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TEST REPORT

Laboratory	ACOUSTICS (AC)	O/References	DE-AC-0201 AC-21-009-01 Page 1 / 5
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Requested by	Slots NV Olekenbosstraat, 27 B-8570 Vichte		
Date of the order	05-03-2021	Samples identification	S-2021-28-004
Date of the test	13-07-2021	Date of reception of samples	12-07-2021
Remark(s)	/	Drafting date of the report	14-09-2021
Tests carried out	Measurement of the sound absorption coefficient in a reverberation room		
Name of the product	KANNVAZZ by Slots - roomhigh seamless woven wall coverings		
Reference standards	EN ISO 354:2003 Acoustics - Measurement of sound absorption in a reverberation room EN ISO 11654:1997 Acoustics - Sound absorbers for use in buildings - Rating of sound absorption		
Disclaimer			
The laboratory is not responsible for the accuracy and completeness of the information provided by the customer and taken over in this report. The sampling was not carried out by the laboratory and thus the results of this report apply only to the sample as received by the laboratory. The equivalence between the tested product covered by this report and the commercialised product lies entirely under the responsibility of the requestor.			

This test report contains 5 pages. This test report may only be reproduced in its entirety. Each page has a stamp of the laboratory (in red) and is initialised by the head of laboratory. The results and findings are only valid for the tested samples.

- No test sample
 Test sample(s) submitted to a destructive test
 Test sample(s) to be removed from our laboratories 30 calendar days after sending of the report, unless a written request is received by the demander of the test



Responsible in charge of the test,
 ir. D. Wuyts

Technical responsible of the test,
 F. Corbugy



The head of the laboratory,
 ir. D. Wuyts

MEASUREMENT UNCERTAINTIES and TEST CONFIGURATION

1 MEASUREMENT UNCERTAINTIES

The standard uncertainty under reproducibility conditions can be estimated by the reproducibility standard deviation according to the standard ISO 12999-2:2020, derived from inter-laboratory measurements. The reported expanded uncertainties U on page 3 of this report, both for the frequency dependant measurement values as for the single number values, are calculated for a coverage factor $k = 2$ corresponding to a confidence level of 95% assuming a Gaussian distribution.

$$U = k u$$

with

- u the standard uncertainty determined in accordance to ISO 12999-2:2020
- k the coverage factor, depending on the assumed distribution of the measurement values and the considered confidence level

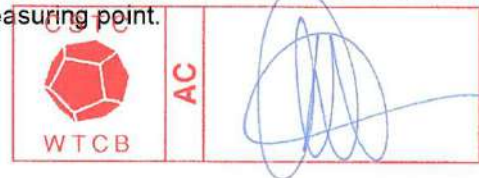
2 TEST CONFIGURATION

Signal

- Interrupted pink noise generated by two modules (non-correlated signals) Norsonic N850-MF1 belonging to the measurement system Norsonic NOR850 v.2.3
- 4 tetrahedron shaped loudspeakers in the upper corners of the room, each with 4 membranes BEYMA 6P200Fe, amplified by 2 amplifiers QSC RMX 2450, generating an omnidirectional radiation pattern
- The emitted broad-band noise between 50 Hz and 5000 Hz generates sound pressure levels that differ less than 6 dB in adjacent one-third octave bands in the test room in a measuring point.

Microphones and recording system

- Bruël & Kjaer - 4943: 2 microphones
- Bruël & Kjaer - 2669L: 2 preamplifiers for microphones
- Bruël & Kjaer - 2829: 2 current supplies for microphone
- Norsonic NOR850 v.2.3: Measurement system
- Number of source pair configurations: 2; distances between the different source positions at least 3 m
- Number of measurement positions per source configuration: 12; Distances between all measurement positions at least 1.5 m, at least distanced 2 m from the sound source and at least 1m from any reflecting surface and of the test
- Total number of measurements: 24



Signal analysis and processing

- Norsonic NOR850 v.2.3: Measurement system
- Possibility to intervene by means of a graphical interface to determine the reverberation time from the decay curves

Reverberation room

- Volume of the reverberation room : 264,3 m³
- $l_{\max} = 12.10 \text{ m} < 1.9V^{1/3} (=12.19 \text{ m})$
- $S_t = \text{total surface (walls, floor, ceiling)} = 267,1 \text{ m}^2$
- Diffusors are present ($\pm 34 \text{ m}^2$)
- $(V/200\text{m}^3)^{2/3} = \text{volume multiplication factor for spaces bigger than } 200 \text{ m}^3 = 001$
- Maximum surface for test elements in function of the volume = 14,45 m²

α_s

SOUND ABSORPTION COEFFICIENT - GELUIDABSORPTIECOEFFICIENT
COEFFICIENT D'ABSORPTION ACOUSTIQUE - SCHALLABSORPTIONKOEFFIZIENT

EN ISO 354:2003 Acoustics - Measurement of sound absorption in a reverberation room
EN ISO 11654:1997 Acoustics - Sound absorbers for use in buildings - Rating of sound absorption

