

KARNDEAN DESIGNFLOORING ACOUSTICAL PERFORMANCE TEST REPORT

SCOPE OF WORK

ISO 10140-2, ISO 10140-3 TESTING ON
4.5 MM KNIGHT TILE RIGID CORE SCB KP104

SPECIMEN TYPE

Concrete Slab - 152 mm (6")

REPORT NUMBER

P1663.04-113-11-R0

TEST DATE

09/21/22

ISSUE DATE

10/05/22

RECORD RETENTION END

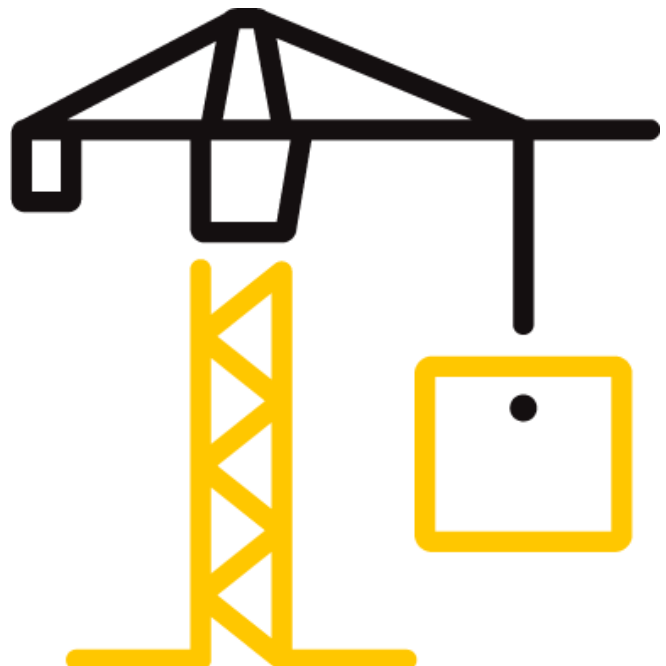
09/21/26

PAGES

11

DOCUMENT CONTROL

ATI 00629 (03/21/18)
RTTDS-R-AMER-Test-2844
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TEST REPORT FOR KARNDEAN DESIGNFLOORING

Report No.: P1663.04-113-11-R0

Date: 10/05/22

REPORT ISSUED TO

KARNDEAN DESIGNFLOORING

1100 Pontiac Court, Bushy Run Corporate Park
Export, Pennsylvania 15632

SECTION 1

SCOPE

Intertek Building & Construction (B&C) was contracted by Karndean Designflooring to perform testing in accordance with ISO 10140-2, ISO 10140-3 on 4.5 mm Knight Tile Rigid Core SCB KP104 . Results obtained are tested values and were secured by using the designated test methods. Testing was conducted in the VT test chambers at Intertek B&C located in York, Pennsylvania. These test chambers satisfy the lab requirements specified in ISO 10140-5.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory.

SECTION 2

SUMMARY OF TEST RESULTS

DATA FILE NO.	P1663.04			
SERIES/MODEL:	4.5 mm Knight Tile Rigid Core SCB KP104			
R_w	51 dB	$C_{50-3,150} = -2$ dB	$C_{50-5,000} = -1$ dB	$C_{100-5,000} = -1$ dB
		$C_{tr,50-3,150} = -5$ dB	$C_{tr,50-5,000} = -5$ dB	$C_{tr,100-5,000} = -5$ dB
L_{n,w}	54 dB	$C_{l,100-2,500} = -1$ dB	$C_{l,50-2,500} = 0$ dB	
$\Delta L_{n,w}$	20 dB			

COMPLETED BY: Michael A. Unnone
Technician - Acoustical
TITLE: Testing

SIGNATURE:

DATE: 10/05/22

REVIEWED BY: Daniel B. Mohler
Project Lead - Acoustical
TITLE: Testing

SIGNATURE:

DATE: 10/05/22

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TEST REPORT FOR KARNDEAN DESIGNFLOORING

