

Evidence of performance

Reduction of impact sound pressure level by floor coverings

Test report

No. 15-000322-PR01

(PB X5.1-F03-04-en-02)



Product	Floating screed on a heavyweight floor
Designation	TABIABSORBER 8/4
Screed	80 mm Concrete screed, $m' = 179 \text{ kg/m}^2$
Insulation	TABIABSORBER 8/4 mm, $m' = 4.0 \text{ kg/m}^2$
Unfinished floor	160 mm Reinforced concrete floor, $m' = 400 \text{ kg/m}^2$
External Dimension	5,000 mm x 5,250 mm
Total Thickness	248 mm
Area related mass	583 kg/m ²
Reference floor	heavyweight reference floor as per EN ISO 10140-5, Annex C

Weighted reduction of impact sound pressure level ΔL_w
Spectrum adaptation term $C_{I,\Delta}$



$$\Delta L_w (C_{I,\Delta}) = 26 (-12) \text{ dB}$$

ift Rosenheim
02.06.2015

Dr. Joachim Hessinger, Dipl.-Phys.
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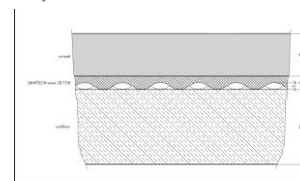
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Basis

EN ISO 10140-1: 2010
+A1: 2012 + A2:2014
EN ISO 10140-3 : 2010
EN ISO 717-2 : 2013

Replaces test report no. 15-000322-PR01 (PB X5.1-F03-04-en-01) dated 22.05.2015

Representation



Instructions for use

This test report serves to document the reduction of impact sound pressure level by a floor covering and serves not to demonstrate the reduction of impact sound pressure level as per DIN 4109.

Validity

The data and results given relate solely to the tested and described specimen.

Testing the sound insulation does not allow any statement to be made on further characteristics of the present construction regarding performance and quality.

Notes on publication

The ift Guidance Sheet "Conditions and Guidance for the Use of ift Test Documents" applies.
The cover sheet can be used as abstract.

Contents

The test report contains a total of 9 pages:

- 1 Object
- 2 Procedure
- 3 Detailed results
- 4 Instructions for use
Data sheet (1 page)

1 Object

1.1 Description of test specimen

Product	Floating screed on a heavyweight floor
Product designation	TABIABSORBER 8/4
Dimensions of floor (l x w)	5,000 mm x 5,250 mm
Clear dimensions (l x w)	4,000 mm x 5,000 mm
Area related mass m'	583 kg/m ²
Total Thickness t	248 mm
Screed	
Manufacturer*	Own production
Material	Concrete screed as prefabricated board
Thickness t	80 mm
Area related mass m'	179 kg/m ²
Mounting	On impact sound insulation boards
Impact sound insulation boards	
Material*	Granules of recycled rubber with PU elastomer bonding agent, surface: smooth with granular texturing, profiled on one side
Product designation *	TABIABSORBER 8/4
Size	8,000 mm x 1,250 mm (delivery format)
Thickness (nominal thickness)* t _N	8/4 mm
Thickness (under load 250 Pa) t _L	Not specified
Compressibility* c	Not specified
Area related mass m'	4.0 kg/m ²
Airflow resistivity r	Not specified
Dynamic stiffness s'	Not specified
Mounting	Insulation, with profiling downwards, laid all-over , narrow edges butt-jointed
Unfinished floor	heavyweight reference floor as per EN ISO 10140-5, Annex C
Manufacturer	Own production
Type	Reinforced concrete floor
Thickness t	160 mm
Center-to-center distance of supports	4,800 mm
Area related mass m'	400 kg/m ²
Further characteristics	Classification of floor covering: Category II as per EN ISO 10140-1, Annex H



The description is based on inspection of the test specimen at **ift** Laboratory for Building Acoustics. Article designations / numbers as well as material specifications were given by the client. Additional data provided by the client are marked with *.

