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A CRH COMPANY

PLAKA

Plaka dBreak

Improving the acoustic properties of concrete and brickwork structures

Leviat®
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We are Leviat.

Leviat is the new name of CRH's construction accessories companies worldwide.

Under the Leviat brand, we are uniting the expertise, skills and resources of Plaka and its sister companies to create a world leader in fixing, connecting and anchoring technology.

The products you know and trust, including Plaka, will remain an integral part of Leviat's comprehensive brand and product portfolio. As Leviat, we can offer you an extended range of specialist products and services, greater technical expertise, a larger and more agile supply chain and better, faster innovation.

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60 locations

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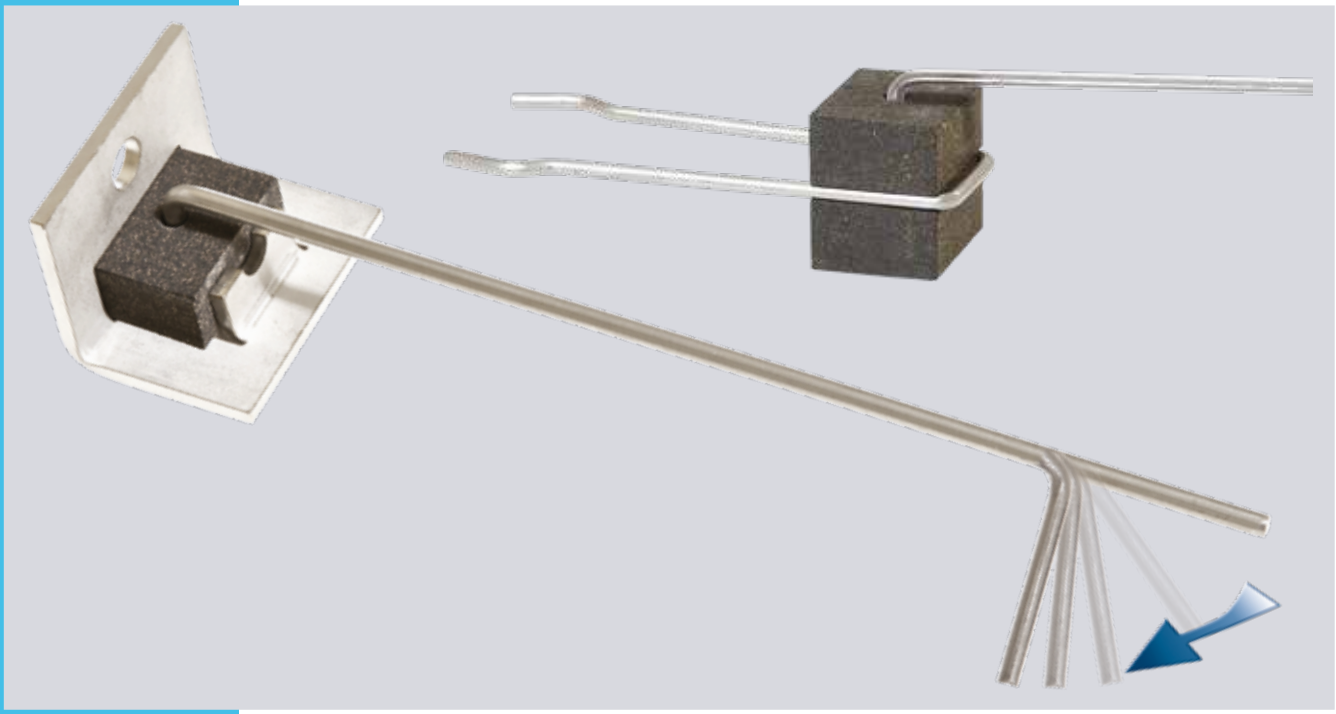
Plaka dBreak Acoustic cavity ties

These acoustic cavity ties have been designed for situations where connections between building elements are necessary for the strength of the structure and where sound and/or vibration insulation are required.



Sound and vibrations from outside (traffic, wind ...) affect the outer walls. They are transferred to the inner structure via the cavity ties. The energy that enters the inner walls and floor slabs spreads throughout the building in the form of air-transmitted sound.
Just replacing the metallic cavity ties with sound-damping ties is enough to obtain acoustic separation. The mass-spring-damper principle can be met much better by replacing the classic cavity ties with acoustic cavity ties.
The natural frequency of our cavity ties is about approx. 15 Hz. This therefore means that they can provide acoustic insulation for frequencies from 21 Hz (15Hz x √2) corresponding to the lower limit of audible sound.

