For sound absorption in reinforced concrete stairs and landings
OUR MISSION:
FORWARD CONSTRUCTING.

Not just to reflect the current state of building technology, but always to be a decisive step ahead – this is our promise. This is why we constantly achieve pioneering work in all product areas. Our employees consistently use their extensive practical experience and creativity to benefit our customers. Through regular collaborative dialogue with our target groups, we develop today the products which are needed tomorrow. With our dynamics we set consistently milestones in building technology – yesterday, today and tomorrow. This is what we mean by Forward Constructing.
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For sound absorption in reinforced concrete stairs and landings

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We are at your service. Wherever you are, you can count on us.
TYPE OVERVIEW

ISOBOX® TSB-F
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Impact sound insulation element for prefabricated stair landings. Stair landing – wall connection

ISOBOX® TSB-M+B
PAGE 6
Impact sound insulation element for in-situ concrete stair landings. Stair landing – wall connection

ISOBOX® TSB-T
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Impact sound insulation element with reinforcement cage for stair landings. Stair landing – wall connection

ISOBOX® TSB-BT
PAGE 6
Impact sound insulation element with supporting element for stair landings. Stair landing – wall connection

ISODORN HQW
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Impact sound insulation element for sound absorption in straight and spiral flights of stairs. Flight of stairs – wall connection and stair landing – wall connection
TYPE OVERVIEW

ISOSTEP® HT-V
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Impact sound insulation element for sound absorption in flights of stairs. Flight of stairs – stair landing connection

ISOTRITT® Z
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Impact sound insulation element for sound absorption in prefabricated flights of stairs. Flight of stairs – stair landing connection

ISOTRITT® ZB
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Impact sound insulation element for sound absorption in prefabricated flights of stairs. Flight of stairs – base plate connection

TSP IMPACT SOUND PLATE
PAGE 42
Impact sound plate for stair stringers and stair landings. Inserted between the staircase and the wall
ISOBOX® TSB

THE PRODUCT
The ISOBOX® TSB is used to isolate the impact sound generated in staircases between stair landings and staircase walls so that it is not transferred into living or working areas. The ISOBOX® is made of polyurethane with integrated elastomer bearings to transfer the load. Depending on the design, positive and/or negative shearing forces as well as horizontal forces can be transferred.

The sound absorption elements satisfy the requirements for increased sound insulation.

APPLICATION AREA
The ISOBOX® TSB is suitable for use in both brick and concrete walls. The stair landings can be made using in-situ concrete or provided as a prefabricated part.

BENEFITS
- Type-tested
- Considerable impact sound reduction
- R90 fire safety inspection report
- Simple reinforcement layout
- For in-situ concrete and prefabricated landings
APPLICATION

Landings can be supported at four points using ISOBOX® elements. The ISOBOX® may, of course, be arranged differently for specific staircase or landing types.

SUGGESTED ARRANGEMENT FOR ISOBOX® TSB – FLOOR PLAN

Support on opposite sides of the landings

Support on opposite sides and adjacent sides of the landings
PRODUCT OVERVIEW

ISOBOX® TSB-F
Isolation of prefabricated landing and staircase wall
Installation in the prefabricated structure

System components:
- ISOBOX® Standard (10 mm EPDM bearing) or Maxi (20 mm EPDM bearing)

Type-tested impact sound box made of polyurethane with EPDM bearing. The basis for all ISOBOX® version.

ISOBOX® TSB-M+B
Isolation of in-situ concrete landings and staircase wall
Installation in in-situ concrete or brick walls

System components:
- ISOBOX® Standard (10 mm EPDM bearing) or Maxi (20 mm EPDM bearing)
- Assembly plate for the formwork for reinforced concrete walls
- Packing for stabilisation while concreting or to support brickwork

ISOBOX® TSB-T
Isolation of in-situ concrete landing and staircase wall
Installation in the prefabricated structure or on the building site

System components:
- ISOBOX® Standard (10 mm EPDM bearing) or Maxi (20 mm EPDM bearing)
- Assembly plate and packing (as per TSB-M+B)
- Reinforcement cage for the bracket
- Load-bearing capacity of the bracket when using the reinforcement cage is type-tested

ISOBOX® TSB-BT
Isolation of in-situ concrete landing and staircase wall
Installation in the prefabricated structure or on the building site

System components:
- ISOBOX® Standard (10 mm EPDM bearing) or Maxi (20 mm EPDM bearing)
- Assembly plate and packing (as per TSB-M+B)
- Reinforcement cage with pre-concreted bracket
- Load-bearing capacity of the bracket when using the concrete supporting element is type-tested
SYSTEM CROSS SECTIONS

