



## Technical Information according to EC2

### Schöck Isokorb® R for renovation

September 2018



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design support services**

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# Schöck Isokorb® R

## Planning advisory service

The engineers of Application Engineering are happy to advise you with static, design and building physical questions and produce for you proposals for solution with calculations and detail drawings.

For this please send your planning documents (ground plans, sections, static details) with information on the building project address to:

**Schöck Ltd**  
**Staniford House**  
**4 Wedgwood Road**  
**Bicester**  
**Oxfordshire OX26 4UL**

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# Notes

## Technical information

This technical information for the respective product applications is valid only in its totality and therefore may only be copied in full. With publication of texts and diagrams solely in extracts there is a danger of the dissemination of insufficient or even falsified information. Therefore the dissemination lies alone in the responsibility of the user or issuer!

- ▶ This technical information is based on German standards and takes into account the federal state specific approvals and standards.
- ▶ If installation takes place in another country please contact our structural engineers.
- ▶ The respective current technical information is to be applied.  
The respective currently valid technical information can be downloaded from [www.schoeck.com/download](http://www.schoeck.com/download).

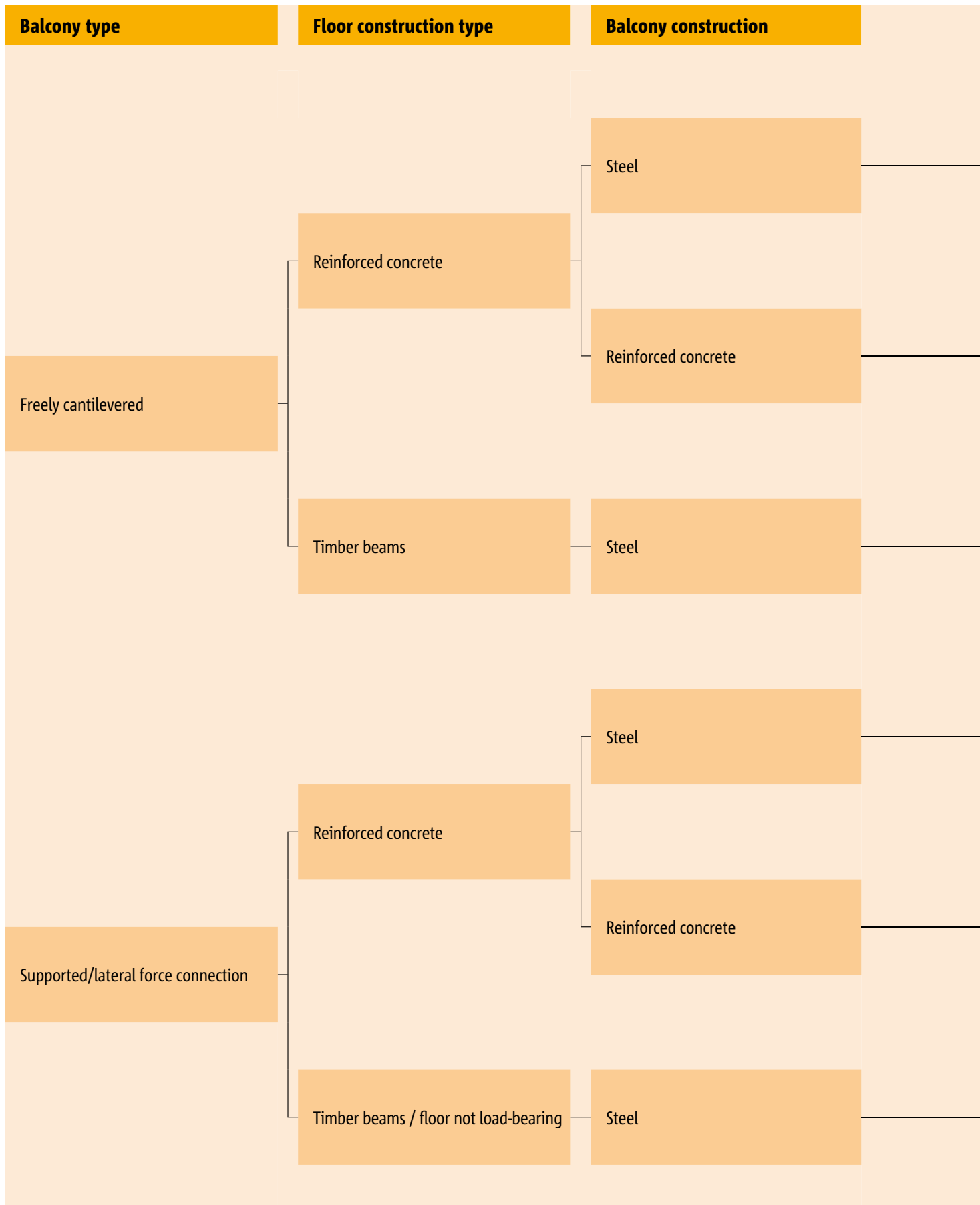
# Schöck Isokorb® R

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# Schöck Isokorb® R

## Connection variants / type overview

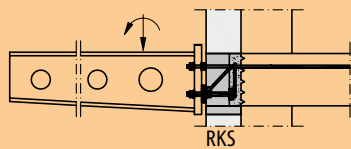


## Schöck Isokorb® type

Page

### RKS

Free cantilevered balconies



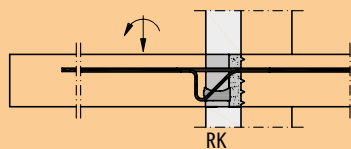
**Isokorb® height**  
160, 180, 200, 220 mm

**Isokorb® length**  
340 mm

Building physics 9 -14  
Planning principles 15 - 23  
Structural planning 31 - 44  
Building construction 89 - 96

### RK

Free cantilevered balconies



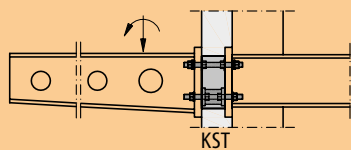
**Isokorb® height**  
180, 200, 220, 240, 250 mm

**Isokorb® length**  
1.00 m

Building physics 9 -14  
Planning principles 15 - 23  
Structural planning 45 - 56  
Building construction 97 - 105

### KST

Free cantilevered balconies



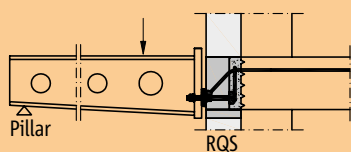
**Isokorb® height**  
Variable

**Isokorb® length**  
180 mm

Building physics 9 -14  
Planning principles 15 - 23  
Structural planning 57 - 60  
Building construction 107 - 111

### RQS

Supported balconies



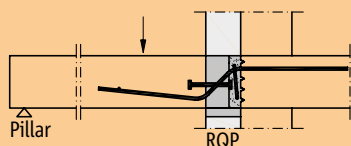
**Isokorb® height**  
160, 180, 200, 220 mm

**Isokorb® length**  
340 mm

Building physics 9 -14  
Planning principles 15 - 23  
Structural planning 61 - 72  
Building construction 113 - 120

### RQP and RQP+RQP

Supported balconies with point load peaks



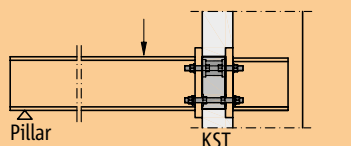
**Isokorb® height**  
180, 200, 220, 240, 250 mm

**Isokorb® length**  
360 - 660 mm

Building physics 9 -14  
Planning principles 15 - 23  
Structural planning 73 - 84  
Building construction 121 - 135

### KST

Supported balconies



**Isokorb® height**  
Variable

**Isokorb® length**  
180 mm

Building physics 9 -14  
Planning principles 15 - 23  
Structural planning 57 - 60  
Building construction 107 - 111

# Schöck Isokorb® R

## Approvals and directives

### Schöck Isokorb® type RK

For the Schöck Isokorb® type RK the special provisions of the general building supervisory approval document Z-15.7-240 apply with those additional and deviating provisions given in the building supervisory approval Z-15.7-297.

### Schöck Isokorb® type RQP / type RQP+RQP

For Schöck Isokorb® types RQP and RQP+RQP the special provisions of the general building supervisory approval document Z-15.7-239 apply with those additional and deviating provisions given in the building supervisory approval Z-15.7-297.

### Schöck Isokorb® type RKS / type RQS

For Schöck Isokorb® types RKS and RQS the special provisions of the general building supervisory approval document Z-15.7-292 apply with those additional and deviating provisions given in the building supervisory approval Z-15.7-298.

### Grouting mortar Hilti HIT-RE 500 V3 / fischer FIS EM

The subsequent connection of the tension and shear force bars of the Schöck Isokorb® to the as-completed floor takes place with the aid of reinforcement connection using grouting mortar Hilti HIT-RE 500 V3 or fischer FIS EM. With this, for Hilti HIT-RE 500 V3, the provisions of the general building supervisory approval document Z-21.8-2064 and the European technical approval ETA-16/0142 are to be observed. With regard to the grouting mortar fischer FIS EM the general building supervisory approval document Z-21.8-1874 and the European technical approval ETA-09/0089 apply.

According to the approval a drilling aid is to be used; the permitted drilling process is hammer drilling or diamond drilling in each case with drilling aid. If existing reinforcement is met while drilling, the drilling is to be discontinued. The mis-drilling (diameter  $\Phi_{s0}$ ) is to be mortared using HIT-RE 500 V3 or FIS EM and a new drill hole is to be created at a clear distance of at least  $2d_b$ .

### Sealing concrete PAGEL VERGUSS V1/50

The 4 cm wide joint between as-completed floor and insulation material of the slab connection is to be filled with grouting concrete PAGEL VERGUSS V1/50. PAGEL VERGUSS V1/50 conforms with the DAfStb Directive "Production and application of cement-bound grouting concrete and grouting mortar". The face of the as-completed floor is to be formed as rough or toothed joint in accordance with DIN EN 1992-1-1 (EC2): 2011-01 and DIN EN 1992-1-1/NA (NAD to EC2): 2011-01 (depending on Isokorb® type).

- Request for and download of Schöck Isokorb® - approval documents (contact see page 3)
- Request for and download of Hilti HIT-RE 500 V3 - approval documents (contact see page 87)
- Request for and download of fischer FIS EM - approval documents (contact see page 87)
- Request for and download of documents on PAGEL VERGUSS V1/50 (contact see page 87)

- ① Schöck Isokorb® R
- ② Reinforcement bars pasted into the as-completed floor using grouting mortar Hilti HIT-RE 500 V3 or fischer FIS EM
- ③ PAGEL VERGUSS V1/50 grouting concrete for optimum force transmission

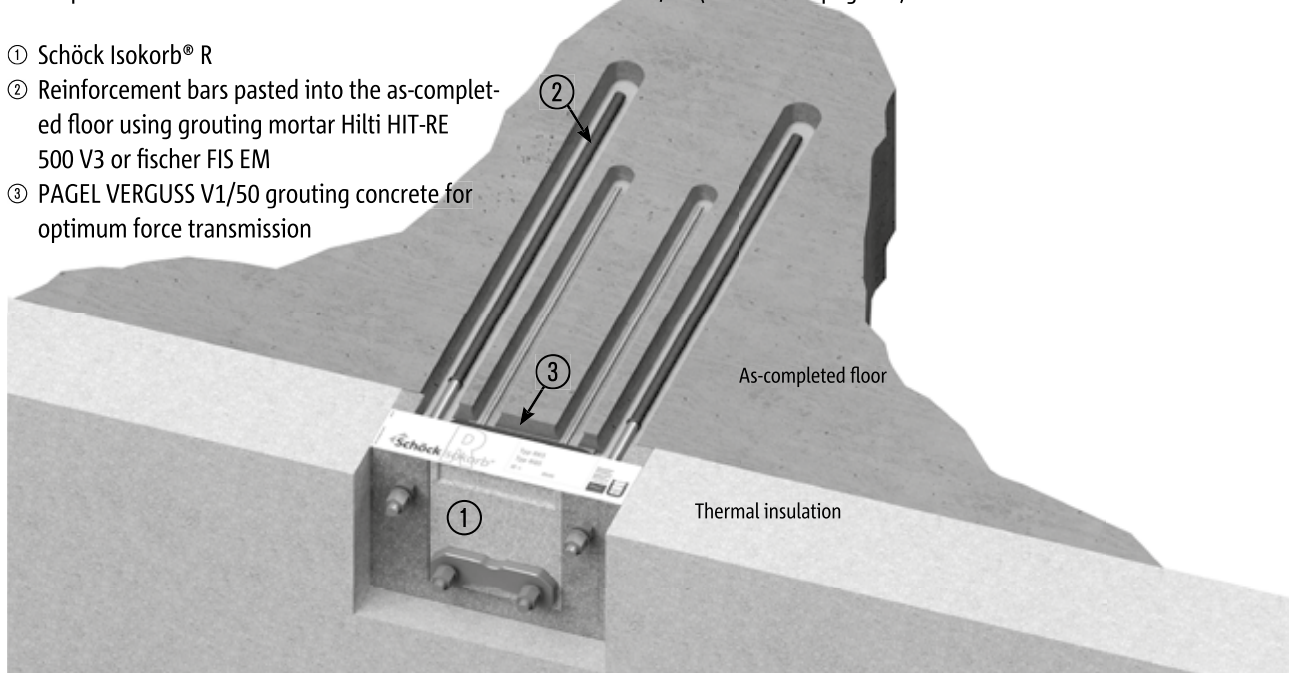


Fig.1: Installation situation: Schöck Isokorb® type RKS for the connection of reinforced concrete balconies to reinforced concrete floors

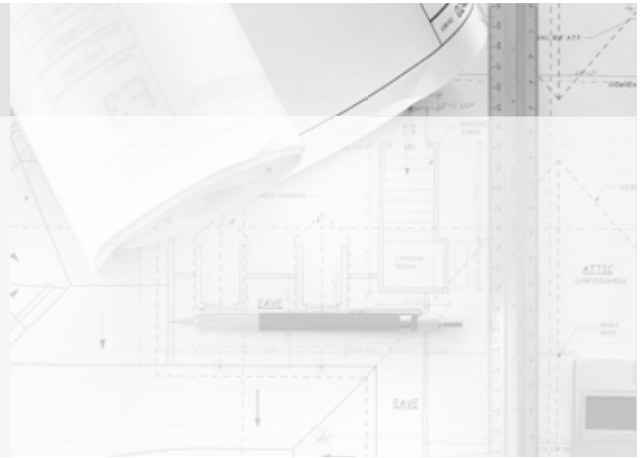


## **Building physics**

**Planning principles**

**Structural planning**

**Building construction**





## Thermal protection



### **Thermal protection**

For online technical information on thermal protection, visit:

[www.schoeck.co.uk/download/building-physics](http://www.schoeck.co.uk/download/building-physics)



## Building physics characteristic values



### Building physics characteristic values

For online building physics characteristic values, visit:

[www.schoeck.co.uk/download/building-physics](http://www.schoeck.co.uk/download/building-physics)

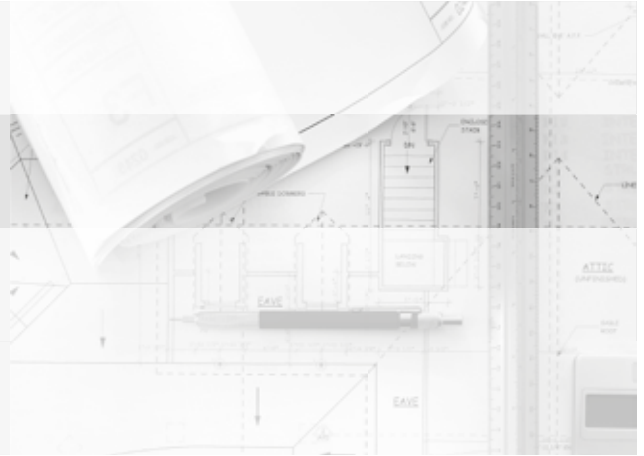


**Building physics**

**Planning principles**

**Structural planning**

**Building construction**



# Schöck Isokorb® R

## The project participants with their tasks

The "Renovation team" consists of architect, structural engineer and implementing firm.  
Success is also dependent on the collaboration of the team.

### Architect

- Coordination of the renovation
- Research planning documents (architecture and bearing structure)
- Investigate (structural component geometry)
  - floors and walls (material, thickness)
- Agree design concept for balcony structural engineer
  - balcony type: freely cantilevered /supported
  - balcony construction: steel / reinforced concrete
  - selection Schöck Isokorb® R
- Implementation- and detail planning

### Structural engineer

- Investigate (load-bearing system)
  - assessment load-bearing structure (planning documents, measurement)
  - assessment material structure such as, for example, concrete quality, reinforcement ratio etc.  
(Methods see page 17)
- Assessment of load-bearing capacity of existing load-bearing system
- Design according to DIN EN 1992-1-1 (EC2): 2011-01 and DIN EN 1992-1-1/NA (NAD to EC2): 2011-01
- Selection Schöck Isokorb® R (see Chapter Load-bearing structure planning)
- Production of calculations and engineering drawings

### Implementing firm (construction supervision)

- Integration in building survey and planning (possibly)
- Fabrication of the mortared slab connections
- Management of assembly protocol

The firm entrusted with the fabrication of the retrospectively mortared slab connections must possess a valid proof of suitability with regard to the "Requirements on the firm for the production of reinforcement connections using retrospectively mortared in reinforcement bars" in accordance with the general building supervisory approval document Z-21.8-2064, Section 4.1 as well as Annexes 10-12 or Z-21.8-1874, Section 4.1, Annexes 9-11.

### Schöck application technology

Advice with static, structural and building physical questions on the Schöck Isokorb® R.



# Schöck Isokorb® R

## Boundary conditions / Stock-taking

### Boundary conditions

The framework for the possible Schöck Isokorb® R balcony connection is formed by the existing building. With the planning using the Schöck Isokorb® R it is absolutely essential that this is assessed in all important parameters and is to be included in the planning:

<b>Structural component geometry</b>	The existing building is to be surveyed with detailed measurements of the building geometry. Here the complete substance of the building should be examined (inspection of the structural component geometry).
<b>Load-bearing system</b>	The load-bearing system is to be surveyed by the structural engineer and is to be subsequently assessed. Particular attention should be paid here to the floors, downstand beams and the walls (assessment load-bearing system).
<b>Construction technique</b>	The building technique (reinforced concrete floor, ribbed floor, timber beam floor etc.) must be input into the assessment of the load-bearing system.
<b>Reinforcement in the existing floor</b>	If position, cross-section and quality of the existing reinforcement bars is not apparent, this must be established using methods suitable for this based on building documents. (see below) Attention is to be paid, even at the planning, for an arrangement of the required drill holes, which do not lead to a damaging of the existing reinforcement.
<b>Electrical lines and sanitary piping</b>	Attention is to be paid, even at the planning, for an arrangement of the required drill holes, which do not lead to a damaging of the electrical lines and sanitary pipelines in the existing floor.
<b>Concrete strength of the existing floor</b>	The concrete strength of the existing floor is important determining factor for the professional design of the Isokorb® R. (see below).
<b>Conditions of the building activity</b>	Building (un-) occupied?

### Methods of stock-taking

The assessment of concrete strength, reinforcement ration and exact position of the reinforcement etc. is critical for a subsequent professional planning.

<b>Assessment of concrete strength</b>	<ul style="list-style-type: none"> <li>• Pull-out Test, simple and precise, not non-destructive</li> <li>• Rebound Test (jumping spring), not so precise, non-destructive</li> <li>• Coring, not non-destructive</li> <li>• (Chemical methods)</li> </ul>
<b>Assessment of reinforcement ratio with position</b>	<ul style="list-style-type: none"> <li>• Possibly cut off existing balcony, (tension bars and/or stirrups visible)</li> <li>• Employment of reinforcement scanners/detectors</li> </ul>

For example the firm Hilti offers appropriate systems, which supply very accurate results on the existing reinforcement in reinforced concrete structural components. On request you receive at Hilti the contact data of appropriate firms which are specialised in the detection of existing reinforcement.



Hilti Customer Service: Tel. +49 (0)800-888 55 22 (toll-free)

# Schöck Isokorb® R

## Schöck renovation principle / functional principle Isokorb® R

The mode of operation of the existing load-bearing structure is to be checked by a structural engineer and the load-bearing capacity is to be verified according to the standards valid today. The load-bearing capacity of the existing floor as a rule is the decisive determining factor for the balcony connected using the Schöck Isokorb®.

### Cantilever length with renovation of an existing balcony

It is to be assumed that at the time of the construction of the member an upper reinforcement sufficient for the cantilever length of the existing balcony was laid in the existing floor. This existing reinforcement is to be checked by the structural engineer according to the current valid standards.

As the upper reinforcement is subsequently cemented, the Schöck Isokorb® R has a smaller lever arm (a smaller static effective depth) than the original concreted-through reinforced concrete slab. Through this the allowable moment is smaller.

### Supporting width of a new balcony built on to an existing floor

The possible supporting width of a subsequently attached balcony is based on the load-bearing capacity of the existing floor, existing downstand beams and existing walls. The existing reinforcement is to be checked by the structural engineer according to the current valid standards.

### Functional principle Isokorb® R

- ① Schöck Isokorb® R
- ② Reinforcement bars bonded in the existing floor using grouting mortar: Hilti HIT-RE 500 V3 according to the general building supervisory approval document Z-21.8-2064 and the European Technical Approval ETA-16/0142. Alternatively the fischer FIS EM according to the general building supervisory approval document Z-21.8-1874 and the European Technical Approval ETA-09/0089. Following approval, a drilling aid is to be used, permitted drilling procedures are hammer drillings and diamond drillings. If, with drilling, an existing reinforcement is contacted, drilling is to be broken off. The mis-drilling (diameter  $\Phi_{s0}$ ) is to be filled with Hilti HIT-RE 500 V3 mortar and a new drill hole is to be created with a clear separation of at least  $2d$
- ③ Poured joint  $d = 40$  mm filled with:  
Grouting concrete: PAGEL VERGUSS V1/50 in accordance with DAfStb Directive "Manufacture and application of cement-bonded grouting concrete and grouting mortar"

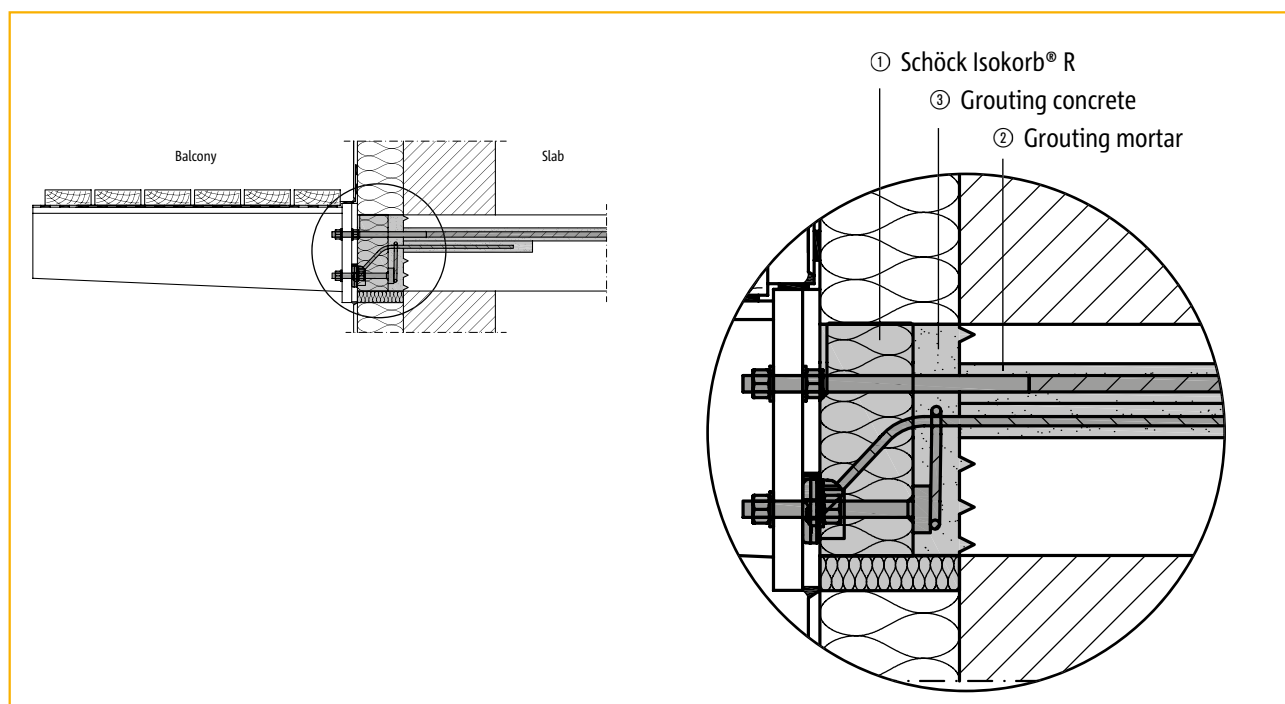


Fig.5: Functional principle Isokorb® R

# Schöck Isokorb® R

## Design aid

Schöck Isokorb® type <sup>1)</sup> with	Balcony construction					
	Steel			Reinforced concrete		
	freely cantilevered <sup>3)</sup>	supported	suspended	Using in-situ concrete		Precast construction
Freely cantilevered <sup>3)</sup>				supported	supported	
Reinforced concrete floor: Concrete strength $\geq$ C20/25	RKS	RQS	RQS <sup>5)</sup>	RK	RQP RQP+RQP	RKS
Timber beam floor	KST <sup>4)</sup>	KST	KST	–	–	–
Wall connection	–	KST	KST <sup>6)</sup>	–	–	–

<sup>1)</sup> Deliverable Isokorb® heights see-page 29

<sup>2)</sup> Assessment of the floor construction type by the planner required.

<sup>3)</sup> Connection variants as a rule only possible when renovation of an existing balcony is carried out for reasons of energy.

