

Test Report No.: A-2021-473-01



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The accreditation is valid for the test procedures listed in the annex of the certificate D-PL-11217-01-01.

Test Order: Laboratory measurement of impact sound insulation of building elements according
DIN EN ISO 10140-3:2015-11

Order date: 14.10.2021

Sample description: floor underlay
Marathon Dual 6 mm

Number of samples: N/A

Sampling: by client

Sample receipt: 13.10.2021

Test period: 14.10.2021

Aachen, 21.10.2021

A handwritten signature in black ink, appearing to read "A. Siebel".

i.V. Prof. Dr.-Ing. Alexander Siebel
Laboratory Manager

A handwritten signature in black ink, appearing to read "P. Thomas".

i.A. Patrick Thomas M.Eng
Test engineer

The test results relate only on the items tested. Without the written approval of the testing laboratory, a duplication in extracts of the test report is not permitted.

1 Product Description

Product Description (Construction from top to bottom)

* customer information

| Position | Description | Thickness [mm] | Weight [g/m ²] |
|----------|---------------------|----------------|----------------------------|
| 1 | Verend vinyl 2,5 mm | 2,5* | - |
| 2 | Marathon Dual 6 mm | 6* | - |
| 3 | LDPE film | 0,2* | - |



Illustration / drawing for sample assembly

2 Scope of testing / Annexes

| No | Annex | Designation | Standard | Pages general | Pages evaluation |
|----|-------|-------------------------|----------------------------|---------------|------------------|
| 1 | TS | Impact Sound Insulation | DIN EN ISO 10140-3:2015-11 | 2 | 1 |

General Annex TS for laboratory impact sound tests

1 Test stand description

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

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 the 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 ΔL_{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 717-2:2021-05.

$C_{I,r}$ 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 717-2:2021-05 ² | Akustik – Bewertung der Schalldämmung in Gebäuden und von Bauteilen – Teil 2: Trittschalldämmung |
| DIN EN ISO 12999-1:2021-04 ² | Akustik - Bestimmung und Anwendung der Messunsicherheiten in der Bauakustik - Teil 1: Schalldämmung |
| ASTM E989 – 18 ³ | Standard Classification for Determination of Single-Number Metrics for Impact Noise |
| ASTM E2179 - 03(2016) ³ | Standard Test Method for Laboratory Measurement of the Effectiveness of Floor Coverings in Reducing Impact Sound Transmission Through Concrete Floors |

² german issue

³ 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.

**Laboratory measurement of Impact sound insulation according to
DIN EN ISO 10140-3:2015-11**

Annex TS - ΔL_w

Evaluation according DIN EN ISO 717-2:2021-05

Measurement uncertainty according DIN EN ISO 12999-1:2021-04

Date of test: 14.10.2021

Construction: Verend Vinyl 2,5 mm
(from top to bottom) Marathon dual 6 mm
LDPE-film 0,02 mm

Remarks: -

Installation: by the client

Receiving room:

Volume: 53,6 m³

Sending room:

Volume: 100,6 m³

Air temperature: 19,4 °C

Relative air humidity: 56,4 %

Boundary conditions:

Tapping Machine positions: 4

Microphone positions: 4

Category / sample area: II / ~10 m²

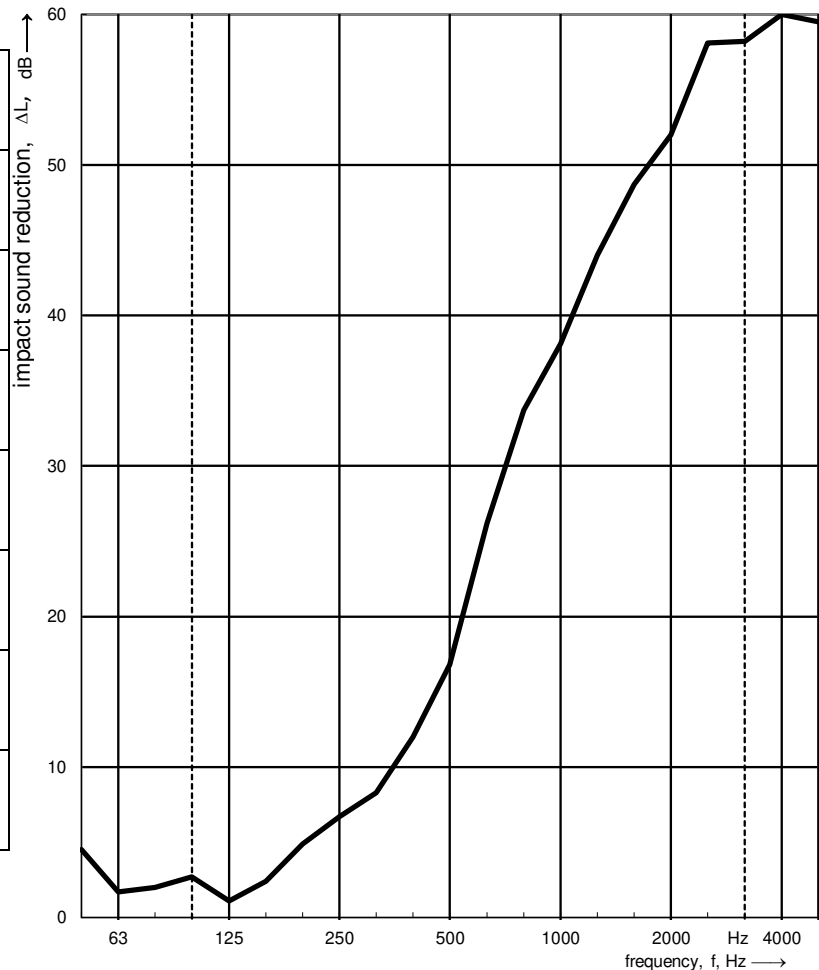
Type of reference floor: heavyweight

----- Frequency range for rating according to DIN EN ISO 717-2:2021-05

| Frequency f [Hz] | L _{n,0} 1/3 oct. [dB] | ΔL 1/3 oct. [dB] | U 1/3 oct. [dB] |
|------------------------|--------------------------------------|------------------------|-----------------------|
| 50 | 60,4 | 4,5 | ± 1,4 |
| 63 | 64,0 | 1,7 | ± 1,3 |
| 80 | 57,7 | 2,0 | ± 1,2 |
| 100 | 58,8 | 2,7 | ± 1,1 |
| 125 | 63,8 | 1,1 | ± 1,0 |
| 160 | 59,6 | 2,4 | ± 1,0 |
| 200 | 62,9 | 4,9 | ± 1,0 |
| 250 | 65,4 | 6,7 | ± 1,0 |
| 315 | 65,4 | 8,3 | ± 1,0 |
| 400 | 64,0 | 12,0 | ± 1,1 |
| 500 | 63,6 | 16,8 | ± 1,2 |
| 630 | 66,3 | 26,2 | ± 1,3 |
| 800 | 66,7 | 33,7 | ± 1,6 |
| 1000 | 67,8 | 38,1 | ± 1,9 |
| 1250 | 67,9 | 44,0 | ± 2,2 |
| 1600 | 68,3 | 48,7 | ± 2,5 |
| 2000 | 68,6 | 52,0 | ± 2,8 |
| 2500 | 68,1 | 58,1 ¹ | ± 3,2 |
| 3150 | 68,9 | 58,2 ¹ | ± 3,6 |
| 4000 | 68,3 | 60,0 ² | ± 4,0 |
| 5000 | 64,9 | 59,5 ² | ± 4,4 |

¹ Background noise correction

² Measurement limit reached



Evaluation according DIN EN ISO 717-2:2021-05

ΔL_w = 21 dB C_{l,Δ} = -11 dB

ΔL_{in} = 10 dB C_{l,r} = 0 dB

Measurement uncertainty according DIN EN ISO 12999-1:2021-04

ΔL_w = (20,9 ± 1,1) dB (k = 1, two-sided)

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

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