Installation cross section of ISOBOX® TSB-F Standard

Installation cross section of ISOBOX® TSB-T Standard

Installation cross section of ISOBOX® TSB-BT Standard

Installation cross section of ISOBOX® TSB-MB Standard

PRODUCT INFORMATION:

- Standard version with 10 mm EPDM bearing and Maxi version with 20 mm EPDM bearing
- Reduction in impact sound $\Delta L_{n,n,w} \geq 35$ dB for ISOBOX® TSB Maxi
- Reduction in impact sound $\Delta L_{n,n,w} \geq 23$ dB for ISOBOX® TSB Standard
- Flexible use in the prefabricated structure and on the building site
- Type-tested
- High-quality EPDM elastomer bearing in accordance with approval Z-16.32-426
- Fire-resistance rating of R90 provided the minimum centre distances for the on-site reinforcement are observed
PRODUCT DEFINITION

Depending on the configuration of the bearings, positive shearing forces, positive and negative shearing forces, or positive and negative shearing forces as well as horizontal loads can be transferred.

**DIMENSIONS h x w x d [mm]**

<table>
<thead>
<tr>
<th>ISOBOX® TSB</th>
<th>Standard</th>
<th>Maxi</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Internal</td>
<td>External</td>
</tr>
<tr>
<td>11 / 12 / 13</td>
<td>180 x 245 x 150</td>
<td>200 x 275 x 155</td>
</tr>
<tr>
<td>21 / 22 / 23</td>
<td>200 x 245 x 150</td>
<td>220 x 275 x 155</td>
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</tbody>
</table>

**TYPE DESIGNATION**

TSB Maxi MB 12

1 = lower bearing / 2 = lower & upper bearings / 3 = lower, upper & side bearings

1 = landing thickness 160 - 180 mm / 2 = landing thickness ≥ 200 mm

MB = brick + concrete / F = prefabricated part / T = reinforcement cage / BT = concrete supporting element with reinforcement cage

EPDM bearing design – optional for Maxi design

TSB = impact sound box
FIRE PROTECTION – SOUND INSULATION

FIRE PROTECTION
ISOBOX® product versions TSB T/TSB-BT have a fire-resistance rating of R90 (F90); see expert opinion of MPA Leipzig. ISOBOX® product versions TSB F/TSB M+B have a fire-resistance rating of R90 (F90) provided the minimum centre distances of the on-site bracket reinforcement are observed as per the design of versions TSB T/TSB BT.

To meet the requirements for the integrity of the staircase walls, the impact sound insulation elements must be installed in solid walls with a minimum thickness of 175 mm and these must also have a fire-resistance rating of R90 (F90).

SOUND INSULATION
- Reduction in impact sound $\Delta L_{n,w} \geq 35$ dB for ISOBOX® TSB Maxi
- Reduction in impact sound $\Delta L_{n,w} \geq 22$ dB for ISOBOX® TSB Standard
## Dimensioning Table for ISOBOX® TSB Standard and Maxi – Concrete ≥ C20/25

<table>
<thead>
<tr>
<th>TSB-F element</th>
<th>Plate h [mm]</th>
<th>$V_{Rd,z,u}$ [kN]</th>
<th>$V_{Rd,z,o}$ [kN]</th>
<th>$V_{Rd,x}$ [kN]</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
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<td>73.8</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td>14.4*</td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>≥ 180</td>
<td>73.8</td>
<td>-</td>
<td>35.8</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td>14.4</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>≥ 180</td>
<td>73.8</td>
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<td>21</td>
<td>≥ 200</td>
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<td>-</td>
</tr>
<tr>
<td>23</td>
<td></td>
<td></td>
<td></td>
<td>35.8</td>
</tr>
</tbody>
</table>

*With a landing thickness of < 180 mm, the finished bracket in the ISOBOX® must be filled with mortar (minimum MG IIa).

## Notes:
- In individual cases, evidence of the transfer of forces into the neighbouring component must be provided by the responsible structural engineer.
- The responsible structural engineer must verify the load-bearing capacity of the bracket for TSB-F and TSB-M+B. If the reinforcement of the bracket is matched to reinforcement cage T, the load-bearing capacity of the bracket can be taken from the dimensioning table for TSB-T (see page 13).
- The load-bearing capacity of the bracket for ISOBOX® TSB-T and TSB-BT is verified after the type test.