<sup>4)</sup> The floor construction must be opened for installation

<sup>5)</sup> The load-bearing capacity given in the design tables reduces through the additional compression force perpendicular to the joint

<sup>6)</sup> The additional compression force perpendicular to the joint must be able to be taken up from the wall support

# Schöck Isokorb® R

## Application examples

### Height offset

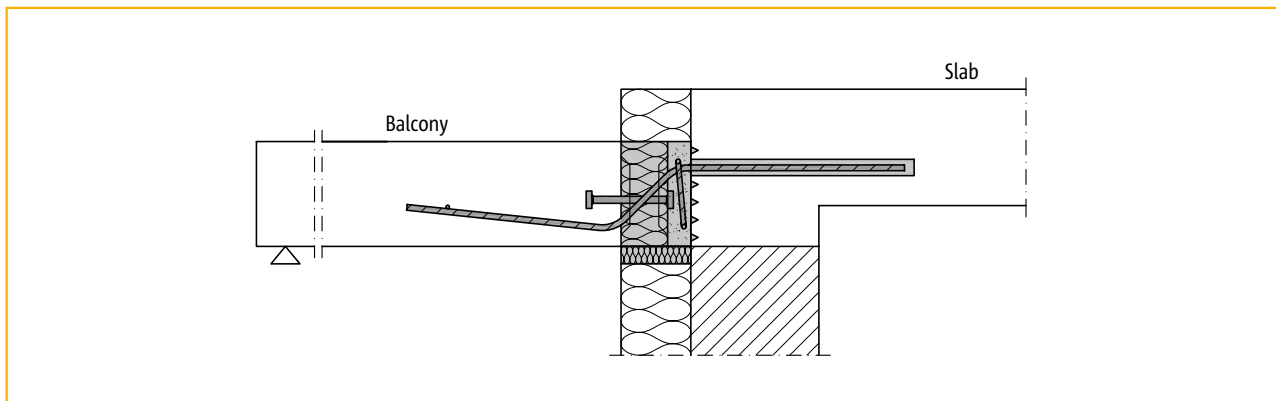


Fig.6: Connection with thermal insulation composite system (TCIS) and small height offset using type RQP

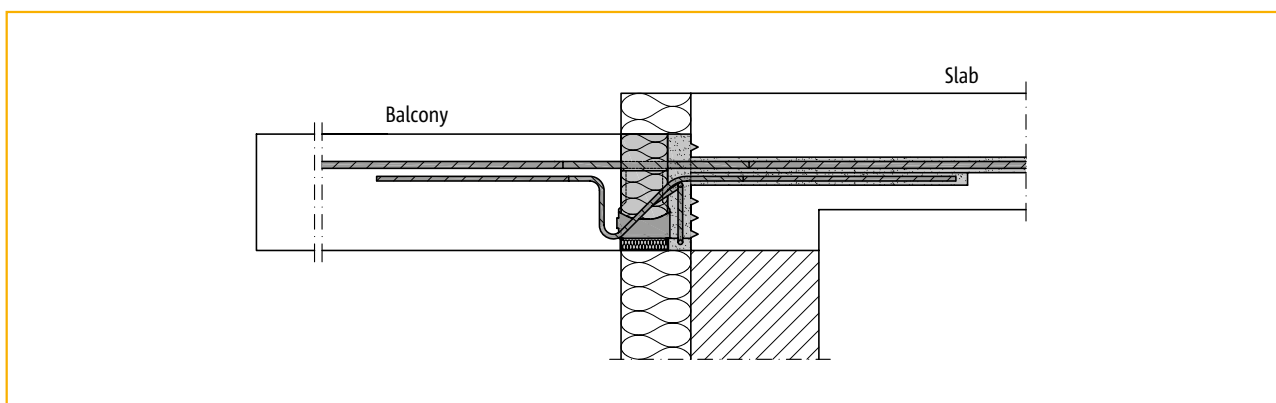


Fig.7: Connection with thermal insulation composite system (TCIS) and small height offset using type RK

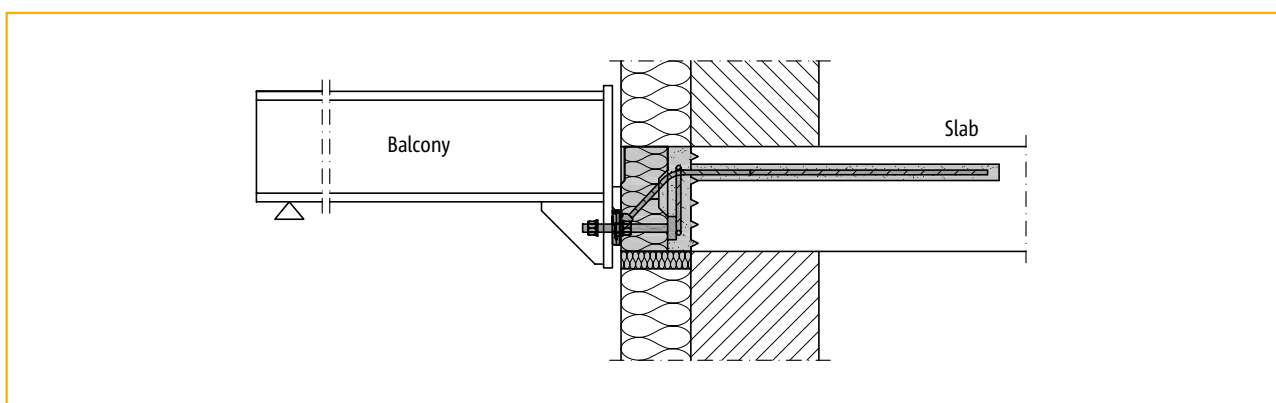


Fig.8: Barrier-free transition through height offset using type RQS

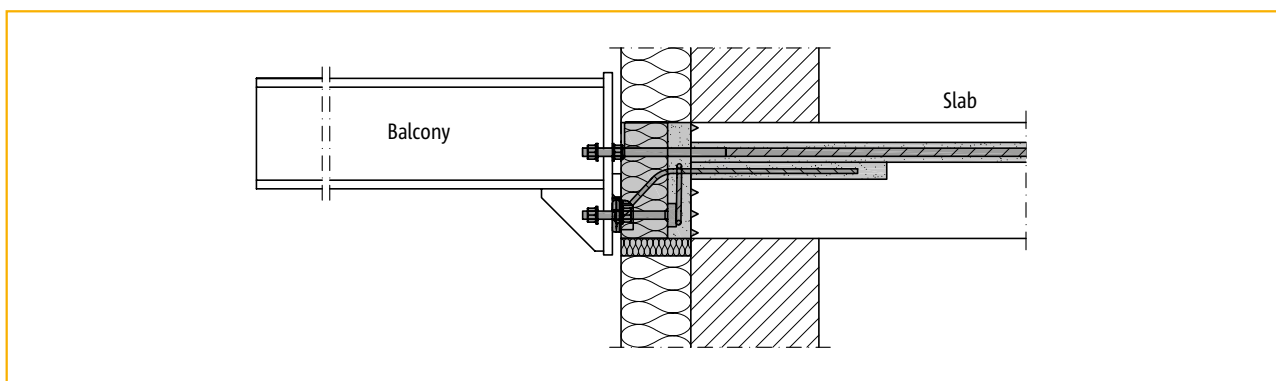


Fig.9: Barrier-free transition through height offset using type RKS

# Schöck Isokorb® R

## Application examples

### Prefabricated component

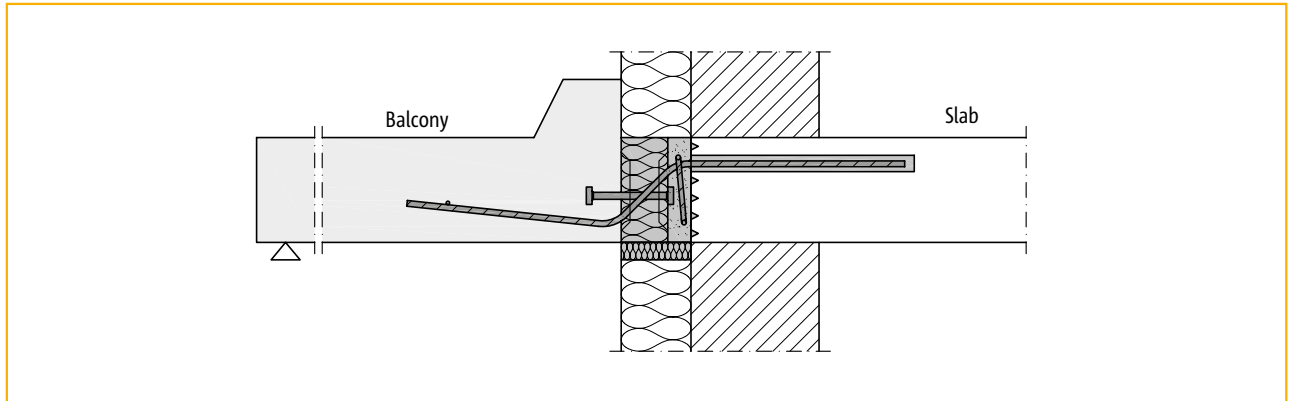


Fig.10: Connection of a prefabricated balcony on an existing floor using type RQP

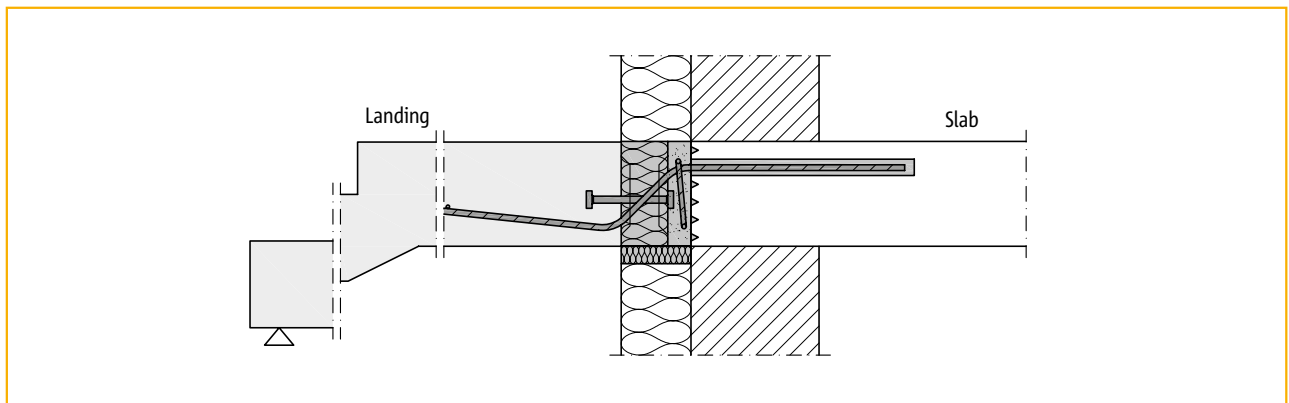


Fig.11: Connection of flight of stairs using type RQP

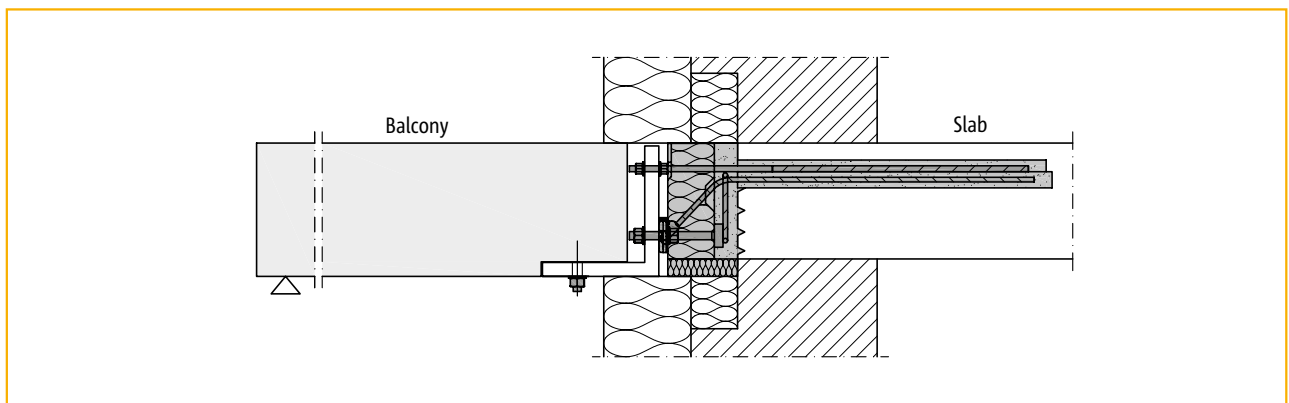


Fig.12: Connection of a prefabricated balcony on an existing floor using type RKS, supported structure

# Schöck Isokorb® R

## Application examples

Thin floors  $h_p \geq 12\text{cm}$

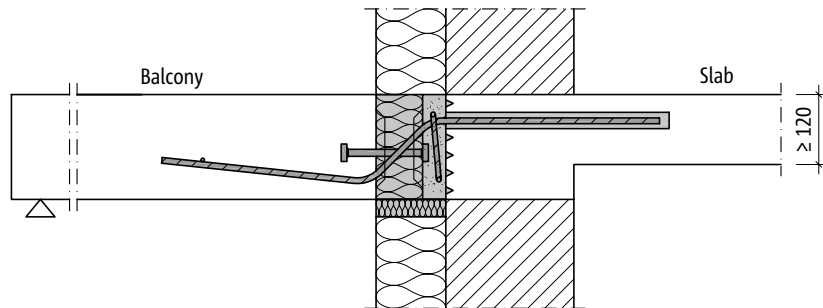


Fig.13: Connection with thermal insulation composite system (TCIS) and thin floor with type RQP

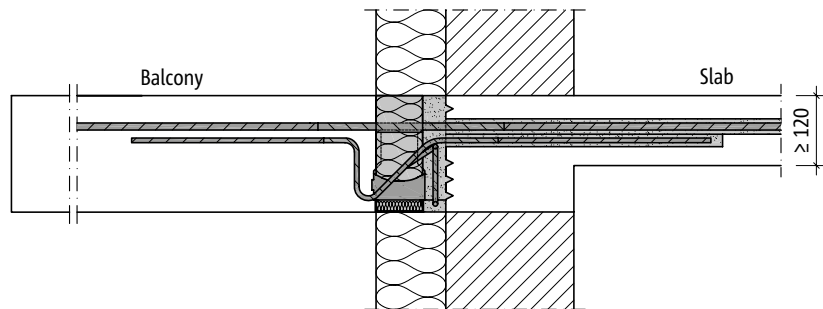


Fig.14: Connection with thermal insulation composite (TCIS) system and thin floor with type RK

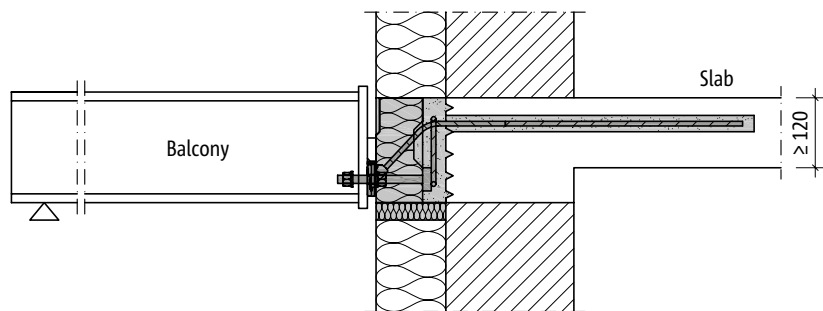


Fig.15: Connection with thermal insulation composite (TCIS) system and thin floor with type RQS

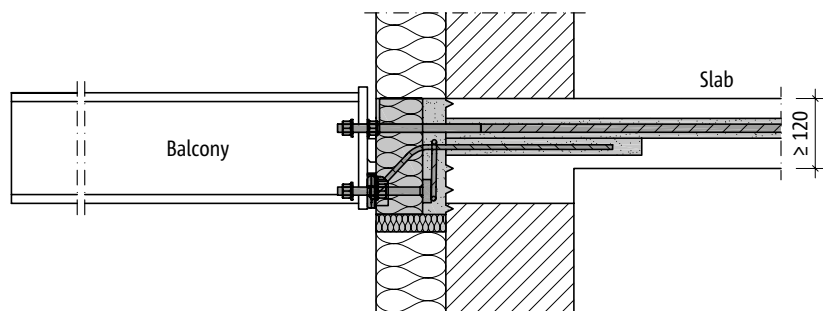


Fig.16: Connection with thermal insulation composite (TCIS) system and thin floor with type RKS

# Schöck Isokorb® R

## Application examples

### New construction/Immediate renovation

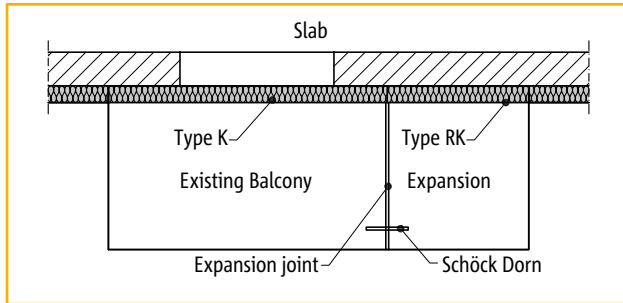


Fig.17: Balcony freely cantilevered with direct support with extension of an existing balcony - plan view

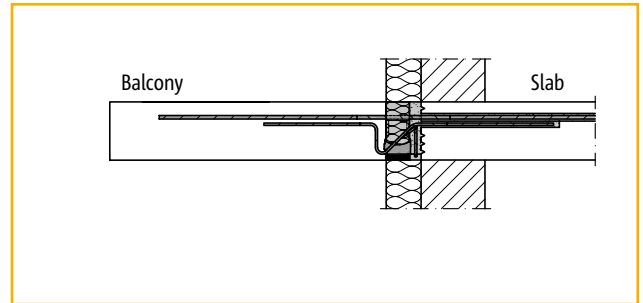


Fig.18: Balcony freely cantilevered with direct support with extension of an existing balcony - cross-section

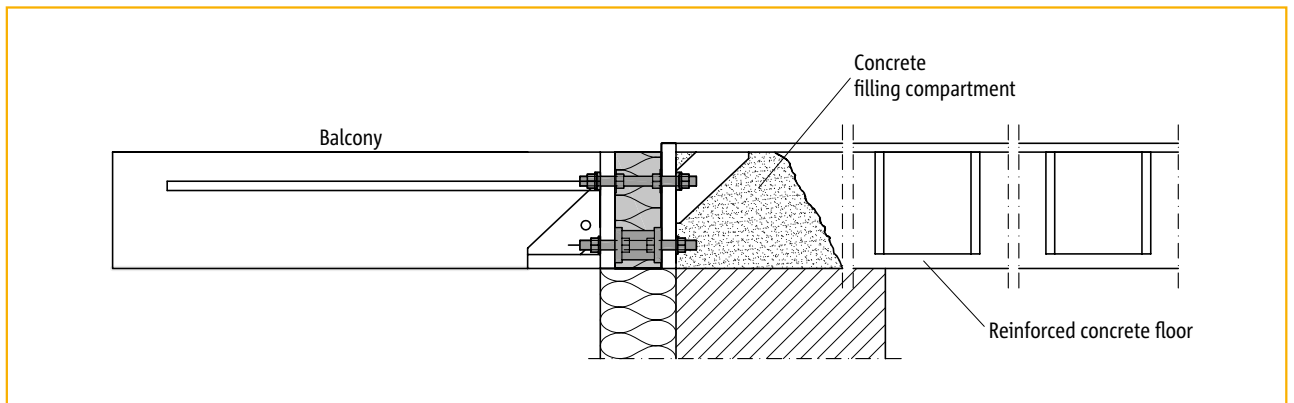


Fig.19: Balcony freely cantilevered, connected with type KST (in-situ concrete)

### Timber balcony floors

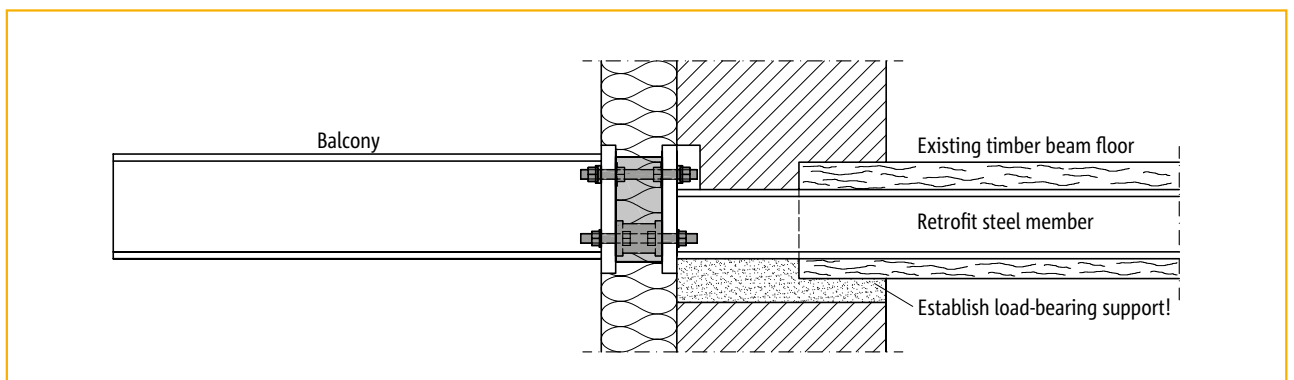


Fig.20: Balcony freely cantilevered, connected with type KST on timber balcony floor (steel balcony)

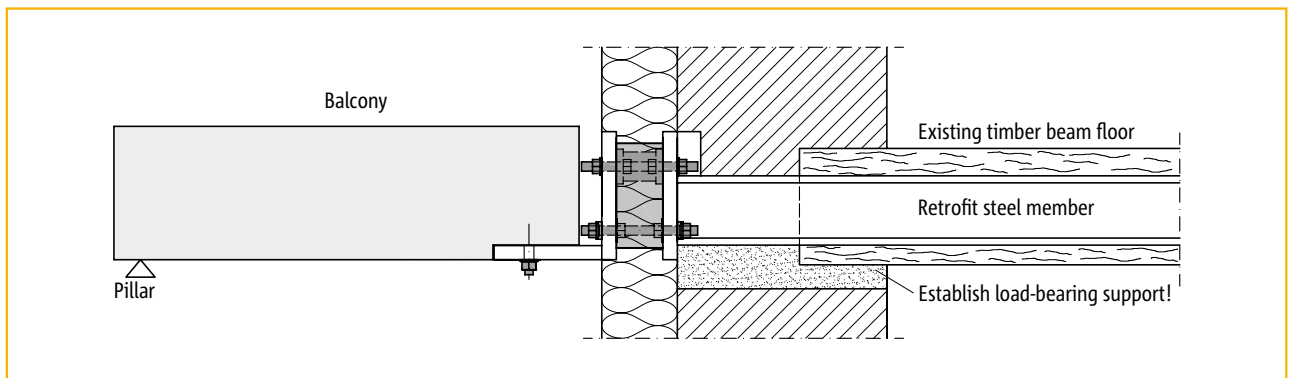


Fig.21: Balcony supported, connected with type KST on timber balcony floor (concrete prefabricated component)



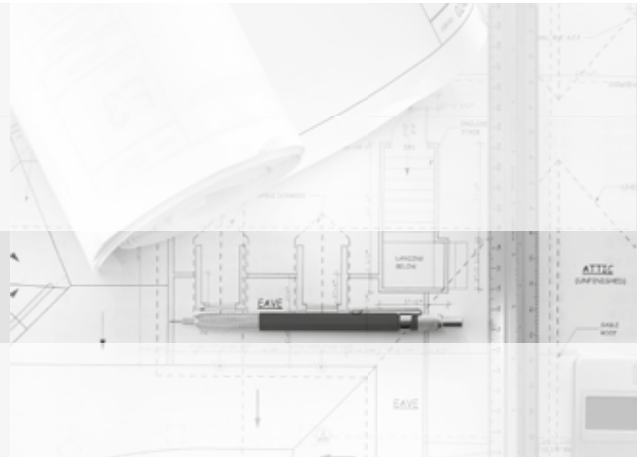


**Building physics**

**Planning principles**

**Structural engineering**

**Building construction**



# Schöck Isokorb® R

## Information on structural engineering

### Planning / Planning documents<sup>1)</sup>

The Schöck Isokorb® connection is to be planned on an engineering basis and to be documented on design drawings, the planning documents must be available on the construction site.

The requirements from Sect. 3: "Regulations for design and dimensioning" and Sect. 4: "Regulations for implementation" from the respective general building supervisory approvals are to be complied with in the planning and design. The following Isokorb® approvals form the basis for this (see also page 8):

Type RK: Z-15.7-297 and Z-15.7-240

Type RQP, type RQP+RQP: Z-15.7-297 and Z-15.7-239

Type RKS, type RQS: Z-15.7-298 and Z-15.7-292

(Request for and download of Schöck Isokorb® approval documents; contact see page 3)

If position, cross-section and quality of the existing reinforcement bars are not apparent, these must be established using suitable methods for this (e.g. reinforcement detection equipment) on the basis of the building documentation and for the overlap joints entered in the design drawings and in the implementation phase marked on the structural component.

It is to be checked that the strength class of the concrete of the existing floor, in which the Schöck Isokorb® is to be placed, is not lower than C20/25.

The following must be entered as a minimum on the design drawing:

- Concrete strength class of the existing floor
- Hammer drilling process with drilling aid.
- Diameter, concrete cover, centre-to-centre distance and setting depth of the mortared reinforcement bars depending on the Isokorb® type used.
- Marking lengths dimension  $l_m$  and  $l_v$  respectively  $l_{e,tot}$  on the combined elongation for Hilti HIT-RE 500 V3 in accordance with ETA-16/0142, Annex B17, for Fischer FIS EM in accordance with ETA-09/0089, Annex B 9.
- Type of preparation of the front face of the existing structural component including thickness of the concrete layer which, if necessary, has to be removed, and specifying the surface roughness of the front face.

### Injections system Hilti HIT-RE 500 V3 and Fischer FIS EM

The bonding of the Schöck Isokorb® R in the existing floor is to be carried out using the Hilti HIT-RE 500 V3 or Fischer FIS EM injection systems. For Hilti HIT-RE 500 V3 the regulations from the approval documents ETA-16/0142 and Z-21.8-2064 apply.

For Fischer FIS EM the regulations from the approval documents ETA-09/0089 and Z-21.8-1874 apply.

- Separations of the reinforcement bars according to: "General design regulations for mortared reinforcement bars" according to ETA-16/0142, Annex B2.
- Minimum concrete cover for mortared reinforcement bars according to DIN EN 1992-1-1 (EC2): 2011-01 and DIN EN 1992-1-1/NA (NAD to EC2): 2011-01 and ETA-16/0142, Annex B5.
- Following approval a drilling aid is to be used, permitted drilling procedure is hammer drilling with drilling aid. If, with drilling, an existing reinforcement is contacted, the drilling is to be broken off. The mis-drilling (diameter  $\Phi_{s0}$ ) is to be mortared using Hilti HIT-RE 500 V3 and a new drilling hole is to be created with a clear separation of at least  $2d_0$ .

Installation instructions and further information on the installation of the Schöck Isokorb® R types see Chapter Building Construction pages 85 - 135.

### Drill hole arrangement

- It is imperative that care is taken already in planning that an arrangement of necessary drill holes does not lead to damage of existing reinforcement as well as of existing electrical lines and sanitary pipelines in the existing floor.
- The risk of mis-drilling (reinforcement strikes) can be minimised in that the Isokorb® height is selected smaller than the floor height.