Uses

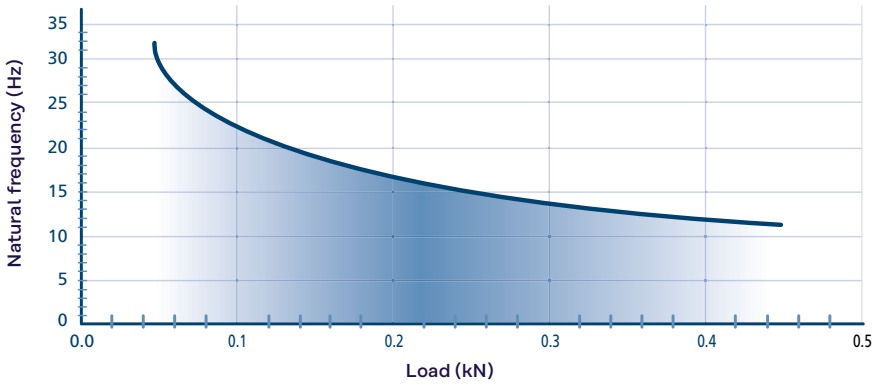
- Decoupling of outer façades when outside noise is significant
- Party walls on terraced houses
- Cavity walls in apartments
- Decoupling from noisy inner rooms

Minimum cavity width = 45 mm for the L-shaped holder
= 35 mm for the U-shaped holder

Plaka dBreak Acoustic cavity ties

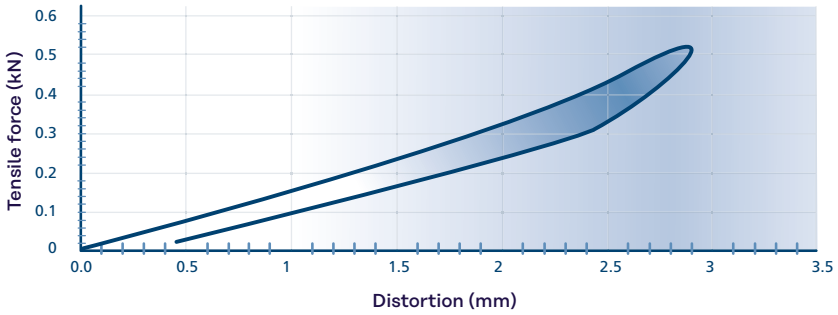
Characteristics

Resonance frequency



- Maximum working load: 500 N
- Breaking strain: 1920 N

Charge

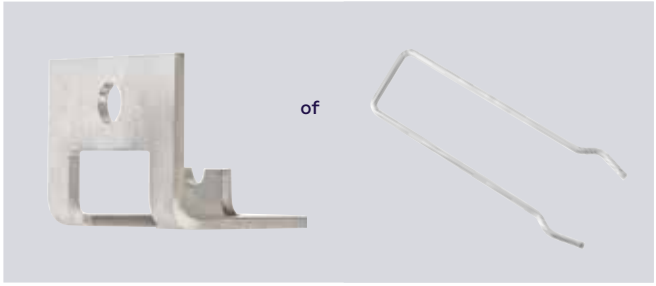


- Distortion as a result of an axial tensile or pressure force: see graph

Installation

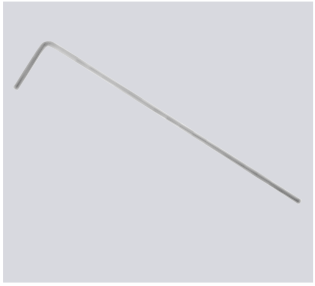
The acoustic block, the steel holder and the cavity tie will be delivered to the site separately.