## Dimensioning the Connecting Landing Slab:
- Use of flush beams as bar-like connections to the brackets
- Verification of the shearing-force resistance of the landing slab

You can download the **Type Test** from www.h-bau.com
INSTALLATION INSTRUCTIONS

INSTALLATION INSTRUCTIONS FOR ISOBOX® TSB-F

INSTALLING THE PREFABRICATED PART
- Produce a landing slab with bracket supports
- With regard to the landing size, the thickness of the surrounding TSP impact sound plate must be taken into account
- After removing the formwork, fit the impact sound box onto the bracket. Note the “THIS SIDE UP” marking

INSTALLATION IN BRICKWORK
- Brick the impact sound box type TSB precisely into the brickwork. It is important to ensure that there is a mortar bed (≥ MG lla) across the entire surface beneath the impact sound box
- The impact sound box must be flush with the front edge of the wall. Note the “THIS SIDE UP” marking
- Produce the formwork for the landing and flight of stairs
- Attach the TSP impact sound plate all the way round the staircase wall
- Insert and concrete the on-site reinforcement

INSTALLATION IN IN-SITU CONCRETE WALL
- Mark the position of the impact sound box type TSB on the formwork
- Nail down the assembly plate
- Fix the impact sound box with packing to the assembly element. Note the “THIS SIDE UP” marking
- Reinforce and concrete the wall and remove the formwork
- After removing the formwork, remove the packing
- Produce the formwork for the landing and flight of stairs
- Attach the TSP impact sound plate all the way round the staircase wall
- Reinforce and concrete the landing
INSTALLATION INSTRUCTIONS

INSTALLATION INSTRUCTIONS FOR ISOBOX® TSB-T

INSTALLATION IN BRICKWORK OR IN-SITU CONCRETE WALLS
- Installation as per TSB-M+B

INSTALLATION IN AN IN-SITU CONCRETE LANDING
- Produce the ceiling formwork for the landing
- Attach the TSP impact sound plate all the way round the staircase wall
- Install the lower reinforcement as per structural analysis
- Install the reinforcement cage supplied for the bracket in the impact sound box. Ensure the correct amount of concrete covering is applied
- Install the edge reinforcement and upper reinforcement as per structural analysis
- Concrete the landing

INSTALLATION INSTRUCTIONS FOR ISOBOX® TSB-BT

INSTALLATION IN BRICKWORK OR IN-SITU CONCRETE WALLS
- Installation as per TSB-M+B

INSTALLATION IN AN IN-SITU CONCRETE LANDING
- Produce the ceiling formwork for the landing
- Attach the TSP impact sound plate all the way round the staircase wall
- Install the lower reinforcement as per structural analysis
- Install the supporting element in the impact sound box
- Install the edge reinforcement and upper reinforcement as per structural analysis
- Concrete the landing

On-site reinforcement
Reinforcement cage bracket ≥ C20/25

Pre-concreted bracket
On-site reinforcement
Reinforcement cage bracket ≥ C20/25
THE PRODUCT
The ISODORN HQW is used to isolate the impact sound generated in staircases so that it is not transferred into living or working areas. The transfer of the impact sound from straight and spiral stairs can be prevented by means of a simple installation. The element consists of an impact sound box made of polyurethane with integrated elastomer bearing and load distribution plate as well as a supporting element to transfer the load. Positive shearing forces are transferred.

The sound absorption elements satisfy the requirements for increased sound insulation.

APPLICATION AREA
The ISODORN HQW is particularly suitable for use in spiral staircases. The stairs can be made using in-situ concrete or provided as a prefabricated part. This solution can be used in brick as well as concrete walls. The ISODORN HQW is used as a wall support to prevent the transmission of impact sound in spiral staircases, stair landings or corridor slabs. It is still possible to bridge large joint widths when combined with thermal insulation.

BENEFITS
- General technical approval Z-15.7-321 for internal and external components
- Two load-bearing capacities
- Considerable impact sound reduction
- Joint widths of up to 120 mm
- Can be combined with thermal insulation
APPLICATION

Use of the ISODORN HQW in a half-spiral staircase in combination with the TSP impact sound plate

Use of the ISODORN HQW in a landing in combination with the TSP impact sound plate

Use of the ISODORN HQW in a landing with large joint widths of up to 120 mm
PRODUCT OVERVIEW

PRODUCT COMPONENTS

IMPACT SOUND BOX
- HQW 60x40: 10 mm EPDM bearing
- HQW 60x40: 20 mm EPDM bearing
- HQW 60x60: 10 mm EPDM bearing
- HQW 60x60: 20 mm EPDM bearing

Impact sound box made of polyurethane with EPDM bearing and steel load distribution plate

SUPPORTING ELEMENT
- HQW 60x40x5 mm in S355, galvanised
- HQW 60x40x4 mm in S275, V2A (1.4301) / V4A (1.4571)
- Available in lengths of 300 mm to 410 mm
- HQW 60x60x5 mm in S355, galvanised
- HQW 60x60x5 mm in S275, V2A (1.4301) / V4A (1.4571)
- Available in lengths of 350 mm to 460 mm

BEARING SLEEVE WITH PORTAL
- HQW 60x40: Plastic sleeve with reinforcement stirrup, B500B material
- HQW 60x60: Galvanised sleeve with reinforcement stirrup, B500B material