<sup>1)</sup> Requirements from the Schöck Isokorb® R approvals Z-15.7-297 and Z-15.7-298

# Schöck Isokorb® R

## Information on structural engineering

### Grouting concrete PAGEL VERGUSS V1/50

The 4 cm width joint between existing floor and insulation material of the slab connection is to be filled with PAGEL VERGUSS V1/50 grouting concrete. PAGEL VERGUSS V1/50 conforms with the DAFStb Directive "Production and application of cement-bound grouting concrete and grouting mortar".

Installation instructions and further information on the installation of the Schöck Isokorb® R types see chapter Building construction page 85 - 135.

### Shearing force transmission between grouting concrete and existing floor

In the connection area of the Schöck Isokorb® R the front face of the existing floor construction must be configured as rough or toothed joint according to DIN EN 1992-1-1 (EC2): 2011-01 and DIN EN 1992-1-1/NA (NAD to EC2): 2011-01 (depending on Isokorb® type). This ensures the transmission of shear force in the joint between grouting concrete and the front face of the existing floor.

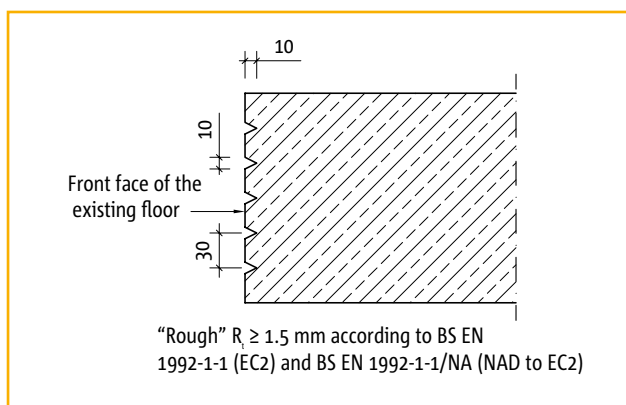


Fig.22: Shear joint: "rough"

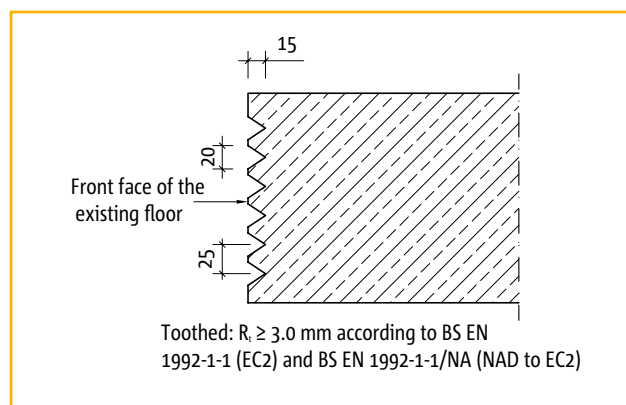


Fig.23: Shear joint: "toothed"

Schöck Isokorb® type	RK	RKS	RQP	RQP+RQP	RQS8	RQS10	RQS12
Surface properties of the front face of the existing floor	rough	rough	rough	rough	rough	toothed	toothed

### Area of application

- Existing floors cannot be toughened up using the Schöck Isokorb® R types.
- The area of application of the Schöck Isokorb® R types extends to floors and balcony constructions with predominantly static, evenly distributed working loads according to DIN EN 1991-1-1/NA (NAD to EC2), Table 6.1DE .

### Required floor properties

Minimum concrete strength :  $\geq C20/25$   
 Minimum floor thickness: depending on Isokorb® type  
 Reinforcement (position, cross-section and quality): depending on the planned Isokorb® R connection variant

### Bending of reinforcing steels

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

Attention: If original Schöck Isokorb® reinforcing steel is to be bent or bent and straightened on site, the compliance with and monitoring of the relevant requirements (building supervisory approval, DIN EN 1992-1-1 (EC2) and DIN EN 1992-1-1/NA (NAD to EC2)) lies outside the influence of the Schöck Bauteile GmbH. Therefore, in such cases, our warranty expires.

# Schöck Isokorb® R

## Fatigue resistance / Expansion joint spacing

### Impact from temperature change

Other than the stability of structural components the fatigue resistance is to be verified additionally, if they are continuously subjected to changing and repetitive loading. The verification of the operational stability respectively fatigue resistance excludes a material fatigue and thus the failure of the structural component over the planned service life.

Balconies, access balconies and canopy constructions, as external structural components, are subjected to different and changing weather influences. The temperature variations resulting from this cause considerable deformations and changes to length in this structural components.

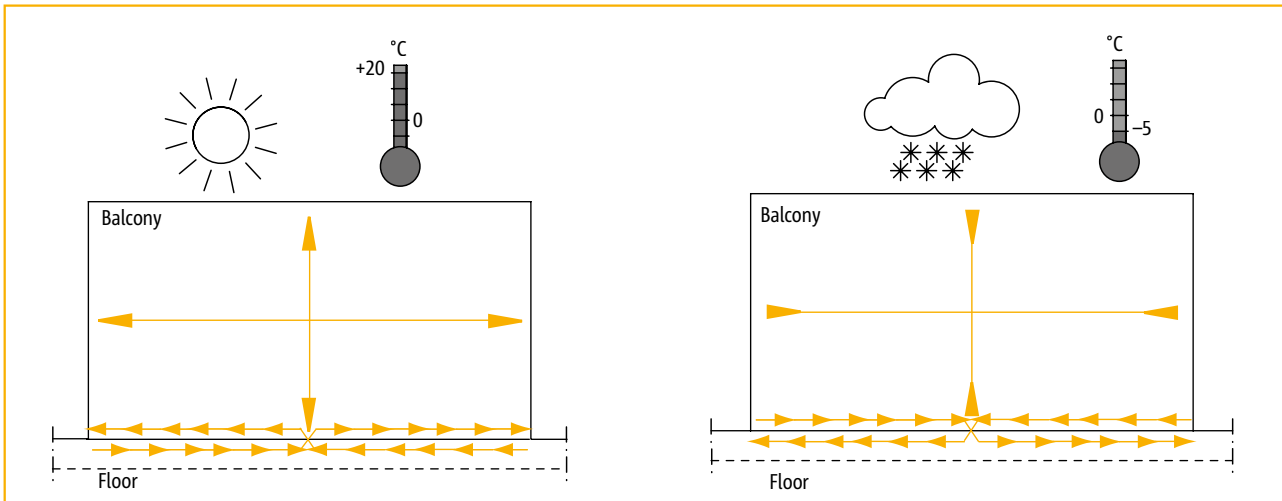


Fig.24: Plan view: Temperature-conditioned deformations cause restraints in the area of the connection

With regard to a connection using Schöck Isokorb® this means: As a result of the expansion and shortening of the balcony slabs the bars and pressure elements fed through the thermal insulation are deflected up to several millimetres transversely. In order that the bars and the concrete can withstand many thousands of temperature changes without damage, the allowable expansion joint spacings, determined through trials and anchored in the approval document, may not be exceeded. In practice this means that the resistance against fatigue of balcony connections is verified through the compliance with the respective allowable expansion joint spacings.

### The expansion joint spacings are to be limited in accordance with the approval

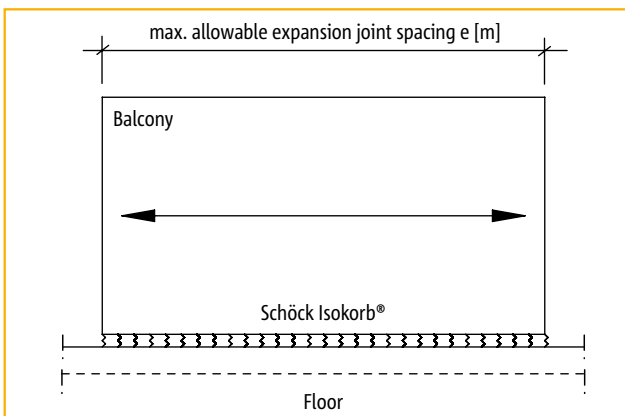


Fig.25: Plan view: Balcony

The connection is permanently resistant against fatigue with structurally constraint-free configuration and with compliance with the maximum allowable expansion joint spacings in accordance with the approval.

Various Schöck Isokorb® types have, as a result of the different construction methods and bar diameter different maximum expansion allowable joint spacings.

With the configurations at the corners the maximum allowable expansion joint spacing reduces to  $e/2$ .

Maximum allowable expansion joint spacings of the Isokorb® R, see design tables in the following product chapters page 31 - 84.

# Schöck Isokorb® R

## Product programme / Information

Schöck Isokorb® R				
Basic type	Load-bearing level	Height H [mm]	Length [mm]	Type designation
Type RK	RK25, RK45	180, 200, 220, 240, 250	1000	RK25-H180
Type RQP	RQP10, RQP40, RQP60, RQP70	160, 180, 200 160, 180, 200 180, 200 180, 200	360 360 460 660	RQP10-H180
Type RQP+RQP	RQP10+RQP10, RQP40+RQP40, RQP60+RQP60, RQP70+RQP70	160, 180, 200 160, 180, 200 180, 200 180, 200	360 360 460 660	RQP10+RQP10-H180
Type RKS	RKS10, RKS14	160, 180, 200, 220	340	RKS10-H180
Type RQS	RQS8, RQS10, RQS12	160, 180, 200, 220 180, 200, 220	340 340	RQS8-H180

### Type designation in planning documents

(Statics, invitation to tender, implementation plans, ordering)

E. g.:

**RK25-V6-H180**

Type/Load capacity

Isokorb® height

### Notes

- ▶ The Isokorb® height H [mm] given in the table is the respective dimension without the Neopor shuttering on the underside. The thickness of the the shuttering on the underside is 30mm; type RK **without** shuttering on the underside.
- ▶ The Isokorb® length [mm] given in the table is the respective dimension **including** the lateral Neopor shuttering. The thickness of the the shuttering laterally on both sides respectively 30mm; with type RK **laterally** on both sides 20mm.
- ▶ In the following type chapters are presented the individual Isokorb® R types with the respective product-specific information such as element arrangement, product description, design table, design example, checklist etc.



## Schöck Isokorb® type RKS

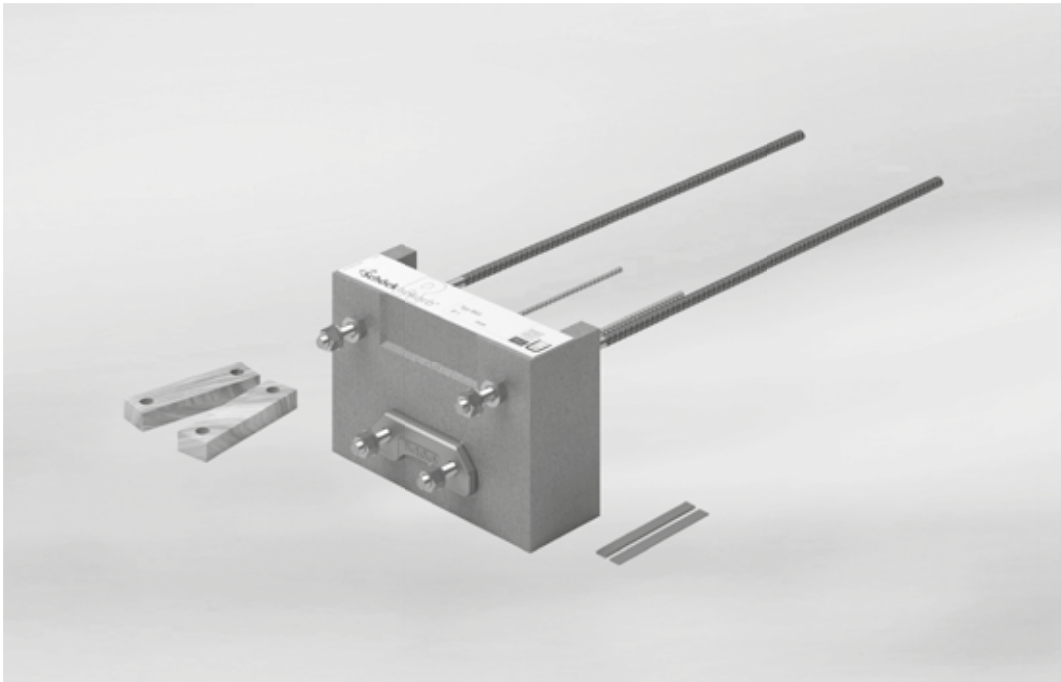


Fig.26: Schöck Isokorb® type RKS

The Schöck Isokorb® type RKS is a load-bearing thermal insulation element for the connection of steel balconies to existing reinforced concrete floors. It transfers negative moments, positive shear forces and horizontal forces.

RKS

Structural engineering

# Schöck Isokorb® type RKS

## Approvals / Building materials / Corrosion protection

### Approvals

Schöck Isokorb® type RKS:	Z-15.7-298
Hilti grouting mortar HIT-RE 500 V3:	Z-21.8-2064 and ETA-16/0142
fischer grouting mortar FIS EM:	Z-21.8-1874 and ETA-09/0089
PAGEL grouting concrete V1/50:	DAfstb Directive "Production and application of cement-bound grouting cement and grouting mortar"

### Schöck Isokorb® construction materials

Reinforcing steel approval	B500 B according to DIN 488-1, BSt 500 NR according to general building supervisory approval
Pressure bearing in the grouting concrete	S 235 JRG2 according to DIN EN 10025-2 for pressure plates
Stainless steel	Material No.: 1.4401, 1.4404, 1.4362, 1.4462 and 1.4571, S 460 according to approval number.: Z-30.3-6 Structural components and fasteners made from stainless steels or BSt 500 NR
Load plates	Material No.: 1.4404, 1.4362 and 1.4571 or higher quality e.g. 1.4462
Shims	Material No.: 1.4401 S 235, thickness 2 mm and 3 mm
Insulation material	Neopor® – This insulation material is polystyrene hard foam and a registered trademark of the firm BASF, $\lambda = 0.031 \text{ W}/(\text{m}\cdot\text{K})$ , Building material classification B1 (flame resistant)

### Connected components

Reinforcing steel	B500A or B500B according to DIN 488-1, or DIN EN 1992-1-1 (EC2) and DIN EN 1992-1-1/NA
Concrete	Floors: normal concrete; indicative minimum strength class $\geq \text{C } 20/25$
Structural steel	Balconies: at least S 235; strength class, static verification and corrosion protection according to structural engineer

### Corrosion protection

- ▶ The stainless steel used with the Schöck Isokorb® type RKS complies with the Material No.: 1.4362, 1.4401, 1.4404 or 1.4571. According to the general building supervisory approval document Z-30.3-6 Annex 1 „Structural components and connecting elements made from stainless steels“ are rated in Resistance Class as III/medium.
- ▶ The connection of the Schöck Isokorb® type RKS in conjunction with a galvanised or corrosion protection coated face plate, with regard to contact corrosion resistance, is uncritical (see approval Z-30.3-6, Section 2.1.6.4). With connections using Schöck Isokorb® type the surface of the base metal (face plate made from steel) is significantly greater than that of the stainless steel (bolts, shims and dogs), so that a failure of these connections as a result of contact corrosion is excluded.



# Schöck Isokorb® type RKS

## Examples for element configuration

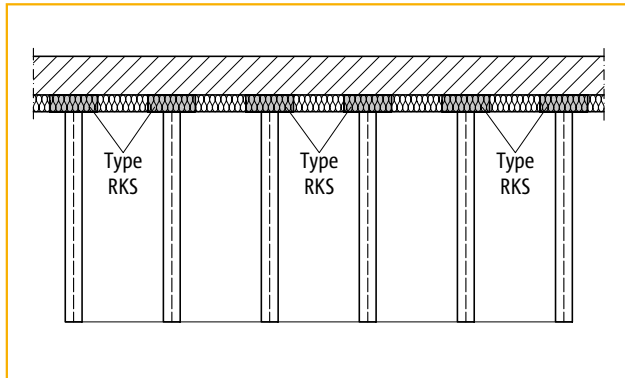


Fig.27: Renewal of an existing balcony using type RKS14, freely cantilevered

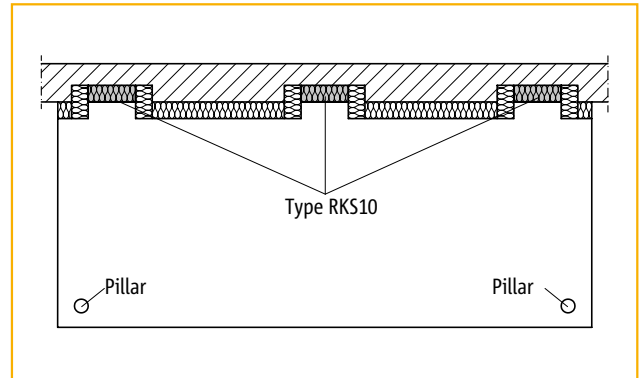


Fig.28: Connection of a balcony to an existing floor using type RKS10, supported construction

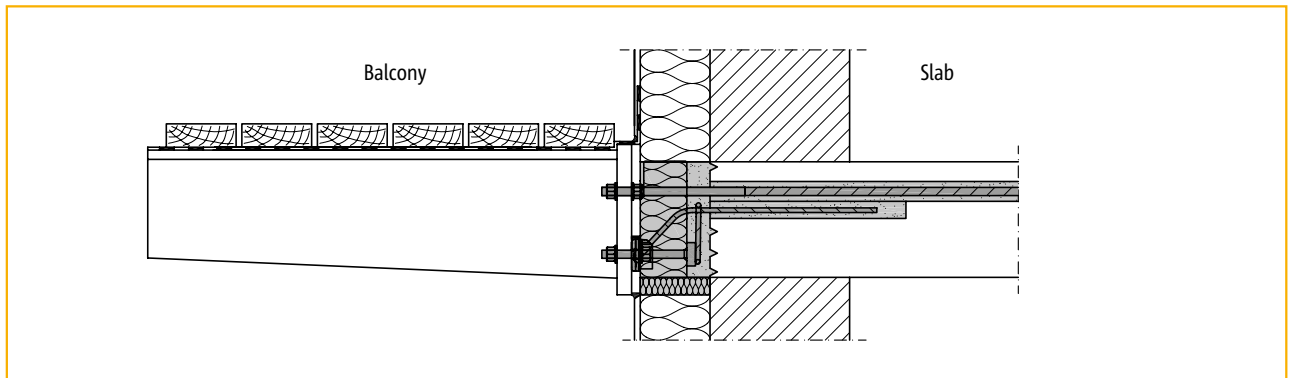


Fig.29: Balcony freely cantilevered using type RKS14 with renewal of an existing balcony

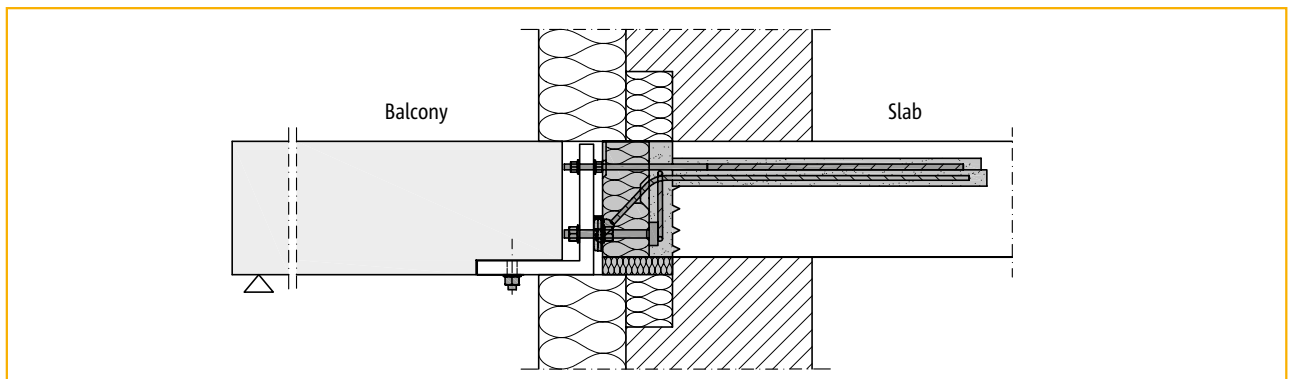


Fig.30: Connection of a prefabricated balcony to an existing floor using type RKS10, support construction

