

All tests in this report are executed according to the ISO 9001 certified Quality management system of the BBRI

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TEST REPORT

Laboratory	ACOUSTICS (AC)	O/References	DE-AC-0212 AC-21-020-01 Page 1 / 8
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Requested by	Scan Underlay ApS Ursusvej 16 8464 Galten DENMARK		
Date of the order	04-05-2021	Samples identification	S-2021-39-013
Date of the test	27-10-2021	Receipt of the test element	27-09-2021
Remark(s)	/	Drafting date of the report	16-11-2021
Test carried out	Laboratory measurement of impact sound insulation of floors and improvement of impact sound insulation of floor coverings in laboratory		
Product tested Manufacturer	Acoustic Silence 1050, 3mm Scan Underlay ApS		
References	NBN EN ISO 10140 Acoustics – Measurement of sound insulation in buildings and of building elements - Part 1 (2021): Application rules for specific products (ISO 10140-1:2021) - Part 3 (2021): Measurement of impact sound insulation (ISO 10140-3:2021) - Part 5 (2021): Requirements for test facilities and equipment (ISO 10140-5:2021) NBN EN ISO 717-2:2021 Acoustics - Rating of sound insulation in buildings and of building elements - Part 2: Impact sound insulation (ISO 717-2:2020)		

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 report contains 8 pages. It may only be reproduced in its entirety.

Each page of the original report has been stamped (in red) by the laboratory and initialised by the head of laboratory.

The results and findings are only valid for the tested samples.

- No sample
 Sample(s) submitted to a destructive 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



Technical responsible of the test,
F. Corbugy

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



Head of laboratory,
ir. D. Wuyts

Technical Assistant: -



NORMALIZED IMPACT SOUND PRESSURE LEVEL

NIVEAU DU BRUIT DE CHOC NORMALISÉ / GENORMALISEERD CONTACTGELUIDNIVEAU

EN ISO 10140-3:2021 Acoustics – Measurement of sound insulation in buildings and of building elements – Part 3: Measurement of impact sound insulation

EN ISO 717-2:2020 Acoustics – Rating of sound insulation in buildings and of building elements – Part 2: Impact sound insulation

Mounting / Montage : 27/09/2021

Curing time / Droogtijd / Temps de séchage / Trockenzeit : 30 days

Date of Test / Testdatum / Date d'essais / Prüfdatum:

27/10/2021

Source room / Zendruimte / Salle d'émission / Senderaum:

K % H₂O = 53.1 % T = 20.7 °C

Receiving room / Ontvangstruimte / Salle de réception / Empfangsraum:

A V = 75.4 m³ % H₂O = 59.8 % T = 19 °C

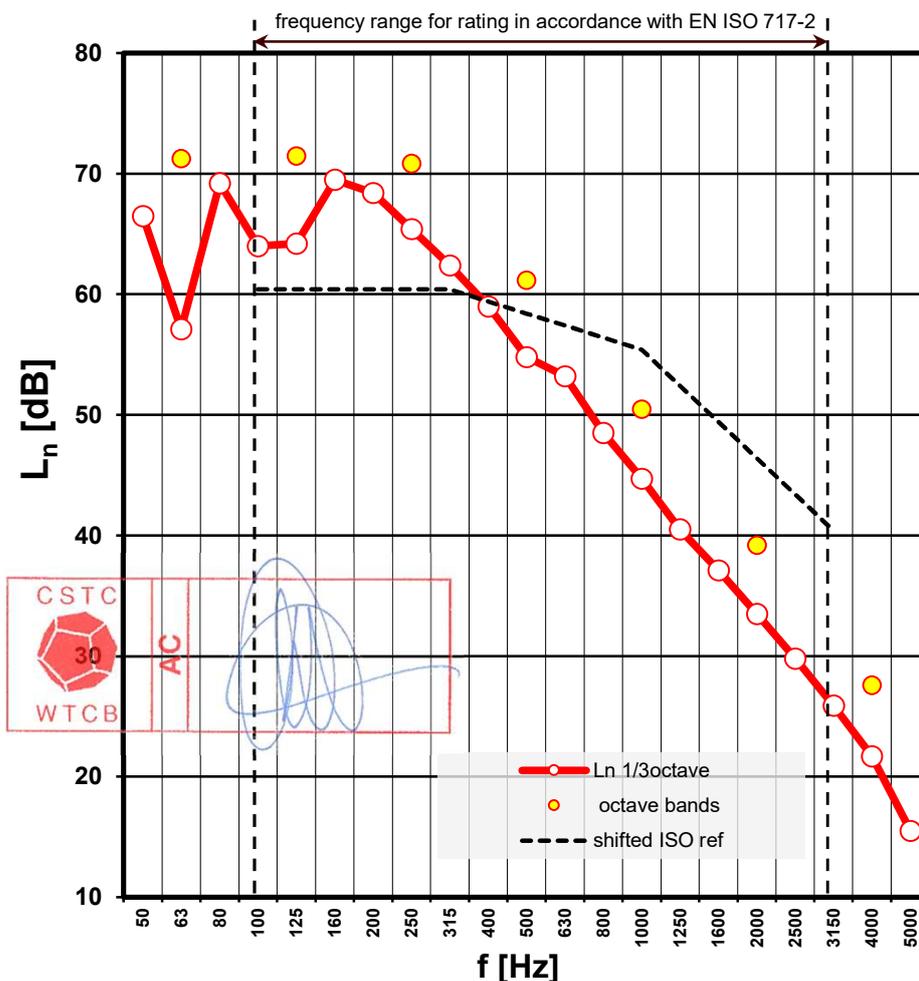
Test sample / Testelemt / Elément de l'essai / Testelemt:

S_{testelement} = 10.7 m²

Supporting floor / Draagvloer / Plancher support / Lagerboden:

S_{load-bearing floor} = 11.5 m²

f (Hz)	L _n (dB)	L _{n,min} (dB)
1/3 octaves		
50	66.5	
63	57.1	
80	69.2	
100	64.0	
125	64.2	
160	69.5	
200	68.4	
250	65.4	
315	62.4	
400	59.0	
500	54.8	
630	53.2	
800	48.5	
1000	44.7	
⁽²⁾ 1250	40.5	25.7
⁽²⁾ 1600	37.1	22.6
⁽²⁾ 2000	33.5	19.7
⁽²⁾ 2500	29.8	20.4
⁽²⁾ 3150	25.9	13.5
⁽²⁾ 4000	21.7	12.0
⁽²⁾ 5000	15.5	10.8



L _{n,w} = 59 dB	C _l = 0 dB	C _{l,50-2500} = 2 dB	cat = II a
L _{n,r,w} = 57 dB	C _{l,r} = 1 dB		
ΔL _w = 21 dB	C _{l,Δ} = -12 dB		ΔL _{lin} = 9 dB

Rating based on laboratory measurement results obtained by an engineering method

⁽²⁾ Frequency band with minimum R-value due to flanking transmission in the laboratory

Description by the producer - Beschrijving door de fabrikant - Description par le fabricant

Acoustic Silence 1050, 3mm is a textile-rubber mat for under screed insulation. It comes in rolls that are 1m wide and 10m long and 3mm thick. It has a density of 350 kg/m³ and is covered on both sides with a textile layer. Acoustic silence 1050, 3mm is made of 90% recycled rubber and has a LCA/Environment Product declaration.

Characteristics of the basic test floor - Beschrijving van basistestvloer - Description du plancher d'essai de base

Reinforced concrete slab of uniform thickness 140 mm over a surface of 260 cm x 442 cm, with 160 mm high elevated borders that simulate the surrounding walls of an actual floor slab.



