SINTON

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

**SINTON X**
PAGE 6
Impact sound insulation element for stair landings. Stair landing – wall connection

**SINTON X T1**
PAGE 6
Impact sound insulation element with reinforcement cage for stair landings. Stair landing – wall connection

**SINTON 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

**SINTON HT-V**
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Impact sound insulation element for sound absorption in flights of stairs. Flight of stairs – stair landing connection
TYPE OVERVIEW

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

**SINTON ZB**
PAGE 36
Impact sound insulation element for sound absorption in prefabricated flights of stairs.
Flight of stairs – base plate connection

**SINTON TSP**
PAGE 42
Impact sound plate for stair stringers and stair landings.
Inserted between the staircase and the wall
THE PRODUCT

The impact sound element SINTON X 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. SINTON X is made of polyurethane with integrated elastomer bearings to transfer the load and filling material. Depending on the design, positive and negative shearing forces as well as horizontal forces can be transferred.

The impact sound element is optionally available with a prefabricated reinforcement cage.

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

BENEFITS

- Type-tested
- Considerable impact sound reduction
- R90 fire safety inspection report
- Simple reinforcement layout
- For in-situ concrete and prefabricated landings
- Elastomer bearings with approval

APPLICATION AREA

SINTON X 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.
APPLICATION

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

SUGGESTED ARRANGEMENT FOR SINTON X – FLOOR PLAN

Support on opposite sides of the landings

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

SINTON X
- Isolation of in-situ concrete or prefabricated landing and staircase wall
- Type-tested impact sound element
- Basis for all SINTON X variants

SINTON X-T
- Impact sound element SINTON X with prefabricated reinforcement cage T1 for the bracket
- Load-bearing capacity of the bracket when using the reinforcement cage is type-tested
APPLICATION – ELEMENT CONSTRUCTION

SYSTEM CROSS SECTION

Installation cross section SINTON X

PRODUCT INFORMATION:

- Reduction in impact sound $\Delta L_{I,n,w} \geq 23$ dB
- Flexible use in the prefabricated structure and on the building site
- Type-tested
- High-quality 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

ELEMENT CONSTRUCTION

PRODUCT COMPONENTS

1. Sound absorption element for impact sound insulation
2. Elastomer bearing with approval; number depending on variant
3. Frame for quick and easy mounting
4. Filling material for stabilisation in the concreting state or by the load from the brickwork
5. Sticker with installation instructions
PRODUCT DEFINITION

SINTON X1  SINTON X2  SINTON X3

Depending on the configuration of the bearings, following forces can be transferred:
- SINTON X1: positive shearing forces
- SINTON X2: positive and negative shearing forces
- SINTON X3: positive and negative shearing forces as well as horizontal forces

DIMENSIONS $h \times w \times d$ [mm]

<table>
<thead>
<tr>
<th></th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SINTON X</strong></td>
<td>180 x 245 x 150</td>
<td>210 x 275 x 155</td>
</tr>
</tbody>
</table>

PLATE HEIGHTS

Plate height $h < 180$ mm  Plate height $h = 180$ mm  Plate height $h > 180$ mm

* For plate heights smaller than 180 mm, the remaining gap in the box for the SINTON X2 or X3 version must be filled with mortar (min. MG IIa).

TYPE DESIGNATION

SINTON X1-T1

Optional: Version with prefabricated reinforcement cage

Forces absorbed by the box
- $V_{bd,z,u}$
- $V_{bd,z,u}$ und $V_{bd,z,o}$
- $V_{bd,z,u}$ und $V_{bd,z,u}$ und $V_{bd,x}$
## DIMENSIONING

### DIMENSIONING TABLE SINTON X – CONCRETE ≥ C20/25 ACCORDING TO TYPE TEST

<table>
<thead>
<tr>
<th></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>SINTON X1</td>
<td>≥ 160</td>
<td>73,8</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>SINTON X1-T1</td>
<td></td>
<td></td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>SINTON X2</td>
<td></td>
<td></td>
<td>24,5*</td>
<td>-</td>
</tr>
<tr>
<td>SINTON X2-T1</td>
<td></td>
<td></td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>SINTON X3</td>
<td></td>
<td></td>
<td>± 24,5</td>
<td>± 24,5</td>
</tr>
<tr>
<td>SINTON X3-T1</td>
<td></td>
<td></td>
<td></td>
<td>± 24,5</td>
</tr>
</tbody>
</table>

* For plate height < 180 mm, the finished bracket in the box must be filled with mortar (min. 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 verification of the load-bearing capacity of the bracket for SINTON X without prefabricated reinforcement cage T1 is carried out by the responsible structural engineer.
- The load-bearing capacity of the bracket for the reinforcement cage T1 is verified after the type test.
- With SINTON X, higher forces can also be transmitted in individual cases. Please contact our technical department.