Dimensions of acoustic block
30 x 30 x 25 mm.
Material: cork and elastomer reinforced with Kevlar fibres.
Code: HUCACD 3030254



Stainless steel L-shaped holder
3 mm thick.
Code: HUCALI 240403

Steel U-shaped holder
Ø 3 mm.
Code: HUCAUI 2003

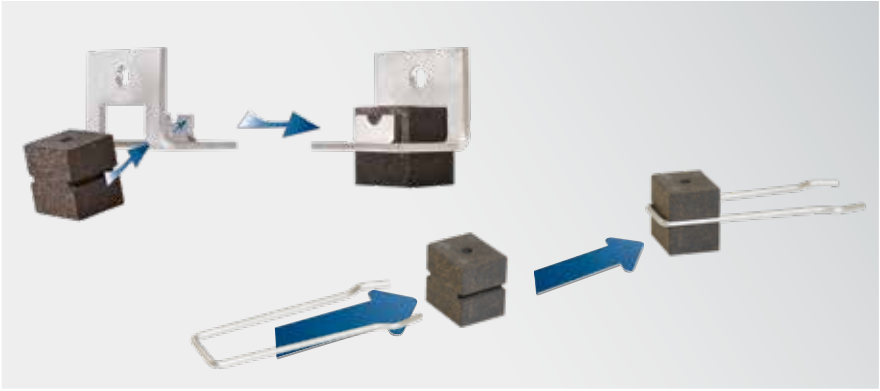


Cavity tie Ø 4 mm in stainless steel bent at one end. The length of the cavity tie is adjusted in relation to the building situation.
Code: HUCACI 2420040
or HUCACI 2425040

Plaka dBreak Acoustic cavity anchors

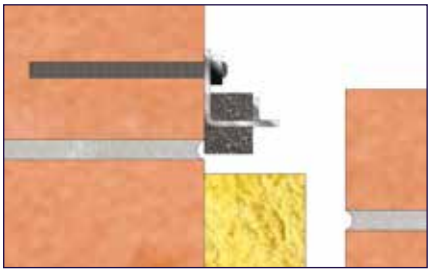
Installation step 1

Slide the acoustic block up to the upright lip on the steel L-shaped holder.
Or push the block into the U-shaped holder up to the end.

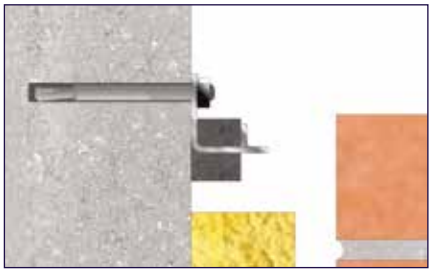


Installation step 2

Fix the L-shaped holder with the acoustic block to the wall or floor slab or brick in the U-shaped holder.



Attaching with M8 threaded rod
+ chemical anchoring



Attaching with FSA bolt M8

Attaching with wood screw

Incorporating U-shaped holder in brickwork joints

Installation step 3

Slide the bent end of the cavity tie into the acoustic block opening. The other end of the cavity tie is placed in the brick work joint and bent at the appropriate point to form a good bond.

The end of the cavity tie must be visible along the underside of the acoustic block