REDUCTION OF IMPACT SOUND PRESSURE LEVEL
REDUCTION DU NIVEAU DU BRUIT DE CHOC / CONTACTGELUIDNIVEAUREDUCTIE

EN ISO 10140-3:2021 Acoustics – Measurement of sound insulation in buildings and of building elements – Part 3: Measurement of impact sound insulation

EN ISO 717-2:2020 Acoustics – Rating of sound insulation in buildings and of building elements – Part 2: Impact sound insulation

Mounting / Montage : 27/09/2021

Curing time / Droogtijd / Temps de séchage / Trockenzeit : 30 days

Date of Test / Testdatum / Date d'essais / Prüfdatum:

27/10/2021

Source room / Zendruimte / Salle d'émission / Senderaum:

K % H2O = 53.1 % T = 20.7 °C

Receiving room / Ontvangstruimte / Salle de réception / Empfangsraum:

A V = 75.4 m³ % H2O = 59.8 % T = 19 °C

Test sample / Testelemt / Élément de l'essai / Testelemt:

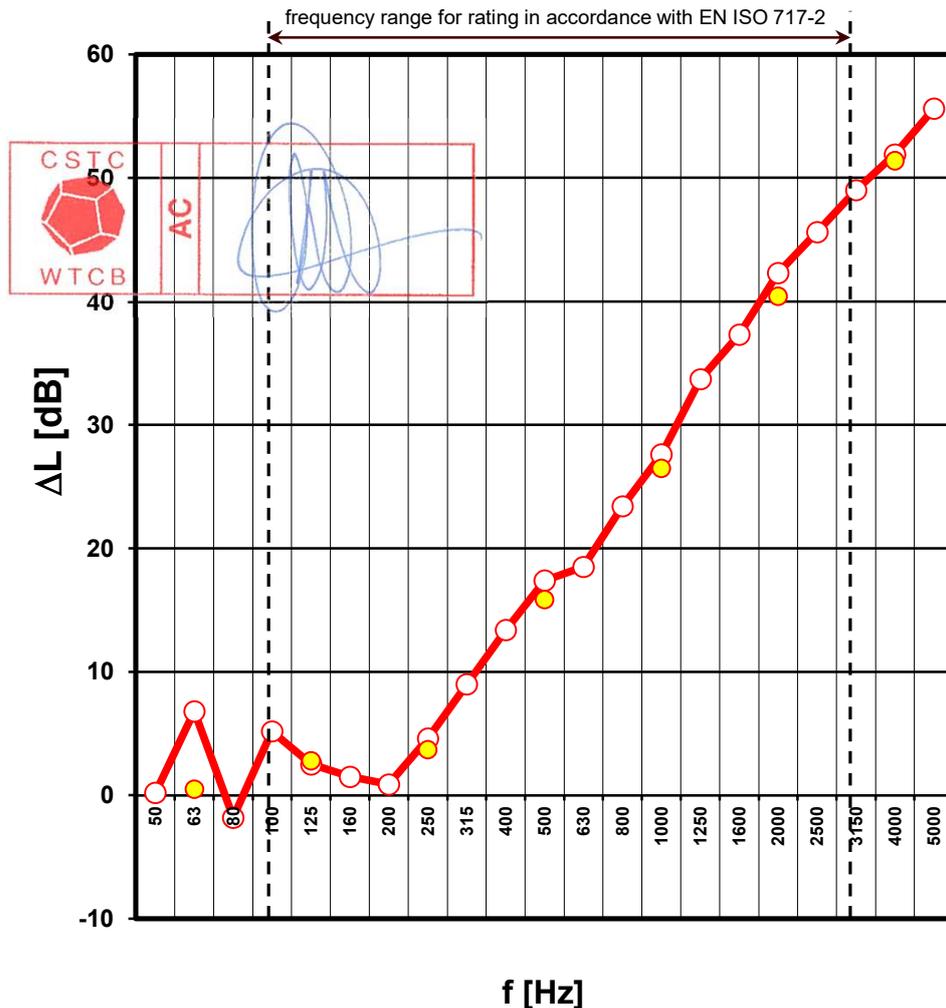
S_{testelement} = 10.7 m²

Load-bearing floor / Draagvloer / Plancher support / Lagerboden:

S_{load-bearing floor} = 11.5 m²

f (Hz)	ΔL (dB)
1/3 octaves	
50	0.2
63	6.8
80	-1.8
100	5.2
125	2.5
160	1.5
200	0.9
250	4.6
315	9.0
400	13.4
500	17.4
630	18.5
800	23.4
1000	27.6
1250	33.7
1600	37.3
2000	42.3
2500	45.6
3150	49.0
4000	51.9
5000	55.6

octaves	○
63	0.5
125	2.8
250	3.7
500	15.8
1000	26.5
2000	40.4
4000	51.4



$L_{n,w} = 59$ dB	$C_i = 0$ dB	$C_{1,50-2500} = 2$ dB	cat = II a
$L_{n,r,w} = 57$ dB	$C_{i,r} = 1$ dB		
$\Delta L_w = 21$ dB	$C_{i,\Delta} = -12$ dB		$\Delta L_{lin} = 9$ dB

Rating based on laboratory measurement results obtained by an engineering method

Description by the producer - Beschrijving door de fabrikant - Description par le fabricant

Acoustic Silence 1050, 3mm is a textile-rubber mat for under screed insulation. It comes in rolls that are 1m wide and 10m long and 3mm thick. It has a density of 350 kg/m³ and is covered on both sides with a textile layer. Acoustic silence 1050, 3mm is made of 90% recycled rubber and has a LCA/Environment Product declaration.

Characteristics of the basic test floor - Beschrijving van basistestvloer - Description du plancher d'essai de base

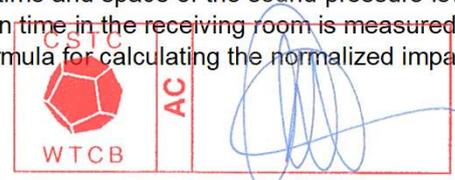
Reinforced concrete slab of uniform thickness 140 mm over a surface of 260 cm x 442 cm, with 160 mm high elevated borders that simulate the surrounding walls of an actual floor slab.

1. Measurement and calculation methods

A detailed description of the mounting and measuring procedures can be respectively found in EN 10140-1, -5 and -3 (see page 1). In simple terms, the determination principle can be summarized as follows : The impact sound is generated by the standardized tapping machine (with steel-headed hammers) which is set successively at various positions on the test floor. For each position, sound pressure measurements are carried out with the help of 2 continuously rotating microphones in the measuring cell located beneath the floor. Measurements are done during at least one complete rotation and different planes of rotation. One thus obtains an integration over time and space of the sound pressure level spectrum, which results in an average sound pressure level. The reverberation time in the receiving room is measured, which permits one to calculate the correction term to be integrated into the formula for calculating the normalized impact sound pressure level:

$$L_n = L_{pm} + 10 \lg (A / A_0)$$

- with: L_{pm} = the average sound pressure level in the receiving room, in dB (reference 20 Micro Pa);
 A_0 = the reference equivalent absorption area 10 m²;
 A = the equivalent absorption area of the receiving room in m².



