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Industrieweg 114H
B-9032 Wondelgem
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BTW nr.: BE 0887 763 992

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NOISE LAB
REPORT Number ASTM-2018_ES_211-I099_43432_E

Customer : **Kinetics Middle East, LLC**
P.O. Box: 37670
Dubai
United Arab Emirates

Contacts : Client : Karim Abouseda
Noise lab : Volker Spessart

Tests : **Laboratory Measurement of the Effectiveness of Floor Coverings in Reducing Impact Sound Transmission Through Concrete Floors.**
Product name : **KINLAYMENT 3mm**

Normative references:

ASTM E2179 - 03 (2009)	Standard Test Method for Laboratory Measurement of the Effectiveness of Floor Coverings in Reducing Impact Sound Transmission Through Concrete Floors
Referenced documents:	
E492− 09	Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine
E989− 06 (2012)	Standard Classification for Determination of Impact Insulation Class (IIC)
NBN EN ISO 10140-1:2010	Acoustics - Laboratory measurement of sound insulation of building elements - Part 1: Application rules for specific products
NBN EN ISO 10140-3:2010	Acoustics - Laboratory measurement of sound insulation of building elements - Part 3: Measurements of impact sound insulation
NBN EN ISO 10140-4:2010	Acoustics - Laboratory measurement of sound insulation of building elements - Part 4: Measurement procedures and requirements
NBN EN ISO 10140-5:2010	Acoustics - Laboratory measurement of sound insulation of building elements - Part 5: Requirements for test facilities and equipment

Date and reference of the request:	8-Nov-2018	2018_ES_211
Date of receipt of the specimen (s):	27-Nov-2018	SONI099
Date of tests:	28-Nov-2018	
Date of preparation of the report:	30-Nov-2018	

This test report together with its annexes contains : 8 pages and must be multiplied only in its entirety.

Technical Manager,

Volker Spessart

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MEASURING EQUIPMENT

Source signal
Brüel & Kjaer - 4292 : Omni Power Sound Source
Brüel & Kjaer - 2716 : Power amplifier
Norsonic Nor277 : Tapping machine conform ISO 10140-5 Annex E

Microphone and data acquisition system:
Brüel & Kjaer - 4189 : 1/2" free field microphone, 6Hz to 20kHz, prepolarized
Brüel & Kjaer - ZC-0032 : 1/2" microphone preamplifier
Brüel & Kjaer - 4231 : Sound calibrator 94&114dB SPL-1000Hz, Fulfils IEC 60942(2003)Class1
Brüel & Kjaer - JP 1041 : dual 10-pole adaptor JP-1041
Brüel & Kjaer - 2270 : Sound level meter - dual channel instrument (measuring both channels simultaneously)
Conforms with IEC 61672-1 (2002-05) Class 1
Brüel & Kjaer - 3923 : rotating microphone boom

One rotating microphone system in the receiving room

Number of tapping machine positions:	4	
Minimum 0,7m between the different source positions		
Distances to the board of the floor at least 0.5 m		
Random positions and orientation of the tapping machine.		
Number of microphone positions for each tapping machine position:	2	
Microphone position with a rotating microphone		
Number of rotations:	3	
Rotation speed:	16	s/tr
Minimum rotation time:	30	s
Just not a rotation angle <10 ° to the chamber surfaces		

Data processing
Brüel & Kjaer - BZ-5503 : utility software for hand-held analyzers
Brüel & Kjaer - BZ-7229 : dual-channel building acoustics software
Brüel & Kjaer - 7830 : Qualifier Software for reporting results
A computer with proprietary software

Averaging Time per measurement:	48	s
Number of reverberation time measurements (with graphic control):	27	

Test chambers

Volume receiving room:	51.4	m^3	=	1814.9 ft^3
Reference floor area:	12.00	m^2	=	129.1 ft^2
Surface test floor :	12.00	m^2	=	129.1 ft^2

There is absorption material applied in the receiving room.

Standard floor
The standard concrete base floor used is a 140 mm thick solid reinforced concrete slab.
According to ISO 10140-5 Annex C this is the "heavyweight standard floor".

