
Impact Sound Insulation

1 Transaction

Product designation IVC Group/Mohawk Group Academic view 959

IVC sample number

Testing period 13/03/2018

2 Test Method / Requirements

EN ISO 10140-1:2014	Acoustics - Laboratory measurement of sound insulation of building elements - Part 1: Application rules for certain products
EN ISO 10140-2:2010	Acoustics - Laboratory measurement of sound insulation of building elements - Part 2: Measurement of airborne sound insulation
EN ISO 10140-3:2015	Acoustics - Laboratory measurement of sound insulation of building elements - Part 3: Measurement of impact sound reduction
EN ISO 10140-4:2010	Acoustics - Laboratory measurement of sound insulation of building elements - Part 4: Measurement procedures and requirements
EN ISO 10140-5:2014	Acoustics - Laboratory measurement of sound insulation of building elements - Part 5: Requirements for test facilities and equipment
EN ISO 717-1:2013	Acoustics - Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation
EN ISO 717-2:2013	Acoustics - Rating of sound insulation in buildings and of building elements - Part 2: Impact sound reduction

3 Remarks

None

4 Measuring Operation

Measurement of the impact sound pressure level:	Using with 3 tapping machine position. The single results of the one-third-octave-bands were averaged on an energy basis.
Test surface:	~1 m ²
Category:	I
Connection with the floor:	Loose laid
Damage to the sample:	None

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5 Laboratories

Test rooms:	Laboratories of IVC, Nijverheidslaan 29, 8580 Avelgem, Belgium
Sending room:	$V = 69,7 \text{ m}^3$ (with diffusers)
Receiving room:	$V = 50,4 \text{ m}^3$ (with diffusers)
	$4.30 \text{ m} \times 4.50 \text{ m}; S = 19.35 \text{ m}^2$
Reference floor:	14 cm concrete slab floor with an area-related mass of $m' \sim 322 \text{ kg/m}^2$
Flanking walls:	10 cm concrete blocks with 1 cm plaster with an area-related mass of $m' \sim 216 \text{ kg/m}^2$
Weighted normalized impact sound pressure level	$L_{n,0,w} = 78 \text{ dB}; C_{l,0} = -13 \text{ dB}$
Weighted normalized impact sound pressure level	$L_{n,w} = 49 \text{ dB}; C_1 = 1 \text{ dB}$
Weighted normalized impact sound pressure level	$L_{n,r,w} = 53 \text{ dB}; C_{l,r} = 1 \text{ dB}$

6 Measuring Devices

Real time analysers:	SINUS Messtechnik, TYP: Apollo PCIe, SN: 10061, 10062, 10063
Microphones:	Microtech Gefell, TYP: M 370, SN: 0981, 0979, 0980, 0982, 0971, 0973, 0977, 0974, 0978, 1105
Calibrator:	Larson Davis, TYP: CAL200, SN: 11893
Tapping machines:	SINUS Messtechnik, TYP: TM50, SN: TM14036, TM14172 (standard tapping machine with 3 feet and 5 hammers according to ISO 10140)

7 Evaluation

The impact sound pressure level generated by the standard tapping machine is measured in the receiving room under a bare heavy floor with and without a floor covering. The impact sound reduction is determined on the basis of the measured values as follows:

$$\Delta L = L_{n,0} - L_n \text{ (dB)}$$

$L_{n,0}$: Impact sound pressure level without a floor covering (dB)

L_n : Impact sound pressure level with a floor covering (dB)

For the evaluation of the weighted reduction in impact sound pressure level ΔL_w , the relevant reference curve is shifted in increments of 1 dB towards the measured curve until the sum of unfavourable deviations is as large as possible, but not more than 32 dB.

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The linear impact sound level ΔL_{lin} is determined according to the following equation:

$$\Delta L_{lin} = L_{n,r,0,w} + C_{l,r,0} - (L_{n,r,w} + C_{l,r}) = \Delta L_w + C_{l,\Delta}$$

$L_{n,r,w}$ is the calculated weighted normalized impact sound pressure level of the reference floor with the floor covering under test

$L_{n,r,0,w}$ 78 dB, calculated from $L_{n,r,0}$ according to Section 4.3.1 of DIN EN ISO 717-2: 2013

$C_{l,r}$ Spectrum adaptation term for the reference floor with the floor covering to be tested

$C_{l,r,0}$ -11 dB, spectrum adaptation term for the reference floor with $L_{n,r,0}$ determined according to Annex A, Section A.2.1 of DIN EN ISO 717-2:2013

8 Note

The results are based on measurements performed under laboratory conditions with artificial excitation (standard procedure). The test results are applicable in due consideration of the national provisions and the local circumstances and/or constructions.