Report No.: P1663.04-113-11-R0

Date: 10/05/22

SECTION 3**TEST METHODS**

The specimen was evaluated in accordance with the following:

ISO 10140-2:2010(E), *Laboratory measurement of sound insulation of building elements - Measurement of airborne Sound insulation*

ISO 717-1:1996(E), *Rating of sound insulation in buildings and of building elements - Airborne sound insulation*

ISO 10140-3:2010(E), *Laboratory measurement of sound insulation of building elements - Measurement of impact sound insulation*

ISO 717-2:2013(E), *Rating of sound insulation in buildings and of building elements - Impact sound insulation*

ISO 10140-5:2010, *Laboratory measurement of sound insulation of building elements - Requirements for test facilities and equipment*

SECTION 4**MATERIAL SOURCE/INSTALLATION**

The full test specimen was assembled into the testing frame on the day of testing by B&C. All materials provided by the client were installed on an existing B&C assembly (Concrete Slab - 152 mm (6")) utilizing B&C-supplied materials. The assembly was installed in a steel test frame which was installed into the opening between the source and receive rooms in the test chamber. The test frame was isolated from the structure with dense neoprene gasket.

The total weight of the floor/ceiling assembly was 4111.8 kg / 9065 lbs. B&C will store samples of the test specimen for four years. Photographs of the test specimen are included in the report. A drawing of the test specimen is included in the report.

B&C will service this report for the entire test record retention period. Test records, such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation, will be retained by B&C for the entire test record retention period. The test record retention period ends four years after the test date.

TEST REPORT FOR KARNDEAN DESIGNFLOORING

Report No.: P1663.04-113-11-R0

Date: 10/05/22

SECTION 5 EQUIPMENT

INSTRUMENT	MANUFACTURER	MODEL	DESCRIPTION	ASSET #	CAL DATE	
2-Channel Analog Input	National Instruments	NI 9250	2-Channel Analog Input	INT02586	04/22	*
2-Channel Analog Input	National Instruments	NI 9250	2-Channel Analog Input	INT02587	04/22	*
2-Channel Analog Input	National Instruments	NI 9250	2-Channel Analog Input	INT02608	04/22	*
2-Channel Analog Input	National Instruments	NI 9250	2-Channel Analog Input	INT02609	04/22	*
2-Channel Analog Input	National Instruments	NI 9250	2-Channel Analog Input	INT02610	04/22	*
2-Channel Analog Input	National Instruments	NI 9250	2-Channel Analog Input	INT02612	04/22	*
2-Channel Analog Output	National Instruments	NI 9260	2-Channel Analog Input	INT02573	04/22	*
Microphone Calibrator	Norsonic	34093	Acoustical Calibrator	65105	10/21	
Receive Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	63741	06/22	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63740	04/22	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64340	10/21	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63744	09/21	
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	65968	01/22	
Receive Room Environmental Indicator	Comet	T7510	Temperature and Humidity Transmitter	63810	10/21	
				63811	10/21	
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	65103	02/22	
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	64902	12/21	
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	63739	07/22	
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	63742	04/22	
Source Room Microphone	PCB Electronics	378C20	Microphone and Preamplifier	64906	04/22	
Source Room Environmental Indicator	Comet	T7510	Temperature and Humidity Transmitter	63812	10/21	
Tapping Machine	Norsonic	Nor277	Tapping Machine	INT00936	02/22	

* The calibration frequency for this equipment is every two years per the manufacturer's recommendation.

VT RECEIVE ROOM VOLUME	158.86 m ³ (5610.1 ft ³)
VT SOURCE ROOM VOLUME	190 m ³ (6709.79 ft ³)

SECTION 6 LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Michael A. Unnone	Intertek B&C
Daniel B. Mohler	Intertek B&C

TEST REPORT FOR KARNDEAN DESIGNFLOORING

Report No.: P1663.04-113-11-R0

Date: 10/05/22

SECTION 7

TEST PROCEDURE

The microphones were calibrated before conducting the tests. The air temperature and relative humidity conditions were monitored and recorded during all measurements. The average temperature and humidity of both the source and received rooms are listed in Sections 10 and 11. The maximum and minimum temperatures and humidities of the receive room from the duration of the test are listed in Sections 12 through 15.