FIRE PROTECTION SLEEVE
- HQW 60x40
- HQW 60x60

Available for joint widths of up to 50 mm, mineral wool material with intumescent coating applied on one side
PRODUCT OVERVIEW

HQW 60X40

HQW 60X60

PRODUCT INFORMATION

- Reduction in impact sound $\Delta L_{n,w}^{A}$ = 41 dB for ISODORN HQW Maxi for the highest sound insulation class A* in accordance with DEGA 103
- Reduction in impact sound $\Delta L_{n,w}^{A}$ = 30 dB for ISODORN HQW
- Joint widths of up to 120 mm
- With general technical approval no. Z-15.7-321
- High-quality EPDM elastomer bearing in accordance with approval Z-16.32-426
- Fire-resistance rating of R90 for joint widths of up to 50 mm when using the fire protection sleeve
## DIMENSIONS

### ISODORN HQW 60X40

Product cross section of ISODORN HQW 60x40 – example with joint width of 15 mm with TSP

View from above of ISODORN HQW 60x40

Product cross sections of ISODORN HQW 60x40

### ISODORN HQW 60X60

Product cross section of ISODORN HQW 60x60 – example with joint width of 120 mm

View from above of ISODORN HQW 60x60

Product cross sections of ISODORN HQW 60x60

### ISODORN HQW TYPE DESIGNATION

HQW Maxi 60x40 x5 VZ 15

- Joint width – essential for determining the required dowel length
- Material quality – VZ or V2A / V4A
- Dimensions of the supporting element – 60x40x4 / 60x40x5 / 60x60x5
- EPDM bearing design – optional for Maxi design
- Type designation
DIMENSIONS

SYSTEM CROSS SECTIONS

Installation cross section of the ISODORN HQW 60x40 in combination with the TSP impact sound plate

Installation cross section of the ISODORN HQW 60x60 with large joint widths and with sound and thermal insulation
## DIMENSIONING

### DIMENSIONING TABLE FOR THE ABSORBABLE SHEARING FORCE $V_{rd}$ [kN] – CONCRETE C20/25

<table>
<thead>
<tr>
<th>ISODORN</th>
<th>HQW 60x40</th>
<th>HQW 60x60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joint width $f$ [mm]</td>
<td>Dowel length $l$ [mm]</td>
<td>HQW 60x40x5 S 355 VZ</td>
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<tr>
<td>10</td>
<td>300</td>
<td>37.6</td>
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<tr>
<td>15</td>
<td>305</td>
<td>36.8</td>
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<tr>
<td>120</td>
<td>410</td>
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### DIMENSIONING TABLE FOR THE ABSORBABLE SHEARING FORCE $V_{rd}$ [kN] – CONCRETE C25/30

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<td>Dowel length $l$ [mm]</td>
<td>HQW 60x40x5 S 355 VZ</td>
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<tr>
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<tr>
<td>120</td>
<td>410</td>
<td>23.0</td>
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</table>

You can download the TYPE TEST from [www.h-bau.com](http://www.h-bau.com)
## DIMENSIONING

### DIMENSIONING TABLE FOR THE ABSORBABLE SHEARING FORCE $V_{rd}$ [kN] – CONCRETE $\geq$ C30/37

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<th align="center">HQW 60x60</th>
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</thead>
<tbody>
<tr>
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<td align="center">Dowel length $l$ [mm]</td>
<td align="center">HQW 60x40x4 S 355 V2</td>
<td align="center">HQW 60x40x4 S 275 V2A / V4A</td>
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<td align="center">460</td>
<td align="center">37.7</td>
<td align="center">29.2</td>
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</tbody>
</table>

### NOTES:
- Additional $V_{rd}$ values can be found in the approval Z-15.7-321. Intermediate values may also be interpolated linearly.
- The ISODORN HQW can be used as a connection element between reinforced concrete components or between brickwork and reinforced concrete components under the action of static or quasi-static loads.
- A structural verification of the connecting components must be performed by the structural engineer.
- Permitted joint widths: $0 \leq f \leq 120$ mm
- Minimum slab thickness/concrete covering:
  - ISODORN HQW 60x40: $h \geq 160$ mm, $c_{nom} \geq 20$ mm
  - ISODORN HQW 60x60: $h \geq 200$ mm, $c_{nom} \geq 35$ mm
- The ISODORN HQW can be used in reinforced concrete or brick walls.
- The concrete strengths indicated are the respective minimum requirements.
- For brickwork, brick compressive strength class 20 is required in conjunction with mortar group III. For lower brick compressive strength classes, the maximum permitted compression can be achieved using load-distributing concrete padding or a steel plate.
- For long external components, expansion joints in accordance with approval Z-15.7-321 must be taken into account.
ARRANGEMENT OF THE ELEMENTS