Successively, the following normalised impact sound pressure level spectra are obtained for:

- $L_{n,0}$ ⇒ (a) measured 1/3d octave band values for the bare load-bearing floor described in EN ISO 10140-5:2021
- L_n ⇒ (b) measured 1/3d octave band values for the total test floor (load-bearing floor + eventually a topping and/or a suspended ceiling)
- ΔL ⇒ (a)-(b) calculated reduction of impact sound pressure level due to the topping and/or suspended ceiling
- $L_{n,r,0}$ ⇒ (c) given 1/3d octave band values for a fictitious reference load bearing floor (EN ISO 717-2:2020)
- $L_{n,r}$ ⇒ (c)-(a)+(b) calculation of the normalized impact sound pressure level of a reference lightweight floor with the floating floor (covering) and/or suspended ceiling

The single-number values (given by the index "w") and spectrum adaptation terms are described in the standard EN ISO 717-2:2020 (see page 1). Calculation modules and more information about the single-number value (and about acoustical standardisation in general) can be found on the website of the Acoustics laboratory, i.e.:
http://www.bbri.be/antenne_norm/

	(a)	(b)	(a)-(b)	(c)	(c)-(a)+(b)
f (Hz)	$L_{n,0}$ (dB)	L_n (dB)	ΔL (dB)	$L_{n,r,0}$ (dB)	$L_{n,r}$ (dB)
50	66.7	66.5	0.2	/	/
63	63.9	57.1	6.8	/	/
80	67.4	69.2	-1.8	/	/
100	69.2	64.0	5.2	67.0	61.8
125	66.7	64.2	2.5	67.5	65.0
160	71.0	69.5	1.5	68.0	66.5
200	69.3	68.4	0.9	68.5	67.6
250	70.0	65.4	4.6	69.0	64.4
315	71.4	62.4	9.0	69.5	60.5
400	72.4	59.0	13.4	70.0	56.6
500	72.2	54.8	17.4	70.5	53.1
630	71.7	53.2	18.5	71.0	52.5
800	71.9	48.5	23.4	71.5	48.1
1000	72.3	44.7	27.6	72.0	44.4
1250	74.2	40.5	33.7	72.0	38.3
1600	74.4	37.1	37.3	72.0	34.7
2000	75.8	33.5	42.3	72.0	29.7
2500	75.4	29.8	45.6	72.0	26.4
3150	74.9	25.9	49.0	72.0	23.0
4000	73.6	21.7	51.9	/	/
5000	71.1	15.5	55.6	/	/

<p>Basic test floor: [based on spectrum (a)] $L_{n,0,w} = 81$ dB $C_{1,0} = -12$ dB</p> <p>Basic floor + linings: [based on spectrum (b)] $L_{n,w} = 59$ dB $C_1 = 0$ dB</p> <p>Reference load-bearing floor: (c) given 1/3d octave band values for a fictitious reference load bearing floor (EN ISO 717-2:2020) $L_{n,r,0,w} = 78$ dB $C_{1,r,0} = -11$ dB</p> <p>Reference floor + linings: [calculated (c)-(a)+(b)] $L_{n,r,w} = 57$ dB $C_{1,r} = 1$ dB</p> <p>Reduction of impact sound pressure level $\Delta L_w = L_{n,r,0,w} - L_{n,r,w} = 21$ dB $C_{1\Delta} = C_{1,r,0} - C_{1,r} = -12$ dB $\Delta L_{lin} = \Delta L_w + C_{1\Delta} = 9$ dB</p>
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↑ **TABLE 1: calculation of the single ratings as to EN ISO 717-2:2013**
 ⇐ **TABLE 2: 1/3 octave band measured and calculated spectral values**

2. Test equipment

TEST EQUIPMENT	BRANDMARK
2 microphones 1/2"	Brüel & Kjær type 4943
2 pre-amplifiers for microphone	Brüel & Kjær type 2669-L
One power supply for microphones	Brüel & Kjær type 2829
One rotating microphone set-up	Norsonic Nor265
Acquisition system	Norsonic Nor850 Distributed Multichannel System
Measurement software	Norsonic Nor850 Building Acoustic Software
One calibration source pistonphone	Brüel & Kjær type 4228
One standardized tapping machine	Norsonic NOR278

