

TECHNICAL INFORMATION – MARCH 2024

Isokorb[®] T for reinforced concrete structures



Load-bearing thermal insulation elements for the effective reduction of thermal bridges on projecting structural elements such as balconies, arcades and canopies.

Planning and consulting service

The engineers of Schöck's technical design department would be very happy to advise you on static, structural and building-physics questions and will produce for you proposals for your solution with calculations and detailed drawings. For this please send your planning documentation (general arrangements, sections, static data) with the address of the building project to:

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Johan Follestad's vei 3
3474 Åros

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Tel.: +47 31 30 25 00
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post@haucon.no

Downloads and requests

post@haucon.no
www.schoeck.com

Notes | Symbols

i Technical Information

- This Technical Information on the respective product application is valid only if complete and therefore may only be reproduced as a whole. With texts and graphics published solely as extracts there is a danger of communicating insufficient or even misleading information. Therefore dissemination is the sole responsibility of the user or the person carrying out the process!
- This technical information is valid solely for Norway and takes into account country-specific standards and product-specific accreditations / approvals.
- If the installation takes place in another country, then the technical information applicable for the respective country must be used.
- The current Technical Information is to be applied The current version is available at:
www.schoeck.com/download-teknisk-informasjon/no

i Installation instructions

Current installation instructions can be found online at:
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i Special constructions

Some connection situations cannot be realised with those standard product variants presented in this Technical Information. In this case special constructions can be requested from the application engineering department (for contact see page 3.) This applies, for example, with additional requirements as a result of prefabricated component construction (limitation due to manufacturing constraints or through transport width), which can possibly be met using coupler bars.

i Bending of reinforcing steel

With the production of the Schöck Isokorb® in the factory it is ensured through monitoring that the conditions of the general building supervisory approval document and of NS-EN 1992-1-1 (EC2) and NS-EN 1992-1-1/NA with regard to bending of reinforcing steel are observed.

Attention: If original Schöck Isokorb® reinforcing steels are bent or bent and bent back on-site, the observation and the monitoring of the respective conditions (European Technical Assessment (ETA), NS-EN 1992-1-1 (EC2) and NS-EN 1992-1-1/NA) lie outside the influence of Schöck Bauteile GmbH. Therefore, in such cases, our warranty is invalidated.

Notes Symbols

⚠ Hazard note

The triangle with exclamation mark indicates a hazard warning. This means there is a danger to life and limb if compliance is not observed.

i Info

The square with an “i” indicates important information which, for example, must be read in conjunction with the design.

☑ Check list

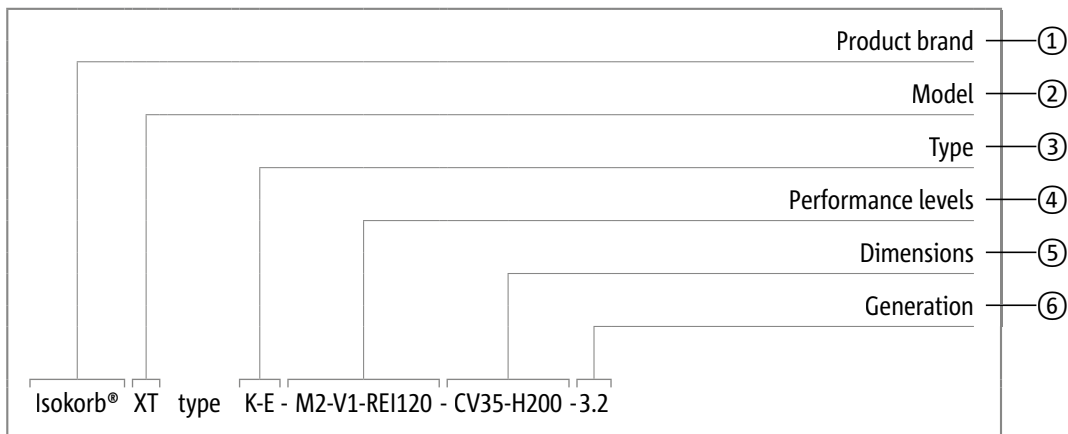
The square with a tick indicates the check list. Here, the essential points of the design are briefly summarised.

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Explanation of the naming of Schöck Isokorb® types

The naming system for the Schöck Isokorb® product group has changed. This page contains information about the name components for easier conversion.



Every Schöck Isokorb® only receives the name components that are relevant for the respective product.

① Product brand

Schöck Isokorb®

② Model

The model designation is an integral part of the name of each Isokorb®. It stands for a core characteristic of the product. The corresponding abbreviation will always be positioned before the type word.

Model	Core characteristics of the products	Connection	Components
XT	For eXtra Thermal insulation	Reinforced concrete – reinforced concrete, steel – reinforced concrete, timber – reinforced concrete	Balcony, passageway walk, canopy, floor slab, parapet, balustrade, corbel, beam, wall
CXT	With Combar® for eXtra Thermal insulation	Reinforced concrete – reinforced concrete	Balcony, passageway walk, canopy
T	For Thermal break	Reinforced concrete – reinforced concrete, steel – reinforced concrete, steel – steel, timber – reinforced concrete	Balcony, passageway walk, canopy, floor slab, parapet, balustrade, corbel, beam, wall
RT	For Reconstruction of components with a Thermal break	Reinforced concrete – reinforced concrete, steel – reinforced concrete, timber – reinforced concrete	Balcony, passageway walk, canopy, beam

③ Type

The type is a combination of the following name components:

- Basic type
- Configuration variation
- Static connection variation
- Geometric connection variation

Basic type					
K	Balcony, canopy – cantilevered	A	Parapet, balustrade	SK	Steel balcony – cantilevered
Q	Balcony, canopy – supported (shear force)	F	Parapet, balustrade – attached	SQ	Steel balcony – supported (shear force)
H	Balcony with horizontal loads	O	Corbel	S	Steel structure
Z	Balcony with intermediate insulation	B	Beam, inner slab joist		
D	Floor – continuous (indirect support)	W	Shear wall		

Explanation of the naming of Schöck Isokorb® types

Configuration variant	
T	Available in lengths L1000 and L500
E	Available in lengths L1000, L500 and L250; can be used with Schöck IDock®

Static connection variation	
Z	Free of constraint forces
P	Intermittent
V	Shear force
N	Normal force

Geometric connection variation	
W	Shear force bar on floor side bent

④ Performance levels

Performance levels include load-bearing levels and fire protection. The various load-bearing levels of an Isokorb® type are numbered consecutively, beginning with 1 for the lowest load capacity. Different Isokorb® types with the same load-bearing level do not have the same load bearing capacity. The load-bearing level must always be determined via the design and calculation tables or the calculation program.

The load-bearing level has the following name components:

- Main load-bearing level: Combination of internal force and number
- Secondary load-bearing level: Combination of internal force and number

Internal force of the main load-bearing level	
M	Moment
MM	Moment with positive or negative force
V	Shear force
VV	Shear force with positive or negative force
N	Normal force
NN	Normal force with positive or negative force

Internal force of the secondary load-bearing level	
V	Shear force
VV	Shear force with positive or negative force
N	Normal force
NN	Normal force with positive or negative force

The name component for the fire protection contains the fire resistance class.

Fire resistance class	
REI	R – load bearing capacity, E – integrity, I – insulation under the influence of fire

⑤ Dimensions

The following name components are part of the dimensions:

- Concrete cover CV
- Bond length LR, bond height HR
- Isokorb® height H, length L, width B (insulation element)
- Diameter of thread D

⑥ Generation

Each type designation ends with a generation number. If Schöck develops a product further and through this the characteristics of the product change, the generation number increases. With large product changes the number in front of the dot increases, with small product changes the number after the dot increases. Examples:

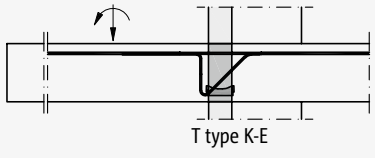
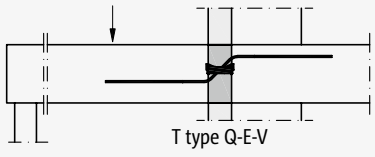
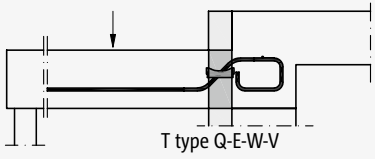
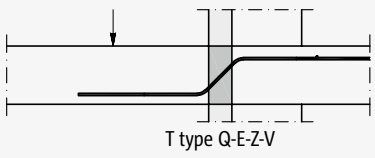
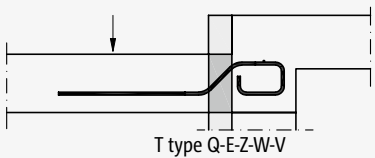
- Large product change: Generation 6.0 becomes 7.0
- Small product change: Generation 7.0 becomes 7.1

i Generation number in tables

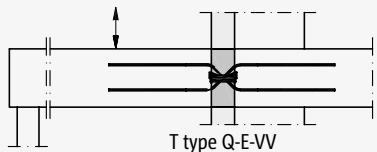
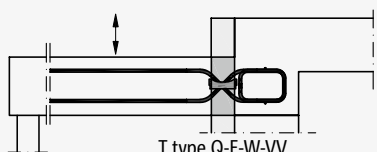
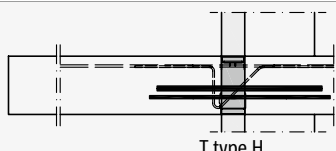
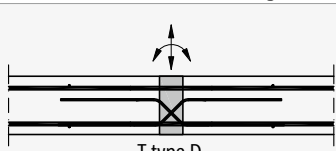
In tables with a product reference, the Schöck Isokorb® type is always stated in the header together with the generation number. For example:

- Schöck Isokorb® XT type K 6.2

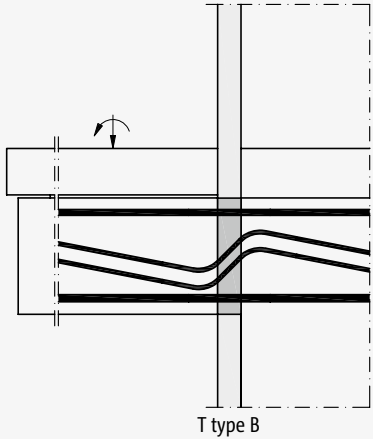
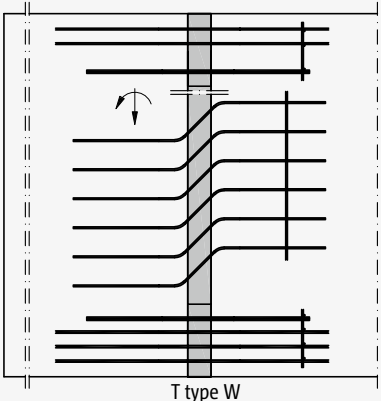
Summary of types

Application	Production type	Schöck Isokorb® type
<p>Free cantilevered balconies</p>  <p>T type K-E</p>	<p>In-situ concrete Completely prefabricated part</p>	<p>T type K-E, K-T</p> <p>Page 31</p>
<p>Supported balconies</p>  <p>T type Q-E-V</p>	<p>In-situ concrete Completely prefabricated part</p>	<p>T type Q-E-V, Q-T-V</p> <p>Page 55</p>
<p>Supported balconies with height offset</p>  <p>T type Q-E-W-V</p>	<p>In-situ concrete Completely prefabricated part</p>	<p>T type Q-E-W-V, Q-T-W-V</p> <p>Page 55</p>
<p>Zero-stress shear force connection</p>  <p>T type Q-E-Z-V</p>	<p>In-situ concrete Completely prefabricated part</p>	<p>T type Q-E-Z-V, Q-T-Z-V</p> <p>Page 55</p>
<p>Shear force connection with height offset free of constraint force</p>  <p>T type Q-E-Z-W-V</p>	<p>In-situ concrete Completely prefabricated part</p>	<p>T type Q-E-Z-W-V, Q-T-Z-W-V</p> <p>Page 55</p>

Summary of types

Application	Production type	Schöck Isokorb® type
<p>Supported balconies with positive and negative shear force</p>  <p>T type Q-E-VV</p>	<p>In-situ concrete Completely prefabricated part</p>	<p>T type Q-E-VV, Q-T-VV Page 55</p>
<p>Supported balconies with positive and negative shear force and height offset</p>  <p>T type Q-E-W-VV</p>	<p>In-situ concrete Completely prefabricated part</p>	<p>T type Q-E-W-VV, Q-T-W-VV Page 55</p>
<p>Addition for horizontal loads</p>  <p>T type H</p>	<p>In-situ concrete Completely prefabricated part Semi-finished component</p>	<p>T type H Page 79</p>
<p>Continuous floors with bending moments and shear forces</p>  <p>T type D</p>	<p>In-situ concrete Completely prefabricated part Semi-finished component</p>	<p>T type D Page 89</p>

Summary of types

Application	Production type	Schöck Isokorb® type
<p>Free cantilevered downstand beams and reinforced concrete beams</p>  <p>T type B</p>	<p>In-situ concrete Completely prefabricated part</p>	<p>T type B Page 107</p>
<p>Free cantilevered shear walls</p>  <p>T type W</p>	<p>In-situ concrete Completely prefabricated part</p>	<p>T type W Page 117</p>

Building physics

Effective heat insulation of thermal bridges

Definition of thermal bridges

Thermal bridges are local component areas in the building shell, in which heat loss occurs. The increased heat loss can either result from the component area deviating from the level form (geometric thermal bridge) or from local materials with increased thermal conductivity being present in the affected region (material-related thermal bridge).

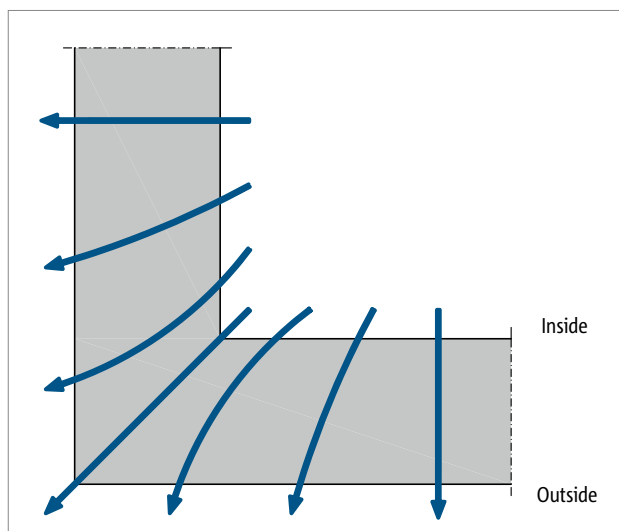


Fig. 1: Geometric thermal bridges

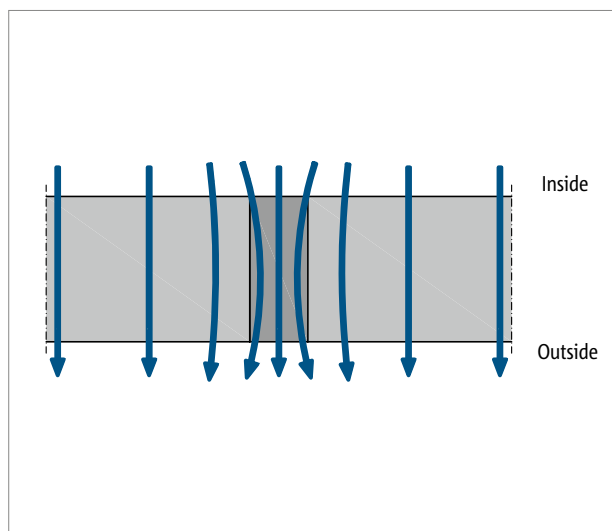


Fig. 2: Material-conditioned thermal bridges

Effects of thermal bridges

In the area of the thermal bridge the locally increased heat loss leads to a lowering of the inner surface temperature. As soon as the surface temperature falls below the so-called “mildew temperature” Θ_s over a longer period, there is a significantly increased risk of mould. What is more, if the surface temperature falls below the dew-point temperature Θ_τ , then the moisture in the ambient air condenses on the cold surfaces in the form of condensate. This can result in long-term damage to the building fabric. If mould has formed in the area of a thermal bridge, then considerable impairments can occur to health for the resident due to the emitted mould spores in the room. Mould spores cause allergies and can therefore provoke allergic reactions in people, such as, for example, sinusitis, rhinitis and asthma. Through the general long-lasting daily exposure in dwellings there is a high risk that the allergic reactions will become chronic.

Summarised, the effects of thermal bridges are thus:

- Danger of the formation of mould
- Danger of impairments to health (allergies etc.)
- Danger of occurrence of condensation
- Increased thermal energy loss
- Danger of structural damage

Uninsulated cantilevered structural components

With uninsulated cantilevered structural components such as, for example, reinforced concrete balconies or steel girders, the co-action of the geometric thermal bridge (cooling fin effect of the cantilever) as well as of the material-conditioned thermal bridge (breaching of the heat insulating layer with reinforced concrete or steel), there is a strong heat drainage. With this, cantilevers are among the most critical thermal bridges of the building shell. The results of uninsulated cantilevers are considerable heat losses and a significant lowering of the surface temperature. This leads to a marked increase in heating costs and a very high risk of mould in the area of the connection of the cantilever.

Effective heat insulation of thermal bridges

For the reasons mentioned, it is important to observe the requirements relating to protection against moisture and thermal insulation. The use of a load bearing thermal break element for balconies and passageway walks is a standard recognised method and thus reduces thermal losses to a minimum.

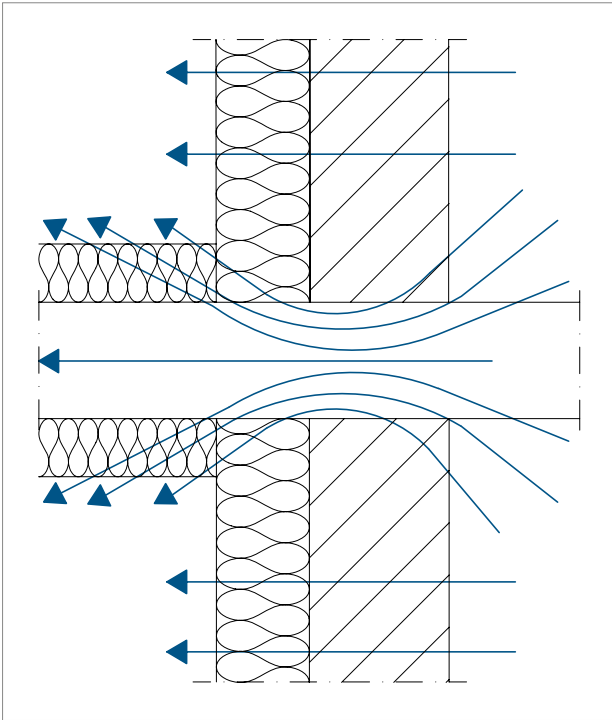


Fig. 3: Increased thermal loss for balconies or passageway walks wrapped in insulation

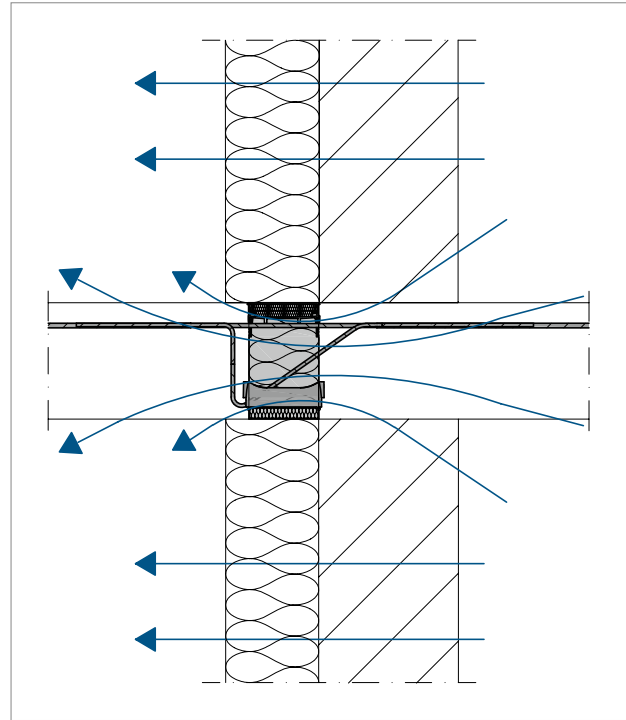


Fig. 4: Minimal thermal loss for balconies or passageway walks with a load bearing thermal break element

Characteristic values of thermal insulation products

Characteristic building-physical values of cantilevered components

Several characteristic values exist for describing the effects of a thermal bridge. The property of a Schöck Isokorb® for preventing heat transfer is described by the equivalent thermal conductivity λ_{eq} . This is a product parameter, just like the equivalent thermal resistance R_{eq} derived from it, which in addition takes into account the thickness of the insulating element of a Schöck Isokorb®. It can be used to compare products with different insulation thicknesses.

Product parameters	Characteristic value	Type of thermal bridge
Equivalent thermal conductivity	λ_{eq}	Cantilevered structural elements such as balconies and parapets, designed with Schöck Isokorb®.
Equivalent resistance to heat transmission	R_{eq}	Cantilevered structural elements such as balconies and parapets, designed with Schöck Isokorb®.

In addition, there are also characteristic values to describe the requirements relating to moisture proofing: $\theta_{si,min}$ and f_{Rsi} are requirements relating to the temperature of the heat-side wall surface temperature of a building to rule out condensation and mould formation.

There are also requirements relating to the energy loss through the thermal bridge. These are described for linear thermal bridges using the ψ value (length-related heat transfer coefficient) and the point thermal bridges using the χ value (point-related heat transfer coefficient).

Thermal effects	Characteristic value	Type of thermal bridge
Moisture proofing		
Condensation result, mould formation	f_{Rsi} $\theta_{si,min}$	all
Thermal protection for thermal bridges		
Energy loss	ψ	linear
	χ	punctual

Info

ψ , χ , $\theta_{si,min}$ and f_{Rsi} are also calculated for a specific thermal bridge – a specific construction in which a specific Isokorb® is embedded. Therefore these values are always dependent on the construction, while λ_{eq} and R_{eq} describe only the thermal insulation effect of a Schöck Isokorb®. So if one modifies characteristics of the construction such as the Isokorb® type or the insulation thickness of the wall insulation, then the heat transfer through the thermal bridge (and with this ψ , χ , $\theta_{si,min}$ and f_{Rsi}) also changes.

The application of λ_{eq} and the calculation of ψ , χ , $\theta_{si,min}$ and f_{Rsi} are explained in the Detailed thermal bridge calculation section.

Equivalent thermal conductivity λ_{eq}

The equivalent thermal conductivity λ_{eq} is the overall thermal conductivity of all components of the Schöck Isokorb® and is – at the same insulating element thickness – a measure for the thermal insulating effect of the connection. The smaller λ_{eq} , the higher the thermal insulation of the balcony connection. λ_{eq} values are determined through detailed thermal bridge calculations. Since each product has an individual geometry and placement specification, each Schöck Isokorb® has an individual number.

The calculation methodology to determine λ_{eq} was validated based on the European Assessment Document – EAD for load bearing thermal insulating elements and – based on this – for Schöck Isokorb® in a European Technical Assessment – ETA.

It is possible to do the calculations using commercially available thermal bridge software by means of the thermal boundary conditions according to NS-EN ISO 6946. In doing so, surface temperatures θ_{si} and the resulting temperature factor f_{Rsi} can be calculated in addition to the heat loss through the thermal bridge (ψ value).

Detailed thermal bridge calculation

Where a detailed thermal bridge calculation is to be provided for the determination of ψ or f_{Rsi} values, the λ_{eq} value can be used in modelling of the connection details. For this purpose, a homogenous rectangle of the same dimensions of the Schöck Isokorb® insulating element is placed into the model in its position and the equivalent thermal conductivity λ_{eq} assigned. Refer to figure. In this way, the building physics characteristic values of a design can be simply calculated.

The individual λ_{eq} values can be found online at:
www.schoeck.com/nedlastinger/no

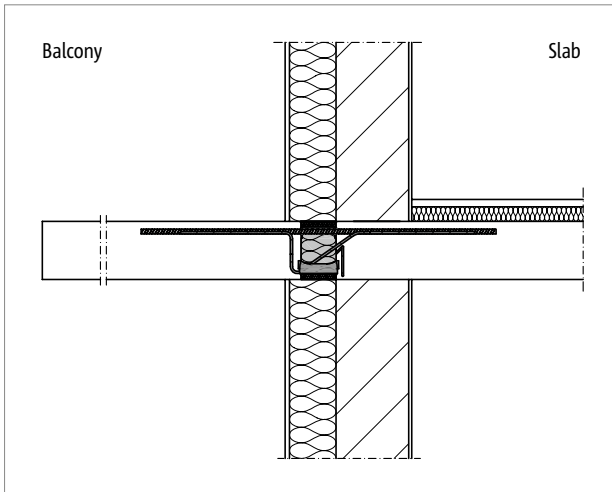


Fig. 5: Representation of a sectional drawing with detailed Schöck Isokorb® model

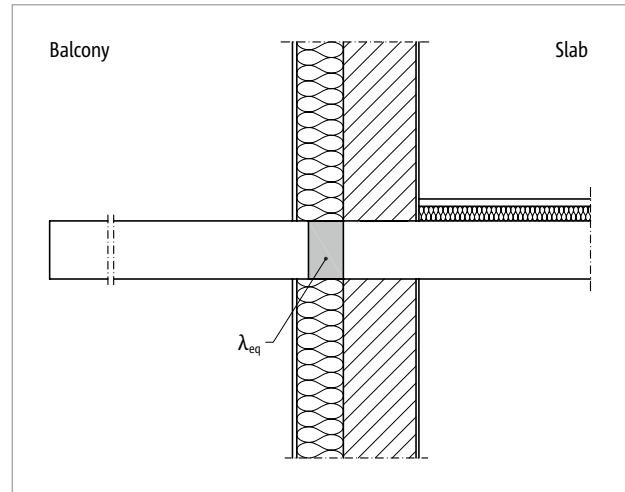


Fig. 6: Representation of a sectional drawing with substitute insulating element

Please note that a large section from the construction is selected so that the areas of the surrounding construction being influenced by the thermal bridge are shown in the model. A spacing of 2 metres around the thermal bridge is normally sufficient to take these boundary effects into account.

Thermal bridge details

Design of balconies, passageway walks and canopies

The Schöck Isokorb® must always be positioned in the insulating layer flush with the inner edge of the insulation. For monolithic constructions such as single-leaf masonry, the Isokorb® is positioned flush with the outside edges of the wall construction. The Isokorb® is also positioned flush with the inner edge of the insulation in the insulating layer of the wall for canopies. However, it is important here that the insulating layer is not interrupted. For the configuration with windows and doors, it is particularly important that they are positioned in the insulating layer.

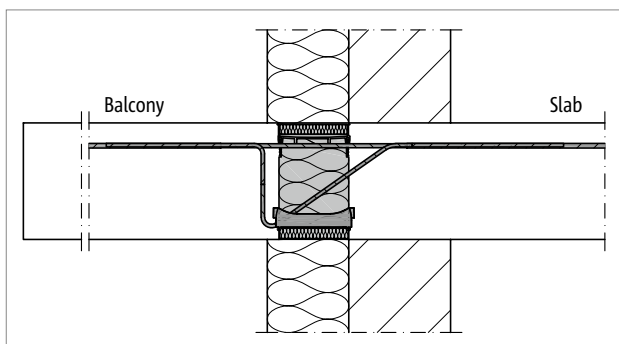


Fig. 7: Schöck Isokorb® XT type K: Connection with thermal insulation composite system (WDVS)

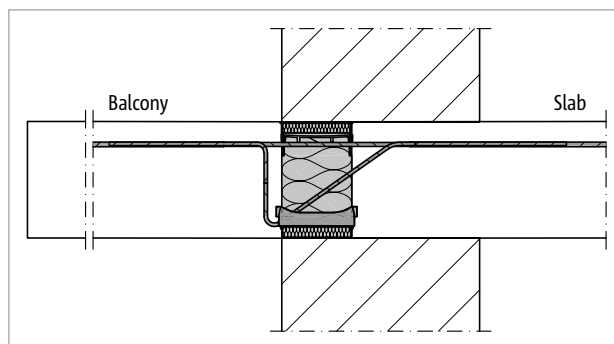


Fig. 8: Schöck Isokorb® XT type K: Connection with single-leaf masonry

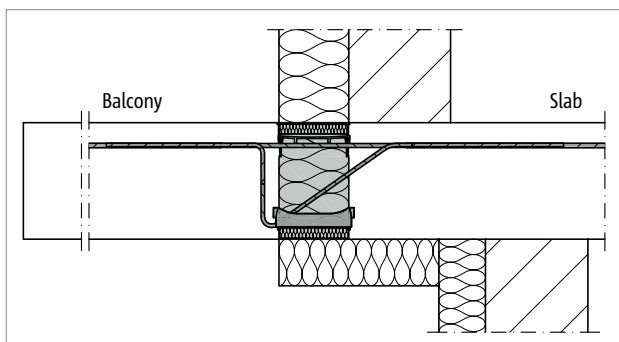


Fig. 9: Schöck Isokorb® XT type K: Connection with indirectly positioned floor and thermal insulation composite system (WDVS)

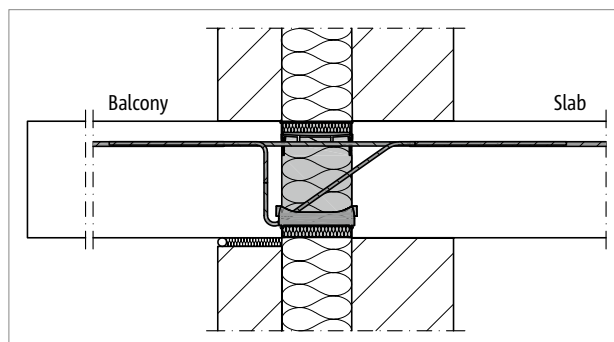


Fig. 10: Schöck Isokorb® XT type K: Connection with filled cavity brickwork with core insulation

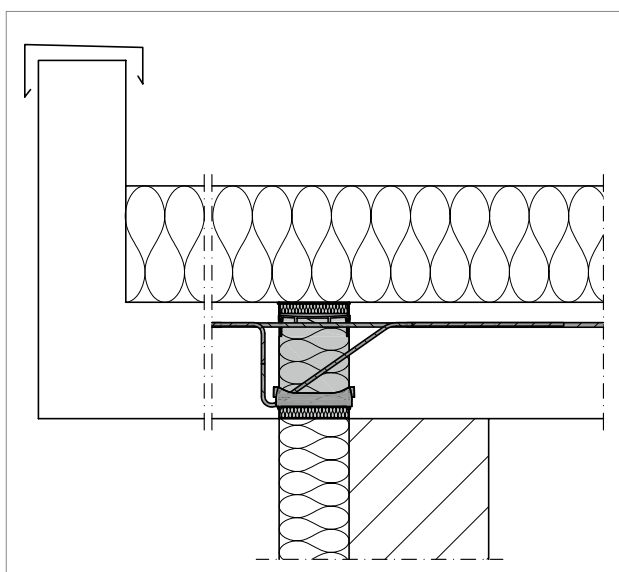


Fig. 11: Schöck Isokorb® XT type K: Connection to a canopy

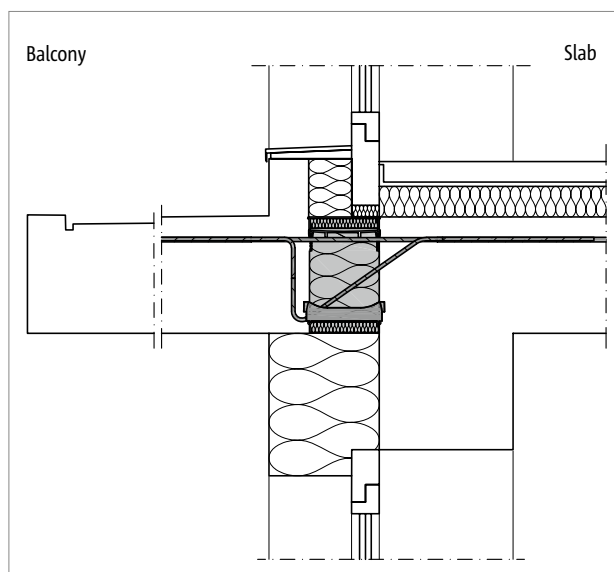


Fig. 12: Schöck Isokorb® XT type K: Connection with window detail above and below the connection

Thermal bridge details

Design of parapets and balustrades

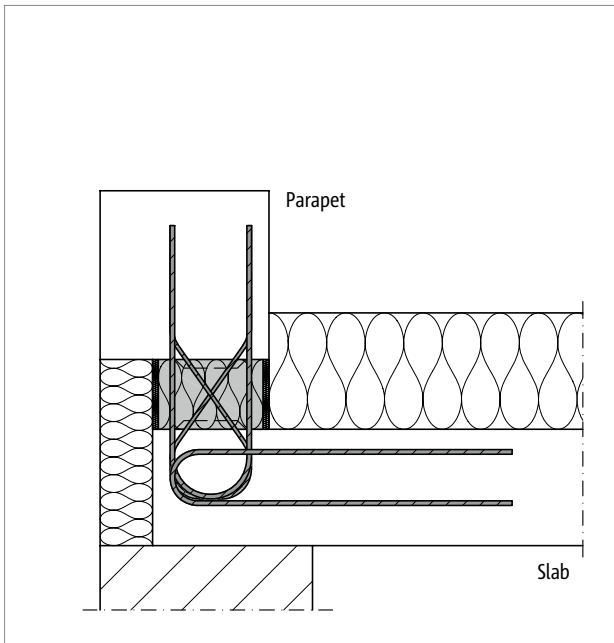


Fig. 13: Schöck Isokorb® XT type A: Connection to a parapet (type A-MM1-VV1)

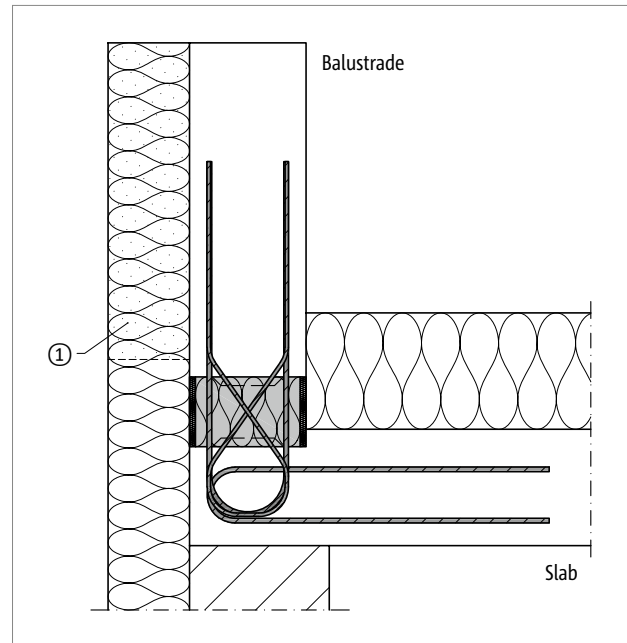


Fig. 14: Schöck Isokorb® XT type A: Connection to a balustrade (type A-MM2-VV1)

For a parapet design, it should be noted that the Schöck Isokorb® is always placed in the insulating layer. It is not necessary to wrap the parapets in insulation. The marked area of insulation ① does not have to be installed for energetic reasons. For practical reasons only, the insulation is usually installed up to the upper edge of the parapet.

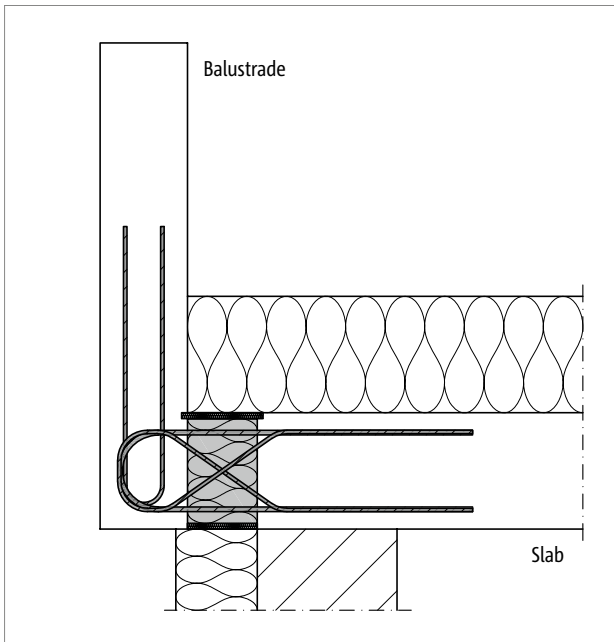


Fig. 15: Schöck Isokorb® XT type F: Connection to a corbelled sill with thermal insulation composite system (WDVS)

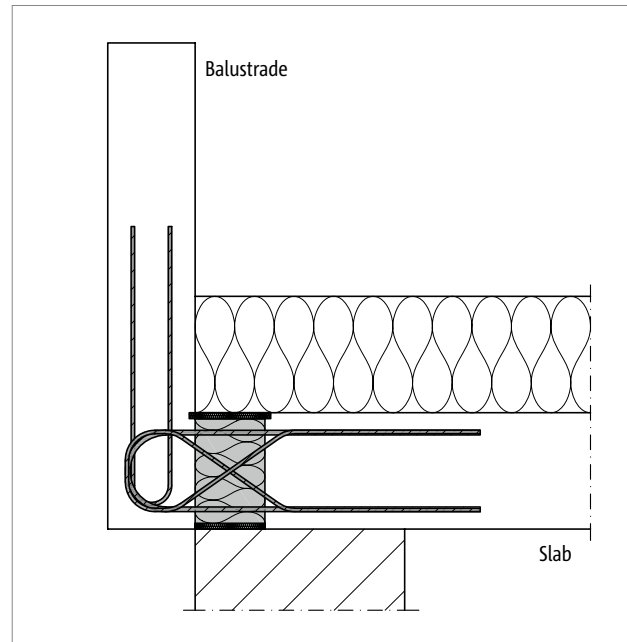


Fig. 16: Schöck Isokorb® XT type F: Connection to a corbelled sill for thermally insulated brickwork

Fire protection

Fire protection configuration | Fire-resistance classes

Schöck Isokorb® T with fire protection

The Schöck Isokorb® T comes with fire protection as standard.

The fire protection designation specially for T type B and T type W is R90. The fire protection designation for T type K, Q-E, H and D is REI120.

For this purpose, fire protection boards are attached to the Schöck Isokorb® (see figure). Prerequisite for the fire resistance classification of the balcony connection is that the balcony slab and the ceiling also fulfil the requirements for the necessary fire resistance class according to NS-EN 1992-1-1 and NS-EN 1992-1-2 (EC2). If, in addition to the load-bearing capacity (R), integrity (E) and insulation (I) are also required in case of fire, then the block-outs between the Schöck Isokorb® are to be closed, e.g. using the Schöck Isokorb® T type Z fire protection configuration.

The enclosing design function of the Schöck Isokorb® T has been tested based on the requirements for floors according to NS-EN 1365-2. The basis for this test is NS-EN 1365-5. The fire protection of the Schöck Isokorb® is also tested in the same manner as floors according to NS-EN 1365-2. The classification REI (R – load-bearing capacity, E – integrity, I – shielding against heat when exposed to fire) is therefore obtained.

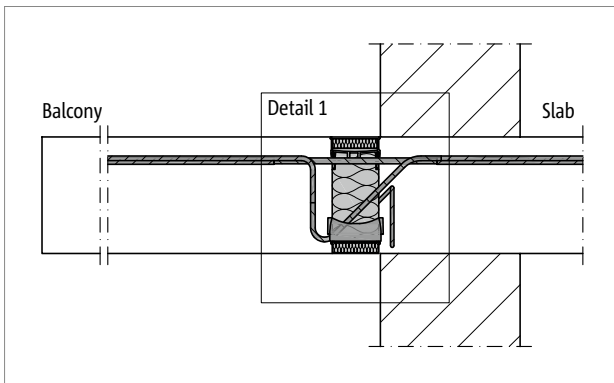


Fig. 17: Schöck Isokorb® T type K-E, K-T for REI120: Fire protection board top and bottom; lateral integrated fire protection bands

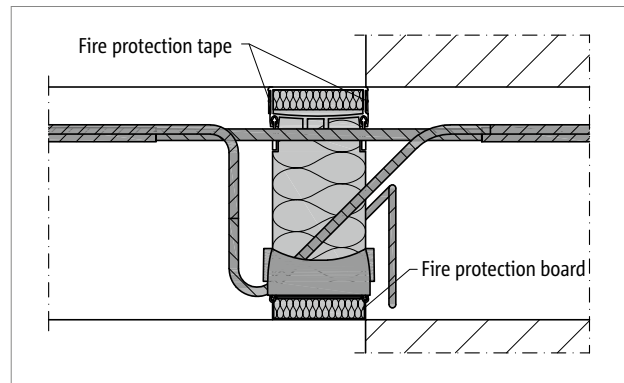


Fig. 18: Schöck Isokorb® T type K-E, K-T for REI120: Detail 1

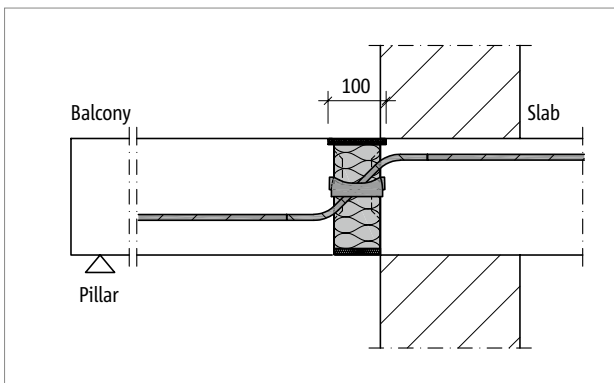


Fig. 19: Schöck Isokorb® T type Q-E-V for REI120: Fire protection board top, projecting laterally

Fire resistance classes REI120, R90

The reaction to fire of structural components is classified on the basis of the European Standard NS-EN 13501-2. The European classification system is on par along side the previous classification system as per DIN 4102.

Users have the option for verification of reaction to fire or fire resistance based either on DIN 4102 or on NS-EN 13501-1 (reaction to fire) and/or NS-EN 13501-2 (fire resistance).

The various types of Schöck Isokorb® T achieve the following fire resistance classes:

Schöck Isokorb® T type	Q-E, K-E, K-T, H, D	B, W
Fire resistance class	REI120	R90

Fire protection configuration for passageway walks

Linear and point slab connections

Walkway passages that serve as necessary corridors, “must, as load-bearing and space-enclosing building components between storeys, be sufficiently stable and resistant to the spread of fire in the event of fire”. In order to meet the requirement of the room closure it is possible to combine point and linear, load-bearing and non-load-bearing Schöck Isokorb® types. The elements must be installed perfect fit and the fire protection panels must lie in one plane.

