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Ihr Zeichen

Ihre Nachricht vom

Unser Zeichen
PT

Stuttgart,
June 17, 2007

S 9712 – Technical Comment on the Noise Control Performance "Pacifyre® MKII – Fire Protection Sleeve"

Dear Mr. Schnippe,

on April 18, 2006 acoustic measurements of the fire protection sleeve "Pacifyre® MKII – fire protection sleeve" with the approval number Z-19.17-1737 of J. van Walraven B.V. company were carried out at the premises of BIS-Walraven GmbH. Testing was aimed at investigating the acoustic properties of the fire protection sleeve. For this process, several cast iron pipes (SML, DN 100) or plastic pipes (PE-HD, DN100) of 1 m length were installed in the gaps of 15 cm thick concrete slab (2,45 m x 3,60 m) to simulate a ceiling breakthrough (Fig. 1 and Fig. 2). The test specimens 1 and 2 were moulded soundproof without pipe covering. The test specimens 3 and 7 were covered by a "Pacifyre® MKII – fire protection sleeve" before mortar grouting with "Henkel Tangit FP300 – fire protection mortar". The installation of these test specimens was effected according to the assembly instructions of the manufacturer by BIS-Walraven GmbH in each case.

After the drying of the fire protection mortar, the concrete slab was excited by means of a normalized impact sound tapping machine. The impact sound transferred by the concrete slab (may be by the fire protection sleeve) to the pipes is measured by means of accelerometers. In the process, two transducer positions and two excitation positions respectively were selected and the measured sound level was energetically averaged. (The distance between transducer and excitation position was equal for all pipes.)

The frequency-dependent insertion loss D_e results from the difference of the impact sound levels against the soundproof moulded pipes (test specimens 1 and 2) and the respective pipes with the "Pacifyre® MKII – fire protection sleeve" (and fire protection mortar). Thus, insertion loss indicates

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the reduction of impact sound transmission in case of applying the "Pacifyre® MKII – fire protection sleeve" in comparison to the soundproof installation of the pipe (unfavourable installation variation) and may be considered as a measurement for the acoustic suitability of a product. High values mean an intense reduction of impact sound transmission. Insertion losses of the investigated specimens are presented in Fig. 3 and Fig. 4. All investigated test set-ups show a considerable reduction of impact sound transmission in comparison to a rigidly moulded pipe.

To compare different products, a single-number indication is desirable for the frequency-dependent insertion loss. As different factors such as the frequency spectrum of the excitation or the surrounding building influence this single-number indication, the analysed insertion losses were weighted by a waste water spectrum (Fig. 5). The spectrum of a waste water system made of SML pipes (values for plastic pipes were not available) and measured in a room behind the installation wall in the test facility of the Fraunhofer Institute for Building Physics was selected for testing. As concerns this test set-up, sound transmission was primarily effected via the concrete-covered breakthrough in the ceiling (waste water system without decoupling of noise in the area of the breakthrough). It is possible to assess the spectrum, which would result from the installation of the "Pacifyre® MKII – fire protection sleeve" by subtraction of the insertion loss from the spectrum of the concrete-covered waste water system. The difference of the humming level of both spectra serves as single-number indication of the insertion loss as well as for the acoustic characterisation of the investigated products in connection with waste water systems (Table 1).

Note: The test set-up used is a simplified reproduction of a ceiling breakthrough for waste water systems and a simplified measurement method. The stated measurement results must be considered as reference values and do not replace any measurement in the test facility or with the executed object. This applies for the analysed single-number indications in particular, as they are based on a simplified model. It may, however, be assumed that an effective sound decoupling is possible in practice by applying the „Pacifyre® MKII – fire protection sleeve“. Moreover it must be noticed that in this case only sound transmission in the range of the ceiling breakthrough / fire protection sleeve was taken into consideration. Other fixing elements (e.g. pipe clamps) may cause an increase in sound transmission via the waste water system in practice.