Date / Datum: 13/07/2021

Reverberation room / Nagalmruimte / Salle réverbérante / Hallraum:

Alpha K2 : $V_1 = 264 \text{ m}^3$

$S_t = 267.1 \text{ m}^2$

Empty space / Lege ruimte / salle vide / Leere Hallraum:

$h_{r1} \% \text{H}_2\text{O} = 68 \%$

$T_1 = 22 \text{ °C}$

$p_{a1} = 100 \text{ kPa}$

With testelement / Met testelement / Avec l'élément d'essai / Mit Testelementes:

$h_{r2} \% \text{H}_2\text{O} = 70 \%$

$T_2 = 22 \text{ °C}$

$p_{a2} = 100 \text{ kPa}$

N° test sample / N° testelement / N° de l'élément d'essai / Nr. Testelementes:

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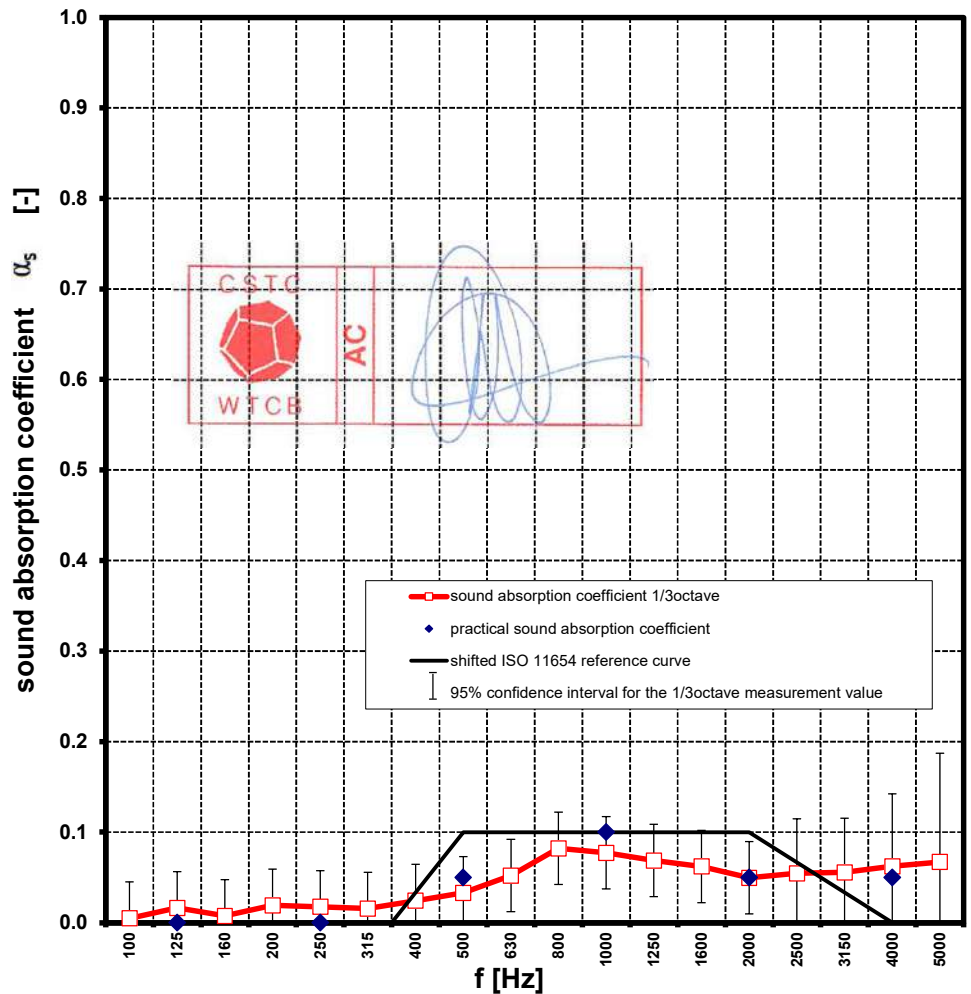
Area of test element / Opp. testelement / Surf. de l'élément d'essai / Fläche des Testelementes:

$S = 11.25 \text{ m}^2$

f [Hz]	T_1 [s]	T_2 [s]	α_s	$\pm U$ (k=2)
50	7.09	6.67	0.03	
63	6.55	6.51	0.00	± 0.04
80	7.25	7.42	-0.01	± 0.02
100	5.59	5.55	0.00	± 0.04
125	5.54	5.41	0.02	± 0.04
160	6.04	5.97	0.01	± 0.04
200	6.07	5.89	0.02	± 0.04
250	6.18	6.01	0.02	± 0.04
315	6.53	6.36	0.02	± 0.04
400	6.76	6.48	0.02	± 0.04
500	6.62	6.26	0.03	± 0.04
630	6.59	6.04	0.05	± 0.04
800	6.55	5.73	0.08	± 0.04
1000	6.47	5.71	0.08	± 0.04
1250	6.19	5.56	0.07	± 0.04
1600	5.70	5.21	0.06	± 0.04
2000	5.11	4.79	0.05	± 0.04
2500	4.50	4.23	0.05	± 0.06
3150	3.97	3.76	0.06	± 0.06
4000	3.42	3.25	0.06	± 0.08
5000	2.83	2.71	0.07	± 0.12

f [Hz]	α_p	$\pm U$ (k=2)
125	0.00	
250	0.00	± 0.04
500	0.05	± 0.08
1000	0.10	± 0.08
2000	0.05	± 0.08
4000	0.05	± 0.10

