Test Report

Report nº ACL 322/20 **Date:** 2020/10/30

Requested by:

Name: dBcover Solutions, S.L.

Address: Pol. Ind. Campo Alto, Avda. Benelux, 91; 03600 - Elda Alicante, Espanha

Contact: **Fax:** --- **Tel.:** +34 966 981 772 **e-mail:** m.taborga@dbcover.com

Manufacturer and test specimen identification:

Name*: dBcover Solutions, S.L.

Test specimen*: Double Layer Gypsum Plasterboard System with dBSonic Ceracoustic

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Sampling responsibility*: Customer. The results presented apply to the sample as received.

Responsability of test specimen installation*: Customer.

Test data:

Test: **Laboratory test: Determination of airborne sound reduction index for R_w. Range: $R_w \leq 72$ dB**

Test date:	2020/10/20	**Construction date of the test specimen:**	2020/10/20
Source room:		**Receiving room:**	
Temperature (ºC):	17,4 ± 1	**Temperature (ºC):**	17,7 ± 1
Relative humidity (%):	85,1 ± 5	**Relative humidity (%):**	83,3 ± 5
Static pressure (mbar):	991,7 ± 5	**Static pressure (mbar):**	991,7 ± 5

Test method: ISO 10140-1:2016 (except annexes J and K); ISO 10140-2:2010; ISO 10140-4:2010; ISO 717-1:2013

Test site: Itecons, Rua Pedro Hispano s/n; 3030-289 Coimbra

Operator: José Nascimento

Test equipment:

Acoustic chambers at Itecons (Source room: cubic shape with approximately 5,65 m edges and reinforced concrete walls about 25 cm thick; receiving room: cubic shape with approximately 5,85 m edges and double layered reinforced concrete walls with masonry units about 50 cm thick); "Brüel & Kjær" pulse multianalyser system, PUL02, model 3560-C-T46, with five acquisition channels; "Brüel & Kjær" 1/2" microphone, type 4190, MIC07; "Brüel & Kjær" rotating microphone boom, type 3923, GIR01; "Brüel & Kjær" 1/2" microphone, type 4190, MIC06; "Brüel & Kjær" rotating microphone boom, type 3923, GIR05; "Brüel & Kjær" 1/2" microphone, type 4955, MIC22; "Brüel & Kjær" sound calibrator, type 4231, CLS03; termohygrometer, THR09; barometer, BAR01; omnidirectional sound source OMNIPOWER 4292, from "Brüel & Kjær", FSO03; omnidirectional sound source OMNIPOWER 4292-L, from "Brüel & Kjær", FSO07.

Brief description of test procedure:

The test is performed in the laboratory, in accordance with the ISO 10140-2:2010 standard, by the following procedure: measurement of the sound pressure level in the source room, for 2 source positions and within the sweeping range of a moving microphone; simultaneous sound pressure level measurement in the receiving room, during a microphone rotation and for the same 2 positions of the emitting source within the source room; measurement of the background noise within the sweeping range of a moving microphone in the receiving room (with the source turned off); evaluation of the reverberation times in the receiving room, considering 1 source position and 2 decays measured, at least, at 3 microphone positions (engineering method). The normalized sound insulation curve is then determined in accordance with the ISO 10140-2:2010 standard, and the sound insulation index is determined in accordance with the ISO 717-1:2013 standard.

Observations:

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Data reported with * supplied by customer.

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Test specimen description*:

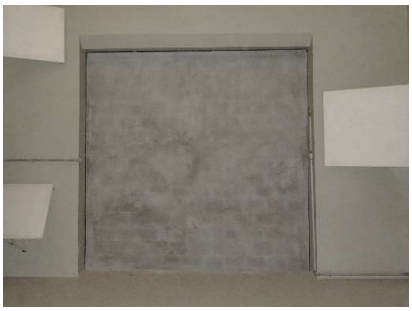
Test specimen with our reference ACL245A/20 composed by a masonry wall (bricks with individual dimensions of 300 mm x 200 mm x 150 mm (length x height x thickness) with 10 mm thick joints filled with traditional mortar of sand and cement) plastered on both sides (thickness of approximately 15 mm, each side) [Basic element], with the application of an acoustical lining on the inner face formed by the following elements: discrete supports (ref. "EP 700 + Sylomer 15") fixed with bushings and screws to the basic element (air space of approximately 100 mm); metal structure filled with low density mineral wool (nominal thickness of 50 mm) formed by aluminum profiles with thickness of 48 mm fixed to the discrete supports with screws and bounded on top and bottom with support elements (ref. "EP 500 + Sylomer s35"); one layer of plasterboard with nominal thickness of 12,5 mm and nominal surface mass of 8,0 kg/m² fixed with screws to the metal structure; one layer of elastic polymer and minerals with double anti-cracking layer by traction with nominal thickness of 3 mm (ref. "dBimpact Ceracoustic 3.0") fixed with staples, and one layer of plasterboard with nominal thickness of 15 mm and nominal surface mass of 10,9 kg/m². The joints of the plasterboard layers were covered with plaster filler and the layers of plasterboard were peripherally detached from the test rim with acoustic band.

