



REPORT

issued by an Accredited Testing Laboratory

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Windmüller flooring products WFP GmbH

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Determination of the reduction of transmitted impact noise by floor coverings on a heavyweight (concrete) standard floor – Laboratory measurements according to ISO 10140-1

Client

Windmüller flooring products WFP GmbH

Test object

The measurements were performed for PVC-free mats called Purline manufactured by Wineo.

Six pieces of the test object were glued to the self-adhesive plastic film which was attached to the standard concrete floor. The dimension of the pieces of the test object was 70 cm × 50 cm. Pictures from the test objects are presented in the report.

Test object arrival date

2015-10-15

Date of test

2015-10-23

Results

A good floor covering from impact noise perspective should have the highest possible ΔL_w and $\Delta L_w + C_{I\Delta}$. The results are valid only for the tested objects.

Tabel 1 - Results

Floor cover on the concrete floor	Weighted impact sound improvement ΔL_w (dB)	Adaptation term for impact sound improvement $C_{I\Delta}$ (dB)
Purline	17	-10

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The product fulfills the floor covering sound class 7 according to the Swedish standard SS 25267-2004. This standard is replaced by the new standard SS 25267-2013.

Usage of the results

For an arbitrary rigid concrete floor with floor covering, and with a known impact sound improvement, weighted impact sound level plus the adaptation term can be calculated as:

$$L_{n,w} + C_I = L_{n,w,1} + C_{I,1} - \Delta L_W - C_{I\Delta}$$

For an arbitrary rigid concrete floor with floor covering, and with a known impact sound improvement, weighted impact sound level can be calculated as:

$$L_{n,w} = L_{n,w,1} - \Delta L_W$$

where

$L_{n,w,1}$ = Impact sound level for the concrete floor without the floor covering.

$C_{I,1}$ = Adaptation term for the concrete floor without the floor covering.

ΔL_W = Weighted impact sound improvement for the floor covering.

$C_{I\Delta}$ = Adaptation term for the floor covering.

Measurement method

The measurements are performed in large according to ISO 10140-1 annex H, but with less measurement positions. The evaluations are performed according to ISO 717-2:1996 and SS 25267 edition 3.

Impact sound improvement ΔL is determined using the following equation:

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

where $L_{n,0}$ is the normalized impact sound pressure level in the receiving room without the floor covering and L_n is the normalized impact sound pressure level in the receiving room with the floor covering. For normalization, the impact sound pressure level is calculated by a correction term using the ratio of the measured equivalent absorption area in the receiving room and Sabine's reference equivalent area, 10 m². The equivalent absorption area of the receiving room can be obtained using the measured reverberation time of the room.

Weighted impact sound improvement can be determined as follows:

$$\Delta L_W = 78 - L_{n,r,w}$$

where $L_{n,r,w}$ is the calculated weighted normalized impact sound pressure level of the reference floor with the floor covering under test

The adaptation term for impact sound reduction of the floor coverings, $C_{I\Delta}$, is calculated as:

$$C_{I\Delta} = C_{I,r,0} - C_{I,r}$$

where

$C_{I,r}$ the adaptation term for the reference floor with the floor covering under test

$C_{I,r,0}$ the adaptation term for the reference floor ($C_{I,r,0} = -11$ dB)

The floor coverings were installed on a 150 mm thick concrete floor with dimensions 5.2 m x 4.2 m, on top of SP's impact transmission lab. (The concrete floor was not placed on rubber moldings). The volume of the receiving room was 107 m³. For the impact sound measurements a standardized tapping machine was used as the sound source.

Six tapping machine positions were used on the test object. The measurement duration at each position was 64 seconds.

Installation conditions

For measurements of impact noise improvement, the floor coverings were glued to SP's concrete floor. SP's concrete floor was lying directly at its frame without rubber moldings.