$\alpha_w = 0.10$ () ± 0.07 (k=2)
ISO 11654 Sound absorption class: /



REQUESTED BY / AANVRAGER / DEMANDEUR / ANTRAGSTELLER:

Slots NV, Olekenbosstraat, 27, B-8570 Vichte

TEST ELEMENT / PROEFELEMENT / ELEMENT D'ESSAI / PRÜFMUSTER:

(Short description by the manufacturer, details: see page 5 *** Beknopte beschrijving door het bedrijf, details: zie pag. 5 *** Description sommaire par l'entreprise, détails: voir page 5 *** Kurze Beschreibung durch den Hersteller, Details auf Seite 5

NL: Geen nederlandse beschrijving beschikbaar

FR: Pas de description en Français disponible

GB: KANVAZZ is a textile jacquard woven, room high wall decoration. The backing has a solid foam. The total thickness of this product is +/-1mm.

D: Keine Deutsche Beschreibung verfügbar

ANNEX 1: MEASUREMENT METHOD AND SINGLE VALUE RATINGS

1. MEASUREMENT METHOD

The determination of the sound absorption coefficient follows the standard EN ISO 354 "Acoustics – Measurement of sound absorption in a reverberation room (ISO 354)". A detailed description of the measurement procedure can be found in this standard.

The measurement principle is as follows: The sound absorption coefficient of a test specimen can be derived from measurements of the reverberation time in a reverberation room. The reverberation time for a specified frequency band is defined as the time needed to decay 60 dB after switching off a sound source. First the reverberation time of the empty room is measured. This leads to a reverberation time spectrum T1. Then the test sample is fitted into the reverberation room over a sufficient area, in such a way that the mounting and detailing corresponds to a real practice. The reverberation times for this new situation lead to a second spectrum T2. According to the standard, the "Sabine" sound absorption coefficients for each frequency band can be obtained using the following formula:

$$\alpha_s = \frac{A_T}{S}$$

A_1, A_2 = equivalent sound absorption area of the empty and the fitted room respectively [m²]

V_1, V_2 = the volume of the empty and the fitted reverberation room respectively [m³]

$$A_T = A_2 - A_1$$

$$= 55.3V \left(\frac{1}{c_2 T_2} - \frac{1}{c_1 T_1} \right) - 4(V_2 m_2 - V_1 m_1)$$

c_1, c_2 = the speed of sound in the empty and the fitted room respectively [m/s]

T_1, T_2 = the reverberation time in the empty and the fitted room respectively [s]

m_1, m_2 = the power attenuation coefficient, in reciprocal metres, calculated according to ISO 9613-1 [1/m]

A_T = the equivalent sound absorption area of the test specimen [m²]

S = the area of the test specimen [m²]

α_s = the sound absorption coefficient of the specimen [-]

$$V_2 = V_1$$

2. α_p PRACTICAL SOUND ABSORPTION COEFFICIENT

This is the sound absorption coefficient per octave band, deduced from third-octave band measurements according to the procedure in EN ISO 11654. It is calculated by taking the arithmetic average of the sound absorption coefficients of the three third-octave bands within the octave band. This average needs to be rounded to the nearest multiple of 0.05 and is limited to 1.

3. α_w SINGLE RATING

The single number rating (indicated by the subscript "w") procedure is explained in ISO 11654 "Acoustics - Sound absorbers for use in buildings - Rating of sound absorption". The calculation is based on the practical sound absorption coefficients, and is too complex to describe in a few lines here. We refer to the cited standard. More information can also be found on the following website: <http://www.normen.be>

4. FORM INDICATORS L, M, H

Each time a practical sound absorption coefficient exceeds the shifted reference curve by 0.25 or more, one or more form indicators (L, M, H) need to be added to the weighted sound absorption coefficient.

- if the excess happens in the 250 Hz band, the indicator "L" is added
- if the excess happens in the 500 Hz or 1000 Hz band, the indicator "M" is added
- if the excess happens in the 2000 Hz or 4000 Hz band, the indicator "H" is added

The form indicators indicate that, in one or more octave bands, the practical sound absorption coefficient is considerably higher than the value of the shifted reference curve. The interested parties are invited to study the absorption curve in detail.



ANNEX 2: DESCRIPTION OF THE TEST ARRANGEMENT

This description is given by the producer of the test element and is not guaranteed by the laboratory. The equivalence between the tested product in this report and the commercialised product is the sole responsibility of the producer.



The product is glued on gypsum boards laid directly on the floor surface, according to mounting type B (EN ISO 354:2003 - Annex B). The perimeter of the gypsum boards is tightly butted and sealed to the floor by means of an acoustically reflective tape.