### 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
FIRE PROTECTION

SINTON X with prefabricated reinforcement cage (product variant SINTON X-T1) corresponds to fire resistance class R90 (F90), see expert opinion of MFPA Leipzig. The fire resistance class R90 (F90) is achieved with reinforcement cages manufactured on-site if the minimum centre distances according to variant T1 are adhered to.

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 correspond to fire resistance class R90 (F90).

SOUND INSULATION

- Reduction in impact sound $\Delta L_{n,w} \geq 23$ dB

SINTON X

![Graph showing reduction in impact sound vs. pressure load on the bearing in kN]
INSTALLATION INSTRUCTIONS FOR SINTON X IN BRICKWORK WALLS AND FOR IN-SITU CONCRETE CONSTRUCTION

1a

1b

2a

2b

3

4
INSTALLATION INSTRUCTIONS SINTON X FOR PREFABRICATED LANDINGS

1

2

3

4
THE PRODUCT
SINTON HQW consists of a load-overlapping dowel, a vibration-damping wall bearing and a stair-side bearing sleeve with portal reinforcement.

BENEFITS
- General technical approval Z-15.7-321
- For internal and external components
- Joint widths of up to 120 mm

APPLICATION AREA
SINTON HQW can be used in in-situ concrete and prefabricated construction. Areas of application are spiral staircases, stair landings as well as supported pergolas. The load transfer can take place evenly in brickwork or concrete walls.
APPLICATION

IN STAIRCASES

Use of SINTON HQW in a half-spiral staircase, joint insulation with SINTON TSP

IN STAIR LANDINGS

SINTON HQW in a landing, joint insulation with SINTON TSP

SINTON HQW in a landing at thermally insulated joints.

IN SUPPORTED PERGOLAS

SINTON HQW in a landing, joint insulation with SINTON TSP
PRODUCT OVERVIEW

PRODUCT COMPONENTS

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

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

**IMPACT SOUND BOX MOUNTING FRAME**
- HQW 60x40: 10 mm EPDM bearing
- HQW 60x40 Maxi: 20 mm EPDM bearing
- HQW 60x60: 10 mm EPDM bearing
- HQW 60x60 Maxi: 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)
- Length 300 - 410 mm
- HQW 60x60x5 mm in S355, galvanised
- HQW 60x60x5 mm in S275, V2A (1.4301) / V4A (1.4571)
- Length 350 - 460 mm
PRODUCT OVERVIEW

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 COMPONENTS

PRODUKTINFORMATION
- Reduction in impact sound $\Delta L_{n,w}^{A}$ = 41 dB for SINTON HQW Maxi for the sound insulation class A* in accordance with DEGA 103
- Reduction in impact sound $\Delta L_{n,w}^{A}$ = 30 dB for SINTON HQW
- Joint widths of up to 120 mm
- With general technical approval no. Z-15.7-321
- Elastomer bearing in accordance with approval Z-16.32-426
- Fire resistance class F90 for joint widths of up to 40 mm when using the fire protection sleeve
DIMENSIONS

**SINTON HQW 60X40**

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

View from above SINTON HQW 60x40
DIMENSIONS

SINTON HQW 60X60

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

View from above SINTON HQW 60x60
DIMENSIONING TABLE FOR THE ABSORBABLE SHEARING FORCE $V_{rd}$ [kN] – CONCRETE C20/25

<table>
<thead>
<tr>
<th>SINTON</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 60x40xS355 VZ</td>
</tr>
<tr>
<td>10</td>
<td>300</td>
<td>37.6</td>
</tr>
<tr>
<td>15</td>
<td>305</td>
<td>36.8</td>
</tr>
<tr>
<td>20</td>
<td>310</td>
<td>36.0</td>
</tr>
<tr>
<td>40</td>
<td>330</td>
<td>33.1</td>
</tr>
<tr>
<td>50</td>
<td>340</td>
<td>31.8</td>
</tr>
<tr>
<td>60</td>
<td>350</td>
<td>30.6</td>
</tr>
<tr>
<td>80</td>
<td>370</td>
<td>28.5</td>
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<tr>
<td>100</td>
<td>390</td>
<td>25.9</td>
</tr>
<tr>
<td>120</td>
<td>410</td>
<td>23.0</td>
</tr>
</tbody>
</table>

