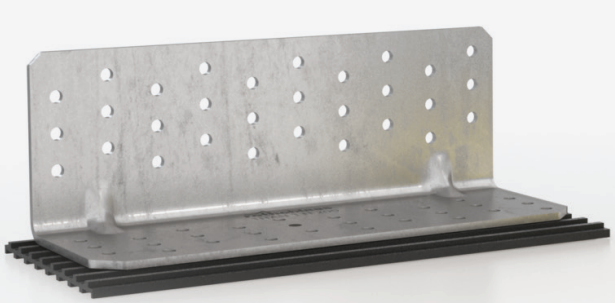
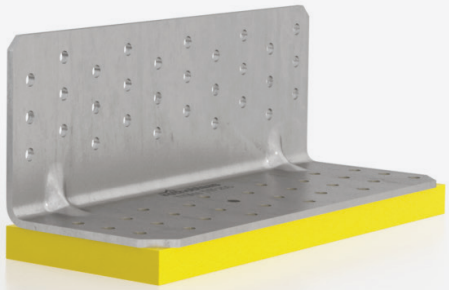
TITAN SILENT

Angle bracket for shear loads with sound insulating profile

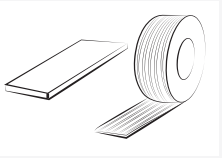
Steel three-dimensional perforated plate with resilient polymeric profile





TWO VERSIONS

Soundproofing structural profiles for TITAN TTF200: Absorber Plate ready to use and Aladin Stripe to be cut on site



ACOUSTIC INSULATION

Significant attenuation of walking excitation and noise transfer, for an excellent acoustic comfort

ACOUSTIC BRIDGES

The excellent shear strength of the angle bracket combined with the soundproofing properties of the plate allow to limit acoustic bridges

TESTED VALUES

Shear strength values and vibration reduction qualities are validated by tests, within the academia and the industrial world

FIELD OF USE

Timber-to-timber joints with reduction of acoustic bridges

- XLAM (Cross Laminated Timber)
- framed structures (platform frame)
- wood-based panels
- LVL (Laminated Veneer Lumber)
- solid timber
- glulam (Glued Laminated Timber)

HOUSING COMFORT

TITAN TTF200 strength combined with the soundproofing performance of the profiles, ensures the reduction of noise associated with walking excitation on timber floors

DECIBEL

In a shear joint realized through angle brackets, the use of TITAN Silent decreases the vibration transfer of more than 3 dB, as demonstrated by laboratory testing

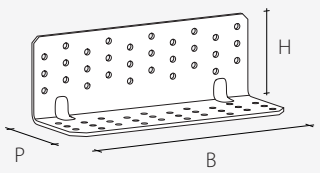
ACOUSTICS / STATICS

Absorber Plate for an excellent acoustic insulation, with little reduction of the mechanical strength. Aladin Stripe for a good sound insulation and a great strength

CODES AND DIMENSIONS

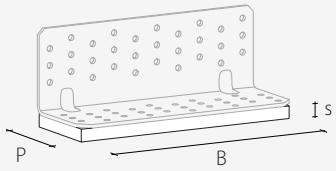
TITAN SILENT

TITAN TTF200



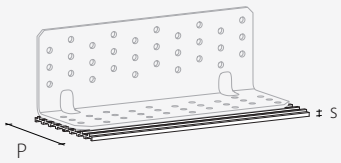
code	type	B [mm]	P [mm]	H [mm]	n_H Ø5 [pcs]	n_V Ø5 [pcs]	s [mm]		pcs/box
TTF200	**TTF200**	200	71	71	30	30	3	•	5

ABSORBER PLATE



code	type	B [mm]	P [mm]	s [mm]	pcs/box
D82361	**yellow**	200	70	12,5	10

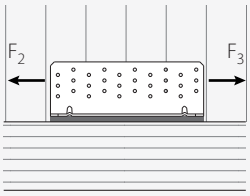
ALADIN STRIPE

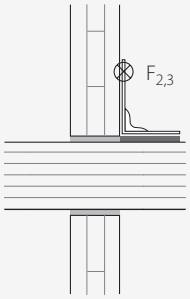


code	type	langth [m]	P [mm]	s [mm]	pcs/box
D82113	**soft xl**	50*	95	5	1
D82123	**extra soft xl**	50*	115	7	1

* to be cut on sitea

EXTERNAL LOADS





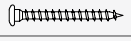
MATERIAL AND DURABILITY

TITAN TTF200: Z275 bright zinc plated DX51D carbon steel Z275.
To be used in Service class 1 and 2 (EN 1995:2008).
ABSORBER PLATE: polyurethane with closed cells, without softeners and VOC.
ALADIN STRIPE: epdm compact and extruded (version soft xl) and epdm compact expanded (version extra soft xl). High chemical stability, it does not contain VOC.