The airborne sound insulation test was conducted in accordance with the ISO 10140-2 test method using the single direction method. Two background noise sound pressure level and five sound absorption measurements were conducted at each of five microphone positions. Two sound pressure level measurements were made simultaneously in both rooms, at each of five microphone positions.

The impact sound insulation test was conducted in accordance with the ISO 10140-3 test method. Two background noise sound pressure level, two sound pressure level measurements with the tapping machine operating at each position specified by ISO 10140-3, and five sound absorption measurements were conducted at each of five microphone positions.

The delta impact insulation test was conducted in accordance with ISO 10140-3 test method. In addition to the impact sound transmission test, two sound pressure level measurements with the tapping machine operating at each position specified by ISO 10140-3 with only the concrete slab installed were conducted at each of five microphone positions.

Detailed test procedures, data for flanking limit tests, repeatability measurements, and reference specimen tests are available upon request.

SECTION 8

TEST CALCULATIONS

The R_w (Sound Reduction Index), IIC (Impact Sound Insulation), and ΔL_w (Improvement of Impact Sound Insulation) ratings were calculated in accordance with ISO 717-1, ISO 717-2, respectively.

TEST REPORT FOR KARNDÉAN DESIGNFLOORING

Report No.: P1663.04-113-11-R0

Date: 10/05/22

SECTION 9

TEST SPECIMEN DESCRIPTION

MATERIAL	Dimensions (mm/inch)	Thickness (mm/inch)	MANUFACTURER AND SERIES	QUANTITY	AVERAGE WEIGHT
Rigid Core SCB KP104	1220 by 180 48 by 7.1	4.5 / 0.18	Knight Tile	10.98 m ² 118.19 ft ²	8.3 kg/m ² 1.7 lb/ft ²
	Note: Loose laid. The flooring had an attached pad.				
Concrete Slab	3023 by 3632 119 by 143	152.4 / 6	5000 PSI	10.98 m ² 118.19 ft ²	366.18 kg/m ² 75 lb/ft ²
	Note: Installed in a test frame flush to the source room. Mats of #5 reinforcing bars were placed 25.4 mm from both the top and bottom of the slab, with bars spaced on 305 mm centers in both directions. No noticeable shrinkage or cracking was visible on the specimen.				

TEST REPORT FOR KARNDEAN DESIGNFLOORING

Report No.: P1663.04-113-11-R0

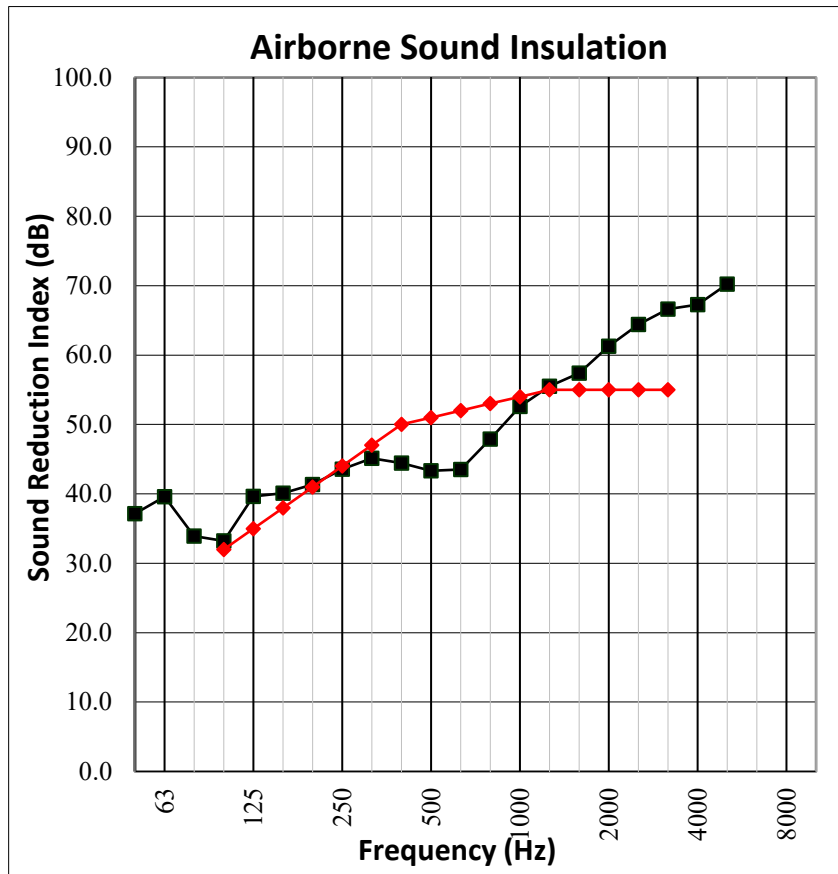
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SECTION 10