DIMENSIONING TABLE FOR THE ABSORBABLE SHEARING FORCE $V_{rd}$ [kN] – CONCRETE C25/30

<table>
<thead>
<tr>
<th>SINTON</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 60x40xS355 VZ</td>
</tr>
<tr>
<td>10</td>
<td>300</td>
<td>42.6</td>
</tr>
<tr>
<td>15</td>
<td>305</td>
<td>41.7</td>
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<tr>
<td>20</td>
<td>310</td>
<td>40.7</td>
</tr>
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<td>40</td>
<td>330</td>
<td>37.4</td>
</tr>
<tr>
<td>50</td>
<td>340</td>
<td>36.0</td>
</tr>
<tr>
<td>60</td>
<td>350</td>
<td>34.6</td>
</tr>
<tr>
<td>80</td>
<td>370</td>
<td>29.7</td>
</tr>
<tr>
<td>100</td>
<td>390</td>
<td>25.9</td>
</tr>
<tr>
<td>120</td>
<td>410</td>
<td>23.0</td>
</tr>
</tbody>
</table>
DIMENSIONING TABLE FOR THE ABSORBABLE SHEARING FORCE $V_{rd}$ [kN] – CONCRETE $\geq$ C30/37

<table>
<thead>
<tr>
<th>SINTON</th>
<th>HQW 60x40</th>
<th></th>
<th></th>
<th>HQW 60x60</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Joint width $f$ [mm]</td>
<td>Dowel length $l$ [mm]</td>
<td>HQW 60x40x4 S 355 VZ</td>
<td>HQW 60x40x4 S 275 V2A / V4A</td>
<td>Dowel length $l$ [mm]</td>
<td>HQW 60x60x5 S 355 VZ</td>
<td>HQW 60x60x5 S 275 V2A / V4A</td>
</tr>
<tr>
<td>10</td>
<td>300</td>
<td>46.8</td>
<td>34.2</td>
<td>350</td>
<td>64.2</td>
<td>60.4</td>
</tr>
<tr>
<td>15</td>
<td>305</td>
<td>45.8</td>
<td>33.0</td>
<td>355</td>
<td>63.1</td>
<td>58.3</td>
</tr>
<tr>
<td>20</td>
<td>310</td>
<td>44.7</td>
<td>31.8</td>
<td>360</td>
<td>61.9</td>
<td>56.2</td>
</tr>
<tr>
<td>40</td>
<td>330</td>
<td>41.1</td>
<td>26.7</td>
<td>380</td>
<td>57.8</td>
<td>48.6</td>
</tr>
<tr>
<td>50</td>
<td>340</td>
<td>37.7</td>
<td>24.5</td>
<td>390</td>
<td>56.0</td>
<td>45.3</td>
</tr>
<tr>
<td>60</td>
<td>350</td>
<td>34.7</td>
<td>22.5</td>
<td>400</td>
<td>54.3</td>
<td>42.2</td>
</tr>
<tr>
<td>80</td>
<td>370</td>
<td>29.7</td>
<td>19.3</td>
<td>420</td>
<td>47.5</td>
<td>36.8</td>
</tr>
<tr>
<td>100</td>
<td>390</td>
<td>25.9</td>
<td>16.9</td>
<td>440</td>
<td>42.1</td>
<td>32.6</td>
</tr>
<tr>
<td>120</td>
<td>410</td>
<td>23.0</td>
<td>14.5</td>
<td>460</td>
<td>37.7</td>
<td>29.2</td>
</tr>
</tbody>
</table>

NOTES:

- Additional $V_{rd}$ values can be found in the approval Z-15.7-321. Intermediate values may also be interpolated linearly.
- SINTON X 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:
  - SINTON HQW 60x40: $h \geq 160$ mm, $c_{nom} \geq 20$ mm
  - SINTON HQW 60x60: $h \geq 200$ mm, $c_{nom} \geq 35$ mm
- SINTON 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

CENTRE AND EDGE CLEARANCES

Arrangement of the elements in stair cases – use of HQW with SINTON TSP

<table>
<thead>
<tr>
<th>SINTON</th>
<th>Slab thickness h [mm]</th>
<th>Edge clearance $a_e$ [mm]</th>
<th>Dowel clearance $a_D$ [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>HQW 60x40</td>
<td>$\geq 160$</td>
<td>$\geq 200$</td>
<td>$\geq 400$</td>
</tr>
<tr>
<td>HQW 60x60</td>
<td>$\geq 200$</td>
<td>$\geq 300$</td>
<td>$\geq 600$</td>
</tr>
</tbody>
</table>
ARRANGEMENT OF THE ELEMENTS

COMPONENT DIMENSION

SINTON HQW 60x40 – Installation for a slab thickness of 160 mm

SINTON HQW 60x60 – Installation for a slab thickness of 200 mm

SINTON HQW 60x40 – Installation in spiral staircases

SINTON HQW 60x60 – Installation in spiral staircases
DEFORMATION

In the event of deformation of the SINTON 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

When an appropriate fire protection sleeve is used, SINTON HQW can be assigned to fire resistance class of R90, provided it has joint openings up to a maximum of 50 mm.

