		<b><math>L_{i,F,max}</math></b> acc. to DIN EN ISO 10140-5:2014-09 (1 p.)	<input type="checkbox"/>
		<b>IIC</b> according to ASTM E 989 (1 p.)	<input checked="" type="checkbox"/>
<b>GS</b> – walking sound DIN EN 16205:2018-05 (2 pages)	<input type="checkbox"/>	$L_{n,walk,A}$ acc. to DIN EN 16205:2018-05 (1 p.)	<input type="checkbox"/>
		<b>RWS</b> acc. to DIN EN 16205:2018-05, Annex E (1 p.)	<input type="checkbox"/>
<b>LS</b> – airborne sound insulation DIN EN ISO 10140-2 (2 pages)	<input type="checkbox"/>	<b><math>R_w</math></b> according to DIN EN ISO 717-1:2013-06 (1 p.)	<input type="checkbox"/>
<b>IR</b> - sound absorption in impedance tubes DIN EN 10534-1 / DIN EN 10534-2 (1 pages)	<input type="checkbox"/>	$\alpha_s$ acc. to DIN EN 10534-1 / DIN EN 10534-2 (1 p.)	<input type="checkbox"/>

The test results only relate to the behaviour of the tested samples. The test should only be published as fullversion. A shortend version can only be published with aprobal of the test laboratory.

# Impact sound insulation according ISO 10140-1

Annex TS - ΔL<sub>w</sub>

Laboratory measurements of the reduction of transmitted impact noise by floor coverings on a heavyweight reference floor  
Annex TS – Impact sound insulation

Date of test: 14.10.2019

Construction: Amtico Signature 2,8 mm  
(from top to bottom) Jumpax HD 10 mm  
PE-foil

Remarks: Tested with weights.

Receiving room:

Volume: 53,6 m<sup>3</sup>

Source room:

Volume: 52,1 m<sup>3</sup>

Air temperature: 20,0 °C

Relative air humidity: 62,0 %

Boundary conditions:

