

# KERAKOLL PP LEVEL DUO

## Floor Impact Test Summary

2 August 2021

Kerakoll

MD485-01F01 Acoustic Report (r0)

## Document Details

Detail	Reference
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## Document Control

Date	Revision history	Non-issued revision	Issued revision	Prepared	Instructed	Authorised
02.08.2021	Issued	-	0	G.Rowe	-	G.Rowe

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The information contained herein is for the purpose of acoustics only. No claims are made and no liability is accepted in respect of design and construction issues falling outside of the specialist field of acoustics engineering including and not limited to structural integrity, fire rating, architectural buildability and fit-for-purpose, waterproofing and the like. Supplementary professional advice should be sought in respect of these issues.

## Summary of Impact Sound Insulation Test Results

Renzo Tonin & Associates conducted impact sound insulation testing between apartments 1103 (outdoor) and 1002 (indoor), at 17-19 Arnold Street, Box Hill, on 27<sup>th</sup> July 2021.

Table 1 presents a summary of test results in which several pedestal configurations were tested. Appendix A presents the test reports and Appendix B presents the test methodology.

**Table 1: Test result summary**

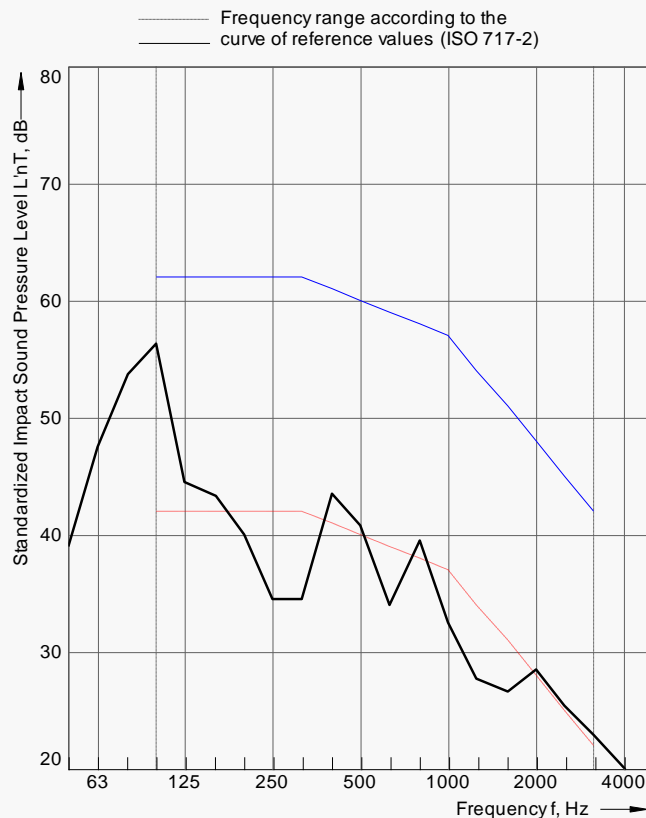
Test	Floor/ceiling construction summary	Test result
1.	Sample of 20mm porcelain paver, atop 25mm PP Level Duo 25/37 pedestals, atop a 200mm concrete slab, with suspended 13mm standard plasterboard ceiling below to form a 130mm cavity.	$L'_{nT,w}$ 40 dB
2.	Sample of 20mm porcelain paver, atop 37mm PP Level Duo 25/37 pedestals, atop a 200mm concrete slab, with suspended 13mm standard plasterboard ceiling below to form a 130mm cavity.	$L'_{nT,w}$ 39 dB
3.	Sample of 20mm porcelain paver, atop 61mm PP Level Duo 60/105 pedestals, atop a 200mm concrete slab, with suspended 13mm standard plasterboard ceiling below to form a 130mm cavity.	$L'_{nT,w}$ 39 dB
4.	200mm concrete slab, with suspended 13mm standard plasterboard ceiling below to form a 130mm cavity.	$L'_{nT,w}$ 51 dB