SOUND INSULATION

SINTON HQW
- Reduction in impact sound $\Delta L_{n,w}^{a} = 30.0$ dB for SINTON HQW 60x40
- Reduction in impact sound $\Delta L_{n,w}^{a} = 30.6$ dB for SINTON 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

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

A-A view

Item ①
Item ①
Item ③
Item ②

A-A view
<table>
<thead>
<tr>
<th>SINTON HQW</th>
<th>Dimensions and clearances</th>
<th>Reinforcement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a [mm]</td>
<td>a₁ [mm]</td>
</tr>
<tr>
<td>HQW 60x40</td>
<td>120</td>
<td>20</td>
</tr>
<tr>
<td>HQW 60x60</td>
<td>124</td>
<td>20</td>
</tr>
</tbody>
</table>
THE PRODUCT
SINTON 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 class R90
- High load-bearing capacity
- Installation on the building site or in the prefabricated structure
- Quick and easy installation
- Acoustically tested

APPLICATION AREA
SINTON 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.
APPLICATION – PRODUCT OVERVIEW

APPLICATION

Use of SINTON HT-V in a landing in combination with SINTON TSP

PRODUCT OVERVIEW

FIRE PROTECTION
SINTON HT-V corresponds to fire resistance class R90.

SOUND INSULATION
Impact sound absorption $\Delta L_w = 16$ dB
DIMENSIONS – DIMENSIONING

**DIMENSIONS**

![View of SINTON HT-V - example illustration](image)

![Side view of SINTON HT-V](image)

![Installation cross section of SINTON HT-V](image)

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

<table>
<thead>
<tr>
<th>SINTON</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:**

- SINTON 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 SINTON 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 SINTON 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 SINTON 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 SINTON 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 SINTON HT-V
- Align SINTON 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
THE PRODUCT

SINTON Z is used to isolate the impact sound generated between prefabricated stairs and stair landings. The SINTON 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.

BENEFITS

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

APPLICATION AREA

The SINTON 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.
APPLICATION

SYSTEM CROSS SECTION OF TYPE Z

SYSTEM CROSS SECTION OF TYPE ZB

SUGGESTED ARRANGEMENT FOR SINTON TYPE Z – FLOOR PLAN
DIMENSIONING & DIMENSIONS

DIMENSIONING TABLE FOR SINTON Z

<table>
<thead>
<tr>
<th>SINTON type Z</th>
<th>Staircase width [mm]</th>
<th>$V_{nd}$</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 SINTON Z elements increases by 8.75 kN with every additional bearing.

DIMENSIONS

SINTON Z dimensions - configuration with single bearings

SINTON Z dimensions - configuration with linear bearing
## DIMENSIONING & DIMENSIONS

### DIMENSIONING TABLE FOR SINTON ZB

<table>
<thead>
<tr>
<th>SINTON type ZB</th>
<th>Staircase width (mm)</th>
<th>$V_{rd}$</th>
<th>Dimensions $w \times h \times d$ (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>
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<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>
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<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>
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<td>ZB 120 x 36/L / ZB 120 x 60/L</td>
<td>1100 - 1200</td>
<td>87.5 kN/m</td>
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<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 SINTON ZB elements increases by 8.75 kN with every additional bearing.

### DIMENSIONS

SINTON ZB dimensions – configuration with single bearings

SINTON ZB dimensions – configuration with linear bearings
FIRE PROTECTION

The SINTON 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 \( \leq 30 \) mm. In order for the bracket support to correspond to resistance class 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 SINTON Z & ZB sound absorption elements, reductions in impact sound of \( \Delta L'_{w} \geq 28 \) 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 \( \Delta L'_{w} \geq 28 \) dB, the quasi-continuous load case is required.
- The load based on the level of suitability for use is determined as follows: \( V_{E_k} = \frac{V_{E_{lim}}}{1.4} \times (2/3 + 1/3 \times 0.3) \)
- 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/mü/2002 for the sound damping ribbed bearing.
INSTALLATION INSTRUCTIONS

INSTALLATION SINTON 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 SINTON on the staircase support
- In the case of a re-entrant staircase support, use end plates
- Centre the SINTON 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 SINTON TSP must be attached to the stair stringer.

SINTON ZB

- Offsetting the flight of stairs
- In the case of flights of stairs without clearance from the wall, an impact sound plate type SINTON TSP must be attached to the stair stringer.
The SINTON 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 SINTON 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.
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 SINTON TSP impact sound plate reliably isolates the sound generated in flights of stairs and landings from the staircase walls.

FIRE PROTECTION
The SINTON 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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