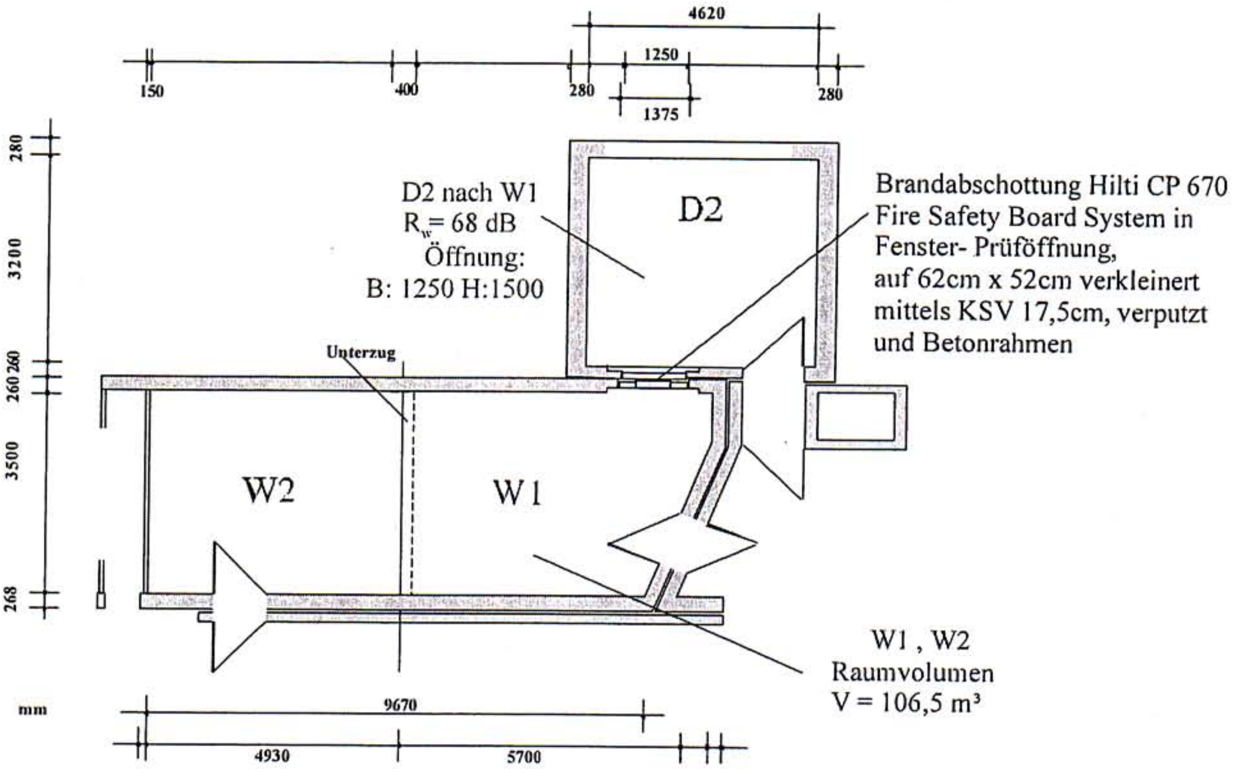
Figure 3 shows the test set up between the two adjoining laboratory rooms D2 and W1/W2. The test set up complies with DIN EN ISO 20140-1 (Acoustics - Laboratory measurement of the flanking transmission of airborne and impact noise between adjoining rooms) The maximum insulation rating was R_w = 68 dB.



Translation of diagram text:
Fire proof penetration sealing with CP 670
Fire Safety Board System in miniaturised
dimension 62cm x 52cmwindow test bench
using lime stone bricks 17,5 cm ,plastered and installed
in concrete frame

Figure 3: Window test bench between the adjoining rooms D2 and W1
Measurement of a small building component to determine the normal sound level difference $D_{n,w}$.

Installation of the test object CP 670 Fire Safety Board System

Vertical cross-sectional view according to manufacturer's drawing with indications of materials used is pictured in Appendix 1 *(A 51313)*. The following pictures illustrate the set-up and installation of the test specimen.