3. Measurement uncertainty

The values of standard deviation of reproducibility (Situation A) in Table 5 and Table 7 of the ISO 12999-1:2020 can be applied as an estimation of the standard uncertainty of the single number ratings. The reported expanded uncertainty is calculated for a coverage factor $k = 1.96$ (two-sided) corresponding to a confidence level of 95% assuming a Gaussian distribution.

$$L_{n,w} = 58.4 \text{ dB} \pm 2.9 \text{ dB} \quad (k=1.96, \text{ two-sided})$$

$$L_{n,w} + C_1 = 59.4 \text{ dB} \pm 2.9 \text{ dB} \quad (k=1.96, \text{ two-sided})$$

$$\Delta L_w = 20.6 \text{ dB} \pm 2.2 \text{ dB} \quad (k=1.96, \text{ two-sided})$$

The values in Table 6 (ISO 12999-1) can be applied as an estimation for the standard uncertainty of the reduction of impact sound pressure level ΔL , in one-third octave bands (page 3).

4. Description of the test element

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.

GENERAL DESCRIPTION

Acoustic Silence 1050, 3mm is a textile-rubber mat for under screed insulation. It comes in rolls that are 1m wide and 10m long and 3mm thick. It has a density of 350 kg/m³ and is covered on both sides with a textile layer. Acoustic silence 1050, 3mm is made of 90% recycled rubber and has a LCA/Environment Product declaration.

COMPOSITION OF THE TESTELEMENT

Only parts of the table below can be made unreadable in copies of this report, e.g. if some data are confidential.

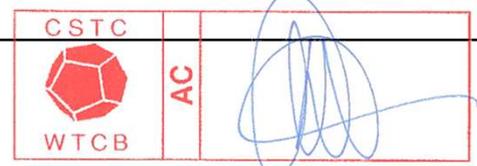
layer	thickness [mm]	density [kg/m ³]	surface mass [kg/m ²]	description
↑ +5 +4 +3 +2 +1				
	70 mm	1600 kg/m ³	112 kg/m ²	Cement screed
	0.1 mm			PE-foil
	3 mm	350 kg/m ³	1.05 kg/m ²	Acoustic Silence 1050
	BASIC FLOOR	140 mm	-	-
↓ -1 -2 -3				

Total thickness of the layers on top of the basic floor = 73 mm (calculated value)

Total surface mass on top of the basic floor = 113 kg/m² (calculated value)

REMARKS

Test sample mounted by the client.