## APPENDIX A Impact Sound Insulation Test Reports

IMPACT SOUND INSULATION - FIELD TEST REPORT			
Report reference:	MD485-01F01 Acoustic Report (r0)		
Test reference:	MD485-01-01		
Date of test:	27 <sup>th</sup> July 2021		
Test site address:	17-19 Arnold Street, Box Hill		
Source room:	Apartment: 1103	Room type:	Outdoor balcony
Receiver room:	Apartment: 1002	Room type:	Living room
Understood construction:	<u>Floor finish in source room:</u>	<ul style="list-style-type: none"> <li>Sample of 20mm porcelain paver 600mm x 600mm, atop 25mm PP Level Duo 25/37 pedestals, atop</li> </ul>	
	<u>Existing substrate:</u>	<ul style="list-style-type: none"> <li>200mm Concrete slab, with</li> </ul>	
	<u>Ceiling in receiving room:</u>	<ul style="list-style-type: none"> <li>One layer of 13mm standard plasterboard suspended from the slab soffit to form a 130mm cavity</li> </ul>	

Frequency f Hz	L'nT 1/3 Octave dB
50	39.0 B
63	47.5 B
80	53.7
100	56.3
125	44.5
160	43.3
200	40.0 B
250	34.5 B
315	34.5 B
400	43.5
500	40.8
630	34.0
800	39.5
1000	32.5
1250	27.7 B
1600	26.6
2000	28.5
2500	25.4 B
3150	22.9 B
4000	20.1 B
5000	16.7 B

B: L'nT =< value shown



Rating according to ISO 717-2

$$L'_{nT,w}(C_i) = 40 ( 2) \text{ dB}$$

$$C_{i,50-2500} = 4 \text{ dB}$$

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

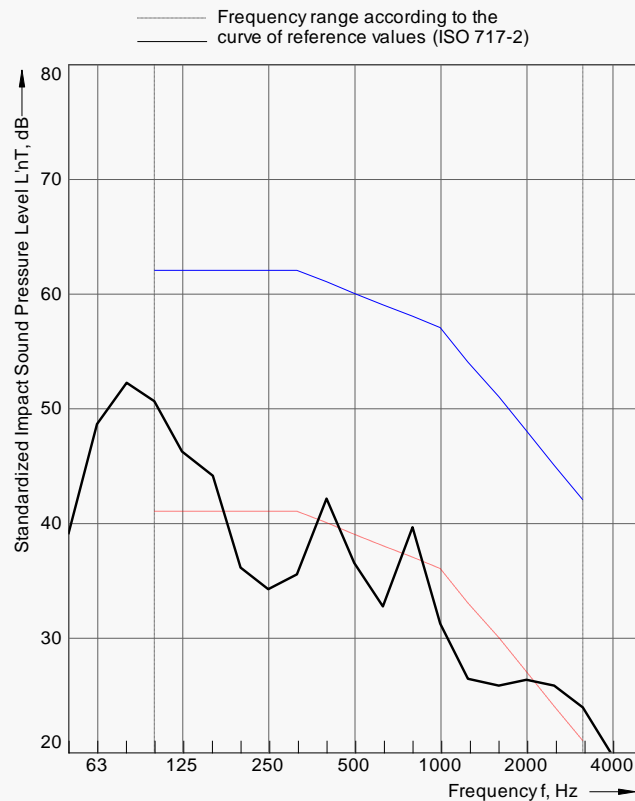
Measurements conducted in general accordance with International Standard ISO 16283-2:2018 'Acoustics – Field measurement of sound insulation in buildings and of building elements – Part 2: Impact sound insulation' and International Standard ISO 717.1:2013 'Acoustics – Rating of sound insulation in buildings and of building elements – Part 1: Impact sound insulation.' Measurements and procedures documented in this report have been carried out in accordance with the Renzo Tonin & Associates Quality Assurance System. This quality system is based on AS/NZS ISO 9001.

**IMPACT SOUND INSULATION - FIELD TEST REPORT**

Report reference:	MD485-01F01 Acoustic Report (r0)		
Test reference:	MD485-01-02		
Date of test:	27 <sup>th</sup> July 2021		
Test site address:	17-19 Arnold Street, Box Hill		
Source room:	Apartment: 1103	Room type:	Outdoor balcony
Receiver room:	Apartment: 1002	Room type:	Living room
Understood construction:	<u>Floor finish in source room:</u>	<ul style="list-style-type: none"> <li>• Sample of 20mm porcelain paver 600mm x 600mm, atop 37mm PP Level Duo 25/37 pedestals, atop</li> </ul>	
	<u>Existing substrate:</u>	<ul style="list-style-type: none"> <li>• 200mm Concrete slab, with</li> </ul>	
	<u>Ceiling in receiving room:</u>	<ul style="list-style-type: none"> <li>• One layer of 13mm standard plasterboard suspended from the slab soffit to form a 130mm cavity</li> </ul>	

Frequency f Hz	L'nT 1/3 Octave dB
50	39.0 B
63	48.6 B
80	52.2
100	50.6
125	46.2
160	44.1
200	36.1 B
250	34.2 B
315	35.5
400	42.1
500	36.5
630	32.7
800	39.6
1000	31.2
1250	26.4 B
1600	25.8 B
2000	26.3 B
2500	25.8
3150	23.9
4000	19.7 B
5000	16.4 B

B: L'nT <= value shown



Rating according to ISO 717-2

$$L'_{nT,w}(C_i) = 39 (0) \text{ dB}$$

$$C_{i,50-2500} = 3 \text{ dB}$$

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

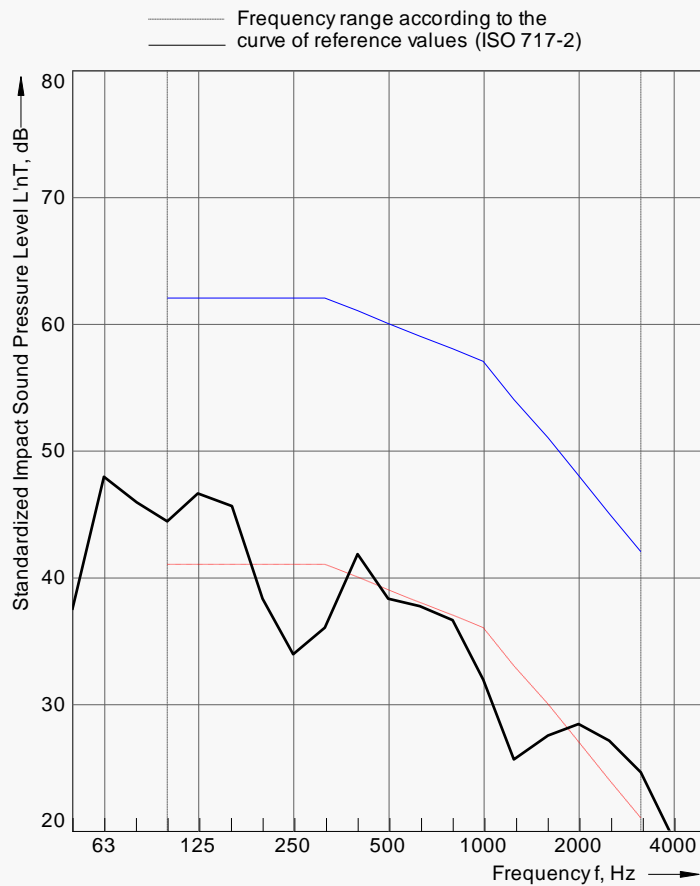
Measurements conducted in general accordance with International Standard ISO 16283-2:2018 'Acoustics – Field measurement of sound insulation in buildings and of building elements – Part 2: Impact sound insulation' and International Standard ISO 717.1:2013 'Acoustics – Rating of sound insulation in buildings and of building elements – Part 1: Impact sound insulation.' Measurements and procedures documented in this report have been carried out in accordance with the Renzo Tonin & Associates Quality Assurance System. This quality system is based on AS/NZS ISO 9001.

**IMPACT SOUND INSULATION - FIELD TEST REPORT**

Report reference:	MD485-01F01 Acoustic Report (r0)		
Test reference:	MD485-01-03		
Date of test:	27 <sup>th</sup> July 2021		
Test site address:	17-19 Arnold Street, Box Hill		
Source room:	Apartment: 1103	Room type:	Outdoor balcony
Receiver room:	Apartment: 1002	Room type:	Living room
Understood construction:	<u>Floor finish in source room:</u>	<ul style="list-style-type: none"> <li>• Sample of 20mm porcelain paver 600mm x 600mm, atop 61mm PP Level Duo 60/105 pedestals, atop</li> </ul>	
	<u>Existing substrate:</u>	<ul style="list-style-type: none"> <li>• 200mm Concrete slab, with</li> </ul>	
	<u>Ceiling in receiving room:</u>	<ul style="list-style-type: none"> <li>• One layer of 13mm standard plasterboard suspended from the slab soffit to form a 130mm cavity</li> </ul>	

Frequency f Hz	L'nT 1/3 Octave dB
50	37.4 B
63	47.9 B
80	45.9 B
100	44.4 B
125	46.6
160	45.6
200	38.3 B
250	33.9 B
315	36.0
400	41.8
500	38.3
630	37.7
800	36.6
1000	31.9
1250	25.6 B
1600	27.5
2000	28.4
2500	27.1
3150	24.6
4000	19.3 B
5000	14.3 B

B: L'nT <= value shown



Rating according to ISO 717-2

$L'_{nT,w}(C_i) = 39 (-2) \text{ dB}$

$C_{i,50-2500} = 0 \text{ dB}$

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

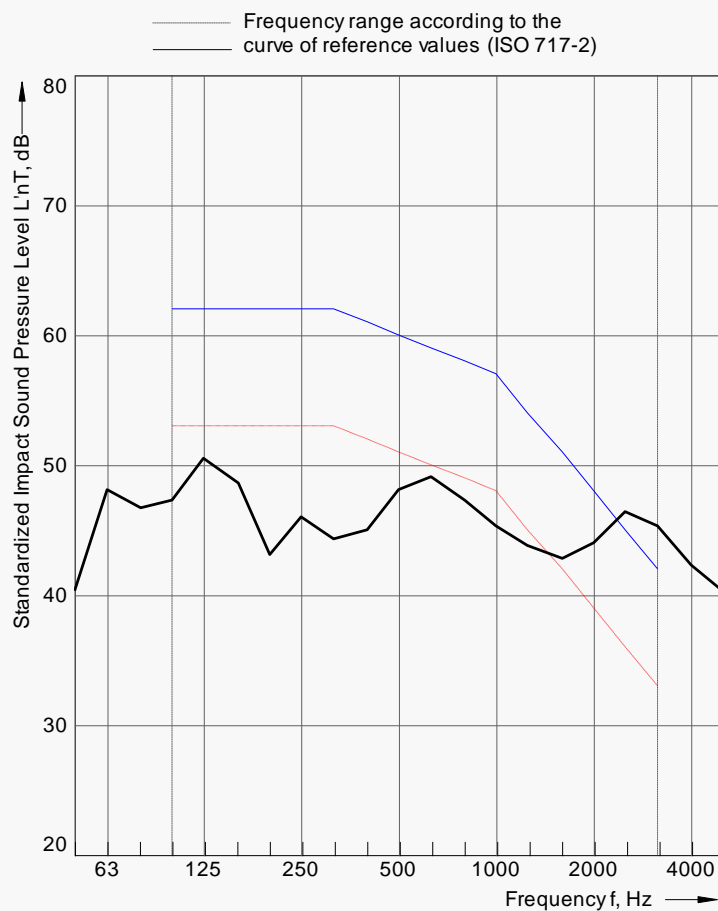
Measurements conducted in general accordance with International Standard ISO 16283-2:2018 'Acoustics – Field measurement of sound insulation in buildings and of building elements – Part 2: Impact sound insulation' and International Standard ISO 717.1:2013 'Acoustics – Rating of sound insulation in buildings and of building elements – Part 1: Impact sound insulation.' Measurements and procedures documented in this report have been carried out in accordance with the Renzo Tonin & Associates Quality Assurance System. This quality system is based on AS/NZS ISO 9001.

**IMPACT SOUND INSULATION - FIELD TEST REPORT**

Report reference:	MD485-01F01 Acoustic Report (r0)		
Test reference:	MD485-01-04		
Date of test:	27 <sup>th</sup> July 2021		
Test site address:	17-19 Arnold Street, Box Hill		
Source room:	Apartment: 1103	Room type:	Outdoor balcony
Receiver room:	Apartment: 1002	Room type:	Living room
Understood construction:	<u>Floor finish in source room:</u>	• Nil (bare slab)	
	<u>Existing substrate:</u>	• 200mm Concrete slab, with	
	<u>Ceiling in receiving room:</u>	• One layer of 13mm standard plasterboard suspended from the slab soffit to form a 130mm cavity	

Frequency f Hz	L'nT 1/3 Octave dB
50	40.3 B
63	48.1 B
80	46.7 B
100	47.3 B
125	50.5
160	48.6
200	43.1
250	46.0
315	44.3
400	45.0
500	48.1
630	49.1
800	47.3
1000	45.3
1250	43.8
1600	42.8
2000	44.0
2500	46.4
3150	45.3
4000	42.3
5000	40.3

B: L'nT =< value shown



Rating according to ISO 717-2

$$L'_{nT,w}(C_i) = 51 (-8) \text{ dB}$$

$$C_{i,50-2500} = -7 \text{ dB}$$

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

Measurements conducted in general accordance with International Standard ISO 16283-2:2018 'Acoustics – Field measurement of sound insulation in buildings and of building elements – Part 2: Impact sound insulation' and International Standard ISO 717.1:2013 'Acoustics – Rating of sound insulation in buildings and of building elements – Part 1: Impact sound insulation.' Measurements and procedures documented in this report have been carried out in accordance with the Renzo Tonin & Associates Quality Assurance System. This quality system is based on AS/NZS ISO 9001.

## APPENDIX B Impact Sound Insulation Test Methodology

### B.1 Introduction

This report provides results of sound transmission loss tests conducted in general accordance with the following Australian and International Standards:

- ISO 16283-2:2018 'Acoustics – Field measurement of sound insulation in buildings and of building elements – Part 2: Impact sound insulation'
- ISO 717.2:2013 'Acoustics – Rating of sound insulation in buildings and of building elements – Part 2: Impact sound insulation'
- ISO 3382-2:2008 'Acoustics – Measurement of room acoustic parameters – Part 2: Reverberation time in ordinary rooms'

### B.2 Test Procedure

The test procedure has been carried out in general accordance with ISO 16283-2:2018 as follows:

The field measurement of impact sound insulation of building partitions was conducted in one-third octave bands. The values for impact sound insulation, which are frequency dependent, have been calculated at all frequencies of measurement to provide the  $L'_{nT}$  (standardised impact sound pressure level). The one-third octave  $L'_{nT}$  values were converted into a single number quantity  $L'_{nT,w}$  (weighted standardised impact sound pressure level), in accordance with the procedure defined in ISO 717-2:2013.

The standardised impact sound pressure level is defined in ISO 16283-2:2018, equation (1).

$$L'_{nT} = L_i - 10 \lg \frac{T}{T_0}$$

Where:

- $L_i$  = the average sound pressure level in the receiving room, in decibels
- $T$  = the reverberation time in the receiving room
- $T_0$  = the reference reverberation time, for dwellings,  $T_0 = 0.5s$

A tapping machine was placed in two different positions randomly distributed on the floor sample in general accordance with Standards indicated above.

Whilst this tapping machine was operating, noise levels were recorded at two locations in the receiver room with the average time of 30 seconds at each position, for each tapping machine position using a Bruel & Kjaer 2250 sound level meter. The measured noise level was filtered simultaneously in all one-third octave frequency bands in real time. These values were recorded and subsequently statistically analysed to determine the average sound pressure levels for each room and to indicate the precision of the measurements.



The average sound pressure level difference was obtained by using a Bruel & Kjaer Type 2250 Investigator Class 1 Sound Level Meter. The calibration of the device was checked in the field immediately before and after the measurement using a Brüel & Kjær Type 4231 calibrator; no drift in calibration was observed. The sound meter conforms with IEC 61672-3:2013 and IEC 61260-3:2016; the sound calibrator conforms with IEC 60942:2017, and all carry manufacturers certification or NATA certification detailing Standard conformance testing within the last two years and one year, respectively.

The reverberation time in the receiving room was measured using impulse response method (balloon burst) in accordance with ISO 3382-2:2008. Four (4) microphone and impulse source positions were used for the reverberation time calculation, with one decay measured for each position.

The Weighted Standardised Impact Sound Pressure Level  $L'_{nT,w}$  and Spectrum Adaptation Term  $C_1$  were calculated in accordance with ISO 717-2:2013.

### **B.3 Flanking Transmission**

Flanking sound transmission was not corrected for.

### **B.4 Test Signals and Frequencies**

The range of frequencies tested was from 50Hz - 5000Hz.