RKS

Structural engineering

# Schöck Isokorb® type RKS10

## Product description

RKS

RKS10

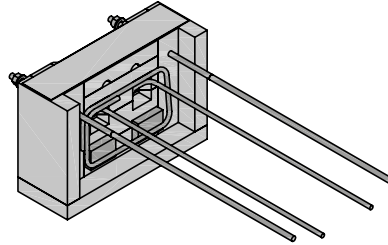


Fig.31: Isometric drawing: Schöck Isokorb® type RKS10

RKS10

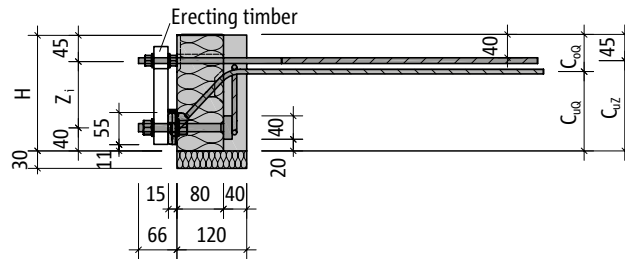


Fig.32: Section: Schöck Isokorb® type RKS10

RKS10

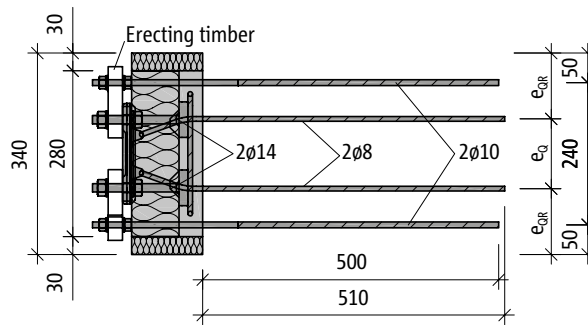


Fig.33: Plan view: Schöck Isokorb® type RKS10

Structural engineering

RKS10

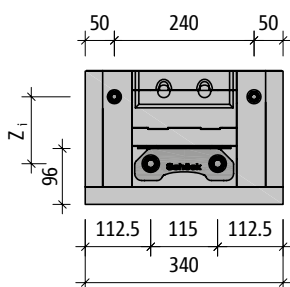


Fig.34: Side elevation from outside: Schöck Isokorb® type RKS10

RKS10

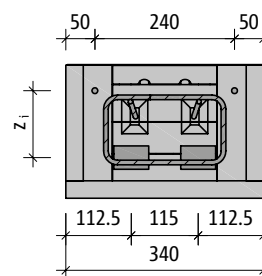


Fig.35: Side elevation from inside: Schöck Isokorb® type RKS10

# Schöck Isokorb® type RKS14

## Product description

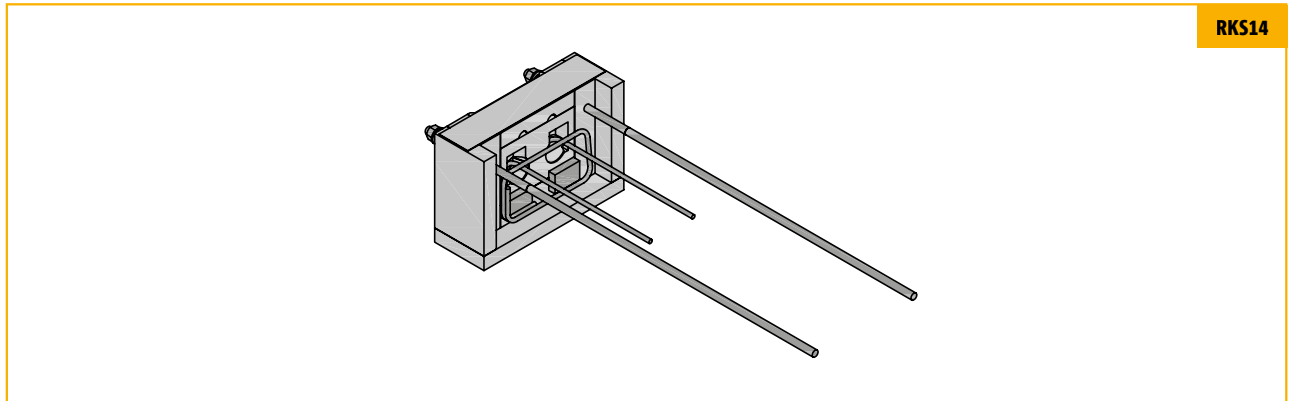


Fig.36: Isometric drawing: Schöck Isokorb® type RKS14

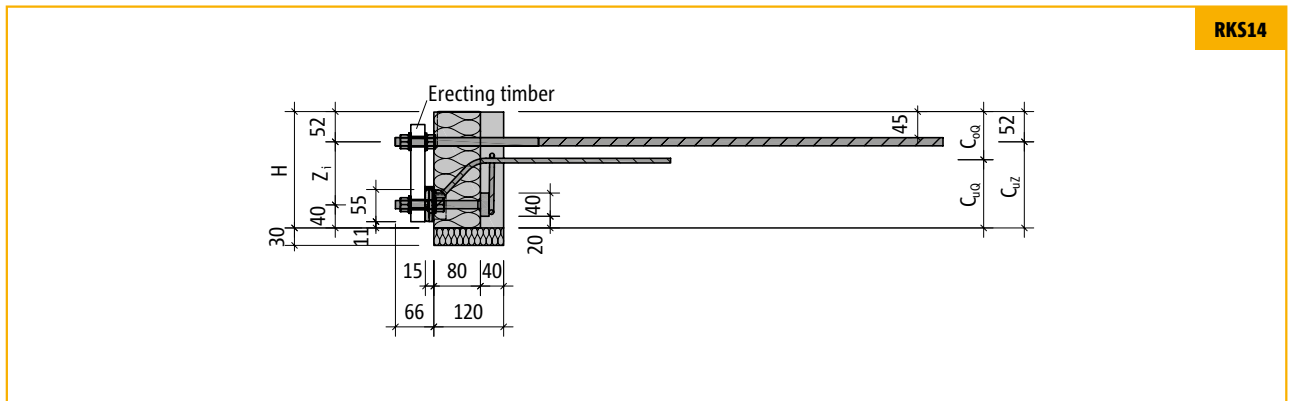


Fig.37: Section: Schöck Isokorb® type RKS14

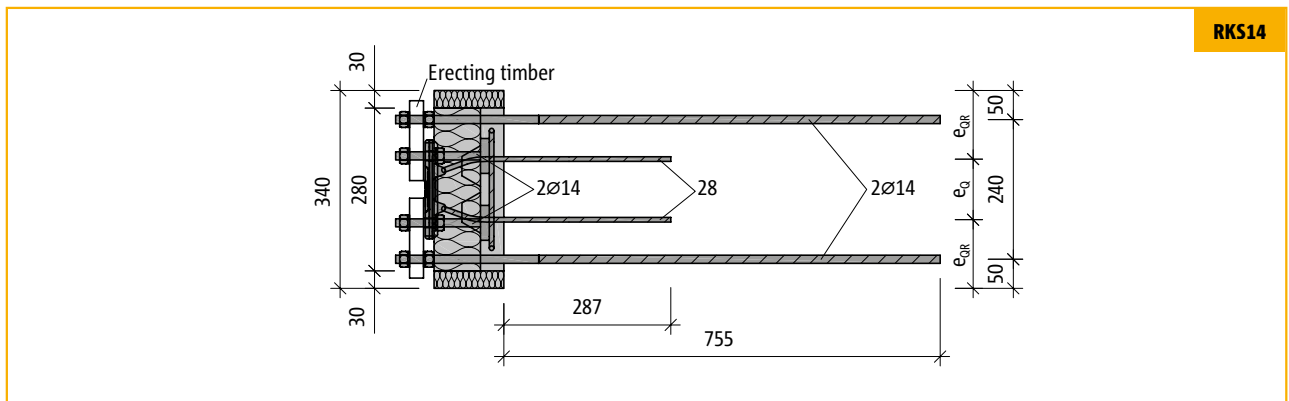


Fig.38: Plan view: Schöck Isokorb® type RKS14

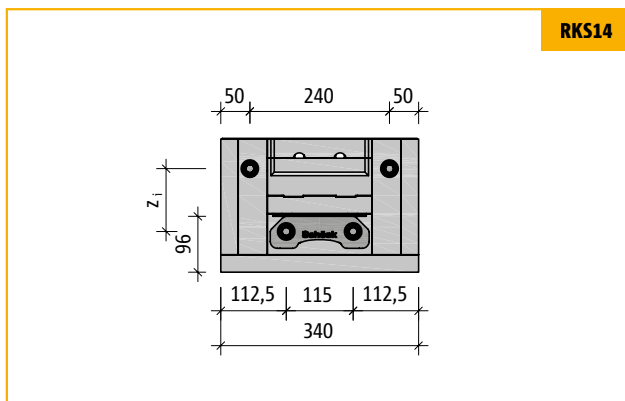


Fig.39: Side elevation from outside: Schöck Isokorb® type RKS14

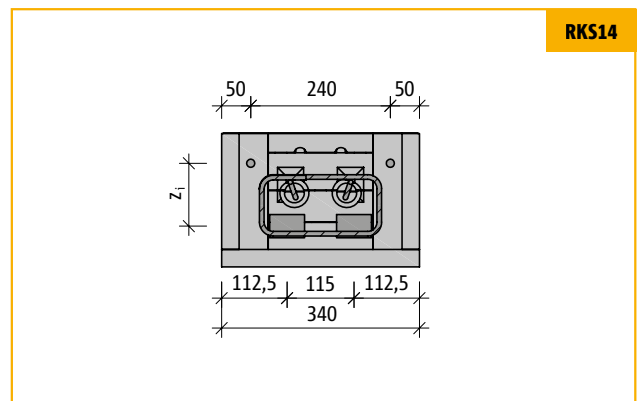


Fig.40: Side elevation from inside: Schöck Isokorb® type RKS14

RKS

Structural engineering

# Schöck Isokorb® type RKS

## Product description

Schöck Isokorb® type		RKS10				RKS14			
Isokorb® height H [mm]		160	180	200	220	160	180	200	220
Product Description	Isokorb® length [mm]	340				340			
	Tension bars ( $l_{f, floor}$ in mm)	2 $\varnothing$ 10 (500)				2 $\varnothing$ 14 (755)			
	Shear force bars ( $l_{f, floor}$ in mm)	2 $\varnothing$ 8 (510)				2 $\varnothing$ 8 (287)			
	Pressure bearing	2 $\varnothing$ 14				2 $\varnothing$ 14			
	$z_i$ [mm]	75	95	115	135	68	88	108	128
	$C_{oz}$ [mm]	45	45	45	45	52	52	52	52
	$C_{uz}$ [mm]	115	135	155	175	108	128	148	168
	$C_{oQ}$ [mm]	44	44	64	84	44	64	84	104
	$C_{uQ}$ [mm]	116	136	136	136	116	116	116	116
	$e_Q$ [mm]	104	118	118	118	104	104	104	104
$e_{QR}$ [mm]	118	111	111	111	118	118	118	118	

- $l_v$  settlement depth
- $z_i$  inner lever arm
- $C_{oz}$  centre-to centre distance tension bars from upper edge Isokorb®
- $C_{uz}$  centre-to centre distance tension bars from lower edge Isokorb®(floor edge)
- $C_{oQ}$  centre-to centre distance shear force bars from upper edge Isokorb®
- $C_{uQ}$  centre-to-centre distance shear force bars from lower edge Isokorb®(floor edge)
- $e_Q$  centre distance of shear force bars between each other
- $e_{QR}$  centre distance of shear force bars from outer edge Isokorb®

RKS

# Schöck Isokorb® type RKS

## Design table

Design values are to be referred to the centre of the wall

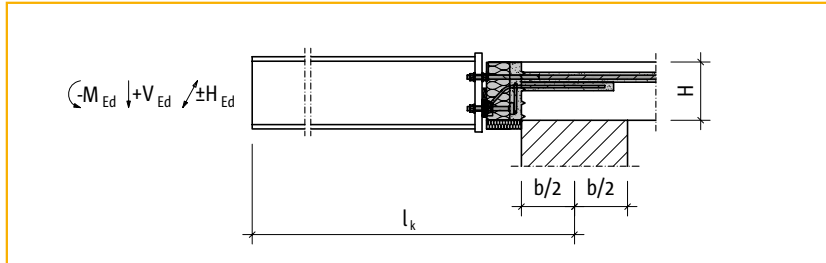


Fig.41: Load case: Downward acting forces

Schöck Isokorb® type		RKS10	RKS14
Design values for	Concrete strength	≥ C20/25	
	Surface floor front face	rough	rough
Isokorb® height H [mm]		<b>M<sub>Rd</sub> [kNm]</b>	
	160	-3.1	-6.3
	180	-3.9	-8.1
	200	-4.7	-10.0
	220	-5.5	-11.8
		<b>Shear force V<sub>Rd</sub> [kN]</b>	
	160 - 220	+28.0	+15.0
		<b>Horizontal force H<sub>Rd</sub> [kN]<sup>1)</sup></b>	
	160 - 220	±2.5	±2.5
		<b>Deformation factor tan α [%]</b>	
	160	0.5	0.9
	180	0.4	0.7
	200	0.3	0.6
	220	0.3	0.5
		<b>Torsion bar C [kNm/rad]</b>	
	160	600	700
	180	1000	1200
	200	1500	1700
220	1800	2400	
	<b>Max. expansion joint spacing [m]</b>		
160	5.1	5.1	
180 - 220	5.8	5.1	

<sup>1)</sup> For the acceptance of the existing horizontal force (H<sub>Ed</sub>) parallel to the outside wall a minimum shear force of 2.9 · H<sub>Ed</sub> is to be ensured.

# Schöck Isokorb® type RKS

## Notes

**The information on the load-bearing structure planning on pages 26 - 29 is to be observed.**

### Lifting loads

Upwards directed shear forces (e.g. from wind suction) CANNOT be taken up ordinarily by Schöck Isokorb® type RKS.

### Verification in the serviceability limit state

For the verification in the serviceability limit state the spring values of the Schöck Isokorb® are to be taken into account. So far as an investigation of the vibration behaviour of the steel structure to be connected is necessary, the additional deformation resulting from the Schöck Isokorb® is to be taken into account

### Camber

The deformation factors given in the table result alone from the elastic steel elongation of the Schöck Isokorb®. The final camber of the balcony results from the deformation calculation of the connected balcony structure together with the deformation from the Schöck Isokorb®.

Deformation ( $w_{\ddot{u}}$ ) as a result of Schöck Isokorb®:

$$w_{\ddot{u}} [\text{mm}] = \tan \alpha \cdot l_k \cdot 10 M_{\text{Ed}} / M_{\text{Rd}}$$

$\tan \alpha$  Deformation factor (see table)

$l_k$  Projection length [m]

$M_{\text{Ed}}$  Relevant bending moment for the calculation of the camber.

The load combination to be applied for this can be made by the structural engineer.

$M_{\text{Rd}}$  Design value bending moment for the Schöck Isokorb®

### Note:

The given values serve solely as approximation for the estimate for the deformation from Schöck Isokorb®. Further deformation amounts, which have to be considered, can added be to this.

### Expansion joint spacing

The determination of the allowable joint spacing is to be based on a balcony slab made from reinforced concrete securely connected using the steel beams. If structural measures have been carried out for the movability of the balcony slab and the individual steel beams, then only the spacing of the immovably configured connections are relevant.

### Edge and element spacing

The distance of the structural component axis of the Schöck Isokorb® type RKS and type RQS to the edge of the structural component must be at least 190 mm, the axis-to-axis distance between between each other may not be less than 340 mm.

### Installation tolerances

Due to the construction, only tolerances in the vertical direction can be balanced out via the Schöck Isokorb® type RKS/RQS with the assembly of the steel beams. The tolerance is: +10 mm vertical and  $\pm 0$  mm horizontal. The Isokorb® types RKS/RQS must therefore must be placed according to precise measurement details.

The firm entrusted with the production of the subsequently mortared-in slab connections is to be informed of the accuracies in the implementation plans by the structural engineer. In order to enable the functionally correct connection of the shell with the steel structure without adjustment and reworking, the observation of the tolerances must be checked by the building supervision and taken into account in the steel structure.

### Tip:

A start with the fabrication of the new balcony (steel construction or prefabricated component) should first take place when the Schöck Isokorb® R types are placed and their final position has been determined through an accurate measurements (mm).

# Schöck Isokorb® type RKS

## Design example

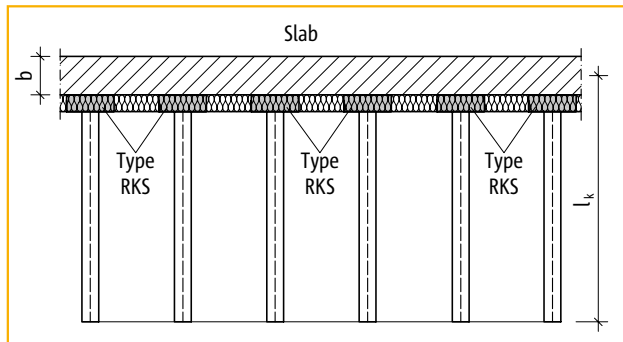


Fig.42: Plan view

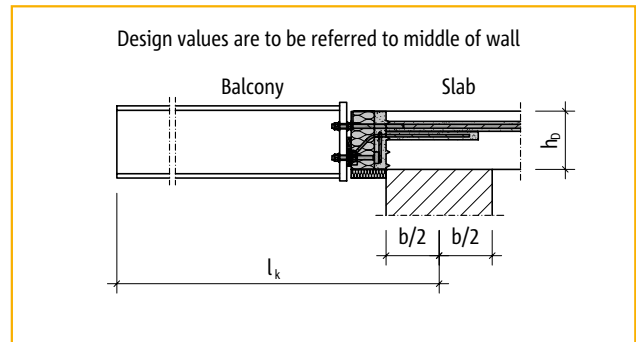


Fig.43: Section

### Planned: Balcony freely cantilevered using type RKS

Geometry:	Cantilever length ( $l_k$ is to be referred to middle of wall)	$l_k$	= 1.80 m
	Floor slab thickness	$h_b$	= 200 mm
	Centre-to-centre distance of the Isokorb® connections	$a$	= 0.70 m
Design loads:	Self-weight with light screed	$g$	= 0.6 kN/m <sup>2</sup>
	Imposed load	$q$	= 4.0 kN/m <sup>2</sup>
	Self-weight balustrade	$F_G$	= 0.75 kN/m
	Horizontal load on balustrade (cross beam height 1.0 m)	$H_G$	= 0.5 kN/m

### Design

internal forces:

$$M_{Ed} = -[(\gamma_G \cdot g + \gamma_Q \cdot q) \cdot l_k^2 / 2 \cdot a + \gamma_G \cdot F_G \cdot l_k \cdot a + \gamma_Q \cdot \psi_0 \cdot H_G \cdot 1.0 \cdot a]$$

$$M_{Ed} = -[(1.35 \cdot 0.6 + 1.5 \cdot 4.0) \cdot 1.8^2 / 2 \cdot 0.7 + 1.35 \cdot 0.75 \cdot 1.8 \cdot 0.7 + 1.5 \cdot 0.7 \cdot 0.5 \cdot 1.0 \cdot 0.7]$$

$$M_{Ed} = -9.4 \text{ kNm}$$

$$V_{Ed} = +(\gamma_G \cdot g + \gamma_Q \cdot q) \cdot l_k \cdot a + \gamma_G \cdot F_G \cdot a$$

$$V_{Ed} = +(1.35 \cdot 0.6 + 1.5 \cdot 4.0) \cdot 1.8 \cdot 0.7 + 1.35 \cdot 0.75 \cdot 0.7$$

$$V_{Ed} = +9.3 \text{ kN}$$

### Existing: Reinforced concrete floor slab

Geometry:	Floor slab thickness	$h_b = 200 \text{ mm}$
Reinforcement:	Avail. tension reinforcement in projection direction	R335
	Diameter of the mat longitudinal bars	8 mm
	Concrete cover of the upper tension reinforcement in projection direction	$c_v = 30 \text{ mm}$
Minimum concrete quality:		inside C20/25
Existing:		Concrete quality B25 with existing floor

# Schöck Isokorb® type RKS

## Design example / Notes

### Verification Schöck Isokorb® type

Selected: Schöck Isokorb® type RKS14-V8-H200

$$\begin{aligned} M_{Ed} = -9.4 \text{ kNm} &\leq M_{Rd} = -10.0 \text{ kNm} \quad \checkmark && (M_{Rd} \text{ see page 37}) \\ V_{Ed} = +9.3 \text{ kN} &\leq V_{Rd} = +15.0 \text{ kN} \quad \checkmark && (V_{Rd} \text{ see page 37}) \\ H_{Ed} = 0.0 \text{ kN} &\leq H_{Rd} = \pm 2.5 \text{ kN} \quad \checkmark && (H_{Rd} \text{ see page 37}) \end{aligned}$$

### Verification of the existing floor for the existing loading

Required cross-section of the reinforcement in the existing floor for the further transmission of the tension forces from the bending moment ( $k_d$  procedure):

$$d_{\text{floor}} = 200 - 30 - 8/2 = 166 \text{ mm (166 cm)}$$

$$M_{Ed} = 9.4 \text{ kNm}$$

$$b = 0.45 \text{ m}$$

The impact width "b" of the floor reinforcement is determined by the structural engineer, it may not be greater than the centre-to-centre distance "a" of the Isokorb® connections.

$$k_d = d/\sqrt{M_{Ed}/b}$$

$$k_d = 16.6/\sqrt{9.4/0.45}$$

$$k_d = 3.63$$

$$k_s = 2.39$$

(from  $k_d$  table for rectangular sections without compression reinforcement for bending with longitudinal force and concrete strength C20/25)

$$a_s = k_s \cdot M_{Ed} / d$$

$$a_s = 2.39 \cdot 9.4 / 16.6$$

$$a_s = 1.35 \text{ cm}^2/0.45 \text{ m}$$

$$a_{s,\text{req}} = 1.35 \text{ cm}^2/0.45 \text{ m} \leq a_{s,\text{prov}} = 1.51 \text{ cm}^2/0.45 \text{ m} \rightarrow (R335: 3.35 \text{ cm}^2/\text{m} \cdot 0.45 \text{ m}) \quad \checkmark$$

In the case  $a_{s,\text{req}} > a_{s,\text{prov}}$  reduce loading and / or cantilever length  $l_k$  reduce to  $a_{s,\text{req}} \leq a_{s,\text{prov}}$ .

The available bonding length  $l_v = 755 \text{ mm}$  of the tension bars type RKS14 results from taking as a basis the maximum anchoring and/or lap length according to DIN EN 1992-1-1 (EC2) and DIN EN 1992-1-1/NA (NAD to EC2), a concrete cover  $c_1 = 30 \text{ mm}$  and stainless steel thread length on  $c_1 = 60 \text{ mm}$  of the front face of the floor as well as a maximum bar spacing of the tension bars of  $8 \varnothing_s$ .

$$l_v = l_0 + c_1 + 4 \varnothing_s$$

$$l_v = 639 \text{ mm} + 60 \text{ mm} + 4 \cdot 14 \text{ mm}$$

With an exceeding of the spacing of the tension bars of  $8 \varnothing_s$  the lap length of the floor and Isokorb® reinforcement according to DIN EN 1992-1-1 (EC2), Section 8.7.3 and DIN EN 1992-1-1/NA (NAD to EC2), NCI to 8.7.3 must be checked.

Already during planning, watch out for conflict between the Isokorb® bars and the existing floor reinforcement.

The existing floor cannot be toughened with the Isokorb®.



# Schöck Isokorb® type RKS10

## Steel construction / on site face plates

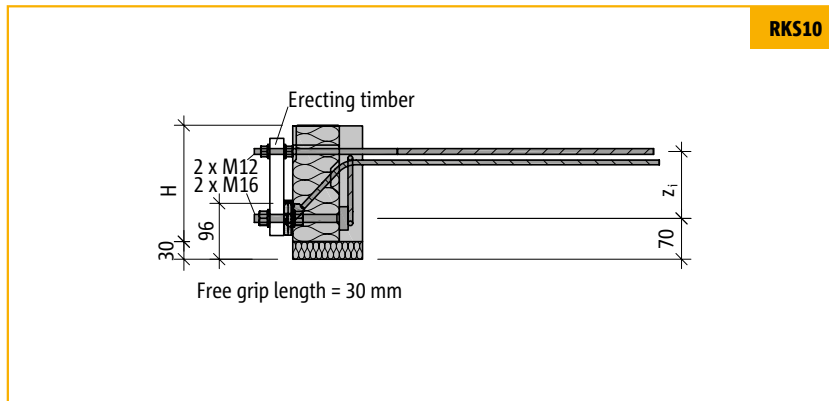


Fig.44: Side elevation: Schöck Isokorb® type RKS10

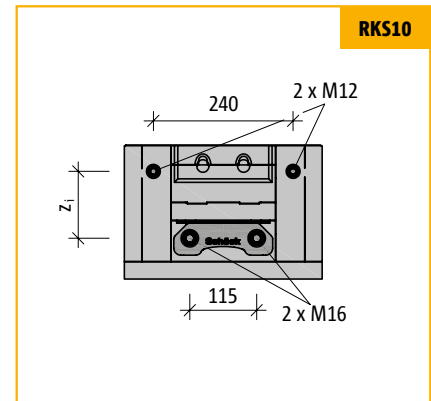


Fig.45: Front view: Schöck Isokorb® type RKS10

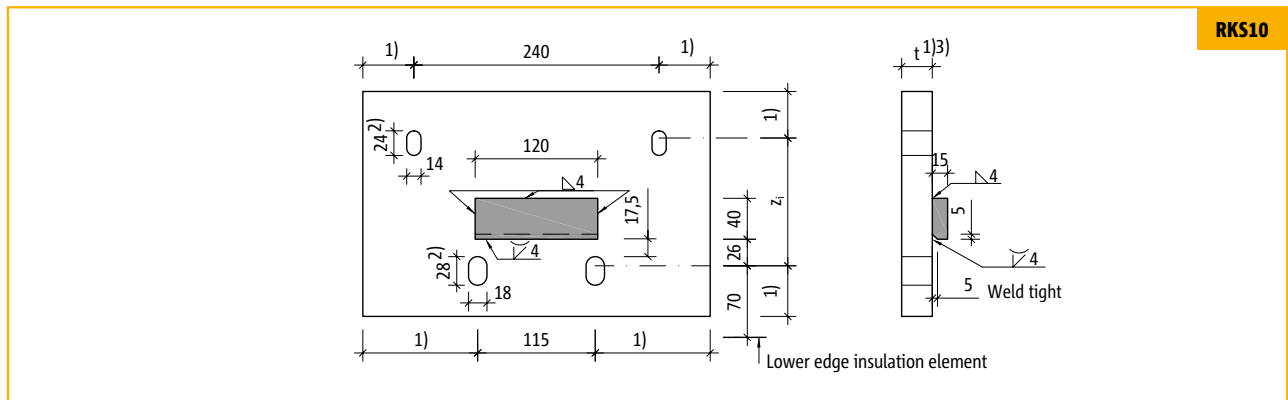


Fig.46: On site front plates for Schöck Isokorb® type RKS10

Schöck Isokorb® type		RKS10-V8
Inner lever arm		$z_1$ [mm]
Isokorb® height H [mm]	160	75
	180	95
	200	115
	220	135

### Notes

- ▶ The dog (mechanical device for gripping) is absolutely necessary for the transmission of shear forces! See page 43.
- ▶ Steel grade according to static requirements. Carry out corrosion protection following welding.
- ▶ Steel construction: Tolerances of the shell have to be checked!

<sup>1)</sup> According to structural engineer's details.

<sup>2)</sup> Hole size corresponds to a height adjustment of +10mm. Through the enlargement of the hole size the height adjustment can be increased.

<sup>3)</sup> Note free clamp length: 30 mm with RKS10 and RKS14.

# Schöck Isokorb® type RKS14

## Steel construction / On site face plates

RKS

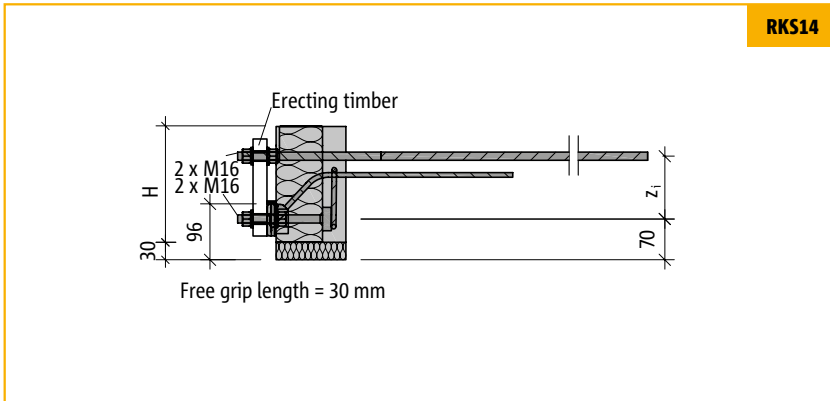


Fig.47: Side view: Schöck Isokorb® type RKS14

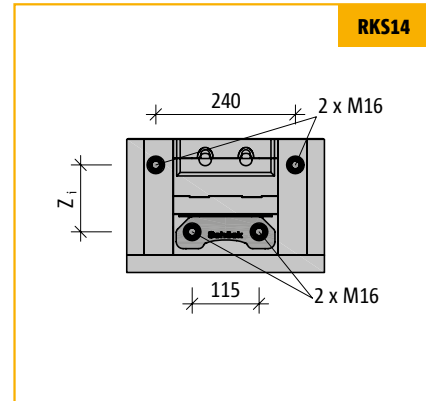


Fig.48: Front view: Schöck Isokorb® type RKS14

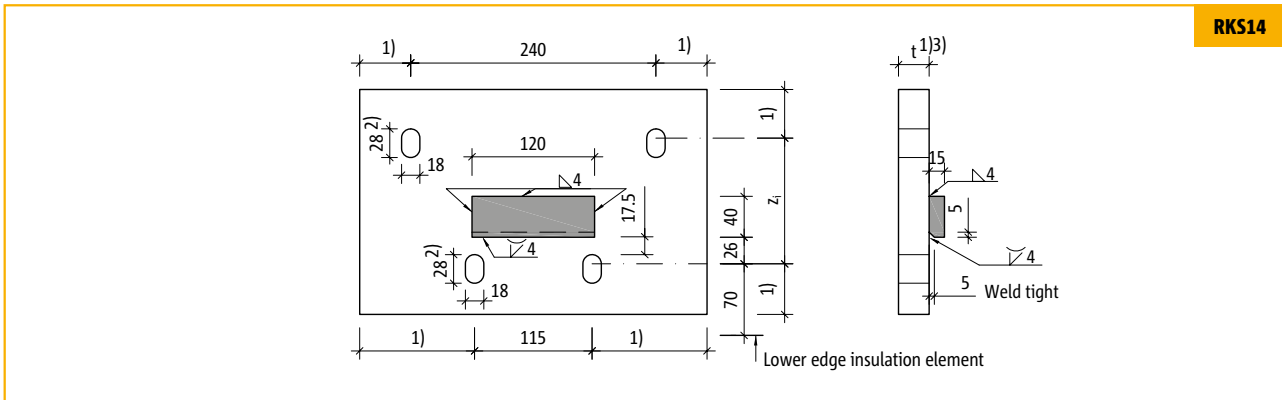


Fig.49: On site face plate for Schöck Isokorb® type RKS14

Schöck Isokorb® type		RKS14-V8
inner lever arm		$z_i$ [mm]
Isokorb® height H [mm]	160	68
	180	88
	200	108
	220	128

### Notes

- ▶ The dog is absolutely necessary for the transmission of shear forces!! See page 43.
- ▶ Steel grade according to the static requirements. carry out corrosion protection following welding.
- ▶ Steel construction: Tolerances of the shell have to be checked!

<sup>1)</sup> According to the structural engineer's details.

<sup>2)</sup> Hole size corresponds to a height adjustment of +10 mm. Through the enlargement of the hole size the height adjustment can be increased.

<sup>3)</sup> Note free clamp length: 30 mm with RKS10 and RKS14.

# Schöck Isokorb® type RKS

## Steel construction / On site dog

An in-situ dog (flat steel  $h=40\text{mm}$ ,  $l=120\text{mm}$ ,  $t=15\text{mm}$ ), welded on to the face plate is absolutely necessary for the safe transmission of shear forces in the Schöck Isokorb® type RKS (or RQS)!

