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Technical Report
82348-SRL-RP-XT-001-P1

Project

The Laboratory Measurement of The Improvement of Impact Sound Insulation of Ryno 3mm Rubber Crumb Sheet

Prepared for

Ryno Ltd

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Quality Assurance		
Project Title	The Laboratory Measurement of The Improvement of Impact Sound Insulation of Ryno 3mm Rubber Crumb Sheet	
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Version History

Version	Date	Comments
P1	15/10/2024	

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1.0 Description of Test

Tests have been done in SRL's Laboratory at Holbrook House, Sudbury, Suffolk, on a flexible floor covering to determine the improvement of impact sound insulation in accordance with BS EN ISO 10140-3:2021.

The results are given in 1/3rd octave bands over the frequency range 100Hz to 5kHz.

1.1 Description of Sample

A 1m x 1m sample of Ryno 3mm rubber crumb sheet was laid loose on the floor in our East laboratory and tested. For more details and description of the sample tested, see Section 2.0 and Data Sheet 1.

Sampling plan:	Enough for test
Sample condition:	New
Details supplied by:	Ryno Ltd
Sample installed by:	SRL Technical Services Ltd

1.2 Sample Delivery Date

02 October 2024

1.3 Test Procedures

The sample was mounted/located and tested in accordance with the relevant standard. The details of measurements are given in Appendix A. The method and procedure are described in Appendix B. The measurement uncertainty is given in Appendix C.

2.0 Results

The results of the measurements and subsequent analysis are given in Data Sheet 1 and summarised below.

Results relate only to the items as received and tested.

SRL Test No.	Description in Brief	ΔL_w ($C_{I,\Delta}$)
1	Ryno 3mm Rubber Crumb Sheet 1000x1000x3mm	17 (-10) dB

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Data Sheet 1

Laboratory Measurement of the improvement of impact sound insulation by floor coverings on a heavyweight standard floor according to BS EN ISO 10140-3

Test Number:	1	**Method of mounting:**	Loose laid	**Test Room:**	**Source**	**Receiving**
Client:	Ryno Ltd			**Air Temperature:**	16.3 °C	15.3 °C
Test Date:	11/10/2024	The sample did not suffer visible damage during the test		**Air Humidity:**	66 %	63 %
Sample Length:	1.00 m	**Sample Width:**	1.00 m	**Volume:**	64.4 m³	50.1 m³
Sample Weight:	2.3 kg/m²	**Sample Thickness:**	3 mm	**Air Pressure:**	1011 mbar	
Product Identification:	**Ryno 3mm Rubber Crumb Sheet 1000x1000x3mm**					

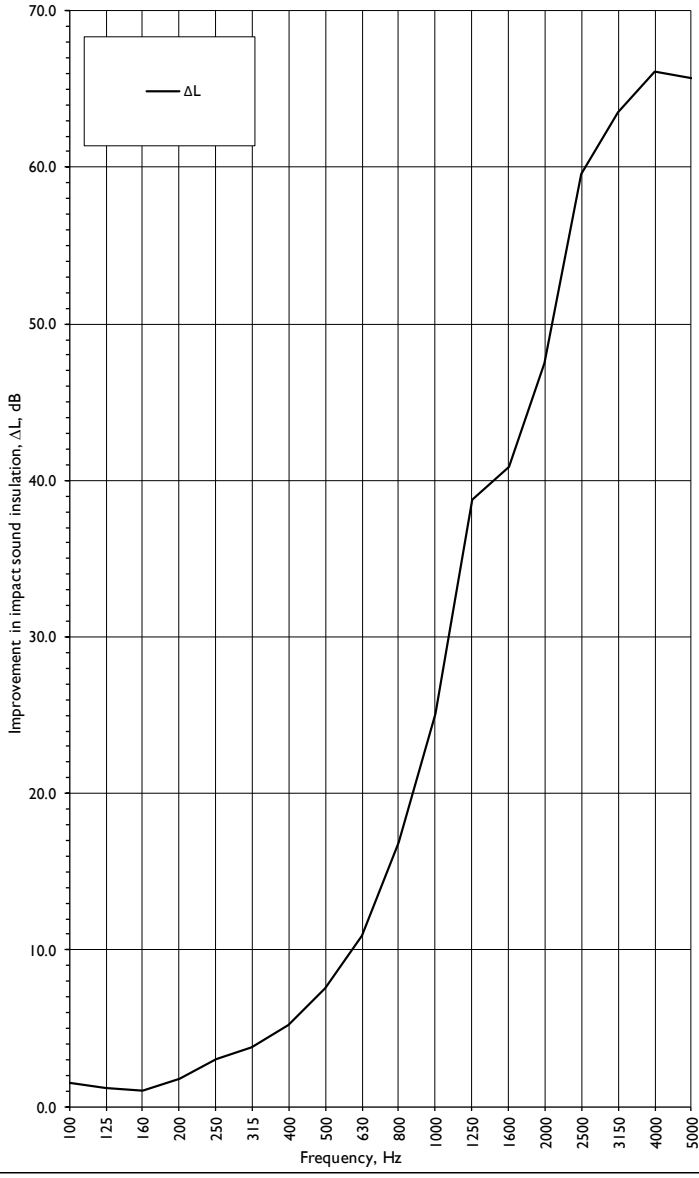
Frequency, Hz	$L_{n,0}$ 1/3 octave dB	**ΔL 1/3 octave dB**
100	65.6	**1.5**
125	63.2	**1.2**
160	66.2	**1.0**
200	65.2	**1.8**
250	67.4	**3.0**
315	68.4	**3.8**
400	68.8	**5.2**
500	69.4	**7.6**
630	69.1	**10.9**
800	69.4	**16.9**
1000	70.3	**25.1**
1250	71.1	**38.8**
1600	71.6	**40.9**
2000	72.9	**47.5**
2500	73.5	**59.6** *
3150	73.6	**63.5** *
4000	72.6	**66.1** >
5000	71.8	**65.7** >

