Requested by

Halltex Oy
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Order: Mr Markku Nikonen

Testing laboratory

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Task

Determination of airborne sound reduction index of Halltex wallboard

Specimen

Wallboard - 1200/1200 mm (height/width):

Name	thickness	mass per unit area
HALLTEX wallboard (cloth lined)	13 mm*)	4.24 kg/m^2

*) basic board 12 mm

Date of reception of the specimen: 4th June 2008

Installation and measuring

The wall board was installed by VTT into the measurement opening (with dimensions 1205 by 1205 mm) between two reverberation rooms.
The airborne sound reduction index of the specimen was determined by means of two-channel sound pressure level measurement with two fixed sources and moving microphones.

Date of installations and measurements: 9th June 2008

Methods and equipment

The sound reduction index R was measured in accordance with *EN ISO 140-3:1995* [1] and the weighted sound reduction index R_w was determined in accordance with *EN ISO 717-1:1996* [2].

Deviations from the test method:

The size of the specimen was smaller than that specified in *ISO 140-3:1995* for wall constructions.

Reverberation rooms:
The thickness of the concrete walls, floors and ceilings of the reverberation rooms is 0.25 m. The floor dimensions of the source room are 4.7 by 5.8 m, and the height is 3.7 m. The respective dimensions of the receiving room are 5.0 by 6.5 m and 4.0 m. The volumes are 102 and 130 m^3.

Measuring equipment:

Condenser microphones	B&K (Brüel&Kjær) 4166
Microphone preamplifiers	B&K 2669
Rotating microphone booms	B&K 3923
Power amplifier	Yamaha MX-1000
Loudspeakers	Sinmarc V121L
Real-time analyser	Norsonic 830
Sound calibrator	B&K 4228

Results

The results of the measurements are presented in Table 1 and in Appendix 1.

Table 1. The weighted sound reduction index R_w of the wall board. The values R_w+ C and R_w+ C_{tr} are also presented (spectrum adaption terms C and C_{tr} calculated in frequency range 100 to 3150 Hz). ISO 140-3 and ISO 717-1.

Wallboard		Weighted sound reduction index		
Name	mm / kg/m^2	R_w, dB	R_w+ C, dB	R_w+ C_{tr}, dB
Halltex (cloth lined)	**13 / 4.24**	26	25	22

The results of the measurement are valid only for the measured specimen. In laboratories, a repeatability of 1 dB is normally achievable for single-number quantities [3].

References

[1] and [3] *ISO 140: Acoustics - Measurement of sound insulation in buildings and of building elements - Part 3:1995 Laboratory measurements of airborne sound insulation of building elements. - Part 2:1991: Determination, verification and application of precision data*
[2] *ISO 717: Acoustics - Rating of sound insulation in buildings and of building elements - Part 1:1996: Airborne sound insulation*

Espoo, 10th June 2008

Pekka Sipari
Research Scientist

Reijo Heinonen
Research Engineer

APPENDIX 1 Results of the measurements
DISTRIBUTION Customer Original
VTT Original

Manufacturer: Halltex Oy

Client: Halltex Oy

Test specimen mounted by: VTT

Description of test facility, test specimen and test arrangement:

Product identification: Halltex wallboard (cloth lined) 13 mm

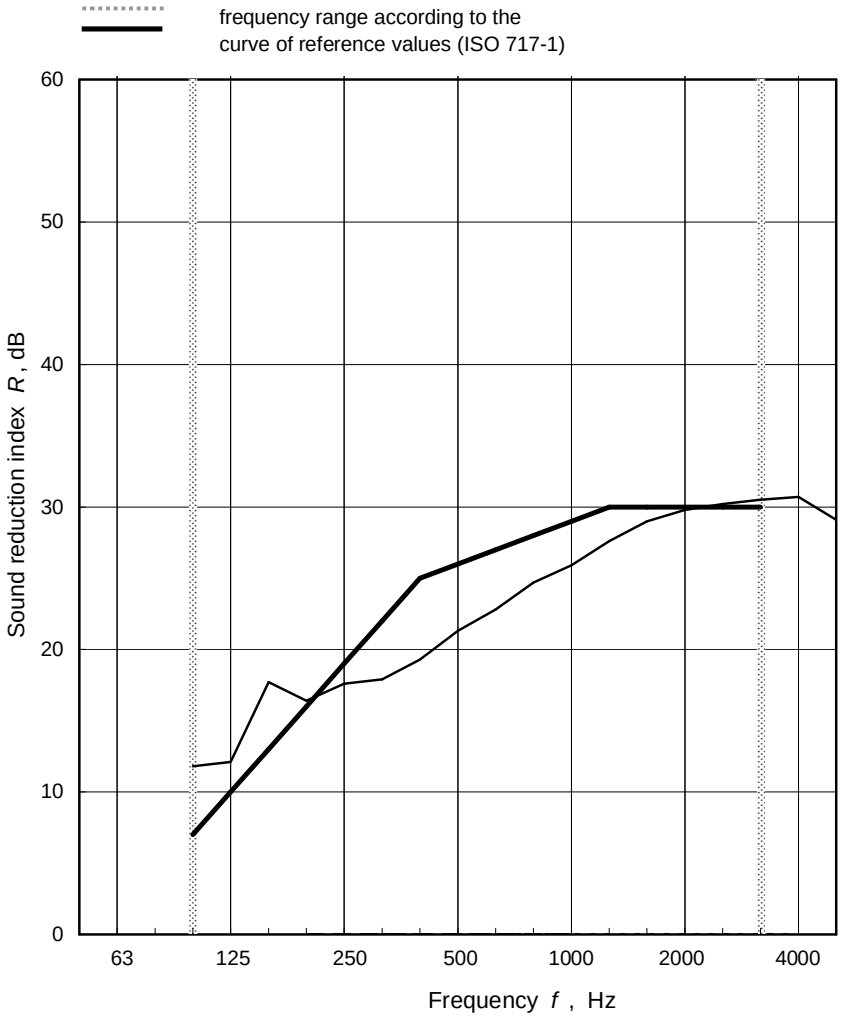
Test room identification: Reverberation rooms 1 and 2

Date of test: 9 June 2008

The specimen was installed by VTT to the measurement opening with dimensions (mm): width x height 1205 x 1205 lying between two reverberation rooms. The airborne sound reduction index of the board was determined by means of two channel sound pressure level measurement with two fixed sources and moving microphones.

Area S of test specimen:	1.5	m²
Mass per unit area:	4.24	kg/m²
Air temp. in the test rooms:	21	°C
Air humidity in the test rooms:	47	%
Source room volume:	102	m³
Receiving room volume:	131	m³

Frequency *f* Hz	One-third octave *R* dB
50	
63	
80	
100	11,8
125	12,1
160	17,7
200	16,4
250	17,6
315	17,9
400	19,3
500	21,3
630	22,8
800	24,7
1000	25,9
1250	27,6
1600	29,0
2000	29,8
2500	30,2
3150	30,5
4000	30,7
5000	29,1



Rating according to ISO 717-1:

$R_w (C;C_{tr})$ = 26 (-1 ; -4) dB; $C_{100\text{-}5000}$ = -3 dB; $C_{tr,100\text{-}5000}$ = -4 dB;

Evaluation based on laboratory measurement results obtained by an engineering method: