PIANO

CE
ETA-23/0193

RESILIENT SOUNDPROOFING PROFILE

CERTIFIED, PRACTICAL AND CONVENIENT

PIANO is the new resilient profile that reduces vibrations and provides good acoustic comfort, both in lightweight floors and in more complex, high-load buildings. Made of expanded and extruded EPDM blend, it is available in five versions. The elastic mix is able to compensate for expansion of the timber and structure, ensuring high durability and stability against chemical attack and UV radiation. In addition, the compact cross-section makes it more stable when crushed.

PIANO is tested and certified for use as a desolidarisation and mechanical interruption layer between building materials.

The acoustic performance tested in various applications ensures a noise reduction of 4-5 dB with a good cost-performance balance.

COMPLETE RANGE

Different versions are available to cover a wide load range, from floating floors to multi-storey buildings.

SMART

Pre-cut in some versions to obtain more widths with fewer product codes. Although it comes in various colours, it can be installed between visible elements as it masks itself in the shadow of the gap.

DURABLE

Extruded and expanded EPDM blend to optimise sound absorption. It offers high chemical stability and is VOC-free.

EASY INSTALLATION

The different colours and moulds on the profiles make it easier to choose and identify the profile, both during installation and on site. Dry installation with mechanical fastening.

CODES AND DIMENSIONS

CODE	B	L	s	*B*	*L*	*s*	pcs
	[mm]	[m]	[mm]	*[in]*	*[ft]*	*[in]*	
PIANOA4040	80	10	6	*3 1/8*	*33*	*1/4*	1
PIANOA5050	100	10	6	*4*	*33*	*1/4*	1
PIANOA6060	120	10	6	*4 3/4*	*33*	*1/4*	1
PIANOA140	140	10	6	*5 1/2*	*33*	*1/4*	1
PIANOB4040	80	10	6	*3 1/8*	*33*	*1/4*	1
PIANOB5050	100	10	6	*4*	*33*	*1/4*	1
PIANOB6060	120	10	6	*4 3/4*	*33*	*1/4*	1
PIANOB140	140	10	6	*5 1/2*	*33*	*1/4*	1
PIANOC080	80	10	6	*3 1/8*	*33*	*1/4*	1
PIANOC100	100	10	6	*4*	*33*	*1/4*	1
PIANOC120	120	10	6	*4 3/4*	*33*	*1/4*	1
PIANOC140	140	10	6	*5 1/2*	*33*	*1/4*	1
PIANOD080	80	10	6	*3 1/8*	*33*	*1/4*	1
PIANOD100	100	10	6	*4*	*33*	*1/4*	1
PIANOD120	120	10	6	*4 3/4*	*33*	*1/4*	1
PIANOD140	140	10	6	*5 1/2*	*33*	*1/4*	1
PIANOE080	80	10	6	*3 1/8*	*33*	*1/4*	1
PIANOE100	100	10	6	*4*	*33*	*1/4*	1
PIANOE120	120	10	6	*4 3/4*	*33*	*1/4*	1
PIANOE140	140	10	6	*5 1/2*	*33*	*1/4*	1

PRODUCT COMPARISON

products	thickness	acoustic improvement $\Delta_{l,ij}$ [1]	compressive modulus E_c	acoustic load / maximum applicable load
PIANO A 	**6** mm *1/4 in*	**> 4** dB	**0,23** N/mm² *33 psi*	acoustic load [N/mm²]: **0,008** – **0,052** maximum applicable load [N/mm²]: 0,008 – 0,15
PIANO B 	**6** mm *1/4 in*	**> 4** dB	**1,08** N/mm² *157 psi*	acoustic load [N/mm²]: **0,04** – **0,286** maximum applicable load [N/mm²]: 0,04 – 0,85
PIANO C 	**6** mm *1/4 in*	**> 4** dB	**7,92** N/mm² *1449 psi*	acoustic load [N/mm²]: **0,26** – **1,4** maximum applicable load [N/mm²]: 0,26 – 12,07
PIANO D 	**6** mm *1/4 in*	**> 4** dB	**22,1** N/mm² *3205 psi*	acoustic load [N/mm²]: **1,2** – **2,28** maximum applicable load [N/mm²]: 1,2 – 16,9
PIANO E 	**6** mm *1/4 in*	**> 4** dB	**24,76** N/mm² *3591 psi*	acoustic load [N/mm²]: **1,8** – **3,2** maximum applicable load [N/mm²]: 1,8 – 17,07

[1] $\Delta_{l,ij} = K_{ij,with} - K_{ij,without}$. See the manual for more information on configuration.

LEGEND:

load for acoustic optimisation (resonance frequency 20-30 Hz)

compressive stress at 3 mm (ultimate limit state)

PIANO A

CODES AND DIMENSIONS

CODE	B [mm]	L [m]	s [mm]	*B [in]*	*L [ft]*	*s [in]*	pcs
PIANOA4040	80	10	6	*3 1/8*	*33*	*1/4*	1
PIANOA5050	100	10	6	*4*	*33*	*1/4*	1
PIANOA6060	120	10	6	*4 3/4*	*33*	*1/4*	1
PIANOA140	140	10	6	*5 1/2*	*33*	*1/4*	1

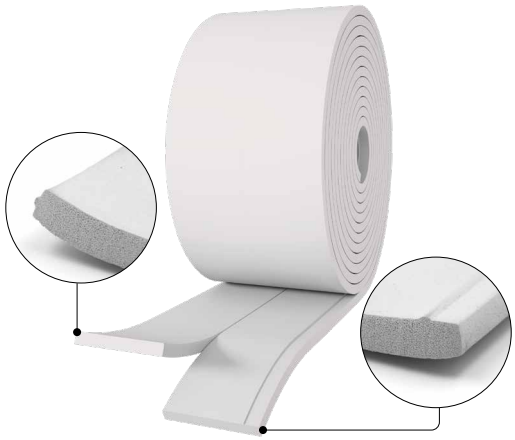


TABLE OF USE[1]

CODE	B [mm]	load for acoustic optimisation[2] [kN/m] *[lbf/ft]* min		max		compression for acoustic optimisation[2] [N/mm²] *[psi]* min	max	reduction [mm] *[mil]* min	max	*compressive stress at 3 mm (ultimate limit state)* [N/mm²] *[psi]*
PIANOA4040	80	0,64	*472*	4,16	*3068*	0,008 *1.2*	0,052 *7.5*	0,2 *8*	1,35 *53*	***0,15*** *22*
	40 (divided)	0,32	*236*	2,08	*1534*					
PIANOA5050	100	0,8	*590*	5,2	*3835*					
	50 (divided)	0,4	*295*	2,6	*1918*					
PIANOA6060	120	0,96	*708*	6,24	*4602*					
	60 (divided)	0,48	*354*	3,12	*2301*					
PIANOA140	140	1,12	*826*	7,28	*5369*					

[1] The load ranges reported here are optimised with respect to the acoustic and static behaviour of the material in compression. However, it is possible to use profiles with loads outside the indicated range if the resonance frequency of the system and the deformation of the profile at the ultimate limit state are assessed. See the manual for transmissibility and attenuation graphs.

[2] Resilient profiles must be properly loaded in order to isolate medium/low frequency vibrations transmitted structurally. It is advisable to assess the load according to the operating conditions because the building must be acoustically insulated under everyday load conditions (add the value of the permanent load to 50% of the characteristic value of the incidental load $Q_{linear} = q_{gk} + 0.5\ q_{vk}$).

TECHNICAL DATA

Properties	standard	value	*USC conversion*
Acoustic improvement $\Delta_{l,ij}$[3]	ISO 10848	> 4 dB	-
Compressive modulus E_c	ISO 844	0,23 MPa	*33 psi*
Dynamic elastic modulus $E'_{10Hz\ -E'50Hz}$	ISO 4664-1	0,5 MPa- 0,5 MPa	*73 psi - 73 psi*
Damping factor $tan\delta_{10Hz}$ - $tan\delta_{50Hz}$	ISO 4664-1	0,19 - 0,24	-
Compressive stress at 1 mm (*1/32 in*)strain σ_{1mm}	ISO 844	0,04 N/mm²	*6 psi*
Compressive stress at 2 mm (*1/16 in*) strain σ_{2mm}	ISO 844	0,08 N/mm²	*12 psi*
Compressive stress at 3 mm (*1/8 in*) strain σ_{3mm}	ISO 844	0,15 N/mm²	*22 psi*
Reaction to fire	EN 13501-1	class E	-
Water absorption after 48h	ISO 62	4,25%	-

[3] $\Delta_{l,ij} = K_{ij,with} - K_{ij,without}$. See the manual for more information on configuration.

PERFORMANCE

Acoustic improvement tested:

$\Delta_{l,ij}^{(3)}$: **> 4** dB

Maximum applicable load (deformation 3 mm):

0,15 N/mm²

Acoustic load:

from **0,008** to **0,052** N/mm²

PIANO B

CODES AND DIMENSIONS

CODE	B [mm]	L [m]	s [mm]	*B [in]*	*L [ft]*	*s [in]*	pcs
PIANOB4040	80	10	6	*3 1/8*	*33*	*1/4*	1
PIANOB5050	100	10	6	*4*	*33*	*1/4*	1
PIANOB6060	120	10	6	*4 3/4*	*33*	*1/4*	1
PIANOB140	140	10	6	*5 1/2*	*33*	*1/4*	1

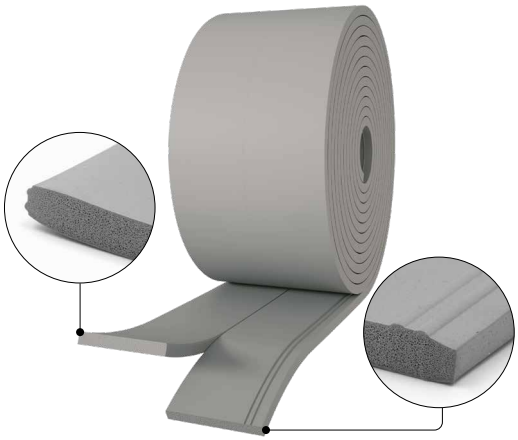


TABLE OF USE[1]

CODE	B [mm]	load for acoustic optimisation[2] [kN/m] *[lbf/ft]* min		max		compression for acoustic optimisation[2] [N/mm²] *[psi]* min	max	reduction [mm] *[mil]* min	max	*compressive stress at 3 mm (ultimate limit state)* [N/mm²] *[psi]*
PIANOB4040	80	3,2	*2360*	21,6	*15931*	0,04 *5.8*	0,27 *39.2*	0,2 *8*	1,49 *59*	***0,85*** *123*
	40 (divided)	1,6	*1180*	10,8	*7966*					
PIANOB5050	100	4	*2950*	27	*19914*					
	50 (divided)	2	*1475*	13,5	*9957*					
PIANOB6060	120	4,8	*3540*	32,4	*23897*					
	60 (divided)	2,4	*1770*	16,2	*11949*					
PIANOA140	140	5,6	*4130*	37,8	*27880*					

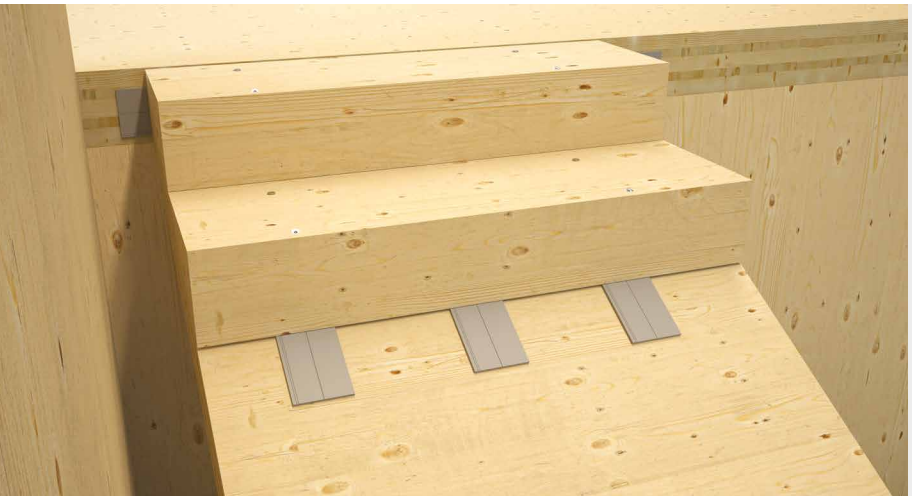
[1] The load ranges reported here are optimised with respect to the acoustic and static behaviour of the material in compression. However, it is possible to use profiles with loads outside the indicated range if the resonance frequency of the system and the deformation of the profile at the ultimate limit state are assessed. See the manual for transmissibility and attenuation graphs.

[2] Resilient profiles must be properly loaded in order to isolate medium/low frequency vibrations transmitted structurally. It is advisable to assess the load according to the operating conditions because the building must be acoustically insulated under everyday load conditions (add the value of the permanent load to 50% of the characteristic value of the incidental load $Q_{linear} = q_{gk} + 0.5\ q_{vk}$).

TECHNICAL DATA

Properties	standard	value	*USC conversion*
Acoustic improvement $\Delta_{l,ij}$[3]	ISO 10848	> 4 dB	-
Compressive modulus E_c	ISO 844	1,08	*157 psi*
Dynamic elastic modulus $E'_{10Hz\ -E'50Hz}$	ISO 4664-1	1,9 MPa - 2,1 MPa	*276 psi - 305 psi*
Damping factor $tan\delta_{10Hz}$ - $tan\delta_{50Hz}$	ISO 4664-1	0,3 - 0,4	-
Compressive stress at 1 mm (*1/32 in*)strain σ_{1mm}	ISO 844	0,14 N/mm²	*20 psi*
Compressive stress at 2 mm (*1/16 in*) strain σ_{2mm}	ISO 844	0,31 N/mm²	*45 psi*
Compressive stress at 3 mm (*1/8 in*) strain σ_{3mm}	ISO 844	0,85 N/mm²	*123 psi*
Reaction to fire	EN 13501-1	class E	-
Water absorption after 48h	ISO 62	1,40%	-

[3] $\Delta_{l,ij} = K_{ij,with} - K_{ij,without}$. See the manual for more information on configuration.



PERFORMANCE

Acoustic improvement tested:

$\Delta_{l,ij}^{(3)}$: **> 4** dB

Maximum applicable load (deformation 3 mm):

0,85 N/mm²

Acoustic load:

from **0,04** to **0,27** N/mm²

PIANO C

CODES AND DIMENSIONS

CODE	B [mm]	L [m]	s [mm]	*B [in]*	*L [ft]*	*s [in]*	pcs
PIANOC080	80	10	6	*3 1/8*	*33*	*1/4*	1
PIANOC100	100	10	6	*4*	*33*	*1/4*	1
PIANOC120	120	10	6	*4 3/4*	*33*	*1/4*	1
PIANOC140	140	10	6	*5 1/2*	*33*	*1/4*	1

TABLE OF USE[1]

CODE	B [mm]	load for acoustic optimisation[2] [kN/m] *[lbf/ft]* min		max		compression for acoustic optimisation[2] [N/mm²] *[psi]* min	max	reduction [mm] *[mil]* min	max	*compressive stress at 3 mm (ultimate limit state)* [N/mm²] *[psi]*
PIANOC080	80	9,6	*7081*	112	*82607*					
PIANOC100	100	12	*8851*	140	*103259*	0,12 *17.4*	1,4 *203.1*	0,12 *5*	0,63 *25*	***12,07*** *1751*
PIANOC120	120	14,4	*10621*	168	*123910*					
PIANOC140	140	16,8	*12391*	196	*144562*					

[1] The load ranges reported here are optimised with respect to the acoustic and static behaviour of the material in compression. However, it is possible to use profiles with loads outside the indicated range if the resonance frequency of the system and the deformation of the profile at the ultimate limit state are assessed. See the manual for transmissibility and attenuation graphs.

[2] Resilient profiles must be properly loaded in order to isolate medium/low frequency vibrations transmitted structurally. It is advisable to assess the load according to the operating conditions because the building must be acoustically insulated under everyday load conditions (add the value of the permanent load to 50% of the characteristic value of the incidental load $Q_{linear} = q_{gk} + 0.5\ q_{vk}$).

TECHNICAL DATA

Properties	standard	value	*USC conversion*
Acoustic improvement $\Delta_{l,ij}$[3]	ISO 10848	> 4 dB	-
Compressive modulus E_c	ISO 844	7,90 MPa	*1449 psi*
Dynamic elastic modulus $E'_{10Hz\ -E'50Hz}$	ISO 4664-1	9,91 MPa - 11,61 MPa	*1437 psi - 1684 psi*
Damping factor $\tan\delta_{10Hz}$ - $\tan\delta_{50Hz}$	ISO 4664-1	0,3 - 0,3	-
Compressive stress at 1 mm (*1/32 in*)strain σ_{1mm}	ISO 844	1,50 N/mm²	*218 psi*
Compressive stress at 2 mm (*1/16 in*) strain σ_{2mm}	ISO 844	3,55 N/mm²	*514 psi*
Compressive stress at 3 mm (*1/8 in*) strain σ_{3mm}	ISO 844	9,23 N/mm²	*1339 psi*
Reaction to fire	EN 13501-1	class E	-
Water absorption after 48h	ISO 62	< 1%	-

[3] $\Delta_{l,ij} = K_{ij,with} - K_{ij,without}$. See the manual for more information on configuration.