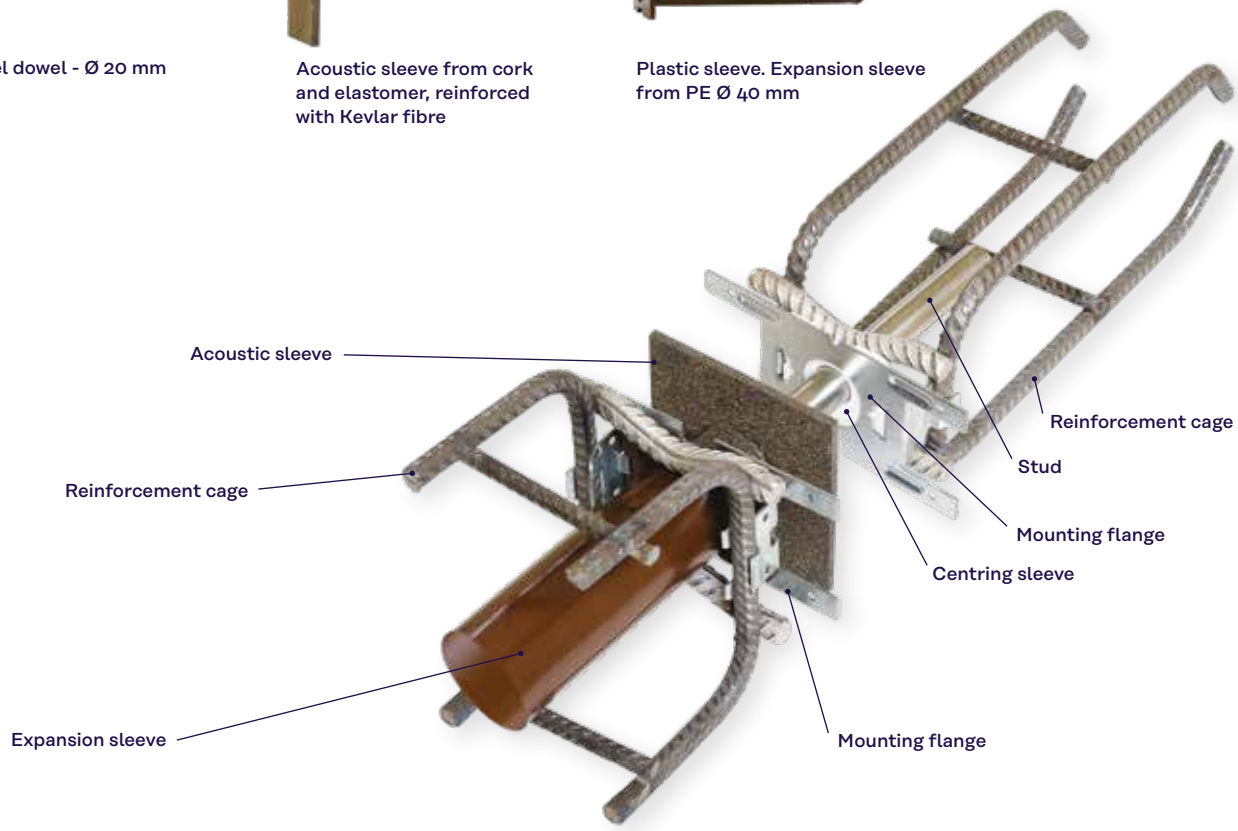
Plaka dBreak Acoustic Titan dowels

Dowels for the absorption of shear force with acoustic insulation ΔL_w = 34 tot 36 dB