* corrected for background > limited by background

Rating according to BS EN ISO 717-2:2020

Weighted Reduction of impact sound pressure level ΔL w and (spectrum adaptation term)	**ΔL_w ($C_{I,\Delta}$) = 17 (-10) dB**
Weighted normalised impact sound pressure level of bare reference floor and (spectrum adaptation term)	$L_{n,r,0,w}$ ($C_{I,r,0}$) = 78 (-11) dB
Weighted normalised impact sound pressure level of reference floor with sample and (spectrum adaptation term)	$L_{n,r,w}$ ($C_{I,r}$) = 61 (-1) dB

v 1.3



Appendix A - Details of Measurements

A1. Location

SRL Technical Services (Sound Research Laboratories)

Holbrook House

Little Waldingfield

Sudbury

Suffolk

CO10 0TF

Tel: 01787 247595

A2. Test Date

11 October 2024

A3. Tester

Kieron Farrow of SRL Technical Services Limited

A4. Instrumentation and Apparatus Used

Make	Description	Type
Norsonic	Multichannel Sound Level Meter	Nor850
Norsonic	Rotating microphone boom	Nor265-A
Norsonic	Tapping Machine	Nor211
G.R.A.S	Microphone Pre-Amp	26AK
G.R.A.S	Calibrator	42AB

Make	Description	Type
G.R.A.S	Microphone	40AR
dbx	Graphic Equaliser	131s
Crown	Class D Amplifier	XLS 1502
ntek	Rotating microphone boom	MB01
Bruel & Kjaer	Omni directional loud speaker	4296
Bresser	Temperature / Humidity sensor	n/a
Oregon Scientific	Barometer	WMR86

A5. References

BS EN ISO 717-2:2020 — Rating of sound insulation in buildings and of building elements. Part 2: Impact Impact Sound Insulation

BS EN ISO 10140-3:2021 — Laboratory measurement of sound insulation of building elements. Part 3: Measurement of impact sound insulation

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Appendix B – Test Procedure

Measurement of The Improvement of Impact Sound Insulation by a Floor Covering on a Reference floor in Accordance with BS EN ISO 10140-3 & BS EN ISO 10140-1 (Appendix H) - Category 1 (Small Samples) – TP32

In the laboratory, impact sound improvement is determined from the difference a sample floor covering makes to the sound pressure levels generated by a standard impact machine. The impact machine, known as a tapping machine, is operated standing first on a concrete slab and then on the test sample installed on that slab. The test floor for the installation of the test samples measures 4.15m by 4.59m and is 140mm thick. The test sample is installed on top of the roof of a reverberation room, which is acoustically "live", and the sound pressure levels are measured in that room. The test is done under conditions which restrict the transmission of sound other than directly through the sample and test slab. The measured sound pressure levels are corrected for the amount of sound absorption in the reverberation room.