PERFORMANCE

Acoustic improvement tested:

$\Delta_{l,ij}^{(3)}$: **> 4** dB

Maximum applicable load (deformation 3 mm):

12,07 N/mm²

Acoustic load:

from **0,12** to **1,4** N/mm²

PIANO D

CODES AND DIMENSIONS

CODE	B [mm]	L [m]	s [mm]	*B [in]*	*L [ft]*	*s [in]*	pcs
PIANOD080	80	10	6	*3 1/8*	*33*	*1/4*	1
PIANOD100	100	10	6	*4*	*33*	*1/4*	1
PIANOD120	120	10	6	*4 3/4*	*33*	*1/4*	1
PIANOD140	140	10	6	*5 1/2*	*33*	*1/4*	1

TABLE OF USE[1]

CODE	B [mm]	load for acoustic optimisation[2] [kN/m] *[lbf/ft]* min		max		compression for acoustic optimisation[2] [N/mm²] *[psi]* min	max	reduction [mm] *[mil]* min	max	*compressive stress at 3 mm (ultimate limit state)* [N/mm²] *[psi]*
PIANOD080	80	96	*70806*	182,4	*134531*					
PIANOD100	100	120	*88507*	228	*168164*	1,2 *174*	2,28 *330.7*	0,33 *13*	0,62 *24*	***16,9*** *2451*
PIANOD120	120	144	*106209*	273,6	*201797*					
PIANOD140	140	168	*123910*	319,2	*235430*					

[1] The load ranges reported here are optimised with respect to the acoustic and static behaviour of the material in compression. However, it is possible to use profiles with loads outside the indicated range if the resonance frequency of the system and the deformation of the profile at the ultimate limit state are assessed. See the manual for transmissibility and attenuation graphs.

[2] Resilient profiles must be properly loaded in order to isolate medium/low frequency vibrations transmitted structurally. It is advisable to assess the load according to the operating conditions because the building must be acoustically insulated under everyday load conditions (add the value of the permanent load to 50% of the characteristic value of the incidental load $Q_{linear} = q_{gk} + 0.5\ q_{vk}$).

TECHNICAL DATA

Properties	standard	value	*USC conversion*
Acoustic improvement $\Delta_{l,ij}$[3]	ISO 10848	> 4 dB	-
Compressive modulus E_c	ISO 844	22,1 MPa	*3205 psi*
Dynamic elastic modulus $E'_{10Hz\ -E'50Hz}$	ISO 4664-1	21,6 MPa - 26 MPa	*3133 psi - 3771 psi*
Damping factor $tan\delta_{10Hz}$ - $tan\delta_{50Hz}$	ISO 4664-1	0,3 - 0,31	-
Compressive stress at 1 mm (*1/32 in*)strain σ_{1mm}	ISO 844	4,4 N/mm²	*638 psi*
Compressive stress at 2 mm (*1/16 in*) strain σ_{2mm}	ISO 844	10,49 N/mm²	*1521 psi*
Compressive stress at 3 mm (*1/8 in*) strain σ_{3mm}	ISO 844	16,9 N/mm²	*2451 psi*
Reaction to fire	EN 13501-1	class E	-
Water absorption after 48h	ISO 62	< 1%	-

[3] $\Delta_{l,ij} = K_{ij,with} - K_{ij,without}$. See the manual for more information on configuration.

PERFORMANCE

Acoustic improvement tested:

$\Delta_{l,ij}^{(3)}$: **> 4** dB

Maximum applicable load (deformation 3 mm):

16,9 N/mm²

Acoustic load:

from **1,2** to **2,28** N/mm²

PIANO E

CODES AND DIMENSIONS

CODE	B [mm]	L [m]	s [mm]	*B [in]*	*L [ft]*	*s [in]*	pcs
PIANOE080	80	10	6	*3 1/8*	*33*	*1/4*	1
PIANOE100	100	10	6	*4*	*33*	*1/4*	1
PIANOE120	120	10	6	*4 3/4*	*33*	*1/4*	1
PIANOE140	140	10	6	*5 1/2*	*33*	*1/4*	1

TABLE OF USE[1]

CODE	B [mm]	load for acoustic optimisation[2] [kN/m] *[lbf/ft]* min		max		compression for acoustic optimisation[2] [N/mm²] *[psi]* min	max	reduction [mm] *[mil]* min	max	*compressive stress at 3 mm (ultimate limit state)* [N/mm²] *[psi]*
PIANOE080	80	144	*106209*	256	*188816*					
PIANOE100	100	180	*132761*	320	*236020*	1,8 *261.1*	3,2 *464.1*	0,44 *17*	0,77 *30*	***17,07*** *2476*
PIANOE120	120	216	*159313*	384	*283224*					
PIANOE140	140	252	*185866*	448	*330428*					

[1] The load ranges reported here are optimised with respect to the acoustic and static behaviour of the material in compression. However, it is possible to use profiles with loads outside the indicated range if the resonance frequency of the system and the deformation of the profile at the ultimate limit state are assessed. See the manual for transmissibility and attenuation graphs.