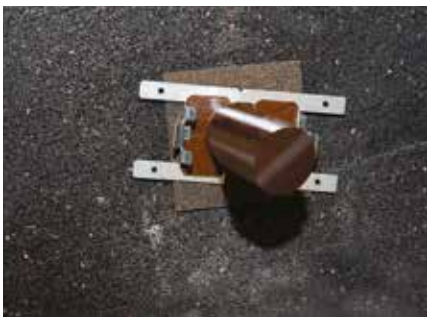
Stainless steel dowel - Ø 20 mm

Acoustic sleeve from cork and elastomer, reinforced with Kevlar fibre

Plastic sleeve. Expansion sleeve from PE Ø 40 mm



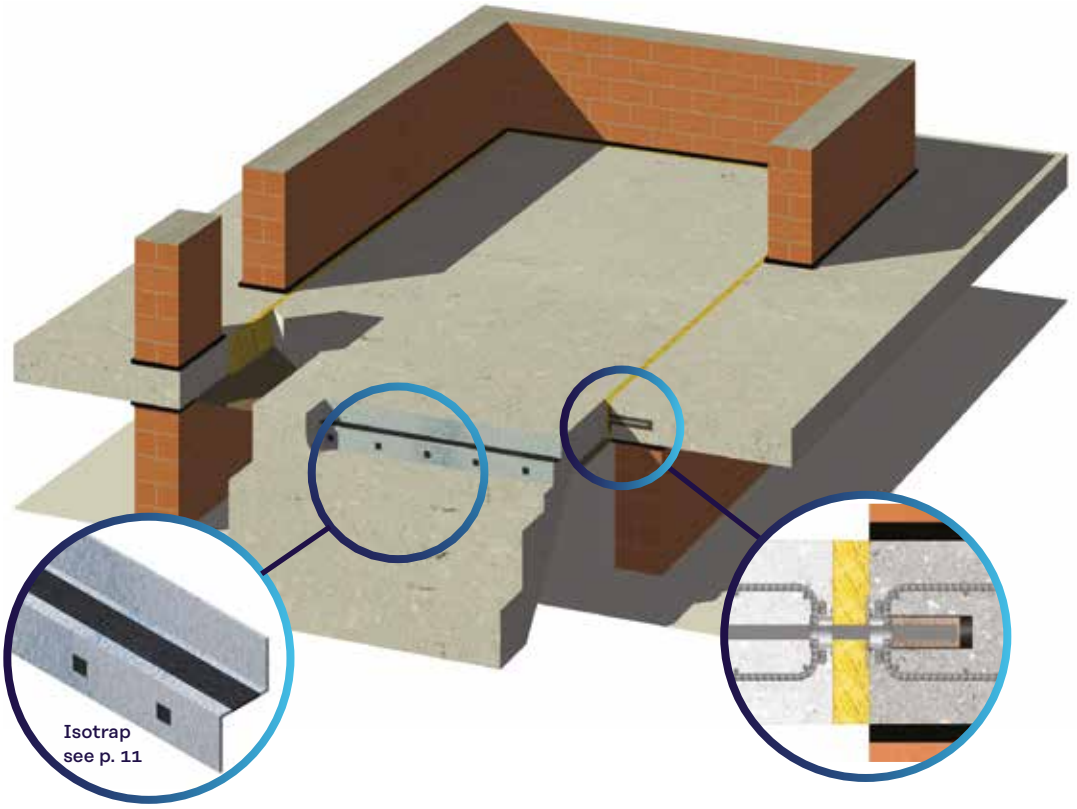
Use



Acoustic separation of stairways and lift shafts

Vibrations caused by stairs and in lift shafts will unavoidably spread to adjacent structures, for want of elastic decoupling. In order to combat this vibration transfer, stairways and lift shafts can be separated from the adjacent structure by means of a joint filled with a sound-absorbing material (mineral wool, ...)
The joint has acoustic Titan dowels to make load transfer around the joint possible. This way the shear forces are absorbed and the acoustic decoupling remains safeguarded. A PE expansion sleeve is placed in the concrete during the first concreting phase which allows a metal rod – called a dowel – to be introduced. An acoustic insulation bushing can be found in the PE expansion sleeve. This sleeve is manufactured from 10 mm thick vibration-damping Kevlar-reinforced cork-rubber elastomer material. The sound waves transferred via the concrete in the stairways and lift shafts are systematically dampened. This way an important reduction in the transfer of contact noise can be obtained. The forces absorbed by the dowel are transferred to the concrete via the integrated Titan reinforcement cage. Several shear forces can be absorbed.
The shape of the reinforcement cage is adjusted according to the construction situation (floor slab-wall or floor slab-floor slab; see Titan dowels brochure).

Plaka dBreak Acoustic Titan dowels

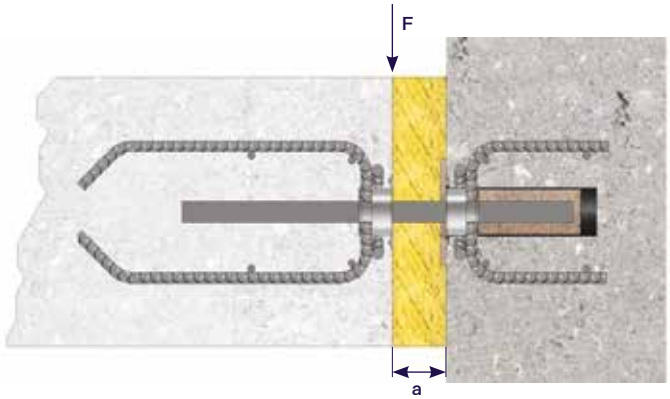


Other uses

- External galleries: acoustic and thermal separation from the building
- Floors: Isolate the whole floor for special applications i.e. theatres, party rooms ...

