F 2344

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Sound Resulating Installation walls

Short Report

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Approaches to reduce considerably the transfer of impact sound between the walls of bathrooms or similar rooms and appartments located below such bathrooms. For this purpose, measurements in buildings as well as on wall-ceiling model structures were performed, in which the vibrations were generated by an electromagnetic transmitter (see Fig. 1). The results of these investigations are summarized in the following:

a. By using heavier walls suprisingly no or only a small reduction in the transmission of vibrations can be accomplished. Athough for heavier walls their vibrations are much smaller, the transfer from the wall to the ceiling is much larger in relative terms.

b: By filling of cavities in the wall with lose sand, the impact sound insulation of the wall is increased so much, that the sound transfered to the ceiling, depending on the amount of sand, is reduced by 10 - 20 dB. The insulation D_K which can be accomplished is shown in Fig. 2 for two examples.

c: By making the central parts of the wall much heavier then at the rim, the transfer to the rooms located below may be reduced by about 10 dB. An example is shown in Fig. 3.

d. By reducing the benching stiffness of the wall close to the attachment to the ceiling, the sound transfer may also be reduced by about 10 dB as shown in Fig, 4.

In conclusion, there is reason to believe that by one of the discussed approaches the transfer of installation noises from bathrooms into other appartments may be considerably reduced.

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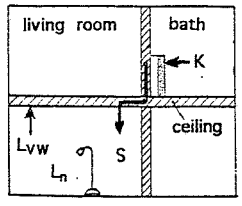
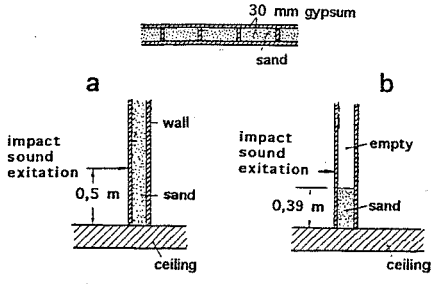
Fig. 1:

Investigated sound transfer by impact sound exitation (K) of the installations wall I





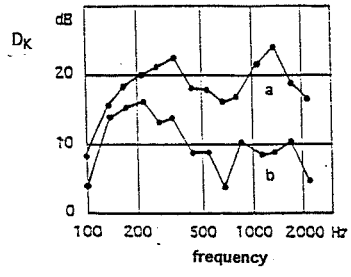


Fig. 2:

Impact sound insulation of an installation wall towards a ceiling due to a filling with sand*)

a: cavities filled completly with sand

b: only partially filled cavities

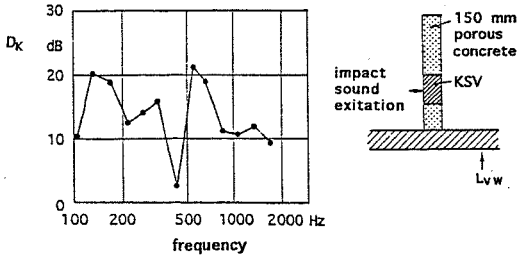


Fig. 3:

Insulation D_K of a inhomogenous installation wall*) (heavy KSV-blocks at the location of impact sound excitation the rest of the wall consorts of light weight porous concrete blocks).

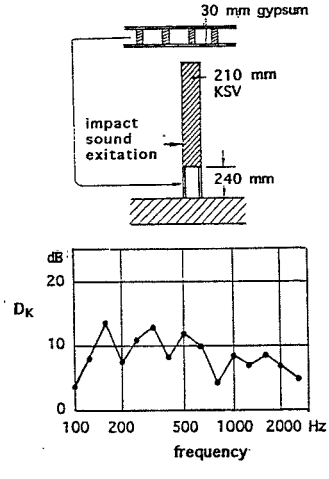


Fig. 4:

Impact sound insulation D_K of a KSV-wall on a pedstal of hollow blocks*)

The good sound insulation is caused by the softer attachment of the wall to the ceiling.

*)model experiment; values given are calculated for actual fall size arrangement