1.2 Mounting in test rig

Test rig	Floor test rig ("X-wall"): Test rig with suppressed flanking sound transmission acc. to EN 10140-5. Test rig as lightweight construction. The flanking lightweight walls completely de-coupled from test floor.
Mounting of test specimen	Test specimen mounted by ift Laboratory for Building Acoustics and employees of the client.
Mounting position	Floor mounted without contact to flanking walls. Load transfer by external steel structure.
Sealing of test rig	Perimeter joint between floor and flanking wall on both sides sealed using permanently resilient sealant.
Drying time	not required because of prefabricated screed. Setting time > 21 days

1.3 Representation of test specimen

The structural details were examined solely on the basis of the characteristics to be classified. The illustrations are based on unchanged documentation provided by the client.

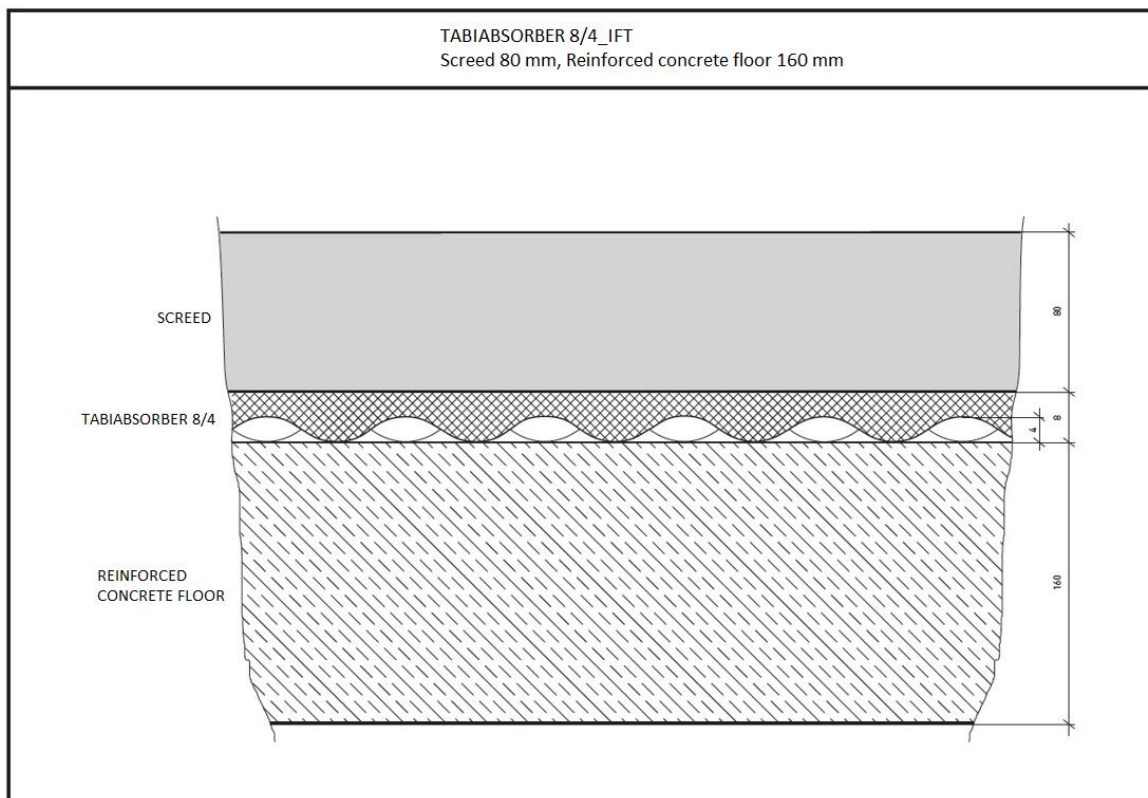


fig 1 Vertical cross section of floor structure

2 Procedure

2.1 Sampling

Sampling	The samples were selected by the client
Quantity	1
Delivery at ift	03.03.2015 by the client via forwarder
ift registration number	38816/02