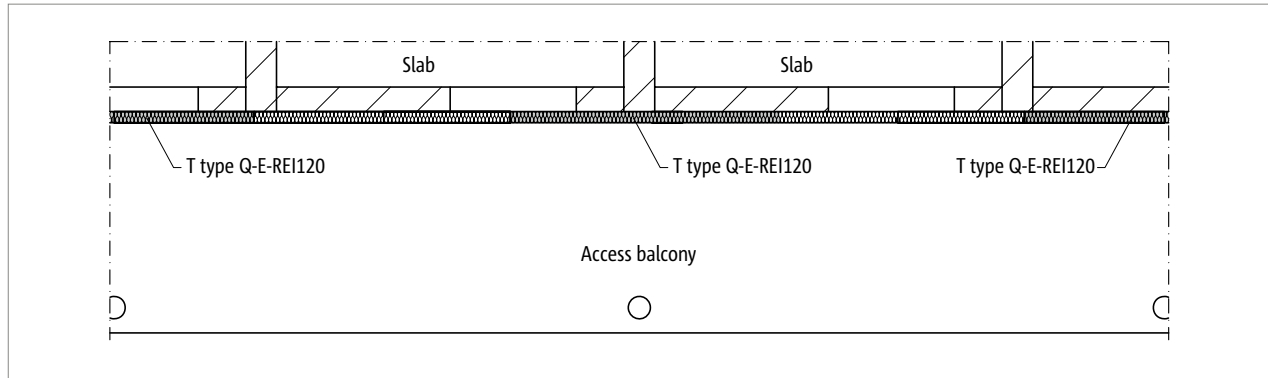


Fig. 20: Schöck Isokorb® T type Q-E-REI120: Room-closing passageway walk

Reinforced concrete – reinforced concrete

Fatigue/Temperature effect

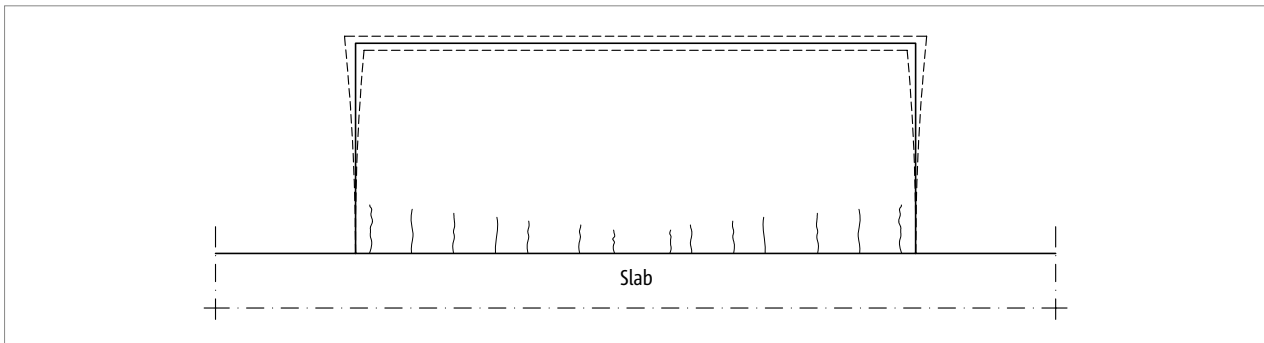


Fig. 21: Balcony slab without Schöck Isokorb®: Crack formation through fatigue possible

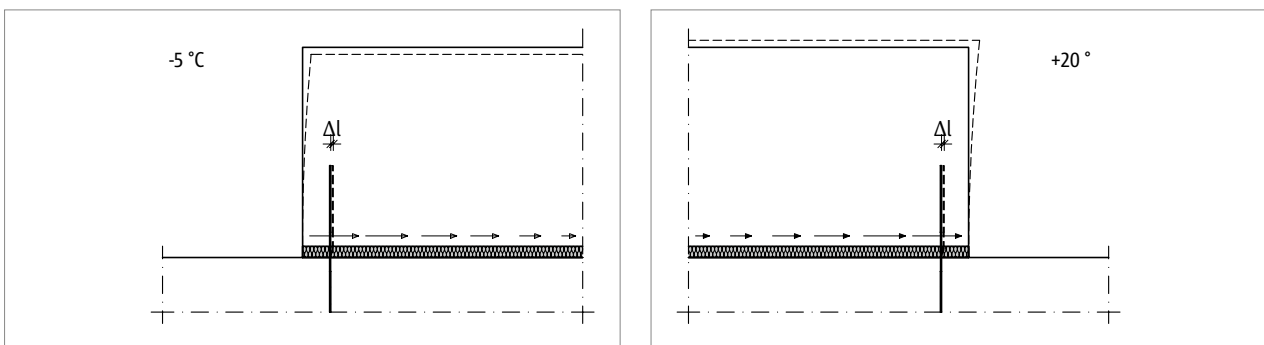


Fig. 22: Schöck Isokorb®: Displacement of the outer bars of a balcony slab by Δl as a result of temperature deformation

Balcony slabs, passageway walks and canopy constructions expand with warming and contract with cooling. With a continuous reinforced concrete slab cracks in the reinforced concrete slab can result at this point through which moisture can penetrate. The Schöck Isokorb® defines a joint which with correct execution prevents cracks in the concrete.

The tension bars, the shear force bars and the HTE-Compact® pressure bearings in the Schöck Isokorb® are consistently deflected transverse to their axis through thermal stressing. Therefore a verification of the fatigue safety is to be carried out for the Schöck Isokorb®. This verification of the fatigue safety is provided through the observation of the respective expansion joint spacings 'e' for the Schöck Isokorb® type (as per approval document). Thus material fatigue and the failure of the structural component over the planned useful life is excluded.

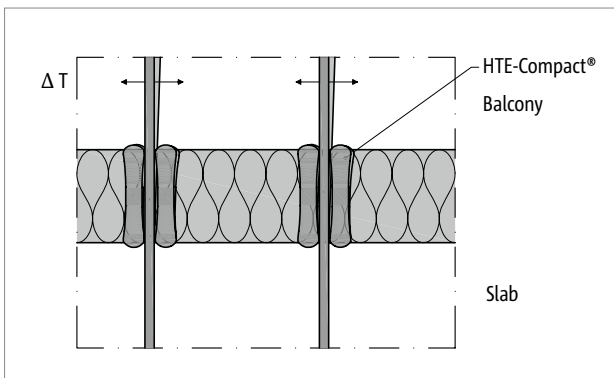


Fig. 23: Schöck Isokorb® detail: deflection of the pressure bearing as a result of temperature difference

The HTE-Compact® pressure bearing compensates the movement of the structural component through individual inclination of each individual compression element. The bars are deflected only in the fatigue safe area.

Fatigue | Expansion joint spacing

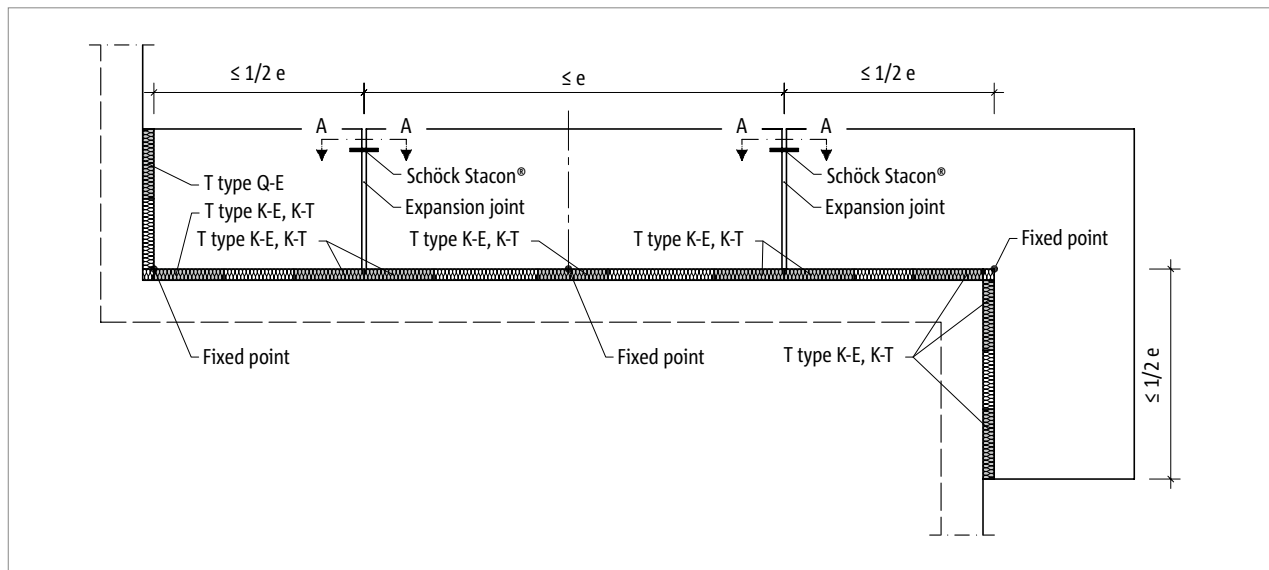


Fig. 24: Schöck Isokorb® T type K-E, K-T: Expansion joint formation with longitudinally displaceable shear force dowel, e.g. Schöck dowel

The maximum permitted expansion joint spacings e of the Schöck Isokorb® types depend on the bar diameter and type of construction of the chosen Schöck Isokorb® types. For the respective Schöck Isokorb® type, the maximum expansion joint spacings are provided in the Product chapter.

The shear force transmission in the expansion joint can be ensured using a longitudinally displaceable shear force dowel, e.g. Schöck Stacon®.

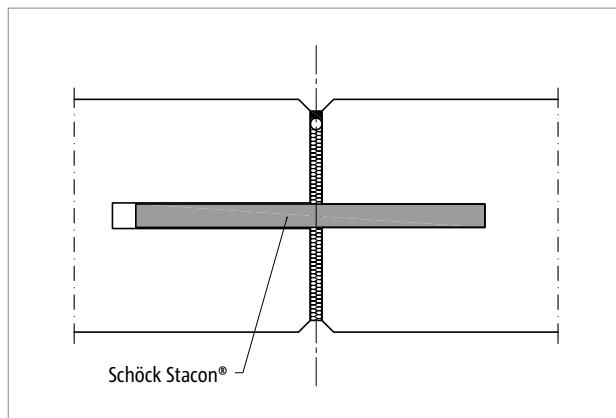


Fig. 25: Schöck Stacon®: Expansion joint formation in in-situ concrete

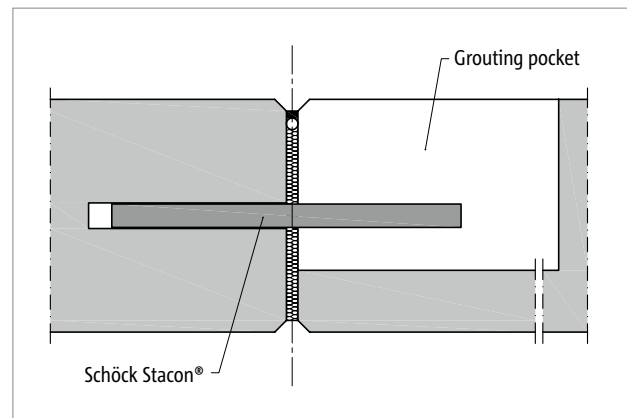


Fig. 26: Schöck Stacon®: Expansion joint formation precast concrete balcony

Expansion joints

- Details for the formation of expansion joints see also: Technical Information Schöck Stacon® application examples.
- The notional fixed point of the concrete element is the point where no expansion occurs due to the temperature loads. This point must be determined before estimating the maximum bar spacing. The outermost bar may not be further than $e/2$ from this notional fixed point.

Deflection

Deflection due to moment loading

For Schöck Isokorb® with moment capacity, it must be noted that a small angle distortion φ occurs. This angle distortion φ leads to a deflection of $w_{\bar{u}} = \varphi \cdot l_k$ for cantilever balconies. The angle distortion φ is caused by various strains δ_1 , δ_2 , of the tension and shear force bars under tension.

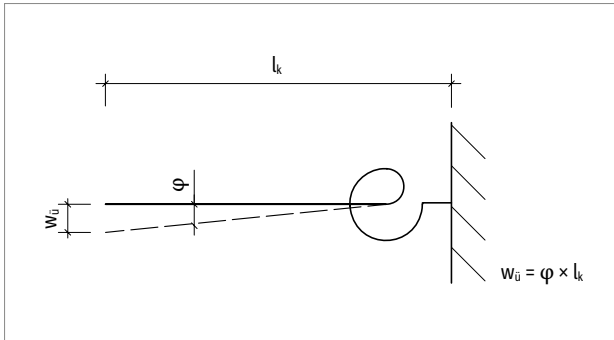


Fig. 27: Schöck Isokorb® T type K-E, K-T: Rotation angle φ and deflection $w_{\bar{u}}$ for modelling as a fixed torsion spring

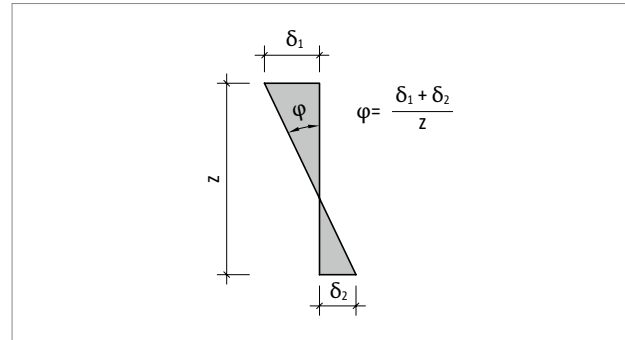


Fig. 28: Schöck Isokorb® T type K-E, K-T: Rotation angle φ via strain as a result of moment loading

Deflection ($w_{\bar{u}}$) as a result of the Schöck Isokorb®

$$w_{\bar{u}} = M_{Ed,GZG} / C \cdot l_k = \varphi \cdot l_k$$

i Notes on deflection

- If you need to prevent a large deflection at the cantilever end, the corresponding concrete elements must be pre-cambered at the cantilever end during installation.
- The deflection caused by the Schöck Isokorb®, the creeping of the concrete and each desired deflection amount for water drainage are superimposed for the calculation of the total deflection.
- The angular deflection of the Schöck Isokorb® is a linearly elastic deformation. The angular deflection is again eliminated when the connection is relieved.
- Depending on the moment capacity, the Schöck Isokorb® has the spring constant C [kNm/rad].

Natural frequency

Avoiding disruptive vibration in cantilevers

In order to avoid vibration in cantilevers, the additional deflection from the live load should be limited to 2–2.5 mm depending on the cantilevered length l_k .

In addition, it is recommended that the natural frequency $f_e = (a / w_{\ddot{u}})^{0.5}$ have a min. value of 6 Hz for a mass distributed evenly. Whereby $a = 0.384 \text{ m/s}^2$ applies to the acceleration and $w_{\ddot{u}}$ is the calculated deflection of the Schöck Isokorb®.

- As rule of thumb, the height H [mm] of the Schöck Isokorb® should be at least as large as 1/11 of the cantilevered length l_k .

FEM calculation

A numerical FEM analysis is an alternative when an analytical calculation does not provide sufficient clarity about the force impact on the Schöck Isokorb® connection. An investigation of the balcony with an Isokorb® connection in the reinforced concrete inner slab can be performed in a 2D slab calculation. The transmission of the forces between various components and within the components themselves is clarified. Additional information is also found in relation to deflections.

i Design

- A combination of a thin floor slab and a rigid balcony element with a large cantilever can lead to the floor hanging on the balcony element in sections. Structural analysis, see page 28.
- It is very difficult to estimate which element transfers which forces for strongly asymmetrical component geometries. The internal static forces can be determined with the help of a FEM analysis.
- If the force transfer depends on the stiffness of concrete components and the Schöck Isokorb® for statically undetermined load-bearing systems, a FEM analysis provides some clarity.

FEM calculation/Modelling

Modelling

In order to obtain useful data from the FEM analysis, it is very important that the connection between the balcony and the floor slab be modelled in a meaningful way. The floor and the balcony must be separated in the FEM model and then linked with bar-shaped elements. It is recommended to insert a finite element length of 250 mm in order to make the force distribution visible within a Schöck Isokorb®. The bars should be laid out so that the behaviour of a Schöck Isokorb® with a length of L250 is represented.

Example 1

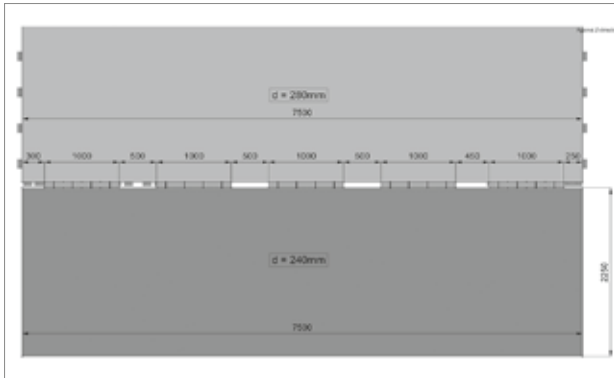


Fig. 29: Schöck Isokorb® T type K-E, K-T: Geometry of the interior floor slab and balcony

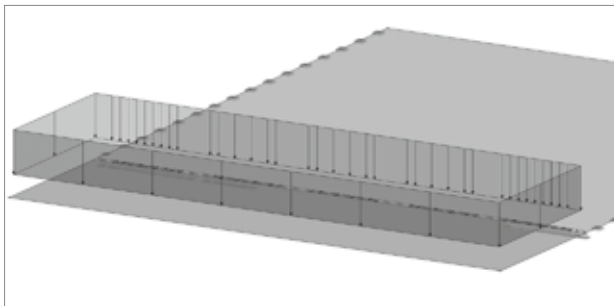


Fig. 30: Schöck Isokorb® T type K-E, K-T: 3D view of the load on the balcony; left slab support articulated, right restrained

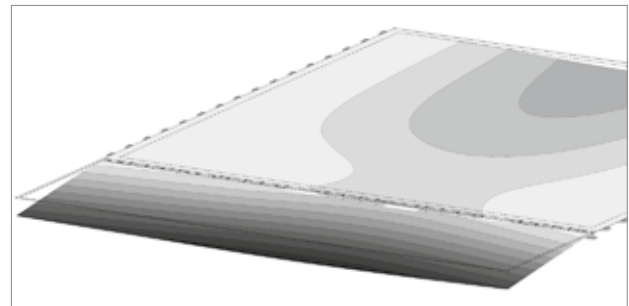


Fig. 31: Schöck Isokorb® T type K-E, K-T: 3D view of floor and balcony deformations

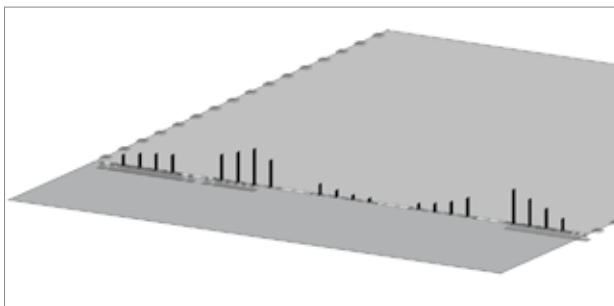


Fig. 32: Schöck Isokorb® T type K-E, K-T: 3D view of uneven shear force distribution; the floor only supports the balcony at the ends, in-between the floor hangs on the balcony

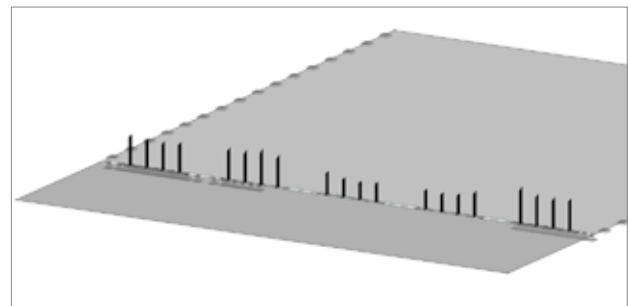


Fig. 33: Schöck Isokorb® T type K-E, K-T: 3D view of the acting moment with uniform moment distribution

This example shows that shear force peaks can occur at the location of the singularity. The use of a Schöck Isokorb® with a high shear force capacity can avoid problems.

FEM calculation/Modelling

Spring stiffness

The connection between the balcony and the inner floor can be represented as a model via bar elements. The stiffness of these bar elements determines the mutual influence of the floor slab and the balcony. For good modelling, 3 different bearing stiffnesses should be taken into account:

- Torsion spring stiffness: Indicates the required bending moment to effect a rotation of 1 rad. For the Schöck Isokorb®, the torsion spring stiffness C is listed in the value tables [kNm/rad; kNm/rad/m].
- Torsional stiffness: Indicates the required torsional moment to effect a rotation of 1 rad. The calculation value of the torsional stiffness of the Schöck Isokorb® is equal to zero.
- Vertical stiffness: This is the force required to effect a lowering of 1 metre. The vertical stiffness has an elastic portion (bar elongation) and a plastic portion. For the calculation of the shear force deformations, a stiffness of 100,000 kN/m per metre should be taken into account.

Example 2

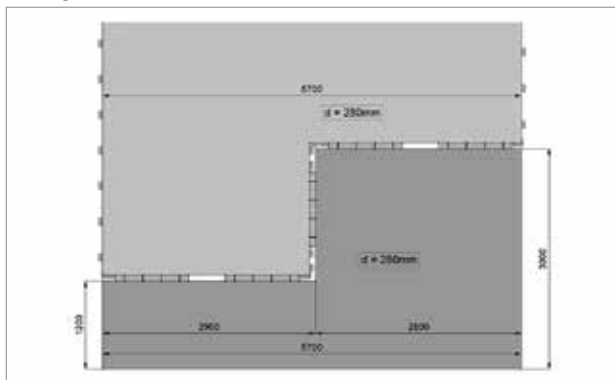


Fig. 34: Schöck Isokorb® T type K-E, K-T: Geometry of the interior floor slab and balcony

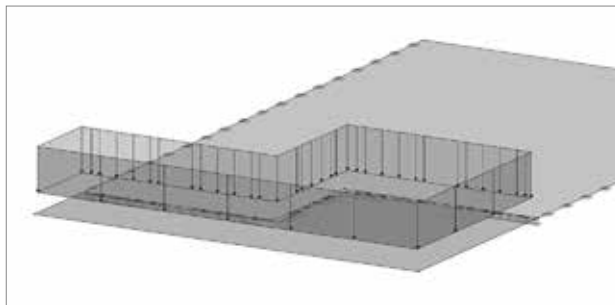


Fig. 35: Schöck Isokorb® T type K-E, K-T: 3D view of the load on the balcony; left and right slab support restrained

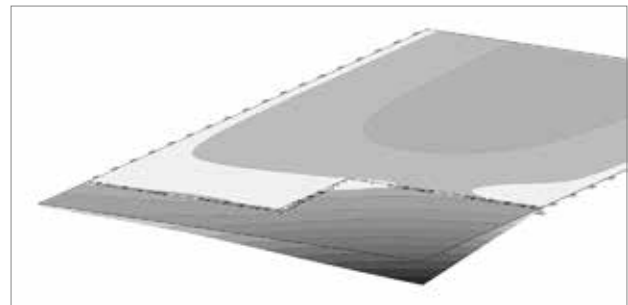


Fig. 36: Schöck Isokorb® T type K-E, K-T: 3D view of floor and balcony deformations

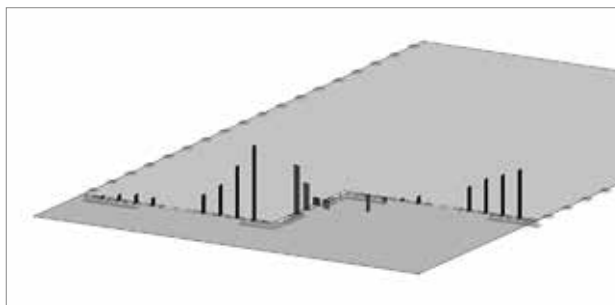


Fig. 37: Schöck Isokorb® T type K-E, K-T: 3D view of uneven shear force distribution

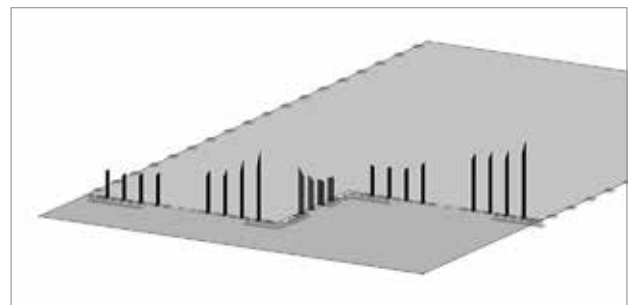


Fig. 38: Schöck Isokorb® T type K-E, K-T: 3D view of the acting moment with uniform moment distribution

Construction materials

The Schöck Isokorb® construction materials

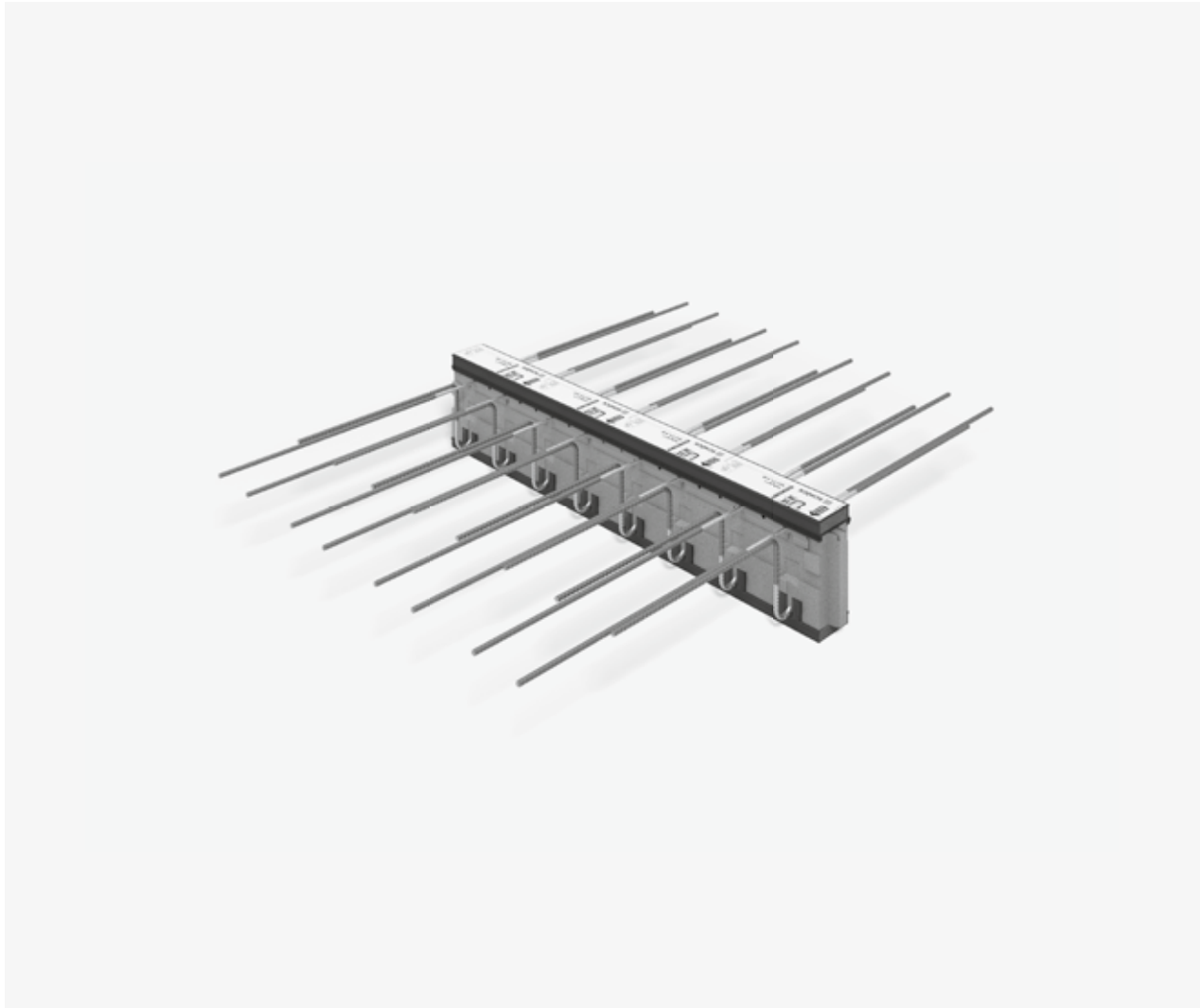
Reinforcing steel	B500B as per DIN 488-1, class A1 as per NS-EN 13501-1
Structural steel	S 235 JR, S 235 JO, S 235 J2, S 355 JR, S 355 J2, or S 355 JO as per NS-EN 10025-2 for the compression slabs, class A1 as per NS-EN 13501-1
Stainless steel	Stainless reinforcing steel or stainless round steel (S355, S460, S690) with corrosion resistance class III as per NS-EN 1993-1-4, class A1 as per NS-EN 13501-1
Concrete pressure bearing	HTE-Compact® pressure bearing (made from micro steel fibre-reinforced high-performance fine concrete), Class A1 as per NS-EN 13501-1 PE-HD plastic sheathing (as per NS-EN ISO 17855-1 and NS-EN ISO 17855-2), Class E as per NS-EN 13501-1
Insulating material	Neopor® – rigid polystyrene foam (EPS) as per NS-EN 13163, Class E as per NS-EN 13501-1, registered BASF trademark, $\lambda = 0.032 \text{ W/(m}\cdot\text{K)}$
Fire protection material	Moisture-repellent, weatherproof and UV-resistant design, Class A1 as per NS-EN 30115-1, integrated fire protection tapes, Class E as per NS-EN 13501-1
Plastic rails	PVC-U as per NS-EN 13245-1 and NS-EN 13245-2, Class E as per NS-EN 13501-1
Connected components	
Reinforced concrete	Reinforced concrete slabs made from normal concrete with a strength class of at least C20/25 (for external components C25/30) as per NS-EN 1992-1-1 in conjunction with NS-EN 1992-1-1/NA

i Bending of reinforcing steel

With the production of the Schöck Isokorb® in the factory it is ensured through monitoring that the conditions of the general building supervisory approval document and of NS-EN 1992-1-1 (EC2) and NS-EN 1992-1-1/NA with regard to bending of reinforcing steel are observed.

Attention: If original Schöck Isokorb® reinforcing steels are bent or bent and bent back on-site, the observation and the monitoring of the respective conditions (European Technical Assessment (ETA), NS-EN 1992-1-1 (EC2) and NS-EN 1992-1-1/NA) lie outside the influence of Schöck Bauteile GmbH. Therefore, in such cases, our warranty is invalidated.

Schöck Isokorb® T type K-E, K-T



Schöck Isokorb® T type K-E, K-T

Load-bearing thermal insulation element for freely cantilevered balconies. The element transfers negative moments and positive shear forces. Schöck Isokorb® T type K-T with load-bearing level VV additionally transfers negative shear forces.

T
type K-E

Reinforced concrete – reinforced concrete

Element arrangement | Installation cross sections

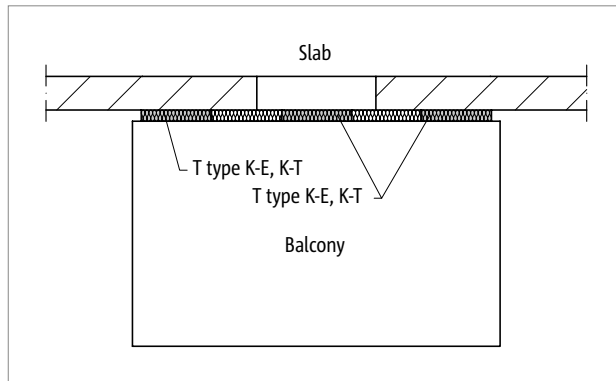


Fig. 39: Schöck Isokorb® T type K-E, K-T: Cantilevered balcony

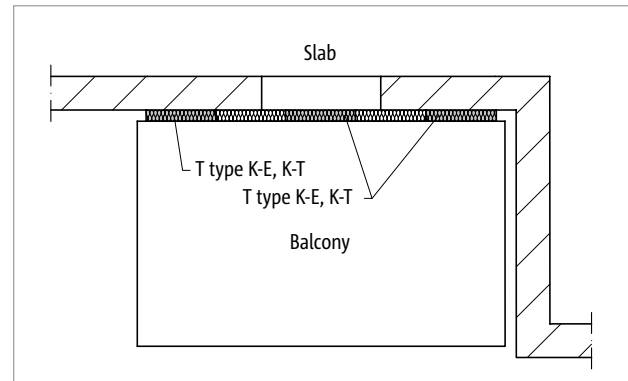


Fig. 40: Schöck Isokorb® T type K-E, K-T: Balcony with façade offset

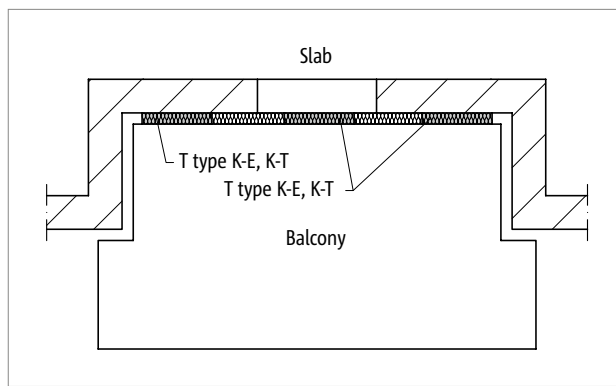


Fig. 41: Schöck Isokorb® T type K-E, K-T: Balcony with façade recess

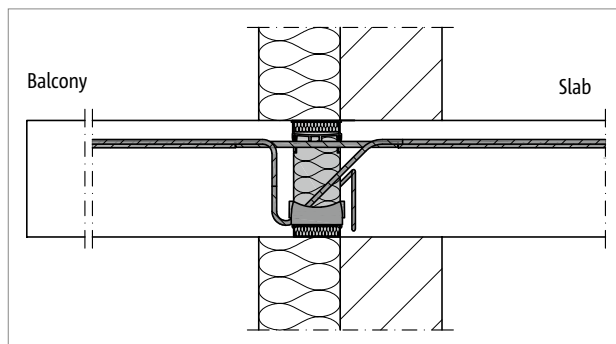


Fig. 42: Schöck Isokorb® T type K-E, K-T: Connection for a thermal insulation bonded system WDVS

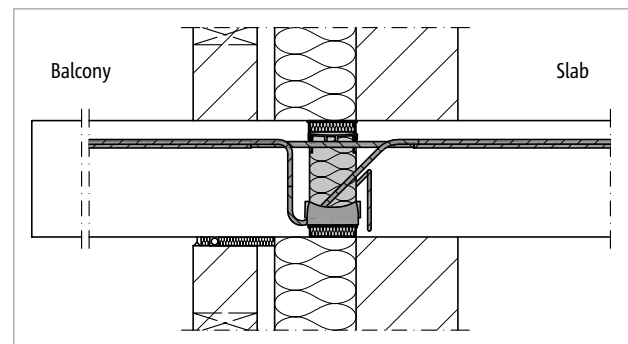


Fig. 43: Schöck Isokorb® T type K-E, K-T: Connection for core insulation

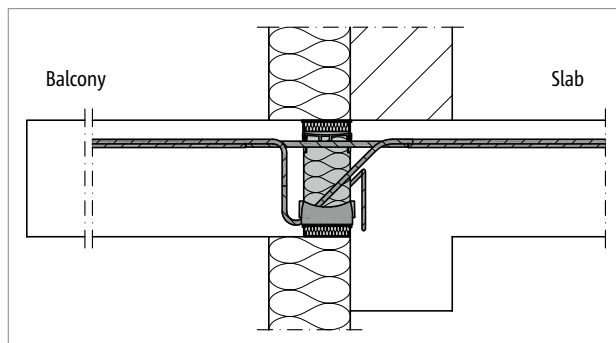


Fig. 44: Schöck Isokorb® T type K-E, K-T: Connection for edge beam and thermal insulation composite system (WDVS)

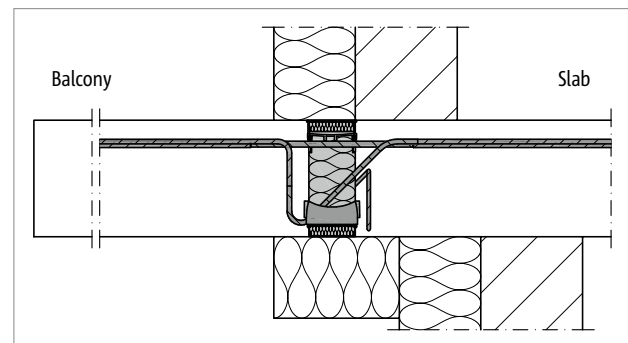


Fig. 45: Schöck Isokorb® T type K-E, K-T: Connection for an indirectly supported floor and WDVS

T
type K-E

Reinforced concrete – reinforced concrete

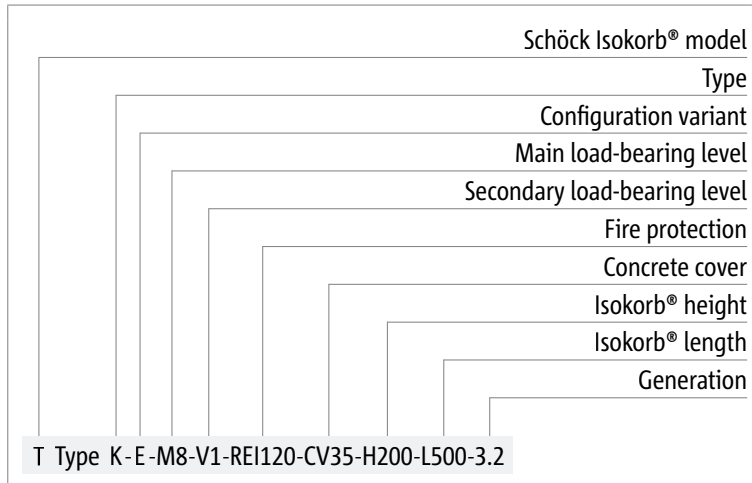
Product selection | Type designations | Special designs

Schöck Isokorb® T type K variants

The configuration of the Schöck Isokorb® T type K can be varied as follows:

- Configuration variant:
 - type K-E: Available in lengths L1000, L500 and L250; can be used with Schöck IDock®
 - type K-T: Available in lengths L1000 and L500
- Main load-bearing level:
 - M1 to M10
 - type K-E with main load-bearing level M2, M4, M6, M8
 - type K-T with main load-bearing level M1, M3, M5, M7, M9, M10
- Secondary load-bearing level:
 - type K-E: V1, V2
 - type K-T: V1, V2, VV1
- Fire resistance class:
 - REI120 (standard)
- Concrete cover of the tension bars:
 - CV30 = 30 mm, CV35 = 35 mm, CV50 = 50 mm
- Isokorb® height:
 - H = 160–250 mm for concrete cover CV30, CV35
 - H = 180–250 mm for concrete cover CV50
- Isokorb® length:
 - L1000 = 1000 mm, L500 = 500 mm, L250 = 250 mm
- Generation:
 - 3.2

Type designations in planning documents



Special designs

Please contact the Technical Design Department if you cannot achieve the connections you require using the standard product variants shown in this technical information (contact details on page 3).

This also applies with additional requirements as a result of precast concrete construction. For additional requirements determined by manufacturing or transportation there are solutions available with coupler bars.

Design

i Design

- The Schöck Isokorb® T type K-E with Schöck IDock® can be used for a flexible design of the construction process See Schöck IDock® technical information.
- With CV50, $H = 180$ mm is the lowest Isokorb® height, this requires a minimum slab thickness of $h = 180$ mm.
- For cantilever slab constructions without live load, stressed from moment loading without direct shear force effectiveness or lightweight constructions, contact our Design Support department.

Static system

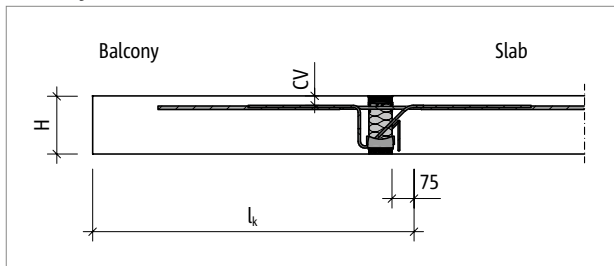


Fig. 46: Schöck Isokorb® T type K-E, K-T: Static system, cross-section

Design C25/30

Schöck Isokorb® T type K-E, K-T 3.2			K-T-M1	K-E-M2	K-T-M3	K-E-M4	K-T-M5	K-E-M6	
Design values with	Concrete cover CV [mm]		Concrete strength class \geq C25/30						
	CV30	CV35	CV50	$m_{Rd,y}$ [kNm/m]					
Isokorb® height H [mm]		160		-8.5	-16.5	-23.8	-22.6	-30.5	-32.5
	160		180	-9.0	-17.5	-25.1	-24.0	-32.4	-34.5
		170		-9.6	-18.5	-26.5	-25.4	-34.3	-36.6
	170		190	-10.1	-19.5	-27.9	-26.7	-36.2	-38.7
		180		-10.6	-20.6	-29.2	-28.1	-38.2	-40.8
	180		200	-11.2	-21.5	-30.6	-29.5	-40.1	-42.9
		190		-11.7	-22.6	-31.9	-30.9	-42.1	-45.1
	190		210	-12.2	-23.6	-33.3	-32.3	-44.0	-47.2
		200		-12.8	-24.7	-34.6	-33.7	-46.0	-49.4
	200		220	-13.4	-25.7	-36.0	-35.1	-48.0	-51.5
		210		-13.9	-26.7	-37.3	-36.6	-49.9	-53.6
	210		230	-14.5	-27.8	-38.7	-38.0	-51.8	-55.8
		220		-15.1	-28.9	-40.0	-39.5	-53.6	-58.0
	220		240	-15.6	-29.9	-41.4	-40.9	-55.5	-60.1
		230		-16.2	-31.0	-42.7	-42.4	-57.4	-62.4
	230		250	-16.8	-32.0	-44.1	-43.8	-59.3	-64.5
		240		-17.4	-33.2	-45.4	-45.2	-61.1	-66.8
240			-18.0	-34.2	-46.8	-46.5	-63.0	-68.9	
	250		-18.6	-35.3	-48.1	-47.9	-64.9	-71.2	
250			-19.1	-36.4	-49.5	-49.2	-66.8	-73.4	
$v_{Rd,z}$ [kN/m]									
Secondary load-bearing level		V1	28.0	56.0	42.0	99.5	56.0	99.5	
		V2	-	99.5	-	-	99.5	-	

Schöck Isokorb® T type K-E, K-T 3.2		K-T-M1	K-E-M2	K-T-M3	K-E-M4	K-T-M5	K-E-M6
Placement with		Isokorb® length [mm]					
		1000	1000	1000	1000	1000	1000
Tension bars V1/V2		4 \emptyset 8	8 \emptyset 8	12 \emptyset 8	8 \emptyset 10	16 \emptyset 8	8 \emptyset 12
Shear force bars V1		4 \emptyset 6	8 \emptyset 6	6 \emptyset 6	8 \emptyset 8	8 \emptyset 6	8 \emptyset 8
Shear force bars V2		-	8 \emptyset 8	6 \emptyset 8	-	8 \emptyset 8	-
Pressure bearing V1/V2 [piece]		4	8	8	8	10	12
Special stirrups		-	-	-	-	-	4

Schöck Isokorb® T type K-E, K-T 3.2		K-T-M1	K-E-M2	K-T-M3	K-E-M4	K-T-M5	K-E-M6
Placement with		Isokorb® length [mm]					
		500	500	500	500	500	500
Tension bars V1/V2		2 \emptyset 8	4 \emptyset 8	6 \emptyset 8	4 \emptyset 10	8 \emptyset 8	4 \emptyset 12
Shear force bars V1		2 \emptyset 6	4 \emptyset 6	3 \emptyset 6	4 \emptyset 8	4 \emptyset 6	4 \emptyset 8
Shear force bars V2		-	4 \emptyset 8	-	-	4 \emptyset 8	-
Pressure bearing V1/V2 [piece]		2	4	4	4	5	6
Special stirrups		-	-	-	-	-	2

Design

- Static system and information on the design see page 35.
- T type K-E is also available in length L250.

Design C25/30

Schöck Isokorb® T type K-E, K-T 3.2			K-T-M7	K-E-M8	K-T-M9	K-T-M10	
Design values with	Concrete cover CV [mm]		Concrete strength class \geq C25/30				
	CV30	CV35	CV50	$m_{Rd,y}$ [kNm/m]			
Isokorb® height H [mm]		160		-40.4	-40.7	-46.4	-46.4
	160		180	-42.9	-43.2	-49.2	-49.2
		170		-45.6	-45.8	-52.1	-52.1
	170		190	-48.1	-48.3	-55.0	-55.0
		180		-50.8	-50.9	-57.8	-57.8
	180		200	-53.3	-53.4	-60.7	-60.7
		190		-56.0	-56.0	-63.5	-63.5
	190		210	-58.6	-58.5	-66.4	-66.4
		200		-61.3	-61.1	-69.3	-69.3
	200		220	-63.9	-63.6	-72.1	-72.1
		210		-66.6	-66.1	-75.0	-75.0
	210		230	-69.2	-68.7	-77.8	-77.8
		220		-71.7	-71.2	-80.7	-80.7
	220		240	-74.3	-73.8	-83.6	-83.6
		230		-76.8	-76.3	-86.4	-86.4
	230		250	-79.4	-78.9	-89.3	-89.3
	240		-81.9	-81.4	-92.2	-92.2	
240			-84.5	-84.0	-95.0	-95.0	
	250		-87.0	-86.5	-97.9	-97.9	
250			-89.5	-89.0	-100.7	-100.7	
$v_{Rd,z}$ [kN/m]							
Secondary load-bearing level		V1	99.5	99.5	99.5	124.4	
		VV1	99.5/-49.8	-	-	124.4/-49.8	

Schöck Isokorb® T type K-E, K-T 3.2	K-T-M7	K-E-M8	K-T-M9	K-T-M10
Placement with	Isokorb® length [mm]			
	1000	1000	1000	1000
Tension bars V1/VV1	10 \emptyset 12	8 \emptyset 14	12 \emptyset 12	14 \emptyset 12
Shear force bars V1	8 \emptyset 8	8 \emptyset 8	8 \emptyset 8	10 \emptyset 8
Shear force bars VV1	8 \emptyset 8 + 4 \emptyset 8	-	-	10 \emptyset 8 + 4 \emptyset 8
Pressure bearing V1/ V2/VV1 [pce]	16	16	18	18
Special stirrups	4	4	4	4

Schöck Isokorb® T type K-E, K-T 3.2	K-T-M7	K-E-M8	K-T-M9	K-T-M10
Placement with	Isokorb® length [mm]			
	500	500	500	500
Tension bars V1/VV1	5 \emptyset 12	4 \emptyset 14	6 \emptyset 12	7 \emptyset 12
Shear force bars V1	4 \emptyset 8	4 \emptyset 8	4 \emptyset 8	5 \emptyset 8
Shear force bars VV1	4 \emptyset 8 + 2 \emptyset 8	-	-	5 \emptyset 8 + 2 \emptyset 8
Pressure bearing V1/VV1 [pce]	8	8	9	9
Special stirrups	2	2	2	2

i Design

- Static system and information on the design see page 35.
- T type K-E is also available in length L250.