TEST RESULTS - SOUND REDUCTION INDEX (IN ACCORDANCE WITH ISO 10140-2)

TEST DATE	9/21/2022				
DATA FILE NO.	P1663.04				
CLIENT	Karndean Designflooring				
DESCRIPTION	4.5 mm (0.18") Knight Tile Rigid Core SCB KP104 , 152.4 mm (6") 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m ²	Receive Temp.	22.1°C (71.7°F)	Source Temp.	20.3°C (68.5°F)
TECHNICIAN	MSJK	Receive Humidity	61%	Source Humidity	61%

FREQUENCY <i>f</i> Hz	R one-third octave dB
50	37.1
63	39.6
80	33.9
100	33.2
125	39.7
160	40.1
200	41.3
250	43.6
315	45.1
400	44.4
500	43.3
630	43.5
800	47.9
1000	52.6
1250	55.5
1600	57.4
2000	61.3
2500	64.4
3150	66.6
4000	67.3
5000	70.2



Rating in accordance with ISO 717-1:

$$R_w(C; C_{tr}) = 51 \text{ dB} \quad C_{50-3,150} = -2 \text{ dB} \quad C_{50-5,000} = -1 \text{ dB} \quad C_{100-5,000} = -1 \text{ dB}$$

Evaluation based on laboratory measurement results obtained by an engineering method:

$$C_{tr,50-3,150} = -5 \text{ dB} \quad C_{tr,50-5,000} = -5 \text{ dB} \quad C_{tr,100-5,000} = -5 \text{ dB}$$