Dimensioning

Permissible load on the acoustic dowel
= 20 kN for joint openings a ≤ 2 cm
= 10 kN for 2 < a < 4 cm



Plaka dBreak Acoustic Titan dowels

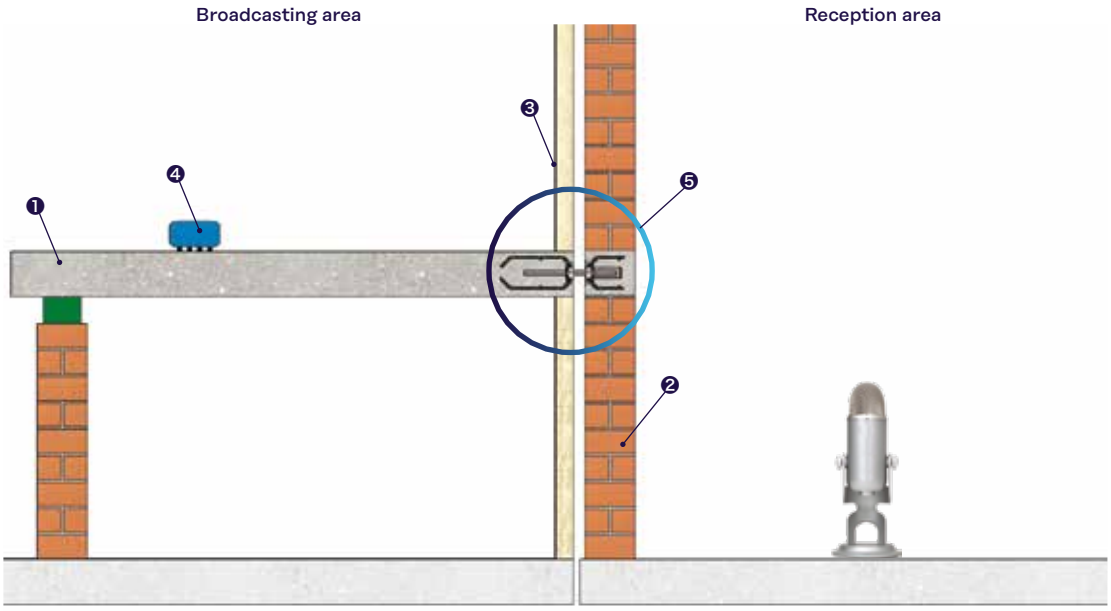
Implemented tests

1) Specification of the reduction in the lateral contact noise insulation ΔL_w

The contact noise reduction due to the use of the dowels is evaluated by means of calculating the difference between the contact noise level transferred through a rigid reference connection ($L_{n,w,o}$) and the contact noise level through the dowels ($L_{n,w}$):

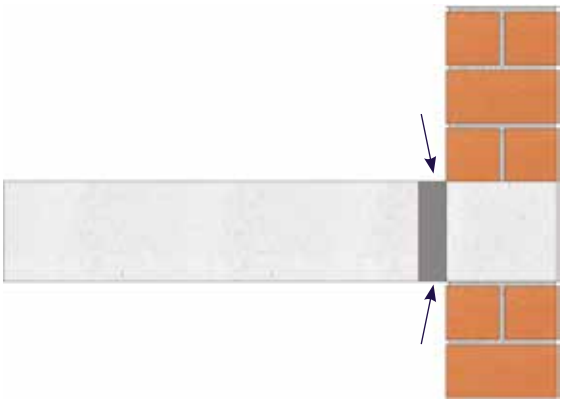
$$\Delta L_w = L_{n,w,o} - L_{n,w}$$

Test set-up for determining $L_{n,w}$



❶ Reinforced concrete floor slab d = 18 cm.
❷ Brick wall d = 19 cm.
❸ Wall lining.
❹ Standard rotary hammer drill.
❺ Acoustic Titan dowel.

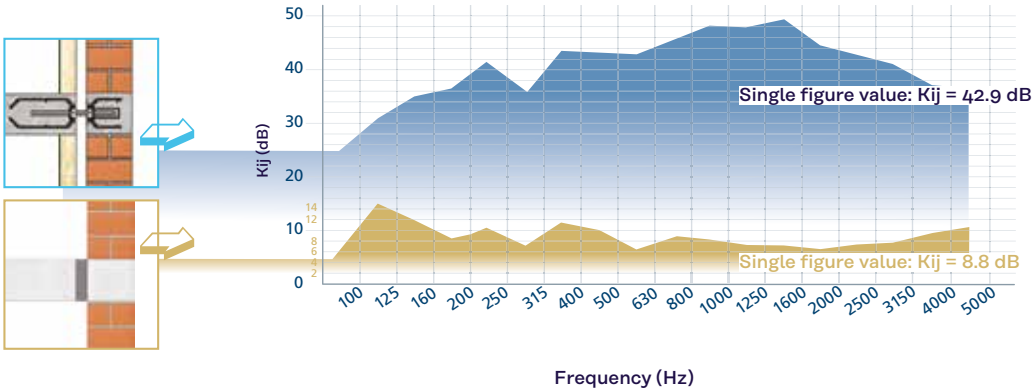
Test set-up for determining $L_{n,w,o}$
The joint is filled with mortar to make a rigid connection.