FIELD OF USE

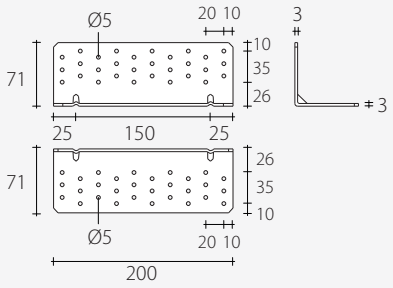
Timber to timber joints
OSB to timber joints

ADDITIONAL PRODUCTS - FASTENERS

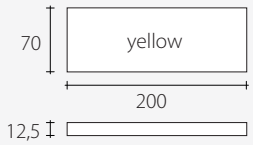
type	description		d_1 [mm]	support	p.
LBA	anker nail		4		364
LBS	screw for plates		5		364

GEOMETRY

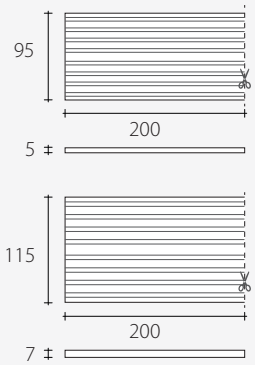
TITAN TTF200



ABSORBER PLATE

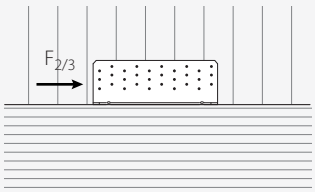


ALADIN STRIPE



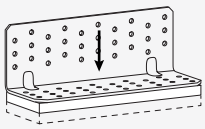
STATIC VALUES AND INSTALLATION

SHEAR JOINT - TIMBER TO TIMBER



TITAN TTF200

Strength values and installation procedure for TITAN TTF200 are reported at p. 165.



ABSORBER STRIPE / ALADIN STRIPE

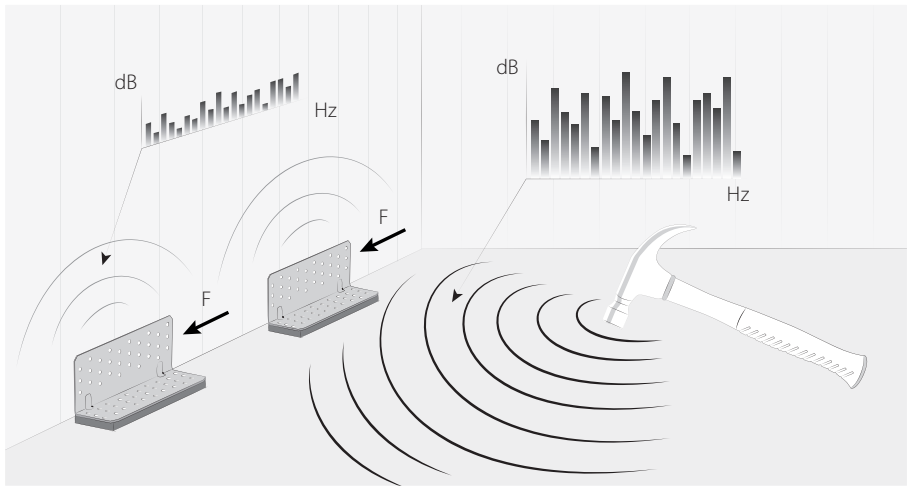
Strength values are listed in the product technical documentation (www.rothoblaas.com)

ACOUSTIC - MECHANICAL BEHAVIOR OF TITAN SILENT

The TITAN Silent system (angle bracket TITAN TTF200 + soundproofing profile) has been tested in order to determine its mechanical and acoustic behavior.

The experimental campaign has been carried out within the X-REV research project in collaboration with prestigious research institutes from both the academic and the industrial world.

The damping properties related to walking-induced vibrations of different resilient materials when applied on timber, have been compared. The consequent variation in the mechanical strength of the joint has also been studied.



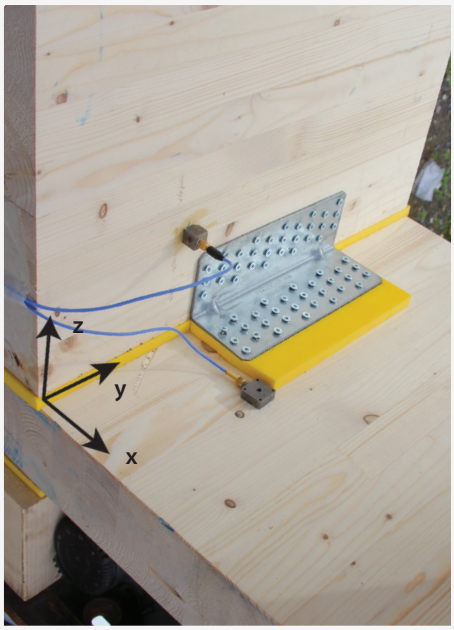
EXPERIMENTAL CAMPAIGN: ACOUSTIC ABATEMENT

TEST SETUP

The test setup has been designed to provide test reproducibility and comparable results from different materials. Based on the outcome of previous testing aimed at maximizing the resilience of different soundproofing profiles, the load pressure was applied parallel to the z axis at predefined steps ranging from 5 to 35 kN/m. The pressure was introduced by an hydraulic jack while the load magnitude was monitored with a pressure gauge.