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STANDARD METHOD

Single rating numbers

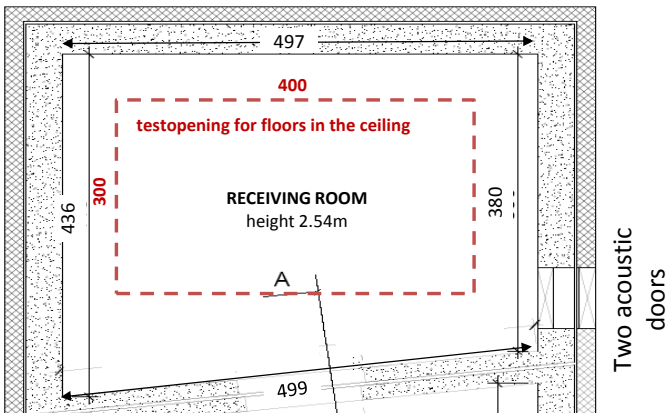
Evaluation according to ASTM E2179-03 (2009) and E989-06 (2012) defines single-number ratings, IIC_c for the impact insulation class of floors and ΔIIC for the improvement in impact insulation class of floor coverings and floating floors from the results of measurements carried out in accordance with ASTM E492-09 and E2179-03 (2009).
The values obtained in accordance with ASTM E492-09 are compared with reference values at the frequencies of measurement within the range 100 to 3150 Hz for measurements in one-third octave bands.

SPECIAL MEASUREMENT CONDITIONS

Receiving room volume < 125 m³

Sound insulation test facilities

The test rooms meet the requirements of ISO 10140-5
Both rooms are isolated for vibrations by using a so called room-in-room construction.



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NORMALIZED IMPACT SOUND PRESSURE LEVEL

Test: ASTM E 492 - 09 / ASTM E 989 - 06

Client: **Kinetics Middle East, LLC** — Date of test: 28-Nov-18

Description of the test setup:

45 mm	= (1.77 inch)	prefab anhydrite screed slab
3 mm	= (0.12 inch)	KINLAYMENT 3mm
140 mm	= (5.51 inch)	heavyweight standard floor = solid reinforced concrete slab

Source room:				***Receiving room:***			
Temperature:	18.9 °C	=	66.0 °F	Temperature:	18.6 °C	=	65.5 °F
Atmospheric pressure:	60 hPa	=	0.87 psi	Atmospheric pressure:	60 hPa	=	0.87 psi
Relative humidity:	1012.0 %RH			Relative humidity:	1012.0 %RH		
				Volume:	51.4 m³	=	1814.9 ft³

Reference floor area: 12.0 m² = 129.1 ft²
Tested floor area: 12.0 m² = 129.1 ft²
Signal: Standard tapping machine with steel-headed hammers.

f (Hz)	L_0 (f) standard floor (dB)	L_c (f) standard floor + floor covering (dB)	(*)
50	48.8	**41.5**	
63	54.7	**51.1**	
80	59.9	**60.0**	
100	56.0	**57.7**	
125	59.8	**58.6**	
160	61.3	**62.2**	
200	64.8	**62.8**	
250	66.9	**61.4**	
315	69.6	**59.9**	
400	68.7	**58.2**	
500	69.8	**55.1**	
630	70.4	**55.3**	
800	71.6	**52.0**	
1000	71.9	**49.9**	
1250	71.4	**48.8**	
1600	72.0	**46.1**	
2000	71.6	**41.8**	
2500	70.8	**39.0**	
3150	70.1	**38.4**	
4000	67.9	**34.8**	
5000	64.4	**30.3**	

ASTM E492-09 & E989-06 (2012)	IIC in dB
	55

f (Hz)	L_d (f) $L_0(f) - L_c(f)$ (dB)	L_{ref} reference floor *(accord. ASTM E2179-03)* (dB)	$L_{ref,c}$ reference floor + floor covering $L_{ref} - L_d$ (dB)
50	7.3	/	**/**
63	3.6	/	**/**
80	-0.1	/	**/**
100	-1.7	67.0	**68.7**
125	1.2	67.5	**66.3**
160	-0.9	68.0	**68.9**
200	2.0	68.5	**66.5**
250	5.5	69.0	**63.5**
315	9.7	69.5	**59.8**
400	10.5	70.0	**59.5**
500	14.7	70.5	**55.8**
630	15.1	71.0	**55.9**
800	19.6	71.5	**51.9**
1000	22.0	72.0	**50.0**
1250	22.6	72.0	**49.4**
1600	25.9	72.0	**46.1**
2000	29.8	72.0	**42.2**
2500	31.8	72.0	**40.2**
3150	31.7	72.0	**40.3**
4000	33.1	/	**/**
5000	34.1	/	**/**