Arrangement of the elements in staircases – use of HQW with TSP impact sound plate

Detail A: Arrangement of the elements – edge clearances

Arrangement of the elements in staircases – use of HQW for large joint widths

Detail B: Arrangement of the elements – edge clearances

CENTRE AND EDGE CLEARANCES

<table>
<thead>
<tr>
<th>ISODORN</th>
<th>Slab thickness h [mm]</th>
<th>Edge clearance a_e [mm]</th>
<th>Dowel clearance a_d [mm]</th>
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</thead>
<tbody>
<tr>
<td>HQW 60x40</td>
<td>≥ 160</td>
<td>≥ 200</td>
<td>≥ 400</td>
</tr>
<tr>
<td>HQW 60x60</td>
<td>≥ 200</td>
<td>≥ 300</td>
<td>≥ 600</td>
</tr>
</tbody>
</table>

Arrangement of the elements in the landing – edge and centre clearances
ARRANGEMENT OF THE ELEMENTS

ISODORN HQW 60x40 – installation for a slab thickness of 160 mm

ISODORN HQW 60x60 – installation for a slab thickness of 200 mm

ISODORN HQW 60x40 – installation in spiral staircases

ISODORN HQW 60x60 – installation in spiral staircases
In the event of deformation of the ISODORN HQW, deformations due to EPDM bearing deflection as well as deformations resulting from the tolerance between the bearing sleeve and the supporting element must be taken into consideration. Here, we recommend applying the shearing force in the limit state of suitability for use.

**EPDM BEARING DEFLECTION**

**NOTES:**

- The deformation of the EPDM bearing results from deflection caused by the vertical load.
- We recommend providing evidence of the deformation for the quasi-continuous load case.
- For deformation resulting from the tolerance between the bearing sleeve and the supporting element, a deformation of 2 mm must also be applied.
FIRE PROTECTION – SOUND INSULATION

FIRE PROTECTION
When an appropriate fire protection sleeve is used, the ISODORN HQW can be assigned a fire-resistance rating of R90, provided it has joint openings up to a maximum of 50 mm.

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SOUND INSULATION

**ISODORN HQW**
- Reduction in impact sound $\Delta L_{n,w} = 30.0$ dB for ISODORN HQW 60x40
- Reduction in impact sound $\Delta L_{n,w} = 30.6$ dB for ISODORN HQW 60x60

Component tests carried out by the Forschungs- und Entwicklungsgemeinschaft für Bauphysik e.V. at the Hochschule für Technik Stuttgart (Research and Development Community for Building Physics at the University of Applied Sciences, Stuttgart), report no. FEB/FS 57/09 dated 15.06.2009

**ISODORN HQW MAXI**
- Reduction in impact sound $\Delta L_{n,w} = 41.9$ dB for ISODORN HQW Maxi 60x40
- Reduction in impact sound $\Delta L_{n,w} = 42.3$ dB for ISODORN HQW Maxi 60x60
ON-SITE REINFORCEMENT
### ISODORN HQW

#### Dimensions and clearances

<table>
<thead>
<tr>
<th>ISODORN HQW</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 1 [mm]</td>
<td>Item 2 [mm]</td>
<td>Item 3 [mm]</td>
<td>Item 4 [mm]</td>
<td>Item 5 [mm]</td>
<td>Item 6 [mm]</td>
<td>Item 7 [mm]</td>
</tr>
<tr>
<td>a</td>
<td>a1</td>
<td>e1</td>
<td>e2</td>
<td>e3</td>
<td>d [mm]</td>
<td>Item 1</td>
</tr>
<tr>
<td>120</td>
<td>20</td>
<td>50</td>
<td>30</td>
<td>165</td>
<td>10</td>
<td>2 x 3 Ø 10</td>
</tr>
<tr>
<td>124</td>
<td>20</td>
<td>71</td>
<td>30</td>
<td>218</td>
<td>12</td>
<td>2 x 3 Ø 12</td>
</tr>
</tbody>
</table>

#### Reinforcement

- Item 1
- Item 2
- Item 3
THE PRODUCT
The ISOSTEP® HT-V is used to isolate the impact sound generated between flights of stairs and stair landings using a 12-mm-thick insulation element. The insulation element meets the R90 fire protection requirements. The load is transferred by shear rods running through the insulation. Positive shearing forces can be transferred.

The sound absorption elements satisfy the minimum requirements for sound insulation.

BENEFITS
- Type-tested
- Fire-resistance rating of R90
- High load-bearing capacity
- Installation on the building site or in the prefabricated structure
- Quick and easy installation
- Acoustically tested

APPLICATION AREA
The ISOSTEP® HT-V is suitable for use in both prefabricated stairs and in-situ concrete stairs. The landing can be made from in-situ concrete or supplied as a semi-finished prefabricated part.
FIRE PROTECTION
The ISOSTEP® HT-V has a fire-resistance rating of R90.

