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*Test report n° **033E/2014/LA***

MEASUREMENT OF SOUND ABSORPTION IN A REVERBERATION ROOM ACCORDING TO ISO 354 AND ISO 11654 STANDARDS

Manifacturer: GABER S.r.l. Via Schiavonesca, 75/1 – 31030 Caselle di Altivole (TV) Italy.

Test specimien: panel mod. "STILLY". Cavity with expanded polyurethane panel.

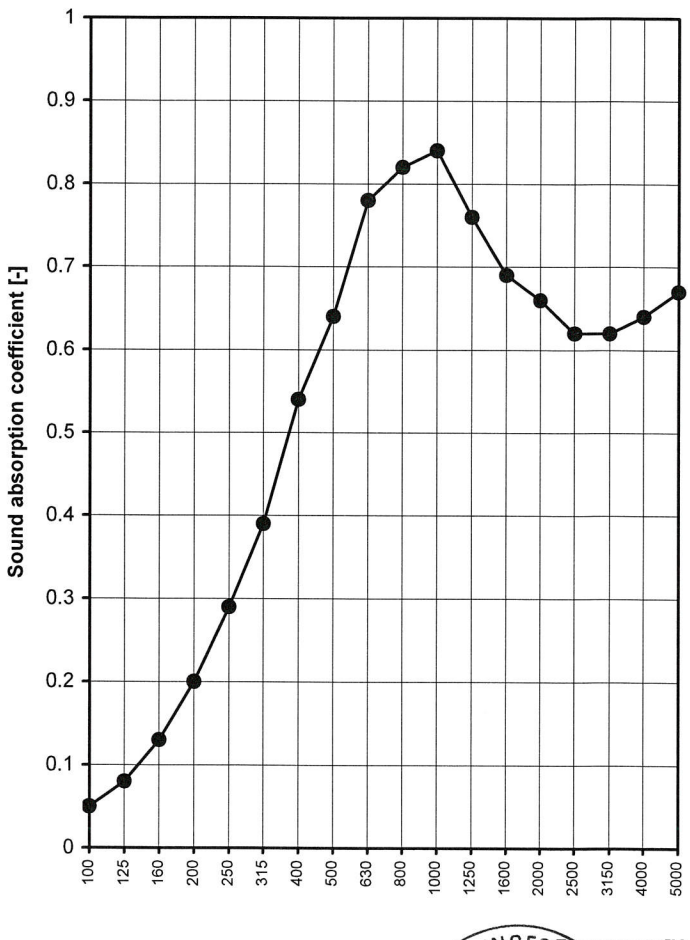
Applicant: GABER S.r.l.

Test specimien assemblers: GABER S.r.l.

Test date: 11/03/2013.

Test specimien description, mounting and position in the reverberation room: see page 2.

Freq. f [Hz]	T_1 [s] empty room	T_2 [s] room with test specimien	A [m²] (*)	α_s [/] (**)
100	19,37	15,04	0,52	0,05
125	20,39	13,74	0,82	0,08
160	16,45	9,77	1,43	0,13
200	16,35	8,03	2,18	0,20
250	16,27	6,52	3,15	0,29
315	15,08	5,27	4,22	0,39
400	13,89	4,12	5,83	0,54
500	12,46	3,52	6,96	0,64
630	11,62	3,01	8,41	0,78
800	10,52	2,83	8,86	0,82
1000	8,91	2,64	9,16	0,84
1250	7,72	2,74	8,19	0,76
1600	6,81	2,78	7,50	0,69
2000	5,55	2,65	7,14	0,66
2500	4,49	2,48	6,77	0,62
3150	3,59	2,24	6,77	0,62
4000	2,69	1,88	6,95	0,64
5000	1,85	1,46	7,30	0,67



Note:

(*) The equivalent sound absorption area of the test specimien, A, has been calculated using the formula:

$$A = 55{,}3\frac{V}{c}\left(\frac{1}{T_2}-\frac{1}{T_1}\right)-4V\left(m_2-m_1\right) \qquad [\text{m}^2]$$

where: V [m³] is the volume of the empty reverberation room;
c [m/s] is the propagation speed of the suond in air;
T_1 [s] is the reverberation time of the empty reverberation room;
T_2 [s] is the reverberation time of the reverberation room after the test the specimien has been introduced;
m_1 [m⁻¹] is the power attenuation coefficient of the empty reverberation room, calculated according to ISO 9613-1;
m_2 [m⁻¹] is the power attenuation coefficient of the reverberation room, calculated according to ISO 9613-1.

(**) The sound absorption coefficient α_s [/], Has been calculate using the formula

$$\alpha_s = \frac{A}{S} \quad [/]$$

where: A [m²] is the equivalent sound absorption area of the test specimien;
S [m²] is the area covered by the test specimien,

Head of the Laboratory

*Padova, **17/03/2014***

Weighted sound absorption coefficient (ISO 11654):

- $\alpha_w = 0,60$
- Sound absorption class: C

Test specimien set-up: according to ISO 354 standard. Perimeter edges of the test specimen covered with an acoustically reflective frame made of MDF, 20 mm thick.

Test specimien description: panel mod. "STILLY" (nominal size 440 mm x 440 mm, maximum height 40 mm, mass 0,4 kg) composed of a plastic support frame and polyester felt (6 mm thick) lined with Trevira polyester tissue. Cavity with expanded polyurethane panel (thickness 25 mm, density 30 kg/m^3).

Test conditions:

Area of test specimien:	10,842	m^2
Average air temperature in reverberant room:	17	°C
Average air relative humidity in reverberant room:	43	%
Atmospheric pressure:	101,3	kPa

Test room: reverberant room of Department of Industrial Engineering, University of Padova; volume 211,2 m³; surface 214,38 m².

Measuring apparatus: Notebook IBM T30, audio device DIGIGRAM VXpocket2, software Brüel & Kjær 7841 DIRAC, microphone G.R.A.S. type 40AQ (S/N 41471), preamplifier G.R.A.S. type 26CA (S/N 57851), signal conditioning amplifier 01dB OPUS (S/N 20225), power amplifier Brüel & Kjær 2716, omnidirectional sound source Brüel & Kjær 4295.

Test procedure: 4 microphone position and 4 source position in reverberant room, with 2 samplings for each combination of microphone and source position.

Note: measurements results in this test report are referred to the measured test specimien; there are no deviations from declared test methods.

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