Design C30/37

Schöck Isokorb® T type K-E, K-T 3.2			K-T-M3	K-E-M4	K-T-M7	K-E-M8	K-T-M9	K-T-M10	
Design values with	Concrete cover CV [mm]		concrete strength class \geq C30/37						
	CV30	CV35	CV50	$m_{Rd,y}$ [kNm/m]					
Isokorb® height H [mm]		160		-24.5	-22.6	-40.4	-44.0	-48.3	-50.2
	160		180	-25.9	-24.0	-42.9	-46.8	-51.3	-53.3
		170		-27.4	-25.4	-45.6	-49.5	-54.5	-56.3
	170		190	-28.9	-26.7	-48.1	-52.3	-57.5	-59.4
		180		-30.4	-28.1	-50.8	-55.0	-60.7	-62.5
	180		200	-31.8	-29.5	-53.3	-57.8	-63.7	-65.6
		190		-33.3	-30.9	-56.0	-60.5	-66.9	-68.7
	190		210	-34.8	-32.3	-58.6	-63.3	-70.0	-71.8
		200		-36.3	-33.7	-61.3	-66.0	-73.2	-74.9
	200		220	-37.8	-35.1	-63.9	-68.8	-76.3	-78.0
		210		-39.4	-36.6	-66.6	-71.6	-79.5	-81.1
	210		230	-40.9	-38.0	-69.2	-74.3	-82.6	-84.2
		220		-42.4	-39.5	-71.9	-77.1	-85.8	-87.3
	220		240	-43.9	-40.9	-74.6	-79.8	-89.0	-90.4
		230		-45.5	-42.4	-77.3	-82.6	-92.3	-93.5
	230		250	-47.0	-43.8	-80.0	-85.3	-95.4	-96.6
		240		-48.7	-45.3	-82.8	-88.1	-98.7	-99.7
240			-50.2	-46.7	-85.4	-90.8	-101.9	-102.8	
	250		-51.8	-48.2	-88.2	-93.6	-105.2	-105.9	
250			-53.3	-49.7	-90.9	-96.3	-108.4	-109.0	
$v_{Rd,z}$ [kN/m]									
Secondary load-bearing level		V1	42.0	99.5	99.5	99.5	99.5	124.4	
		VV1	-	-	99.5/-49.8	-	-	124.4/-49.8	

Design C30/37

Schöck Isokorb® T type K-E, K-T 3.2	K-T-M3	K-E-M4	K-T-M7	K-E-M8	K-T-M9	K-T-M10
Placement with	Isokorb® length [mm]					
	1000	1000	1000	1000	1000	1000
Tension bars V1/VV1	12 ∅ 8	8 ∅ 10	10 ∅ 12	8 ∅ 14	12 ∅ 12	14 ∅ 12
Shear force bars V1	6 ∅ 6	8 ∅ 8	8 ∅ 8	8 ∅ 8	8 ∅ 8	10 ∅ 8
Shear force bars VV1	-	-	8 ∅ 8 + 4 ∅ 8	-	-	10 ∅ 8 + 4 ∅ 8
Pressure bearing V1/VV1 [pce]	8	8	16	16	18	18
Special stirrup [piece]	-	-	4	4	4	4

Schöck Isokorb® T type K-E, K-T 3.2	K-T-M3	K-E-M4	K-T-M7	K-E-M8	K-T-M9	K-T-M10
Placement with	Isokorb® length [mm]					
	500	500	500	500	500	500
Tension bars V1/VV1	6 ∅ 8	4 ∅ 10	5 ∅ 12	4 ∅ 14	6 ∅ 12	7 ∅ 12
Shear force bars V1	3 ∅ 6	4 ∅ 8	4 ∅ 8	4 ∅ 8	4 ∅ 8	5 ∅ 8
Shear force bars VV1	-	-	4 ∅ 8 + 2 ∅ 8	-	-	5 ∅ 8 + 2 ∅ 8
Pressure bearing V1/VV1 [pce]	4	4	8	8	9	9
Special stirrup [piece]	-	-	2	2	2	2

Design

- T type K-E, K-T: The main load-bearing levels M1, M2, M5 and M6 achieve the maximum value of the design moment $m_{Rd,y}$ with concrete strength class $\geq C25/30$.
- T type K-E is also available in length L250.

Torsional spring stiffness

Schöck Isokorb® T type K-E, K-T 3.2				K-T-M1	K-E-M2	K-T-M3	K-E-M4	K-T-M5	K-E-M6
Torsion spring stiffness for	Concrete cover CV [mm]			Concrete strength class \geq C20/25					
	CV30	CV35	CV50	C [kNm/rad/m]					
Isokorb® height H [mm]		160		823	1647	2142	1843	2465	2266
	160		180	923	1846	2402	2069	2783	2565
		170		1028	2057	2676	2307	3120	2884
	170		190	1140	2279	2965	2559	3476	3221
		180		1256	2513	3269	2825	3851	3576
	180		200	1379	2758	3588	3103	4246	3951
		190		1507	3014	3921	3394	4660	4343
	190		210	1641	3282	4270	3698	5093	4755
		200		1781	3561	4633	4015	5546	5185
	200		220	1926	3852	5011	4346	6018	5634
		210		2077	4154	5404	4689	6509	6101
	210		230	2234	4467	5812	5046	7019	6587
		220		2396	4792	6234	5415	7549	7091
	220		240	2564	5128	6672	5798	8097	7615
		230		2738	5476	7124	6193	8665	8156
	230		250	2917	5835	7591	6602	9253	8717
		240		3103	6205	8073	7024	9859	9296
	240			3293	6587	8569	7459	10485	9894
	250		3490	6980	9081	7906	11130	10510	
250			3692	7385	9607	8367	11795	11145	

Torsional spring stiffness

Schöck Isokorb® T type K-E, K-T 3.2			K-T-M7	K-E-M8	K-T-M9	K-T-M10	
Torsion spring stiffness for	Concrete cover CV [mm]		Concrete strength class \geq C20/25				
	CV30	CV35	CV50	C [kNm/rad/m]			
Isokorb® height H [mm]		160		2892	2888	3398	3756
	160		180	3275	3276	3848	4253
		170		3681	3687	4325	4781
	170		190	4111	4123	4831	5340
		180		4565	4584	5364	5929
	180		200	5043	5068	5926	6550
		190		5545	5577	6515	7201
	190		210	6070	6111	7132	7883
		200		6619	6668	7777	8596
	200		220	7192	7251	8450	9340
		210		7788	7857	9151	10115
	210		230	8409	8488	9880	10920
		220		9053	9143	10637	11757
	220		240	9721	9823	11422	12624
		230		10412	10527	12235	13523
	230		250	11128	11255	13075	14452
		240		11867	12008	13944	15412
	240			12630	12785	14840	16403
	250		13417	13586	15765	17424	
250			14227	14412	16717	18477	

Deflection/Camber | Vibrations

Deflection

The deflection calculation is used to estimate the required precamber. The arithmetic camber of the balcony slab formwork results from the calculation acc. to NS-EN 1992-1-1 (EC2) and NS-EN 1992-1-1/NA in addition to the deflection from Schöck Isokorb®. The camber of the balcony slab formwork to be given by the structural engineer/designer in the implementation plans (Basis: Calculated total deflection from cantilever slab + floor rotation angle + Schöck Isokorb®) should be so rounded that the scheduled drainage direction is maintained (round up: with drainage to the building facade, round down: with drainage towards the cantilevered slab end).

Deflection ($w_{\bar{u}}$) as a result of the Schöck Isokorb®

$$w_{\bar{u}} = M_{Ed,GZG} / C \cdot l_k \cdot 10^3 \text{ [mm]}$$

Factors to be applied:

$M_{Ed,GZG}$ = Relevant bending moment [kNm/m] in the ultimate limit state for the determination of the deflection $w_{\bar{u}}$ [mm] from the Schöck Isokorb®.
The load combination to applied for the deflection is determined by the structural engineer.

(Recommendation: Load combination for the determination of the camber $w_{\bar{u}}$: determine $g + 0.3 \cdot q$, $M_{Ed,GZG}$ in the ultimate limit state)

C = Torsion spring stiffness of the Schöck Isokorb® [kNm/rad/m], see design
 l_k = cantilever length [m]

Design example, see page 52

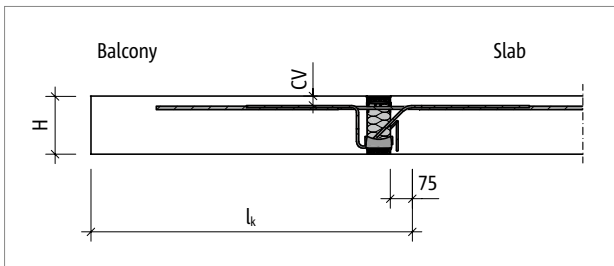


Fig. 47: Schöck Isokorb® T type K-E, K-T: Static system, cross-section

Vibrations

To ensure the serviceability, we recommend calculating the natural frequency of the balcony. The first natural frequency f_e is calculated simply with the deflection $w_{\bar{u}}$ as a result of the Schöck Isokorb®. At $f_e > 6$ Hz, disruptive vibrations should be ruled out. A natural frequency $f_e > 5$ Hz is sufficient when the deflection being used takes into account the bending of the balcony slab.

Natural frequency (f_e) taking into account the torsion spring stiffness of the Schöck Isokorb®

$$f_e = \sqrt{0.384 \cdot 10^3 / w_{\bar{u}}} > 6 \text{ Hz } (> 5 \text{ Hz})$$

Factors to be applied:

$w_{\bar{u}}$ = deflection as a result of the Schöck Isokorb® [mm]

Design example, see page 52

Slenderness | Vibration | Expansion joint spacing

Slenderness

In order to safeguard the serviceability limit state we recommend the limitation of the slenderness to the following maximum cantilever lengths l_k [m]:

Schöck Isokorb® T type K-E, K-T 3.2		K-E, K-T		
Maximum cantilever length with		$l_{k,max}$ [m]		
		CV30	CV35	CV50
Isokorb® height H [mm]	160	1.81	1.74	-
	170	1.95	1.88	-
	180	2.10	2.03	1.81
	190	2.25	2.17	1.95
	200	2.39	2.32	2.10
	210	2.54	2.46	2.25
	220	2.68	2.61	2.39
	230	2.83	2.76	2.54
	240	2.98	2.90	2.68
	250	3.12	3.05	2.83

i Maximum cantilever length

- The maximum cantilevered length for ensuring the serviceability is a benchmark. It can be limited by the load bearing capacity when using the Schöck Isokorb® T type K-E, K-T.
- The table value for the maximum cantilevered length $l_{k,max}$ should be reduced by 10% for heavier balustrades.

Maximum expansion joint spacing

If the component length exceeds the maximum expansion joint spacing e , then expansion joints must be incorporated into the external concrete components at right angles to the insulating layer in order to limit the effect as a result of temperature changes. Because the layout of the Isokorb® is only possible along the side of the component due to the installation in conjunction with the external concrete precast element, corners of balconies, parapets and balustrades cannot form any fixed points.

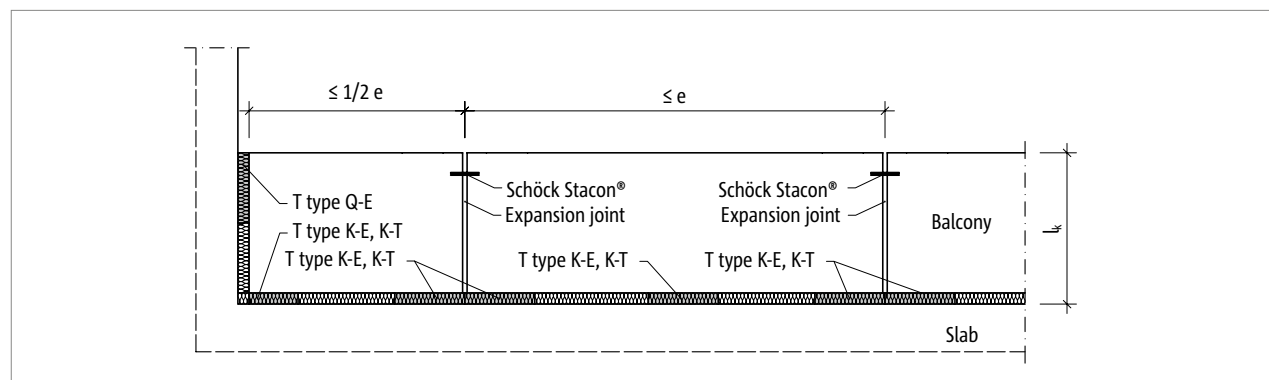


Fig. 48: Schöck Isokorb® T type K-E, K-T: Expansion joint spacing

Schöck Isokorb® T type K-E, K-T 3.2		M1 – M5	M6, M7, M9, M10	M8
Maximum expansion joint spacing when		e [m]		
Insulating element thickness [mm]	80	13.5	13.0	11.7

i Edge distances

The Schöck Isokorb® must be so arranged at the expansion joint that the following conditions are met:

- For the centre distance of the tension bars from the free edge resp. from the expansion joint: $e_R \geq 50$ mm applies.
- For the centre distance of the compression bars from the free edge resp. expansion joint: $e_R \geq 100$ mm applies.

Product description

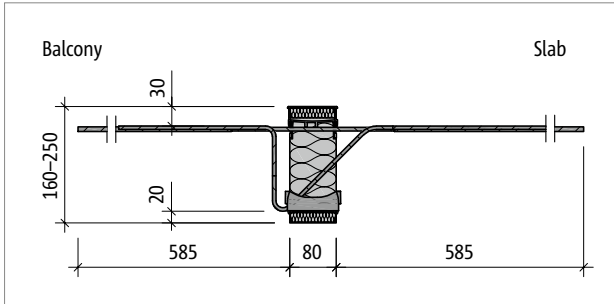


Fig. 49: Schöck Isokorb® T type K-T-M1, K-E-M2, K-T-M3: Product section

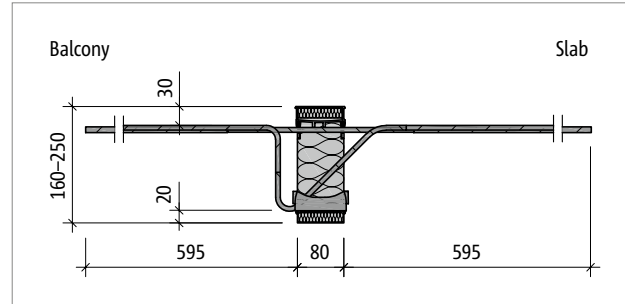


Fig. 50: Schöck Isokorb® T type K-E-M4: Product section

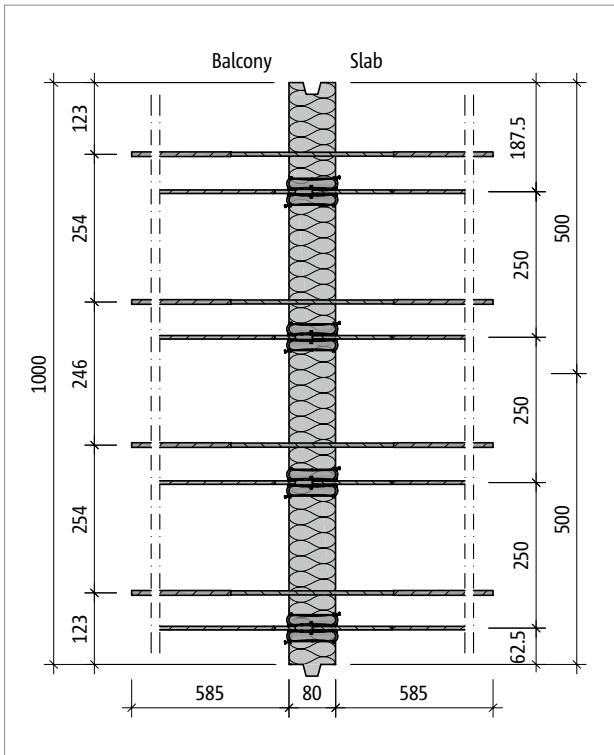


Fig. 51: Schöck Isokorb® T type K-T-M1: Product layout

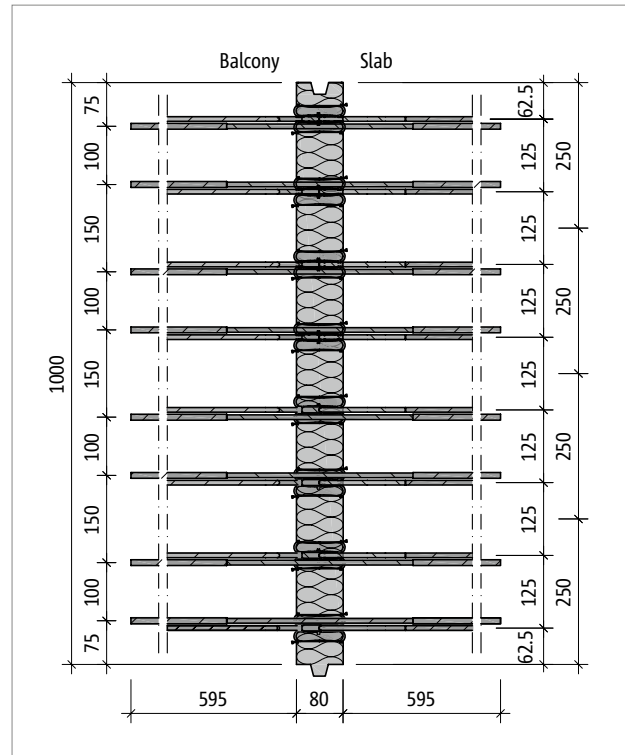


Fig. 52: Schöck Isokorb® T type K-E-M4: Product layout

Product information

- For additional 2D and 3D product drawings contact our Design Support department.
- Concrete cover of the tension bars: CV30 = 30 mm, CV35 = 35 mm, CV50 = 50 mm

Product description

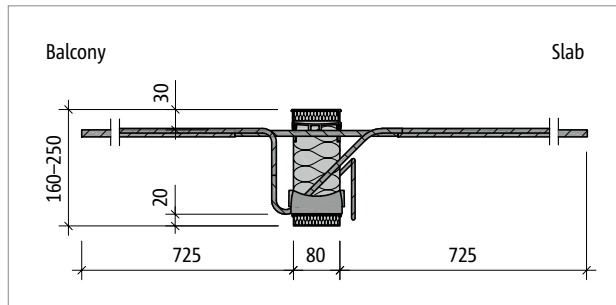


Fig. 53: Schöck Isokorb® T type K-E-M6, K-T-M7, -M9, -M10: Product section

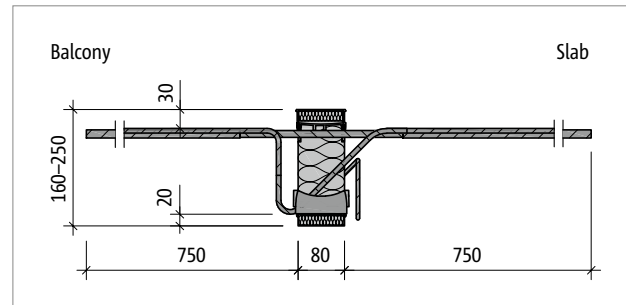


Fig. 54: Schöck Isokorb® T type K-E-M8: Product section

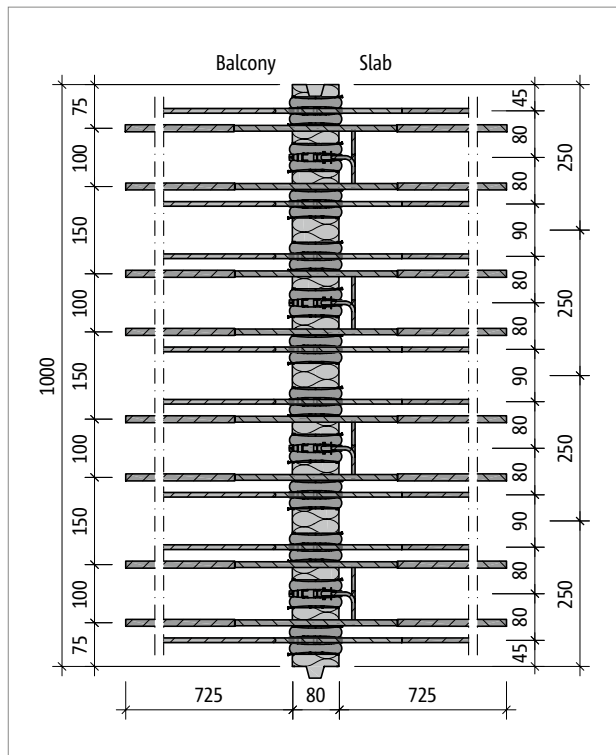


Fig. 55: Schöck Isokorb® T type K-E-M6: Product layout

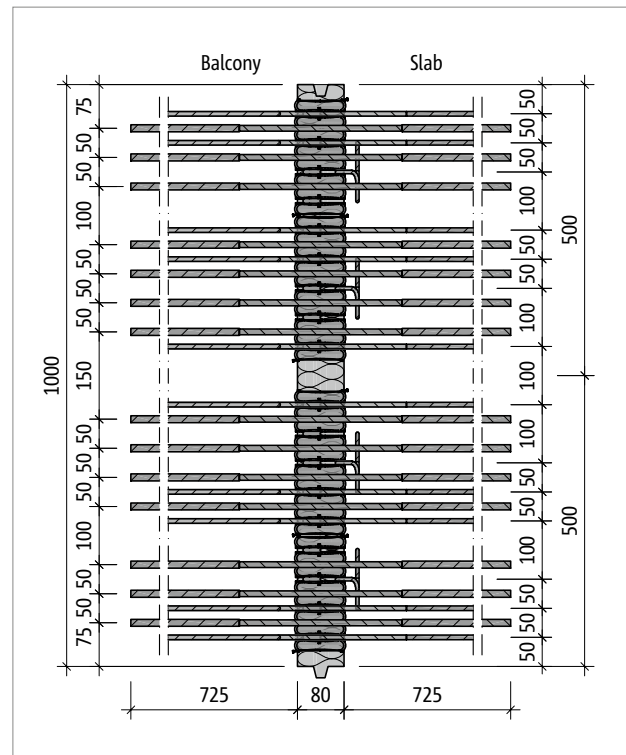


Fig. 56: Schöck Isokorb® T type K-T-M10-V1: Product layout

Product information

- For additional 2D and 3D product drawings contact our Design Support department.
- Concrete cover of the tension bars: CV30 = 30 mm, CV35 = 35 mm, CV50 = 50 mm

Product description

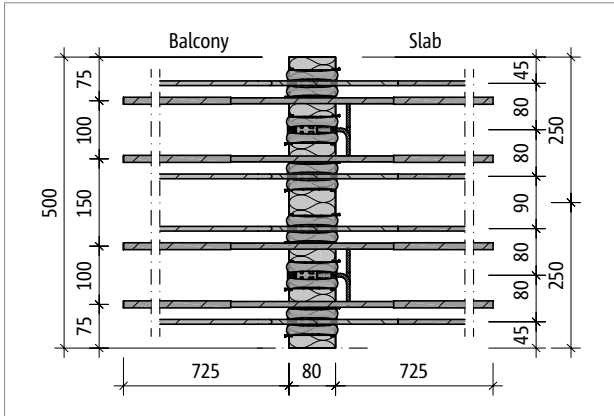


Fig. 57: Schöck Isokorb® T type K-E-M6: Product layout of the variant length L500

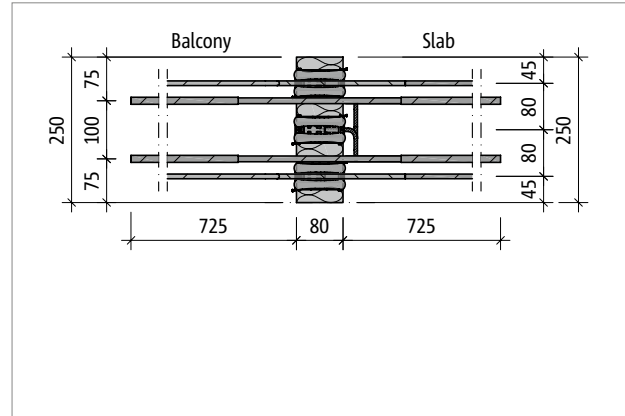


Fig. 58: Schöck Isokorb® T type K-E-M6: Product layout of the variant length L250

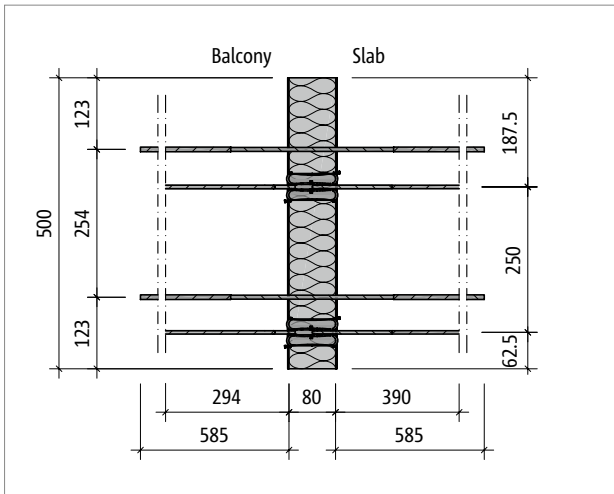


Fig. 59: Schöck Isokorb® T type K-T-M1: Product layout of the variant length L500

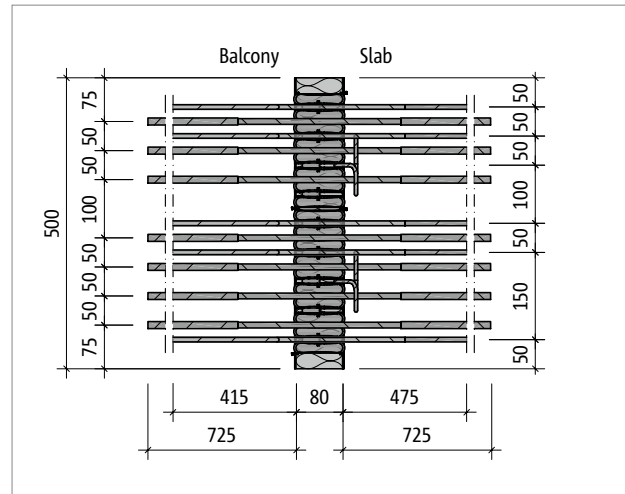


Fig. 60: Schöck Isokorb® T type K-T-M10: Product layout of the variant length L500

Product information

- For additional 2D and 3D product drawings contact our Design Support department.
- Concrete cover of the tension bars: CV30 = 30 mm, CV35 = 35 mm, CV50 = 50 mm
- Length: L = 250 mm, L = 500 mm or L = 1000 mm for Schöck Isokorb® T type K-E
- Length: L = 500 mm or L = 1000 mm for Schöck Isokorb® T type K-T

On-site reinforcement

Without edge beams

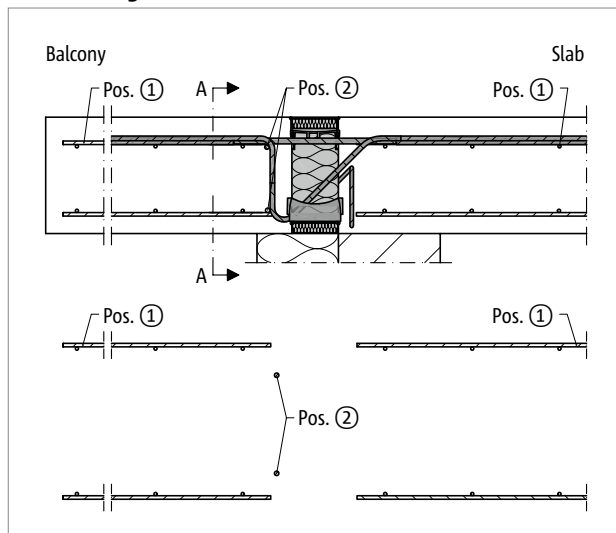


Fig. 61: Schöck Isokorb® T type K-E, K-T: On site reinforcement; inner slab edge with wall support

With edge beams

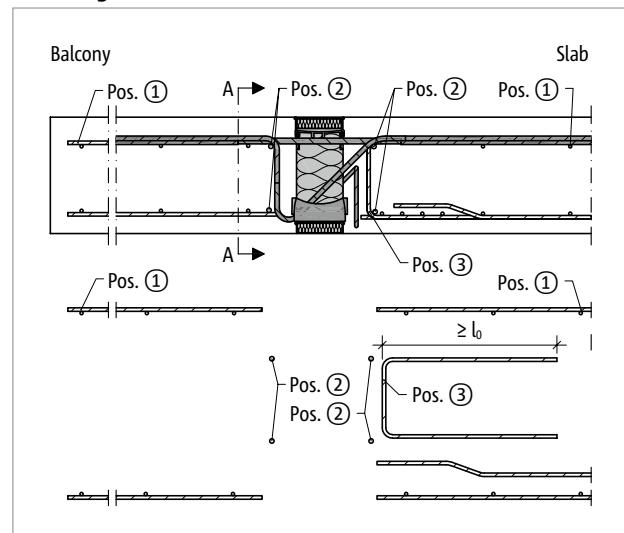


Fig. 62: Schöck Isokorb® T type K-E, K-T: On site reinforcement; floor with edge beams

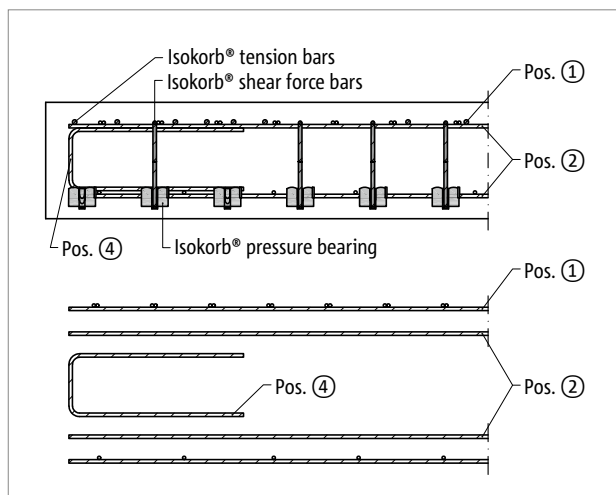


Fig. 63: Schöck Isokorb® T type K-E, K-T: On-site reinforcement on the balcony side in section A-A; Pos.4 = supplementary edge reinforcement on the free edge perpendicular to the Schöck Isokorb®

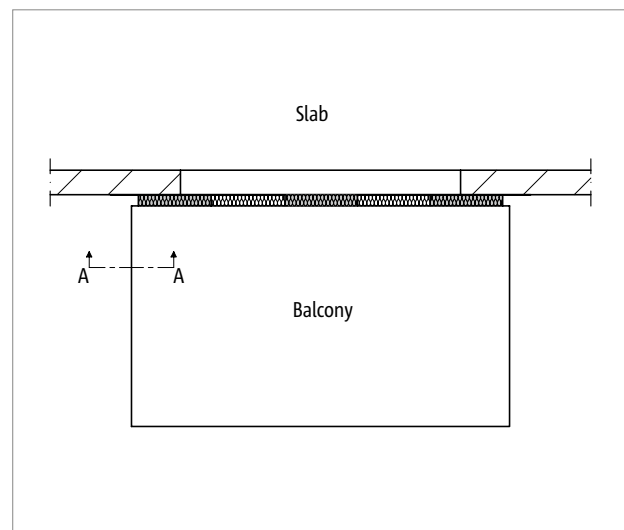


Fig. 64: Schöck Isokorb® T type K-E, K-T: Section A-A

Information on side reinforcement

- The side reinforcement of the slab edge parallel to the Schöck Isokorb® is covered on-site by the integrated suspension reinforcement of the Schöck Isokorb®.

On-site reinforcement

Recommendation for the on-site connection reinforcement

Details on the overlap reinforcement for Schöck Isokorb® with a loading of 100 % of the maximum design moment with C20/25 or C25/30; structurally selected: a_s overlap reinforcement $\geq a_s$ Isokorb® tension bars.

Schöck Isokorb® type K-E, K-T 3.2			K-T-M1	K-E-M2	K-T-M3	K-E-M4	K-T-M5
On-site reinforcement for	Location	Height [mm]	Concrete strength class \geq C25/30				
Overlapping reinforcement							
Pos. 1 [mm ² /m]	Balcony/floor side	160–250	201	402	604	628	804
Steel bars along the insulation joint							
Pos. 2	Balcony side	160–250	2 \varnothing 8				
	Floor side		4 \varnothing 8				
Edge and splitting tensile reinforcement							
Pos. 3 [mm ² /m]	Floor side	160–250	125	125	125	125	287
Side reinforcement at the free edge							
Pos. 4	Balcony/floor side	160–250	According to NS-EN 1992-1-1 (EC2), 9.3.1.4				

Schöck Isokorb® T type K-E, K-T 3.2			K-E-M6	K-T-M7	K-E-M8	K-T-M9	K-T-M10
On-site reinforcement for	Location	Height [mm]	Concrete strength class \geq C25/30				
Overlapping reinforcement							
Pos. 1 [mm ² /m]	Balcony/floor side	160–250	905	1131	1232	1357	1583
Steel bars along the insulation joint							
Pos. 2	Balcony side	160–250	2 \varnothing 8				
	Floor side		4 \varnothing 8				
Edge and splitting tensile reinforcement							
Pos. 3 [mm ² /m]	Floor side	160–250	421	421	421	451	520
Side reinforcement at the free edge							
Pos. 4	Balcony/floor side	160–250	According to NS-EN 1992-1-1 (EC2), 9.3.1.4				

Information about on-site reinforcement

- Alternative connection reinforcements are possible. The rules as per NS-EN 1992-1-1 (EC2) and NS-EN 1992-1-1/NA apply for calculating the lap length. A reduction of the required lap length using m_{Ed}/m_{Rd} is permitted.
- The reinforcement at the free edges Pos. 4 of the structural component perpendicular to the Schöck Isokorb® should be selected as low as possible so that it can be arranged between the upper and lower reinforcement layer.

Tight fit/Concreting section | Precast/Compression joints

Tight fit/Concreting section

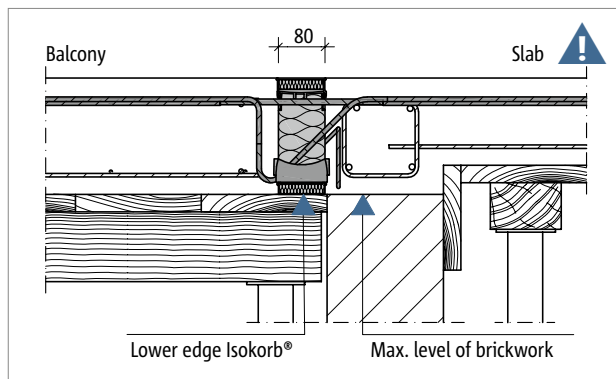


Fig. 65: Schöck Isokorb® T type K-E, K-T: In-situ concrete construction with height offset floor on masonry wall

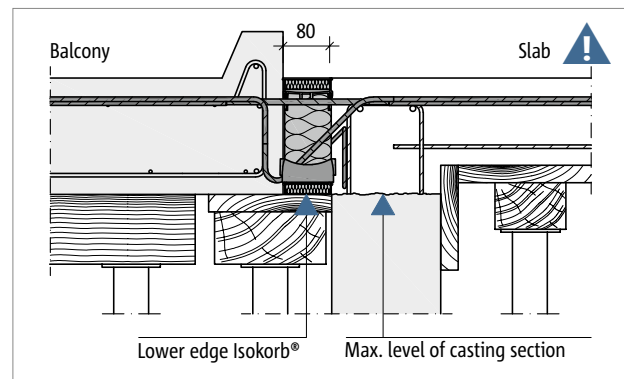


Fig. 66: Schöck Isokorb® T type K-E, K-T: Fully-finished balcony with height offset floor on reinforced concrete wall

⚠ Hazard note: Tight fit with different height levels

The tight fit of the pressure bearings to the freshly poured concrete is to be ensured, therefore the upper edge of the masonry respectively of the concreting section is to be arranged below the lower edge of the Schöck Isokorb®. This is to be taken into account above all with a different height level between inner slab and balcony.

- The concreting joint and the upper edge of the masonry are to be arranged below the lower edge of the Schöck Isokorb®.
- The position of the concreting section is to be indicated in the formwork and reinforcement drawing.
- The joint planning is to be coordinated between precast concrete plant and construction site.

Precast/Compression joints

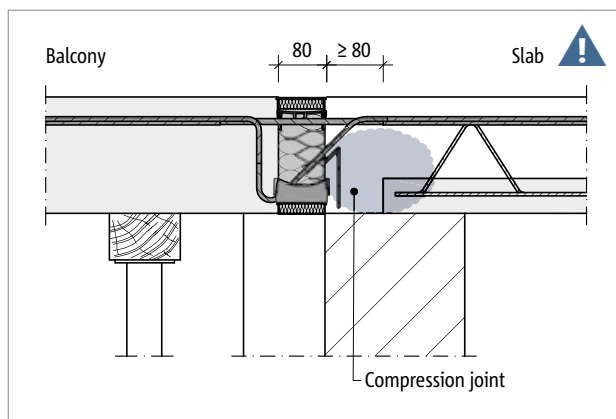


Fig. 67: Schöck Isokorb® T type K-E, K-T: Installation in conjunction with pre-fabricated slab with wall support, compression joint on the floor side

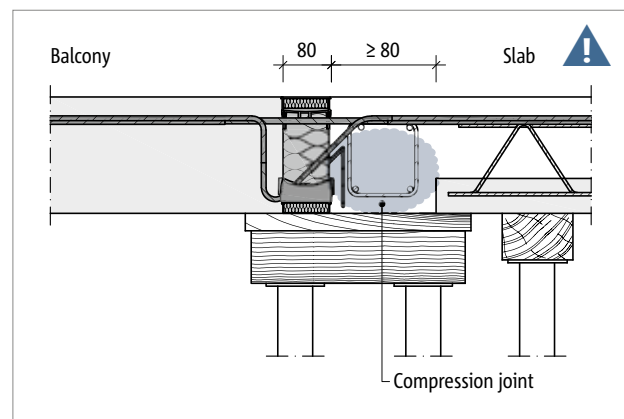


Fig. 68: Schöck Isokorb® T type K-E, K-T: Installation in conjunction with pre-fabricated slab with edge beams, compression joint on the floor side

⚠ Hazard note: Compression joints

Compression joints are joints which, with unfavourable loading combination, remain always in compression (NS-EN 1992-1-1/NA, NCI to 10.9.4.3(1)). The underside of a cantilever balcony is always a compression zone. If the cantilever balcony is a complete precast part or an element slab, and/or the floor is an element slab, then the definition of the standard is effective.

- Compression joints are to be indicated in the formwork and reinforcement drawing!
- Compression joints between precast parts are always to be grouted using in-situ concrete. This also applies for compression joints with the Schöck Isokorb®!
- With compression joints between precast parts (on the inner slab or balcony side) and the Schöck Isokorb®, a in-situ concrete resp. pour of ≥ 80 mm width is to be cast. This is to be entered in the working drawings.
- We recommend the installation of the Schöck Isokorb® and/or the pouring of the balcony-side compression joint already in the precast concrete plant.

Precast construction

Precast part construction – Fully precast balcony IDock1 without edge beams

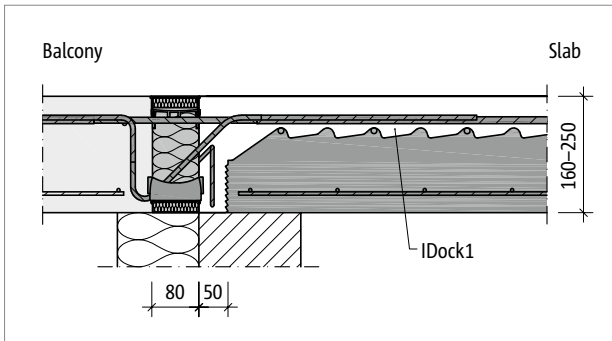


Fig. 69: Schöck Isokorb® T type K-E: Connection of balconies with slab thicknesses of 160 mm to 250 mm with IDock1

IDock2 with edge beams

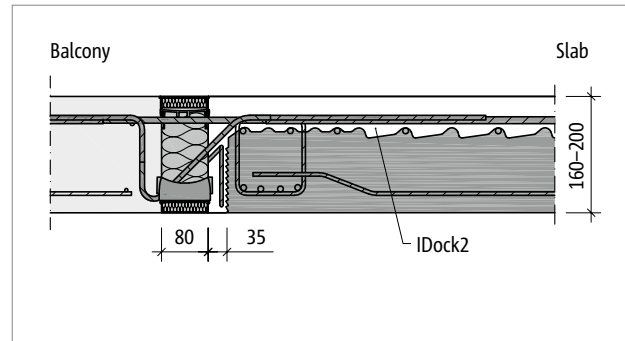


Fig. 70: Schöck Isokorb® T type K-E: Connection of balconies with slab thicknesses of 160 mm to 200 mm with IDock2

i Precast part construction

- The Schöck Isokorb® T type K-E with Schöck IDock® can be used for a flexible design of the construction process. See Schöck IDock® technical information.

Design example

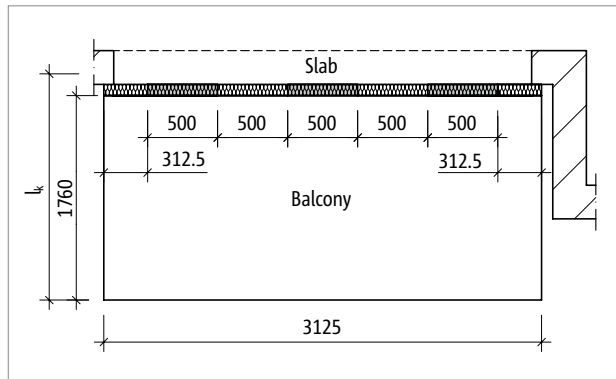


Fig. 71: Schöck Isokorb® T type K-E, K-T: Static system, layout

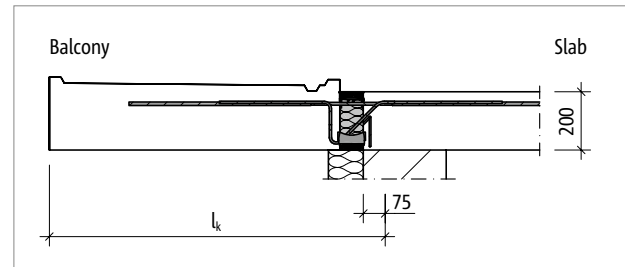


Fig. 72: Schöck Isokorb® T type K-E, K-T: Static system, cross-section

Static system and load assumptions

Geometry:	Schöck Isokorb® height	$h = 200 \text{ mm}$
	cantilever length	$l_k = 1.92 \text{ m}$
	Average balcony slab thickness	$h = 200 \text{ mm}$
Load assumptions:	balcony slab	$g = 5.75 \text{ kN/m}^2$
	live load	$q = 4.0 \text{ kN/m}^2$
	edge load (balustrade)	$g_R = 1.0 \text{ kN/m}$
Exposure classes:	external XC 4	
	internal XC 1	
chosen:	Concrete strength class C25/30 for floor	
	Concrete strength class C45/55 for balcony	
	Concrete cover $c_v = 35 \text{ mm}$ for Schöck Isokorb® tension bars	
Connection geometry:	no height offset, no floor downstand beam, no balcony upstand	
Support floor:	floor edge directly supported	
Support balcony:	restraint of cantilever slab using T type K-E	

Proof of limits of load-bearing capacity (moment stress and shear force)

The calculation takes into account the gaps shown in the above drawing with the proportion of the balcony length to the length of the connection with Isokorb® (= 3.13 m / 1.50 m).

$$\begin{aligned}
 \text{Internal forces:} \quad m_{Ed} &= -(0.5 \cdot [3.125 \cdot (\gamma_G \cdot g + \gamma_Q \cdot q) + 2 \cdot \gamma_G \cdot g_R] \cdot l_k^2 + 3.125 \cdot \gamma_G \cdot g_R \cdot l_k) / 1.50 \\
 m_{Ed} &= -(0.5 \cdot [3.125 \cdot (1.2 \cdot 5.75 + 1.5 \cdot 4.0) + 2 \cdot 1.2 \cdot 1.0] \cdot 1.92^2 + 3.125 \cdot 1.2 \cdot 1.0 \cdot 1.92) \\
 &\quad / 1.50 \\
 &= -57.0 \text{ kNm/m} \\
 V_{Ed} &= +([3.125 \cdot [(\gamma_G \cdot g + \gamma_Q \cdot q) + 2 \cdot \gamma_G \cdot g_R] \cdot l_k + 3.125 \cdot \gamma_G \cdot g_R] / 1.50 \\
 V_{Ed} &= +([3.125 \cdot [(1.2 \cdot 5.75 + 1.5 \cdot 4.0) + 2 \cdot 1.2 \cdot 1.0] \cdot 1.92 + 3.125 \cdot 1.2 \cdot 1.0] / 1.50 \\
 &= +57.0 \text{ kN/m}
 \end{aligned}$$

Selected: **3 pieces of Schöck Isokorb® T type K-E-M8-V1-REI120-CV35-H200-L500**

$$\begin{aligned}
 m_{Rd} &= -61.1 \text{ kNm/m (see page 37)} > m_{Ed} \\
 V_{Rd} &= +99.5 \text{ kN/m (see page 37)} > V_{Ed}
 \end{aligned}$$

Design example

Proof of ultimate limit state (deflection/precamber, vibrations)

The calculation takes into account the gaps shown in the above drawing with the proportion of the balcony length to the length of the connection with Isokorb® (= 3.125 m / 1.50 m).

