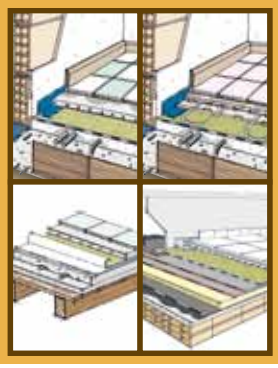
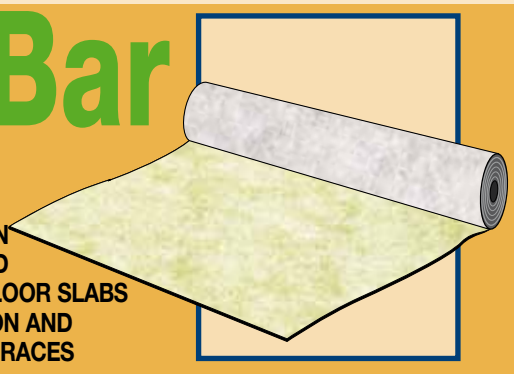


FONOSTOPBar



MULTI-FUNCTIONAL DOUBLE LAYER ACOUSTIC INSULATION AGAINST FOOT TRAFFIC NOISE WITH HIGH RESILIENCE AND MECHANICAL RESISTANCE FOR INDOOR AND OUTDOOR FLOOR SLABS WITH FLOATING FLOORS. IT ALSO WORKS AS A PROTECTION AND SEPARATION SHEET FOR THE WATERPROOF LAYER OF TERRACES

CHARACTERISTICS	IMPACT ON THE ENVIRONMENT		
ACOUSTIC INSULATION	ECO GREEN	RECYCLABLE	NON-DANGEROUS WASTE

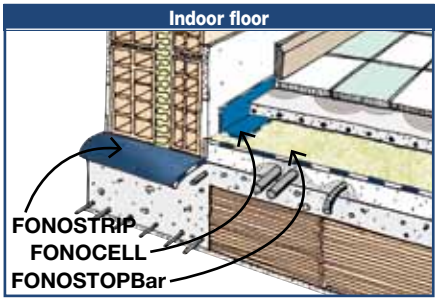
PROBLEM

The installation of resilient material between a floating screed, on which any type of flooring can be laid, and the load-bearing floor slab, reduces the spreading of impact noise or foot traffic noise (**ΔLw**) and increases insulation against airborne noise (**ΔRw**). It also represents the most flexible and effective insulation technique available.
The levels of insulation against foot traffic noise imposed by DPCM dated 5th December 1997 (Premier's Decree) determine the need to avail of insulating materials of maximum efficiency but that are thin enough to be compatible with the parameters usually foreseen in the plans of the building. Furthermore, seeing as the acoustic specifications are measured on site, such insulation materials must also not move while laying the floorings. If these are then laid on rough supports or lightened yielding foundations, they must also be particularly resistant to the typical situations of major building sites where the material is subject to heavy traffic with little attention paid by the various builders.

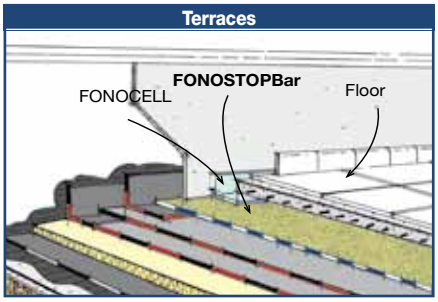
SOLUTION

The need to increase perforation resistance of materials for insulating floor slabs against foot traffic noise with the "floating floor technique" is particularly strong in major work sites, but this often translates into an increase of the material's dynamic stiffness, which consequently leads to a reduction in the insulating properties.
INDEX has designed a new insulation product against foot traffic noise, named **FONOSTOPBar**. It is light (about 1 kg/m²), but offers high mechanical resistance, privileging resistance to punching. Moreover, in addition to increasing resistance to static punching, in order also to increase resistance to dynamic punching, the elasticity of the material had to be increased. This simultaneously resulted in the beneficial effect of achieving an optimum dynamic stiffness to such an extent to also obtain high acoustic insulation performance, superior to most of the rival materials on the same market section.
FONOSTOPBar is INDEX's new acoustic insulation product against foot traffic noise. It is supplied in rolls. Its top face consists of a thin protective foil in non-woven thermally fixed polyester fabric.
This foil is a protective barrier against stress caused by site traffic and laying procedures of the screed on lightened, yielding foundations, but is also a shield against perforation caused by the roughness of the floor slab if laying in a double face-opposite-face layer.
The bottom face is made up of a sound-resilient layer in non-woven polyester fabric with special "elastic needling", being an exclusive INDEX project, which guarantees that thickness is maintained under load and also an excellent elastic reaction.
The fibres are not irritant, they are flexible and do not crumble when compressed or folded.
FONOSTOPBar also has a high ultimate elongation rating, which enables it to adapt to uneven laying surfaces without breaking.
FONOSTOPBar is supplied in rolls of 1×15 meters. The lining of the top face of the product prevents the liquid mortar - when the screed is laid - from encapsulating the fibres of the elastic non-woven fabric underneath.
This would eliminate its insulating properties, while the free fibres of the fabric underneath adhere to the foundations and prevent the sheet from moving when the upper layers are being laid, thus guaranteeing the certainty of correct laying on site.