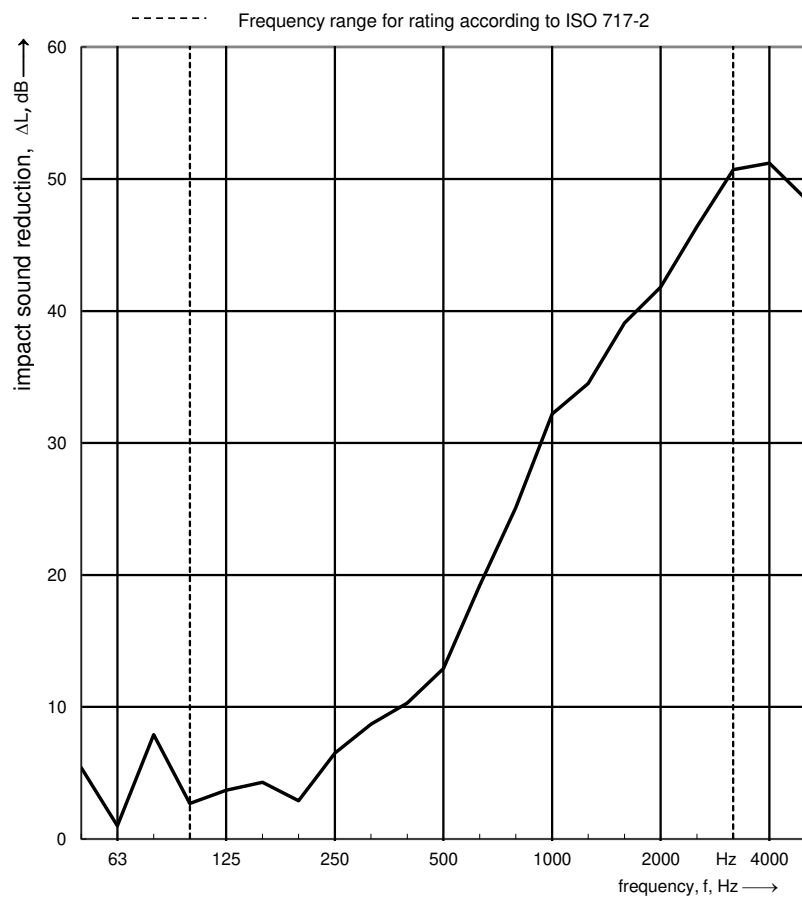
Tapping Machine positions: 4

Microphone positions: 4

Category / sample area: II / ~ 10 m<sup>2</sup>

Type of reference floor: Heavyweight

Frequency f [Hz]	L <sub>n,0</sub> 1/3 oct. [dB]	ΔL 1/3 oct. [dB]
50	59,0	5,4
63	64,1	1,0
80	63,9	7,9
100	59,0	2,7
125	63,6	3,7
160	60,3	4,3
200	66,0	2,9
250	67,7	6,5
315	67,0	8,7
400	66,5	10,3
500	67,4	12,9
630	68,3	19,2
800	69,1	25,1
1000	70,5	32,2
1250	70,7	34,5
1600	71,1	39,1
2000	70,8	41,8
2500	69,9	46,4
3150	70,2	50,7
4000	68,8	51,2
5000	64,3	48,5



Evaluation according to ISO 717-2

ΔL<sub>w</sub> = 21 dB

ΔL<sub>lin</sub> = 10 dB

C<sub>i,Δ</sub> = -11 dB

C<sub>i,r</sub> = 0 dB

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

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# Impact Insulation Class according ASTM E492

Annex TS - IIC

Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine

Date of test: 14.10.2019

Construction: Amtico Signature 2,8 mm  
 (from top to bottom) Jumpax HD 10 mm  
 PE-foil

Remarks: Tested with weights.

Receiving room:

Volume: 53,6 m<sup>3</sup>

Source room:

Floor Type: 140 mm concrete slab with 330 kg/m<sup>2</sup>

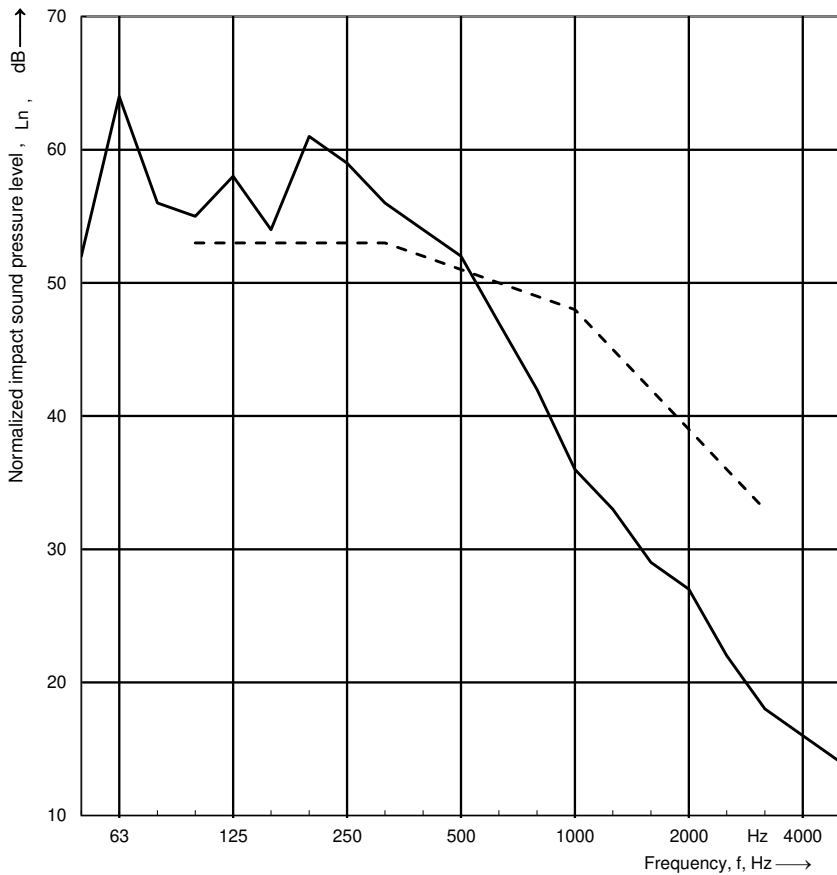
Volume: 52,1 m<sup>3</sup>

Air temperature: 20,0 °C

Relative air humidity: 62,0 %

— Ln  
 - - - IIC Contour

Frequency f [Hz]	Ln 1/3 octave [dB]
50	52
63	64
80	56
100	55
125	58
160	54
200	61
250	59
315	56
400	54
500	52
630	47
800	42
1000	36
1250	33
1600	29
2000	27
2500	22
3150	18
4000	16
5000	14