ASTM E2179-03 & E989-06 (2012)	IIC_c in dB	ΔIIC in dB
	51	**23**

(*)
b : background noise correction used
B : Maximum background noise correction used
Ln=< value shown

L0(f): normalized impact sound level for the standard concrete floor
Lc(f): normalized impact sound level for the standard floor with floor covering
Ld(f): reduction of impact sound pressure level due to the floor covering
Lref(f): assumed normalized impact sound level for the reference concrete floor
Lref,c(f): assumed normalized impact sound level for the reference floor with floor covering

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L_n **NORMALIZED IMPACT SOUND PRESSURE LEVEL in accordance with ASTM E492-09 / ASTM E 989 - 06**

Client: **Kinetics Middle East, LLC** Date of test: 28-Nov-18

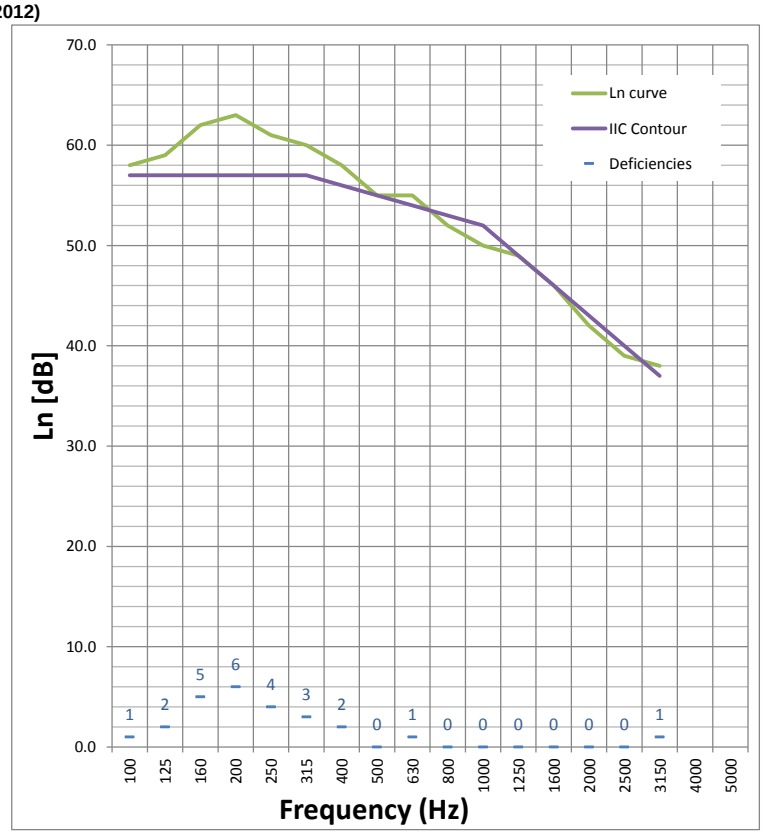
Description of the test setup:

45 mm	= (1.77 inch)	prefab anhydrite screed slab
3 mm	= (0.12 inch)	KINLAYMENT 3mm
140 mm	= (5.51 inch)	heavyweight standard floor = solid reinforced concrete slab

Reference floor area : 12.0 m² = 129.1 ft²
Tested floor area : 12.0 m² = 129.1 ft²
Signal : Standard tapping machine with steel-headed hammers.

According ASTM E492-09 & E989-06 (2012)

f (Hz)	L_n (dB)	(*)
1/3 octave bands :		
50		
63		
80		
100	58	
125	59	
160	62	
200	63	
250	61	
315	60	
400	58	
500	55	
630	55	
800	52	
1000	50	
1250	49	
1600	46	
2000	42	
2500	39	
3150	38	
4000		
5000		



(*) b : background noise correction used
B : Maximum background noise correction used
Ln=< value shown

Rating according to ASTM E 989 - 06

Impact Insulation Class IIC: **55 dB**

Evaluation based on laboratory measurement results obtained in one-third-octave bands by an engineering method

No.of test report: SONI099 Name of test institute: eco-scan bvba
Date: 28-Nov-18 Signature: Volker Spessart

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$L_{n, ref, c}$ **NORMALIZED IMPACT SOUND PRESSURE LEVEL in accordance with ASTM E2179-03 / ASTM E 989 - 06**