Plaka dBreak Acoustic Titan dowels

2) Measuring the vibration reducing index Kij

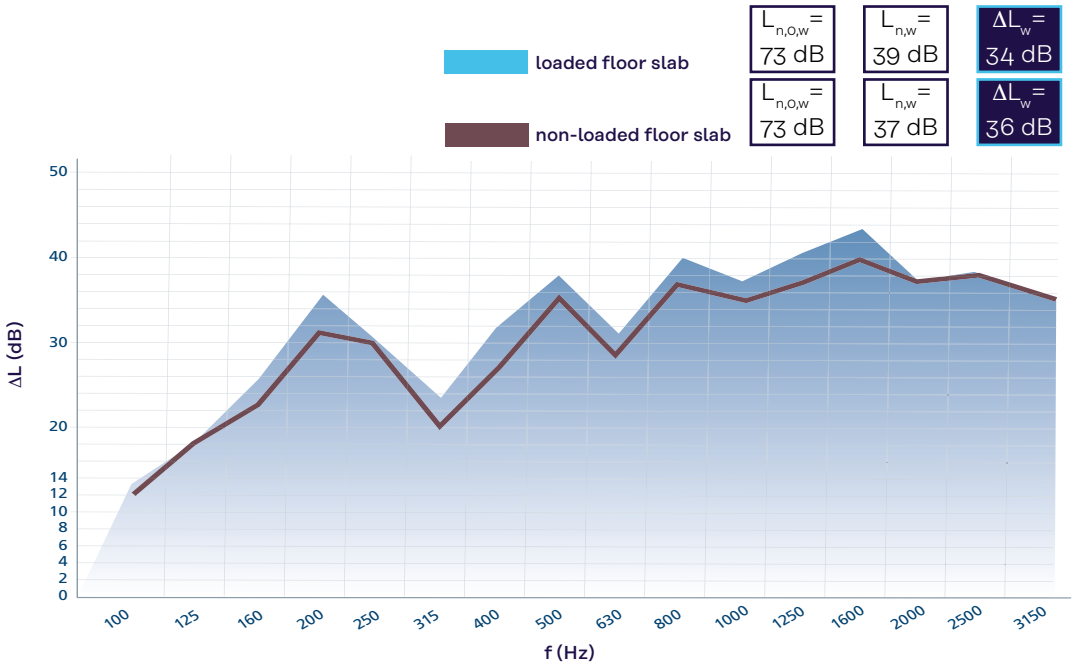
Tested connection
A T-connection made from a horizontally loaded reinforced concrete slab attached to a vertical brick wall by Titan acoustic dowels.



Reference connection
A rigid T-connection made from a horizontal reinforced concrete slab clamped into a vertical brick wall.

Result

The vibration reduction for a T-connection with Titan acoustic dowels is at least 34 dB more than for a rigid T-connection.



In the graph above we can see that the low frequency contact noise level reduction is 20 to 30 dB, this is very exceptional. Values of even more than 40 dB are achieved for the high frequencies. The weighted contact noise level reduction ΔL_w is between 34 and 36 dB. Contact noise reduction for the loaded floor slab is slightly more because the elastomer is working in its optimal load zone (where its natural frequency is the lowest).