Pictures of the floor coverings



Figure 1 – Test pieces

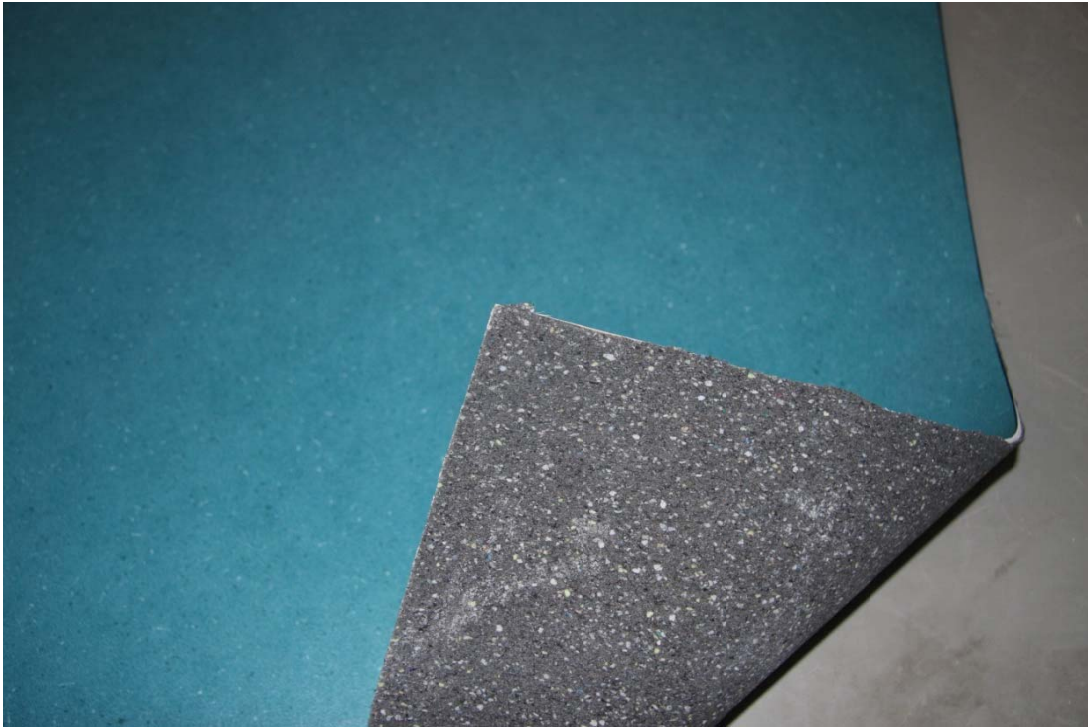


Figure 2 – Different material used on the two sides of the mat

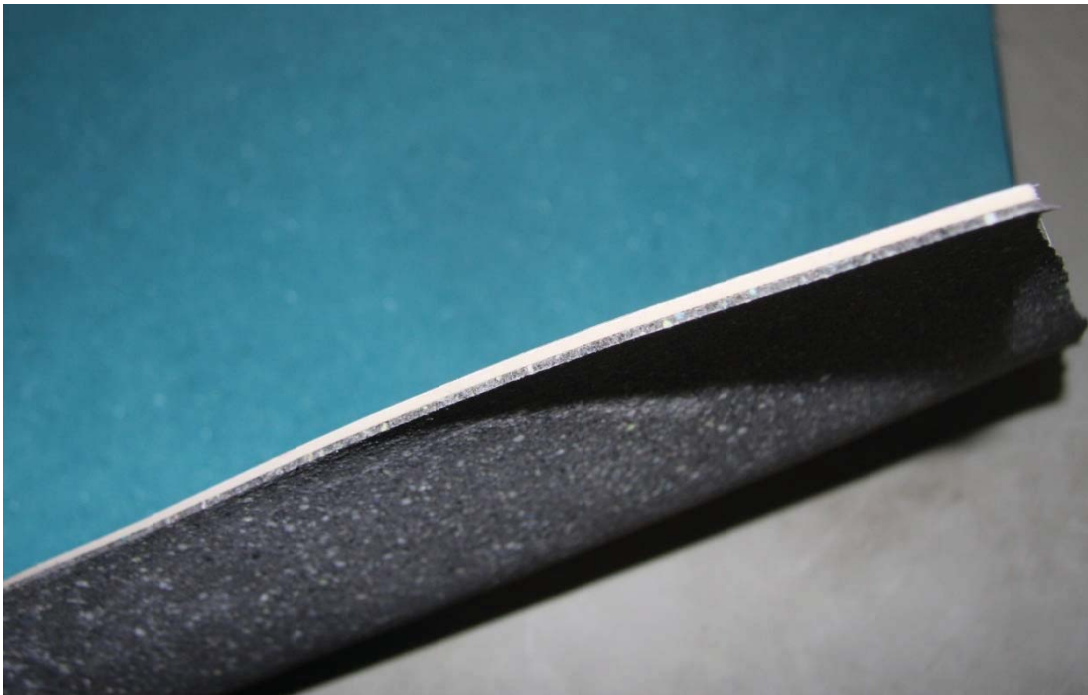


Figure 3 – Profile of the mat

Equipment

<i>Equipment</i>	<i>Brand</i>	<i>Type</i>	<i>Serial nr. / SP nr.</i>
Sound level meter	Norsonic	140	1404569
Calibrator	Brüel & Kjær	4231	1762190
Tapping machine	Norsonic	277	2775718
Microphone	Brüel & Kjær	4166	1011722
Amplifier	Brüel & Kjær	2619	970931
Rotating boom	Brüel & Kjær	3923	681300
Power supply	Brüel & Kjær	2804	455245

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