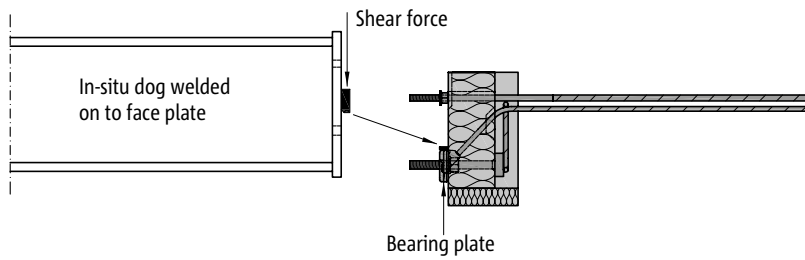


Fig.50: Absolutely necessary dog on the face plate

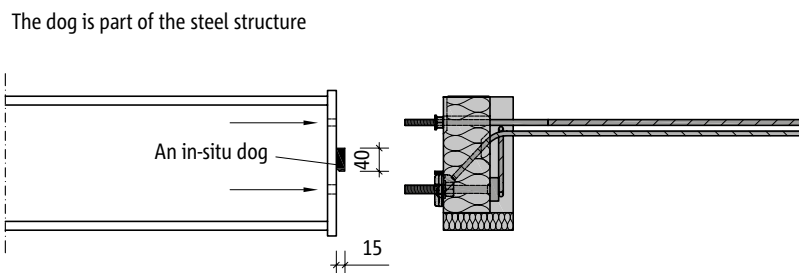


Fig.51: Installation of the steel beam on the Schöck Isokorb® renovation

After assembly, the dog transmits shear forces in the Schöck Isokorb® type RQS (or RKS)

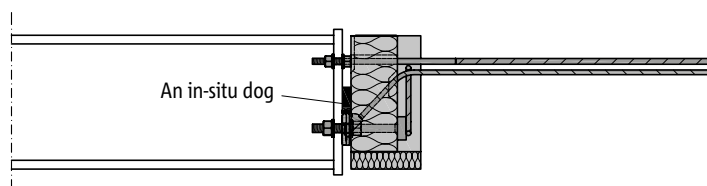


Fig.52: The dog now sits on the bed plate; for height compensation push supplied shims under the dog

# Schöck Isokorb® type RKS

## Checklist



- Have the internal forces on the Schöck Isokorb® been determined at the design level?
- Has the system cantilever length been applied with this?
- Has the concrete quality been analysed and is it the basis for design?
- Are the maximum expansion joint spacings taken into account?
- Are the allowable edge and element spacings observed?
- With the resulting camber details has the drainage direction been taken into account?
- Is the respective required connection reinforcement available in the existing floor?
- Are the position and spacings of the existing reinforcement and of the existing electrical lines and sanitary pipes in the existing floor known?
- Have the overall length and overall height of the insulation element been taken into account for the formwork plans?
- Has the absolutely necessary on site dog been sufficiently well indicated in the implementation plans (page 43)?
- Are the tightening torques of the screwed connections noted in the implementation plans (see also page 96)?  
The nuts are to be tightened without regular initial tension using the torque wrench; the following tightening torques apply:
  - RKS10      Tension bars (Bolts  $\varnothing$  12):  $M_r = 40$  Nm
  - Pressure bearings (Bolts  $\varnothing$  16):  $M_r = 50$  Nm
  - RKS14      Tension bars (Bolts  $\varnothing$  16):  $M_r = 50$  Nm
  - Pressure bearing (Bolts  $\varnothing$  16):  $M_r = 50$  Nm
- Have the system components to be used with Schöck Isokorb® R been pointed out in the implementation plans?  
Grouting mortar: Hilti HIT-RE 500 V3 or fischer FIS EM  
Grouting concrete: Pagel V1/50  
For this see Chapter Building construction (page 85ff).
- Are the requirements from the Schöck Isokorb® R approval documents Z-15.7-297 and Z-15.7-298 on the engineering drawings observed? (see page 26)

RKS

Structural engineering

## Schöck Isokorb® type RK

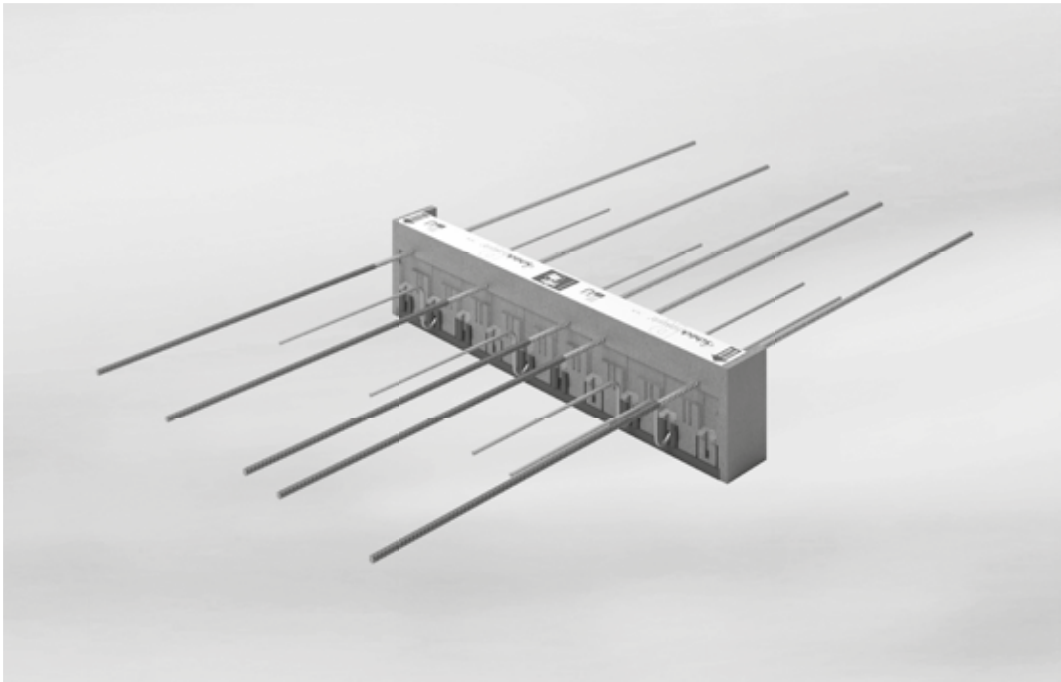


Fig.53: Schöck Isokorb® type RK

The Schöck Isokorb® type RK with pressure bearing HTE Compact is a load-bearing thermal insulation element for the connection of reinforced concrete balconies to existing reinforced concrete floors. It transfers negative moments and positive shear forces.

RK

Structural engineering

# Schöck Isokorb® type RK

## Approval documents / Building materials

### Approval documents

Schöck Isokorb® type RK:	Z-15.7-297
Hilti grouting mortar HIT-RE 500 V3:	Z-21.8-2064 and ETA-16/0142
fischer grouting mortar FIS EM:	Z-21.8-1874 and ETA-09/0089
PAGEL grouting concrete V1/50:	DAfstb Directive "Production and application of cement-bonded grouting concrete and grouting mortar"

### Schöck Isokorb® construction materials

Reinforcing steel	B500 B according to DIN 488-1
Stainless steel	Ribbed bars B500B NR, Material No. 1.4362, 1.4571 or 1.4482 according to approval document Z-15.7-240 Tension bars Material No. 1.4362 ( $f_{yk} = 700 \text{ N/mm}^2$ ) Smooth bar steel, Material No. 1.4571 or 1.4404 hardening grade S 460
Concrete pressure bearing	HTE-Compact pressure bearing (pressure bearing made from micro steel fibre reinforced, heavy duty fine-grained concrete) HDPE plastic coating
Insulating material	Neopor® - this polystyrene hard foam is a registered trademark of BASF, $\lambda = 0.031 \text{ W/(m}\cdot\text{K)}$ , building material classification B1 (flameretardant)

### Connected components

Reinforcing steel	B500A or B500B according to DIN 488-1, or DIN EN 1992-1-1 (EC2) and DIN EN 1992-1-1/NA
Concrete	Normal weight concrete according to DIN 1045-2 or DIN EN 206-1 with an oven-dry density of $2000 \text{ kg/m}^3$ to $2600 \text{ kg/m}^3$ (Lightweight concrete is not permitted)  Indicative minimum strength class of the external structural components: Minimum C25/30 and depending on the environment class according to DIN EN 1992-1-1/NA, Table NA.E1  Indicative minimum strength class of internal structural components: Minimum C20/25 and depending on the environmental class according to DIN EN 1992-1-1/NA, Table NA.E1

RK

Structural engineering

# Schöck Isokorb® type RK

## Examples for element configuration

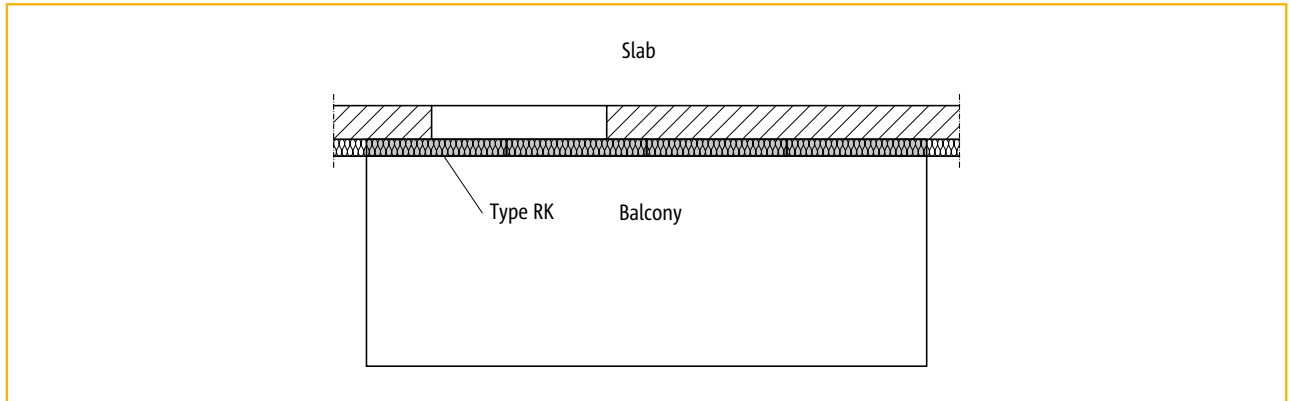


Fig.54: Balcony freely cantilevered with renewal of an existing balcony using type RK

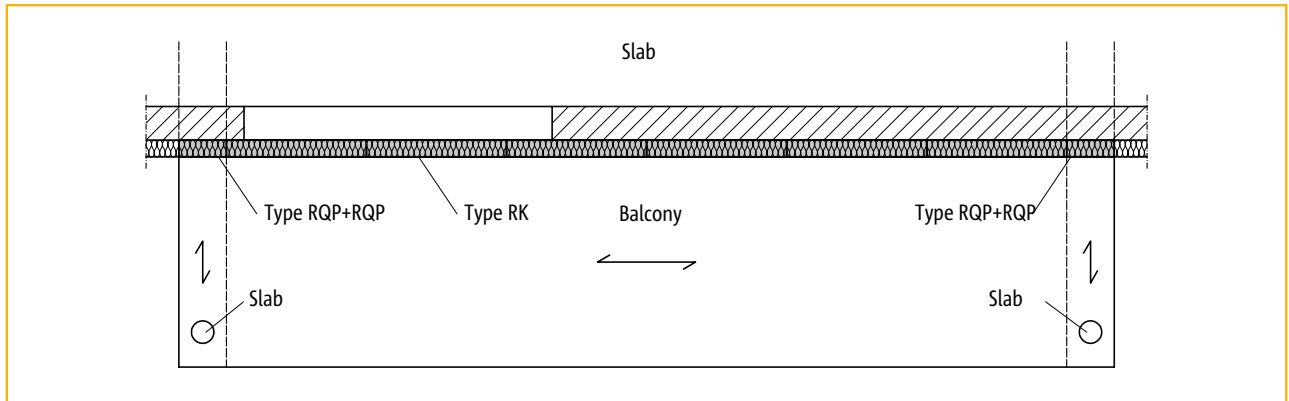


Fig.55: Balcony supported triaxially with renewal of an existing balcony using type RK and type RQP+RQP

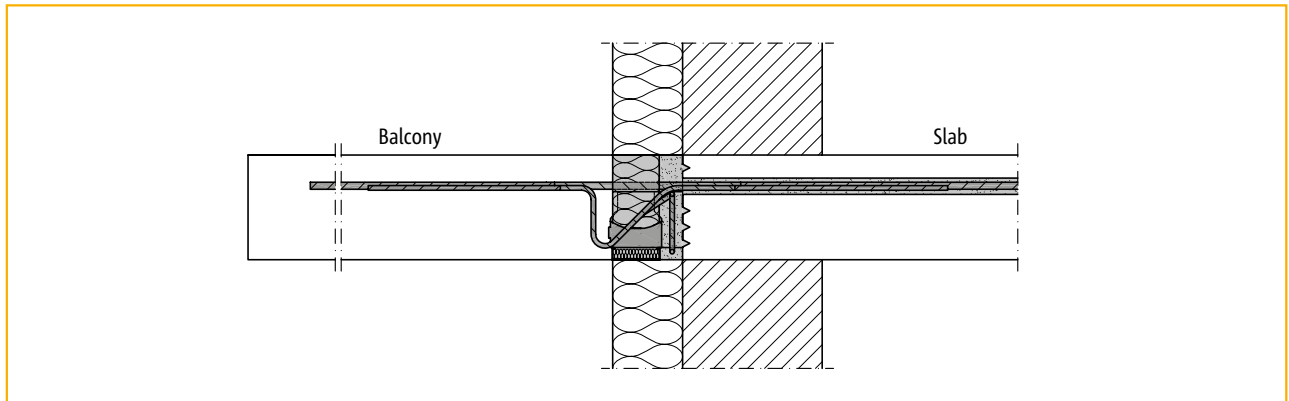


Fig.56: Balcony freely cantilevered with direct support with renewal of an existing balcony

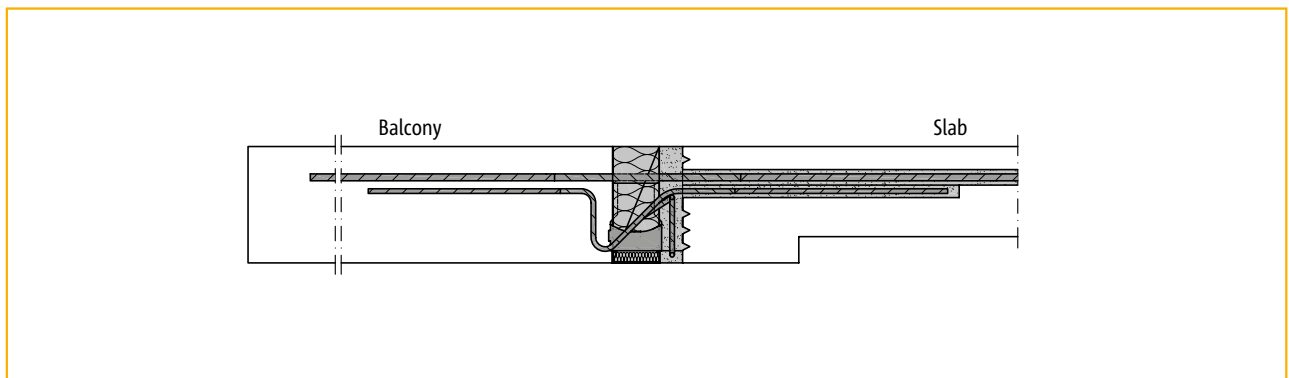


Fig.57: Balcony freely cantilevered with indirect support with renewal of an existing balcony

# Schöck Isokorb® type RK

## Product description

RK

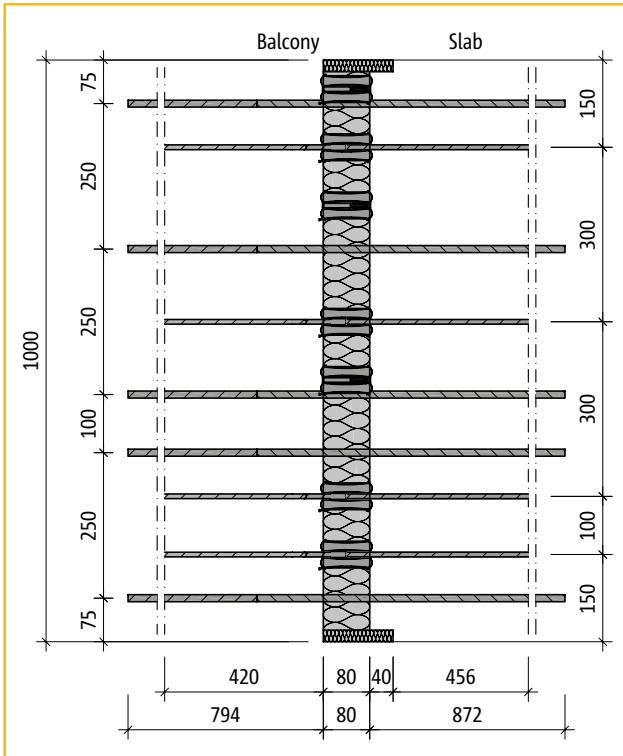


Fig.58: Plan view Schöck Isokorb® type RK25

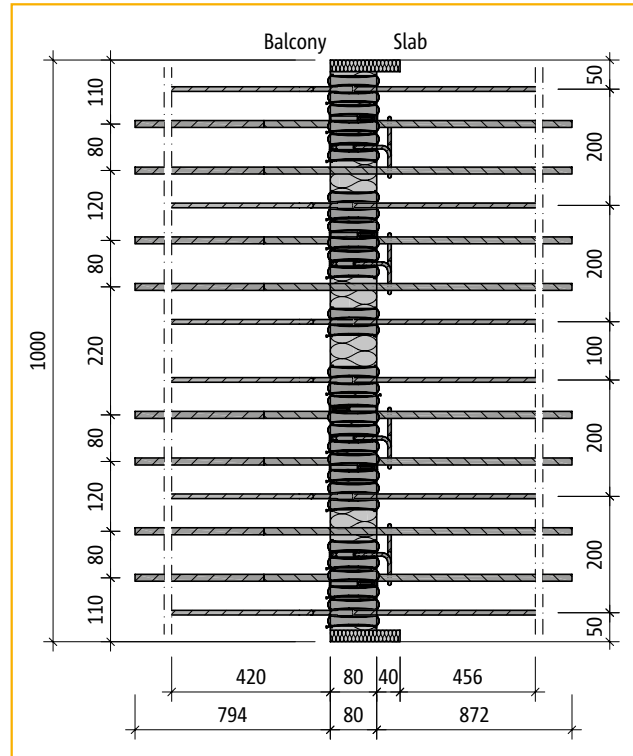


Fig.59: Plan view Schöck Isokorb® type RK45

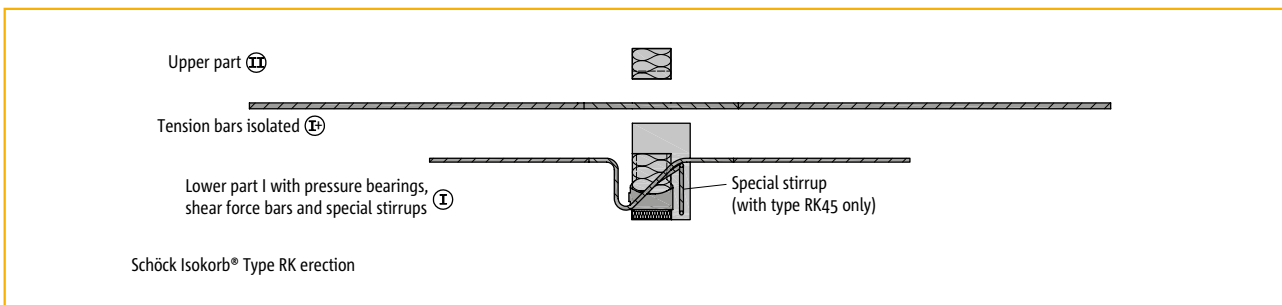


Fig.60: Configuration Schöck Isokorb® type RK25 and type RK45

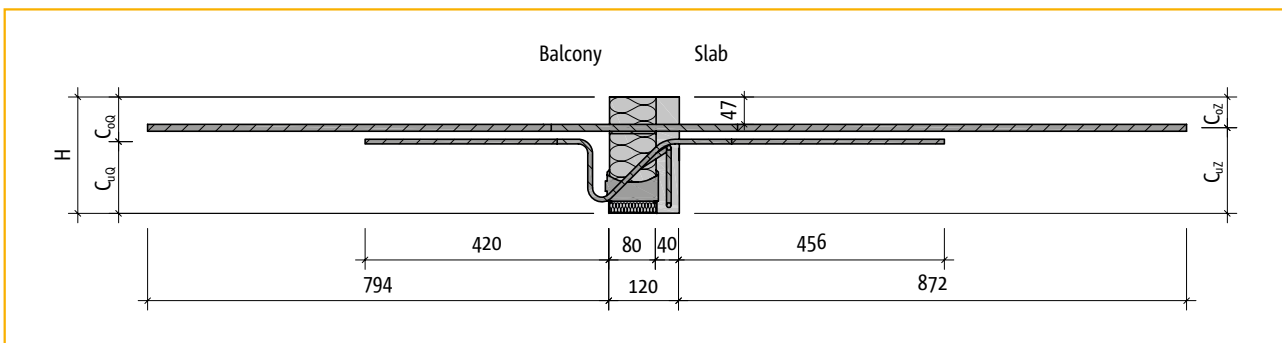


Fig.61: Schnitt Schöck Isokorb® type RK25 and type RK45

Structural engineering



# Schöck Isokorb® type RK

## Product description/edge separations

Schöck Isokorb® type		RK25-V6					RK45-V8				
Isokorb® height H [mm]		180	200	220	240	250	180	200	220	240	250
Product description	Isokorb® length [m]	1,00					1,00				
	Tension bars ( $l_{f, floor}$ in mm)	5 $\varnothing$ 12 (872)					8 $\varnothing$ 12 (872)				
	Shear force bars ( $l_{f, floor}$ in mm)	4 $\varnothing$ 8 (456)					6 $\varnothing$ 8 (456)				
	Pressure bearing [No.]	7					15				
	Special stirrup	-					4				
	$C_{oz}$ [mm]	53	53	53	53	53	53	53	53	53	53
	$C_{uz}$ [mm]	127	147	167	187	197	127	147	167	187	197
	$C_{oQ}$ [mm]	56.5	76.5	96.5	116.5	126.5	56.5	76.5	96.5	116.5	126.5
$C_{uQ}$ [mm]	123.5	123.5	123.5	123.5	123.5	123.5	123.5	123.5	123.5	123.5	

- $l_v$  settlement depth
- $C_{oz}$  centre-to centre distance tension bars from upper edge Isokorb®
- $C_{uz}$  centre-to centre distance tension bars from lower edge Isokorb®(floor edge)
- $C_{oQ}$  centre-to centre distance shear force bars from upper edge Isokorb®
- $C_{uQ}$  centre-to-centre distance shear force bars from lower edge Isokorb®(floor edge)

### Edge separations

With Schöck Isokorb® type RK, in the installed condition, the following centre-to-centre distances of the individual Isokorb components to the free edge or to the expansion joint must be observed:

- Tension bars and compression elements:  $\geq 50$  mm
- Shear force bars:  $\geq 100$  mm
- $\leq 150$  mm

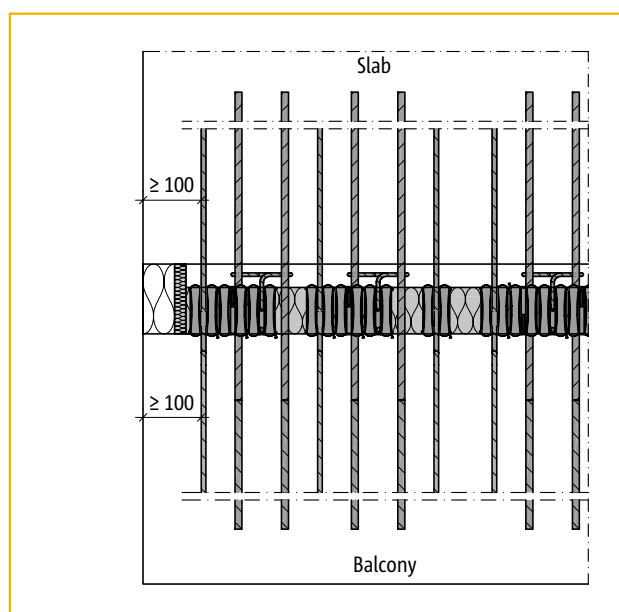


Fig.62: Schöck Isokorb® type RK elevation edge separations

# Schöck Isokorb® type RK

## Design table / Notes

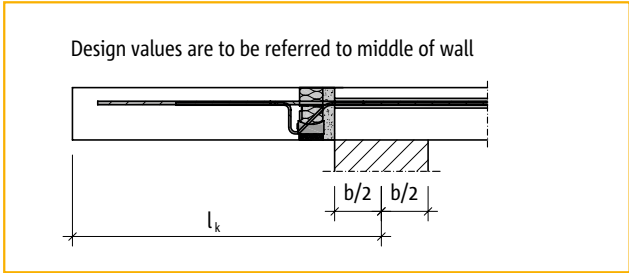


Fig.63: Direct support:  $l_k$  for design

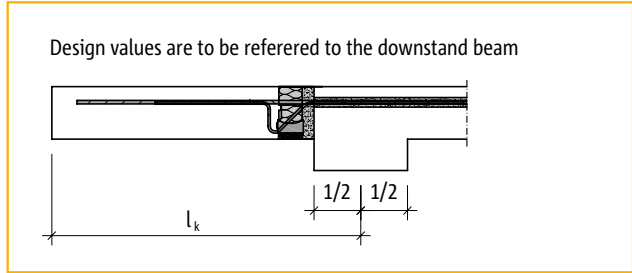


Fig.64: Indirect support:  $l_k$  for design

Schöck Isokorb® type		RK25-V6	RK45-V8
Design values for	Concrete strength	≥ C20/25	
	Surface floor front face	rough	rough
Isokorb® height H [mm]		$m_{Rd}$ [kNm/m]	
	180	-21.4	-34.0
	200	-26.2	-41.7
	220	-31.1	-49.3
	240	-35.9	-57.0
	250	-38.3	-60.8
		$v_{Rd}$ [kN/m]	
	180 - 250	+49.8	+74.6
		Deformation factor $\tan \alpha$ [%]	
	180	1.0	
	200	0.8	
	220	0.7	
240 - 250	0.6		
	Max. expansion joint spacing e [m]		
180 - 250	11.7	11.7	

The information on the load-bearing structure planning on pages 26 - 29 is to be noted.

# Schöck Isokorb® type RK

## Deformation / Camber / Flexural slenderness

### Camber

The deformation factors given in the table ( $\tan \alpha$  [%]) result alone from the deformation of the Schöck Isokorb® in the serviceability limit state (under quasi constant effect combination  $g = 2/3 \cdot p$ ,  $q = 1/3 \cdot p$ ,  $\psi_2 = 0.3$ ). They serve for the estimation of the necessary camber. The arithmetic camber of the balcony slab formwork results from the calculation according to DIN EN 1992-1-1 (EC2) and DIN EN 1992-1-1/NA plus the deformation from Schöck Isokorb®. The camber of the balcony framework to be given in the implementation plans by the structural engineer/designer (Basis: calculated overall deformation from cantilevered slab + floor angle of tilt + Schöck Isokorb®) should be so rounded off that the planned drainage direction is maintained (rounding off: for drainage of the building facade, rounding off: for drainage to end of the cantilevered slab).

