

# TFI Report 462168-09

## Impact Sound Insulation

**Customer**  
Unifloor BV  
Munsterstraat 24  
7418 EV Deventer  
NETHERLANDS

**Product**  
floor underlay  
Bluefloor

This report includes 2 pages and 1 annex(es)

### Responsible at TFI

Dr.-Ing. Heike Kempf  
Tel: +49 241 9679 171  
[h.kempf@tfi-online.de](mailto:h.kempf@tfi-online.de)

**Aachen, 20.12.2016**

### Dr. Alexander Siebel

- Head of the testing laboratory -

The present document is provided with an advanced electronic signature



This report only applies to the tested samples and has been established to the best of our knowledge. Only the entire report shall be reproduced. Under no circumstances, extracts shall be used. Furthermore, we apply the "General Terms and Conditions for the Execution of Contracts" of the TFI Aachen GmbH, also with regard to the order execution.

## 1 Transaction

Test order	Sound insulation according to EN ISO 10140:2010
Order date	02.12.2016
Your reference	F. Vousten
Product designation	Bluefloor 2mm, DD 350 Meister 9mm
TFI sample number	16-12-0073, 16-12-0082

## 2 Product Specification / Construction

Description	Underlayer
Material	foam
Thickness	2 mm*

### Thickness: Material (from top to bottom):

2 mm\* Bluefloor (16-12-0073)

9 mm\* DD 350 Meister (16-12-0082)

\* customer information



Bluefloor (16-12-0073)



DD 350 Meister (16-12-0082)

## 3 Results

Without weight

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

With weight

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

## 4 Annexes

Impact sound insulation TS 462168-09<sup>a</sup>

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

# Annex TS - Impact Sound Insulation

## 1 Transaction

Product designation	Bluefloor 2mm, DD 350 Meister 9mm
TFI sample number	16-12-0073, 16-12-0082
Testing period	02.12.2016

## 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 <sup>2</sup>
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	$L_{n,0,w}$	=	75	dB
Weighted normalized impact sound pressure level	$L_{n,w}$	=	52	dB
Weighted normalized impact sound pressure level	$L_{n,r,w}$	=	56	dB

With weight:

Weighted normalized impact sound pressure level	$L_{n,0,w}$	=	75	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  $\Delta L_w$ , 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  $\Delta L_{lin}$  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

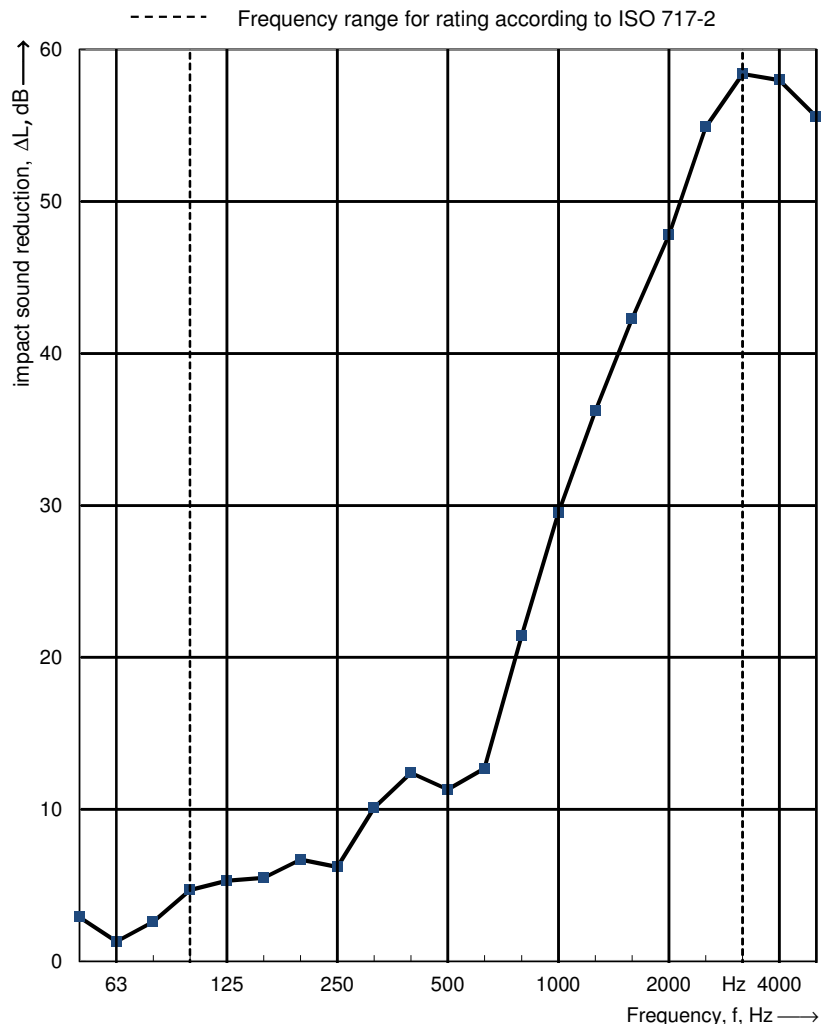
The results are based on measurements performed under laboratory conditions with artificial excitation (standard procedure). The test results are applicable in due consideration of the national provisions and the local circumstances and/or constructions.