SOUND INSULATION
Impact sound absorption $\Delta L^w = 16$ dB
**DIMENSIONS – DIMENSIONING**

**DIMENSIONS**

![View of ISOSTEP® HT-V – example illustration](image1)

![Side view of ISOSTEP® HT-V](image2)

![Installation cross section of ISOSTEP® HT-V](image3)

**DIMENSIONING TABLE FOR CONCRETE ≥ C20/25 – CONFIGURATION – DIMENSIONS**

<table>
<thead>
<tr>
<th>ISOSTEP®</th>
<th>$V_{rd}$ [kN]</th>
<th>$H_{rd}$* [kN]</th>
<th>Number of rods</th>
<th>$l_{b,net, straight}$</th>
<th>$l_{b,net, hook}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>HT-V 4</td>
<td>34.5</td>
<td>± 8.6</td>
<td>4 Ø 6</td>
<td>200</td>
<td>145</td>
</tr>
<tr>
<td>HT-V 6</td>
<td>51.7</td>
<td>± 8.6</td>
<td>6 Ø 6</td>
<td>200</td>
<td>145</td>
</tr>
<tr>
<td>HT-V 8</td>
<td>69.0</td>
<td>± 8.6</td>
<td>8 Ø 6</td>
<td>200</td>
<td>145</td>
</tr>
</tbody>
</table>

* $H_{rd}$ parallel to joint

**NOTES:**
- ISOSTEP® HT-V elements are only suitable for use under predominantly dead loads and evenly distributed traffic loads.
- The maximum shearing forces occurring in the neighbouring components must be limited in accordance with DIN EN 1992-1-1.
- The structural verification of the connected components is performed by the responsible structural engineer. As such, the stairs can be classed as articulated on the ISOSTEP® HT-V.
- The torques of the eccentric connection must be taken into account and superimposed with the torques of the planned load.
ON-SITE REINFORCEMENT

- Item 1 Edge banding as per DIN EN 1992-1-1 along the components to be connected
- Item 2 Stair reinforcement in accordance with details provided by the structural engineer
- Item 3 Attachment reinforcement for the maximum shearing force occurring in the flight of stairs
- Item 4 The lower longitudinal reinforcement of the flight of stairs must reach right up to the ISOSTEP® HT-V element and be bent up and reliably anchored.
- Item 5 Transverse reinforcement as per DIN EN 1992-1-1, at least 2 Ø 6
INSTALLATION INSTRUCTIONS

- Form the flight of stairs and stair landing
- Bond the stair stringer on the staircase wall to the self-adhesive impact sound plate type TSP
- Mark the position of the impact sound element on the formwork
- Nail down the lower U-profile of the element onto the landing formwork
- Insert the ISOSTEP® HT-V into the U-profile and slide it onto the impact sound plate
- Nail down the upper U-profile onto a wooden slat
- Fit the slat with U-profile onto the ISOSTEP® HT-V
- Align the ISOSTEP® HT-V vertically and attach with the wooden slat to the stringer formwork or the staircase wall
- Insert the on-site reinforcement
- Attach the stopend formwork for the steps
- Add concrete

Our applications department would be pleased to assist in finding further solutions.
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Email: technik@h-bau.de
ISOTRITT® Z & ZB

THE PRODUCT
The ISOTRITT® Z is used to isolate the impact sound generated between prefabricated stairs and stair landings. The ISOTRITT® ZB element is used to isolate the impact sound generated between flights of stairs and the base plate. The element consists of a 10-mm-thick insulation plate with integrated sound insulation bearings for transferring positive shearing forces.

The sound absorption elements satisfy the requirements for increased sound insulation.

APPLICATION AREA
The ISOTRITT® Z element is suitable for use between prefabricated flights of stairs and prefabricated or in-situ concrete landings. As such, a bracket is required in order to support the stairs on the landing.