Torsion spring stiffness: $C = 6668 \text{ kNm/rad/m}$ (from table, see page 41)

Quasi-state load combination: $g + 0.3 \cdot q$

(Recommendation for the calculation of the precamber from Schöck Isokorb®)

$M_{Ed,GZG}$ Determine in ultimate limit state

$$M_{Ed,GZG} = -(0.5 \cdot [3.125 \cdot (g + \psi_{2,i} \cdot q) + 2 \cdot g_R] \cdot l_k^2 + 3.125 \cdot g_R \cdot l_k) / 1.50$$

$$M_{Ed,GZG} = -(0.5 \cdot [3.125 \cdot (5.75 + 0.3 \cdot 4.0) + 2 \cdot 1.0] \cdot 1.92^2 + 3.125 \cdot 1.0 \cdot 1.92) / 1.50$$

$$= -33.0 \text{ kNm/m}$$

Deflection $w_{ii} = |M_{Ed,GZG}| / C \cdot l_k \cdot 10^3 \text{ [mm]}$

$$w_{ii} = 33.0 / 6668 \cdot 1.92 \cdot 10^3 = 9.5 \text{ mm}$$

Natural frequency $f_e = \sqrt{(0.384 \cdot 10^3 / 9.5)} = 6.4 \text{ Hz} > 6 \text{ Hz}$

=> no disruptive vibrations

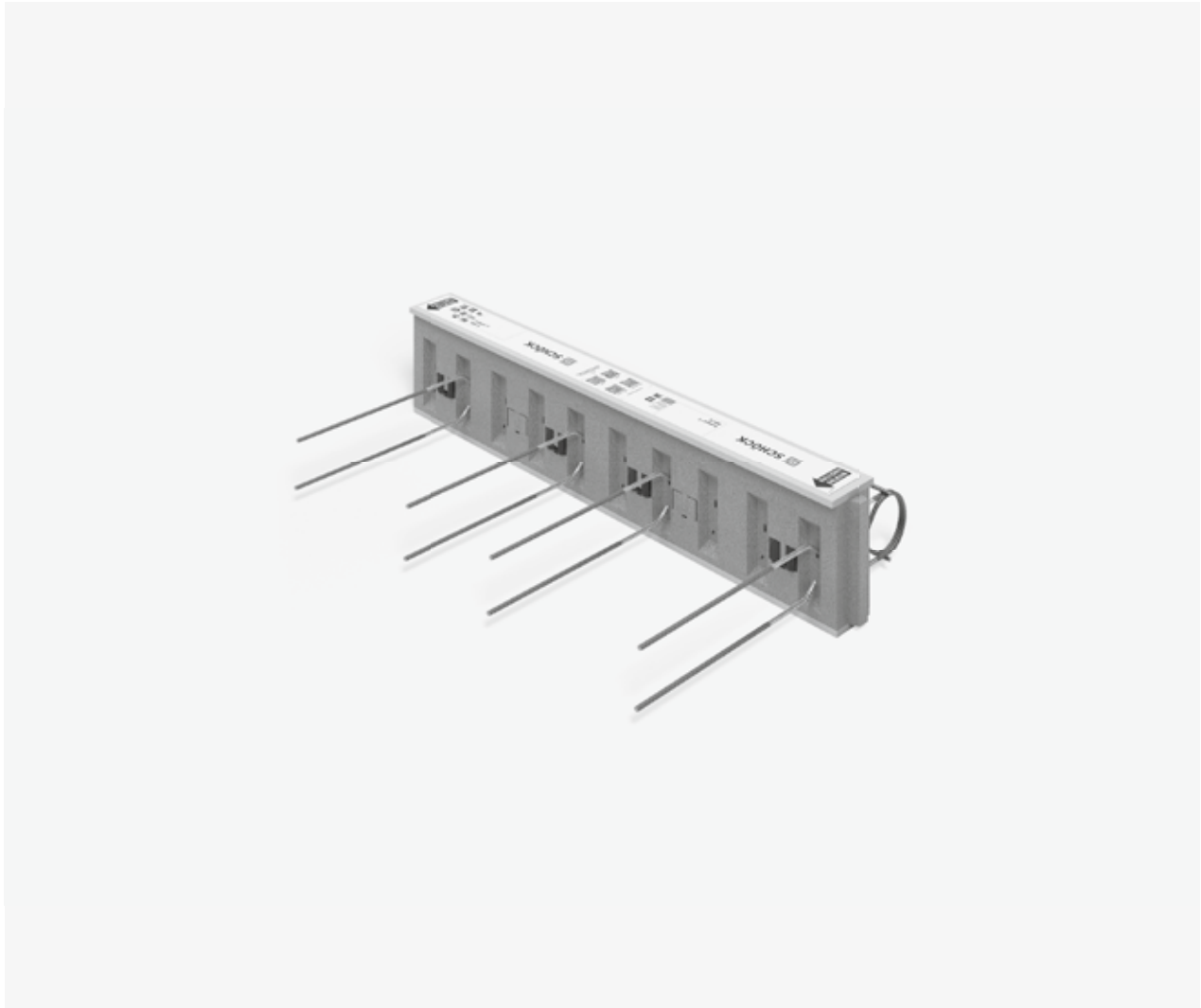
Layout of expansion joints Length of balcony: $3.125 \text{ m} < 11.70 \text{ m}$

=> no expansion joints required

✓ Check list

- Is the same height level planned for the balcony and floor in relation to the upper edges of the shell?
- For fully precast balconies, are any necessary gaps for the frontal transport anchors and rainwater downpipes for internal drainage taken into account?
- Have the loads on the Schöck Isokorb® connection been specified at design level?
- Has the cantilevered system length or the system support width been taken as a basis?
- Has the additional proportionate deflection resulting from the Schöck Isokorb® been taken into account?
- Is the drainage direction taken into account with the resulting camber information? Is the degree of camber entered in the working drawings?
- Is the minimum slab thickness H_{\min} for the respective Schöck Isokorb® type taken into account?
- Are the recommendations for the limitation of the susceptibility to vibration observed?
- Are the maximum allowable expansion joint spacings taken into account?
- Are the Schöck FEM guidelines taken into account with the calculation using FEM?
- Is the relevant concrete strength class taken into account when selecting the design and calculation table?
- Have the fire protection requirements been clarified?
- Have the required cast-in-place strips of concrete for the T type K-E and T type K-T, in the compression joint (width ≥ 80 mm from pressure bearing element), in conjunction with semi-precast balcony slabs, been entered in the construction drawings?
- Have the requirements for on-site reinforcement of connections been defined in each case?
- Has the minimum slab thickness (≥ 180 mm) and the required 2nd layer (-CV50) been taken into account for the corner balcony?
- Has a soft elastic joint been taken into account between the upper edge of the facing shell and the balcony?
- Is the type designation of the Schöck Isokorb® explicit in the plans? - Example: Schöck Isokorb® T type K-E-M6-V1-REI120-CV30-H200-L1000

Schöck Isokorb® T type Q-E, Q-T



Schöck Isokorb® T type Q-E, Q-T

Load-bearing thermal insulation element for supported balconies. The element transfers positive shear forces. The element with the load-bearing level VV additionally transfers negative shear forces.

Schöck Isokorb® T type Q-E-Z, Q-T-Z

Load-bearing thermal insulation element for supported balconies in constraint-free connection. The element transfers positive shear forces.

Element arrangement

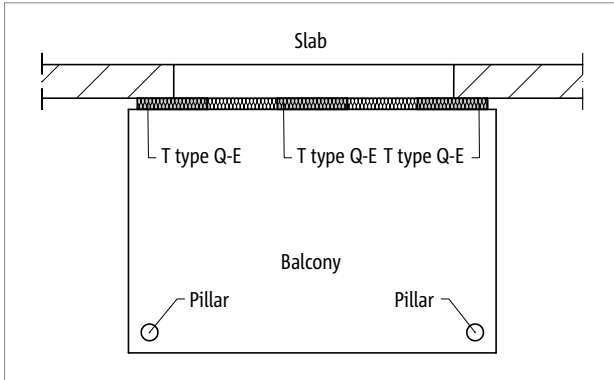


Fig. 73: Schöck Isokorb® T type Q-E: Balcony with pillar support

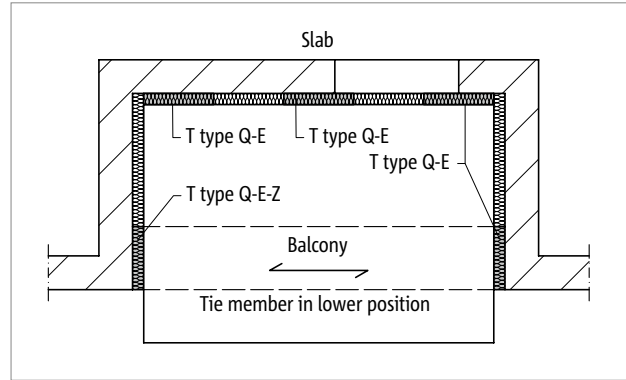


Fig. 74: Schöck Isokorb® T type Q-E, Q-E-Z: Recessed balcony supported on three sides with tie member

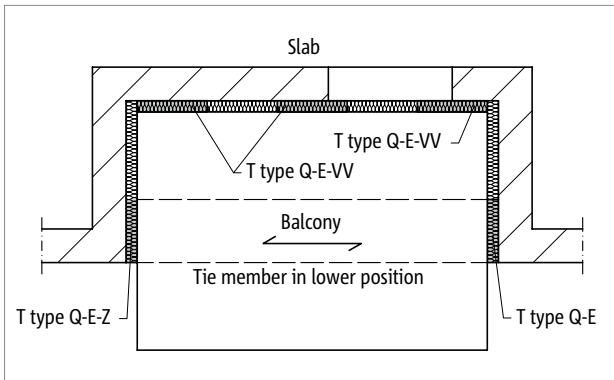


Fig. 75: Schöck Isokorb® T type Q-E, Q-E-Z and Q-E-VV: Recessed balcony supported on three sides with tie member

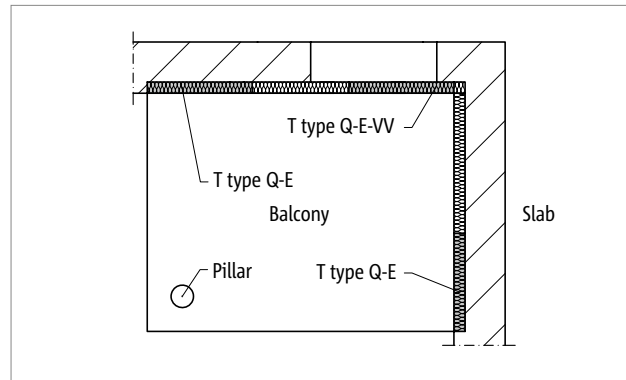


Fig. 76: Schöck Isokorb® T type Q-E, Q-E-VV: Balcony supported on two sides with pillar and positive shear forces

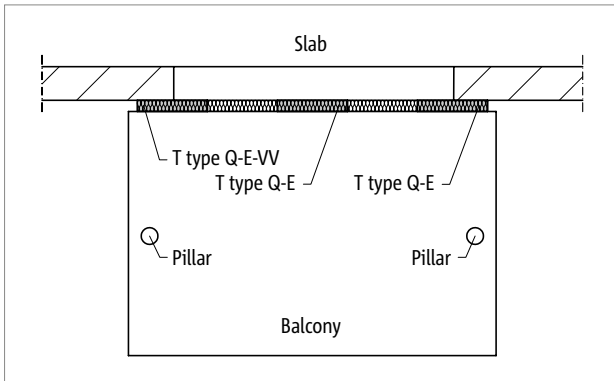


Fig. 77: Schöck Isokorb® T type Q-E, Q-E-VV: Balcony with pillar support

Installation cross sections

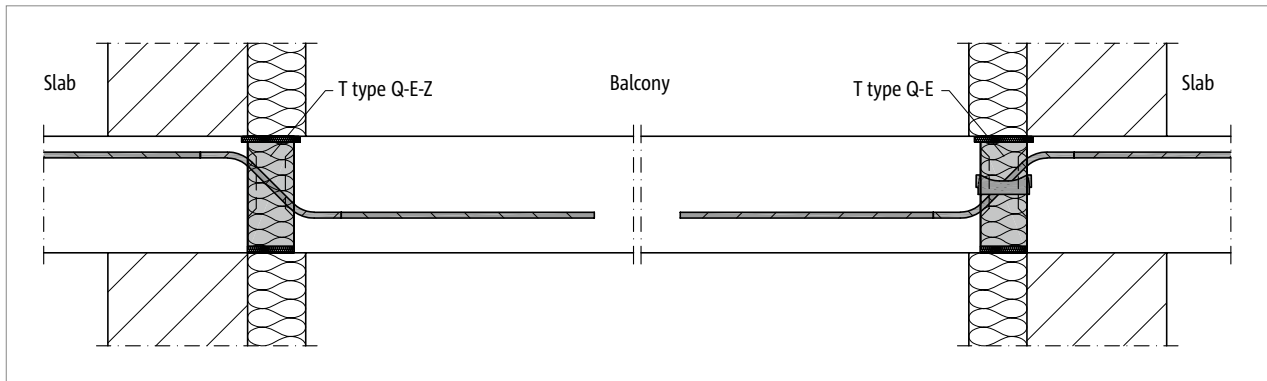


Fig. 78: Schöck Isokorb® T type Q-E-Z, Q-E: Application case one-way reinforced concrete slab

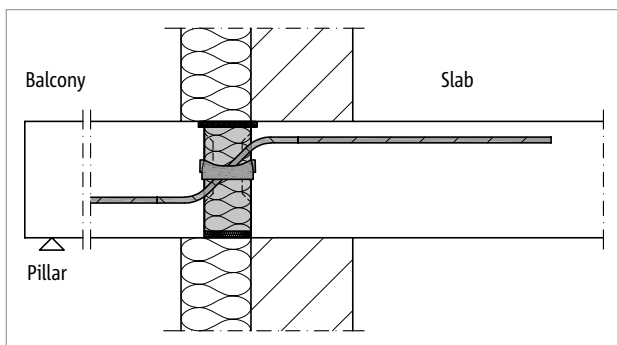


Fig. 79: Schöck Isokorb® T type Q-E: Connection for exterior insulation

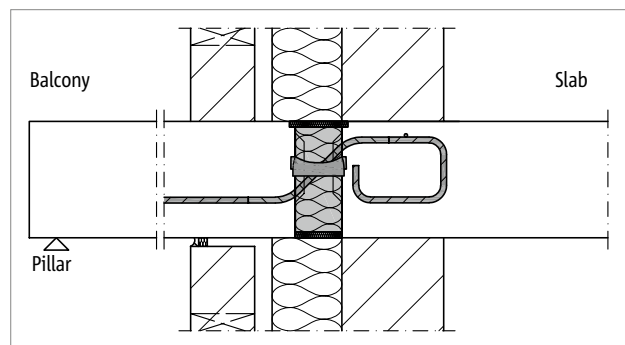


Fig. 80: Schöck Isokorb® T type Q-E-W-V: Connection for core insulation

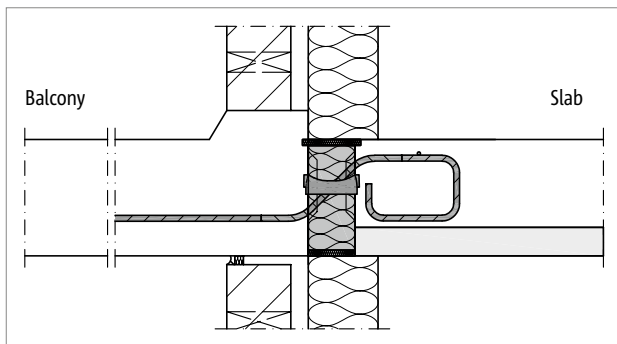


Fig. 81: Schöck Isokorb® T type Q-E-W-V: Point connection

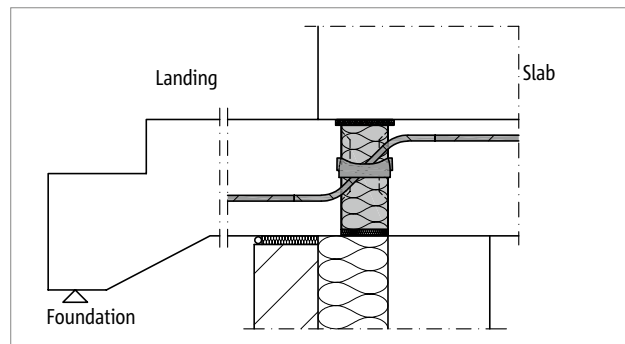


Fig. 82: Schöck Isokorb® T type Q-E-V: Stair flight connection

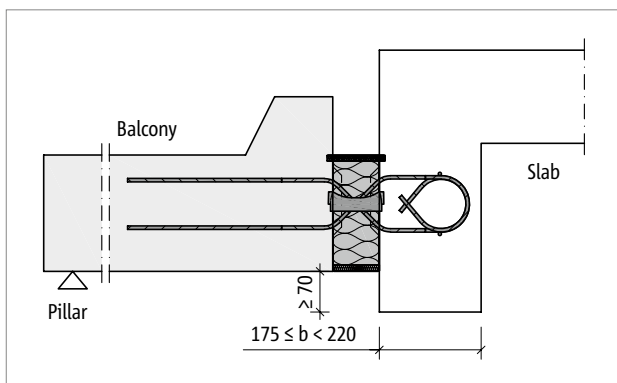


Fig. 83: Schöck Isokorb® T type Q-E-W-VV: Installation situation "pre-cast balcony slab" (e.g. T type Q-E-W-VV1 to VV3)

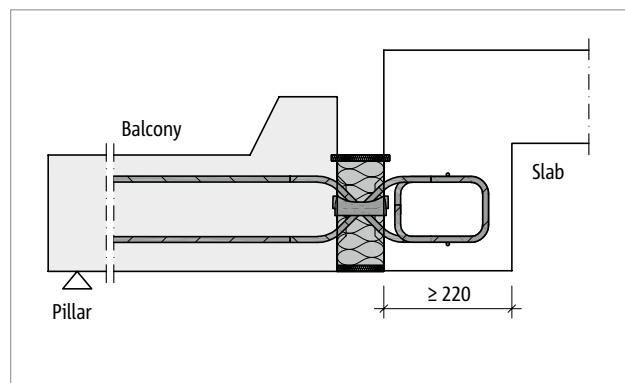


Fig. 84: Schöck Isokorb® T type Q-E-W-VV: Installation situation "pre-cast balcony slab"

T
type Q-E

Reinforced concrete – reinforced concrete

Product selection | Type designations | Special designs

Variants of Schöck Isokorb® T type Q-E, Q-T

All variants have shear force bars for positive shear force. The shear force bars are straight on the balcony side. The configuration of the Schöck Isokorb® T type Q can be varied as follows:

type Q-E/T: Shear force bar for positive shear force and pressure bearing

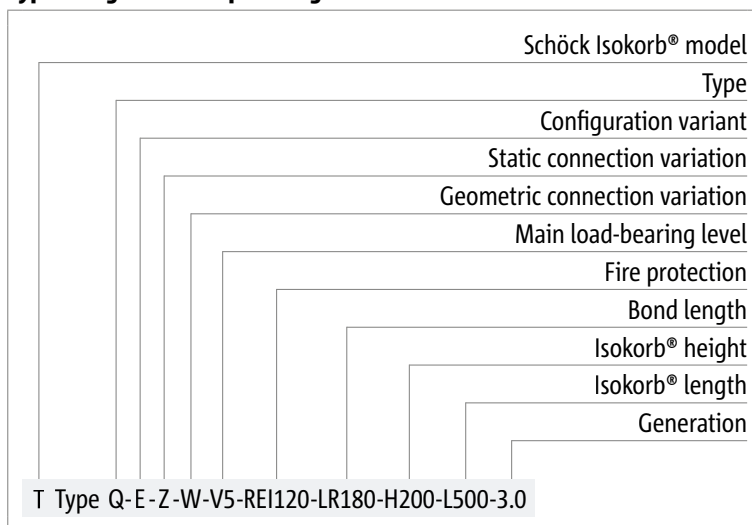
type Q-E/T-Z: Shear force bar for positive shear force, free of constraint forces without pressure bearing

type Q-E/T-VV: Shear force bars for positive and negative shear force, pressure bearings

type Q-E: can be used with Schöck IDock®

- Geometric connection variation:
 - W: Shear force bar on floor side bent, balcony side straight
- Main load-bearing level:
 - V1 to V7: Shear force bar straight on the floor side, straight on the balcony side
 - VV1 to VV7: Shear force bar straight on the floor side, straight on the balcony side
 - W-V1 to W-V5: Shear force bar bent on floor side, straight on balcony side
 - W-VV1 to W-VV5: Shear force bar bent on floor side, straight on balcony side
 - type Q-T with main load-bearing level V1 to V2
 - type Q-E with main load-bearing level V3 to V7
- Fire resistance class:
 - REI120 (Standard): Projection upper fire protection board, both sides 10 mm
- Bond length LR: Dimensions for Schöck Isokorb® T type Q-E-W, Q-E-Z-W, Q-E-W-VV see page59
- Concrete cover of the shear force bars:
 - bottom: $CV \geq 30$ mm (depending on the type and height of the Isokorb®)
 - top: $CV \geq 21$ mm
 - top: $CV \geq 31$ mm for type Q-E-VV, Q-E-W-VV
- Isokorb® height:
 - $H = H_{\min}$ up to 250 mm (note minimum slab height depending on load bearing capacity and fire protection)
- Isokorb® length:
 - L250, L500, L1000, info in mm
- Generation:
 - 3.0

Type designations in planning documents



Special designs

Please contact the Technical Design Department if you cannot achieve the connections you require using the standard product variants shown in this technical information (contact details on page 3).

Bond length

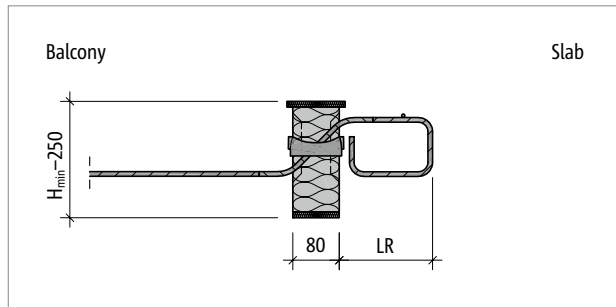


Fig. 85: Schöck Isokorb® type Q-E-W: Product section, representation of bond length LR

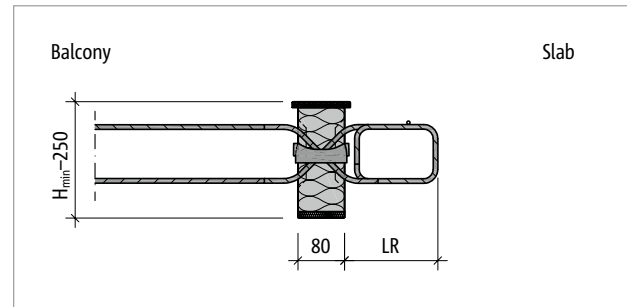


Fig. 86: Schöck Isokorb® type Q-E-W-VV: Product section, representation of bond length LR

Schöck Isokorb® T type Q-T-W, Q-T-Z-W, Q-E-W, Q-E-Z-W 3.0		Q-E-W-V1 Q-E-W-VV1 Q-E-Z-W-V1 Q-E-Z-W-VV1	Q-E-W-V2 Q-E-W-VV2 Q-E-Z-W-V2 Q-E-Z-W-VV2	Q-E-W-V3 Q-E-W-VV3 Q-E-Z-W-V3 Q-E-Z-W-VV3	Q-E-W-V4 Q-E-W-VV4 Q-E-Z-W-V4 Q-E-Z-W-VV4	Q-E-W-V5 Q-E-W-VV5 Q-E-Z-W-V5 Q-E-Z-W-VV5
Bond length for		LR [mm]				
Isokorb® height H [mm]	H _{min} -250	155	155	155	160	180

Design

Design table T type Q-E, Q-T in length L1000

Schöck Isokorb® T type Q-T, Q-T-W, Q-E, Q-E-W 3.0		Q-T-V1 Q-T-W-V1	Q-T-V2 Q-T-W-V2	Q-E-V3 Q-E-W-V3	Q-E-V4 Q-E-W-V4	Q-E-V5 Q-E-W-V5	Q-E-V6	Q-E-V7
Design values with		$V_{Rd,z}$ [kN/m]						
Concrete strength class	C25/30	34.8	52.2	69.5	123.6	193.2	278.2	328.0

Schöck Isokorb® T type Q-T, Q-T-W, Q-E, Q-E-W 3.0		Q-T-V1 Q-T-W-V1	Q-T-V2 Q-T-W-V2	Q-E-V3 Q-E-W-V3	Q-E-V4 Q-E-W-V4	Q-E-V5 Q-E-W-V5	Q-E-V6	Q-E-V7
Placement with		Isokorb® length [mm]						
		1000	1000	1000	1000	1000	1000	1000
Shear force bars		4 \emptyset 6	6 \emptyset 6	8 \emptyset 6	8 \emptyset 8	8 \emptyset 10	8 \emptyset 12	8 \emptyset 14
Pressure bearing [piece]		4	4	4	4	8	8	8
H_{min} [mm]		160	160	160	160	170	180	190

Design table T type Q-E in length L500

Schöck Isokorb® T type Q-E 3.0		Q-E-V4, Q-E-W-V4	Q-E-V5, Q-E-W-V5	Q-E-V6	Q-E-V7
Design values with		$V_{Rd,z}$ [kN/element]			
Concrete strength class	C25/30	61.8	96.6	139.1	164.0

Schöck Isokorb® T type Q-E 3.0		Q-E-V4, Q-E-W-V4	Q-E-V5, Q-E-W-V5	Q-E-V6	Q-E-V7
Placement with		Isokorb® length [mm]			
		500	500	500	500
Shear force bars		4 \emptyset 8	4 \emptyset 10	4 \emptyset 12	4 \emptyset 14
Pressure bearing [piece]		4	4	4	4
H_{min} [mm]		160	170	180	190

Design table T type Q-E in length L250

Schöck Isokorb® T type Q-E 3.0		Q-E-V4, Q-E-W-V4	Q-E-V5, Q-E-W-V5	Q-E-V6	Q-E-V7
Design values with		$V_{Rd,z}$ [kN/element]			
Concrete strength class	C25/30	30.9	48.3	69.5	82.0

Schöck Isokorb® T type Q-E 3.0		Q-E-V4, Q-E-W-V4	Q-E-V5, Q-E-W-V5	Q-E-V6	Q-E-V7
Placement with		Isokorb® length [mm]			
		250	250	250	250
Shear force bars		2 \emptyset 8	2 \emptyset 10	2 \emptyset 12	2 \emptyset 14
Pressure bearing [piece]		2	2	2	2
H_{min} [mm]		160	170	180	190

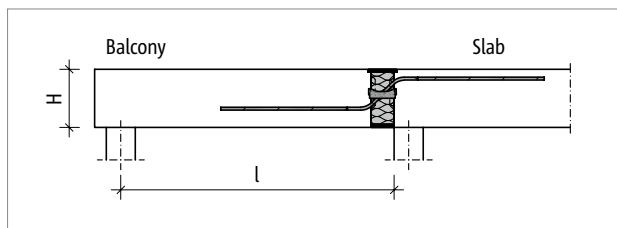


Fig. 87: Schöck Isokorb® T type Q-E-V: Static system

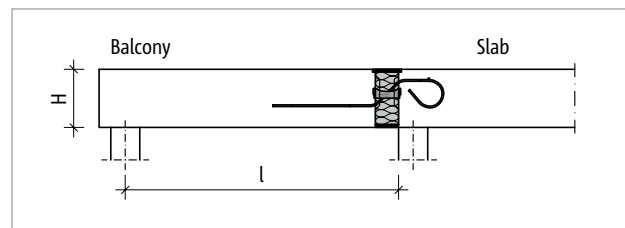


Fig. 88: Schöck Isokorb® T type Q-E-W-V1 up to V3: Static system

Design

Design table T type Q-E-Z, Q-T-Z in length L1000

Schöck Isokorb® T type Q-T-Z, Q-T-Z-W, Q-E-Z, Q-E-Z-W 3.0		Q-T-Z-V1 Q-T-Z-W-V1	Q-T-Z-V2 Q-T-Z-W-V2	Q-E-Z-V3 Q-E-Z-W-V3	Q-E-Z-V4 Q-E-Z-W-V4	Q-E-Z-V5 Q-E-Z-W-V5	Q-E-Z-V6	Q-E-Z-V7
Design values with		$v_{Rd,z}$ [kN/m]						
Concrete strength class	C25/30	34.8	52.2	69.5	123.6	193.2	278.2	378.6

Schöck Isokorb® T type Q-T-Z, Q-T-Z-W, Q-E-Z, Q-E-Z-W 3.0		Q-T-Z-V1 Q-T-Z-W-V1	Q-T-Z-V2 Q-T-Z-W-V2	Q-E-Z-V3 Q-E-Z-W-V3	Q-E-Z-V4 Q-E-Z-W-V4	Q-E-Z-V5 Q-E-Z-W-V5	Q-E-Z-V6	Q-E-Z-V7
Placement with		Isokorb® length [mm]						
		1000	1000	1000	1000	1000	1000	1000
Shear force bars		4 \varnothing 6	6 \varnothing 6	8 \varnothing 6	8 \varnothing 8	8 \varnothing 10	8 \varnothing 12	8 \varnothing 14
Pressure bearing [piece]								
H_{min} [mm]		160	160	160	160	170	180	190

Design table T type Q-E-Z in length L500

Schöck Isokorb® T type Q-E-Z 3.0		Q-E-Z-V4, Q-E-W-V4	Q-E-Z-V5, Q-E-W-V5	Q-E-Z-V6	Q-E-Z-V7
Design values with		$V_{Rd,z}$ [kN/element]			
Concrete strength class	C25/30	61.8	96.6	139.1	189.3

Schöck Isokorb® T type Q-E-Z 3.0		Q-E-Z-V4, Q-E-Z-W-V4	Q-E-Z-V5, Q-E-Z-W-V5	Q-E-Z-V6	Q-E-Z-V7
Placement with		Isokorb® length [mm]			
		500	500	500	500
Shear force bars		4 \varnothing 8	4 \varnothing 10	4 \varnothing 12	4 \varnothing 14
Pressure bearing [piece]		-	-	-	-
H_{min} [mm]		160	170	180	190

Design table T type Q-E-Z in length L250

Schöck Isokorb® T type Q-E-Z 3.0		Q-E-Z-V4, Q-E-W-V4	Q-E-Z-V5, Q-E-W-V5	Q-E-Z-V6	Q-E-Z-V7
Design values with		$V_{Rd,z}$ [kN/element]			
Concrete strength class	C25/30	30.9	48.3	69.5	94.6

Schöck Isokorb® T type Q-E-Z 3.0		Q-E-Z-V4, Q-E-Z-W-V4	Q-E-Z-V5, Q-E-Z-W-V5	Q-E-Z-V6	Q-E-Z-V7
Placement with		Isokorb® length [mm]			
		250	250	250	250
Shear force bars		2 \varnothing 8	2 \varnothing 10	2 \varnothing 12	2 \varnothing 14
Pressure bearing [piece]		-	-	-	-
H_{min} [mm]		160	170	180	190

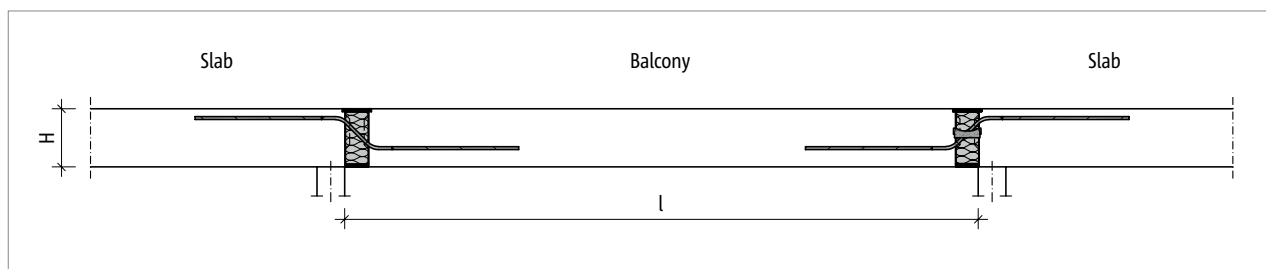


Fig. 89: Schöck Isokorb® T type Q-E-V, Q-E-Z-V: Static system

Design

Design table T type Q-E, Q-T in length L1000

Schöck Isokorb® T type Q-T, Q-T-W, Q-E, Q-E-W 3.0		Q-T-VV1 Q-T-W-VV1	Q-T-VV2 Q-T-W-VV2	Q-E-VV3 Q-E-W-VV3	Q-E-VV4 Q-E-W-VV4	Q-E-VV5 Q-E-W-VV5	Q-E-VV6	Q-E-VV7
Design values with		$V_{Rd,z}$ [kN/m]						
Concrete strength class	C25/30	±34.8	±52.2	±69.5	±123.6	±193.2	±278.2	±328.0

Schöck Isokorb® T type Q-T, Q-T-W, Q-E, Q-E-W 3.0		Q-T-VV1 Q-T-W-VV1	Q-T-VV2 Q-T-W-VV2	Q-E-VV3 Q-E-W-VV3	Q-E-VV4 Q-E-W-VV4	Q-E-VV5 Q-E-W-VV5	Q-E-VV6	Q-E-VV7
Placement with		Isokorb® length [mm]						
		1000	1000	1000	1000	1000	1000	1000
Shear force bars		2 × 4 Ø 6	2 × 6 Ø 6	2 × 8 Ø 6	2 × 8 Ø 8	2 × 8 Ø 10	2 × 8 Ø 12	2 × 8 Ø 14
Pressure bearing [piece]		4	4	4	4	8	8	8
H_{min} for REI 60 [mm]		160	160	160	170	180	190	200
H_{min} for REI120 [mm]		160	160	160	170	180	190	200

Design table T type Q-E in length L500

Schöck Isokorb® T type Q-E 3.0		Q-E-VV4, Q-E-W-VV4	Q-E-VV5, Q-E-W-VV5	Q-E-VV6	Q-E-VV7
Design values with		$V_{Rd,z}$ [kN/element]			
Concrete strength class	C20/25	±61.8	±96.6	±139.1	±164.0

Schöck Isokorb® T type Q-E 3.0		Q-E-VV4, Q-E-W-VV4	Q-E-VV5, Q-E-W-VV5	Q-E-VV6	Q-E-VV7
Placement with		Isokorb® length [mm]			
		500	500	500	500
Shear force bars		4 Ø 8 + 4 Ø 8	4 Ø 10 + 4 Ø 10	4 Ø 12 + 4 Ø 12	4 Ø 14 + 4 Ø 14
Pressure bearing [piece]		4	4	4	4
H_{min} [mm]		170	180	190	200

Design

Design table T type Q-E in length L250

Schöck Isokorb® T type Q-E 3.0		Q-E-VV4, Q-E-W-VV5	Q-E-VV5, Q-E-W-VV5	Q-E-VV6	Q-E-VV7
Design values with		$V_{Rd,z}$ [kN/element]			
Concrete strength class	C20/25	±30.9	±48.3	±69.5	±82.0

Schöck Isokorb® T type Q-E 3.0		Q-E-VV4, Q-E-W-VV4	Q-E-VV5, Q-E-W-VV5	Q-E-VV6	Q-E-VV7
Placement with		Isokorb® length [mm]			
		250	250	250	250
Shear force bars		$2 \varnothing 8 + 2 \varnothing 8$	$2 \varnothing 10 + 2 \varnothing 10$	$2 \varnothing 12 + 2 \varnothing 12$	$2 \varnothing 14 + 2 \varnothing 14$
Pressure bearing [piece]		2	2	2	2
H_{min} [mm]		170	180	190	190

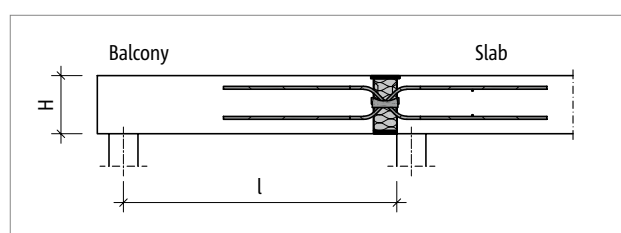


Fig. 90: Schöck Isokorb® T type Q-E-VV: Static system

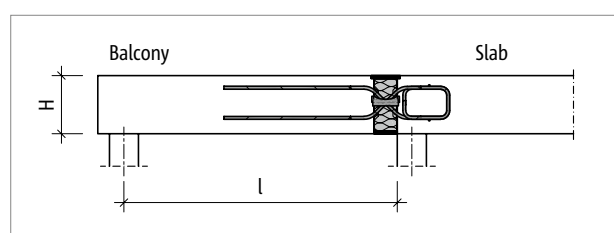


Fig. 91: Schöck Isokorb® T type Q-E-W-VV: Static system

i Notes on design

- A static verification is to be provided for the adjacent reinforced concrete structural component on both sides of the Schöck Isokorb®.
- Due to the excentric force application of the Schöck Isokorb®, an offset moment is generated at the adjacent slab edges. This is to be taken into account with the design of the slabs.

Moments from excentric connection

Moments from excentric connection

Moments from excentric connection for the Schöck Isokorb® are to be taken into account for the design of the connection reinforcement for each balcony and slab side. These moments are respectively to be overlaid with the moments from the ordinary loading, if they have the same sign.

The following table values ΔM_{Ed} have been calculated for 100 % utilisation of v_{rd} .

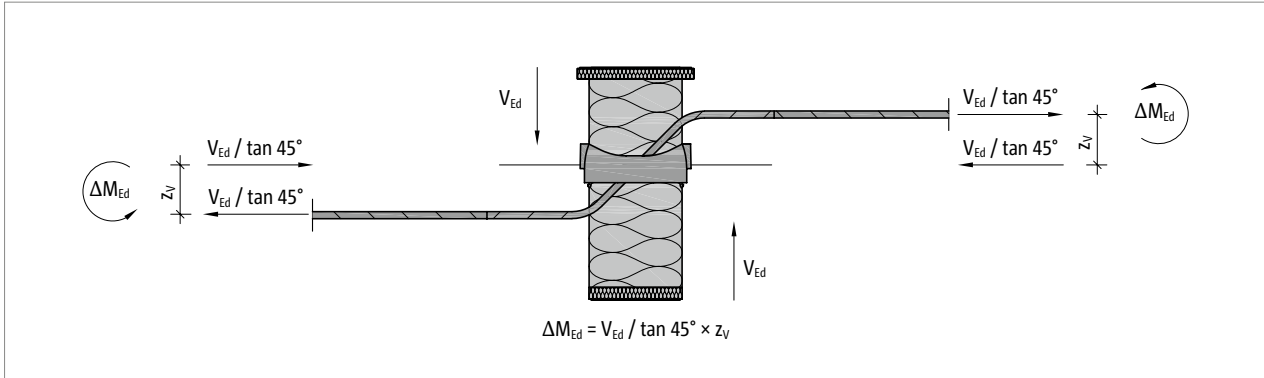


Fig. 92: Schöck Isokorb® T type Q-E, Q-E-W: Moments from excentric connection

Design table T type Q-E, Q-T in length L1000

Schöck Isokorb® T type Q-T, Q-T-W, Q-E, Q-E-W 3.0		Q-T-V1 Q-T-W-V1	Q-T-V2 Q-T-W-V2	Q-E-V3 Q-E-W-V3	Q-E-V4 Q-E-W-V4	Q-E-V5 Q-E-W-V5	Q-E-V6	Q-E-V7
Design values with		M_{Ed} [kNm/element]						
Concrete strength class	C25/30	1.7	2.6	3.5	6.3	10.8	15.9	20.5

Schöck Isokorb® T type Q-T, Q-T-W, Q-E, Q-E-W 3.0		Q-T-VV1 Q-T-W-VV1	Q-T-VV2 Q-T-W-VV2	Q-E-VV3 Q-E-W-VV3	Q-E-VV4 Q-E-W-VV4	Q-E-VV5 Q-E-W-VV5	Q-E-VV6	Q-E-VV7
Design values with		M_{Ed} [kNm/element]						
Concrete strength class	C25/30	1.7	2.6	3.5	6.3	10.8	15.9	20.5

Design table T type Q-E in length L500

Schöck Isokorb® T type Q-E 3.0		V4, W-V4	V5, W-V5	V6	V7
Design values with		M_{Ed} [kNm/element]			
Concrete strength class	C25/30	3.2	5.4	7.9	10.3

Schöck Isokorb® T type Q-E 3.0		VV4, W-VV4	VV5, W-VV5	VV6	VV7
Design values with		M_{Ed} [kNm/element]			
Concrete strength class	C25/30	3.2	5.4	7.9	10.3

Design table T type Q-E in length L250

Schöck Isokorb® T type Q-E 3.0		V4, W-V4	V5, W-V5	V6	V7
Design values with		M_{Ed} [kNm/element]			
Concrete strength class	C25/30	1.6	2.7	4.0	5.1

Schöck Isokorb® T type Q-E 3.0		VV4, W-VV4	VV5, W-VV5	VV6	VV7
Design values with		M_{Ed} [kNm/element]			
Concrete strength class	C25/30	1.6	2.7	4.0	5.1

Expansion joint spacing

Maximum expansion joint spacing

If the component length exceeds the maximum expansion joint spacing e , then expansion joints must be incorporated into the external concrete components at right angles to the insulating layer in order to limit the effect as a result of temperature changes. Because the layout of the Isokorb® is only possible along the side of the component due to the installation in conjunction with the external concrete precast element, corners of balconies, parapets and balustrades cannot form any fixed points. The shear force transmission in the expansion joint can be ensured using a longitudinally displaceable shear force dowel, e.g. Schöck Stacon®.

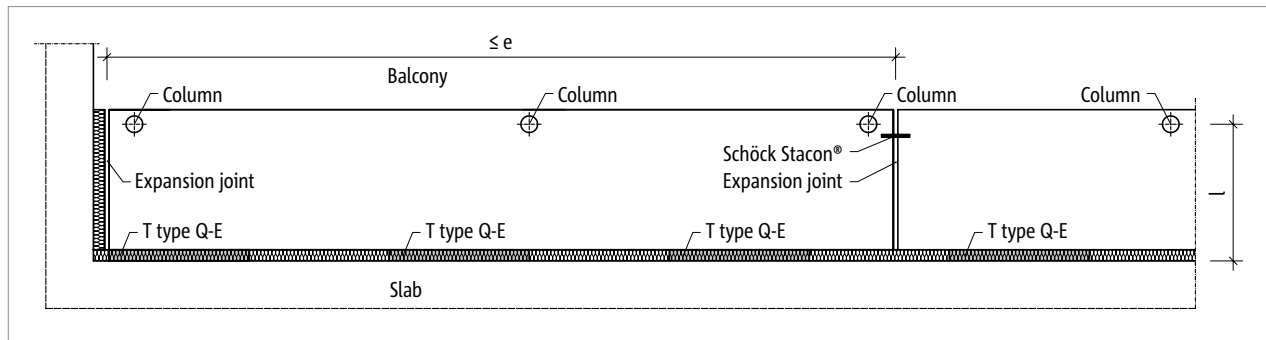


Fig. 93: Schöck Isokorb® T type Q-E: Expansion joint spacing

Schöck Isokorb® T type Q-T , Q-T-Z 3.0		V1, VV1 W-V1, W-VV1	V2, VV2 W-V2, W-VV2
Maximum expansion joint spacing when		e [m]	
Insulating element thickness [mm]	80	11.0	11.0

Schöck Isokorb® T type Q-E, Q-E-Z 3.0		V3, VV3 W-V3, W-VV3	V4, VV4 W-V4, W-VV4	V5, VV5 W-V5, W-VV5	V6, VV6	V7, VV7
Maximum expansion joint spacing when		e [m]				
Insulating element thickness [mm]	80	11.0	11.0	10.6	9.5	8.3

i Edge distances

The Schöck Isokorb® must be so arranged at the expansion joint that the following conditions are met:

- For the centre distance of the compression bars from the free edge resp. expansion joint: $e_R \geq 100$ mm applies.