**Impact sound insulation according ISO 10140-1**

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

<b>Product name</b>	<b>Bluefloor 2mm, DD 350 Meister 9mm</b>	Testing period	02.12.2016
TFI sample number	16-12-0073, 16-12-0082		
Construction (from top to bottom)	Bluefloor 2mm DD 350 Meister 9mm		
Installed by customer			
Without weight			
Receiving room		Source room	
Volume	53,6 m <sup>3</sup>	Volume	52,4 m <sup>3</sup>
Air temperature	17,7 °C	Air temperature	18,8 °C
Relative air humidity	47,3 %	Relative air humidity	44,8 %
Static pressure	100,5 kPa	Type of reference floor:	Massiv

Frequency f [Hz]	L <sub>n,0</sub> 1/3 oct. [dB]	ΔL 1/3 oct. [dB]
50	63,8	2,9
63	64,6	1,3
80	60,3	2,6
100	60,7	4,7
125	62,6	5,3
160	61,5	5,5
200	64,5	6,7
250	68,0	6,2
315	65,1	10,1
400	64,6	12,4
500	65,1	11,3
630	66,3	12,7
800	66,6	21,4
1000	66,7	29,5
1250	67,5	36,2
1600	68,4	42,3
2000	69,0	47,8
2500	69,4	54,9
3150	69,7	58,4 <sup>1</sup>
4000	68,5	58,0 <sup>1</sup>
5000	65,0	55,6 <sup>1</sup>

<sup>1</sup> correction basic noise

Rating according to ISO 717-2

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

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** Bluefloor 2mm, DD 350 Meister 9mm Testing period 02.12.2016

TFI sample number 16-12-0073, 16-12-0082

Construction Bluefloor 2mm  
(from top to bottom) DD 350 Meister 9mm

Installed by customer

With weight 5 x 13.2 kg

Receiving room

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

Air temperature 17,7 °C

Relative air humidity 47,3 %

Static pressure 100,5 kPa

Source room

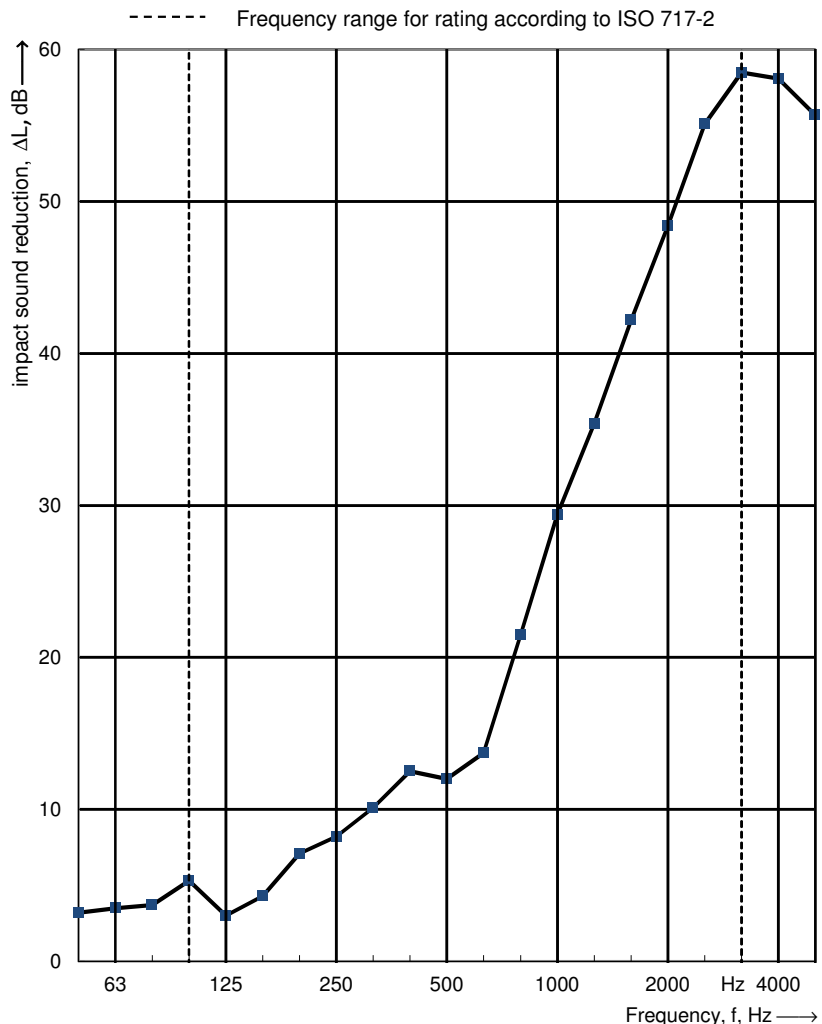
Volume 52,4 m<sup>3</sup>

Air temperature 18,8 °C

Relative air humidity 44,8 %

Type of reference floor: Massiv

Frequency f [Hz]	L <sub>n,0</sub> 1/3 oct. [dB]	ΔL 1/3 oct. [dB]
50	63,8	3,2
63	64,6	3,5
80	60,3	3,7
100	60,7	5,3
125	62,6	3,0
160	61,5	4,3
200	64,5	7,1
250	68,0	8,2
315	65,1	10,1
400	64,6	12,5
500	65,1	12,0
630	66,3	13,7
800	66,6	21,5
1000	66,7	29,4
1250	67,5	35,4
1600	68,4	42,2
2000	69,0	48,4
2500	69,4	55,1
3150	69,7	58,5 <sup>1</sup>
4000	68,5	58,1 <sup>1</sup>
5000	65,0	55,7 <sup>1</sup>

<sup>1</sup> correction of basic

Rating according to ISO 717-2

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

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