2.2 Process

Basis

EN ISO 10140-1: 2010 + A1: 2012 + A2: 2014	Acoustics; Laboratory measurement of sound insulation of building elements - Part 1: Application rules for specific products (ISO 10140-1: 2010+Amd. 1:2012+ Amd. 2: 2014)
EN ISO 10140-2:2010	Acoustics; Laboratory measurement of sound insulation of building elements - Part 2: Measurement of airborne sound insulation (ISO 10140-2:2010)
EN ISO 10140-3:2010	Acoustics; Laboratory measurement of sound insulation of building elements - Part 3: Measurement of impact sound insulation (ISO 10140-3:2010)
EN ISO 10140-5:2010 + A1: 2014	Acoustics; Laboratory measurement of sound insulation of building elements - Part 5: Requirements for test facilities and equipment (ISO 10140-5:2010 + Amd.1:2014)
EN ISO 717-2 : 2013	Acoustics; Rating of sound insulation in buildings and of building elements - Part 2: Impact sound insulation
DIN 4109-11 : 2010-05	Sound insulation in buildings - Part 11: Verification of sound insulation - Quality and suitability testing

Corresponds to the national German standard:

DIN EN ISO 10140-1: 2014-09, DIN EN ISO 10140-2:2010-12, DIN EN ISO 10140-3:2010-12, DIN EN ISO 10140-5:2010-12 and DIN EN ISO 717-2:2013-06



Procedure and scope of measurement are in conformity with the principles of the Working Group of sound insulation testing bodies approved by the national building control authorities in cooperation with the standardization committee NA 005-55-75-AA (subcommittee UA 1 - DIN 4109).

Boundary conditions	Except for the deviations mentioned, in conformity with the requirements set out by the standards
Deviation	<p>A correction was made referring to the airborne sound pressure level of the standard tapping machine as per DIN 4109-11.</p> <p>The floor temperature was not in the recommended range from 18° C to 25°C.</p> <p>The dynamic stiffness s' of the mounted insulating boards was not measured.</p> <p>The Thickness under load* t_L of the mounted insulating boards was not measured.</p> <p>The Compressibility* c of the mounted insulating boards was not measured.</p>
Measuring filter	One-third-octave band filter
Measurement limits	
Background noise level	The background noise level in the receiving room was determined during measurement and the receiving room level L_2 corrected by calculation as per EN ISO 10140-4: 2010 Clause 4.3.
Airborne sound correction	<p>The airborne sound level of the standard tapping machine was determined during the test and corrected as per DIN 4109-11 as follows.</p> $L = 10 \cdot \lg(10^{0,1 \cdot L_I} - 10^{0,1 \cdot (L_{HW} - D)}) \text{ in dB}$
Measurement of reverberation time	Arithmetical mean: 6 measurements each of 2 loudspeaker positions with rotating microphones (total of 12 measurements).
Measurement equation A	$A = 0,16 \frac{V}{T} \text{ m}^2$
Measurement of impact sound level	5 tapping machine positions and rotating microphones.
Measurement equation L_n	$L_n = L_i + 10 \cdot \lg \frac{A}{A_0} \text{ dB}$
Impact sound level reduction ΔL	$\Delta L = L_{n,0} - L_n \text{ dB}$



KEY

A	Equivalent absorption area in m ²
A ₀	Reference absorption area (10 m ²)
T	Reverberation time in s
V	Volume of receiving room in m ³
L _i	Sound level during operation of the tapping machine in receiving room in dB
L _n	Normalized impact sound level in dB
ΔL	Reduction of impact sound level in dB
L _{n,0}	Normalized impact sound level of test floor without floor covering
L _n	Normalized impact sound level of test floor with floor covering
D	Sound level difference L ₁ – L ₂ in dB
L _{HW}	Sound level of standard tapping machine in source room in dB