The reverberation room, which has a volume of 50m³, is constructed from solid dense masonry blocks which is internally plastered with a reinforced concrete roof and floor. The room is isolated from the surrounding structure by resilient mountings and seals, ensuring good acoustic isolation. Reverberation time measurements are done to calibrate the reverberation room.

At least three test samples are installed at predetermined positions. The tapping machine is placed, in turn, immediately each side of the first test sample/position and operated on the bare concrete roof slab. With the tapping machine operating on the bare slab, the resulting sound pressure levels in the room are sampled using a spaced array of microphones connected to a real time analyser. The signal is filtered into one-third octave bandwidths, integrated and averaged.

The procedure is then repeated on the bare concrete slab immediately either side of each of the other sample positions. The individual values for the different positions are arithmetically averaged to give the impact sound pressure level ($L_{i,0}$). This is corrected to a reference room absorption, referred to as normalising, to give the normalised impact sound pressure levels ($L_{n,0}$) for the bare concrete slab.

$$L_{n,0}=L_{i,0}+10\log\frac{A}{A_{ref}} \text{ in decibels}$$

Where A is the actual absorption of the test chamber A_{ref} is the reference room absorption of 10m².

The whole procedure is then repeated in turn on each of the samples to obtain the normalised impact sound pressure levels with covering (L_i) and the corresponding normalised levels (L_n).

The reduction of impact sound pressure level (improvement of impact sound insulation) ΔL, for a given frequency band is determined as follows:

$$\Delta L = L_{n0} - L_n$$

The Weighted Impact Sound Improvement Index ΔL_w, is a single figure rating of impact sound reduction and is calculated in accordance with BS EN ISO 717-2.

The impact sound pressure levels for the test floor with test sample depend to small extent on the particular test floor itself. To standardise these levels they are adjusted by calculation to what they would be if the bare concrete slab were replaced by a reference floor. The impact sound pressure levels that would be produced on the bare reference floor ($L_{n,0}$) are defined in BS EN ISO 717-2. Using these, the impact sound pressure levels for the sample on the reference floor ($L_{n.r}$) and the corresponding weighted level ($L_{n,w,r}$) are calculated in accordance with the same standard.

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Appendix C – Measurement Uncertainty

BS EN ISO 10140-3: 2021; BS EN ISO 10140-1:2021 (Appendix H) – TP32

The following values of uncertainty are based on a standard uncertainty multiplied by a coverage factor of k = 2, which provides a level of confidence of approximately 95%.

Frequency, Hz	Uncertainty, ± dB
100	1.2
125	1.2
160	1.2
200	1.2
250	1.2
315	0.8
400	0.8
500	0.8
630	0.8
800	1.2
1000	1.2
1250	1.2
1600	1.5
2000	2.2
2500	2.2
3150	2.2

Acoustics
Air Quality
Carbon & Net Zero
Lab & Site Testing
Monitoring
Noise & Vibration
Odour & Dust
Sustainability

The services listed below are services which SRL can offer. They are not covered by our UKAS accreditation except for some of our Lab and site testing. For further details please contact us directly.

Acoustics

Since 1967, our team of acoustic consultants has played a key role in major projects where noise or vibration is an issue, in the UK and across the globe – whether it's planning, performance prediction, design, inspection, troubleshooting, measurement or commissioning.

Air Quality

We offer a comprehensive service to model, monitor and analyse air quality, delivering assessments for a broad range of projects and purposes, for both private and public sector clients.

Carbon & Net Zero

Top of the agenda is tackling energy and carbon reduction to limit the impact of climate change. Our team of consultants will help you to achieve your sustainability objectives.

Lab & Site Testing

Design based on test data will always achieve the best results – and that's why we offer a wide range of acoustic testing at our independently accredited laboratories, as well as on-site testing to support live projects.

Monitoring

Our specialist services to monitor and assess noise, vibration, dust, air quality and odour employ the latest technology to provide remote access to data, helping to address issues quickly and to protect our clients.

Noise & Vibration

Ensuring noise and vibration does not exceed agreed levels is an important part of our environmental management services, using state-of-the-art technology to access real-time data remotely, to enable swift remedial action if required.

Odour & Dust

As part of our portfolio of environmental monitoring services, we offer specialist advice on the adverse impact of dust and odour across a range of projects including construction, waste handling and mineral extraction.

Sustainability

Minimising the impact on the environment is at the centre of today's business objectives. Our specialist services help our clients to fulfil their obligations, whether it's a BREEAM assessment, Energy Carbon Reduction or Net Zero.