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LAB N° 0699

**Test report n° 18-570-001/E**

***Notified Body CPR n. 2384***
**Date of issue, 26/01/2018**


| | |
|---|---|
| **Sample description** | **Floor covering made of a laminate, thickness 7 mm, glue with one-component, solvent free, ready-to-use elastic polyurethane adhesive to acoustic insulation ISOLGOMMA Sylpro 3, thickness 3 mm, floating on a reference concrete slab, thickness 140 mm.** |
| **Client** | **ISOLGOMMA S.r.l. Via dell'Artigianato Z.I. 36020 Albettone (VI) Italy** |
| **Origin** | **Factory of Albettone (VI) Italy** |
| **Kind of sample** | **Floor covering** |
| **Sampling by** | **Client** |
| **Sampling date** | **N.d.** |
| **Sampler** | **Client** |
| **Reciving sample date** | **24/01/18** |
| **Acceptance number** | **18-570** |
| **Acceptance date** | **25/01/18** |
| **Test started on** | **25/01/18** |
| **Test ended on** | **25/01/18** |
| **Object** | **UNI EN ISO 10140-1:2016 + UNI EN ISO 10140-3:2015 + UNI EN ISO 10140-4:2010 + UNI EN ISO 717-2:2013**<br>**Laboratory measurement of impact sound insulation** |

Thermo-Acoustic sector Director: **Ing. Rinaldi Cristian**

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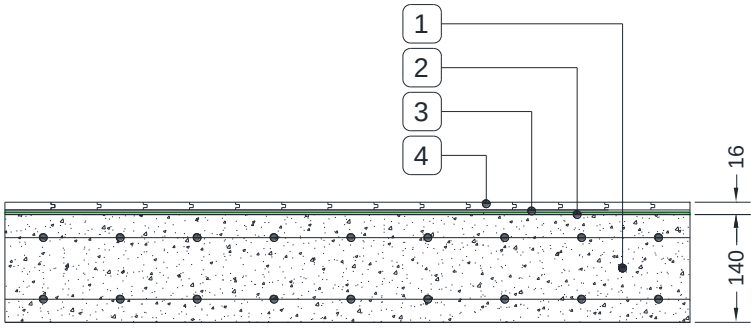
**LABORATORY MEASUREMENT AIRBORNE SOUND INSULATION OF BUILDING ELEMENTS (STANDARD SERIES ISO 10140)**

## 1. SAMPLE DESCRIPTION#

Floor covering made of a laminate, thickness 7 mm, mass per unit area 5,9 kg/m$^2$, glue with one-component, solvent free, ready-to-use elastic polyurethane adhesive to acoustic insulation Isolgomma Sylpro 3, thickness 3 mm, density 730 kg/m$^3$, floating on a reference concrete slab, thickness 140 mm.

Test specimen mounted by ISOLGOMMA S.r.l.




1. Concrete slab, thickness 140 mm
2. **3 mm acoustic insulation rolls, made of SBR (Stirene Butadiene Rubber) fibres and granules rubber compacted with a polyurethane binder in a hot process. Density is 730 kg/m³.**
3. One-component, solvent free, ready-to-use elastic polyurethane adhesive
4. Laminate floor finishing "Naturale 3S" click system, thickness 7 mm

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Photo:

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## 2. REFERENCE STANDARDS

For the technical methods of measurement and determination of the indices that define the performance of building elements must be referred to the following ISO standards:

- ISO 10140-1:2016 Acoustics. Laboratory measurement of sound insulation of building elements. Part 1: Application rules for specific products.
- ISO 10140-3:2015 Acoustics. Laboratory measurement of sound insulation of building elements. Part 3: Measurement of impact sound insulation.
- ISO 10140-4:2010 Acoustics. Laboratory measurement of sound insulation of building elements. Part 4: Measurement procedures and requirements.
- ISO 10140-5:2014 Acoustics. Laboratory measurement of sound insulation of building elements. Part 5: Requirements for test facilities and equipment.
- ISO 717-2:2013 Acoustics. Rating of sound insulation in buildings and of building elements. Part 2: Impact sound insulation.

## 3. EQUIPMENT

The measurements were performed using the following instruments:

- sound level meter Larson&Davis 824 (S. N. 2926), preamplifier Larson&Davis PRM 902 (S. N. 3068), microphone Larson&Davis 2541 (S. N. 7820) (LAT n° 68 tarature certificate of 15/12/2016 n° 38444-A);
- calibrator Larson&Davis CAL 200 (S. N. 4057) (LAT n° 224 tarature certificate of 18/10/2016 n° 16-3537-CAL);
- omnidirectional source Svantek;
- amplifier/ preamplifier with generator of pink noise Svantek;
- standard tapping machine Look Line EM50 ;
- tape measure IDF (S. N. 10/317);
- thermohygrometer Oregon Scientific ICE ALERT (matr. 09A14);
- barometer Delta Ohm S.r.l. mod. HD9908TBARO (S. N. 05020942).

All the equipment and the measurement chain is to meet the requirements in class 1 of EN, we proceeded to the calibration of equipment before and after each series of measurements.

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## 4. TEST ROOMS

The standard tapping machine has been placed in 4 positions on the floor. Sound pressure levels were measured in the receiving room in 6 positions, in the frequency range between the 1/3 octave bands of 100 and 5000 Hz, for a total of 24 measurements.

The reverberation times were measured by the method of the decay of a stationary interrupted source. The dodecahedral source was placed in two positions and the microphone in three positions, repeating the measurement two times, for a total of 12 measurements. The background noise has been measured in order to make the correction of the measured values.

The measurements were made with reference to the procedure and test modes defined by the set of rules ISO 10140.

## 5. RESULTS

The normalized impact sound pressure level without covering is evaluated from:

$L_{n0}=L_{i0}+10\lg(A_{20}/A_0)$ [dB]

where:
$L_{i0}$ is the average sound pressure level in the receiving room, without covering [dB];
$A_{20}$ is the equivalent sound absorption area in the receiving room, without covering = $(55,3/c_0)(V/T_0)$ [$m^2$];
$c_0$ is the sound speed in the receiving room, without covering = $331+0,6t_0$ [m/s];
$t_0$ is the average temperature in the receiving room, without covering [°C];
$T_0$ is the reverberation time in the receiving room, without covering [s];
$V$ is the receiving room volume [$m^3$];
$A_0$ is the reference equivalent sound absorption area = 10 [$m^2$].

The normalized impact sound pressure level with covering is evaluated from:

$L_n=L_i+10\lg(A_2/A_0)$ [dB]

where:
$L_i$ is the average sound pressure level in the receiving room, with covering [dB];
$A_2$ is the equivalent sound absorption area in the receiving room, with covering = $(55,3/c)(V/T)$ [$m^2$];
$c$ is the sound speed in the receiving room, with covering = $331+0,6t$ [m/s];
$t$ is the average temperature in the receiving room, with covering [°C];
$T$ is the reverberation time in the receiving room, with covering [s].

The reduction of impact sound pressure level is evaluated from:

$\Delta L=L_{n0}-L_n$ [dB]

$L_{n,w}$, and $C_I$ are calculated according to ISO 717-2 Standard.

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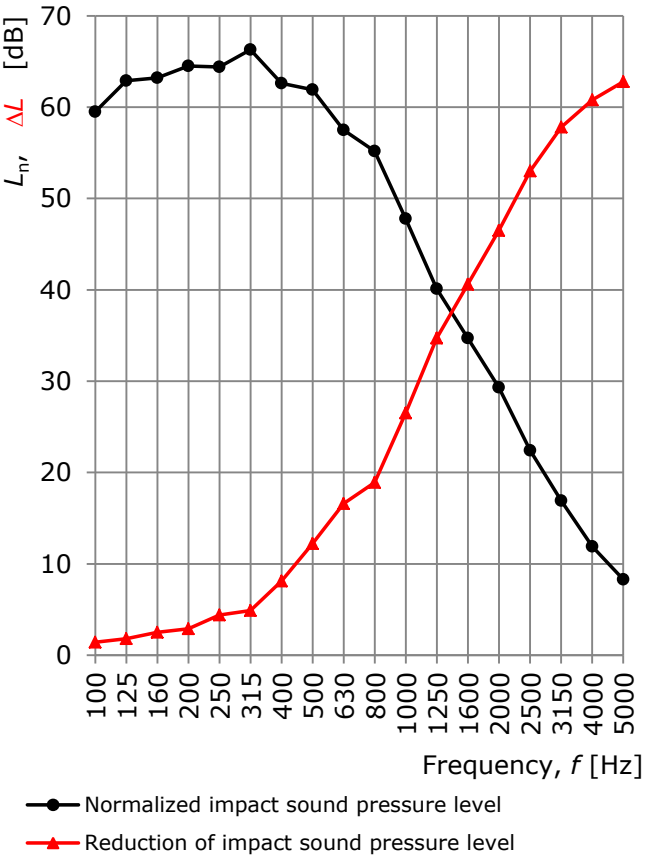
Test specimen area = 12,528 $m^2$
Transmitting room temperature = 16,3 °C ± 0,4 °C;
Receiving room temperature = 16,5 °C ± 0,4 °C
Transmitting room relative umidity = 59% ± 2 %;
Receiving room relative umidity = 57 % ± 2 %
Static pressure = 101,10 kPa ± 0,06 kPa
Transmitting room volume = 53,9 $m^3$
Receiving room volume = 65,5 $m^3$

| Frequency $f$ [Hz] | $L_{n0}$ One third Octave band [dB] | $L_n$ One third Octave band [dB] | $\Delta L$ One third Octave band [dB] |
|---|---|---|---|
| 100 | 60.9 | 59.5 | 1.4 |
| 125 | 64.7 | 62.9 | 1.8 |
| 160 | 65.7 | 63.2 | 2.5 |
| 200 | 67.4 | 64.5 | 2.9 |
| 250 | 68.8 | 64.4 | 4.4 |
| 315 | 71.2 | 66.3 | 4.9 |
| 400 | 70.7 | 62.6 | 8.1 |
| 500 | 74.1 | 61.9 | 12.2 |
| 630 | 74.1 | 57.5 | 16.6 |
| 800 | 74.1 | 55.2 | 18.9 |
| 1000 | 74.3 | 47.8 | 26.5 |
| 1250 | 74.8 | 40.1 | 34.7 |
| 1600 | 75.3 | 34.7 | 40.6 |
| 2000 | 75.8 | 29.3 | 46.5 |
| 2500 | 75.4 | 22.4 | 53.0 |
| 3150 | 74.7 | 16.9 | 57.8 |
| 4000 | 72.7 | 11.9 | 60.8 |
| 5000 | 71.1 | 8.3 | 62.8 |




Rating according to ISO 717-2 Standard:

**$L_{n,w,0}$ ($C_I$)= 81 (-11) dB**

**$L_{n,w}$ ($C_I$)= 58 (0) dB**

**$\Delta L_w$ = 19 dB**

**$\Delta L_{lin}$ = 8 dB**

$C_{I,\Delta}$ = -11 dB

$C_{I,r}$ = 0 dB

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

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