TEST REPORT FOR KARNDEAN DESIGNFLOORING

Report No.: P1663.04-113-11-R0

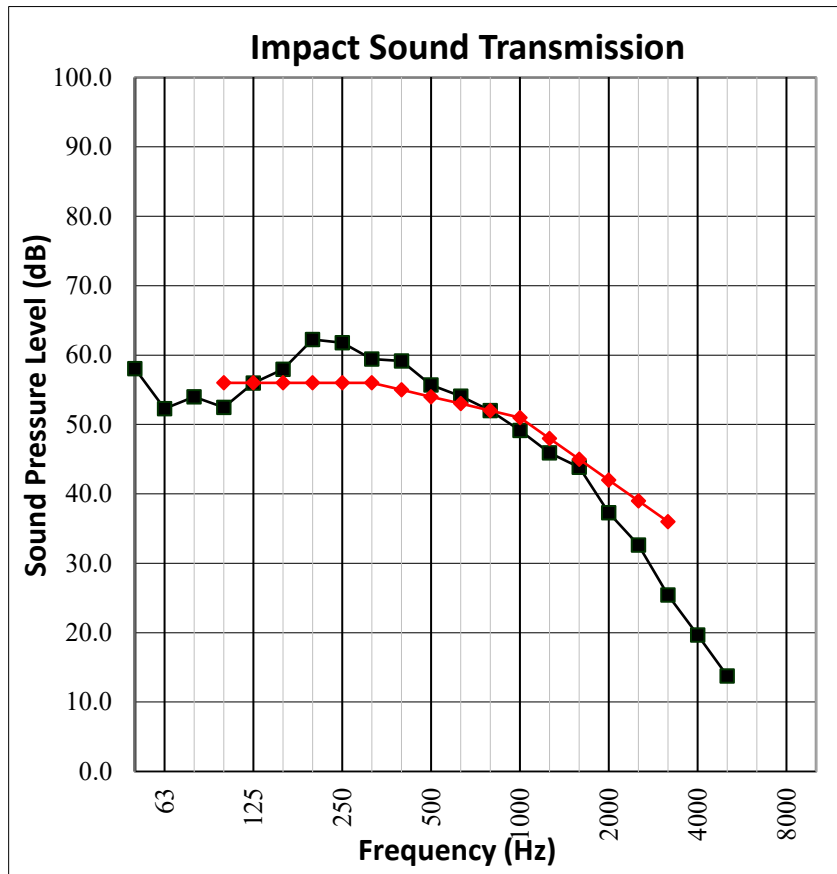
Date: 10/05/22

SECTION 11

TEST RESULTS - NORMALIZED IMPACT SPL (IN ACCORDANCE WITH ISO 10140-3)

TEST DATE	9/21/2022				
DATA FILE NO.	P1663.04				
CLIENT	Karndean Designflooring				
DESCRIPTION	4.5 mm (0.18") Knight Tile Rigid Core SCB KP104 , 152.4 mm (6") 5000 PSI Concrete Slab				
SPECIMEN AREA	10.98 m ²	Receive Temp.	22.1°C (71.7°F)	Source Temp.	20.3°C (68.5°F)
TECHNICIAN	MSJK	Receive Humidity	61%	Source Humidity	61%

FREQUENCY f Hz	L_n one-third octave dB
50	58.0
63	52.3
80	54.0
100	52.5
125	55.9
160	57.9
200	62.2
250	61.8
315	59.4
400	59.2
500	55.7
630	54.1
800	52.0
1000	49.1
1250	45.9
1600	43.8
2000	37.3
2500	32.6
3150	25.4
4000	19.6
5000	13.8



Rating in accordance with ISO 717-1

$$L_{n,w}(C_1) = 54 \text{ (-1) dB} \quad C_{1,50-2,500} = 0 \text{ dB}$$

$$\Delta L_w = 20 \text{ dB}$$

Evaluation based on laboratory measurement results obtained by an engineering method.

TEST REPORT FOR KARNDEAN DESIGNFLOORING

Report No.: P1663.04-113-11-R0

Date: 10/05/22

SECTION 13

PHOTOGRAPHS



Photo No. 1
Source Room View of Test Specimen Installation



Photo No. 2
Receive Room View of Test Specimen Installation

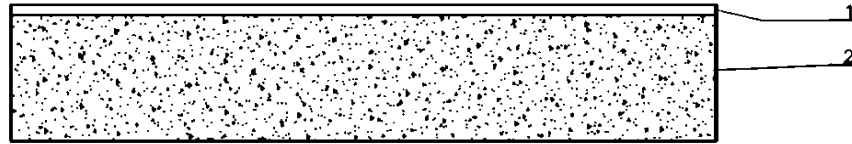
TEST REPORT FOR KARNDÉAN DESIGNFLOORING

Report No.: P1663.04-113-11-R0

Date: 10/05/22

SECTION 14

DRAWING



1-Floor Topping

2-Concrete Slab



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TEST REPORT FOR KARNDÉAN DESIGNFLOORING

Report No.: P1663.04-113-11-R0

Date: 10/05/22

SECTION 15

REVISION LOG

REVISION #	DATE	PAGES	DESCRIPTION
R0	10/05/22	N/A	Original Report Issue