2.3 Test apparatus

Device	Type	Manufacturer
Integrating sound meter	Type Nortronic 830	Norsonic-Tippkemper
Microphone preamplifiers	Type 1201	Norsonic-Tippkemper
Microphone unit	Type 1220	Norsonic-Tippkemper
Calibrator	Type 1251	Norsonic-Tippkemper
Dodecahedron loudspeakers	Own design	-
Amplifier	Type E120	FG Elektronik
Rotating microphone boom	Own design / Type 231-N-360	Norsonic-Tippkemper
Standard tapping machine with 3 foofs of plastic	Type 211	Norsonic-Tippkemper

The **ift** Laboratory for Building Acoustics participates in comparative measurements at the Physikalisch-Technische Bundesanstalt (PTB) in Braunschweig every three years, the last one was in April 2013. The sound level meter used, Series No. 17956, was DKD calibrated by the company Norsonic Tippkemper (DKD - Deutscher Kalibrierdienst “German Calibration Service”) on 26th of January 2015.

2.4 Testing

Date 9th of March 2015
Operating Testing Officer Mr. Stefan Bacher

3 Detailed results

The values obtained from measurement of the impact sound level reduction of the tested floor covering are plotted against frequency in the enclosed data sheet and are presented in

a table. Furthermore, the normalized impact sound level of the test floor with and without floor covering are stated as per EN ISO 10140.

As per EN ISO 717-2, for the frequency range 100 Hz to 3,150 Hz the weighted reduction of impact sound pressure level ΔL_w and the spectrum adaptation term $C_{i,\Delta}$ for the frequency range 100 Hz to 2,500 Hz are calculated as follows:

$$\Delta L_w (C_{i,\Delta}) = 26 (-12) \text{ dB}$$

As per EN ISO 717-2, the weighted normalized impact sound level $L_{n,r,w}$ and the spectrum adaptation term $C_{i,r}$ of the reference floor are calculated as follows:

$$L_{n,r,w} (C_{i,r}) = 52 (1) \text{ dB}$$

As per EN ISO 717-2, the weighted normalized impact sound level $L_{n,w,0}$ and the spectrum adaptation term $C_{i,0}$ of the reference floor are calculated as follows:

$$L_{n,w,0} (C_{i,0}) = 78 (-10) \text{ dB}$$

The test specimen did not exhibit any visible damage during the test.

4 Instructions for use

4.1 Safety margin according to DIN 4109

This test report is not an evidence of suitability as per DIN 4109: 1989-11.
A calculated value is not indicated.

4.2 Test standards

The standard series EN ISO 10140:2010 supersedes those, until the respective date, applicable parts of the standards series EN ISO 140 which describe laboratory tests. According to the two standard series, the test methods are identical.

ift Rosenheim
Laboratory for Building Acoustics
02.06.2015

Reduction of impact sound pressure level according to ISO 10140

Laboratory measurement of the reduction of transmitted impact noise by a floor covering on a heavyweight reference floor.