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

$$w_{\bar{u}} = \tan \alpha \cdot l_k \cdot (m_{\bar{u}d} / m_{Rd}) \cdot 10 \text{ [mm]}$$

$\tan \alpha$  = deformation factor [%]

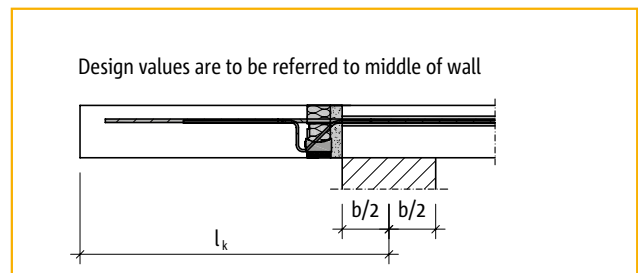
(see design table, page 50)

$l_k$  = cantilever length [m]

$m_{\bar{u}d}$  = relevant bending moment [kNm/m] for the determination of the camber  $w_{\bar{u}}$  [mm] from Schöck Isokorb®.

The load combination to be applied for this is specified by the structural engineer.

$m_{Rd}$  = Maximum design moment [kNm/m] of the Schöck Isokorb® type K (see page 50).



RK

### Note

The given deformation factors serve solely as approximation of the deformation from Schöck Isokorb®. Depending on the installation situation and assembly further deformation amounts can be added on.

### Example

Given: Balcony from page 52

Selected: Schöck Isokorb® type RK25-V6-H200

$$m_{Rd} = -26.2 \text{ kNm/m} \quad (\text{see page 50}) > m_{Ed}$$

$$v_{Rd} = +49.8 \text{ kN/m} \quad (\text{see page 50}) > v_{Ed}$$

$$\tan \alpha = 0.8 \% \quad (\text{see page 50})$$

Selected load combination for camber:  $g + q/2$

$m_{\bar{u}d}$  determine in the ultimate load state

$$m_{\bar{u}d} = -[(\gamma_G \cdot g + \gamma_Q \cdot q/2) \cdot l_k^2/2 + \gamma_G \cdot g_R \cdot l_k]$$

$$m_{\bar{u}d} = -[(1.35 \cdot 6.5 + 1.5 \cdot 4.0/2) \cdot 1.5^2/2 + 1.35 \cdot 1.0 \cdot 1.5]$$

$$= -15.3 \text{ kNm/m}$$

$$w_{\bar{u}} = [\tan \alpha \cdot l_k \cdot (m_{\bar{u}d} / m_{Rd})] \cdot 10 \text{ [mm]}$$

$$= [0.8 \cdot 1.5 \cdot (15.3/26.2)] \cdot 10$$

$$= 7 \text{ mm}$$

### Slenderness

For the ensuring of the fitness for purpose we recommend the limitation of the flexural slenderness through the following maximum cantilever lengths  $l_{k,max}$  [m]:

Concrete cover of the tension bars	$l_{k,max}$ [m] with Isokorb® height H [mm]				
	180	200	220	240	250
$C_v = 47 \text{ mm}$	1.85	2.14	2.44	2.73	2.83

Structural engineering

# Schöck Isokorb® type RK

## Design example

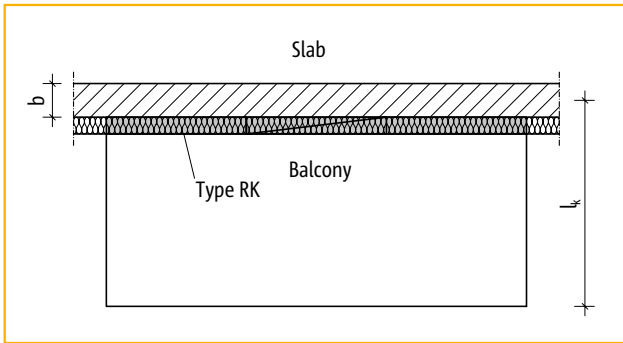


Fig.65: Plan view

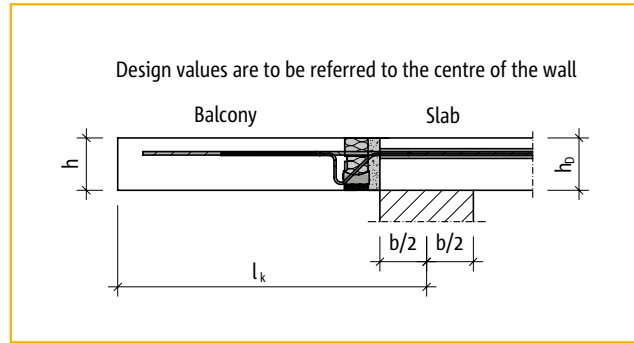


Fig.66: Section

### Planned: Balcony freely cantilevered using type RK

Geometry:	cantilever length	$l_k$	= 1.50 m
	( $l_k$ to be referred to middle of the wall)		
	Balcony slab thickness	$h$	= 200 mm
Design loads:	Balcony slab and covering	$g$	= 6.5 kN/m <sup>2</sup>
	Loading capacity	$q$	= 4.0 kN/m <sup>2</sup>
	Edge load	$g_R$	= 1.0 kN/m
Exposure class:	external XC4		
Minimum concrete quality:	external C25/30		
Selected:	concrete quality C25/30 for balcony		
	Concrete cover for Isokorb® type RK tension bars	$c_v$	= 47mm
Design-internal forces:	$m_{Ed} = -[(\gamma_G \cdot g + \gamma_Q \cdot q) \cdot l_k^2/2 + \gamma_G \cdot g_R \cdot l_k]$		
	$m_{Ed} = -[(1.35 \cdot 6.5 + 1.5 \cdot 4.0) \cdot 1.5^2/2 + 1.35 \cdot 1.0 \cdot 1.5]$		
	$m_{Ed} = -18.7$ kNm/m		
	$V_{Ed} = +(\gamma_G \cdot g + \gamma_Q \cdot q) \cdot l_k + \gamma_G \cdot g_R$		
	$V_{Ed} = +(1.35 \cdot 6.5 + 1.5 \cdot 4.0) \cdot 1.5 + 1.35 \cdot 1.0$		
	$V_{Ed} = +23.5$ kN/m		

### Present: Reinforced concrete floor slab

Geometry:	floor slab thickness	$h_d$	= 200 mm
Reinforcement:	prev. tension reinforcement in cantilever direction	R378	
	Diameter of the mat longitudinal bars	8.5 mm	
	Concrete covering of the upper tension reinforcement in cantilever direction	$c_v$	= 30 mm
Minimum concrete quality:	internal C20/25		
Available:	concrete quality B25 with existing floor		

# Schöck Isokorb® type RK

## Design example /Notes

### Verification Schöck Isokorb®

Selected: Schöck Isokorb® type RK25-V6-H200

$$m_{Ed} = -18.7 \text{ kNm/m} \leq m_{Rd} = -26.2 \text{ kNm/m} \quad \checkmark \quad (m_{Rd} \text{ see page 50})$$
$$v_{Ed} = +23.5 \text{ kN/m} \leq v_{Rd} = +49.8 \text{ kN/m} \quad \checkmark \quad (v_{Rd} \text{ see page 50})$$

### Verification of the existing floor for the present loading

Required cross-section of the reinforcement in the existing floor for the transmission of the tension forces from the bending moment ( $k_d$  - procedure):

$$d_{\text{floor}} = 200 - 30 - 8.5/2 = 165 \text{ mm (16.5 cm)}$$

$$b = 1.0 \text{ m}$$

$$m_{Ed} = 18.7 \text{ kNm}$$

$$k_d = d/\sqrt{m_{Ed}/b}$$

$$k_d = 16.5/\sqrt{18.7/1.0}$$

$$k_d = 3.82$$

$$k_s = 2.38 \text{ (from } k_d \text{ table for rectangular cross-sections without compression reinforcement for bending and longitudinal force and concrete strength C20/25)}$$

$$a_s = k_s \cdot m_{Ed}/d$$

$$a_s = 2.38 \cdot 18.7/16.5$$

$$a_s = 2.7 \text{ cm}^2/\text{m}$$

$$a_{s,\text{req}} = 2.7 \text{ cm}^2/\text{m} \leq a_{s,\text{prov}} = 3.78 \text{ cm}^2/\text{m (R378)} \quad \checkmark$$

In the case  $a_{s,\text{req}} > a_{s,\text{prov}}$ , reduce loading and / or cantilever length  $l_k$  to  $a_{s,\text{req}} \leq a_{s,\text{prov}}$ .

As a rule the cross-section of the available tension reinforcement in the cantilever direction in the floor will be  $\leq \varnothing 12$  mm, therefore the required lap length is ensured through the length of the Isokorb® tension bars.

(Example: R378  $\varnothing 8.5 \leq$  RK tension bars  $\varnothing 12$ )

The available bond length  $l_v = 872$  mm of the tension bars of the type RK results on the basis of the anchoring or lap length according to DIN EN 1992-1-1 (EC2) and DIN EN 1992-1-1/NA and a concrete covering of  $c_1 = 30$  mm on the front face of the floor as well as a maximum bar separation of the tension bars of  $8 \varnothing_s$ .

$$l_v = l_0 + c_1 + 4 \varnothing_s$$

$$l_v = 794 \text{ mm} + 30 \text{ mm} + 4 \cdot 12 \text{ mm}$$

With the exceeding of the spacing of the tension bars of  $8 \varnothing_s$  the lap length of the floor and Isokorb reinforcement must be checked according to DIN EN 1992-1-1 (EC2), Section 8.7.3 and DIN EN 1992-1-1/NA, NCI to 8.7.3.

The existing floor cannot be toughened using the Isokorb®.

Attention is to be paid already during the planning to conflicts between the Isokorb® bars and the existing floor reinforcement.

# Schöck Isokorb® type RK

## On-site reinforcement

### Direct support

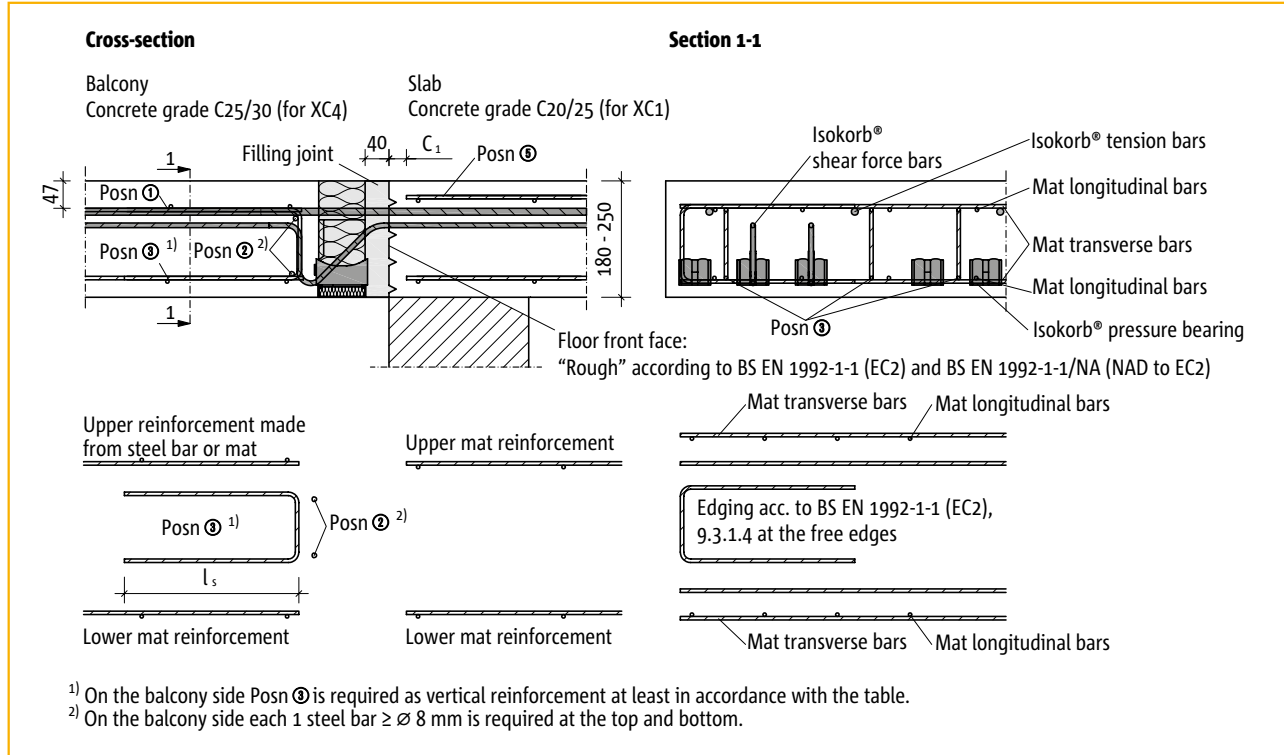


Fig.67: On site reinforcement with direct support of the floor edge

### Indirect support

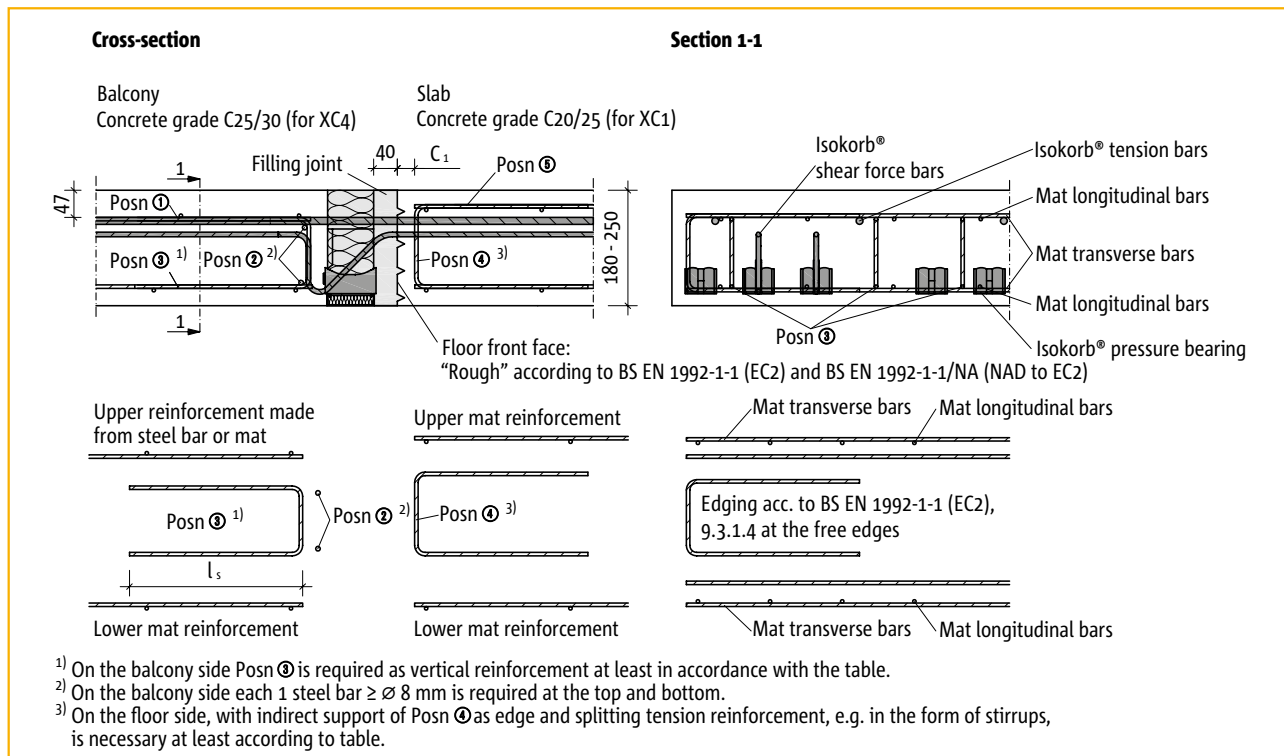


Fig.68: On site reinforcement with indirect support of the floor edge

# Schöck Isokorb® type RK

## On-site reinforcement

Schöck Isokorb® type		RK25	RK45
Concrete strength $\geq$ C25/30		Balcony side	
Isokorb® height H [mm]		Posn ① Lapping reinforcement [cm <sup>2</sup> /m]	
	180 - 250	5.65	9.05
		Posn ② Bar steel	
	180 - 250	2 $\varnothing$ 8	
		Posn ③ Vertical reinforcement [cm <sup>2</sup> /m]	
	180	1.14	2.40
	200		2.59
	220		2.74
240	2.87		
250	2.92		
Concrete strength $\geq$ C20/25		on the floor side	
Isokorb® height H [mm]		Posn ⑤ Req. Lapping reinforcement [cm <sup>2</sup> /m]	
	180 - 250	$a_{s,prov}$ (stock assessment by structural engineer required) $a_{s,req}$ (determination by structural engineer. see design example page 52)	
		Posn ④ <sup>3)</sup> Req. Vertical reinforcement with indirect support [cm <sup>2</sup> /m]	
	180	1.0	2.40
	200		2.59
	220		2.74
	240		2.87
250	2.92		

Posn ①: Lapping reinforcement for Schöck Isokorb® with a load of 100% of the maximum design moment with 25/30 pure design approach:  $a_s$  lapping reinforcement  $\geq a_s$  Isokorb® tension bars. The rules according to DIN EN 1992-1-1 (EC2) and DIN EN 1992-1-1/NA apply for the determination of the overlap length. A reduction of the required lap length with  $a_{s,req}/a_{s,prov}$  is permitted. For the overlap ( $l_o$ ) using the Schöck Isokorb® with types RK25 and RK45 a length of the tension bars of 764 mm can be taken into account.

RK

Structural engineering

# Schöck Isokorb® type RK

## Checklist



- Have the internal forces on the Schöck Isokorb® been determined at the design level?
- Has the system cantilever length been applied with this?
- Has the concrete quality been analysed and is it the basis for design?
- Are the maximum expansion joint spacings taken into account?
- Are the allowable edge and element spacings observed?
- Are the recommendations for the limitations of the flexural slenderness observed?
- With the resulting camber details has the drainage direction been taken into account?
- With  $V_{Rd}$  was the respective limit state of the slab load-bearing capacity checked?
- Is the respectively necessary connection reinforcement available in the existing floor?
- Are the position and spacings of the existing reinforcement and of the existing electrical lines and sanitary pipes in the existing floor known?
- Have the system components to be used with Schöck Isokorb® R been pointed out in the implementation plans?  
Grouting mortar: Hilti HIT-RE 500 V3 or fischer FIS EM  
Grouting concrete: Pagel V1/50  
For this see also Chapter Building construction (Page 85ff).
- Are the requirements from the Schöck Isokorb® R approval documents Z-15.7-297 and Z-15.7-298 on the engineering drawings observed? (see page 26)

RK



## Schöck Isokorb® type KST in the renovation

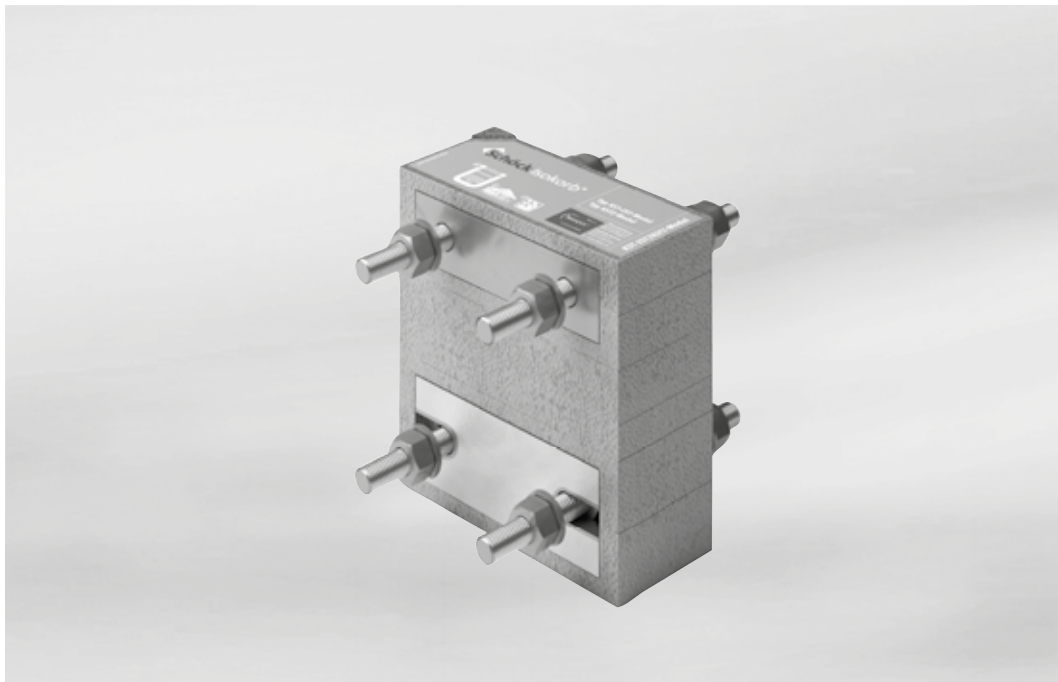


Fig.69: Schöck Isokorb® type KST

The Schöck Isokorb® type KST is a load-bearing thermal insulation element for the connection of steel beams to steel structures. It consists of KSTZ modules for the transfer of tension forces and KSTQ modules for the transfer of shear forces and horizontal forces. The number and arrangement in the construction is dependent on profile size and the stress resultants.

KST

Structural engineering

# Schöck Isokorb® type KST in the renovation

## Building material / corrosion protection

### Building material Schöck Isokorb® type KST

Stainless steel	Material No.: 1.4401, 1.4404, 1.4362 and 1.4571
Threaded rods	Strength class 70 1.4404 (A4I), 1.4362 (-) and 1.4571 (A5)
Rectangular hollow section	S 355
Pressure plate (KSTQ module )	S 275
Spacer plate (KSTZ Module)	S 235
Insulation	Neopor® – this insulation material is a polystyrene hard foam and a registered trademark of the BASF, $\lambda = 0.031 \text{ W/(m}\cdot\text{K)}$ , Building Material Classification B1 (flameresistant)

### Corrosion protection

KST

- ▶ The stainless steel used with the Schöck Isokorb® type KST corresponds to the Material No. 1.4401, 1.4404 or 1.4571. These steels, according to the general building supervisory approval document (Z-30.3-6) Annex 1 "Building components and compound elements made from stainless steels", are classified in the Resistance Class III/medium.
- ▶ Contact corrosion  
The connection of the Schöck Isokorb® type KST in conjunction with a galvanised or corrosion protection-coated face plate is, with regard to resistance against contact corrosion, not critical (see approval document Z-30.3-6, Section 2.1.6.4).  
With connections using Schöck Isokorb® type KST the surface of the non-stainless metal (front plate made from steel) is considerably larger than that of the stainless metal (bolts and washers), so that a failure of the connection as a result of contact corrosion is impossible.