Client: **Kinetics Middle East, LLC** Date of test: 28-Nov-18

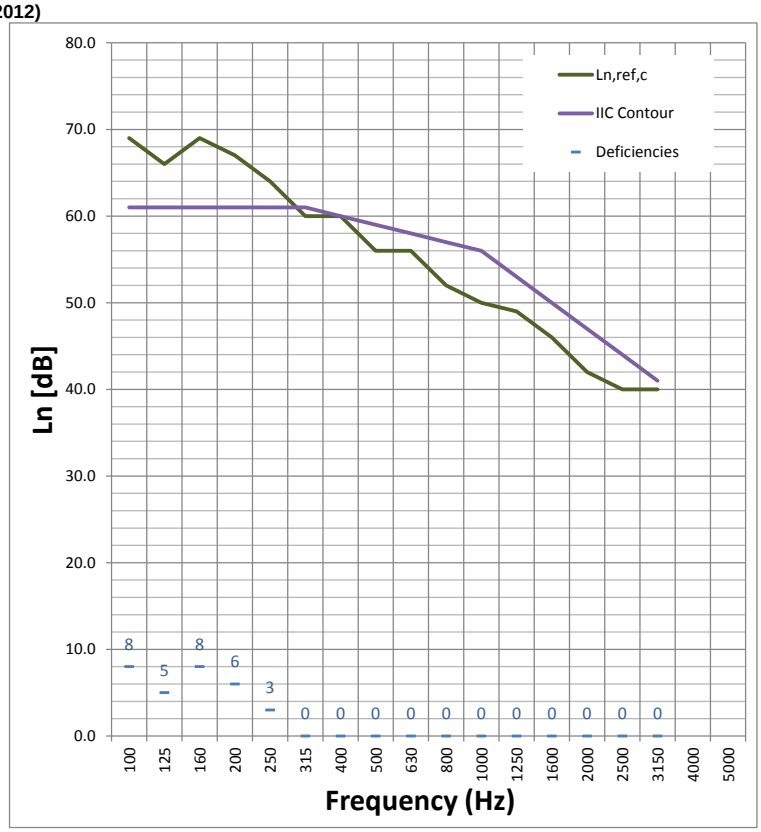
Description of the test setup:

45 mm	= (	1.77 inch)	prefab anhydrite screed slab
3 mm	= (	0.12 inch)	KINLAYMENT 3mm
140 mm	= (	5.51 inch)	heavyweight standard floor = solid reinforced concrete slab

Reference floor area : 12.0 m² = 129.1 ft²
Tested floor area : 12.0 m² = 129.1 ft²
Signal : Standard tapping machine with steel-headed hammers.

According ASTM E2179-03 & E989-06 (2012)

f (Hz)	$L_{n,ref,c}$ (dB)	(*)
1/3 octave bands :		
50		
63		
80		
100	69	
125	66	
160	69	
200	67	
250	64	
315	60	
400	60	
500	56	
630	56	
800	52	
1000	50	
1250	49	
1600	46	
2000	42	
2500	40	
3150	40	
4000		
5000		



(*) b : background noise correction used
B : Maximum background noise correction used
Ln=< value shown

Rating according to ASTM E 989 - 06

Impact Insulation Class IIC_c: **51 dB** **Improvement of Impact Insulation Class ΔIIC:** **23 dB**

Evaluation based on laboratory measurement results obtained in one-third-octave bands by an engineering method

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ANNEX 1: Description of test items by manufacturer

The test sample description given by manufacturer is checked visually as good as possible by the laboratory.
The correspondence between the test element and the commercialized product is the sole responsibility of the manufacturer

Description of the test element as a layered structure

	Thickness (mm)	ρ (kg/m³)	m" (kg/m²)	m" (PSF)	Description of the layer
1	45		90	18.4	prefab anhydrite screed slab
2	3				KINLAYMENT 3mm
3	140	2300	322	65.9	heavyweight standard floor = solid reinforced concrete slab
4					
5					
6					
7					
8					
9					
10					

Total thickness = 188 mm = (7.40 inch)

KINLAYMENT 3mm
It is a floating floor underlayer product for impact and airborne sound isolation.

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ANNEX 2: photographs of the test element or the test arrangement

Description of the assembly or drawing or photo

The floating floor underlayer product was placed on the standard concrete floor.
Then a prefab anhydrite screed slab was placed on top.
The topfloor had no rigid contact with the test opening construction. Gaps between the topfloor and the test opening were filled-up with sound-absorbing material.
Additionally sandbags were placed around the perimeter edges

Remark: the sound-absorbing material and sandbags are not a part of the floating floor product.