[2] Resilient profiles must be properly loaded in order to isolate medium/low frequency vibrations transmitted structurally. It is advisable to assess the load according to the operating conditions because the building must be acoustically insulated under everyday load conditions (add the value of the permanent load to 50% of the characteristic value of the incidental load $Q_{linear} = q_{gk} + 0.5\ q_{vk}$).

TECHNICAL DATA

Properties	standard	value	*USC conversion*
Acoustic improvement $\Delta_{l,ij}$[3]	ISO 10848	> 4 dB	-
Compressive modulus E_c	ISO 844	24,76 MPa	*3591 psi*
Dynamic elastic modulus $E'_{10Hz\ -E'50Hz}$	ISO 4664-1	58,3 - 67 MPa	*8456 psi - 9718 psi*
Damping factor $\tan\delta_{10Hz}$ - $\tan\delta_{50Hz}$	ISO 4664-1	0,24 - 0,25	-
Compressive stress at 1 mm (*1/32 in*)strain σ_{1mm}	ISO 844	3,81 N/mm²	*553 psi*
Compressive stress at 2 mm (*1/16 in*) strain σ_{2mm}	ISO 844	8,36 N/mm²	*1213 psi*
Compressive stress at 3 mm (*1/8 in*) strain σ_{3mm}	ISO 844	17,07 N/mm²	*2476 psi*
Reaction to fire	EN 13501-1	class E	-
Water absorption after 48h	ISO 62	< 1%	-

[3] $\Delta_{l,ij} = K_{ij,with} - K_{ij,without}$. See the manual for more information on configuration.

PERFORMANCE

Acoustic improvement tested:

$\Delta_{l,ij}^{(3)}$: **> 4** dB

Maximum applicable load (deformation 3 mm):

17,07 N/mm²

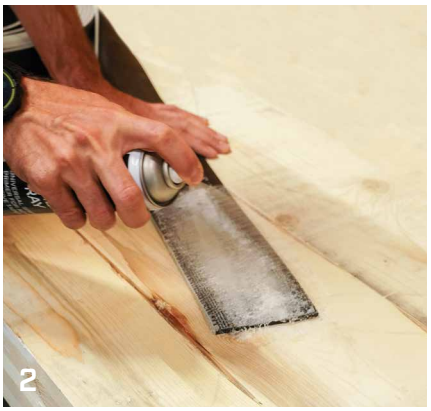
Acoustic load:

from **1,8** to **3,2** N/mm²

PIANO | Recommendations for installation

APPLICATION WITH STAPLES

APPLICATION WITH PRIMER SPRAY



APPLICATION WITH DOUBLE BAND

APPLICATION ON BATTENS

PIANO | Tests carried out

EUROPEAN TECHNICAL ASSESSMENT

he European Technical Assessment (ETA) provides an independent Europe-wide procedure for assessing the essential performance characteristics of non-standard construction products.

- Certified values for application as a resilient profile within structures
- K_{ij} measured for all hardnesses

$\Delta_{l,ij} > 4$ dB

ANTI-VIBRATION

PIANO dampens vibrations in both static and dynamic conditions due to its ability to absorb and dissipate the energy of the system.

Theoretical reduction of **up to 10 dB** when used as a vibration damper

- Application with static loads (e.g. buildings)
- Application with dynamic loads (e.g. machines, bridges)

STATICS AND ACOUSTICS

Rothoblaas promoted a research campaign aimed at characterising the mechanical behaviour of connections in the presence of the resilient profile. Thanks to this project, it was also possible to learn about the influence of PIANO in shear connections and to optimise thickness and material type in order to ensure a perfect cost/performance ratio.

- Influence of PIANO in the presence of screws and nails
- Testing of timber-to-timber joints

possibility of knowing the influence of PIANO in **shear connections**

Use the QR-code to download the complete manual!
www.rothoblaas.com