Product designation TABIABSORBER 8/4

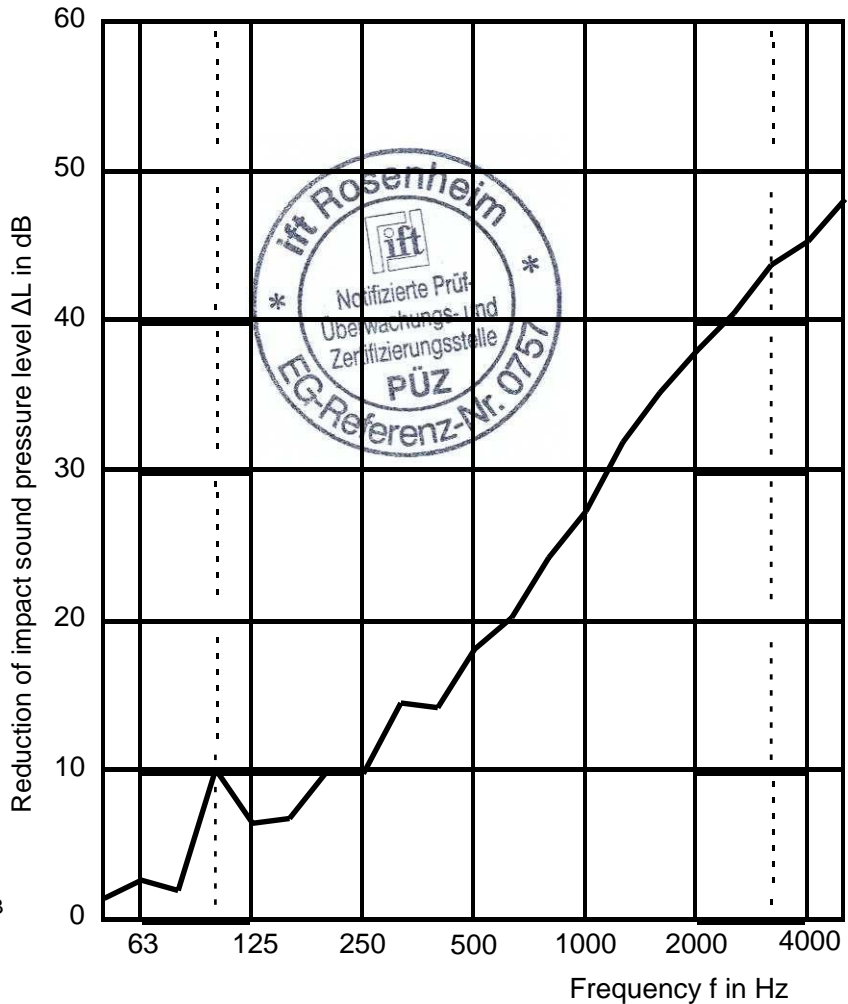
Design of test specimen

Floating screed on a heavyweight floor
 Screed 80 mm Concrete screed
 Impact sound insulation TABIABSORBER 8/4 mm
 Unfinished floor 160 mm Reinforced concrete floor
 Total thickness 248 mm
 Area related mass 583 kg/m²

Test date 9th of March 2015
 Test surface S 4.0 m x 5.0 m = 20.0 m²
 Test rigas per EN ISO 10140-5
 Volumes of test rooms V_S = 54 m³, V_R = 62 m³
 Mounting by ift Laboratory for Building Acoustics
 Climate in RR 13 °C / 50 % RH / 969hPa
 Test rooms SR 14 °C / 48 % RH / 969hPa
 Floor surface temperature 15 °C
 Setting time > 21 days
 heavyweight reference floor as per EN ISO 10140-5, Annex C

f in Hz	L _{n, unfinished floor} One-third octave in dB	ΔL One-third octave in dB
50	56.5	1.5
63	58.1	2.7
80	55.8	2.0
100	66.1	10.1
125	62.1	6.5
160	67.7	6.8
200	69.5	9.9
250	70.5	9.8
315	70.7	14.5
400	70.1	14.2
500	70.9	18.1
630	71.2	20.2
800	72.2	24.2
1,000	72.3	27.3
1,250	72.6	31.9
1,600	72.5	35.2
2,000	72.4	38.0
2,500	71.6	40.5
3,150	70.7	43.7 ^x
4,000	69.8	45.3 ^x
5,000	68.2	48.1 ^x

— Measurement curve
 — Frequency range corresp. to reference curve as per EN ISO 717-2



^x Background noise level difference < 6 dB

Rating according to EN ISO 717-2 (in third octave bands):

$\Delta L_w (C_{l,\Delta}) = 26 (-12) \text{ dB}$

$C_{l,r} = 1 \text{ dB}$

$C_{l,r,50-2500} = -- \text{ dB}$

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Data sheet 1

ift Rosenheim

Laboratory for Building Acoustic

02.06.2015

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