Indoor floor



Terraces



METHOD OF USE AND PRECAUTIONS

SINGLE LAYER APPLICATIONS. The rolls of **FONOSTOPBar** are to be unrolled in their natural unrolling direction with the bottom face covered with softer non-woven fabric facing the laying surface. The **FONOSTOPBar** sheets should not be overlapped, but should be brought close to each other and the joining lines must always be sealed with adhesive SIGILTAPE.
The sheets will cover the whole floor slab and are to be blocked and trimmed-off at the foot of the perimeter walls of the room to be insulated.
To insulate the floating screed from perimeter walls, the latter are to be lined with 10 cm of the extruded polyethylene separation self-adhesive FONOCELL strip, to limit the thickness of the screed, which will be turned over by 5 cm and glued on the insulation material laid on the floor slab where it will be further secured with adhesive SIGILTAPE.
Note. Make sure you lay FONOCELL on terraces only after the waterproof coat has been protected by a layer of plaster mortar reinforced with a metal net and make sure to seal the gap between the flooring and the skirting board with a flexible sealant.

DOUBLE LAYER APPLICATIONS. If you are installing **FONOSTOPBar** in a double layer, the first layer will be laid on site in the opposite direction to the natural unrolling direction of the roll, with the bottom face covered with softer non-woven fabric facing upwards. The **FONOSTOPBar** sheets should not be overlapped, but should be brought close to each other. The sheets of the first layer will cover the whole floor slab and are to be blocked and trimmed-off at the foot of the perimeter walls of the room to be insulated but not sealed. The second layer will then be unrolled parallel with the first layer, in its natural unrolling direction, making sure to offset it to lay it over the joining lines of the first layer. The laying and sealing methods of the second sheet will be those already explained for single layer applications.

FONOSTOPBar

Thickness	6,5 mm approx	
Roll size	1,00×15,00 m	
Mass per unit area	1,0 kg/m² approx	
Heat capacity per unit area (1)	1,650 KJ/m²K	
Thermal resistance **R**	0,115 m² K/W (2)	
Dynamic stiffness • FONOSTOPBar single layer • FONOSTOPBar opposite double layer	Apparent dynamic stiffness s'_t = 9 MN/m³ s'_t = 5 MN/m³	Dynamic stiffness s' = 29 MN/m³ s' = 18 MN/m³
Theoretical estimate of the reduction level in foot traffic noise (2) • FONOSTOPBar single-layer • FONOSTOPBar double layer	 ΔLw = 26 dB ΔLw = 29 dB	
Compression tests under constant load of 200 kg/m² (EN 1606) • FONOSTOPBar single-layer • FONOSTOPBar double layer (1)	Reduction of thickness ≤1 mm approx ≤1 mm approx	
Compression capability (EN 12431:2000 - Determination of thickness) • FONOSTOPBar single-layer • FONOSTOPBar double layer (1)	 ≤2 mm ≤3 mm	
Resistance • to static loading (EN 12730) • to impact (EN 12691)	 35 kg 20 cm	
Impermeability (UNI-EN 13111)	Waterproof	
Aqueous vapour diffusion coefficient	μ = 8.000	
Thermal conductivity coefficient λ	0,045 W/mK	

(1) Apparent value obtained by calculating values of every component expressed per unit area of whole product (m²). (2) Value established on the material subjected to a load of 1 KPa (100 kg/m²)
(3) FONOSTOPBar laid in a double layer with white faces set opposite each other.
WARNING: only the dynamic stiffness values **s'**, ringed in red, are values useful for an estimate calculation conforming to standard EN 12354-2.
(4) Simplified calculation method TR UNI 11175 (Guide to the Standards of the UNI EN 12354 series for predicting the acoustic performance of buildings) for screeds with surface density of 100 kg/m².
La rigidità dinamica è stata calcolata nel laboratorio di Acustica applicata della INDEX S.p.A. dopo la misura della rigidità dinamica e della permeabilità all'aria.

MODULAR ACOUSTIC INSULATION AGAINST FOOT TRAFFIC NOISE

With rigid cement floor slabs, in the most frequently encountered cases, just one layer of **FONOSTOPBar** is sufficient to respect the limits imposed by the decree for residential buildings and hotels, whereas for superior requirements, the insulation effectiveness can be increased by laying two layers of **FONOSTOPBar**.

THEORETICAL ESTIMATE OF THE REDUCTION LEVEL IN FOOT TRAFFIC NOISE

Example of simplified calculation method
TR UNI 11175 - (Guide to the Standards of UNI EN 12354 series for predicting the acoustic performance of buildings) for
FLOOR SLAB of 20+4 IN CLAY-CEMENT MIX OF 300 kg/m²
LIGHTENED FOUNDATION WITH DENSITY OF 300 kg/m³
thickness 10 cm ($L_{n,w,eq}$ = 76 dB)
SCREEDS WITH SURFACE DENSITY m'=100 kg/m²
Calculation of the **fo** resonance frequency of the floating screed system, resilient layer:

FONOSTOPBar single-layer

$$fo = 160\sqrt{\frac{s'}{m'}} = 160\sqrt{\frac{29}{100}} = 86 \text{ Hz}$$

$$\Delta L_w = 30 \text{ Log } (\frac{f}{fo}) + 3 = \mathbf{26\ dB}$$

where **f** = 500 Hz (of reference)

$$L_{n,w} = L_{n,w,eq} - \Delta L_w + K \quad \text{where } K = 3$$

$$L_{n,w} = \mathbf{53\ dB}$$

FONOSTOPBar double-layer

$$fo = 160\sqrt{\frac{s'}{m'}} = 160\sqrt{\frac{18}{100}} = 68 \text{ Hz}$$

$$\Delta L_w = 30 \text{ Log } (\frac{f}{fo}) + 3 = \mathbf{29\ dB}$$

where **f** = 500 Hz (of reference)

$$L_{n,w} = L_{n,w,eq} - \Delta L_w + K \quad \text{where } K = 3$$

$$L_{n,w} = \mathbf{50\ dB}$$

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ANIT Associated

The data in this publication is the result of laboratory tests or observations on site and this does not guarantee the repeatability of the results in equivalent systems.

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