BENEFITS
- Quick and easy assembly
- Simple adaptation to component dimensions
- High load-bearing capacity
APPLICATION

SYSTEM CROSS SECTION OF TYPE Z

SYSTEM CROSS SECTION OF TYPE ZB

SUGGESTED ARRANGEMENT FOR SCHALL-ISOTRITT® TYPE Z – FLOOR PLAN
## DIMENSIONING TABLE FOR ISOTRITT® Z

<table>
<thead>
<tr>
<th>Schall-ISOTRITT® type Z</th>
<th>Staircase width [mm]</th>
<th>(V_{\text{red}})</th>
<th>Dimensions w x h x d [mm]</th>
<th>Number of bearings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z 100/4</td>
<td>800 - 1000</td>
<td>35.0 kN</td>
<td>1000 x 10 x Z</td>
<td>4</td>
</tr>
<tr>
<td>Z 100/5</td>
<td>900 - 1000</td>
<td>43.8 kN</td>
<td>1000 x 10 x Z</td>
<td>5</td>
</tr>
<tr>
<td>Z 100/L</td>
<td>800 - 1000</td>
<td>87.5 kN/m</td>
<td>1000 x 10 x Z</td>
<td>Linear bearing</td>
</tr>
<tr>
<td>Z 110/5</td>
<td>1000 - 1100</td>
<td>43.8 kN</td>
<td>1100 x 10 x Z</td>
<td>5</td>
</tr>
<tr>
<td>Z 110/L</td>
<td>1000 - 1100</td>
<td>87.5 kN/m</td>
<td>1100 x 10 x Z</td>
<td>Linear bearing</td>
</tr>
<tr>
<td>Z 120/6</td>
<td>1100 - 1200</td>
<td>52.5 kN</td>
<td>1200 x 10 x Z</td>
<td>6</td>
</tr>
<tr>
<td>Z 120/L</td>
<td>1100 - 1200</td>
<td>87.5 kN/m</td>
<td>1200 x 10 x Z</td>
<td>Linear bearing</td>
</tr>
<tr>
<td>Z 150/6</td>
<td>1200 - 1500</td>
<td>52.5 kN</td>
<td>1500 x 10 x Z</td>
<td>6</td>
</tr>
<tr>
<td>Z 150/L</td>
<td>1200 - 1500</td>
<td>87.5 kN/m</td>
<td>1500 x 10 x Z</td>
<td>Linear bearing</td>
</tr>
</tbody>
</table>

The maximum load of the Schall-ISOTRITT® elements increases by 8.75 kN with every additional bearing.

## DIMENSIONS

- ISOTRITT® Z dimensions – configuration with single bearings.
- ISOTRITT® Z dimensions – configuration with linear bearing.
# DIMENSIONING & DIMENSIONS

## DIMENSIONING TABLE FOR ISOTRITT® ZB

<table>
<thead>
<tr>
<th>Schall-ISOTRITT® type ZB</th>
<th>Staircase width (mm)</th>
<th>( V_{\text{rd}} )</th>
<th>Dimensions w x h x d [mm]</th>
<th>Number of bearings</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZB 100 x 36/4</td>
<td>800 - 1000</td>
<td>35.0 kN</td>
<td>1000 x 10 x 360</td>
<td>4</td>
</tr>
<tr>
<td>ZB 100 x 60/4</td>
<td>800 - 1000</td>
<td>35.0 kN</td>
<td>1000 x 10 x 600</td>
<td>4</td>
</tr>
<tr>
<td>ZB 100 x 36/5</td>
<td>900 - 1000</td>
<td>43.8 kN</td>
<td>1000 x 10 x 360</td>
<td>5</td>
</tr>
<tr>
<td>ZB 100 x 60/5</td>
<td>900 - 1000</td>
<td>43.8 kN</td>
<td>1000 x 10 x 600</td>
<td>5</td>
</tr>
<tr>
<td>ZB 100 x 36/L / ZB 100 x 60/L</td>
<td>800 - 1000</td>
<td>87.5 kN/m</td>
<td>1000 x 10 x 360</td>
<td>Linear bearing</td>
</tr>
<tr>
<td>ZB 110 x 36/6</td>
<td>1000 - 1100</td>
<td>52.5 kN</td>
<td>1100 x 10 x 360</td>
<td>6</td>
</tr>
<tr>
<td>ZB 110 x 60/6</td>
<td>1000 - 1100</td>
<td>52.5 kN</td>
<td>1100 x 10 x 600</td>
<td>6</td>
</tr>
<tr>
<td>ZB 110 x 36/L / ZB 110 x 60/L</td>
<td>1000 - 1100</td>
<td>87.5 kN/m</td>
<td>1100 x 10 x 360</td>
<td>Linear bearing</td>
</tr>
<tr>
<td>ZB 120 x 36/6</td>
<td>1100 - 1200</td>
<td>52.5 kN</td>
<td>1200 x 10 x 360</td>
<td>6</td>
</tr>
<tr>
<td>ZB 120 x 60/6</td>
<td>1100 - 1200</td>
<td>52.5 kN</td>
<td>1200 x 10 x 600</td>
<td>6</td>
</tr>
<tr>
<td>ZB 120 x 36/L / ZB 120 x 60/L</td>
<td>1100 - 1200</td>
<td>87.5 kN/m</td>
<td>1200 x 10 x 360</td>
<td>Linear bearing</td>
</tr>
<tr>
<td>ZB 150 x 36/6</td>
<td>1200 - 1500</td>
<td>52.5 kN</td>
<td>1500 x 10 x 360</td>
<td>6</td>
</tr>
<tr>
<td>ZB 150 x 60/6</td>
<td>1200 - 1500</td>
<td>52.5 kN</td>
<td>1500 x 10 x 600</td>
<td>6</td>
</tr>
<tr>
<td>ZB 150 x 36/L / ZB 150 x 60/L</td>
<td>1200 - 1500</td>
<td>87.5 kN/m</td>
<td>1500 x 10 x 360</td>
<td>Linear bearing</td>
</tr>
</tbody>
</table>