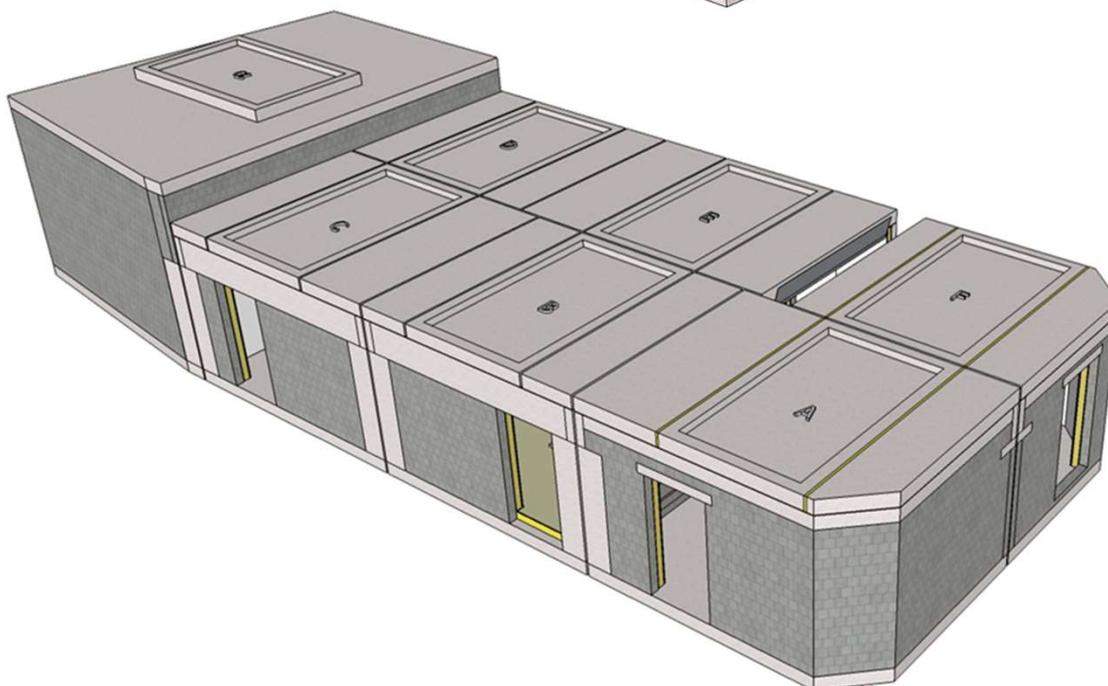
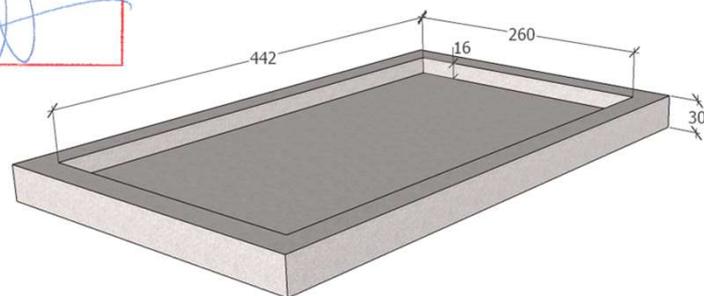
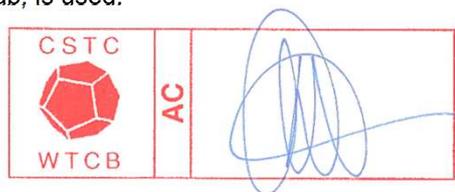
5. Description of the test set-up

The acoustic laboratory disposes of 6 transmission rooms : A, B, C, D, E and F. Each one is provided with a 30 cm thick concrete floor slab, placed on resilient pads placed on the foundation beams. The transmission rooms are separated from each other as well as from the environment by means of a 5 cm large cavity filled with mineral wool.

The ceiling slab of each transmission room consists of three parts being supported from the exterior wall to the central axis : two 30 cm thick external concrete slabs and one central 14 cm thick concrete "tub" (250 cm x 442 cm) with a 25 cm large and 30 cm or 35 cm thick edge. All ceiling slabs can be removed with the roller bridge. They are attached to each other as well to the walls of the underlying rooms by a mortar joint. To avoid flanking transmission, an elastical interlayer is put between the ceiling slabs and the beams above the vertical test openings in rooms B and D. The 30 cm thick ceiling parts are lined with a heavy, removeable false ceiling construction to avoid flanking transmission of impact sound.

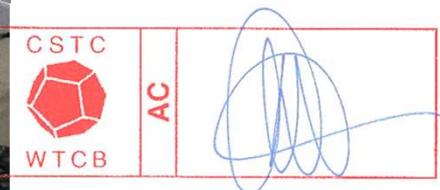
The laboratory construction meets the requirements for impact sound insulation measurements as mentioned in the standard EN ISO 10140-3.

As basic test floor one of the reinforced concrete slabs (A, B, C, D, E or F) of uniform thickness 140 mm over a surface of 260 cm x 442 cm, with 160 mm or 210 mm high elevated borders simulating the surrounding walls of an actual floor slab, is used.



6. Mounting of the test element

The test element is mounted according to the NBN EN ISO 10140-3, in a similar manner to the actual construction. (See also "4. Description of the test element"). The mounting details are illustrated below.



6. Mounting of the test element (2)