Impact sound insulation according ISO 10140-1

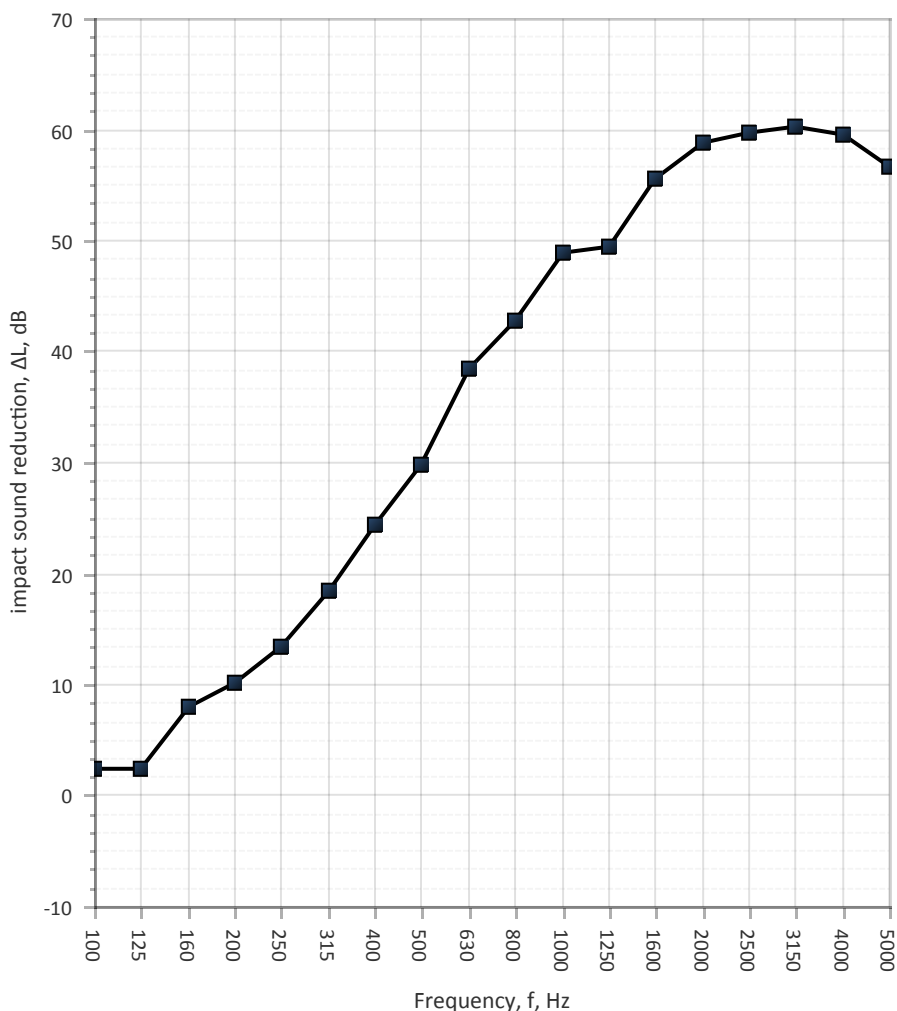
Laboratory measurements of the reduction of transmitted impact noise by floor coverings on a heavyweight reference floor

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Installed by EVA International

Receiving room		Source room	
Volume	50,4 m ³	Volume	69,7 m ³
Air temperature	21,5 °C	Air temperature	39,0 °C
Relative air humidity	36,0 %	Relative air humidity	36,0 %
Static pressure	1006,8 hPa	Type of reference floor	Massive

Frequency f [Hz]	Ln,0 1/3 oct. [dB]	ΔL 1/3 oct. [dB]
100	59,9	2,4
125	62,8	2,5
160	66,9	8,0
200	63,8	10,2
250	66,4	13,4
315	67,2	18,4
400	67,6	24,5
500	68,2	29,9
630	67,7	38,4
800	68,6	42,8
1000	69,7	48,9 ¹
1250	70,2	49,5 ¹
1600	71,3	55,6 ¹
2000	72,1	58,9 ¹
2500	72,3	59,7 ¹
3150	73,0	60,3 ¹
4000	72,5	59,6 ¹
5000	70,3	56,6 ¹

¹ correction basic noise



Rating according to ISO 717-2

$\Delta L_w = 25 \text{ dB}$

$C_{l,\Delta} = -12 \text{ dB}$

$C_{l,r} = 1 \text{ dB}$

The results are based on a test performed with an artificial source under laboratory conditions (engineering method) with the specified reference floor.