Product description

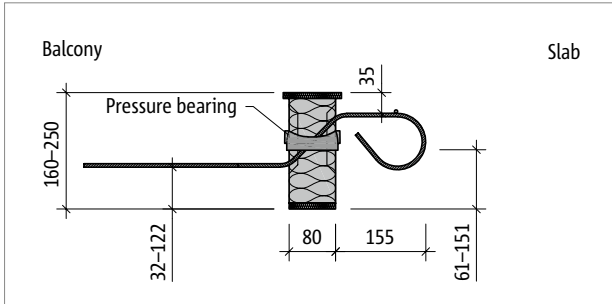


Fig. 94: Schöck Isokorb® T type Q-T-W-V1 to V2: product section

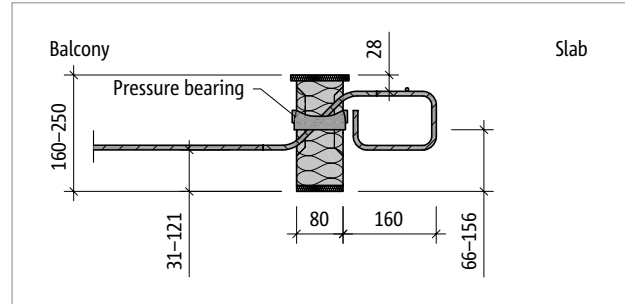


Fig. 95: Schöck Isokorb® T type Q-E-W-V4: Product section

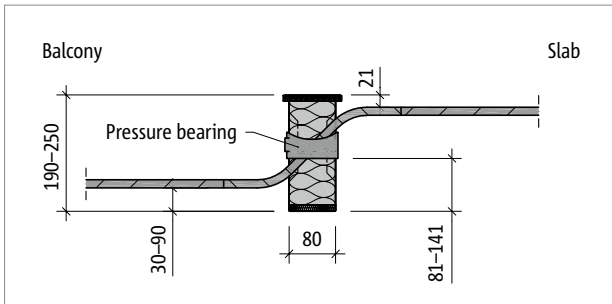


Fig. 96: Schöck Isokorb® T type Q-E-V7: Product section

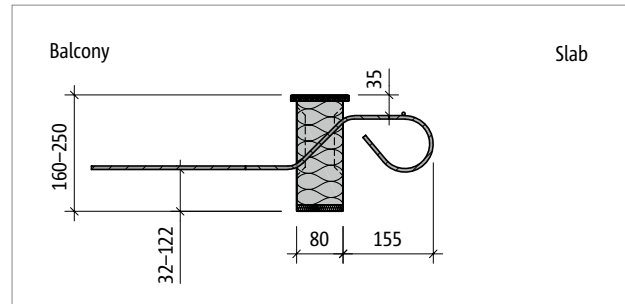


Fig. 97: Schöck Isokorb® T type Q-T-Z-W-V1 to V2: product section

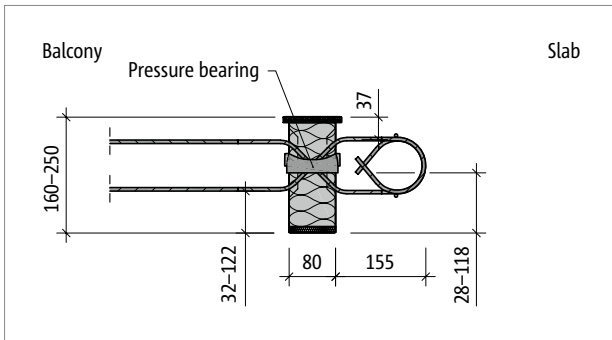


Fig. 98: Schöck Isokorb® T type Q-T-W-VV1 to VV2: product section

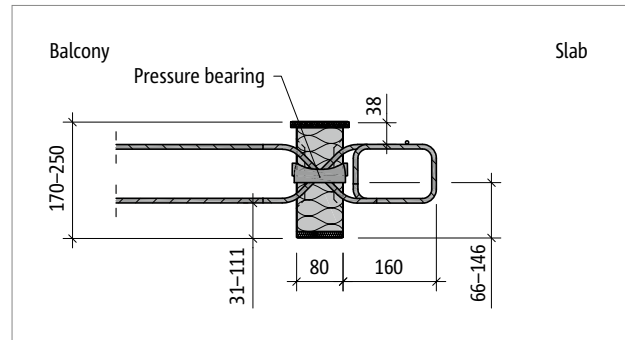


Fig. 99: Schöck Isokorb® T type Q-E-W-VV4: Product section

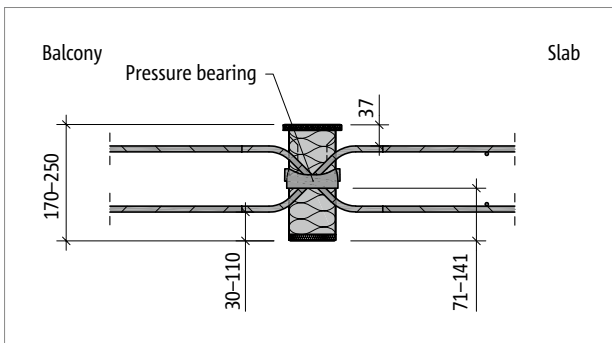


Fig. 100: Schöck Isokorb® T type Q-E-VV5: Product section

Product information

- For additional 2D and 3D product drawings contact our Design Support department.
- Observe min. height H_{\min} Schöck Isokorb® T type Q-E, Q-E-Z.

Product description

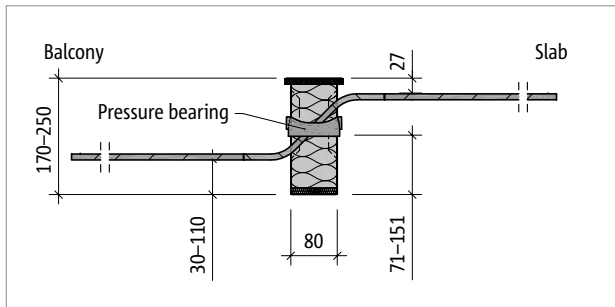


Fig. 101: Schöck Isokorb® T type Q-E-V5: Product section

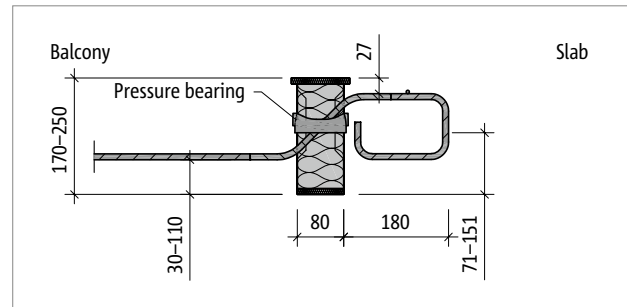


Fig. 102: Schöck Isokorb® T type Q-E-W-V5: Product section

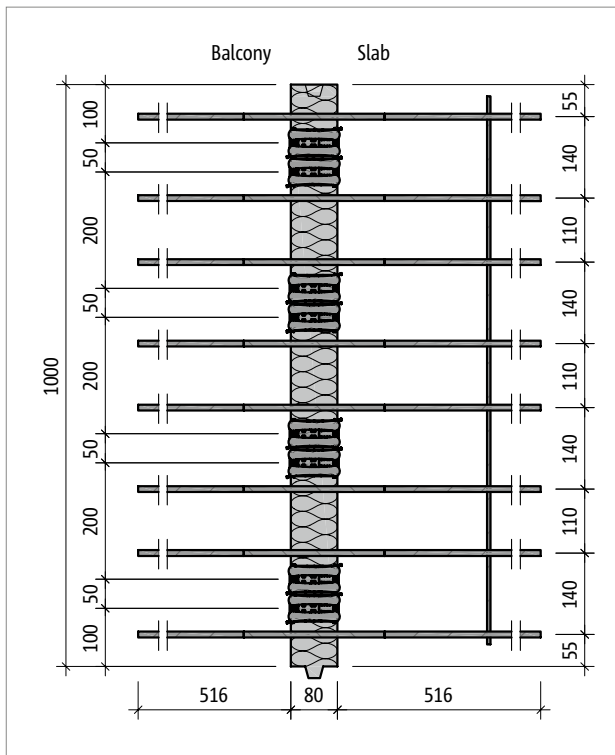


Fig. 103: Schöck Isokorb® T type Q-E-V5: Product layout

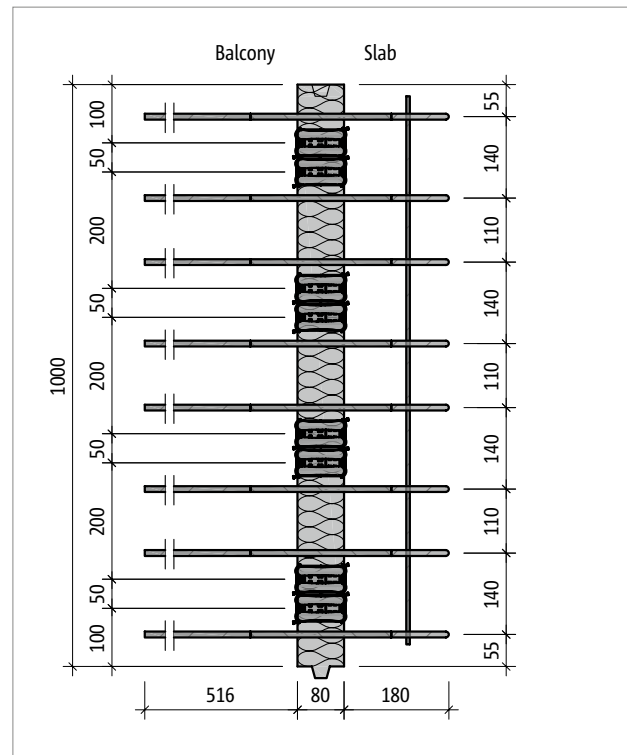


Fig. 104: Schöck Isokorb® T type Q-E-W-V5: Product layout

Product description

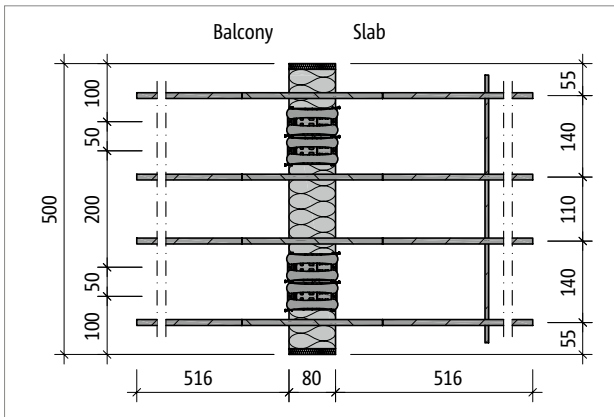


Fig. 105: Schöck Isokorb® T type Q-E-V5-L500: Product layout

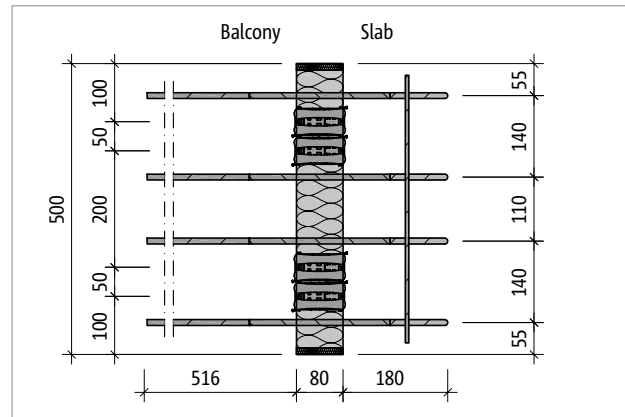


Fig. 106: Schöck Isokorb® T type Q-E-W-V5-L500: Product layout

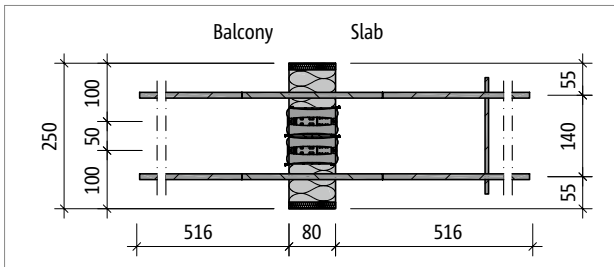


Fig. 107: Schöck Isokorb® T type Q-E-V5-L250: Product layout

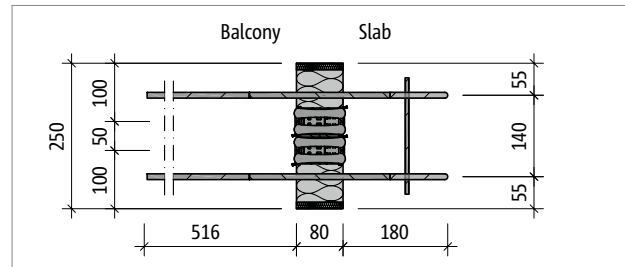


Fig. 108: Schöck Isokorb® T type Q-E-W-V5-L250: Product layout

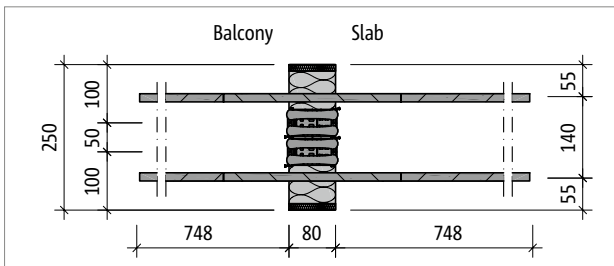


Fig. 109: Schöck Isokorb® T type Q-E-V7-L250: Product layout

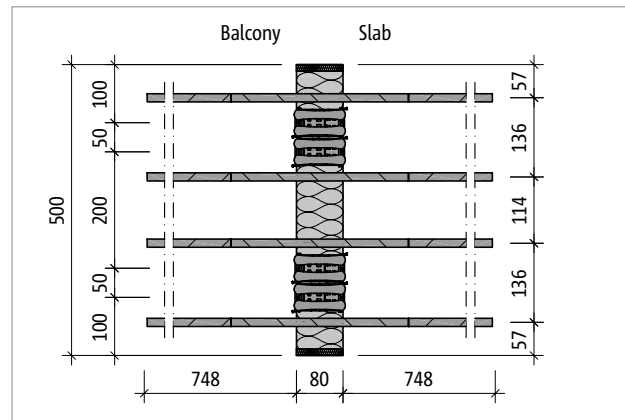


Fig. 110: Schöck Isokorb® T type Q-E-V7-L500: Product layout

Product information

- For additional 2D and 3D product drawings contact our Design Support department.
- Observe min. height H_{\min} Schöck Isokorb® T type Q-E, Q-E-Z.
- Schöck Isokorb® T type Q-E can be planned in combination with Schöck IDock®, see Schöck IDock® technical information.
- Schöck Isokorb® T type Q-E in lengths L250 and L500 with lateral fire protection boards

Product description

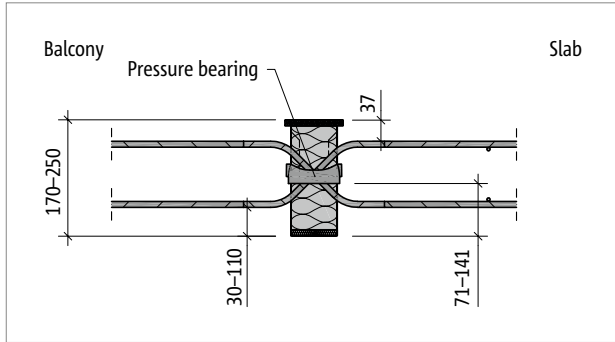


Fig. 111: Schöck Isokorb® T type Q-E-VV5: Product section

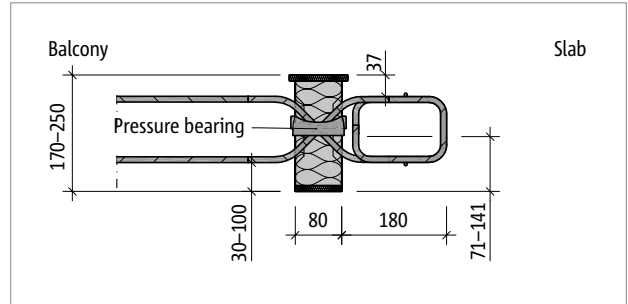


Fig. 112: Schöck Isokorb® T type Q-E-W-VV5: Product section

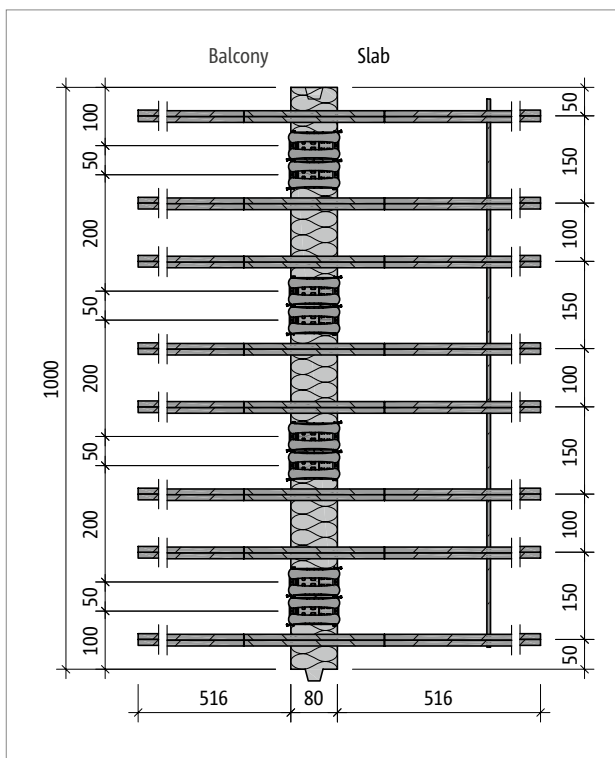


Fig. 113: Schöck Isokorb® T type Q-E-VV5: Product layout

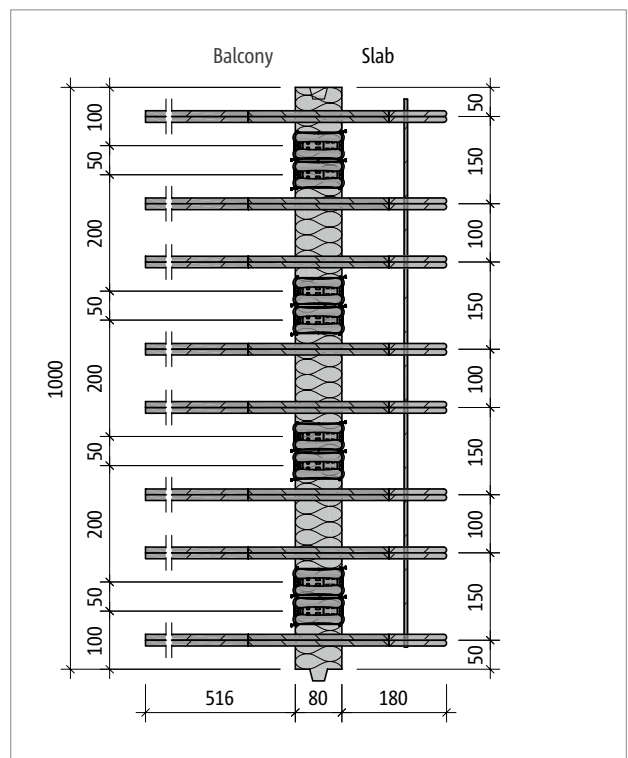


Fig. 114: Schöck Isokorb® T type Q-E-W-VV5: Product layout

T
type Q-E

Reinforced concrete – reinforced concrete

Product description

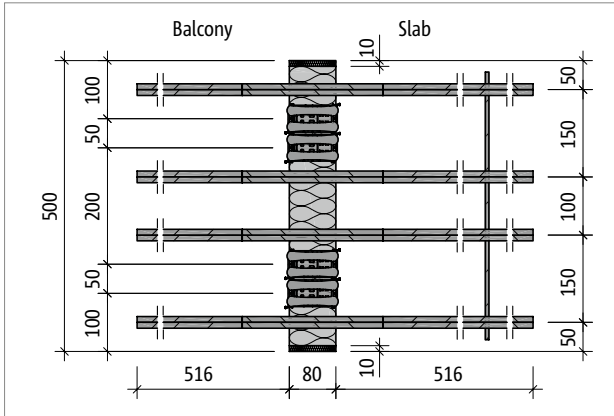


Fig. 115: Schöck Isokorb® T type Q-E-VV5: Product layout; lateral fire protection boards

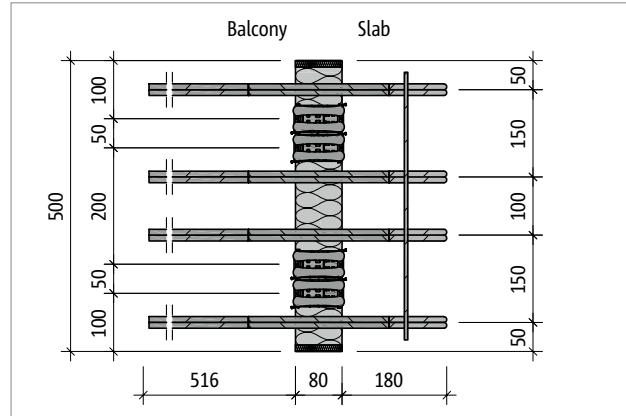


Fig. 116: Schöck Isokorb® type Q-E-W-VV5: Product layout

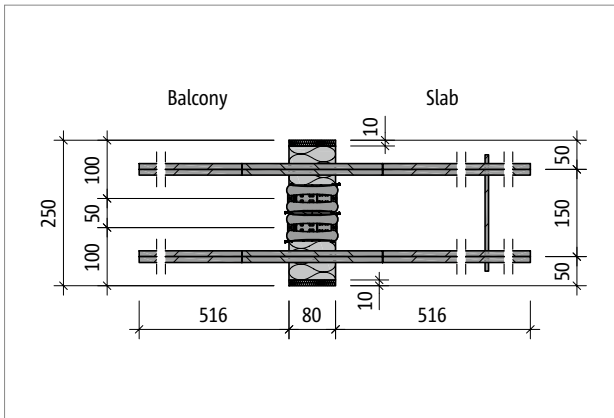


Fig. 117: Schöck Isokorb® T type Q-E-VV5: Product layout; lateral fire protection boards

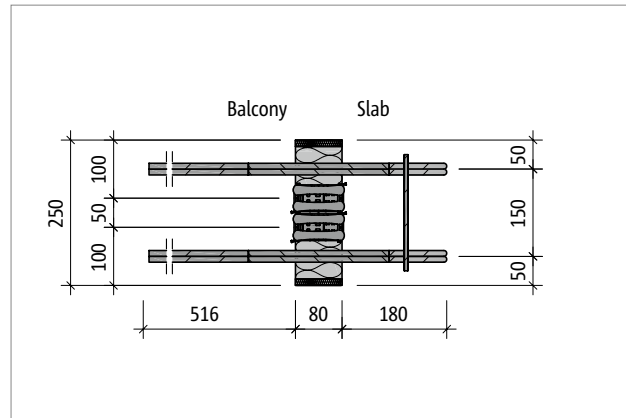


Fig. 118: Schöck Isokorb® T type Q-E-W-VV5: Product layout

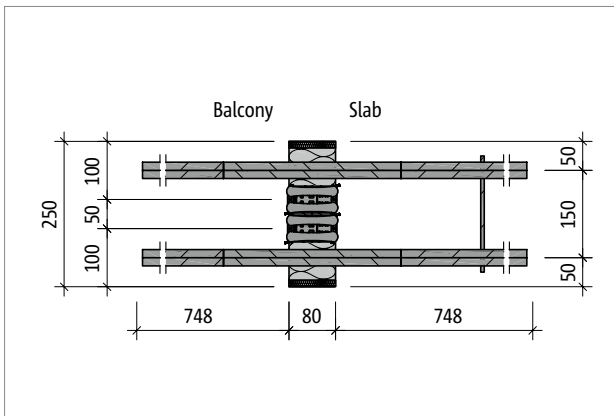


Fig. 119: Schöck Isokorb® T type Q-E-VV7: Product layout

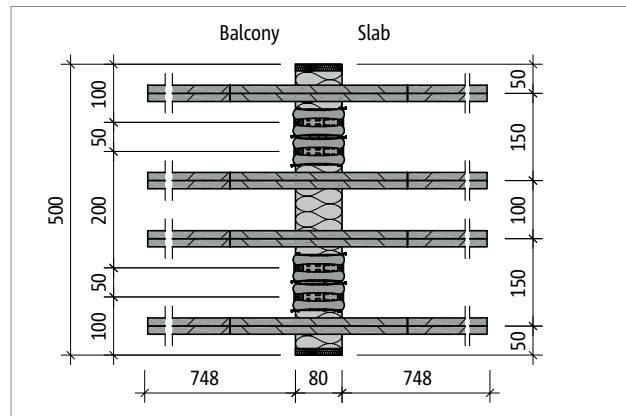


Fig. 120: Schöck Isokorb® T type Q-E-VV7: Product layout

Product information

- For additional 2D and 3D product drawings contact our Design Support department.
- Observe min. height H_{min} Schöck Isokorb® T type Q-E-VV, Q-E-W-VV.
- Schöck Isokorb® T type Q-E in lengths L250 and L500 with lateral fire protection boards

On-site reinforcement

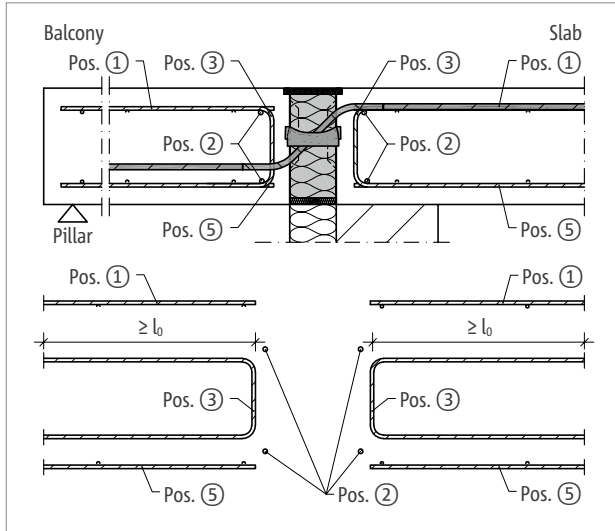


Fig. 121: Schöck Isokorb® T type Q-E-V: On-site reinforcement

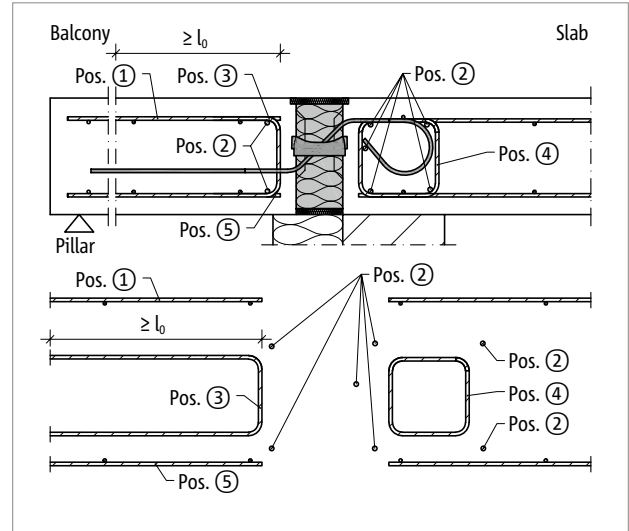


Fig. 122: Schöck Isokorb® T type Q-E-W-V: On-site reinforcement

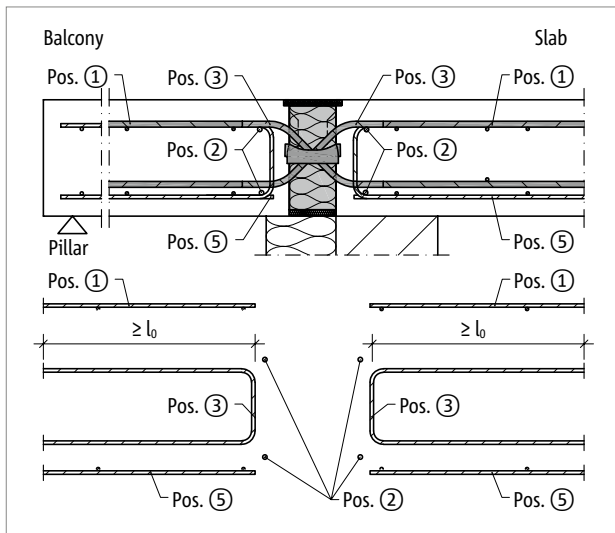


Fig. 123: Schöck Isokorb® T type Q-E-VV: On-site reinforcement

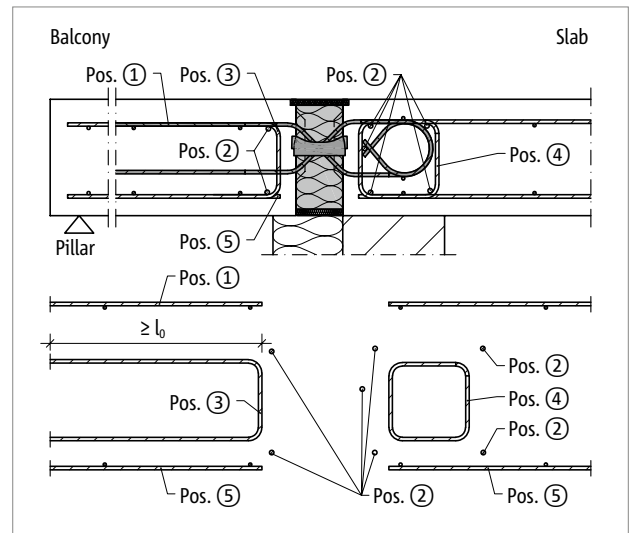


Fig. 124: Schöck Isokorb® T type Q-E-W-VV: On-site reinforcement

On-site reinforcement

Schöck Isokorb® T type Q-T, Q-T-Z, Q-E, Q-E-Z 3.0		Q-T-V1 Q-T-VV1 Q-T-Z-VV1	Q-T-V2 Q-T-VV2 Q-T-Z-VV2	Q-E-V3 Q-E-VV3 Q-E-Z-V3 Q-E-Z-VV3	Q-E-V4 Q-E-VV4 Q-E-Z-V4 Q-E-Z-VV4
On-site reinforcement for	Location	Floor (XC1) concrete strength class \geq C25/30 Balcony (XC4) concrete strength class \geq C25/30			
Overlapping reinforcement					
Pos. 1	Balcony/floor side	acc. to the specifications of the structural engineer			
Steel bars along the insulation joint					
Pos. 2	Balcony/floor side	acc. to the specifications of the structural engineer			
Vertical reinforcement					
Pos. 3 [mm ² /m]	Balcony/floor side	80	120	160	284
Lapping reinforcement					
Pos. 5	Balcony/floor side	necessary in the tension zone, as specified by the structural engineer			
Side reinforcement at the free edge					
Pos. 6		Edging as per NS-EN 1992-1-1 (EC2), 9.3.1.4			

Schöck Isokorb® T type Q-E, Q-E-Z 3.0		Q-E-V5, Q-E-Z-V5, Q-E-VV5, Q-E-Z-VV5	Q-E-V6, Q-E-Z-V6, Q-E-VV6, Q-E-Z-VV6	Q-E-V7, Q-E-Z-V7, Q-E-VV7, Q-E-Z-VV7
On-site reinforcement for	Location	Floor (XC1) concrete strength class \geq C25/30 Balcony (XC4) concrete strength class \geq C25/30		
Overlapping reinforcement				
Pos. 1	Balcony/floor side	acc. to the specifications of the structural engineer		
Steel bars along the insulation joint				
Pos. 2	Balcony/floor side	acc. to the specifications of the structural engineer		
Vertical reinforcement				
Pos. 3 [mm ² /m]	Balcony/floor side	444	640	871
Lapping reinforcement				
Pos. 5	Balcony side	necessary in the tension zone, as specified by the structural engineer		
Side reinforcement at the free edge				
Pos. 6		Edging as per NS-EN 1992-1-1 (EC2), 9.3.1.4		

On-site reinforcement

Schöck Isokorb® T type Q-T, Q-T-W, Q-E, Q-E-W 3.0		Q-T-W-V1 Q-T-W-VV1 Q-T-Z-W-V1 Q-T-Z-W-VV1	Q-T-W-V2 Q-T-W-VV2 Q-T-Z-W-V2 Q-T-Z-W-VV2	Q-E-W-V3 Q-E-W-VV3 Q-E-Z-W-V3 Q-E-Z-W-VV3	Q-E-W-V4 Q-E-W-VV4 Q-E-Z-W-V4 Q-E-Z-W-VV4	Q-E-W-V5 Q-E-W-VV5 Q-E-Z-W-V5 Q-E-Z-W-VV5
On-site reinforcement for	Location	Floor (XC1) concrete strength class \geq C25/30 Balcony (XC4) concrete strength class \geq C25/30				
Overlapping reinforcement						
Pos. 1	Balcony side	acc. to the specifications of the structural engineer				
Steel bars along the insulation joint						
Pos. 2	Balcony side	acc. to the specifications of the structural engineer				
Vertical reinforcement						
Pos. 3 [mm ² /m]	Balcony side	80	120	160	284	444
Pos. 4	Floor side	acc. to the specifications of the structural engineer				
Lapping reinforcement						
Pos. 5	Balcony side	necessary in the tension zone, as specified by the structural engineer				
Side reinforcement at the free edge						
Pos. 6		Edging as per NS-EN 1992-1-1 (EC2), 9.3.1.4				

i Information about on-site reinforcement

- Lapping of the reinforcement in the connecting reinforced concrete components must be applied as close as possible to the insulating element of the Schöck Isokorb®, the required concrete cover must be observed.
- The structural edging Pos. 6 should be selected so low that it can be arranged between the upper and lower reinforcement position.

Application example reinforced concrete slab spanning in one direction

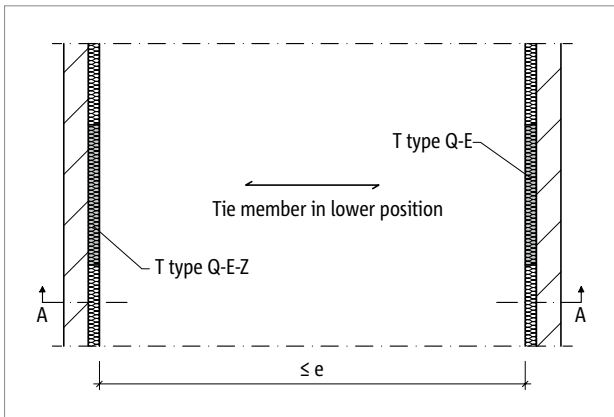


Fig. 125: Schöck Isokorb® T type Q-E, Q-E-Z: Reinforced concrete slab tensioned in a single axis

A type Q-E-Z, Q-E-Z-W without pressure bearing is to be arranged on one side for support free of constraint forces. A type Q-E, Q-E-W with pressure bearing is then required on the opposite side. In order to maintain the balance of forces, a tie member, which overlaps the Schöck Isokorb® shear force bars, is to reinforce between the T type Q-E-Z, Q-E-Z-W and T type Q-E, Q-E-W.

Expansion joints

- Expansion joint spacing e , see page 43.

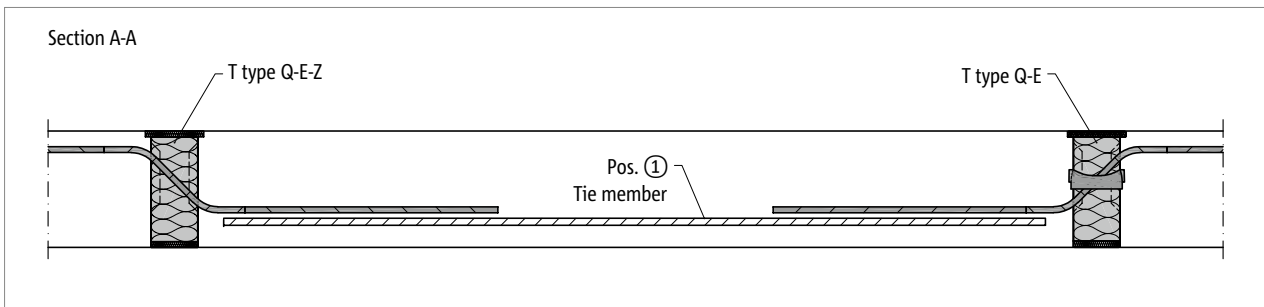


Fig. 126: Schöck Isokorb® T type Q-E, Q-E-Z: Section A-A; one-way reinforced concrete slab

Schöck Isokorb® T type Q-T, Q-T-Z, Q-T-W, Q-T-Z-W, Q-E, Q-E-Z, Q-E-W, Q-E-Z-W 3.0	Q-T-V1, Q-T-Z-V1 Q-T-W-V1 Q-T-Z-W-V1	Q-T-V2, Q-T-Z-V2 Q-T-W-V2 Q-T-Z-W-V2	Q-E-V3, Q-E-Z-V3 Q-E-W-V3 Q-E-Z-W-V3	Q-E-V4, Q-E-Z-V4 Q-E-W-V4 Q-E-Z-W-V4
On-site reinforcement for	Concrete strength class \geq C25/30			
Tie				
Pos. 1	\varnothing 6/250 mm	\varnothing 6/166 mm	\varnothing 6/125 mm	\varnothing 8/125 mm

Schöck Isokorb® T type Q-E, Q-E-Z 3.0	Q-E-V5, Q-E-Z-V5, Q-E-W-V5, Q-E-Z-W-V5	Q-E-V6, Q-E-Z-V6	Q-E-V7, Q-E-Z-V7
On-site reinforcement for	Concrete strength class \geq C25/30		
Tie			
Pos. 1	\varnothing 10/125 mm	\varnothing 12/125 mm	\varnothing 14/125 mm

Information about on-site reinforcement

- The required suspension reinforcement and the on-site slab reinforcement are not shown here.
- On site reinforcement for Schöck Isokorb® T type Q-E, see page 71.

Application case recessed balcony

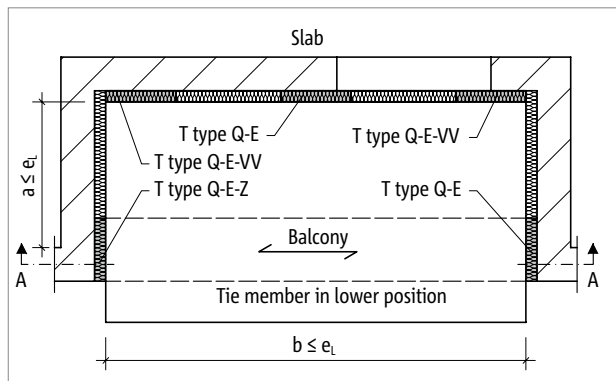


Fig. 127: Schöck Isokorb® T type Q-E-Z, Q-E: Layout of recessed balcony

A type Q-E-Z, Q-E-Z-W without pressure bearing is to be arranged on one side for support free of constraint forces. A type Q-E, Q-E-W with pressure bearing is then required on the opposite side. In order to maintain the balance of forces, a tie member, which overlaps the Schöck Isokorb® shear force bars, is to reinforce between the T type Q-E-Z, Q-E-Z-W and T type Q-E, Q-E-W.

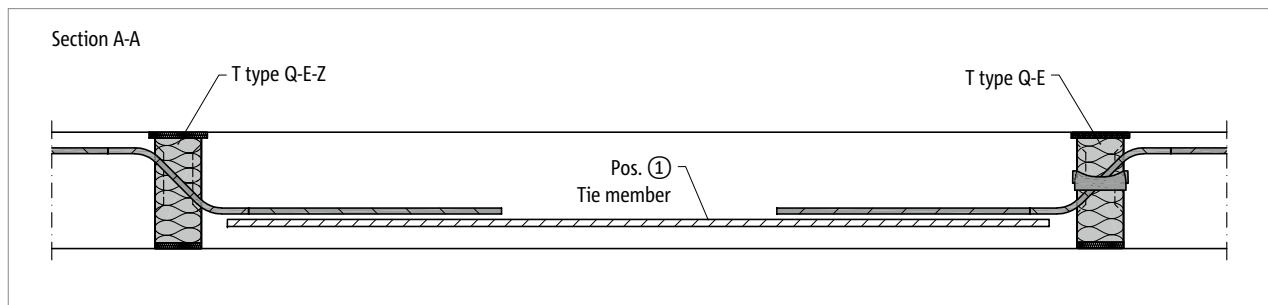


Fig. 128: Schöck Isokorb® T type Q-E, Q-E-Z: Section A-A; one-way reinforced concrete slab

Schöck Isokorb® T type Q-E, Q-E-Z 3.0		Q-E-V4, Q-E-Z-V4 Q-E-W-V4 Q-E-Z-W-V4	Q-E-V5, Q-E-Z-V5, Q-E-W-V5, Q-E-Z-W-V5	Q-E-V6, Q-E-Z-V6	Q-E-V7, Q-E-Z-V7
On-site reinforcement for	Isokorb® length [mm]	Floor (XC1) concrete strength class \geq C25/30 Balcony (XC4) concrete strength class \geq C25/30			
Tie					
Pos. 1	250	2 \varnothing 8	2 \varnothing 10	2 \varnothing 12	2 \varnothing 14
Pos. 1	500	4 \varnothing 8	4 \varnothing 10	4 \varnothing 12	4 \varnothing 14

Schöck Isokorb® T type Q-E, Q-E-Z 3.0		Q-E-V4, Q-E-Z-V4 Q-E-W-V4 Q-E-Z-W-V4	Q-E-V5, Q-E-Z-V5, Q-E-W-V5, Q-E-Z-W-V5	Q-E-V6, Q-E-Z-V6	Q-E-V7, Q-E-Z-V7
Fixed point separation recessed balcony		e_L [m]			
$a, b \leq$	80	5.5	5.3	4.8	4.2

i Information on tie bar

- The fixed point separations a, b are to be selected with $a \leq e_L$ and $b \leq e_L$.
- The required suspension reinforcement and the on-site slab reinforcement are not shown here.

Application example recessed balcony – symmetrical

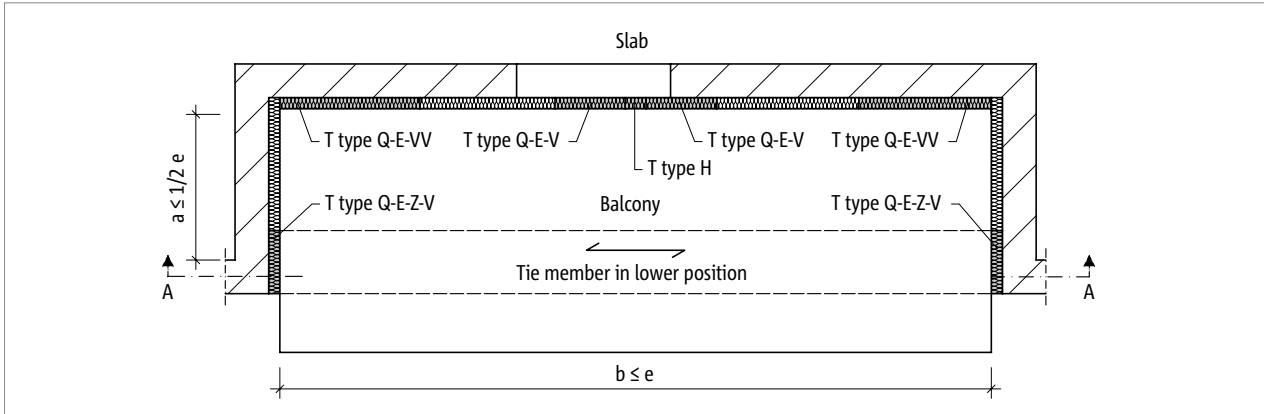


Fig. 129: Schöck Isokorb® T type Q-E-Z-V: Layout of recessed balcony - symmetrical

Under symmetrical loads, a Schöck Isokorb® T type Q-E-Z-V without pressure bearing is to be arranged on both sides for support free of constraint forces. In order to maintain the balance of forces a tie member, which overlaps the shear force bars of both Schöck Isokorb®, is to be used.