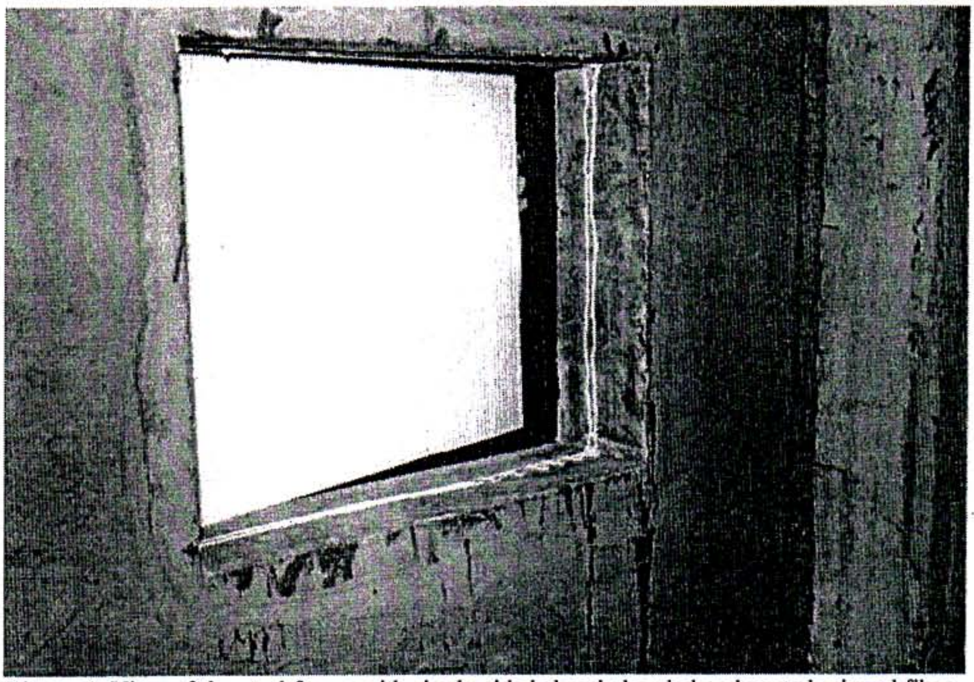


Figure 4: View of the steel frame with single-sided already bonded and coated mineral fibre board.

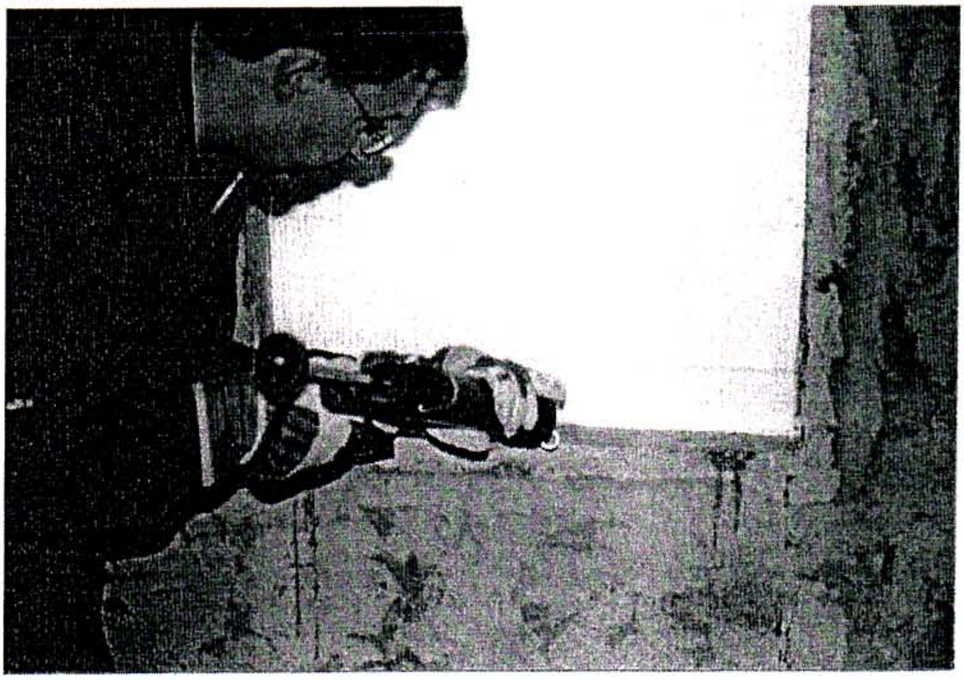


Figure 5: Frame joint being sealed with sealant Hilti CP 606

Test procedure

The test was performed according to DIN EN 20140 – 10 or ISO 140-10 by determining the standard sound level difference by the equation (1)

$$D_n = L_1 - L_2 - 10\lg\frac{A}{A_0} \quad dB \tag{1}$$

with

$$A = 0{,}16\ \frac{V}{T} \tag{2}$$

and

L_1	Sound pressure level in source room	[dB]
L_2	Sound pressure level in receiving room	[dB]
A	equivalent absorption area	[m^2]
A_0	Reference absorption area A_0= 10 mm^2	[m^2]
V	Volume of the receiving room	[m^3]
T	Reverberation time	[s]