Test opening description:

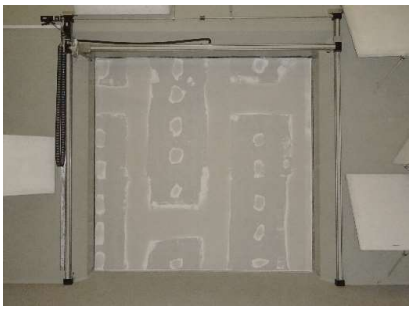
The test opening between the acoustic chambers, where the test specimen was installed, has dimensions of 3,16 m x 3,16 m, which corresponds to an area of approximately 10 m².

Observations:

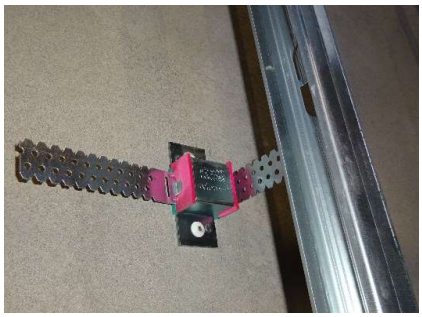
Source room:

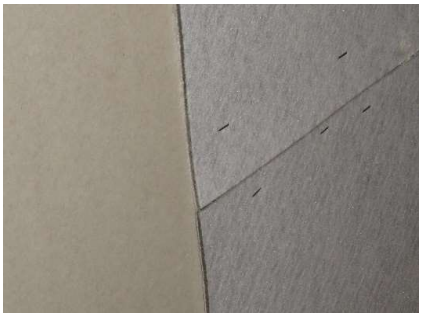


Receiving room:



Construction details:





ACL322/20

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Volume of the rooms (in m³):

Source room: 181,5 Receiving room: 204,0

Test results:

Average sound pressure level in the source room (L_1):

Freq. (Hz)	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000
$L_{1\text{-}1}$ (dB)	98,8	100,0	101,5	99,0	99,0	97,2	97,7	97,6	96,7	96,2	96,8	98,9	101,2	101,2	102,5	100,9	100,5	98,1
$L_{1\text{-}2}$ (dB)	98,8	101,2	99,7	98,2	97,7	97,6	97,8	97,6	96,4	96,2	97,1	99,4	101,5	101,3	102,8	101,4	100,8	97,8

Average sound pressure level in the receiving room (L_2):

Freq. (Hz)	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000
$L_{2\text{-}1}$ (dB)	55,4	48,3	45,9	40,5	38,2	34,7	31,8	29,0	26,2	20,2	15,5	16,3	20,5	19,7	19,0	19,1	18,0	14,4
$L_{2\text{-}2}$ (dB)	56,2	50,0	47,2	38,6	35,5	33,8	31,4	28,0	26,0	20,3	15,8	16,9	20,6	19,7	19,5	19,6	18,6	14,4

Average background noise pressure level in the receiving room (L_0):

Freq. (Hz)	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000
L_0 (dB)	1,1	-3,6	10,3	-6,8	-9,5	-3,4	-6,1	-0,1	-3,2	-2,5	-3,9	-9,3	-7,9	-7,8	-6,8	-6,8	-4,5	-5,5

Average sound pressure level in the receiving room after background noise correction (L'_2):

Freq. (Hz)	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000
$L'_{2\text{-}1}$ (dB)	55,4	48,3	45,9	40,5	38,2	34,7	31,8	29,0	26,2	20,2	15,5	16,3	20,5	19,7	19,0	19,1	18,0	14,4
$L'_{2\text{-}2}$ (dB)	56,2	50,0	47,2	38,6	35,5	33,8	31,4	28,0	26,0	20,3	15,8	16,9	20,6	19,7	19,5	19,6	18,6	14,4

Average reverberation time in the receiving room (T_r):

Freq. (Hz)	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000
T_r (s)	5,01	3,78	3,21	2,92	1,55	1,73	1,66	1,35	1,49	1,59	1,37	1,62	1,69	1,58	1,54	1,56	1,50	1,36

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Test results:

Normalized airborne sound insulation of the basic element without lining, $R_{without\ lining}$ (dB):

