

Technical bulletin

**Impact sound behaviour on
screed-covered ducting systems and screed-flush trunking
systems**

Date: 06/2006

These sheets provide you with information on specific technical subjects. They are based on the current rules and regulations and on our current test results. The contents of this document are not legally binding.

General information

Constructive noise protection concerns itself with the problem of noise dissipation in buildings. Its aim is to avoid noise pollution from sounds coming through components. This is achieved, for example, through the mechanical decoupling of components using compressible layers of insulation (floating screed).

The minimum requirements regarding the different usage of rooms are specified in DIN 4109 "Sound insulation in buildings", dated November 1989.

Noise protection when installing electrical installation ducts and trunkings

The questions pertaining to construction noise protection in conjunction with electrical installation ducts can be reduced as follows:

- a) Is there any reduction in the effectiveness of noise protection components, such as ceilings and their coverings?
- b) If yes, then how significant is the reduction, and might it require the implementation of additional cost-relevant construction measures?

To be able to provide qualified answers to these questions, Ackermann instigated a comprehensive programme of investigations at the renowned institutes:

ITA INGENIEURGESELLSCHAFT FÜR TECHNISCHE AKUSTIK MBH,
BERATENDE INGENIEURE VBI in Wiesbaden

and

Institut für Schall- und Wärmeschutz Dipl.-Math. und Phys. Henning Kröger,
Beratender Ing. VBI in Essen,

who have now produced their results. They investigated the impact sound behaviour on screed-flush duct systems and screed-covered trunking systems in floating screed.

The result

The measurement results prove that the Ackermann screed-flush and screed-covered electrical installation systems scarcely reduce the impact sound properties of a ceiling. The installation systems can be used without any additional noise protection measures.

Information on noise

The following section provides a definition of the term noise. The wide range of installation systems currently on the market mean that it is not always possible to make a direct comparison of usage. Noise surveys help to provide an evaluation, which give practical assistance.

During measurement, both suitable structures, correct execution and the selection of the measuring points play a key role. To achieve realistic evaluations, it should be expected that not just the ceiling structure but also the installed ducting and trunking systems are directly tested for noise. Only this can guarantee a relationship to practical situations and objective evaluations.

Definition of terms

Impact sound

Impact sound is the sound created when walking over or coming into contact with a ceiling, staircase or a similar feature and which may be partially dissipated as airborne sound into a room below or adjacent to the place the sound was created.

Impact sound reduction ΔL

According to DIN 4109, impact sound reduction is the difference in the standard impact sound level of a ceiling with and without a ceiling covering.

Effective perceived standard impact sound level $L_{n,w}$

This is the single-digit specification of the impact sound behaviour of ready-for-use components. The effective perceived standard impact sound level is based on the frequency-dependent, standard impact sound level determined using a third-octave filter analysis. In numerical terms, $L_{n,w}$ is the value of the reference curve at 500 Hz, when shifted by a whole decibel, in accordance with DIN 52210 Part 4.

Impact sound behaviour of screed-flush trunking systems

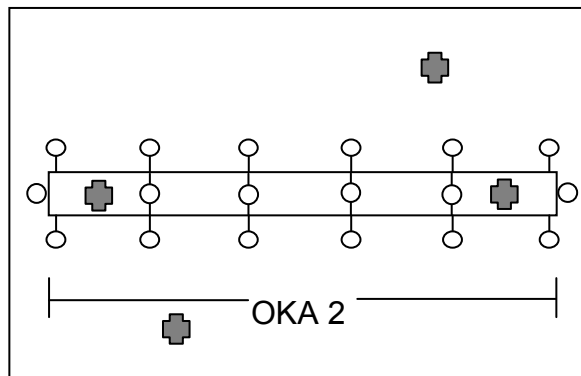
The measurements were carried out on a standardised test bench according to DIN EN ISO 140-1, Type C.

To achieve **realistic, practical** conditions, the measurement sequences carried out on the trunking systems were also carried out with cables and floor coverings.

When evaluating the measurement requirements, it should be noted that the trunking system was also tested at two points, in order to reflect practice conditions.

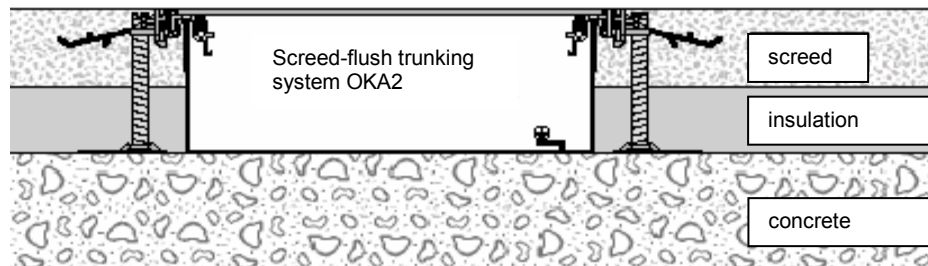
Information sheet on the impact sound behaviour on screed-covered ducting systems and screed-flush trunking systems

Arrangement of measuring points in the testing chamber (3.91 x 4.41 m)



- Measuring point
- Levelling units and cover butt support

Test structure



Measurement results of impact sound reduction according to ISO 717-2

	Structure	
	Bare ceiling	Perceived standard impact sound level $L_{n,w} = 72$ dB
	Screed structure	Perceived impact sound reduction ΔL_w without floor covering = 28 dB; with floor covering = 36 dB

	Floor structure with duct system	Impact sound reduction $\Delta L_{w,p}$	Calculation value for DIN 4109/89 $\Delta L_{w,R}$
1	Only trunking system	24 dB	22 dB
2	Covered with conductors, fill factor 30%	26 dB	24 dB
3	As 1, but covered with carpet	28 dB	26 dB
4	As 2, but covered with carpet	29 dB	27 dB

The above test results are taken from the ITA test report, 0123.00 - P 318/99.

Information sheet on the impact sound behaviour on screed-covered ducting systems and screed-flush trunking systems

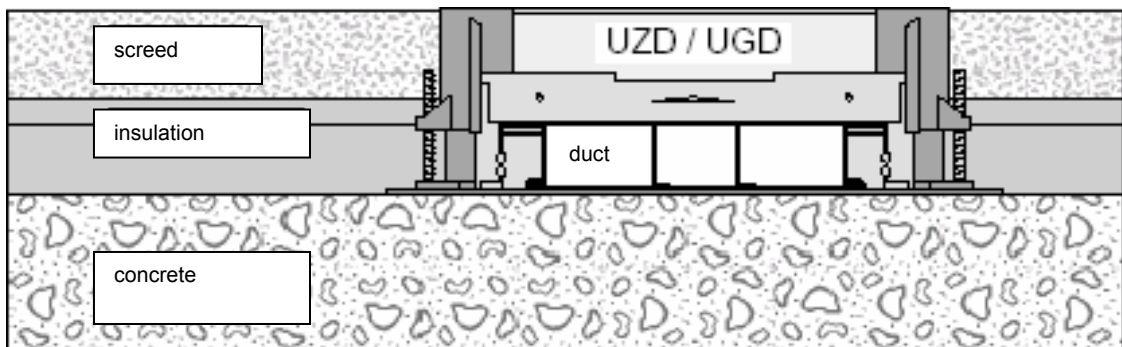
Impact sound behaviour of screed-covered duct systems

The measurements were carried out on an acoustic test bench, with the test itself carried out according to DIN 52 210-02-M-T-PFL-D.

To achieve **realistic, practical** conditions, the measurement sequences carried out on the screed-covered duct systems were also carried out with floor coverings.

When evaluating the measurement requirements, it should be noted that the duct system (using the underfloor UGD floor box) was also directly tested at two points, in order to reflect practice conditions.

Test structure:



Measurement results of impact sound reduction according to DIN 52 210, Part 3

	Structure	Perceived standard impact sound level $L_{n,w}$
	Bare ceiling	75 dB
	Screed structure	31 dB

	Floor structure	Impact sound reduction $\Delta L_{w,p}$	Calculation value for DIN 4109/89 $\Delta L_{w,R}$
1	Duct system installed in screed	25 dB	23 dB
2	As 1, but covered with PVC covering	27 dB	25 dB
3	As 1, but covered with carpet	30 dB	28 dB

For the correctness of the measurement results:

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