**Impact insulation class** IIC = 59 dB  
 Measurement according DIN EN ISO 10140  
 Evaluation according to ASTM E989

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# Delta Impact Insulation Class according ASTM E 2179

Annex TS - ΔIIC

Laboratory Measurement of the Effectiveness of Floor Coverings in Reducing Impact Sound Transmission Through Concrete Floors

Date of test: 14.10.2019

Construction: Amtico Signature 2,8 mm  
 (from top to bottom) Jumpax HD 10 mm  
 PE-foil

Remarks: Tested with weights.

**Receiving room:**

Volume: 53,6 m<sup>3</sup>

**Source room:**

Floor Type: 140 mm concrete slab with 330 kg/m<sup>2</sup>

Volume: 52,1 m<sup>3</sup>

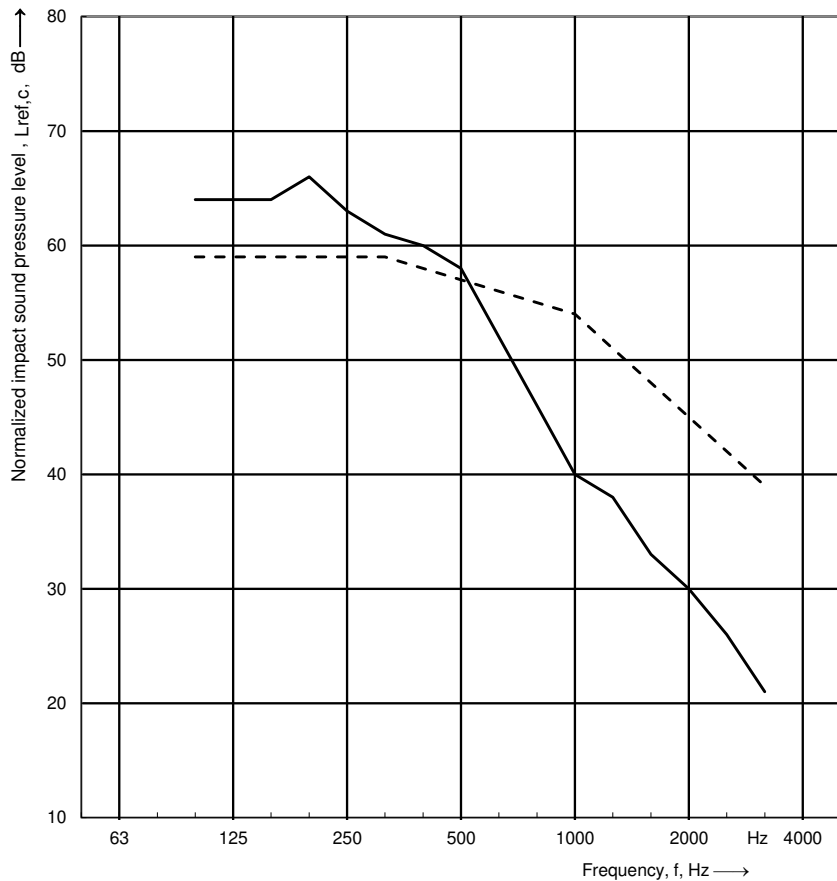
Air temperature: 20,0 °C

Relative air humidity: 62,0 %

— L<sub>ref,c</sub>  
 - - - IIC Contour

$$L_{ref,c} = L_{ref} - L_d$$

Frequency f [Hz]	L <sub>ref,c</sub> 1/3 octave [dB]
50	-
63	-
80	-
100	64
125	64
160	64
200	66
250	63
315	61
400	60
500	58
630	52
800	46
1000	40
1250	38
1600	33
2000	30
2500	26
3150	21
4000	-
5000	-