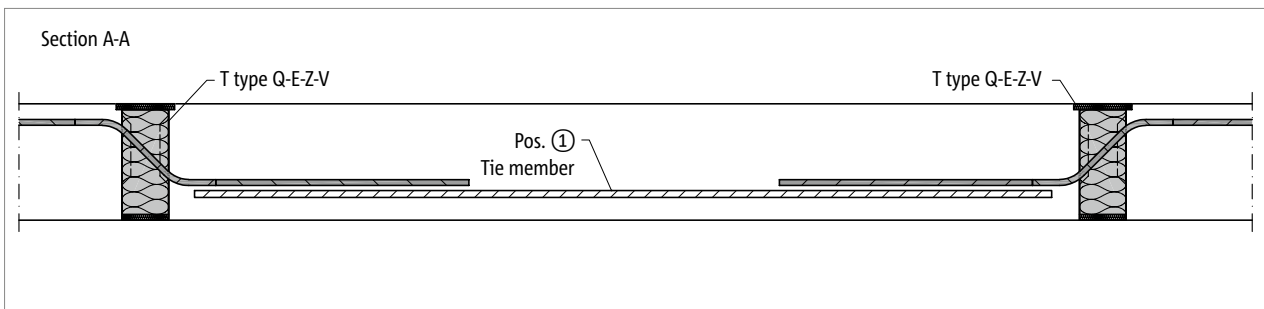


Fig. 130: Schöck Isokorb® T type Q-E-Z-V: Tie member connection

Schöck Isokorb® T type Q-E-Z 3.0		Q-E-Z-V4, Q-E-Z-W-V4	Q-E-Z-V5, Q-E-Z-W-V5	Q-E-Z-V6	Q-E-Z-V7
On-site reinforcement for	Isokorb® length [mm]	Floor (XC1) concrete strength class \geq C25/30 Balcony (XC4) concrete strength class \geq C25/30			
Tie					
Pos. 1	250	2 \varnothing 8	2 \varnothing 10	2 \varnothing 12	2 \varnothing 14
Pos. 1	500	4 \varnothing 8	4 \varnothing 10	4 \varnothing 12	4 \varnothing 14

Schöck Isokorb® T type Q-E-Z 3.0		Q-E-Z-V4, Q-E-Z-W-V4	Q-E-Z-V5, Q-E-Z-W-V5	Q-E-Z-V6	Q-E-Z-V7
Fixed point separation recessed balcony		e [m]			
b \leq	80	11.0	10.6	9.5	8.3

Recessed balcony

- The fixed point spacings a, b are to be selected as $a \leq 1/2 e$ and $b \leq e$.
- The required suspension reinforcement and the on-site slab reinforcement are not shown here.
- This arrangement of the Schöck Isokorb® (T type Q-E-Z opposing) is only suitable for symmetrical layouts only, if the asymmetrical load case is not relevant.
- The horizontal stability of the balcony is to be verified, possibly using a Schöck Isokorb® T type H.

Type of bearing: supported

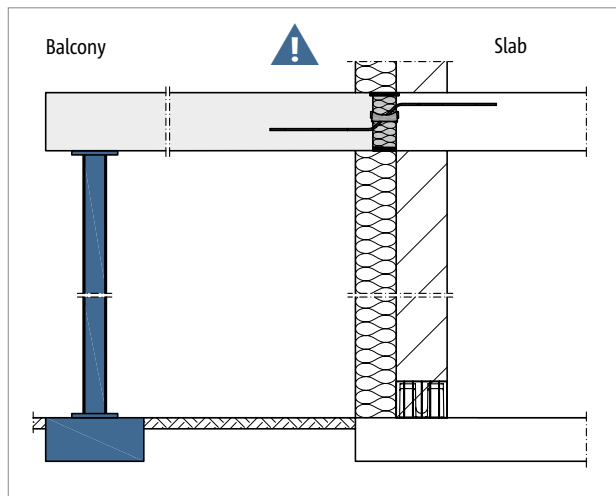


Fig. 131: Schöck Isokorb® T type Q-E-V, Q-E-W-V: Support required at all times

i Supported balconies

The Schöck Isokorb® T type Q-E is developed for supported balconies. It transfers exclusively shear forces, no bending moments.

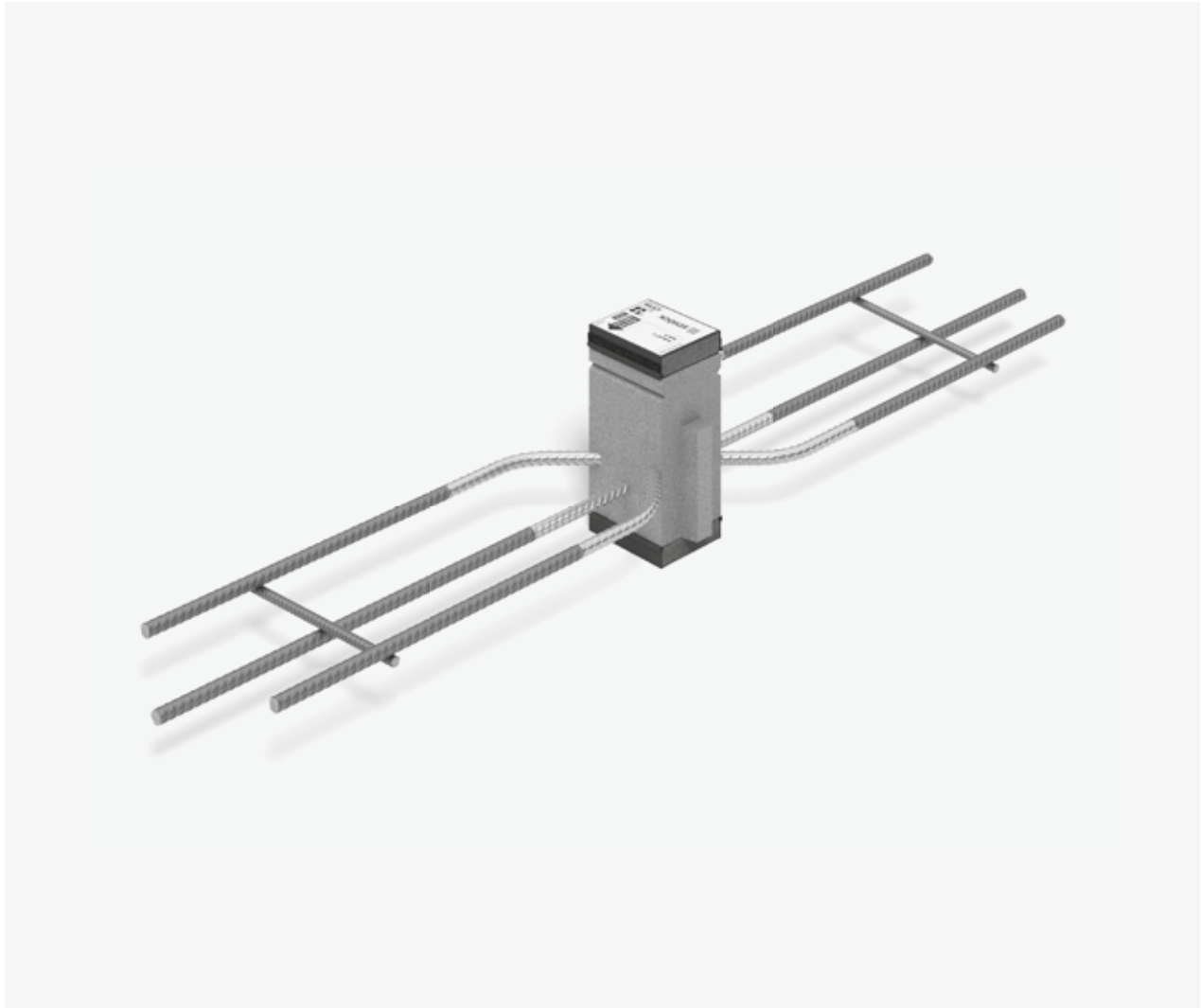
⚠ Warning – omitting the pillars

- The balcony will collapse if not supported.
- At all stages of construction, the balcony must be supported with statically suitable pillars or supports.
- Even when completed, the balcony must be supported with statically suitable pillars or supports.
- A removal of temporary support is permitted only after installation of the final support.

☑ Check list

- Is the same height level planned for the balcony and floor in relation to the upper edges of the shell?
- For fully precast balconies, are any necessary gaps for the frontal transport anchors and rainwater downpipes for internal drainage taken into account?
- Has the right type of Schöck Isokorb® been selected for the static system? T Type Q-E is a connection purely for shear force (moment joint).
- Have the loads on the Schöck Isokorb® connection been specified at design level?
- Has the cantilevered system length or the system support width been taken as a basis?
- Have the requirements for on-site reinforcement of connections been defined in each case?
- Have the maximum permitted expansion joint spacings been taken into account with regards to the fixed points?
- Has the danger warning regarding a missing support been included in the construction drawings?
- Have the fire protection requirements been clarified?
- Is the required component geometry present with the connection to a floor or a wall? Is a special design required?
- Have existing horizontal loads e.g. from wind pressure been taken into account as planned? Are additional Schöck Isokorb® T type H required for this?
- Has a Schöck Isokorb® T type Q-E-Z been selected for a connection free of constraint forces for 2- or 3-sided support?
- Has a soft elastic joint been taken into account between the upper edge of the facing shell and the balcony?
- Is the length $e_l < b \leq e$ for the recessed balcony application example? Then the Schöck Isokorb® T type Q-E-Z without pressure bearings should be arranged on both sides of the tie member. The horizontal stability is to be verified, possibly with a Schöck Isokorb® T type H-VV-NN.

Schöck Isokorb® T type H



Schöck Isokorb® T type H

Load-bearing thermal insulation element for the transmission of planned horizontal forces parallel and perpendicular to the insulation plane. The element may be used only in conjunction with other Isokorb® types that can absorb moments or shear forces.

The element with the load bearing capacity NN transmits forces perpendicular to the insulation plane.

The element with the load bearing capacity VV-NN transmits forces parallel and perpendicular to the insulation plane.

T
type H

Reinforced concrete – reinforced concrete

Element arrangement | Installation cross sections

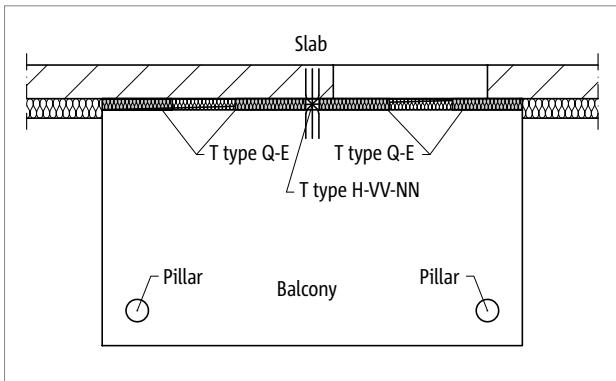


Fig. 132: Schöck Isokorb® T type H: Balcony with pillar support

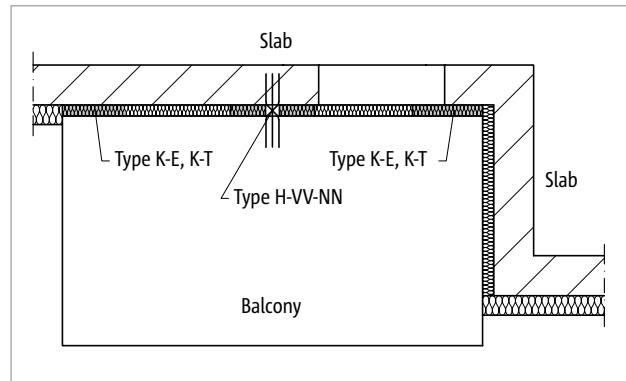


Fig. 133: Schöck Isokorb® T type H: Cantilevered balcony

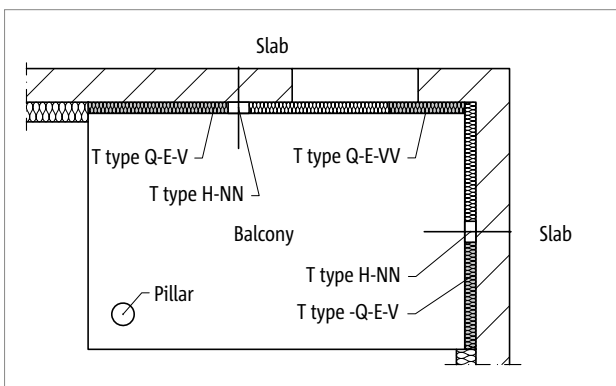


Fig. 134: Schöck Isokorb® T type H: Balcony supported on two sides with pillar

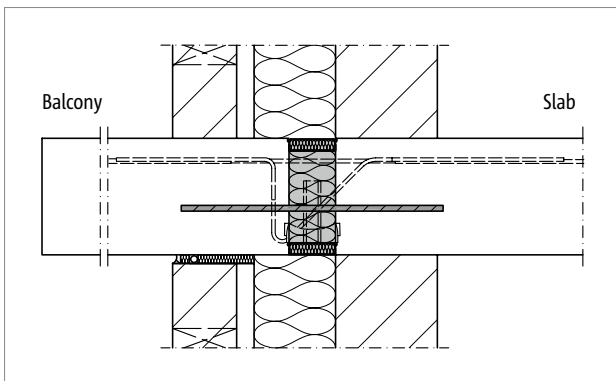


Fig. 135: Schöck Isokorb® T type H-NN: With T type K-E, K-T; connection for core insulation

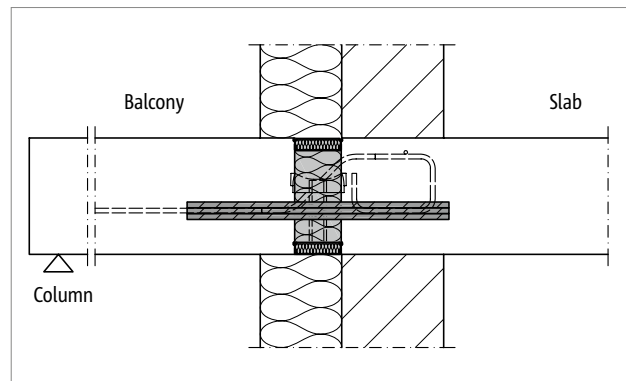


Fig. 136: Schöck Isokorb® T type H-VV-NN: With T type Q-E; connection for exterior insulation

T
type H

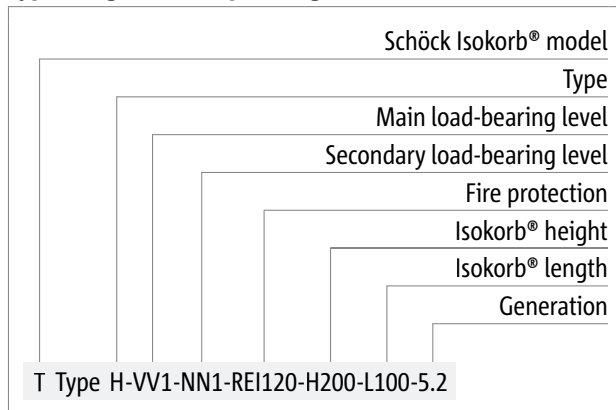
Product selection | Type designations | Special designs

Schöck Isokorb® T type H variants

The configuration of the Schöck Isokorb® T type H can be varied as follows:

- Main load-bearing level:
VV1, VV2, NN1, NN2
- Secondary load-bearing level:
NN1
NN2 is available upon request
- Fire resistance class:
REI120 (standard)
- Isokorb® height:
H = 160 to 250 mm
- Isokorb® length:
L = 100 mm
- Generation:
5.2

Type designations in planning documents



i Special designs

Please contact the Technical Design Department if you cannot achieve the connections you require using the standard product variants shown in this technical information (contact details on page 3).

Design C25/30

Schöck Isokorb® T type H 5.2		NN1		NN2		VV1-NN1		VV2-NN1	
Design values with		$V_{Rd,y}$ [kN]	$N_{Rd,x}$ [kN]	$V_{Rd,y}$ [kN]	$N_{Rd,x}$ [kN]	$V_{Rd,y}$ [kN]	$N_{Rd,x}$ [kN]	$V_{Rd,y}$ [kN]	$N_{Rd,x}$ [kN]
Concrete strength class	C25/30	0.0	±11.6	0.0	±49.2	±10.4	±11.6	±39.2	±49.2

Schöck Isokorb® T type H 5.2		NN1	NN2	VV1-NN1	VV2-NN1
Placement with		Isokorb® length [mm]			
		100	100	100	100
Shear force bars, horizontal		-	-	2 × 1 Ø 10	2 × 1 Ø 12
Tension bars/compression bars		1 Ø 10	1 Ø 12	1 Ø 10	1 Ø 12



Fig. 137: Schöck Isokorb® T type H: Type selection

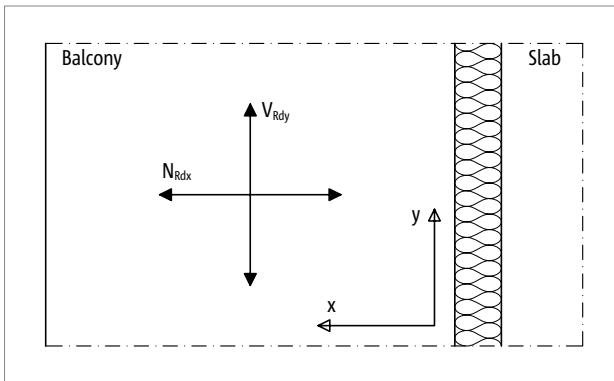


Fig. 138: Schöck Isokorb® T type H: Sign rule for the design

Notes on design

- With the design of a linear connection, attention is to be paid that, with the employment of the supplementary type H, the design values of the linear connection can be reduced (e.g. T type Q-E with $L = 1.0$ m and T type H with $L = 0.1$ m in regular exchange signifies a reduction by ca. 9 % of v_{Rd} of the linear connection using type T type Q-E).

Expansion joint spacing

Maximum expansion joint spacing

If the component length exceeds the maximum expansion joint spacing e , then expansion joints must be incorporated into the external concrete components at right angles to the insulating layer in order to limit the effect as a result of temperature changes. With fixed points such as, for example, corners of balconies, or with the employment of the supplementary Schöck Isokorb® T types H half the maximum expansion joint spacing $e/2$ from the fixed point applies.

The shear force transmission in the expansion joint can be ensured using a longitudinally displaceable shear force dowel, e.g. Schöck Stacon®.

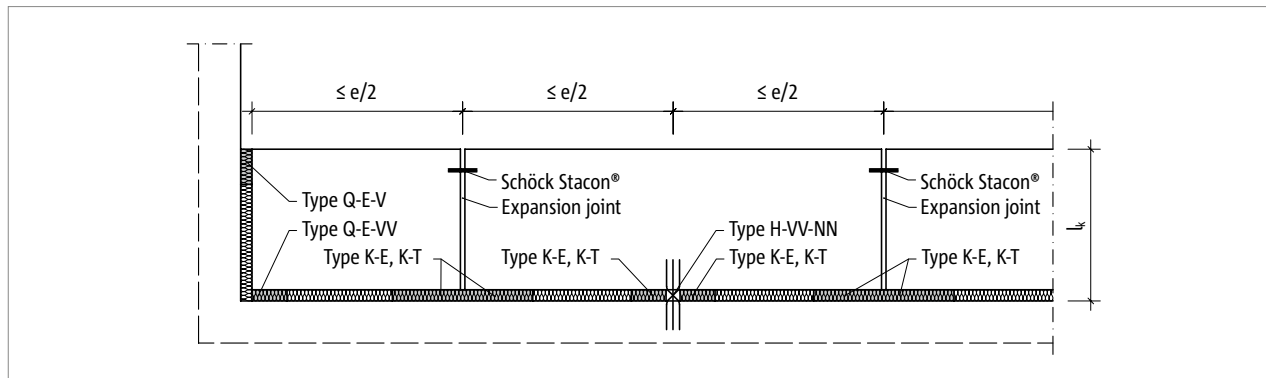


Fig. 139: Schöck Isokorb® T type H: Expansion joint spacing

Schöck Isokorb® T type H combined with	T type K-E, K-T	T type Q-E, Q-T	T type D
Maximum expansion joint spacing from fixed point $e/2$ [m]	$\leq e/2$ see T type K-E, K-T	$\leq e/2$ see T type Q-E, Q-T	$\leq e/2$ see T type D

i Expansion joints

- A maximum of three Schöck Isokorb® T type H-VV-NNs may be connected to a balcony. Another Schöck Isokorb® type with a connection length of one metre must be arranged between two of these elements.
- If two Schöck Isokorb® T type H-NNs are arranged on each edge of the expansion joint, then the following permitted expansion joint spacings must be maintained for T type H-NN:
 - T type H-NN1: 13.0 m
 - T type H-NN2: 11.7 m
 In addition, the combination of Schöck Isokorb® types being used should also be taken into account for determining the maximum expansion joint spacings.

Product description

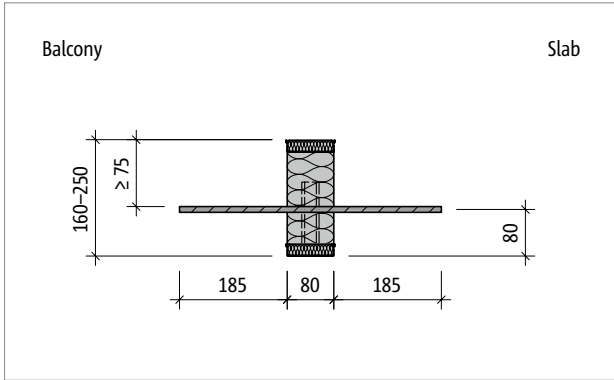


Fig. 140: Schöck Isokorb® T type H-NN1: Product section

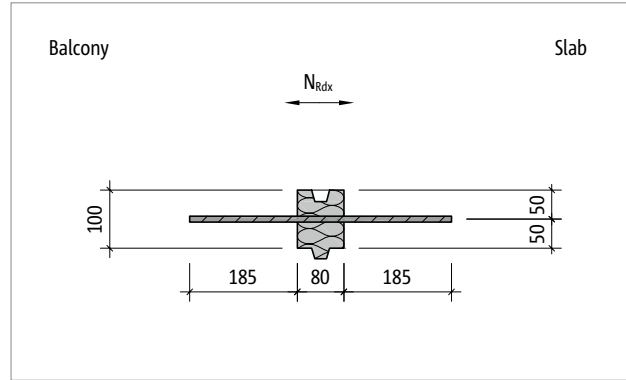


Fig. 141: Schöck Isokorb® T type H-NN1: Product layout

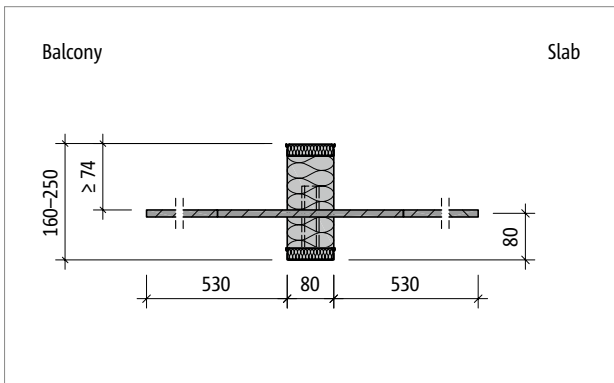


Fig. 142: Schöck Isokorb® T type H-NN2: Product section

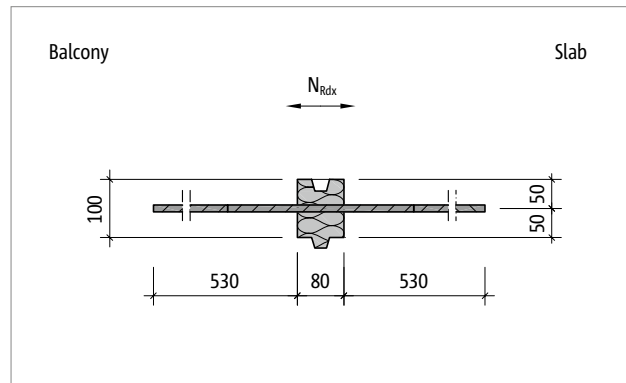


Fig. 143: Schöck Isokorb® T type H-NN2: Product layout

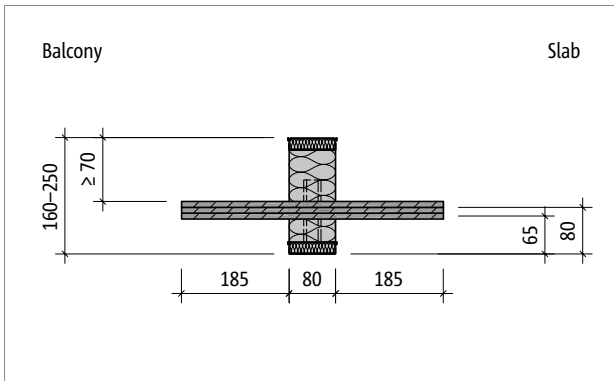


Fig. 144: Schöck Isokorb® T type H-VV1-NN1: Product section

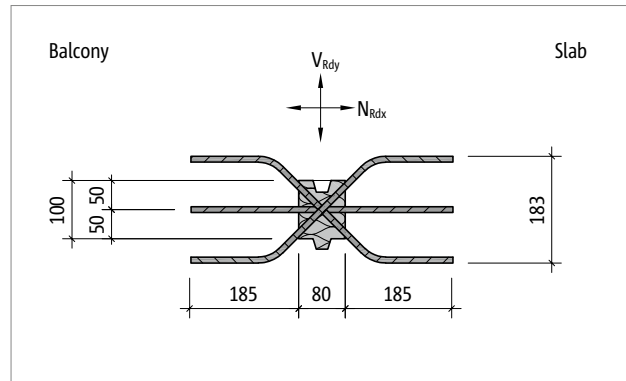


Fig. 145: Schöck Isokorb® T type H-VV1-NN1: Product layout

T
type H

Product description

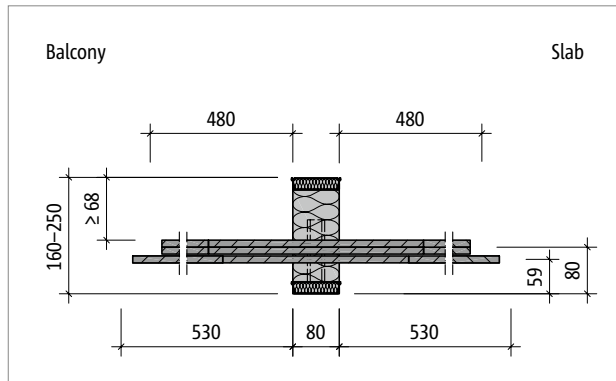


Fig. 146: Schöck Isokorb® T type H-VV2-NN1: Product section

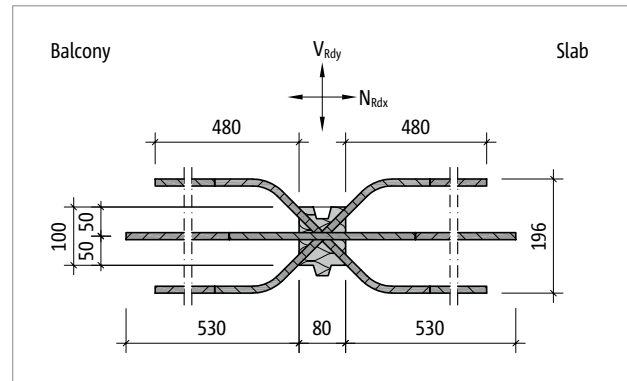


Fig. 147: Schöck Isokorb® T type H-VV2-NN1: Product layout

Design example

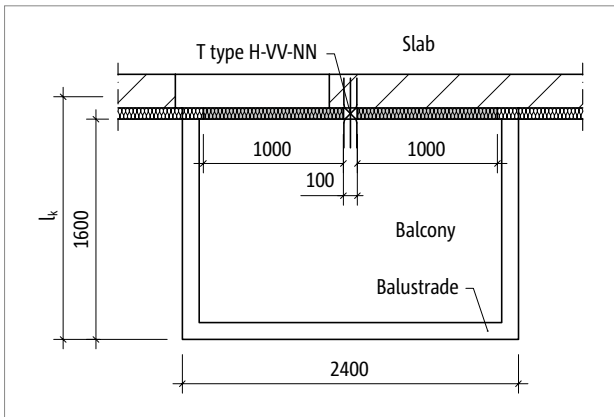


Fig. 148: Schöck Isokorb® T type K-E, K-T with type H: Static system, layout

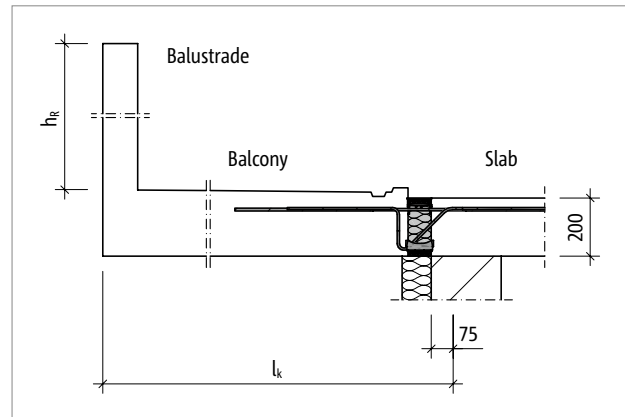


Fig. 149: Schöck Isokorb® T type K-E, K-T: Static system, cross-section

Static system and load assumptions

Geometry:	Schöck Isokorb® height	$H = 200 \text{ mm}$
	cantilever length	$l_k = 1.755 \text{ m}$
	average balcony slab thickness	$h = 230 \text{ mm}$
	three-sided wraparound balustrade	$h_R = 1.0 \text{ m}$
Load assumptions:	balcony slab	$g = 5.75 \text{ kN/m}^2$
	live load	$q = 4.0 \text{ kN/m}^2$
	Edge load (balustrade)	$g_R = 3.0 \text{ kN/m}$
	wind pressure	$w_e = 1.0 \text{ kN/m}^2$
Exposure classes:	exterior XC 4	
	interior XC 1	
Selected:	concrete strength class C25/30 for the floor	
	concrete strength class C45/55 for the balcony	
	Concrete cover $c_v = 35 \text{ mm}$ for Schöck Isokorb® tension bars	
Connection geometry:	no height offset, no floor downstand beam, no balcony upstand	
Floor support:	floor slab edge indirectly supported	
Balcony support:	restraint of the cantilever slab using T type K-E	

Design example

Proof of limits of load-bearing capacity (moment stress and shear force)

The calculation takes into account the length of the connection with Schöck Isokorb® (= 2.40 m / 2.00 m) shown in the above drawing.

Internal forces:

$$m_{Ed} = -(0.5 \cdot [2.40 \cdot (\gamma_G \cdot g + \gamma_Q \cdot q) + 2 \cdot \gamma_G \cdot g_R] \cdot l_k^2 + 2.40 \cdot \gamma_G \cdot g_R \cdot l_k) / 2.00$$

$$m_{Ed} = -(0.5 \cdot [2.40 \cdot (1.2 \cdot 5.75 + 1.5 \cdot 4.0) + 2 \cdot 1.2 \cdot 3.0] \cdot 1.755^2 + 2.40 \cdot 1.2 \cdot 3.0 \cdot 1.755) / 2.00$$

$$= -37.0 \text{ kNm/m}$$

$$V_{Ed} = +([2.40 \cdot [(\gamma_G \cdot g + \gamma_Q \cdot q) + 2 \cdot \gamma_G \cdot g_R] \cdot l_k + 2.40 \cdot \gamma_G \cdot g_R] / 2.00$$

$$V_{Ed} = +([2.40 \cdot [(1.2 \cdot 5.75 + 1.5 \cdot 4.0) + 2 \cdot 1.2 \cdot 3.0] \cdot 1.755 + 2.40 \cdot 1.2 \cdot 3.0] / 2.00$$

$$= +37.8 \text{ kN/m}$$

Selected: **2 pieces of Schöck Isokorb® T type K-T-M5-V1-REI120-CV35-H200-L1000**

$$m_{Rd} = -46.0 \text{ kNm/m (see page 36)} > m_{Ed}$$

$$V_{Rd} = +56.0 \text{ kN/m (see page 36)} > V_{Ed}$$

$$N_{Ed,x} = \gamma_Q \cdot w_e \cdot 2.40 \cdot (h + h_R) = 1.5 \cdot 1.0 \cdot 2.40 \cdot (0.23 + 1.0) = 4.4 \text{ kN (frontal wind)}$$

$$V_{Ed,y} = \gamma_Q \cdot w_e \cdot 2 \cdot 1.6 \cdot (h + h_R) = 1.5 \cdot 1.0 \cdot 2 \cdot 1.6 \cdot (0.23 + 1.0) = 5.9 \text{ kN (wind from the side)}$$

Selected: **1 Schöck Isokorb® T type H-VV1-NN1-REI120-H200-L100**

$$N_{Rd,x} = \pm 11.6 \text{ kN (see page 82)} > N_{Ed,x}$$

$$V_{Rd,y} = \pm 10.4 \text{ kN (see page 82)} > V_{Ed,y}$$

Proof for the exceptional load case of earthquake

Load assumptions for earthquakes: $F_{a,x} = \pm 15.0 \text{ kN/m}$ (horizontal, parallel to the joint)
 $F_{a,y} = \pm 15.0 \text{ kN/m}$ (horizontal, perpendicular to the joint)

Internal forces:

$$N_{EdA,x} = \pm 2.40 \text{ m} \cdot F_{a,x} = \pm 2.40 \text{ m} \cdot 15.0 \text{ kN/m} = 36.0 \text{ kN (force perpendicular to the joint)}$$

$$V_{EdA,y} = \pm 2.40 \text{ m} \cdot F_{a,y} = \pm 2.40 \text{ m} \cdot 15.0 \text{ kN/m} = 36.0 \text{ kN (force parallel to the joint)}$$

Selected: **1 Schöck Isokorb® T type H-VV2-NN1-REI120-H200-L100**

$$N_{Rd,x} = \pm 49.2 \text{ kN (see page 82)} > N_{EdA,x}$$

$$V_{Rd,y} = \pm 39.2 \text{ kN (see page 82)} > V_{EdA,y}$$

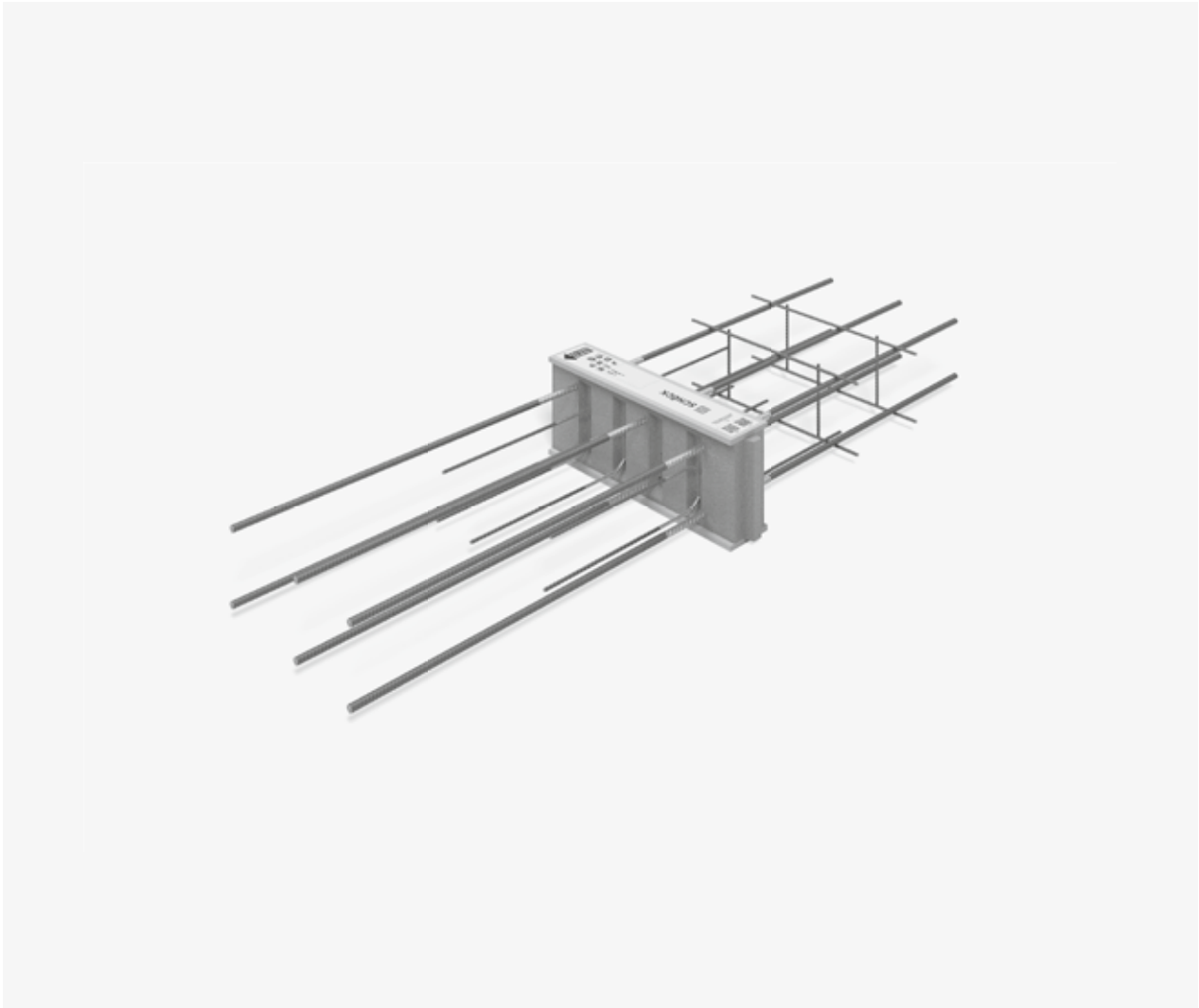
i Design example

- The notes on expansion joint spacing are to be observed, see page 83.

Check list

- Have the loads on the Schöck Isokorb® connection been specified at design level?
- Is the relevant concrete strength class taken into account when selecting the design and calculation table?
- Are the maximum allowable expansion joint spacings taken into account?
- Is the required component geometry present with the connection to a floor or a wall? Is a special design required?
- Have the fire protection requirements been clarified?

Schöck Isokorb® T type D



Schöck Isokorb® T type D

Load-bearing thermal insulation element for continuous flooring. The element transfers moments and shear forces.

T
type D

Reinforced concrete – reinforced concrete

Element arrangement | Installation cross sections

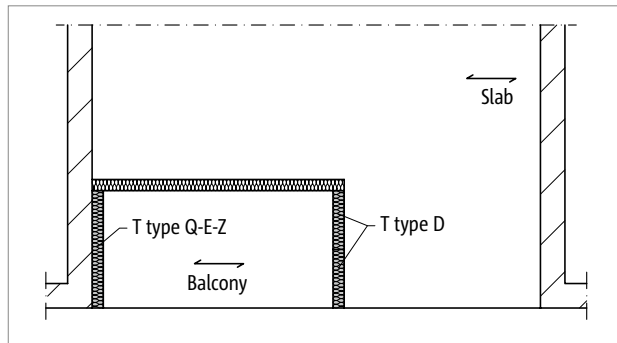


Fig. 150: Schöck Isokorb® T type D, Q-E-Z: One-way reinforced floor

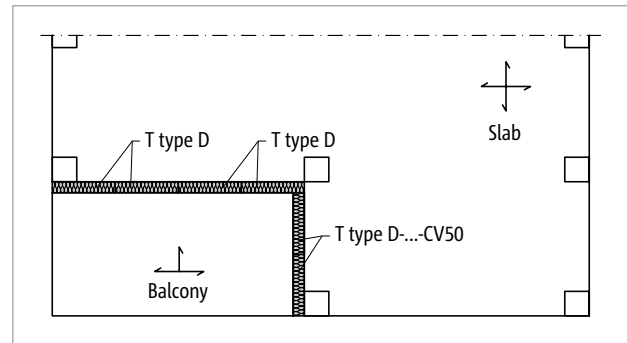


Fig. 151: Schöck Isokorb® T type D: Use in flat slabs

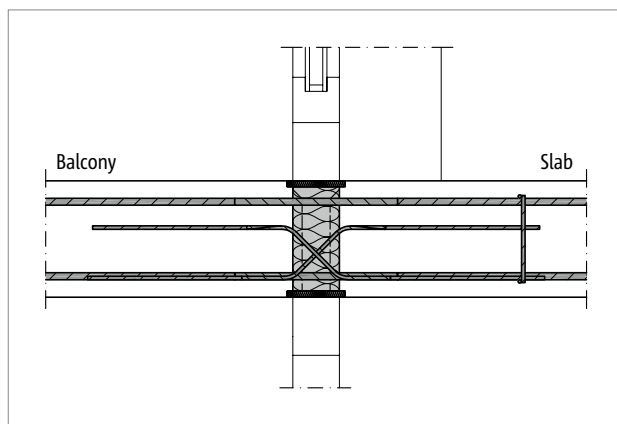


Fig. 152: Schöck Isokorb® T type D: Installation section; one-way reinforced floor

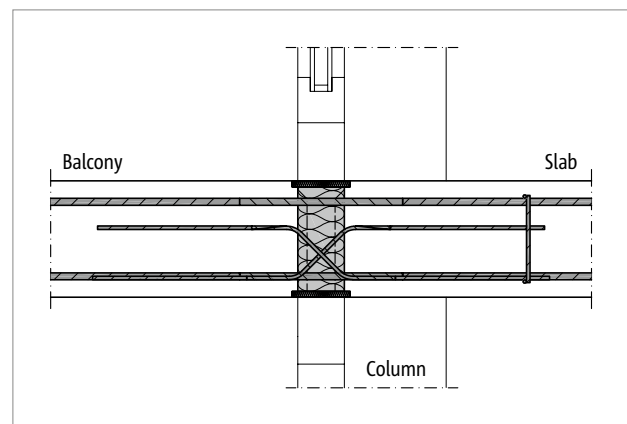


Fig. 153: Schöck Isokorb® T type D: Installation section; flat slab

i Element arrangement

- When connecting across a corner with Schöck Isokorb® T type D, a T type D-CV50 (2nd layer) is required in one axial direction. The resulting minimum slab thickness is therefore 200 mm, depending on the selected secondary load-bearing level.

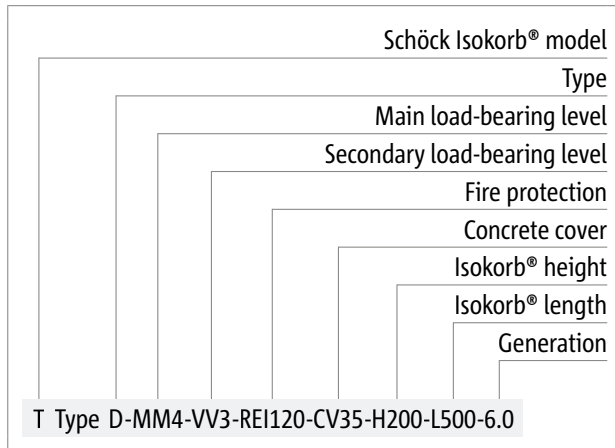
Product selection | Type designations | Special designs

Schöck Isokorb® T type D variants

The configuration of the Schöck Isokorb® T type D can be varied as follows:

- Main load-bearing level:
MM1 to MM6
- Secondary load-bearing level:
VV1 to VV5
- Fire resistance class:
REI120: Fire protection board at top and bottom, projecting by 10 mm on both sides
- Concrete cover of the tension bars:
CV30: Top CV = 30 mm, bottom CV = 30 mm
CV35: Top CV = 35 mm, bottom CV = 30 mm
CV50: Top CV = 50 mm, bottom CV = 50 mm
- Isokorb® height:
 $H = H_{\min}$ up to 280 mm (H_{\min} depends on concrete cover and shear force load-bearing level see page 94)
- Isokorb® length:
L = 500 mm
- Generation:
6.0

Type designation in planning documents



Special designs

Please contact the Technical Design Department if you cannot achieve the connections you require using the standard product variants shown in this technical information (contact details on page 3).