Three timber elements have been assembled to reproduce the floor-to-wall joint with the interposition of different soundproofing profiles.

The principle behind the testing method is to measure the difference in terms of vibration speed, between two points placed on the two perpendicular elements connected by the TITAN TTF200 (LBA nails Ø4 x 60) with and without resilient material interposed. The impulse is generated by a rubber head hammer (weight 350 gr) with repetition of 3 pulses for each reference axis.
The impact phenomenon is monitored simultaneously on both the timber elements where three axial accelerometers are installed and connected to a multichannel acquisition system. Sampling frequency ranged from 5 to 5000 Hz with a time window of 5 ms.



REDUCTION OF VIBRATION TRANSFER RELATED TO WALKING EXCITATION

TEST CONFIGURATION	LOAD MIN	LOAD MAX
TITAN TTF200 + Absorber Plate yellow	33% 3,5 dB	32% 3,4 dB
TITAN TTF200 + Aladin Stripe soft xl	14% 1,3 dB	16% 1,5 dB
TITAN TTF200 + Aladin Stripe extra soft xl	24% 2,3 dB	16% 1,6 dB

The data that are expressed in decibel, should be considered just as a reference for the comparison between different materials with the same boundary conditions. Those values in fact, refer to the sound-transfer reduction measured on the specimens without considering the additional layers that constitutes a real wall (plaster sheets, mineral fiber panels, etc.). Hence, such data do not represent the sound-transfer reduction in a finished building.

The results are both expressed in terms of vibration sound reduction percentage and decibel of reduction of transmitted sound.
To further ease of reading it has been decided to report the global average value at the end of the stripe loads provided.
The value related to mean frequencies is more reliable from the methodological and statistical point of view. Within this range is concentrated the major part of energy transmitted to the specimen through the hammer

More information are available from rothoblaas technical office.

EXPERIMENTAL PHASE: MECHANICAL STRENGTH

TEST SETUP

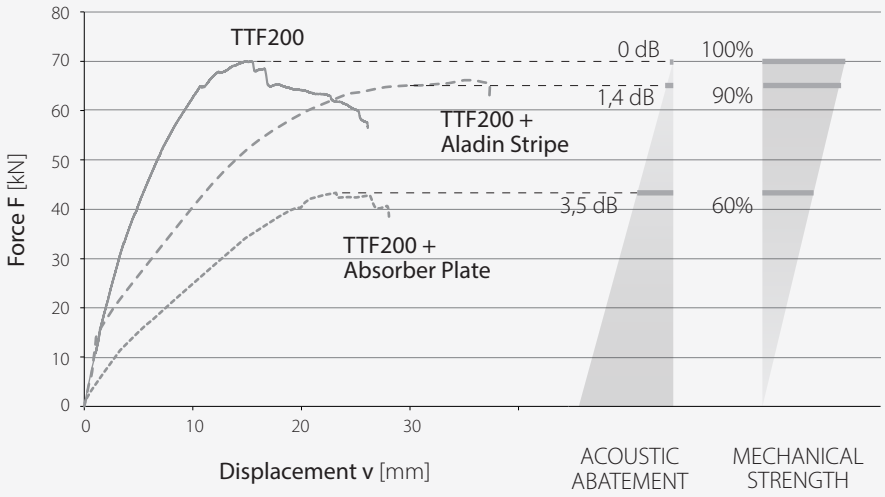
The test setup used for the experimental campaign is comprised of a metal frame designed to apply to the connector either static or cyclic loading, depending on the objectives defined within the X-Rev research project.
In this context, the focus is on the monotonic tests performed with displacement-controlled loading procedures. The main target was to evaluate the variation in TITAN TTF200 ultimate carrying capacity when combined with different soundproofing profiles.

The test setup has been designed to study the behavior of wall-to-wall and wall-to-floor joints under service loads. The test specimens have been realized with XLAM panels (Cross Laminated Timber) of C24 timber grade and TITAN TTF200 angle bracket (60 anker nails LBA Ø4 x 60 mm).

VARIATION OF SHEAR STRENGTH ACCORDING TO THE SOUNDPROOFING PROFILE SELECTED

test configuration	F_{max} [kN]	v_{max} [mm]	F_u [kN]	v_u [mm]	v_y [mm]	K_{ser} [N/mm]
TITAN TTF200	**70,0**	15,4	**57,2**	8,4	6,5	8945
TITAN TTF200 + Absorber Plate	**43,5**	23,0	**40,3**	19,3	15,0	2555
TITAN TTF200 + Aladin Stripe	**65,1**	30,0	**65,1**	30,0	10,3	4771

ACOUSTIC ABATEMENT AND MECHANICAL STRENGTH



Tests show that **TITAN Silent** with **Absorber Plate** offers a noise reduction of 3,5 dB if compared to the use of the sole angle bracket TTF200; with a mechanical strength up to 60% of that of the TTF200 angle bracket (characteristic values available at p. 168).

The system shear strength (TTF200 + D82361) is therefore 15 - 20 times higher than that of a traditional angle bracket (100 mm x 100 mm) with the proper acoustic profile.