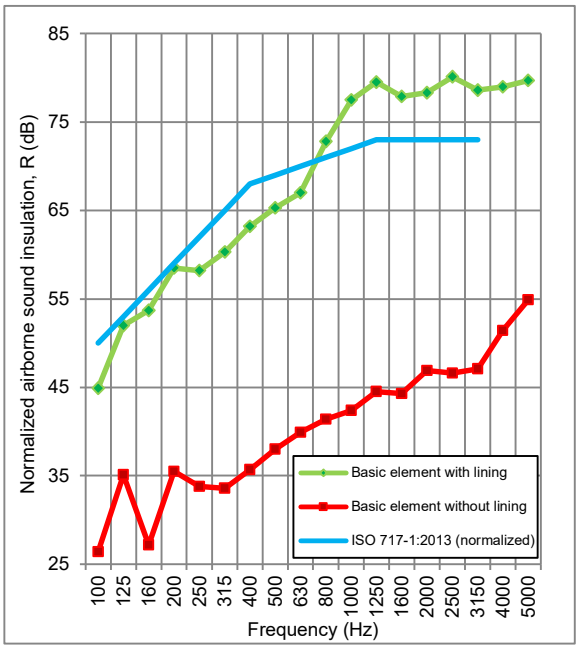
Freq. (Hz)	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000
R (dB)	26,4	35,1	27,2	35,5	33,8	33,6	35,7	38,0	39,9	41,4	42,4	44,5	44,3	46,9	46,6	47,1	51,4	54,9

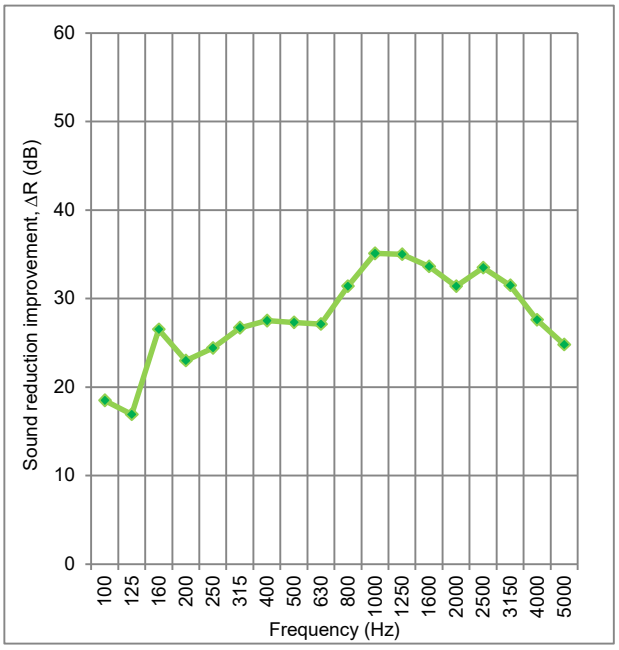
Normalized airborne sound insulation of the basic element with lining, $R_{with\ lining}$ (dB):

Freq. (Hz)	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000
R (dB)	44,9	52,0	53,7	58,5	58,2	60,3	63,2	65,3	67,0	72,8	77,5	79,5	77,9	78,3	80,1	78,6	79,0	79,7

Sound reduction improvement of the basic element with and without lining, ΔR_{direct} (dB):

Freq. (Hz)	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000
ΔR (dB)	18,5	16,9	26,5	23,0	24,4	26,7	27,5	27,3	27,1	31,4	35,1	35,0	33,6	31,4	33,5	31,5	27,6	24,8





$R_{w,\ without\ lining}(C; C_{tr}; C_{100\text{-}5000}; C_{tr,100\text{-}5000}) = 42\ (-1;-4;0;-4)$ dB

$R_{w,\ with\ lining}(C; C_{tr}; C_{100\text{-}5000}; C_{tr,100\text{-}5000}) = 69\ (-2;-7;-1;-7)$ dB

(Results obtained in accordance with ISO 717-1:2013)

Presentation of the airborne sound reduction indexes with the corresponding uncertainty values: $R_{w,\ without\ lining} = 42{,}3 \pm 1{,}3$ dB

$R_{w,\ with\ lining} = 69{,}3 \pm 1{,}8$ dB

$\Delta R_{w,direct} = 27$ dB

$\Delta(R_w+C)_{direct} = 26$ dB

$\Delta(R_w+C_{100\text{-}5000})_{direct} = 26$ dB

$\Delta(R_w+C_{tr})_{direct} = 24$ dB

$\Delta(R_w+C_{tr,100\text{-}5000})_{direct} = 24$ dB

(Results obtained in accordance with ISO 10140-1:2016, Annex G)

(The expanded measurement uncertainties of the airborne sound reduction indexes were obtained according to the standard ISO 12999-1:2014 and are expressed by the standard uncertainty multiplied by the expansion factor k = 2, which, for a normal bilateral distribution, corresponds to a confidence interval of approximately 95 %)

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Report author	Technical responsibility	Administration
José Nascimento Senior Official	Julieta António Technical and Scientific Supervisor	Validated document

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