Yours sincerely,
Fraunhofer Institute for Building Physics

by order of

Dipl.-Ing. Pascal Teller

Table 1 Single-number indications of the insertion loss to be expected for the "Pacifyre® MKII – fire protection sleeve" with "Henkel Tangit FP300 – fire protection mortar" referring to the application in waste water systems.

tested object	insertion loss [dB]
cast iron pipe with "Pacifyre® MKII – fire protection sleeve" and "Henkel Tangit FP300 – fire protection mortar"	37
plastic pipe with "Pacifyre® MKII – fire protection sleeve" and "Henkel Tangit FP300 – fire protection mortar"	21



Fig. 1 Above: soundproof SML pipe moulded by means of mortar (test specimen 1).
Below: SML pipe with "Pacifyre® MK II – fire protection sleeve" installed and remaining opening sealed by „Henkel Tangit FP300 – fire protection mortar“ (test specimen 3).



Fig. 2 Above: soundproof PE-HD pipe moulded by means of mortar (test specimen 2). Below: PE-HD pipe with "Pacifyre® MKII – fire protection sleeve" installed and remaining opening sealed by „Henkel Tangit FP300 – fire protection mortar" (test specimen 7).

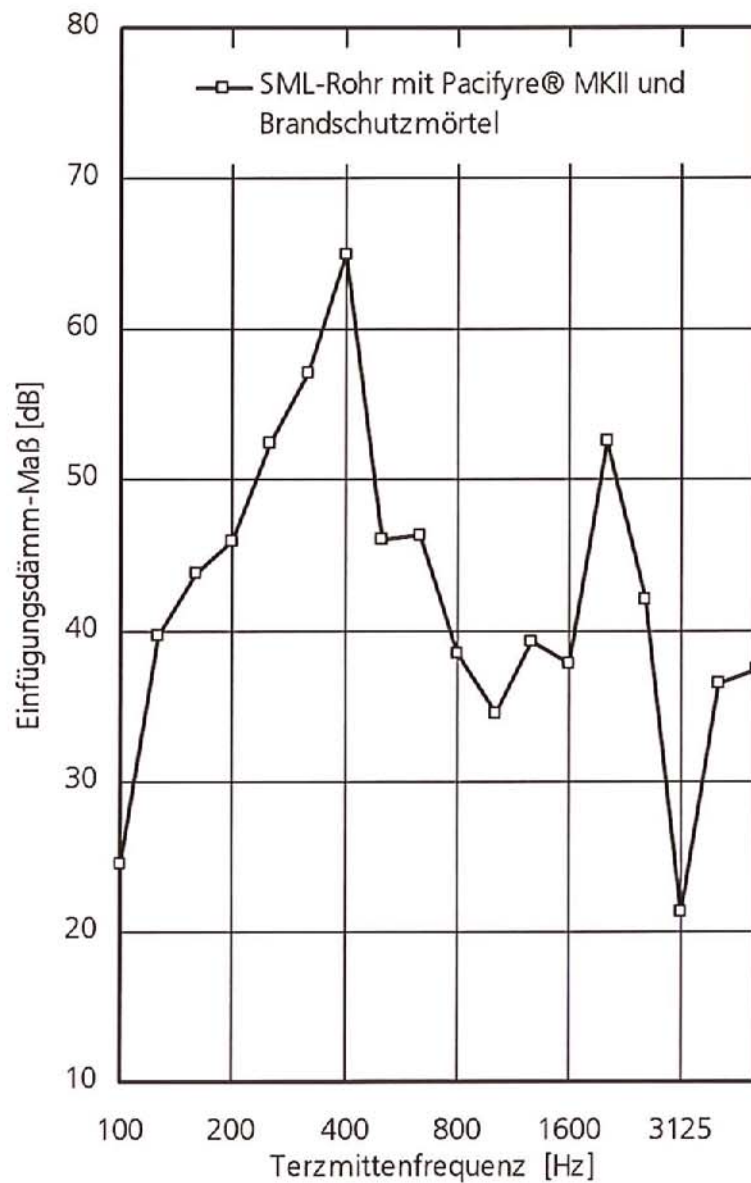


Fig. 3

Frequency-dependent insertion loss of the fire protection sleeve "Pacifyre® MKII" with approval number Z-19.17-1737 of J. van Walraven B.V. in connection with pipes of SML. The specimens were installed by means of "Henkel Tangit FP300 – fire protection mortar". A pipe without fire protection sleeve rigidly moulded by means of mortar served as reference.