The measurement procedure is defined in DIN 52210-1or DIN EN 20140-3 (ISO 140-3). The sound pressure level L_1 is generated in the source room that leads to the sound pressure level L_2 in the receiving room. The resulting sound level difference is calculated by the equation (3):

$$D = L_1 - L_2 \quad dB \tag{3}$$

The sound reduction index originates from the sound power that reaches the surface S of the structural member of the transmission room and is radiated from the same surface into the receiving room. This calculation for a diffuse room is calculated by the equation (4):

$$R = L_1 - L_2 + 10\lg\frac{S}{A} \quad dB \tag{4}$$

with

R	Sound reduction index for the structural member	[dB]
S	common partition between the measuring rooms	[dB]

The sound reduction index and the normal sound level difference given an apostrophe (R´ and D_n´) if the sound travels not only through the partition wall, but also through bypasses between source room and receiving room. Then R´ or D´ mean: Sound insulation with bypass or standard building bypasses. The test set up with a maximum sound insulation of R_w =68 dB met the requirements of laboratory test facilities without flanking transmission according to standard EN EN ISO 140-1. The window test facility complies with the requirements of 3.3.2.1 and Table 1 of standard DIN 52 210-2/1984, that specify the flanking sound reduction index.

Measuring equipment:

Third octave noise is sent from the source room using a speaker with omni directional radiating characteristics. Omni directional microphones rotating in inclining, overlapping circles measure the receiving and source sound levels. The equivalent absorption surface is determined by the reverberation time measurements.

The measuring instruments are subject to calibration specifications and regular inspections by the PTB (National Metrology Institute) in Braunschweig (Brunswick). They are under quality and suitability control of the IAB.

Measured Values:

Frequency	Sound pressure Level Differences	Reverberation Time	Standard Sound pressure difference
f / Hz	D / dB	T / s	D_n / dB
50	35,4	5,15	41,7
63	34,7	2,41	37,7
80	28,2	2,23	30,8
100	24,6	1,85	26,4
125	30,2	1,63	31,5
160	34,2	1,50	35,1
200	31,9	1,27	32,1
250	35,9	1,25	36,0
315	29,0	1,26	29,2
400	30,8	1,11	30,4
500	30,2	1,20	30,1
630	30,6	1,	30,6
800	27,6	1,22	27,6
1k	21,2	1,22	21,6
1,25k	25,3	1,33	25,7
1,6k	32,2	1,34	32,6
2k	33,3	1,35	33,4
2,5k	32,0	1,26	32,2
3,15k	36,2	1,26	36,3
4k	40,2	1,24	40,1
5k	46,0	1,18	45,4

The test object has the following surface dimension: 0,62 m x 0,52 m = 0,322 m².

Measured results:

The sound insulation between 100 and 3150 Hz in accordance with ISO 717-1 was measured with:

$$D_{n,w} = 30 \text{ dB}$$

Temperature in Source/Receiving room: 23°C
Relative Humidity: 69%

Date of Measurement: August 29, 2002

Summary report for test object according to enclosed form, Appendix 2 (A 51325)

The sound insulation index of the test specimen Hilti CP 670 Fire Safety Board achieved the following rating in the miniaturised window test bench

$$D_{n,w} = 30 \text{ dB}$$

Date: October 30, 2002

Institut für Akustik und Bauphysik
(Institute for Acoustics and Building Physics)
Amtlich anerkannte Eignungs- und Güteprüfstelle
(Officially accredited Suitability and Quality Testing Laboratory)

Prof. Dr. Ernst-Jo. Völker
Institute Director

Dipl.-Ing. Wolfgang Teuber
Measurement & Technical Manager

Enclosure 1 (Cross-sectional view A 51324)
Enclosure 2 (Measurement and evaluation sheet A 51325)