Increase in Impact Insulation Class ΔIIC = 25 dB

Measurement according DIN EN ISO 10140  
 Evaluation according ASTM E 2179 / ASTM E 989

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# General Annex TS for laboratory impact sound tests

## 1 Test stand description

Test rooms:	Laboratory of SWA GmbH, Hauptstraße 133, 52477 Alsdorf
Sending room:	4,27 m x 4,45 m x 2,74 m; V = 52,1 m <sup>3</sup> (cubic, with diffusers)
Receiving room:	3,95 m x 4,08 m x 3,33 m; V = 53,6 m <sup>3</sup> (cubic, with diffusers)
Reference ceiling:	4,27 m x 4,45 m; S = 19 m <sup>2</sup> 14 cm concrete solid plate ceiling with an area-related mass m' ≈ 322 kg/m <sup>2</sup>
Flanking walls:	lime sand brick walls with light weighting facing shells (d = 12cm) with a medium area-related mass of m' ≈ 330 kg/m <sup>2</sup>

## 2 Analysis

The impact sound levels generated by the standardized tapping machine are measured in the receiving room under a solid ceiling without and with a textile floor covering. From the measured values the reduction of impact sound pressure is calculated as follows:

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

$$L_{n,0} = \text{Impact sound level without floor covering in dB}$$

$$L_n = \text{Impact sound level with floor covering in dB}$$

To determine the weighted impact sound reduction the applicable reference curve is shifted in 1 dB steps into the measured curve so that the sum of the most unfavorable deviations corresponds as close as possible to the value of 32 dB without exceeding this value.

The linear impact sound level  $\Delta L_{lin}$  you can calculate after the following equation:

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

$L_{n,r,w}$  the calculated weighted norm impact sound level of the cover blanket with the blanket edition to be checked is.

$L_{n,r,0,w}$  78 dB, investigates  $L_{n,r,0}$  to 4.3.1 DIN EN ISO 717-2 : 2013.

$C_{I,r}$  Spectrum customization value.

$C_{I,r,0}$  Spectrum customization value.

## 2.1 Test Standards

Standard: (Issue)	Title
DIN EN ISO 10140-1:2016-12	Akustik – Messung der Schalldämmung von Bauteilen im Prüfstand – Teil 1: Anwendungsregeln für bestimmte Produkte
DIN EN ISO 10140-2:2010-12	Akustik – Messung der Schalldämmung von Bauteilen im Prüfstand – Teil 2: Messung der Luftschalldämmung
DIN EN ISO 10140-3:2015-11	Akustik – Messung der Schalldämmung von Bauteilen im Prüfstand – Teil 3: Messung der Trittschalldämmung
DIN EN ISO 10140-4:2010-12	Akustik – Messung der Schalldämmung von Bauteilen im Prüfstand – Teil 4: Messverfahren und Anforderungen
DIN EN ISO 10140-5:2014-09	Akustik – Messung der Schalldämmung von Bauteilen im Prüfstand – Teil 5: Anforderungen an Prüfstände und Prüfeinrichtungen

## 2.2 Evaluation Standards

Standard: (Issue)	Title
DIN EN ISO 717-1:2013-06 <sup>2</sup>	Akustik – Bewertung der Schalldämmung in Gebäuden und von Bauteilen – Teil 1: Luftschalldämmung
DIN EN ISO 717-2:2013-06 <sup>2</sup>	Akustik – Bewertung der Schalldämmung in Gebäuden und von Bauteilen – Teil 2: Trittschalldämmung
DIN EN ISO 12999-1: 2014 <sup>2</sup>	Akustik - Bestimmung und Anwendung der Messunsicherheiten in der Bauakustik - Teil 1: Schalldämmung
ASTM E989 – 18 <sup>3</sup>	Standard Classification for Determination of Single-Number Metrics for Impact Noise
ASTM E2179 - 03(2016) <sup>3</sup>	Standard Test Method for Laboratory Measurement of the Effectiveness of Floor Coverings in Reducing Impact Sound Transmission Through Concrete Floors

<sup>2</sup> german issue

<sup>3</sup> american issue

## 3 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.