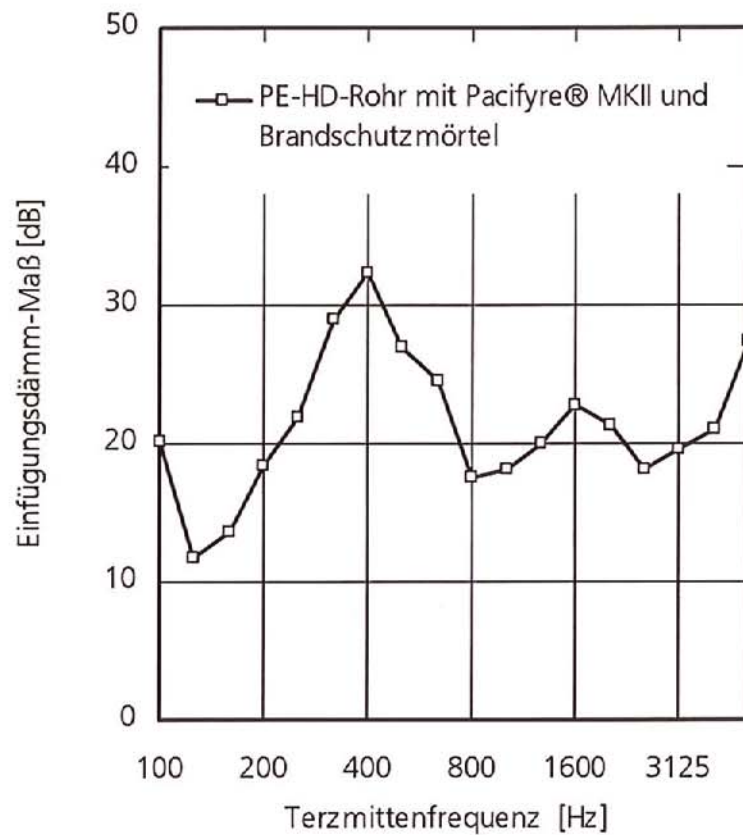


Fig. 4 Frequency-dependent insertion loss of the fire protection sleeve "Pacifyre® MKII" with approval number Z-19.17-1737 of J. van Walraven B.V. in connection with pipes of PE-HD. The specimens were installed by means of "Henkel Tangit FP300 – fire protection mortar". A pipe without fire protection sleeve rigidly moulded by means of mortar served as reference.

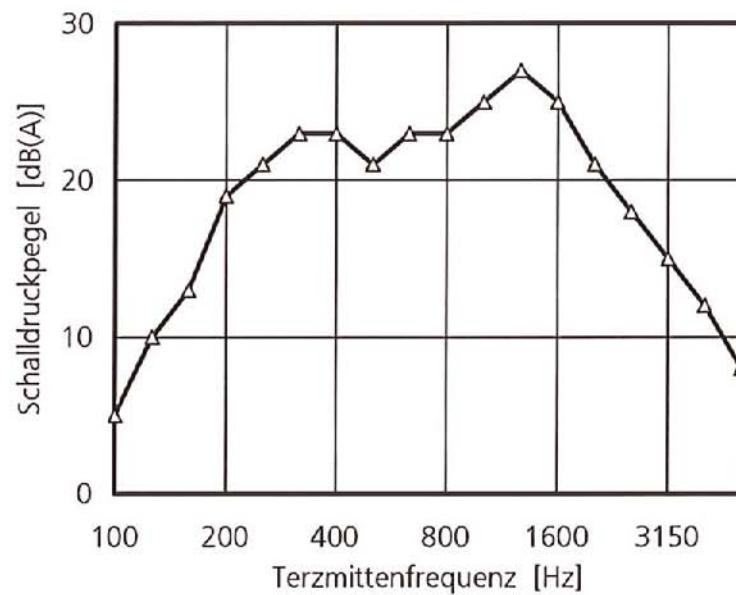


Fig. 5

Spectrum of a waste water system made of SML pipes measured behind the installation wall in the installation test facility of the Fraunhofer Institute for Building Physics at a volume flow of 2 l/s. Sound transmission was effected primarily via the concrete-covered ceiling breakthrough with this test set-up.