Design

i Notes on design

- A static verification is to be provided for the adjacent reinforced concrete structural component on both sides of the Schöck Isokorb®.
- The Schöck Isokorb® T type D transfers bending moments $m_{Rd,y}$ and shear forces $v_{Rd,z}$. The Schöck Isokorb® does not transfer torsional moments

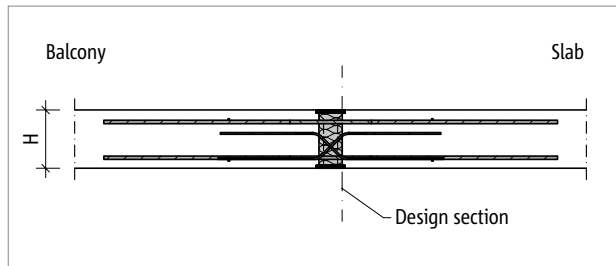


Fig. 154: Schöck Isokorb® T type D: Static system

Design C25/30

Schöck Isokorb® T type D-MM1 to MM6 is only available in length L = 500 mm

Schöck Isokorb® T type D 6.0				MM1			MM2			MM3		
				VV1	VV2	VV3	VV1	VV2	VV3	VV1	VV2	VV3
Design values with	Concrete cover CV [mm]			Concrete strength class \geq C25/30								
	CV30	CV35	CV50	$m_{Rd,y}$ [kNm/m]								
Isokorb® height H [mm]		160		±14.9	±14.2	-	±22.4	-	-	±30.6	-	-
	160		200	±15.8	±15.1	-	±23.7	-	-	±32.4	-	-
		170		±16.7	±15.9	±14.0	±25.1	±23.2	-	±34.3	±32.4	-
	170		210	±17.6	±16.8	±14.8	±26.4	±24.4	-	±36.1	±34.1	-
		180		±18.5	±17.6	±15.5	±27.8	±25.7	±23.5	±37.9	±35.8	±33.7
	180		220	±19.4	±18.5	±16.3	±29.1	±26.9	±24.7	±39.8	±37.6	±35.3
		190		±20.3	±19.3	±17.0	±30.5	±28.2	±25.8	±41.6	±39.3	±37.0
	190		230	±21.2	±20.2	±17.8	±31.8	±29.4	±27.0	±43.5	±41.1	±38.6
		200		±22.1	±21.0	±18.6	±33.2	±30.7	±28.1	±45.3	±42.8	±40.2
	200		240	±23.0	±21.9	±19.3	±34.5	±31.9	±29.3	±47.1	±44.5	±41.9
		210		±23.9	±22.8	±20.1	±35.9	±33.2	±30.4	±49.0	±46.3	±43.5
	210		250	±24.8	±23.6	±20.8	±37.2	±34.4	±31.5	±50.8	±48.0	±45.2
		220		±25.7	±24.5	±21.6	±38.6	±35.7	±32.7	±52.7	±49.8	±46.8
	220		260	±26.6	±25.3	±22.3	±39.9	±36.9	±33.8	±54.5	±51.5	±48.4
		230		±27.5	±26.2	±23.1	±41.3	±38.2	±35.0	±56.4	±53.3	±50.1
	230		270	±28.4	±27.0	±23.8	±42.6	±39.4	±36.1	±58.2	±55.0	±51.7
		240		±29.3	±27.9	±24.6	±44.0	±40.7	±37.3	±60.0	±56.7	±53.3
	240		280	±30.2	±28.7	±25.3	±45.3	±41.9	±38.4	±61.9	±58.5	±55.0
		250		±31.1	±29.6	±26.1	±46.7	±43.2	±39.6	±63.7	±60.2	±56.6
	250			±32.0	±30.5	±26.8	±48.0	±44.4	±40.7	±65.6	±62.0	±58.2
	260		±32.9	±31.3	±27.6	±49.4	±45.6	±41.8	±67.4	±63.7	±59.9	
260			±33.8	±32.2	±28.4	±50.7	±46.9	±43.0	±69.2	±65.4	±61.5	
	270		±34.7	±33.0	±29.1	±52.1	±48.1	±44.1	±71.1	±67.2	±63.2	
270			±35.6	±33.9	±29.9	±53.4	±49.4	±45.3	±72.9	±68.9	±64.8	
	280		±36.5	±34.7	±30.6	±54.8	±50.6	±46.4	±74.8	±70.7	±66.4	
280			±37.4	±35.6	±31.4	±56.1	±51.9	±47.6	±76.6	±72.4	±68.1	
				$v_{Rd,z}$ [kN/m]								
Secondary load-bearing level	VV1 – VV3			±34.8	±52.2	±92.7	±52.2	±92.7	±134.4	±52.2	±92.7	±134.4

Schöck Isokorb® T type D 6.0				MM1			MM2			MM3		
				VV1	VV2	VV3	VV1	VV2	VV3	VV1	VV2	VV3
Placement with				Isokorb® length [mm]								
				500								
Tension bars/compression members				2 × 2 \varnothing 12			2 × 3 \varnothing 12			2 × 4 \varnothing 12		
Shear force bars				2 × 2 \varnothing 6	2 × 3 \varnothing 6	2 × 3 \varnothing 8	2 × 3 \varnothing 6	2 × 3 \varnothing 8	2 × 3 \varnothing 10	2 × 3 \varnothing 6	2 × 3 \varnothing 8	2 × 3 \varnothing 10
H_{min} with CV30 [mm]				160	160	170	160	170	180	160	170	180
H_{min} with CV35 [mm]				160	160	170	160	170	180	160	170	180
H_{min} with CV50 [mm]				200	200	210	200	210	220	200	210	220

Design C25/30

Schöck Isokorb® T type D-MM1 to MM6 is only available in length L = 500 mm

Schöck Isokorb® T type D 6.0			MM4					
			VV1	VV2	VV3	VV4	VV5	
Design values with	Concrete cover CV [mm]		Concrete strength class \geq C25/30					
	CV30	CV35	CV50	$m_{Rd,y}$ [kNm/m]				
Isokorb® height H [mm]		160		± 38.8	-	-	-	-
	160		200	± 41.1	-	-	-	-
		170		± 43.4	± 41.5	-	-	-
	170		210	± 45.8	± 43.8	-	-	-
		180		± 48.1	± 46.0	± 43.9	± 41.6	-
	180		220	± 50.4	± 48.2	± 46.0	± 43.6	-
		190		± 52.8	± 50.5	± 48.1	± 45.6	-
	190		230	± 55.1	± 52.7	± 50.2	± 47.6	± 41.8
		200		± 57.4	± 54.9	± 52.4	± 49.6	± 43.5
	200		240	± 59.8	± 57.2	± 54.5	± 51.6	± 45.3
		210		± 62.1	± 59.4	± 56.6	± 53.7	± 47.1
	210		250	± 64.4	± 61.6	± 58.8	± 55.7	± 48.8
		220		± 66.8	± 63.9	± 60.9	± 57.7	± 50.6
	220		260	± 69.1	± 66.1	± 63.0	± 59.7	± 52.4
		230		± 71.4	± 68.3	± 65.1	± 61.7	± 54.1
	230		270	± 73.8	± 70.6	± 67.3	± 63.7	± 55.9
		240		± 76.1	± 72.8	± 69.4	± 65.8	± 57.7
	240		280	± 78.4	± 75.0	± 71.5	± 67.8	± 59.5
		250		± 80.8	± 77.3	± 73.7	± 69.8	± 61.2
250			± 83.1	± 79.5	± 75.8	± 71.8	± 63.0	
	260		± 85.4	± 81.7	± 77.9	± 73.8	± 64.8	
260			± 87.8	± 84.0	± 80.1	± 75.8	± 66.5	
	270		± 90.1	± 86.2	± 82.2	± 77.9	± 68.3	
270			± 92.5	± 88.4	± 84.3	± 79.9	± 70.1	
	280		± 94.8	± 90.7	± 86.4	± 81.9	± 71.8	
280			± 97.1	± 92.9	± 88.6	± 83.9	± 73.6	
			$v_{Rd,z}$ [kN/m]					
Secondary load-bearing level	VV1 – VV5		± 52.2	± 92.7	± 134.4	± 179.2	± 278.2	

Schöck Isokorb® T type D 6.0		MM4				
		VV1	VV2	VV3	VV4	VV5
Placement with		Isokorb® length [mm]				
		500				
Tension bars/compression members		$2 \times 5 \varnothing 12$				
Shear force bars		$2 \times 3 \varnothing 6$	$2 \times 3 \varnothing 8$	$2 \times 3 \varnothing 10$	$2 \times 4 \varnothing 10$	$2 \times 4 \varnothing 12$
H_{min} with CV30 [mm]		160	170	180	180	190
H_{min} with CV35 [mm]		160	170	180	180	200
H_{min} with CV50 [mm]		200	210	220	220	230

Design C25/30

Schöck Isokorb® T type D-MM1 to MM6 is only available in length L = 500 mm

Schöck Isokorb® T type D 6.0			MM5					
			VV1	VV2	VV3	VV4	VV5	
Design values with	Concrete cover CV [mm]		Concrete strength class \geq C25/30					
	CV30	CV35	CV50	$m_{Rd,y}$ [kNm/m]				
Isokorb® height H [mm]		160		±46.9	-	-	-	-
	160		200	±49.8	-	-	-	-
		170		±52.6	±50.7	-	-	-
	170		210	±55.4	±53.4	-	-	-
		180		±58.2	±56.2	±54.0	±51.7	-
	180		220	±61.1	±58.9	±56.6	±54.2	-
		190		±63.9	±61.6	±59.3	±56.7	-
	190		230	±66.7	±64.3	±61.9	±59.2	±53.4
		200		±69.6	±67.1	±64.5	±61.7	±55.7
	200		240	±72.4	±69.8	±67.1	±64.3	±57.9
		210		±75.2	±72.5	±69.7	±66.8	±60.2
	210		250	±78.0	±75.2	±72.4	±69.3	±62.4
		220		±80.9	±78.0	±75.0	±71.8	±64.7
	220		260	±83.7	±80.7	±77.6	±74.3	±67.0
		230		±86.5	±83.4	±80.2	±76.8	±69.2
	230		270	±89.4	±86.1	±82.9	±79.3	±71.5
		240		±92.2	±88.9	±85.5	±81.8	±73.8
	240		280	±95.0	±91.6	±88.1	±84.3	±76.0
	250		±97.8	±94.3	±90.7	±86.8	±78.3	
250			±100.7	±97.1	±93.3	±89.4	±80.5	
	260		±103.5	±99.8	±96.0	±91.9	±82.8	
260			±106.3	±102.5	±98.6	±94.4	±85.1	
	270		±109.1	±105.2	±101.2	±96.9	±87.3	
270			±112.0	±108.0	±103.8	±99.4	±89.6	
	280		±114.8	±110.7	±106.5	±101.9	±91.9	
280			±117.6	±113.4	±109.1	±104.4	±94.1	
			$v_{Rd,z}$ [kN/m]					
Secondary load-bearing level	VV1 – VV5		±52.1556	±92.721	±134.3731	±179.1641	±278.1631	

Schöck Isokorb® T type D 6.0		MM5				
		VV1	VV2	VV3	VV4	VV5
Placement with		Isokorb® length [mm]				
		500				
Tension bars/compression members		2 × 6 \varnothing 12				
Shear force bars		2 × 3 \varnothing 6	2 × 3 \varnothing 8	2 × 3 \varnothing 10	2 × 4 \varnothing 10	2 × 4 \varnothing 12
H_{min} with CV30 [mm]		160	170	180	180	190
H_{min} with CV35 [mm]		160	170	180	180	200
H_{min} with CV50 [mm]		200	210	220	220	230

Design C25/30

Schöck Isokorb® T type D-MM1 to MM6 is only available in length L = 500 mm

Schöck Isokorb® T type D 6.0			MM6					
			VV1	VV2	VV3	VV4	VV5	
Design values with	Concrete cover CV [mm]		Concrete strength class \geq C25/30					
	CV30	CV35	CV50	$m_{Rd,y}$ [kNm/m]				
Isokorb® height H [mm]		160		± 62.9	-	-	-	-
	160		200	± 66.8	-	-	-	-
		170		± 70.7	± 68.8	-	-	-
	170		210	± 74.6	± 72.6	-	-	-
		180		± 78.4	± 76.4	± 74.3	± 72.0	-
	180		220	± 82.3	± 80.2	± 78.0	± 75.6	-
		190		± 86.2	± 84.0	± 81.7	± 79.2	-
	190		230	± 90.1	± 87.7	± 85.3	± 82.7	± 77.0
		200		± 94.0	± 91.5	± 89.0	± 86.3	± 80.3
	200		240	± 97.9	± 95.3	± 92.7	± 89.9	± 83.6
		210		± 101.8	± 99.1	± 96.4	± 93.4	± 86.9
	210		250	± 105.6	± 102.9	± 100.0	± 97.0	± 90.3
		220		± 109.5	± 106.7	± 103.7	± 100.6	± 93.6
	220		260	± 113.4	± 110.4	± 107.4	± 104.1	± 96.9
		230		± 117.3	± 114.2	± 111.1	± 107.7	± 100.2
	230		270	± 121.2	± 118.0	± 114.8	± 111.3	± 103.5
		240		± 125.1	± 121.8	± 118.4	± 114.8	± 106.9
	240		280	± 128.9	± 125.6	± 122.1	± 118.4	± 110.2
		250		± 132.8	± 129.4	± 125.8	± 122.0	± 113.5
250			± 136.7	± 133.1	± 129.5	± 125.5	± 116.8	
	260		± 140.6	± 136.9	± 133.1	± 129.1	± 120.1	
260			± 144.5	± 140.7	± 136.8	± 132.7	± 123.5	
	270		± 148.4	± 144.5	± 140.5	± 136.2	± 126.8	
270			± 152.2	± 148.3	± 144.2	± 139.8	± 130.1	
	280		± 156.1	± 152.0	± 147.9	± 143.4	± 133.4	
280			± 160.0	± 155.8	± 151.5	± 146.9	± 136.7	
			$v_{Rd,z}$ [kN/m]					
Secondary load-bearing level	VV1 – VV5		± 52.1556	± 92.721	± 134.3731	± 179.1641	± 278.1631	

Schöck Isokorb® T type D 6.0		MM6				
		VV1	VV2	VV3	VV4	VV5
Placement with		Isokorb® length [mm]				
		500				
Tension bars/compression members		$2 \times 6 \text{ } \varnothing 14$				
Shear force bars		$2 \times 3 \text{ } \varnothing 6$	$2 \times 3 \text{ } \varnothing 8$	$2 \times 3 \text{ } \varnothing 10$	$2 \times 4 \text{ } \varnothing 10$	$2 \times 4 \text{ } \varnothing 12$
H_{\min} with CV30 [mm]		160	170	180	180	190
H_{\min} with CV35 [mm]		160	170	180	180	200
H_{\min} with CV50 [mm]		200	210	220	220	230

Torsional spring stiffness

Schöck Isokorb® T type D 6.0				MM1	MM2	MM3	MM4	MM5	MM6
Torsion spring stiffness for	Concrete cover CV [mm]			Concrete strength class \geq C20/25					
	CV30	CV35	CV50	C [kNm/rad/m]					
Isokorb® height H [mm]		160		1247	1870	2493	3117	3740	4407
	160		200	1401	2102	2803	3503	4204	4968
		170		1565	2348	3130	3913	4695	5563
	170		210	1738	2607	3476	4345	5214	6191
		180		1920	2880	3840	4799	5759	6852
	180		220	2111	3166	4221	5277	6332	7548
		190		2311	3466	4621	5777	6932	8276
	190		230	2520	3779	5039	6299	7559	9039
		200		2738	4107	5475	6844	8213	9835
	200		240	2965	4447	5930	7412	8894	10664
		210		3201	4801	6402	8002	9603	11528
	210		250	3446	5169	6892	8615	10338	12424
		220		3700	5551	7401	9251	11101	13355
	220		260	3964	5945	7927	9909	11891	14319
		230		4236	6354	8472	10590	12708	15316
	230		270	4517	6776	9035	11293	13552	16347
		240		4808	7212	9616	12020	14423	17412
	240		280	5107	7661	10215	12768	15322	18510
		250		5416	8124	10832	13540	16247	19642
	250			5733	8600	11467	14334	17200	20807
	260		6060	9090	12120	15150	18180	22007	
260			6396	9594	12791	15989	19187	23239	
	270		6740	10111	13481	16851	20221	24505	
270			7094	10641	14188	17735	21283	25805	
	280		7457	11186	14914	18643	22371	27139	
280			7829	11743	15658	19572	23487	28506	

T
type D

Reinforced concrete – reinforced concrete

Expansion joint spacing

Maximum expansion joint spacing

If the component length exceeds the maximum expansion joint spacing e , then expansion joints must be incorporated into the external concrete components at right angles to the insulating layer in order to limit the effect as a result of temperature changes. With fixed points such as, for example, corners of balconies, or with the employment of the supplementary Schöck Isokorb® T types H half the maximum expansion joint spacing $e/2$ from the fixed point applies.

Schöck Isokorb® T type D 6.0		MM1 VV1–VV3	MM2–MM5 VV1–VV2	MM2 VV3	MM3–MM5 VV3–VV4	MM3–MM5 VV5	MM6 VV1–VV4	MM6 VV5
Maximum expansion joint spacing when		e [m]						
Insulating element thickness [mm]	80	11.0	11.0	10.6	10.6	9.5	10.1	9.5

i Edge distances

The Schöck Isokorb® must be so arranged at the expansion joint that the following conditions are met:

- For the centre distance of the tension bars from the free edge resp. from the expansion joint: $e_R \geq 50$ mm applies.
- For the centre distance of the compression bars from the free edge or the expansion joint the following applies: $e_R \geq 50$ mm and $e_R \leq 150$ mm.
- For the centre distance of the compression bars from the free edge resp. expansion joint: $e_R \geq 100$ mm applies.

Product description

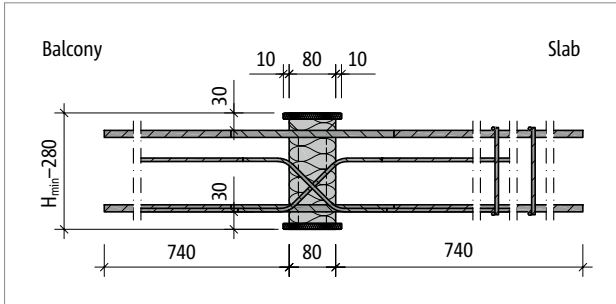


Fig. 155: Schöck Isokorb® T type D-MM1-VV1 to MM5-VV1 for CV30: Product section

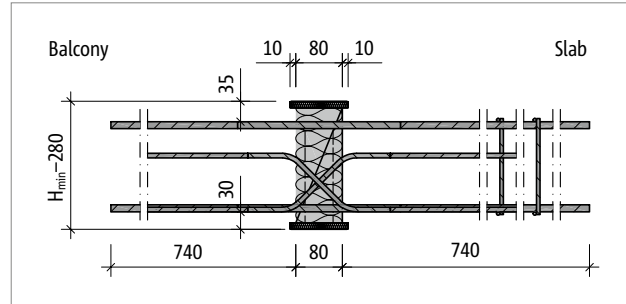


Fig. 156: Schöck Isokorb® T type D-MM1-VV1 to MM5-VV1 for CV35: Product section

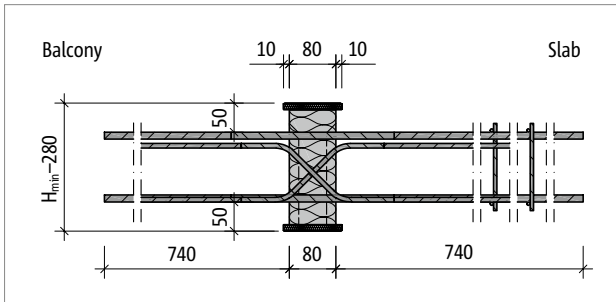


Fig. 157: Schöck Isokorb® T type D-MM1-VV1 to MM5-VV1 for CV50: Product section

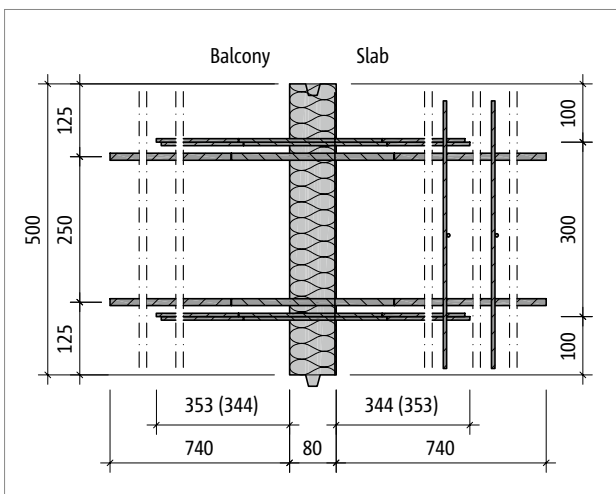


Fig. 158: Schöck Isokorb® T type D-MM1-VV1: Plan

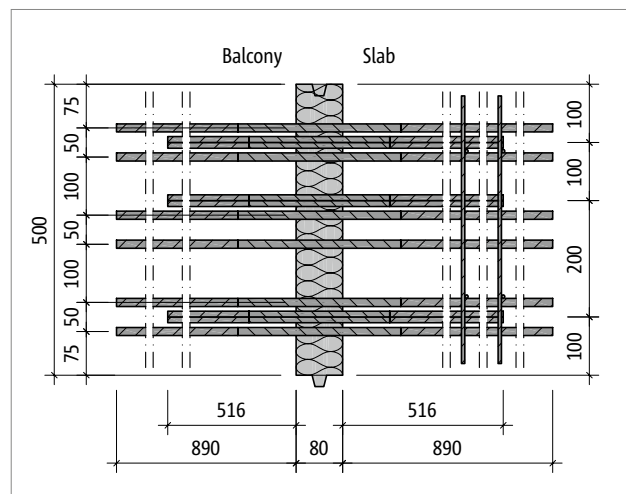


Fig. 159: Schöck Isokorb® T type D-MM6-VV3: Plan

Product information

- Download further product plan views and cross-sections at <https://cad.schoeck.co.uk>

On-site reinforcement

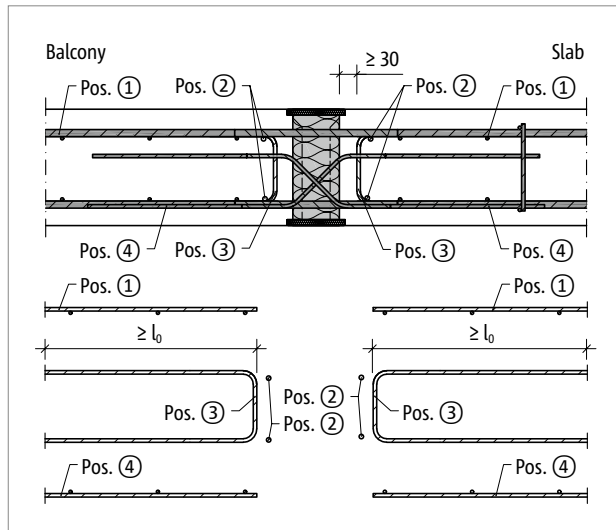


Fig. 160: Schöck Isokorb® T type D: On-site reinforcement

i Information about on-site reinforcement

- The rules as per NS-EN 1992-1-1 (EC2) and NS-EN 1992-1-1/NA apply for calculating the lap length. A reduction of the required lap length with m_{Ed}/m_{Rd} is permitted. For the lapping (l) with Schöck Isokorb® a length of the tension bars of 710 mm is accounted for type D.
- Edge and suspension reinforcement (Pos. 3) is to be placed on both sides of the Isokorb® T type D.

On-site reinforcement

Schöck Isokorb® T type D-MM1 to MM6 is only available in length L = 500 mm

Schöck Isokorb® T type D 6.0				MM1			MM2		
				VV1	VV2	VV3	VV1	VV2	VV3
On-site reinforcement	CV30	CV35	CV50	Floor (XC1) concrete strength class \geq C25/30 Balcony (XC4) concrete strength class \geq C25/30					
	Height [mm]								
Lap reinforcement dependent on bar diameter (necessary for negative moment)									
Pos. 1 with $\varnothing 8$ [mm ² /m]				486	503	467	729	693	679
Pos. 1 with $\varnothing 10$ [mm ² /m]				514	545	524	772	750	725
Pos. 1 with $\varnothing 12$ [mm ² /m]				543	588	580	814	807	796
Steel bars along the insulation joint									
Pos. 2				2 × 2 $\varnothing 8$					
Vertical reinforcement									
Pos. 3 [mm ² /m]	160–170	160–180	200–210	113					
Pos. 3 [mm ² /m]	180–280	190–280	220–280	113	120	213	120	213	313
Lap reinforcement dependent on bar diameter (necessary for positive moment)									
Pos. 4 with H8 [mm ² /m]				486	503	467	729	693	679
Pos. 4 with H10 [mm ² /m]				514	545	524	772	750	725
Pos. 4 with H12 [mm ² /m]				543	588	580	814	807	796

Information about on-site reinforcement

- For information on the on-site reinforcement see page 101.

Schöck Isokorb® T type D-MM1 to MM6 is only available in length L = 500 mm

Schöck Isokorb® T type D 6.0				MM3				
				VV1	VV2	VV3	VV4	VV5
On-site reinforcement	CV30	CV35	CV50	Floor (XC1) concrete strength class \geq C25/30 Balcony (XC4) concrete strength class \geq C25/30				
	Height [mm]							
Lap reinforcement dependent on bar diameter (necessary for negative moment)								
Pos. 1 with $\varnothing 8$ [mm ² /m]				955	919	905	905	905
Pos. 1 with $\varnothing 10$ [mm ² /m]				998	976	951	966	905
Pos. 1 with $\varnothing 12$ [mm ² /m]				1040	1033	1023	1062	905
Steel bars along the insulation joint								
Pos. 2				2 × 2 $\varnothing 8$				
Vertical reinforcement								
Pos. 3 [mm ² /m]	160–170	160–180	200–210	113				
Pos. 3 [mm ² /m]	180–280	190–280	220–280	120	213	313	417	640
Lap reinforcement dependent on bar diameter (necessary for positive moment)								
Pos. 4 with H8 [mm ² /m]				955	919	905	905	905
Pos. 4 with H10 [mm ² /m]				998	976	951	966	905
Pos. 4 with H12 [mm ² /m]				1040	1033	1023	1062	905

Information about on-site reinforcement

- For information on the on-site reinforcement see page 101.

On-site reinforcement

Schöck Isokorb® T type D-MM1 to MM6 is only available in length L = 500 mm

Schöck Isokorb® T type D 6.0				MM4				
				VV1	VV2	VV3	VV4	VV5
On-site reinforcement	CV30	CV35	CV50	Floor (XC1) concrete strength class \geq C25/30 Balcony (XC4) concrete strength class \geq C25/30				
	Height [mm]							
Lap reinforcement dependent on bar diameter (necessary for negative moment)								
Pos. 1 with \varnothing 10 [mm ² /m]				1224	1202	1177	1192	1131
Pos. 1 with \varnothing 12 [mm ² /m]				1267	1259	1249	1288	1131
Pos. 1 with \varnothing 14 [mm ² /m]				1409	1407	1402	1454	1265
Steel bars along the insulation joint								
Pos. 2				2 × 2 \varnothing 8				
Vertical reinforcement								
Pos. 3 [mm ² /m]	160–170	160–180	200–210	113	113	125	113	128
Pos. 3 [mm ² /m]	180–280	190–280	220–280	120	213	313	417	640
Lap reinforcement dependent on bar diameter (necessary for positive moment)								
Pos. 4 with H10 [mm ² /m]				1224	1202	1177	1192	1131
Pos. 4 with H12 [mm ² /m]				1267	1259	1249	1288	1131
Pos. 4 with \varnothing 14 [mm ² /m]				1409	1407	1402	1454	1265

Information about on-site reinforcement

- For information on the on-site reinforcement see page 101.

Schöck Isokorb® T type D-MM1 to MM6 is only available in length L = 500 mm

Schöck Isokorb® T type D 6.0				MM5				
				VV1	VV2	VV3	VV4	VV5
On-site reinforcement	CV30	CV35	CV50	Floor (XC1) concrete strength class \geq C25/30 Balcony (XC4) concrete strength class \geq C25/30				
	Height [mm]							
Lap reinforcement dependent on bar diameter (necessary for negative moment)								
Pos. 1 with \varnothing 10 [mm ² /m]				1450	1428	1403	1418	1357
Pos. 1 with \varnothing 12 [mm ² /m]				1493	1485	1475	1514	1357
Pos. 1 with \varnothing 14 [mm ² /m]				1658	1655	1650	1703	1513
Steel bars along the insulation joint								
Pos. 2				2 × 2 \varnothing 8				
Vertical reinforcement								
Pos. 3 [mm ² /m]	160–170	160–180	200–210	113	113	156	139	213
Pos. 3 [mm ² /m]	180–280	190–280	220–280	120	213	313	417	640
Lap reinforcement dependent on bar diameter (necessary for positive moment)								
Pos. 4 with H10 [mm ² /m]				1450	1428	1403	1418	1357
Pos. 4 with H12 [mm ² /m]				1493	1485	1475	1514	1357
Pos. 4 with \varnothing 14 [mm ² /m]				1658	1655	1650	1703	1513

Information about on-site reinforcement

- For information on the on-site reinforcement see page 101.

On-site reinforcement

Schöck Isokorb® T type D-MM1 to MM6 is only available in length L = 500 mm

Schöck Isokorb® T type D 6.0				MM6				
				VV1	VV2	VV3	VV4	VV5
On-site reinforcement	CV30	CV35	CV50	Floor (XC1) concrete strength class \geq C25/30 Balcony (XC4) concrete strength class \geq C25/30				
	Height [mm]							
Lap reinforcement dependent on bar diameter (necessary for negative moment)								
Pos. 1 with $\varnothing 12$ [mm ² /m]				1983	1975	1965	2004	1847
Pos. 1 with $\varnothing 14$ [mm ² /m]				2025	2032	2037	2100	1932
Steel bars along the insulation joint								
Pos. 2				2 × 2 $\varnothing 8$				
Vertical reinforcement								
Pos. 3 [mm ² /m]	160–170	160–180	200–210	113	113	156	139	213
Pos. 3 [mm ² /m]	180–280	190–280	220–280	120	213	313	417	640
Lap reinforcement dependent on bar diameter (necessary for positive moment)								
Pos. 4 with H12 [mm ² /m]				1983	1975	1965	2004	1847
Pos. 4 with $\varnothing 14$ [mm ² /m]				2025	2032	2037	2100	1932

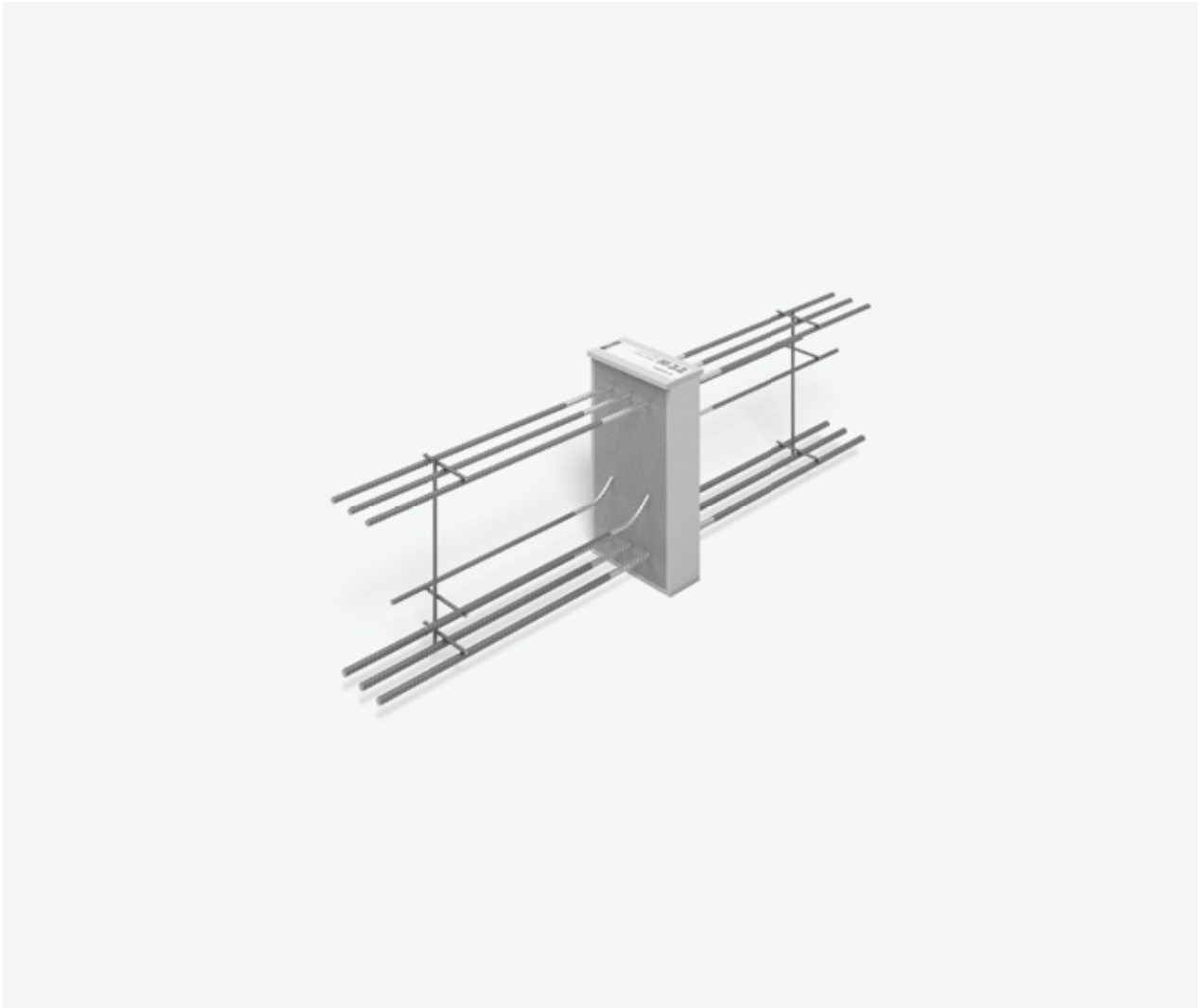
Information about on-site reinforcement

- For information on the on-site reinforcement see page 101.

✓ Check list

- Have the loads on the Schöck Isokorb® connection been specified at design level?
- Has the cantilevered system length or the system support width been taken as a basis?
- Has the additional proportionate deflection resulting from the Schöck Isokorb® been taken into account?
- Are the maximum allowable expansion joint spacings taken into account?
- With the selection of the design table is the relevant concrete cover taken into account?
- Have the fire protection requirements been clarified?
- Has the minimum slab thickness (≥ 200 mm) and the required 2nd layer (CV50) been taken into account for a connection across a corner with Schöck Isokorb® T type D?
- Has the required cutout (width ≥ 760 mm from insulating element) been marked in the construction drawings for the Schöck Isokorb® T type D in conjunction with semi-precast balcony slabs and has the on site reinforcement been adjusted constructively?
- Has a Schöck Isokorb® T type Q-E-Z been selected for a connection free of constraint forces for 2- or 3-sided support?
- Have the requirements for on-site reinforcement of connections been defined in each case?
- Is there a statically undetermined construction for the design for which the stiffness of the Schöck Isokorb® must be taken into account?
- Does an impact load or another extraordinary load need to be taken into account for the design of the Schöck Isokorb®?
- Has a soft elastic joint been taken into account between the upper edge of the facing shell and the balcony?
- Is the type designation of the Schöck Isokorb® explicit in the plans? - Example: Schöck Isokorb® T type D-MM4-VV2-REI120-CV30-H280-L500

Schöck Isokorb® T type B



Schöck Isokorb® T type B

Load-bearing thermal insulation element for cantilever beams and downstand beams. The element transfers negative moments and positive shear forces.

T
type B

Reinforced concrete – reinforced concrete

Element arrangement | Installation cross sections

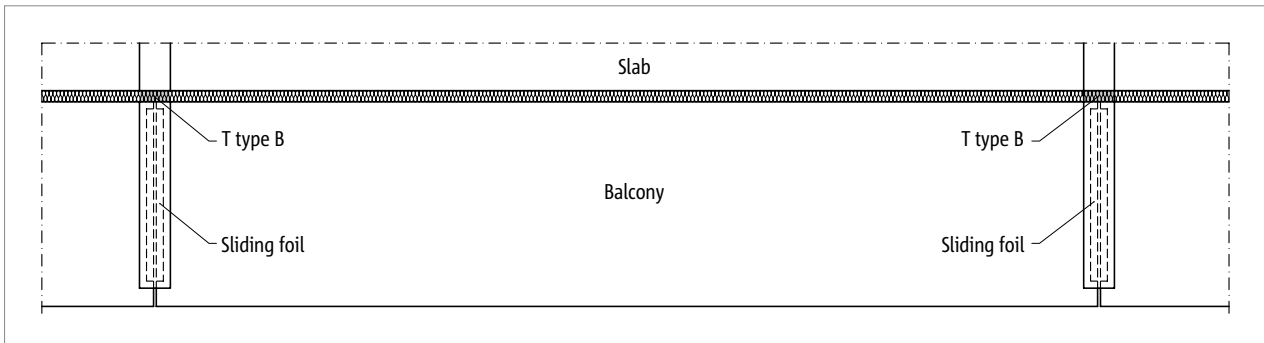


Fig. 161: Schöck Isokorb® T type B: Balcony construction with free cantilevered inner slab joists (precast balcony)

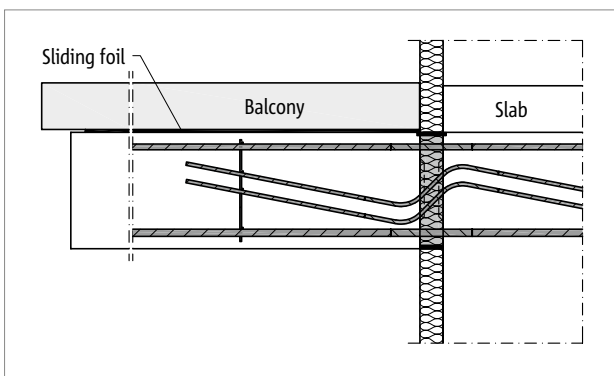


Fig. 162: Schöck Isokorb® T type B: Balcony structure with freely cantilevered downstand beams (precast balcony)

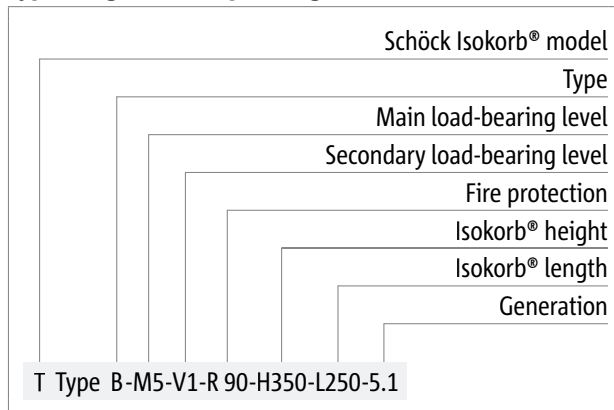
Product selection | Type designations

Schöck Isokorb® T type B variants

The configuration of the Schöck Isokorb® T type B can be varied as follows:

- Main load-bearing level:
M5 to M8
- Secondary load-bearing level:
V1 to V2
- Fire resistance class:
R90: Top fire protection board, projecting on both sides by both 10 mm
- Isokorb® height:
 H_{\min} to 600 mm
- Isokorb® length:
L = 250 mm
L is the horizontal Isokorb® length across the building envelope
- Generation:
5.1

Type designations in planning documents



Design C25/30 | Torsional spring stiffness

Schöck Isokorb® T type B 5.1		M5	M6	M7	M8
Design values with		Concrete strength class \geq C25/30			
		$M_{rd,y}$ [kNm/element]			
Isokorb® height H [mm]	300	83.4	100.4	-	-
	350	107.6	129.1	147.2	-
	400	130.8	149.2	188.5	-
	450	157.7	179.3	219.6	257.2
	500	186.3	209.5	259.8	304.5
	600	248.9	269.7	340.2	420.0
Secondary load-bearing level		$V_{rd,z}$ [kN/element]			
		V1	142.0	142.0	142.0
	V2	189.3	189.3	189.3	284.0

Schöck Isokorb® T type B 5.1		M5	M6	M7	M8
Placement with		Isokorb® length [mm]			
		250	250	250	250
Tension bars		3 \emptyset 20	4 \emptyset 20	5 \emptyset 20	6 \emptyset 20
Shear force bars V1		3 \emptyset 14	3 \emptyset 14	3 \emptyset 14	3 \emptyset 14
Shear force bars V2		4 \emptyset 14	4 \emptyset 14	4 \emptyset 14	6 \emptyset 14
Compression bars		3 \emptyset 25	3 \emptyset 25	4 \emptyset 25	6 \emptyset 25
H_{min} for V1 [mm]		300	300	350	450
H_{min} with V2 [mm]		400	400	450	500

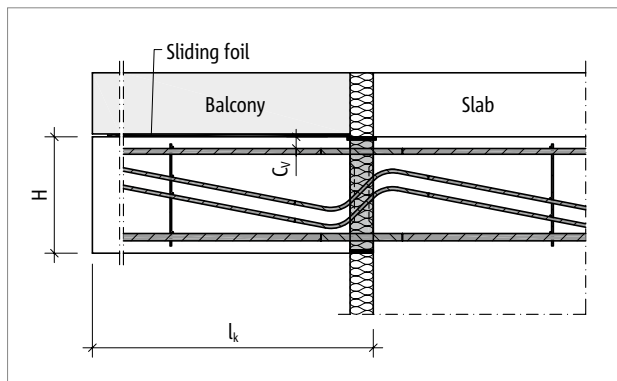


Fig. 163: Schöck Isokorb® T type B: Static system

Schöck Isokorb® T type B 5.1		M5	M6	M7	M8
Torsion spring stiffness for		Concrete strength class \geq C25/30			
		C [kNm/rad]			
Isokorb® height H [mm]	300	11083	11121	-	-
	350	17683	18327	19039	-
	400	25818	27322	29572	-
	450	35489	38107	42416	49000
	500	46694	50682	57569	67881
	600	73710	81203	94806	114851

Fatigue/Temperature effect

Sliding foil for the fatigue resistance

Balcony slabs, passageway walks and canopy constructions expand when heated and contract when cooled. The changes in length associated with this temperature stress can transmit horizontal forces to the substructure. This can affect cantilevered beams that are connected to the building with the Schöck Isokorb®. In order to prevent material fatigue and cantilever beam failure over the planned service life, sliding foil should be used. The sliding foil must be installed between the cantilevered beam and the balcony slab in order to limit the lateral deflection of the Schöck Isokorb® bars due to temperature stress to the fatigue-proof area.

The balcony slab lying on the cantilevered beam must be secured against excessive horizontal displacement in order to secure its position and stability.