# Schöck Isokorb® type KST in the renovation

## Examples for the element configuration

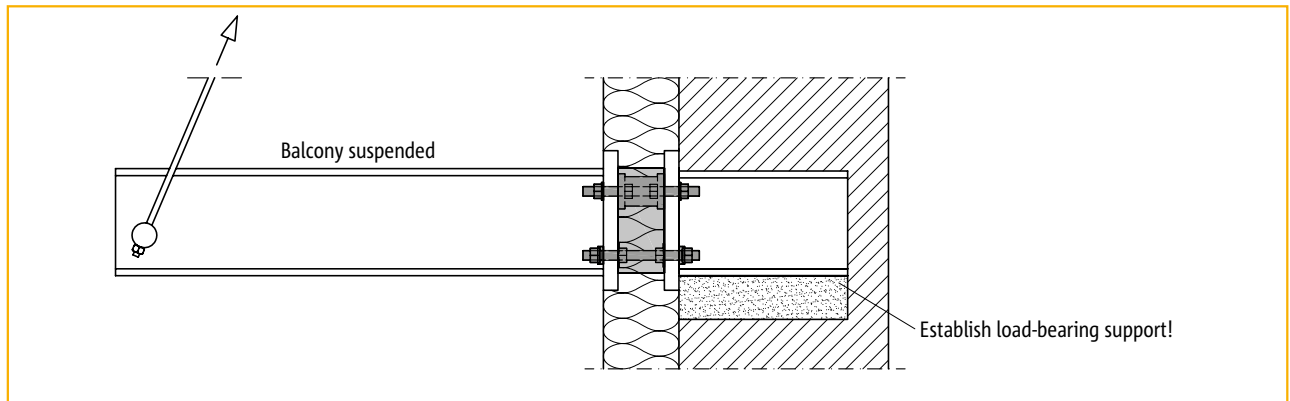


Fig.70: Balcony suspended, connected with KSTZ and KSTQ modules (steel balcony)

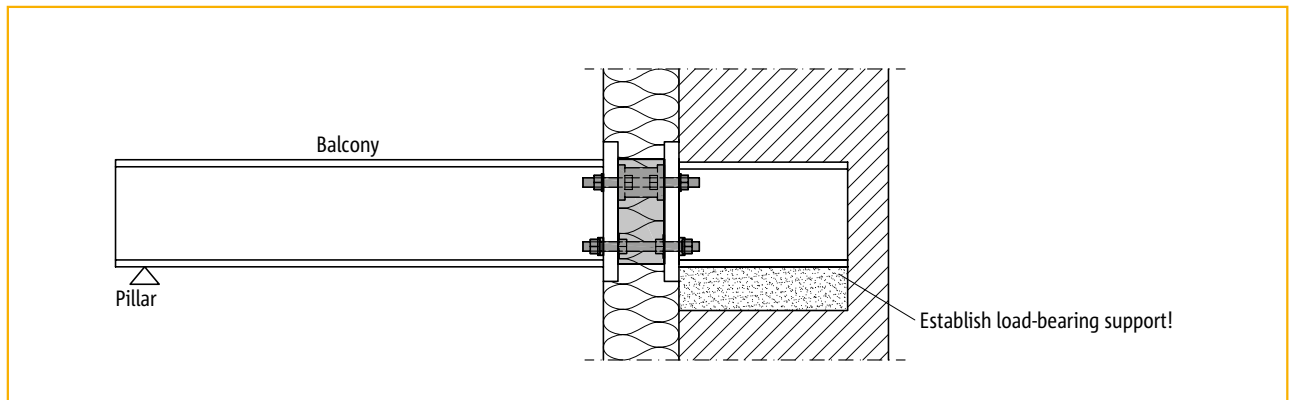


Fig.71: Balcony supported, connected with KSTZ and KSTQ modules (Steel balcony)

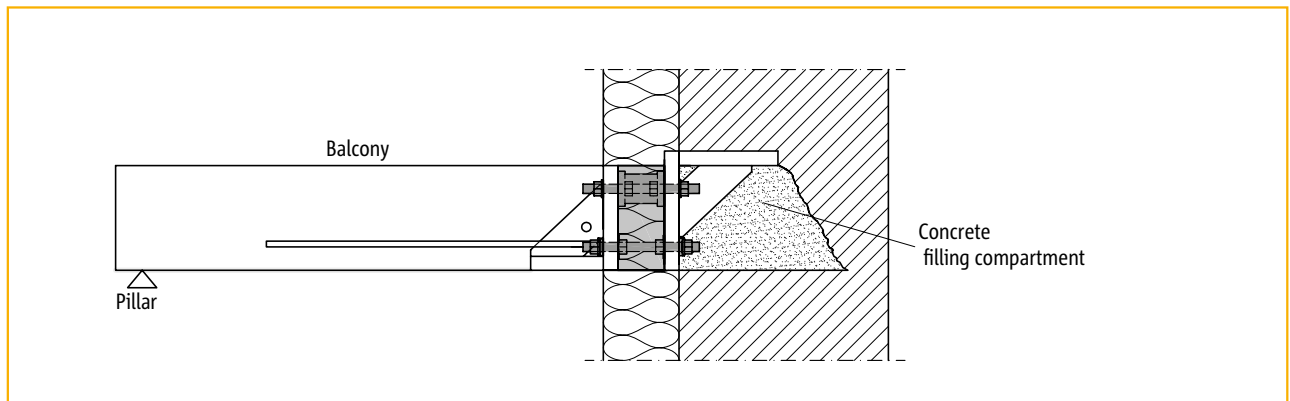


Fig.72: Balcony supported, connected with KSTZ and KSTQ modules (in-situ concrete)

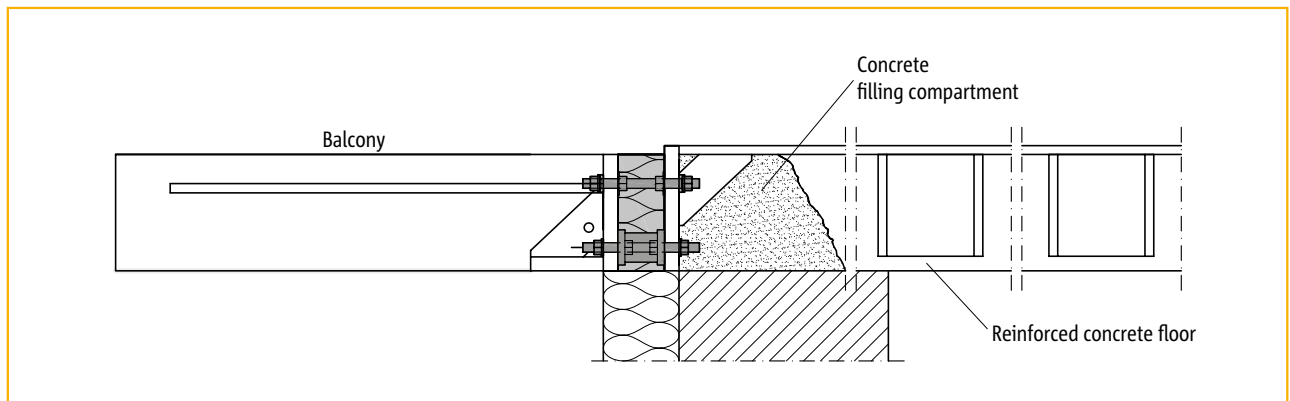


Fig.73: Balcony freely cantilevered, connected with type KST (in-situ concrete)

# Schöck Isokorb® type KST in renovation

## Examples for element configuration

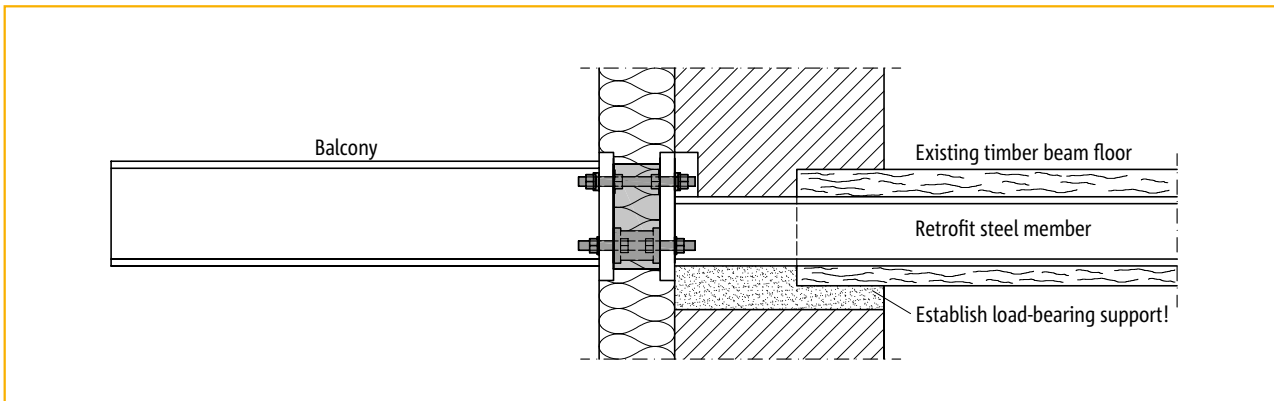


Fig.74: Balcony freely cantilevered, connected with type KST on timber beam floor (steel balcony)

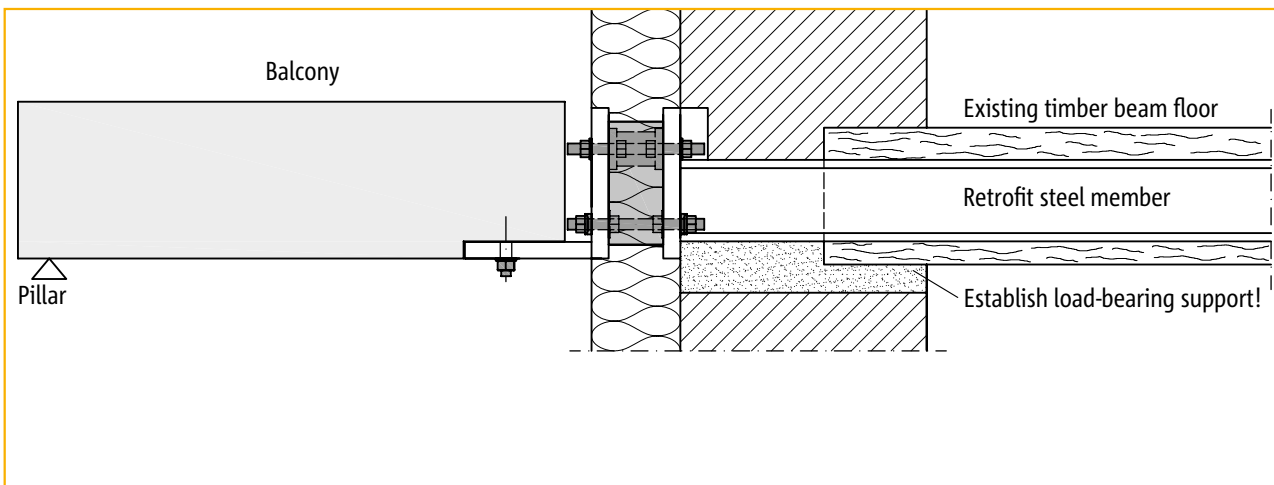


Fig.75: Balcony supported, connected with type KST on timber beam floor (concrete prefabricated component)

Information on measurements and design of the Schöck Isokorb® type KST can be found in the "Technical Information Schöck Isokorb®" in the Chapter Steel/Steel. The engineers of the Schöck Application Engineering division would be happy to advise you on static, structural and building physics questions and to produce solution proposals with calculations and detail drawings (contact data see page 3).

KST

Structural engineering

## Schöck Isokorb® type RQS

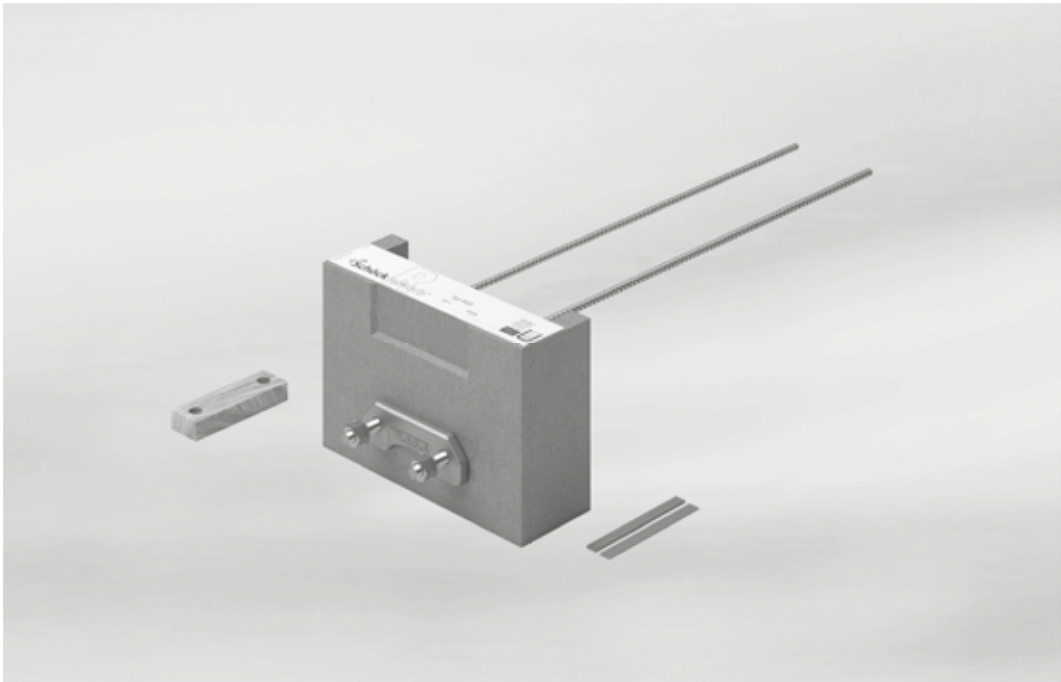


Fig.76: Schöck Isokorb® type RQS

The Schöck Isokorb® type RQS is a load-bearing thermal insulation element for the connection of supported steel balconies to existing reinforced concrete floors. It transfers positive shear forces and horizontal forces.

RQS

Structural engineering

# Schöck Isokorb® type RQS

## Approvals / Building materials / Corrosion protection

### Approvals

Schöck Isokorb® type RQS:	Z-15.7-298
Hilti grouting mortar HIT-RE 500 V3:	Z-21.8-2064 and ETA-16/0142
fischer grouting mortar FIS EM:	Z-21.8-1874 and ETA-09/0089
PAGEL grouting concrete V1/50:	DAfstb Directive "Production and application of cement-bound grouting concrete and grouting mortar"

### Schöck Isokorb® construction materials

Reinforcing steel approval	B500B according to DIN 488-1, BSt 500 NR according to general building supervisory approval
Pressure bearing in grouting concrete	S 235 JRG2 according to DIN EN 10025-2 for pressure plates
Stainless steel	Material No.: 1.4401, 1.4404, 1.4362, 1.4462 and 1.4571, S 460 according to approval document No.: Z-30.3-6 Structural components and made from stainless steels or BSt 500 NR
Load-bearing plate	Material No.: 1.4404, 1.4362 and 1.4571 or superior grade e.g. B. 1.4462
Shims	Material No.: 1.4401 S 235, Thickness 2 mm and 3 mm
Insulating material	Neopor® – this insulating material is a polystyrene hard foam and is a registered trademark of BASF, $\lambda = 0.031 \text{ W}/(\text{m}\cdot\text{K})$ , building material classification B1 (flamere-tardant)

### Connected components

Reinforcing steel	B500A, or B500B according to DIN 488-1 or DIN EN 1992-1-1 (EC2) and DIN EN 1992-1-1/NA
Concrete	floor, normal concrete; indicative minimum strength class $\geq \text{C } 20/25$
Structural steel	balcony minimum S 235; strength class, static verification and corrosion protection according to structural engineer

### Corrosion protection

- ▶ The stainless steel used with the Schöck Isokorb® type RQS equates to the Material Number: 1.4362, 1.4401, 1.4404 or 1.4571. These steels are, according to the general building supervisory approval document Z-30.3-6 Annex 1 "Structural components and fasteners made from stainless steels" are classified in the resistance class III/medium.
- ▶ The connection of the Schöck Isokorb® type RQS in conjunction with a galvanised or corrosion protection coated face plate is un-critical with regard to contact corrosion (see approval document Z-30.3-6, Section 2.1.6.4. With connections using Schöck Isokorb® type RQS the surface of the base metal (steel face plate) is considerably larger than that with stainless steel (bolts, shims and dogs), so that a failure of the connection as a result of contact corrosion is excluded.

# Schöck Isokorb® type RQS

## Examples for element configuration

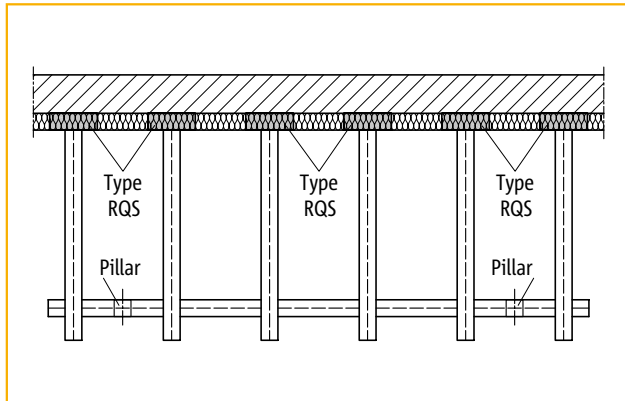


Fig.77: Renewal of an existing balcony using type RQS, supported construction

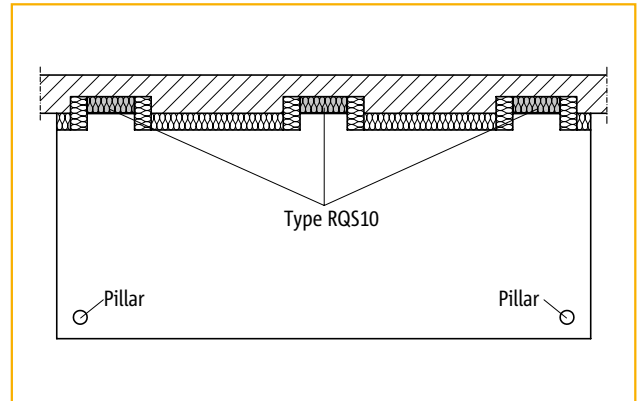


Fig.78: Connection of a balcony to an existing floor using type RQS, supported construction