Plaka dBreak Isotrap

Acoustic inlay for stairs

Characteristics

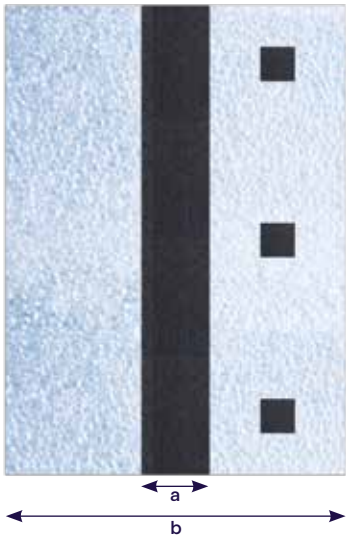
- Thickness: 10, 15 or 23 mm
- Central strip from recycled rubber granules
- PE foam

Types

TL-Z

TL-L

TL-F



Standard types (on 10 m rolls):

- TL-Z-1 - a = 75 mm, b = 475 mm
  - maximal load = 22,5 kN/lm
- TL-Z-2 - a = 100 mm, b = 500 mm
  - maximal load = 30,0 kN/lm

To size:

- TL-Z
- TL-L
- TL-F

Plaka dBreak Isotrap with Titan

Installation

The Isotrap is easy to bend and cut on site to construction requirements.

Additional fastening when there are horizontal loads

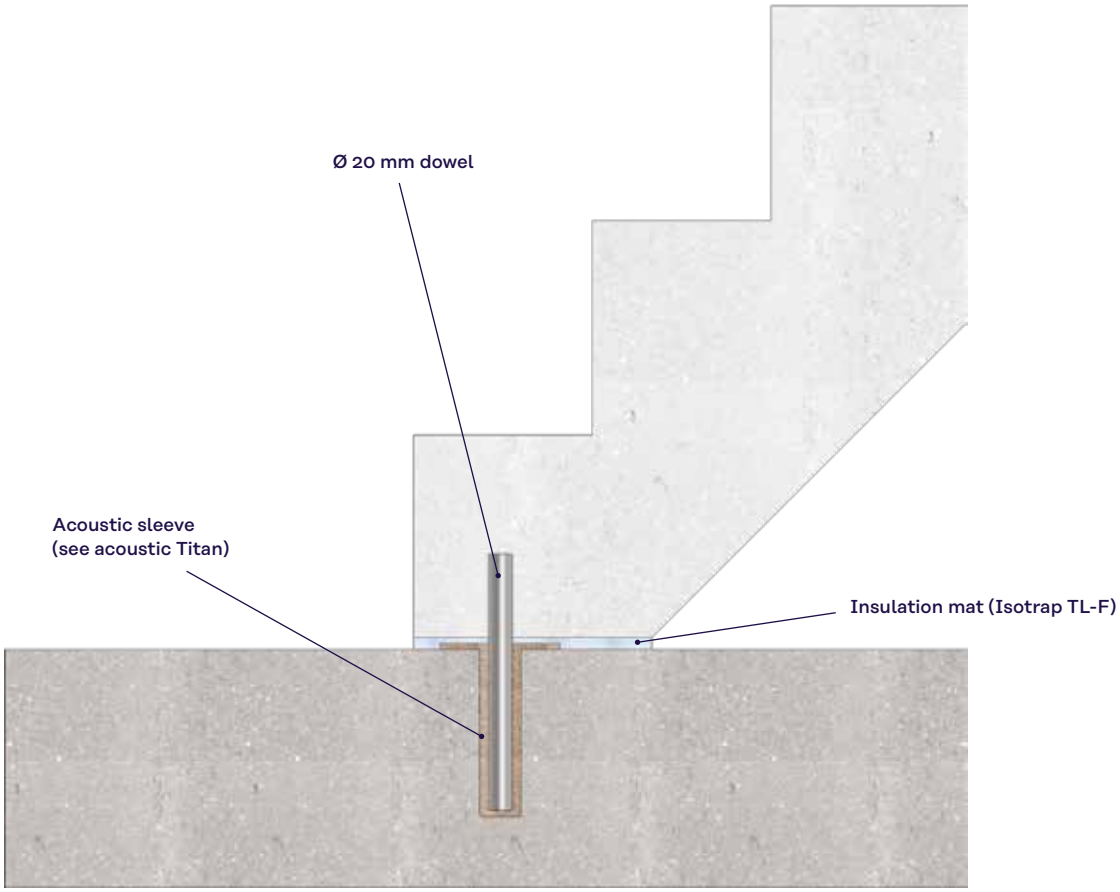
The acoustic separation is guaranteed by the cork-rubber sleeve.

Type A: stainless steel dowel

Type B: galvanised steel dowel

Max. permissible horizontal load:

- 37 kN with 10 mm joint
- 32 kN with 15 mm joint
- 28 kN with 23 mm joint



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