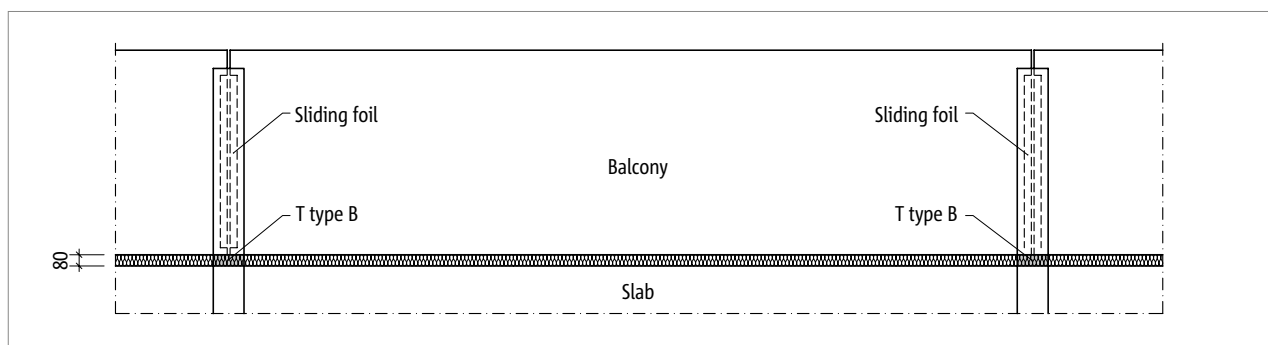


Fig. 164: Schöck Isokorb® T type B: Layout; fatigue resistance due to the sliding foil between the balcony slab and cantilevered beams

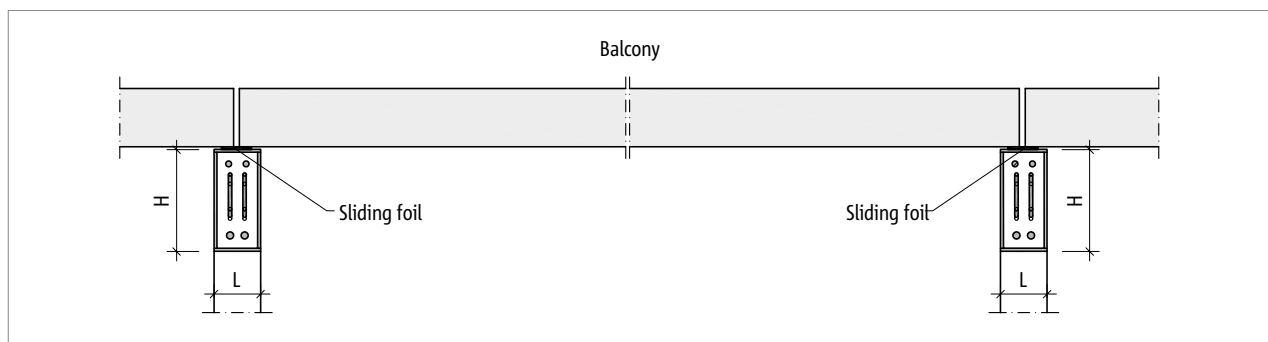


Fig. 165: Schöck Isokorb® T type B: Cross-section; fatigue resistance via the sliding foil between the balcony slab and cantilevered beams

Sliding foil

- Sliding foil: Dynamic friction coefficient $\mu_G \leq 0.03$

Product description

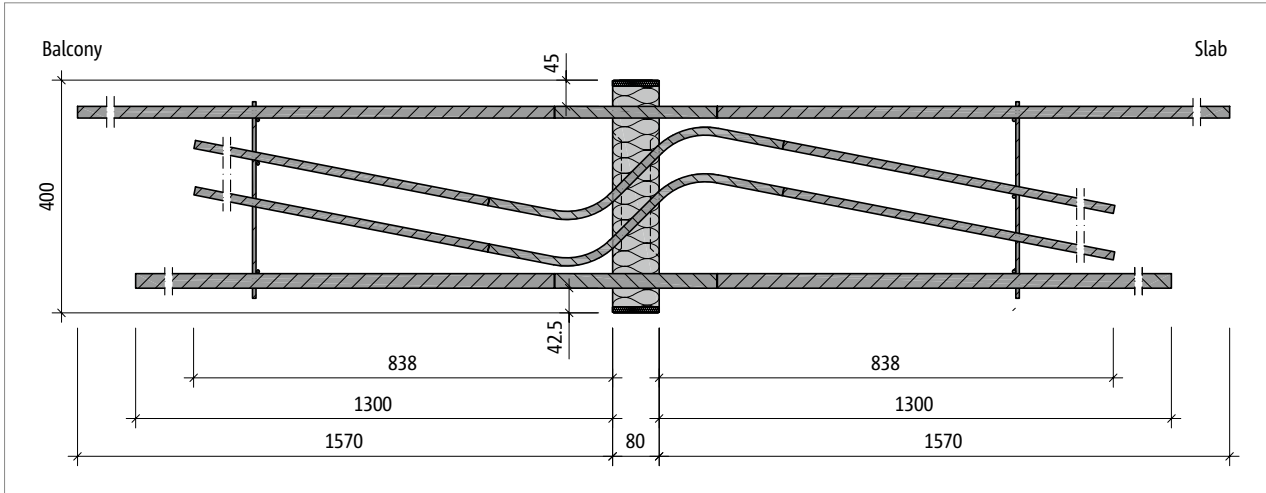


Fig. 166: Schöck Isokorb® T type B-M5-V2 in height H400: Product section

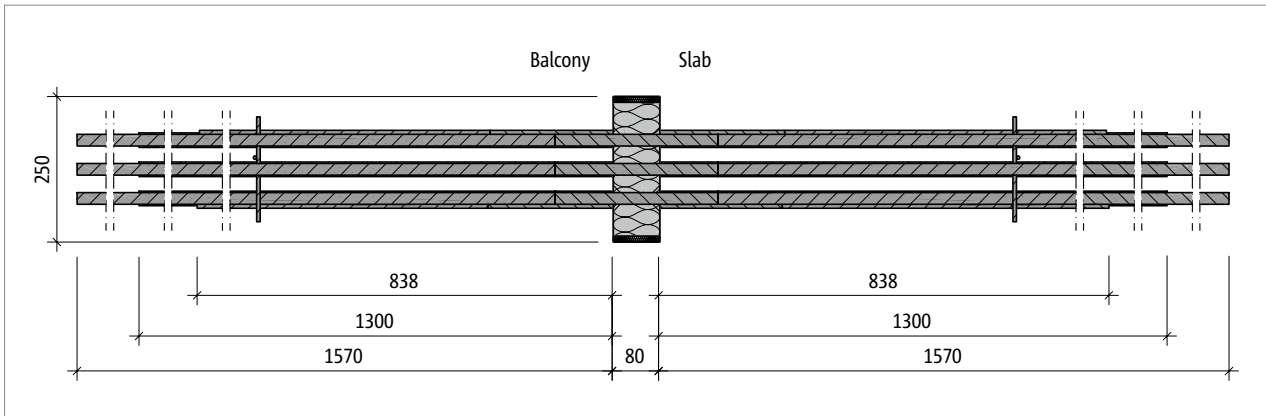


Fig. 167: Schöck Isokorb® T type B-M5-V2: Product layout

Product description

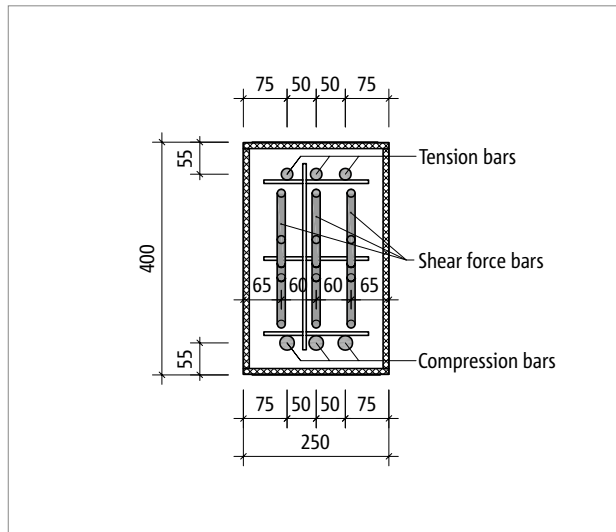


Fig. 168: Schöck Isokorb® T type B-M5-V1 in height H400: Product view

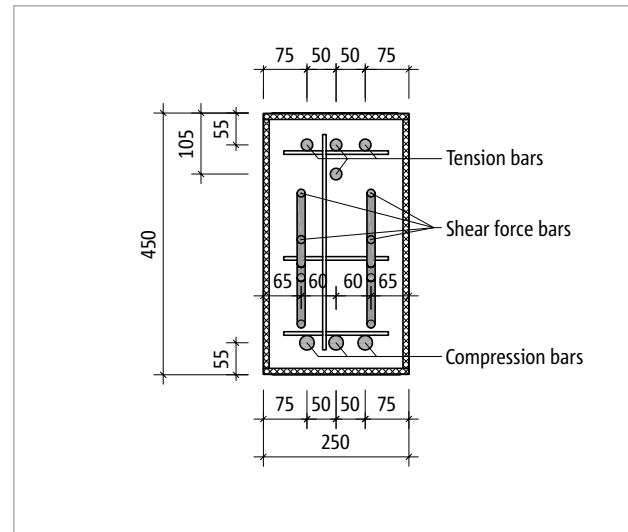


Fig. 169: Schöck Isokorb® T type B-M6-V2 in height H450: Product layout

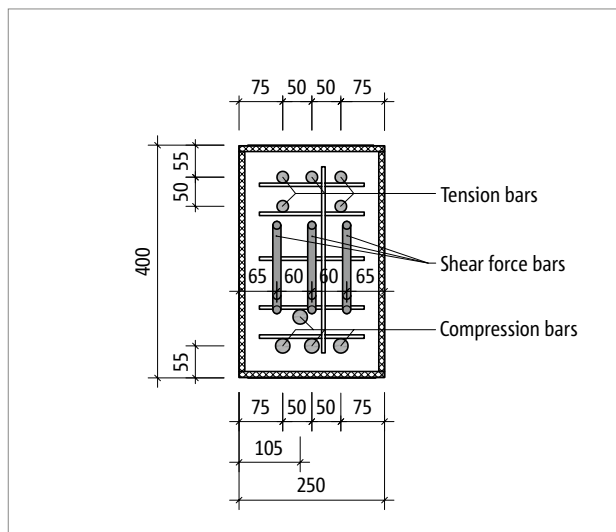


Fig. 170: Schöck Isokorb® T type B-M7-V1 in height H400: Product layout

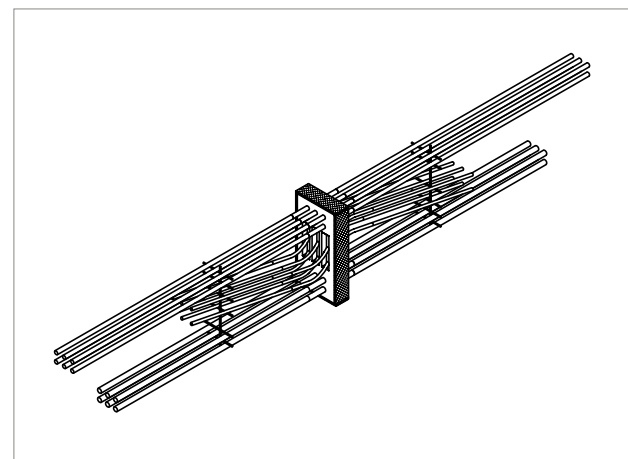


Fig. 171: Schöck Isokorb® T type B: Perimeter fire protection boards

Product information

- For additional 2D and 3D product drawings contact our Design Support department.

On-site reinforcement

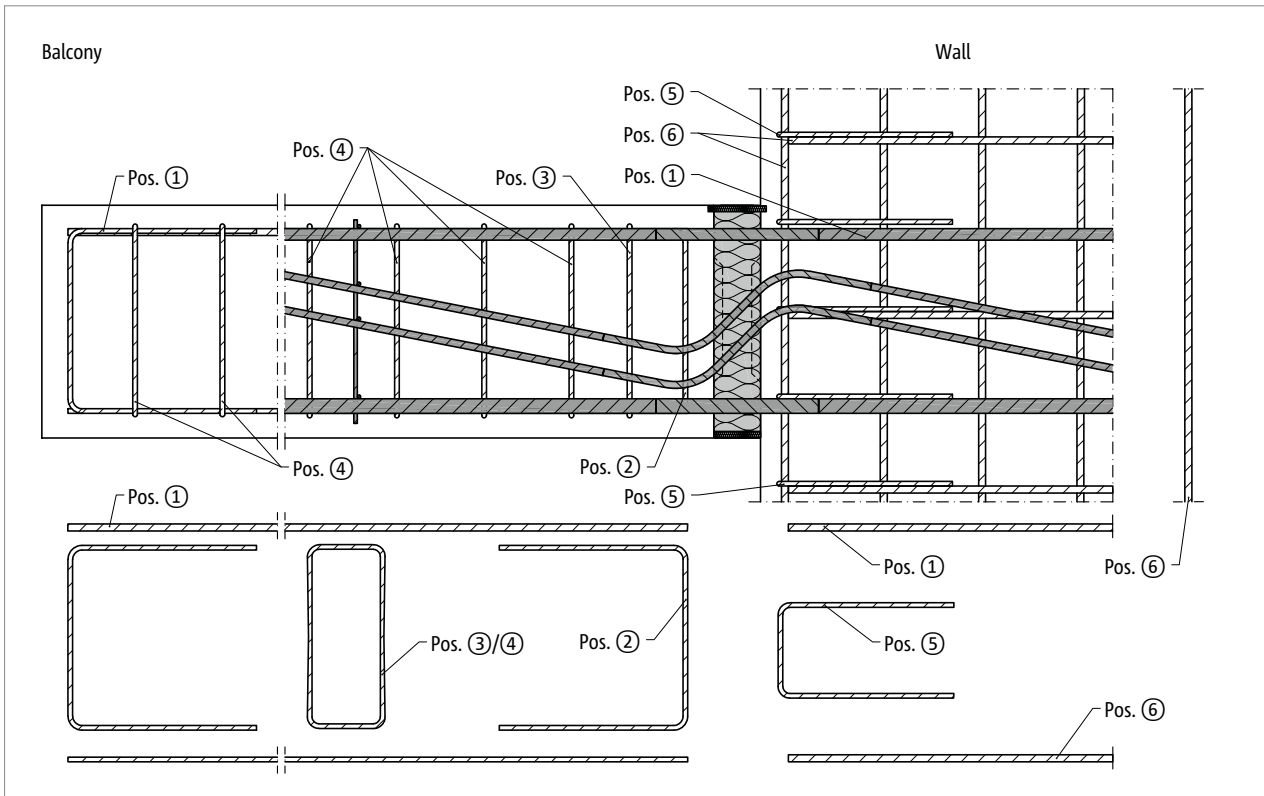


Fig. 172: Schöck Isokorb® T type B: On site reinforcement (cross-section)

Suggestion for on site reinforcement

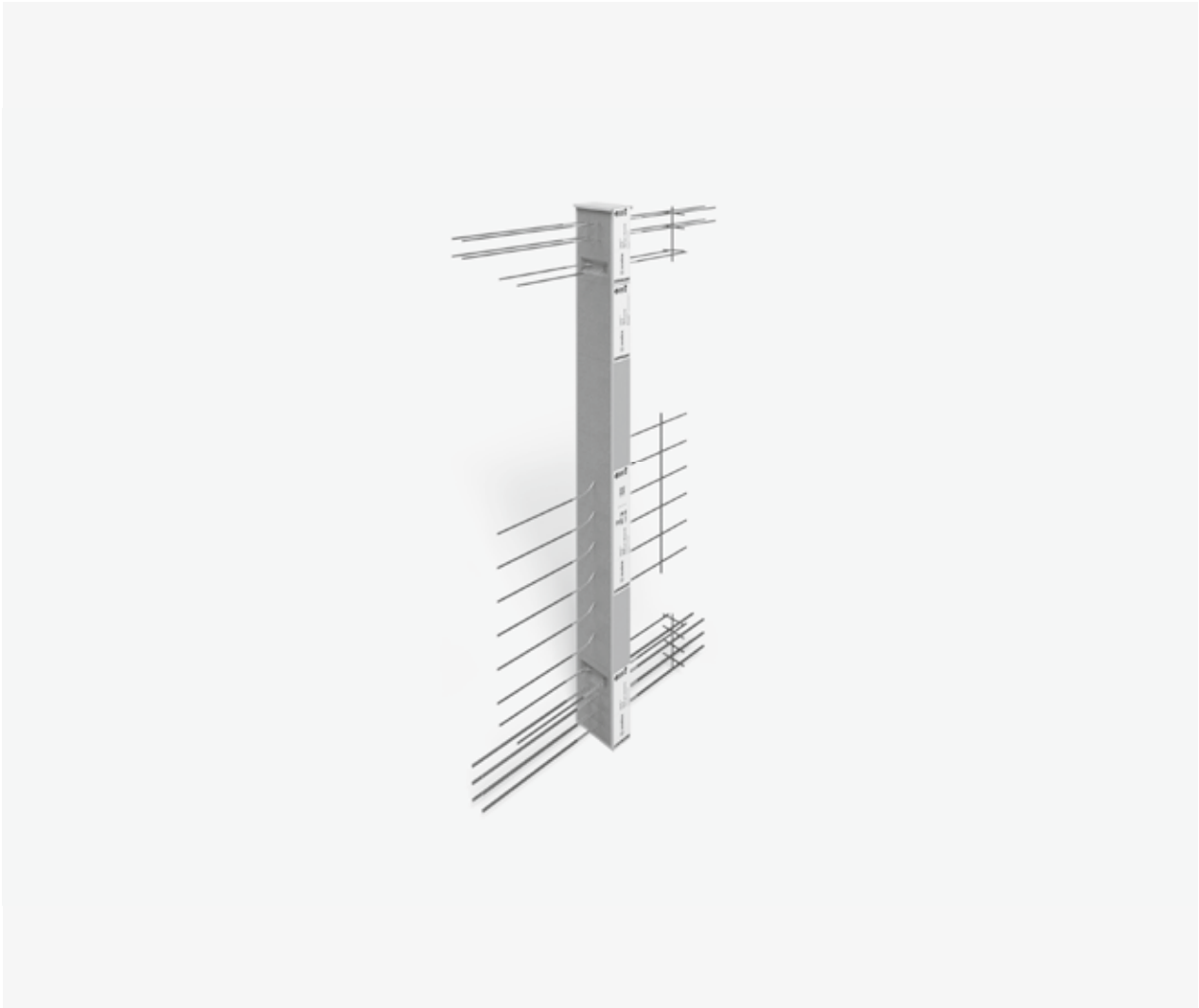
Details of the on-site reinforcement for Schöck Isokorb® with a loading of 100 % of the maximum design moment with concrete strength class C25/30.

Schöck Isokorb® T type B 5.1	M5		M6		M7		M8	
	V1	V2	V1	V2	V1	V2	V1	V2
On-site reinforcement	Concrete strength class \geq C25/30							
Overlapping reinforcement								
Pos. 1	acc. to the specifications of the structural engineer							
Suspension reinforcement								
Pos. 2 [mm ²]	163	218	163	218	163	218	163	326
Suspension reinforcement								
Pos. 3 [mm ²]	245	326	245	326	245	326	245	490
Stirrup								
Pos. 4	acc. to the specifications of the structural engineer							
Supplementary edge reinforcement								
Pos. 5	acc. to the specifications of the structural engineer							
Wall reinforcement and overlap reinforcement shear force bar								
Pos. 6	acc. to the specifications of the structural engineer							

✓ Check list

- Have the loads on the Schöck Isokorb® connection been specified at design level?
- Has the cantilevered system length or the system support width been taken as a basis?
- Is the relevant concrete strength class taken into account when selecting the design and calculation table?
- With the selection of the design table is the relevant concrete cover taken into account?
- Have the fire protection requirements been clarified?
- Have the requirements for on-site reinforcement of connections been defined in each case?
- Has the additional proportionate deflection resulting from the Schöck Isokorb® been taken into account?
- Is the drainage direction taken into account with the resulting camber information? Is the degree of camber entered in the working drawings?
- Is a sliding foil with the dynamic friction coefficient $\mu_G \leq 0.03$ specified for between the balcony slabs and the cantilevered supports?
- Is the balcony supported on the cantilevered beams secured against horizontal displacement?
- Is the type designation of the Schöck Isokorb® explicit in the plans? - Example: Schöck Isokorb® T type B-M3-V2-R90-H400-L250-SC4

Schöck Isokorb® T type W



Schöck Isokorb® T type W

Load-bearing thermal insulation element for cross walls. The element transfers negative moments and shear forces.

T
type W

Reinforced concrete – reinforced concrete

Element arrangement | Installation cross section

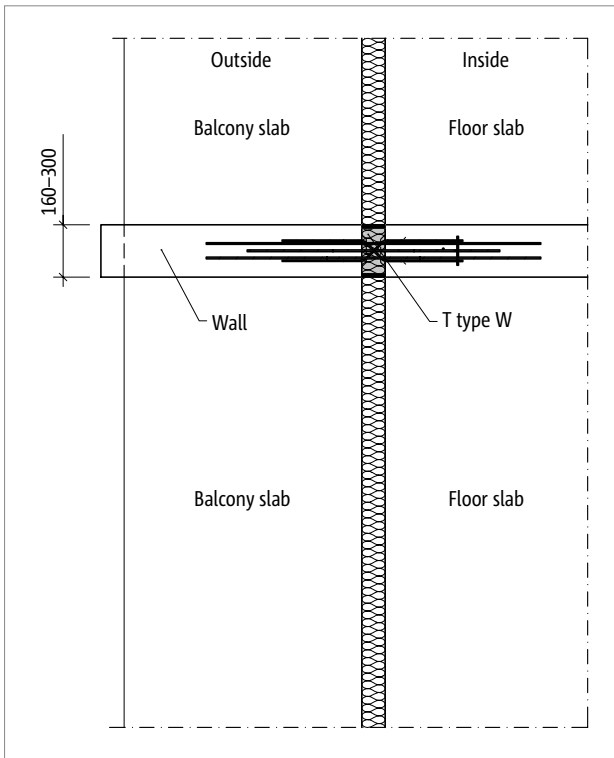


Fig. 173: Schöck Isokorb® T type W: Layout; Balcony structure with thermally insulated load-bearing shear walls

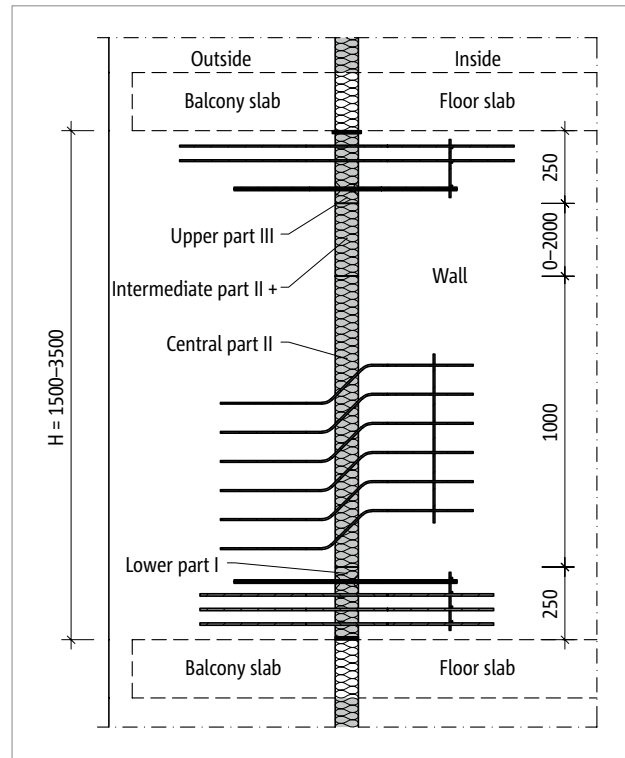


Fig. 174: Schöck Isokorb® T type W: Balcony structure with thermal insulated load-bearing shear walls

i Element arrangement

- The Schöck Isokorb® T type W consists of at least 3 parts: Bottom section I, middle section II, top section III. Depending on height an insulation spacer II+ is additionally required.

Product selection | Type designations

Schöck Isokorb® T type W variants

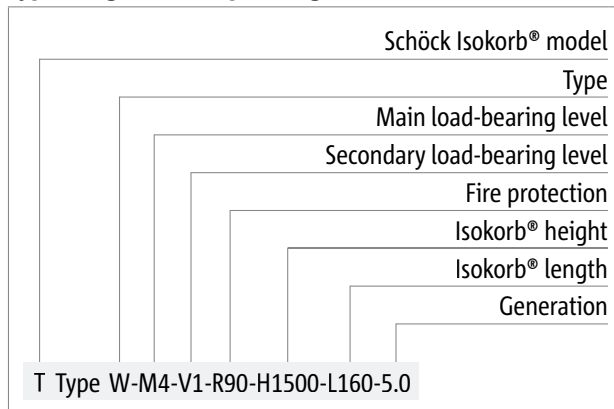
The configuration of the Schöck Isokorb® T type W can be varied as follows:

- Main load-bearing level: M1 to M4
- Secondary load-bearing level: V1
- Fire resistance class:
R90: Top fire protection board, projecting on both sides by both 10 mm
- Isokorb® height:
H = 1500 mm to 3500 mm
- Isokorb® length:
L = 160 mm to 300 mm
- Generation:
5.0

i Variants

- Please specify the required dimensions when ordering.

Type designations in planning documents



Design C25/30 | Torsional spring stiffness

Schöck Isokorb® T type W 5.0		M1	M2	M3	M4	M5
Design values with		Concrete strength class \geq C25/30				
		$M_{Rd,y}$ [kNm/element]				
Isokorb® height H [mm]	1500-1990	89.0	149.2	221.3	307.3	394.6
	2000-2490	114.4	186.5	274.8	379.4	483.1
	2500-3500	138.1	223.7	328.2	451.5	571.5
	$V_{Rd,z}$ [kN/element]					
	1500-3500	52.2	92.7	144.9	208.6	284.0
	$V_{Rd,y}$ [kN/element]					
1500-3500	± 17.4	± 17.4	± 17.4	± 17.4	± 30.9	

Schöck Isokorb® T type W 5.0		M1	M2	M3	M4	M5
Placement with		Isokorb® length [mm]				
		150-300	150-300	150-300	150-300	150-300
Tension bars		4 \emptyset 6	4 \emptyset 8	4 \emptyset 10	4 \emptyset 12	4 \emptyset 14
Compression bars		6 \emptyset 8	6 \emptyset 10	6 \emptyset 12	6 \emptyset 14	6 \emptyset 16
Shear force bars vertical		6 \emptyset 6	6 \emptyset 8	6 \emptyset 10	6 \emptyset 12	6 \emptyset 14
Shear force bars horizontal		2 \times 2 \emptyset 6	2 \times 2 \emptyset 6	2 \times 2 \emptyset 6	2 \times 2 \emptyset 6	2 \times 2 \emptyset 8
L_{min} for R90 [mm]		160	160	160	160	160

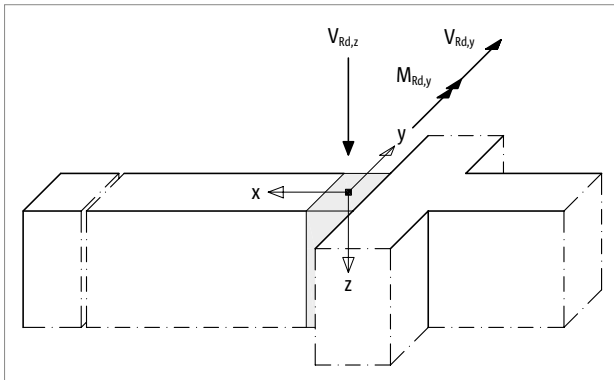


Fig. 175: Schöck Isokorb® T type W: Sign rule for the design

Notes on design

- Moments from wind loading are to be absorbed by the stiffening effect of the balcony slabs. If this is not possible, then $M_{Ed,z}$ can be transferred by the additional layout of a Schöck Isokorb® T type D. The T type D in this case is installed in a vertical position in place of the insulating spacer.
- Poor bonding conditions (bonding range II) are the basis for the determination of the tension bar anchoring lengths.

Schöck Isokorb® T type W 5.0		M1	M2	M3	M4	M5
Torsion spring stiffness for		Concrete strength class \geq C25/30				
		$M_{Rd,y}$ [kNm/element]				
Isokorb® height H [mm]	1500-1990	158845	238506	323733	412913	505007
	2000-2490	301348	452474	614160	783345	958056
	2500-3500	489089	734369	996786	1271373	1554932

Expansion joint spacing

Maximum expansion joint spacing

If the structural component length exceeds the maximum expansion joint spacing e , expansion joints must be installed in the exterior concrete structural components at right angles to the insulation plane, in order to limit the effect as a result of temperature changes.

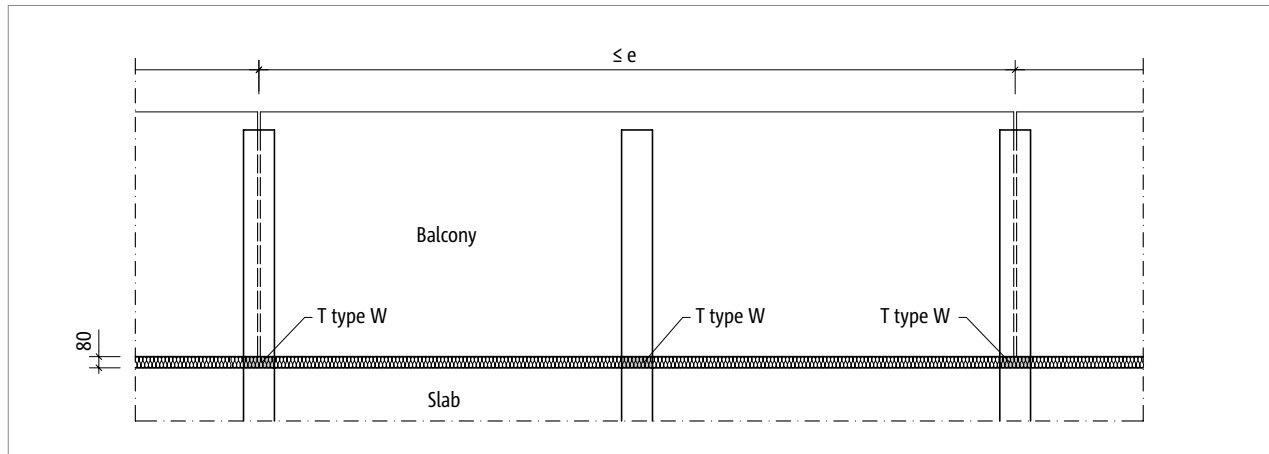


Fig. 176: Schöck Isokorb® T type W: Expansion joint spacing

Schöck Isokorb® T type W 5.0		M1	M2	M3	M4
Maximum expansion joint spacing when		e [m]			
Insulating element thickness [mm]	80	13.5	13.0	11.7	10.1

Expansion joints

- The expansion joint spacings can be enlarged, if there is no fixed connection between balcony slabs and shear walls, e. g. through laying of a sliding foil.

Product description

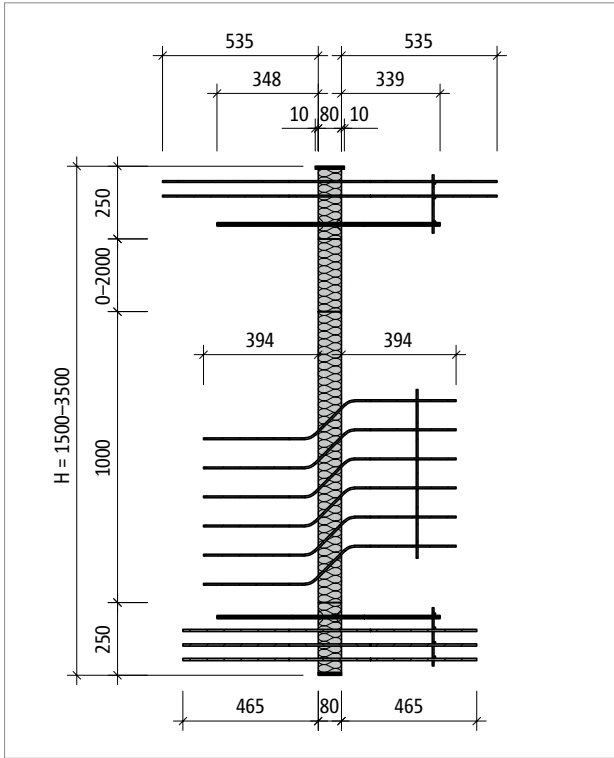


Fig. 177: Schöck Isokorb® T type W-M1-R90: Product layout; Fire protection board top and bottom

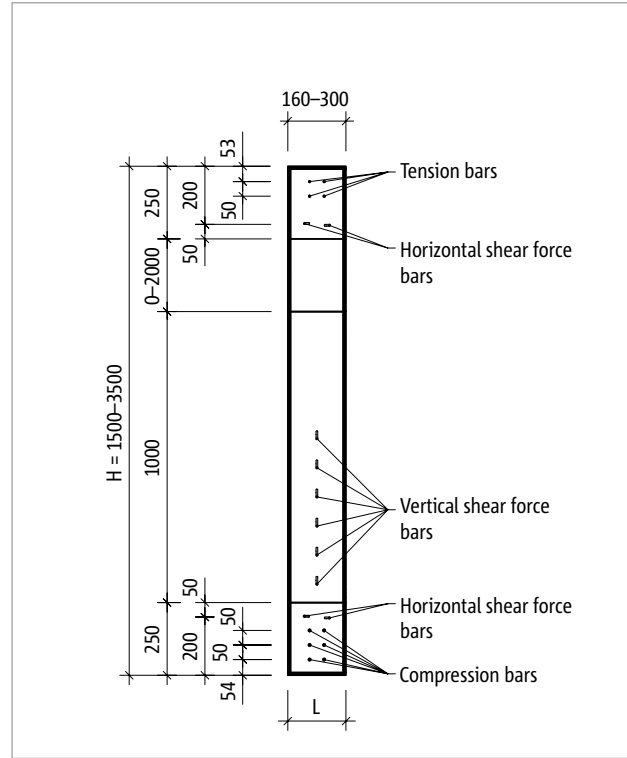


Fig. 178: Schöck Isokorb® T type W-M1-R90: Product layout; perimeter fire protection boards

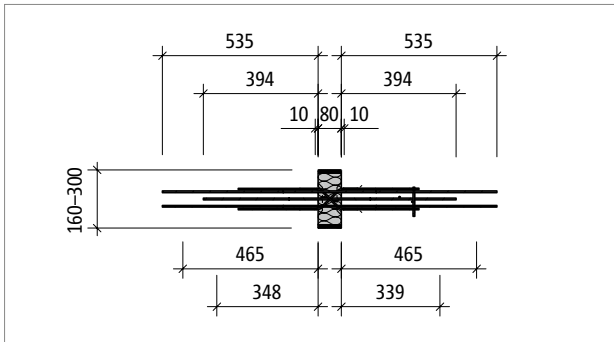


Fig. 179: Schöck Isokorb® T type W-M1: Product layout

Product information

- For additional 2D and 3D product drawings contact our Design Support department.

Product description

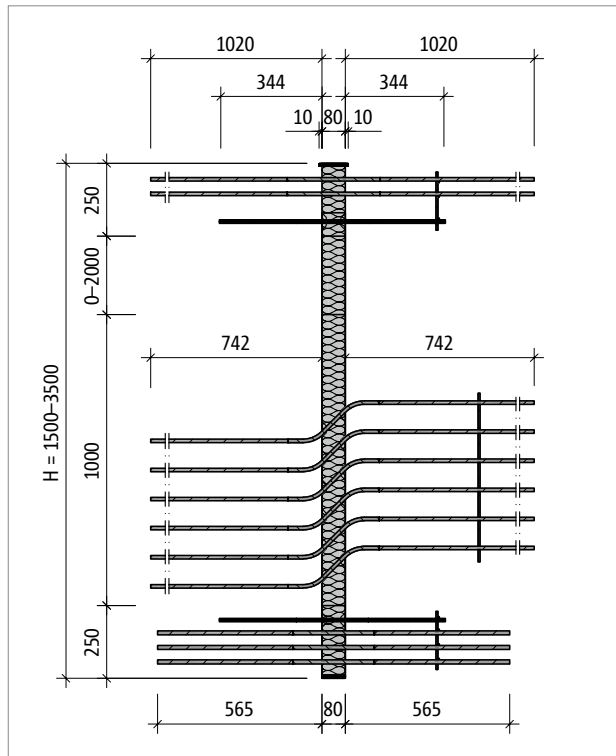


Fig. 180: Schöck Isokorb® T type W-M4-R90: Product layout; fire protection board top and bottom

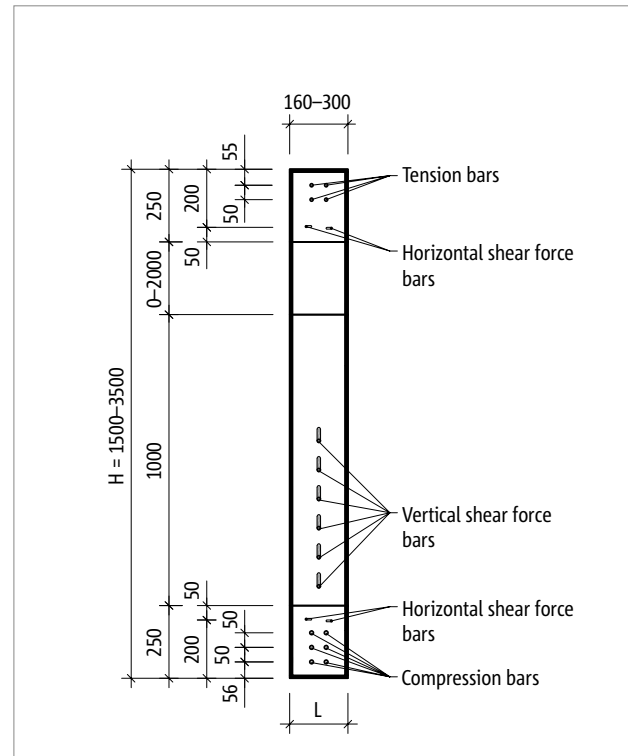


Fig. 181: Schöck Isokorb® T type W-M4-R90: Product layout; perimeter fire protection boards

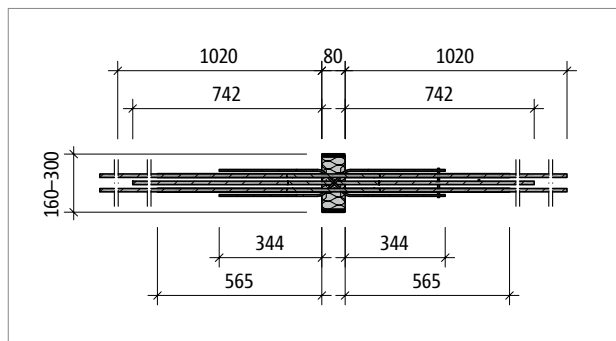


Fig. 182: Schöck Isokorb® T type W-M4: Product layout

Product information

- For additional 2D and 3D product drawings contact our Design Support department.

On-site reinforcement

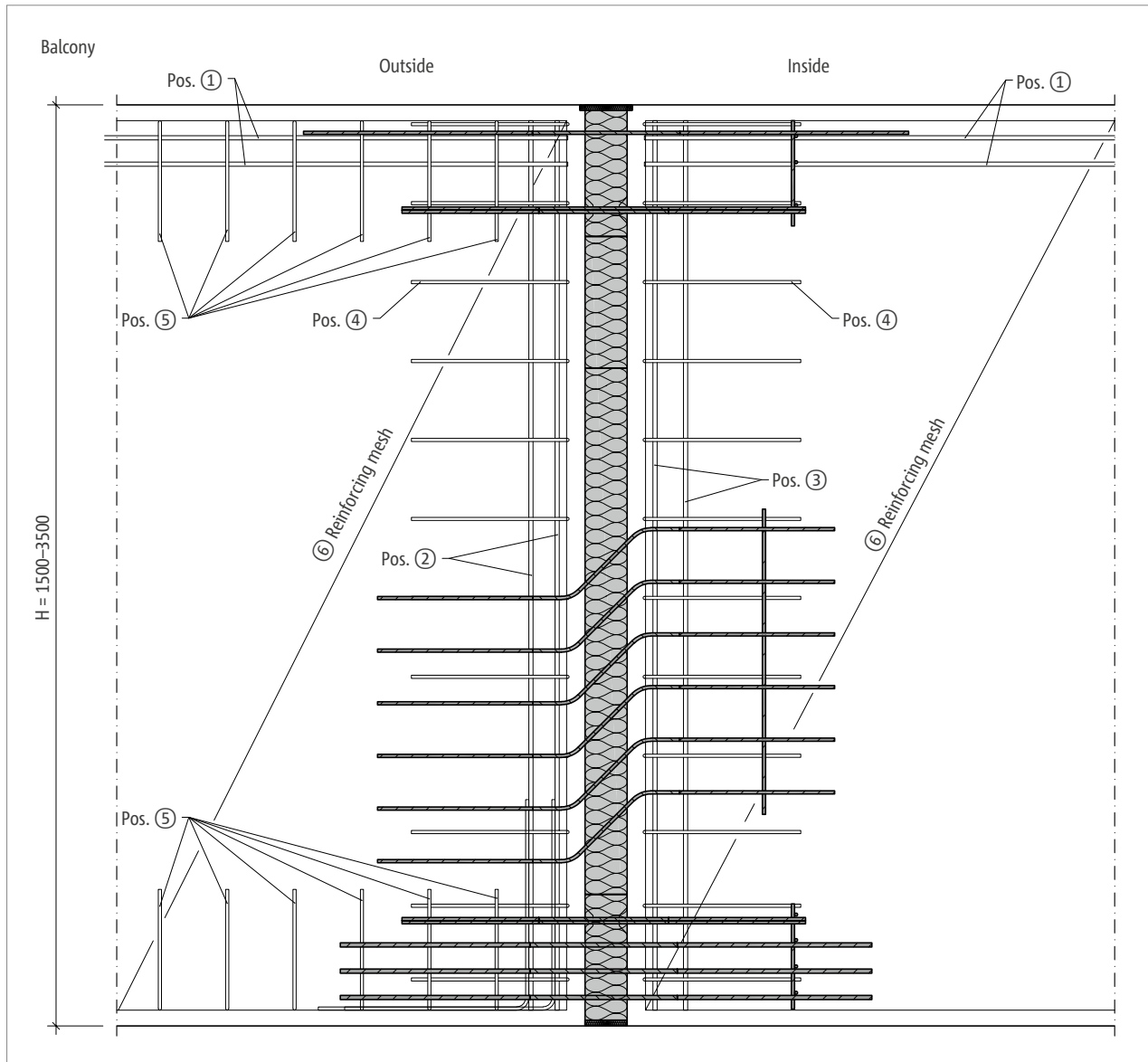


Fig. 183: Schöck Isokorb® T type W: On site reinforcement; cross-section

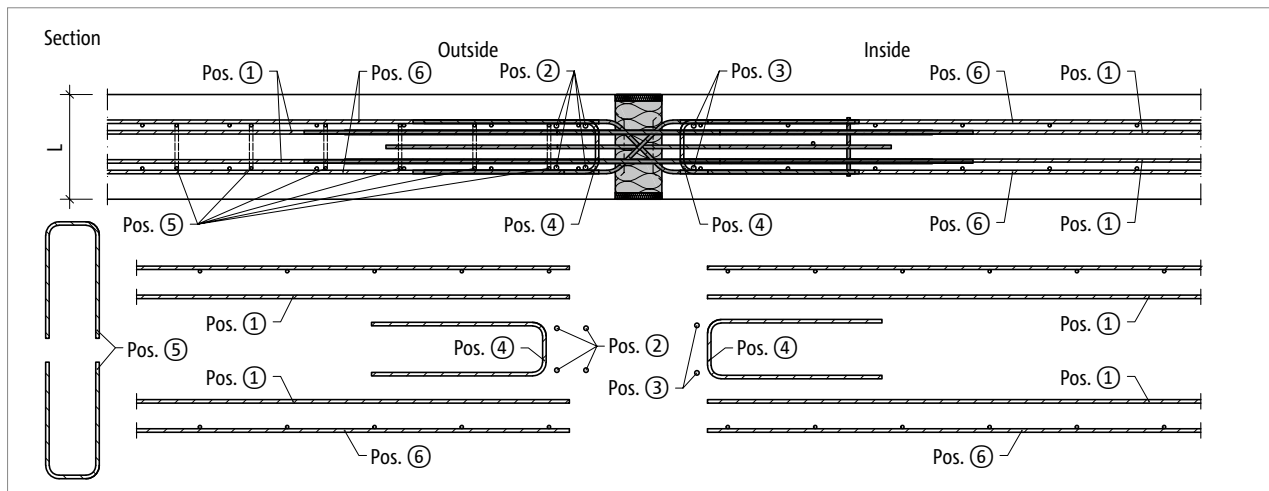


Fig. 184: Schöck Isokorb® T type W: On site reinforcement; layout

T
type W

Reinforced concrete – reinforced concrete

On-site reinforcement | Installation

Recommendation for the on-site connection reinforcement

Details on the lapping reinforcement for Schöck Isokorb® with a loading of 100% of the maximum design moment with C25/30; structurally selected: a_s lapping reinforcement $\geq a_s$ Isokorb® compression/tension bars.

Schöck Isokorb® T type W 5.0	M1	M2	M3	M4
On-site reinforcement	Concrete strength class \geq C25/30			
Pos. 1 lap reinforcement				
Pos. 1	4 \varnothing 6	4 \varnothing 8	4 \varnothing 10	4 \varnothing 12
Lap length l_0 [mm]	481	641	801	961
Pos. 2 and Pos. 3 edge reinforcement				
Pos. 2 and Pos. 3	2 \times 2 \varnothing 10	2 \times 2 \varnothing 10	2 \times 2 \varnothing 12	2 \times 2 \varnothing 14
Pos. 4 and Pos. 5 edging				
Pos. 4 and Pos. 5	acc. to the specifications of the structural engineer			
Pos. 6 wall reinforcement and lapping reinforcement of shear force bars				
Pos. 6	acc. to the specifications of the structural engineer			

i Information about on-site reinforcement

- Alternative connection reinforcements are possible. The rules as per NS-EN 1992-1-1 (EC2) and NS-EN 1992-1-1/NA apply for calculating the lap length. A reduction of the required lap length using m_{Ed}/m_{Rd} is permitted.

i Installation

The Schöck Isokorb® T type W is delivered in various components (bottom section, middle section, intermediate section, upper section).

- Depending on the quantity ordered, similar components will be on one pallet for purposes of transport safety.
- The assignment of components takes place on the building site in accordance with installation instructions.

☑ Check list

- Have the loads on the Schöck Isokorb® connection been specified at design level?
- Has the cantilevered system length or the system support width been taken as a basis?
- Is the relevant concrete strength class taken into account when selecting the design and calculation table?
- With the selection of the design table is the relevant concrete cover taken into account?
- Are the maximum allowable expansion joint spacings taken into account?
- Have the fire protection requirements been clarified?
- Have the requirements for on-site reinforcement of connections been defined in each case?
- Does an impact load or another extraordinary load need to be taken into account for the design of the Schöck Isokorb®?
- Is a sliding felt with the dynamic friction coefficient $\mu_G \leq 0.03$ specified for between the balcony slabs and the cantilevered walls?
- Is the balcony supported on the cantilevered wall secured against horizontal displacement?
- Is the type designation of the Schöck Isokorb® explicit in the plans? - Example: Schöck Isokorb® T type W-M4-V1-R90-H2500-L200

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Subject to technical changes

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