The maximum load of the Schall-ISOTRITT® elements increases by 8.75 kN with every additional bearing.

## DIMENSIONS

**ISOTRITT® ZB dimensions – configuration with single bearings**

**ISOTRITT® ZB dimensions – configuration with linear bearing**
FIRE PROTECTION – SOUND INSULATION

FIRE PROTECTION

The ISOTRITT® Z & ZB sound absorption elements have a construction material class of B2 according to DIN 4102. In accordance with DIN 4102-4, stairs are connected monolithically to landings with joint widths of ≤ 30 mm. In order for the bracket support to have a fire-resistance rating of R90, the conditions specified in DIN 4102-4 Section 3.2.5 for the dimensions of the bracket and minimum centre distances of the reinforcement must be observed.

SOUND INSULATION

By using the ISOTRITT® Z & ZB sound absorption elements, reductions in impact sound of \( \Delta L'_{\omega} \geq 28 \text{ dB} \) can be achieved.

Evaluated reduction in impact sound

![Graph showing evaluated reduction in impact sound vs. pressure load on the bearing](image)

NOTES:

- When determining the reduction in impact sound \( \Delta L'_{\omega} \geq 28 \text{ dB} \), the quasi-continuous load case is required.
- The load based on the level of suitability for use is determined as follows: \( V_{ek} = V_{Rd,\text{max}} / 1.4 \times \left(2/3 + 1/3 \times 0.3\right) \)
- This is based on the assumption that 2/3 of the load consists of dead loads and 1/3 of imposed loads.
- For differing loads, the reduction in impact sound can be found in the diagram above.
- The reductions in impact sound can be found in the expert report no. 11624/Pen/fmü/2002 for the sound damping ribbed bearing.
INSTALLATION INSTRUCTIONS

INSTALLATION OF ISOTRITT® Z

- Install the support on the stair landing
- If necessary, the elements can be cut to length with a knife to match the width of the staircase
- Remove the protective film from the adhesive rear surface
- Position and press down the ISOTRITT® on the staircase support
- In the case of a re-entrant staircase support, use end plates
- Offsetting the flight of stairs
- In the case of flights of stairs without clearance from the wall, an impact sound plate type TSP must be attached to the stair stringer

INSTALLATION OF ISOTRITT® ZB

- Centre the ISOTRITT® ZB sound absorption element on the supporting surface of the flight of stairs, then lay the flight of stairs
- In the case of flights of stairs without clearance from the wall, an impact sound plate type TSP must be attached to the stair stringer.
TSP impact sound plate

FOR STAIR STRINGERS AND STAIR LANDINGS

THE PRODUCT
The TSP impact sound plate is a self-adhesive, flexible insulation plate for isolating the sound generated in concrete components that lie flush with the staircase wall.

BENEFITS
- Quick assembly thanks to self-adhesive rear surface
- 15 m by the roll, reduces impact
- Reliable sound attenuation

INSTALLATION
The TSP impact sound plate is bonded to the front of the component in the case of prefabricated parts. In the case of in-situ concrete, the plate is attached to the staircase wall. Joints must be masked.
The TSP impact sound plate reliably isolates the sound generated in flights of stairs and landings from the staircase walls.

### Dimensions

<table>
<thead>
<tr>
<th>Type</th>
<th>Width [mm]</th>
<th>Thickness [mm]</th>
<th>Roll length [m]</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSP 24</td>
<td>240</td>
<td>15</td>
<td>15.00</td>
</tr>
<tr>
<td>TSP 36</td>
<td>360</td>
<td>15</td>
<td>15.00</td>
</tr>
<tr>
<td>TSP 48</td>
<td>480</td>
<td>15</td>
<td>7.50</td>
</tr>
</tbody>
</table>

### Sound Insulation

The TSP impact sound plate reliably isolates the sound generated in flights of stairs and landings from the staircase walls.

### Fire Protection

The TSP impact sound plate has a construction material class of B2 according to DIN 4102.

### Note:

- The impact sound plates must be connected to one another seamlessly. We recommend masking the joints with adhesive tape in order to prevent the ingress of foreign objects between the stairs and the staircase wall.
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