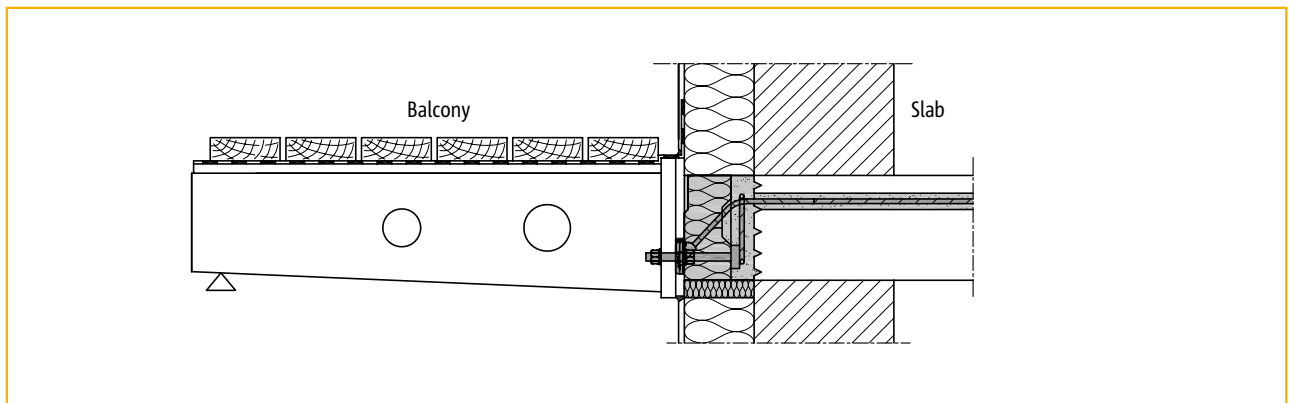


Fig.79: Balcony with support bearing with renewal of an existing balcony

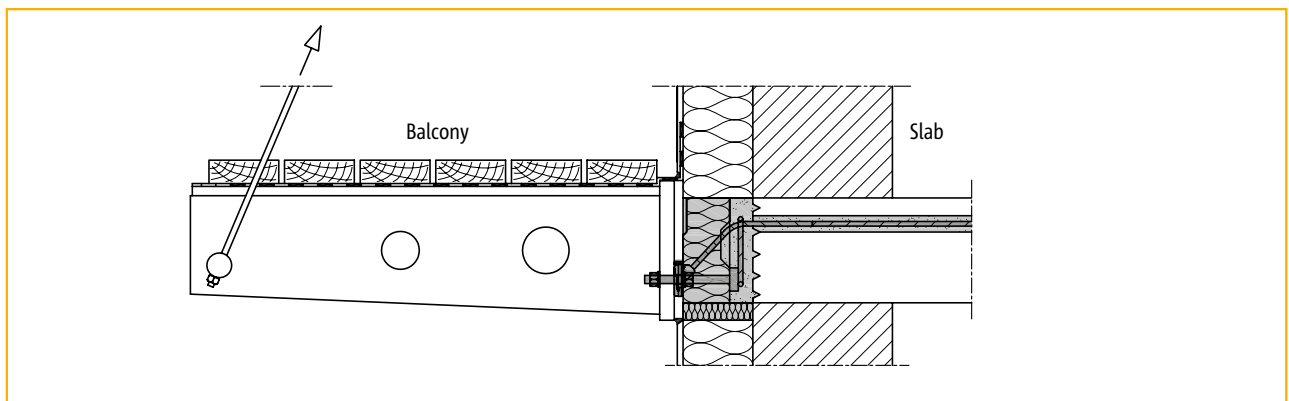


Fig.80: Balcony suspended with renewal of an existing balcony

# Schöck Isokorb® type RQS8

## Product description

RQS8

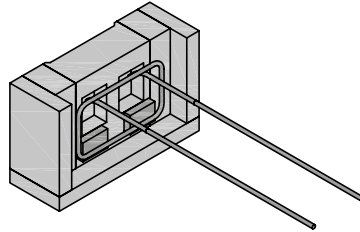


Fig.81: Isometry: Schöck Isokorb® type RQS8

RQS8

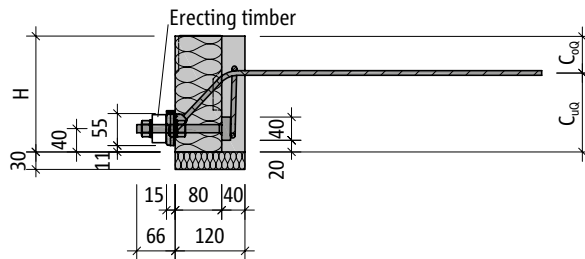


Fig.82: Section: Schöck Isokorb® type RQS8

RQS8

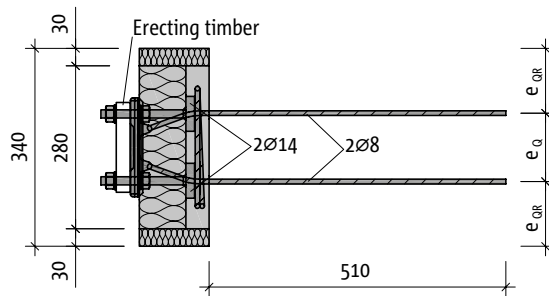


Fig.83: Plan view: Schöck Isokorb® type RQS8

RQS8

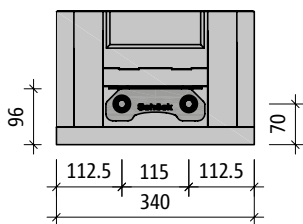


Fig.84: Side view from outside: Schöck Isokorb® type RQS8

RQS8

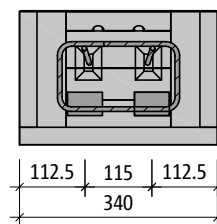


Fig.85: Side view from inside: Schöck Isokorb® type RQS8

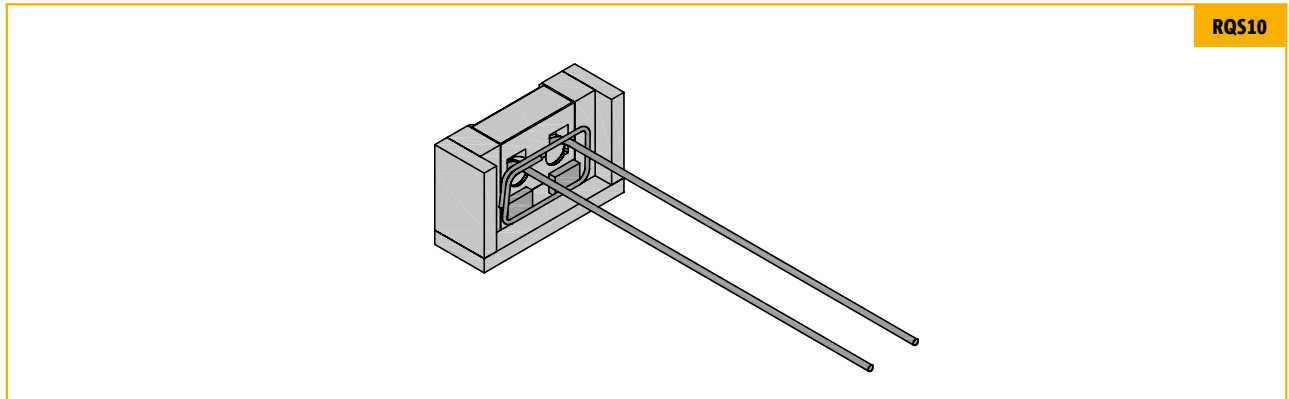
RQS

Structural engineering



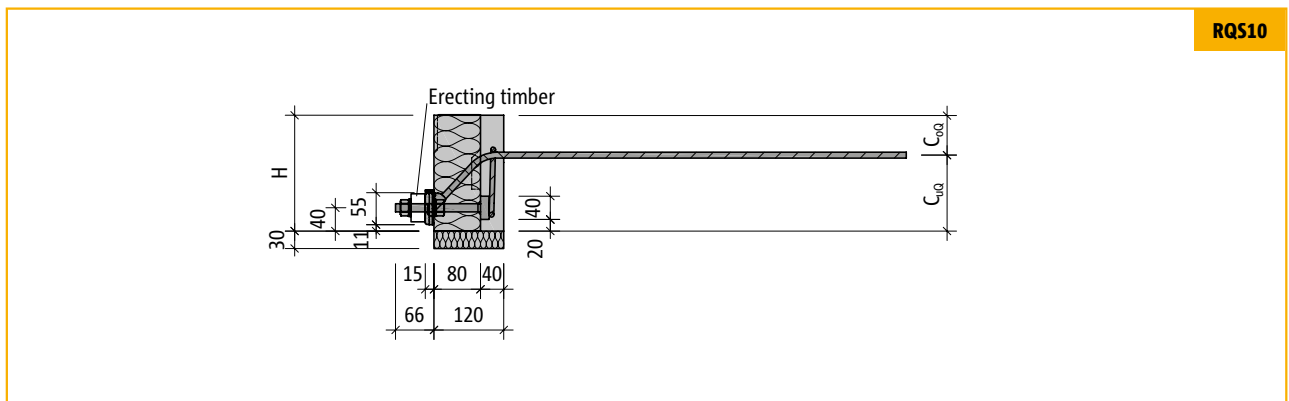
# Schöck Isokorb® type RQS10

## Product description



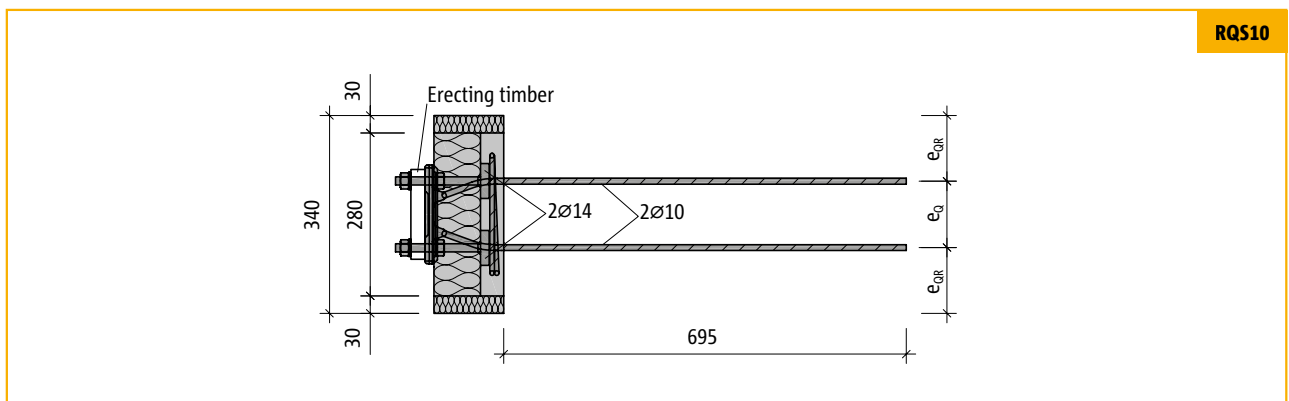
RQS10

Fig.86: Isometry: Schöck Isokorb® type RQS10



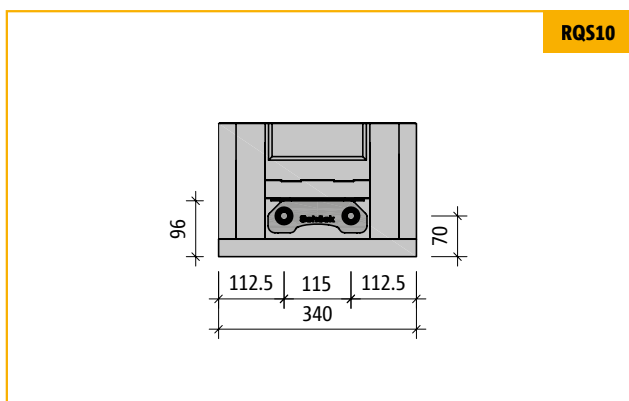
RQS10

Fig.87: Section: Schöck Isokorb® type RQS10



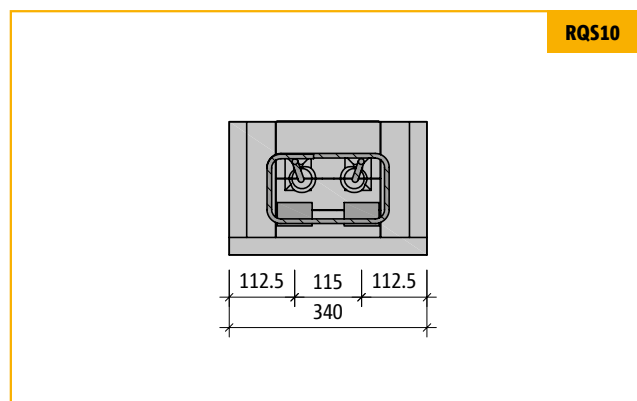
RQS10

Fig.88: Plan view: Schöck Isokorb® type RQS10



RQS10

Fig.89: Side view from outside: Schöck Isokorb® type RQS10



RQS10

Fig.90: Side view from inside: Schöck Isokorb® type RQS10

RQS

Structural engineering

# Schöck Isokorb® type RQS12

## Product description

RQS12

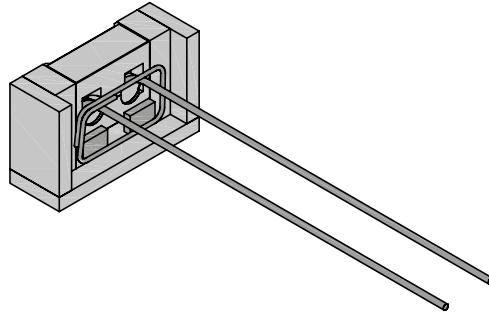


Fig.91: Isometry: Schöck Isokorb® type RQS12

RQS12

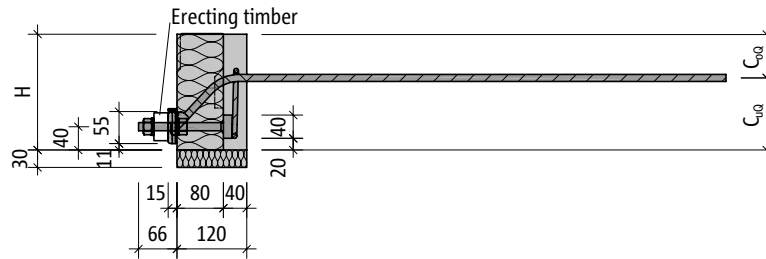


Fig.92: Section: Schöck Isokorb® type RQS12

RQS12

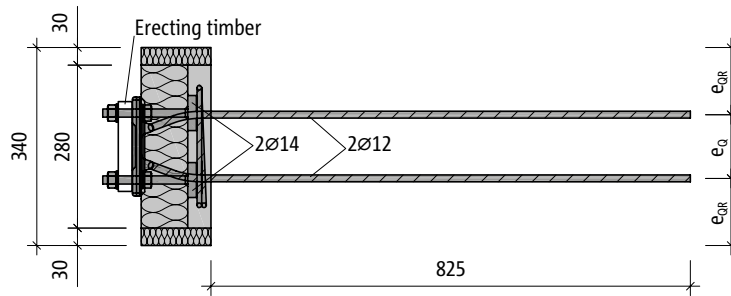


Fig.93: Plan view: Schöck Isokorb® type RQS12

RQS12

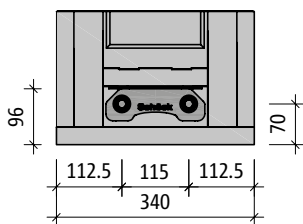


Fig.94: Side view from outside: Schöck Isokorb® type RQS12

RQS12

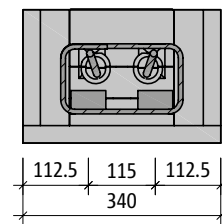


Fig.95: Side view from inside: Schöck Isokorb® type RQS12

RQS

Structural engineering

# Schöck Isokorb® type RQS

## Product description

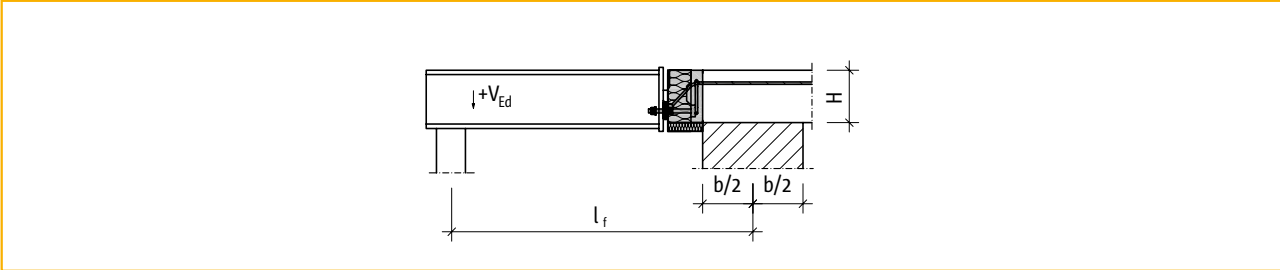
Schöck Isokorb® type		RQS8				RQS10				RQS12		
Isokorb® height H [mm]		160	180	200	220	160	180	200	220	180	200	220
Product description	Isokorb® length [mm]	340				340				340		
	Shear force bars ( $l_{v, floor}$ in mm)	2 $\varnothing$ 8 (510)				2 $\varnothing$ 10 (695)				2 $\varnothing$ 12 (825)		
	Pressure bearing	2 $\varnothing$ 14				2 $\varnothing$ 14				2 $\varnothing$ 14		
	$C_{oQ}$ [mm]	44	44	64	84	50	50	50	70	56	56	76
	$C_{uQ}$ [mm]	116	136	136	136	110	130	150	150	124	144	144
	$e_Q$ [mm]	104	118	118	118	100	114	127	127	109	123	123
	$e_{QR}$ [mm]	118	111	111	111	120	113	106.5	106.5	115.5	108.5	108.5

- $l_v$  settlement depth  
 $C_{oQ}$  centre-to centre distance shear force bars from upper edge Isokorb®  
 $C_{uQ}$  centre-to-centre distance shear force bars from lower edge Isokorb® (floor edge)  
 $e_Q$  centre distance of shear force bars between each other  
 $e_{QR}$  centre distance of shear force bars from outer edge Isokorb®

# Schöck Isokorb® type RQS

## Design table

Design values are to be referred to the middle of the wall.



Schöck Isokorb® type		RQS8	RQS10	RQS12
Design values for	Concrete strength	≥ C20/25		
	Surface floor front face	rough	toothed	toothed
Isokorb® height H [mm]		Shear force $V_{Rd}$ [kN]		
	160	+28.0	+48.3	–
	180/200/220			+69.6
		Horizontal force $H_{Rd}$ [kN] <sup>1)</sup>		
	160 - 220	±2.5	±2.5	±2.5
		max. expansion joint spacing e [m]		
	160	5.1	2.0	–
	180	5.8	5.8	3.1
200	5.8			
220				

RQS

Structural engineering

<sup>1)</sup> For the acceptance of the existing Horizontal force ( $H_{Ed}$ ) parallel to the outside wall, a minimum shear force of  $2.9 \cdot H_{Ed}$  is to be ensured.

# Schöck Isokorb® type RQS

## Notes

### Design

- The structural engineering information on pages 26 - 29 is to be observed.
- The straight sides of the shear force bars are to lap with the reinforcement of the neighbouring slabs in the tension zone.

### Expansion joint spacing

The determination of the allowable joint spacing is to be based a reinforced concrete balcony securely connected with the steel girders. If structural measures allow for movement between the balcony slab and the individual steel girders are carried out, then only the separation of the immovably formed connections is relevant.

### Edge and element separation

The separation of the structural component axis of the Schöck Isokorb® type RKS and type RQS from the edge of the structural component must be at least 190 mm; the centre-to-centre distance of these must not be less than 340 mm.

### Installation tolerances

Design-related, with the assembly of the steel girder, only tolerances in the vertical direction can be compensated via the Schöck Isokorb® type RKS/RQS. The tolerance is: +10 mm vertical and  $\pm 0$  mm horizontal. The Isokorb® types RKS/RQS therefore must be placed according to precise measurement details.

The firm entrusted with the production of the subsequently mortared in slab connections is to be informed by the structural engineer about these accuracies in the implementation plans. In order to enable the functionally correct joining of the shell and steel construction without adjustment and rework, the observation of the tolerances must be checked by the construction supervision taken into account in the steel construction.

#### Tip:

The start of the production of the new balcony steel construction or prefabricated component) is to take place only if the Schöck Isokorb® R types are placed and their final location has been determined to an accurate degree (mm).

# Schöck Isokorb® type RQS

## Steel construction / In-situ face plates

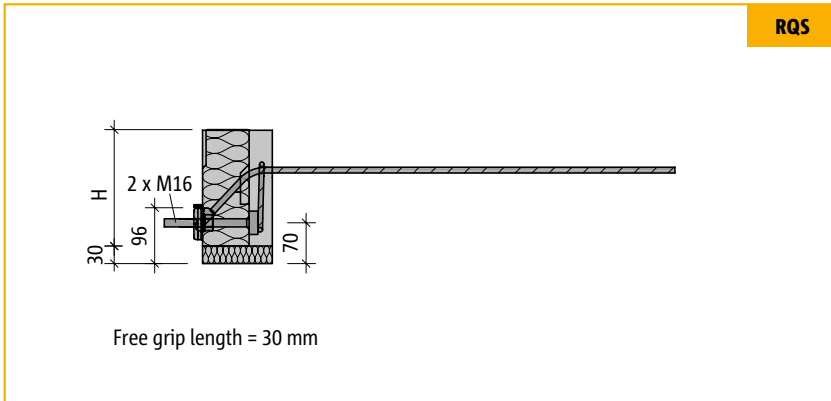


Fig.96: Section: Schöck Isokorb® type RQS

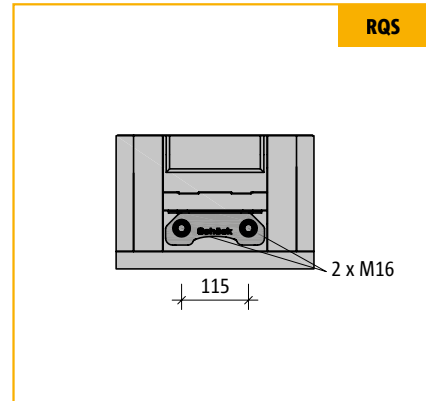


Fig.97: Front view: Schöck Isokorb® type RQS

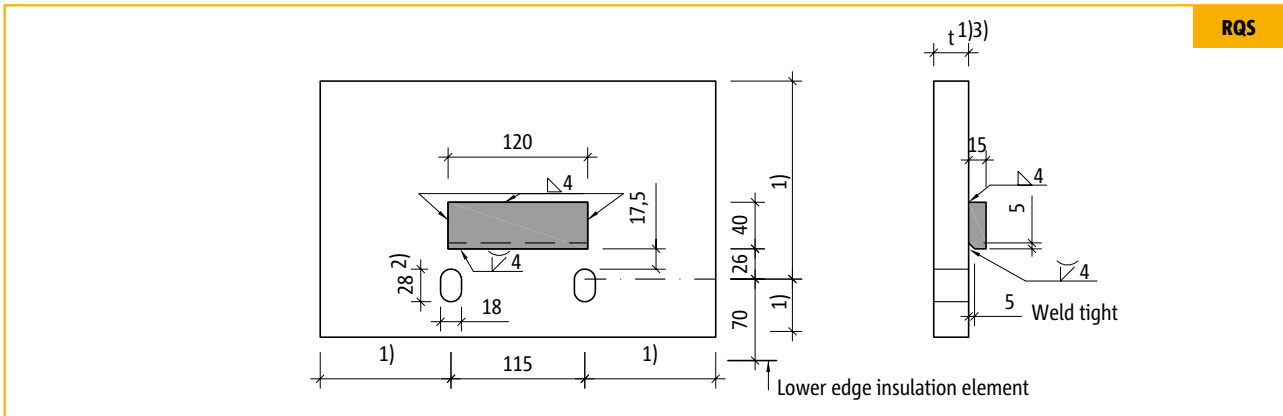


Fig.98: In-situ face plate for Schöck Isokorb® type RQS

### Note:

- ▶ The dog is absolutely necessary for the transmission of shear forces! See page 71.
- ▶ Steel grade according to static requirements. Carry out corrosion protection following welding.
- ▶ Steel construction: Tolerances of the shell must be checked!

<sup>1)</sup> According to details of the structural engineer.

<sup>2)</sup> Hole size corresponds to a height adjustment of +10 mm. The height adjustment can be increased through the enlargement of the hole.

<sup>3)</sup> Note free clamp length: 30 mm with RQS8, RQS10 and RQS12.

# Schöck Isokorb® type RQS

## Steel construction / In-situ dog

An in-situ dog (flat steel  $h=40\text{mm}$ ,  $l=120\text{mm}$ ,  $t=15\text{mm}$ ), welded on to the face plate is absolutely necessary for the safe transmission of shear forces in the Schöck Isokorb® type RKS (or RQS)!

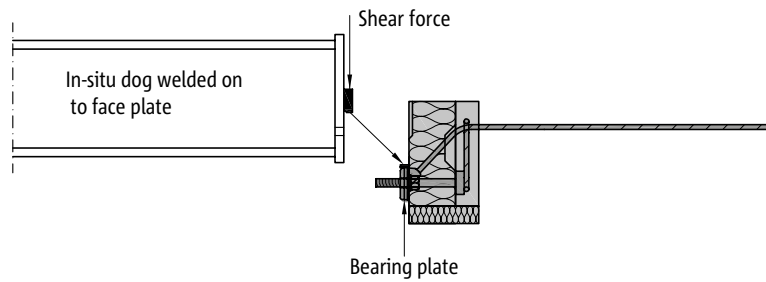


Fig.99: Absolutely necessary dog on the face plate

The dog is part of the steel structure

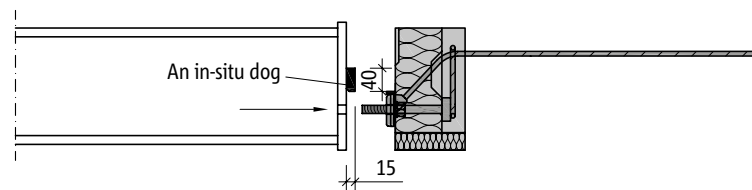


Fig.100: Assembly of the steel girder to the Schöck Isokorb®

After assembly, the dog transmits shear forces in the Schöck Isokorb® type RQS (or RKS)

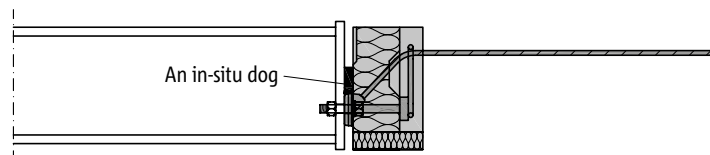


Fig.101: The dog now sits on the support plate; for height adjustment push in shims provided under the dog

# Schöck Isokorb® type RQS

## Checklist



- Was the Schöck Isokorb® type matching the static system selected? Type RQS counts as pure shear force connection (not a moment joint).
- Are the internal forces in the Schöck Isokorb® determined at design level?
- Was the system supporting width applied with this?
- Has the concrete quality been analysed and is it basis for the design?
- Are the maximum expansion joint spacings taken into account?
- Are the allowable edge and element spacings observed?
- Is the required connection reinforcement present in the existing floor?
- Are position and spacings of the existing reinforcement as well as the electrical lines and sanitary pipelines in the existing floor known?
- Were the overall length and overall height of the insulation element taken into account for the formwork plans?
- Was attention drawn sufficiently in the implementation plans to the absolutely necessary in-situ dog (page 71)?
- Have the torques for the screwed connections noted in the implementation plans (see also page 120)?  
The nuts are to be tightened, without normal pre-torque, using the torque wrench;  
The following torques apply:  
RQS8 (Bolts  $\varnothing$  16):  $M_r = 50$  Nm  
RQS10 (Bolts  $\varnothing$  16):  $M_r = 50$  Nm  
RQS12 (Bolts  $\varnothing$  16):  $M_r = 50$  Nm
- Have the system components to be used with Schöck Isokorb® R been pointed out in the implementation plans?  
Grouting mortar: Hilti HIT-RE 500 V3 or fischer FIS EM  
Grouting concrete: Pagel V1/50  
For this see Chapter Building construction (page 85ff).
- Are the requirements on the construction drawings from the Schöck Isokorb® R approval documents Z-15.7-297 and Z-15.7-298 been observed? (see page 26)

RQS

Structural engineering



## Schöck Isokorb® type RQP, RQP+RQP

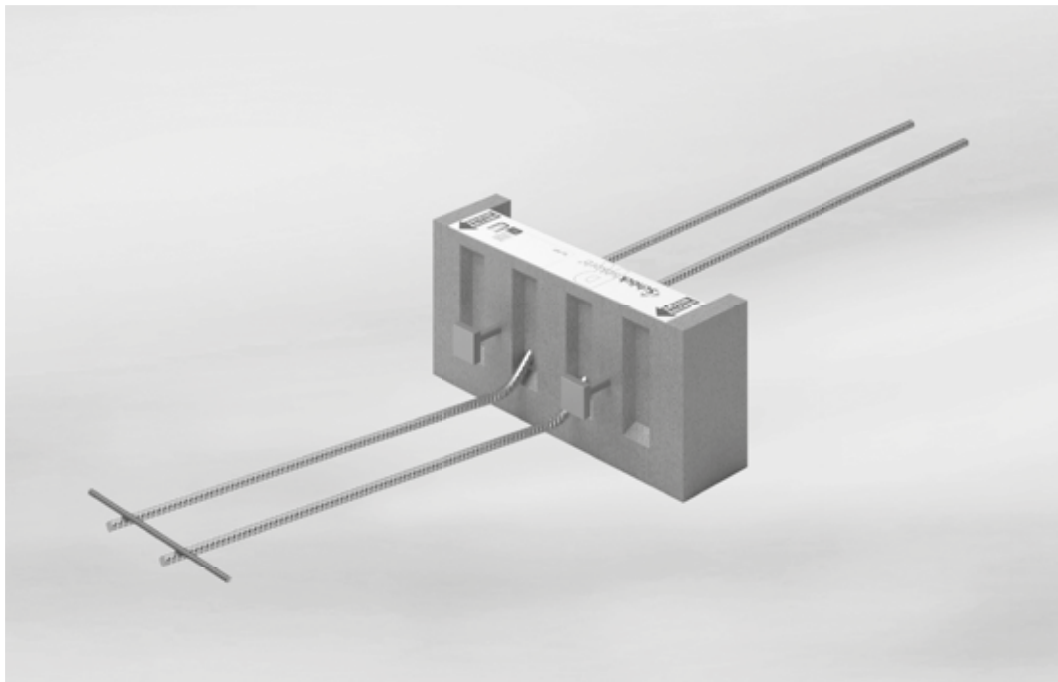


Fig.102: Schöck Isokorb® type RQP

The Schöck Isokorb® type RQP is a load-bearing thermal insulation element for the connection of supported reinforced concrete balconies to existing reinforced concrete floors. It transmits positive shear forces.

The Schöck Isokorb® type RQP+RQP transmits positive and negative shear forces.

RQP

Structural engineering

# Schöck Isokorb® type RQP, RQP+RQP

## Approvals / Building materials

### Approvals:

Schöck Isokorb® type RQP and RQP+RQP:	Z-15.7-297
Hilti grouting mortar HIT-RE 500 V3:	Z-21.8-2064 and ETA-16/0142
fischer grouting mortar FIS EM:	Z-21.8-1874 and ETA-09/0089
PAGEL grouting concrete V1/50:	DAfstb Directive "Production and application of cement-bound grouting concrete and grouting mortar"

### Schöck Isokorb® construction materials

Reinforcing steel	B500 B according to DIN 488-1
Stainless steel	Ribbed bars B500B NR, Material No.: 1.4362, 1.4571 or 1.4482 according to approval document Z-15.7-239 Smooth bar steel Material No.: 1.4571 or 1.4404 of strain hardening grade S 460
Pressure bearing	Stainless steel (see above)
Insulating material	Neopor® - this polystyrene hard foam is a registered trademark of BASF, $\lambda = 0.031 \text{ W/(m}\cdot\text{K)}$ , building material classification B1 (flameretardant)

RQP

### Connected components

Reinforcing steel	B500A or B500 according to DIN 488-1, or DIN EN 1992-1-1 (EC2) and DIN EN 1992-1-1/NA
Concrete	Normal concrete according to DIN 1045-2 or DIN EN 206-1 with an oven-dry density of 2000 kg/m <sup>3</sup> to 2600 kg/m <sup>3</sup> (Lightweight concrete is not permitted)  Indicative minimum strength class of the external structural components: Minimum C25/30 and depending on the environmental class according to DIN EN 1992-1-1/NA, table NA.E.1  Indicative minimum strength class of the internal structural components: Minimum C20/25 and depending on the environmental class according to DIN EN 1992-1-1/NA, table NA.E.1

# Schöck Isokorb® type RQP, RQP+RQP

## Examples for element configuration and sections

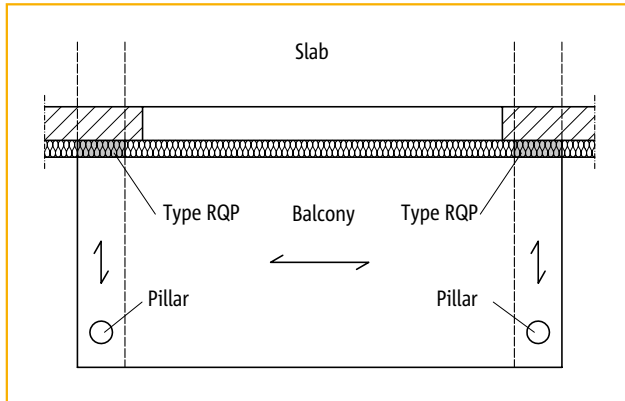


Fig.103: Balcony with support bearing

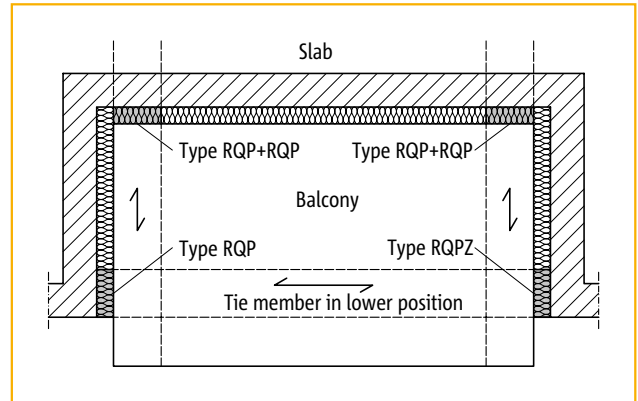


Fig.104: Recessed balcony and lifting shear forces

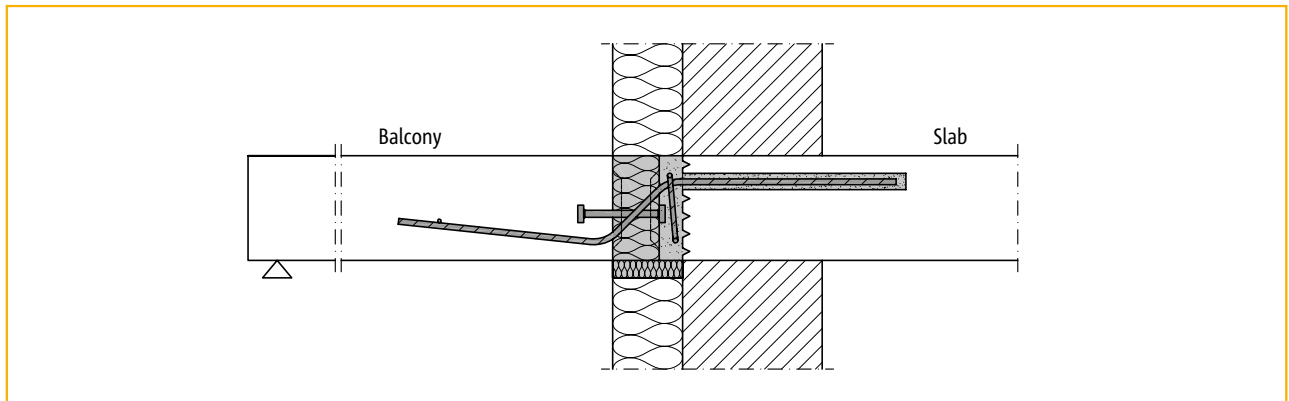


Fig.105: Masonry with external insulation with support bearing and type RQP

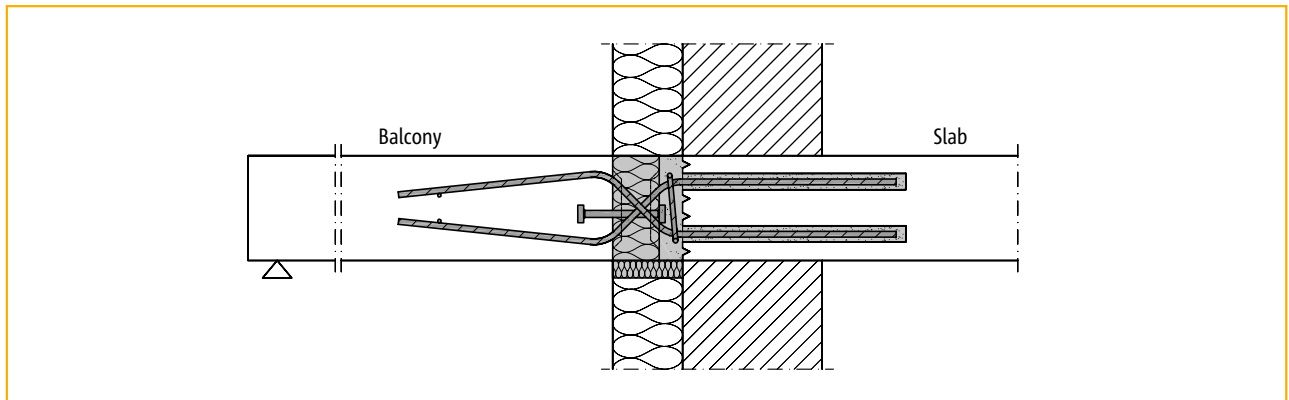


Fig.106: Masonry with external insulation with support bearing and type RQP+RQP

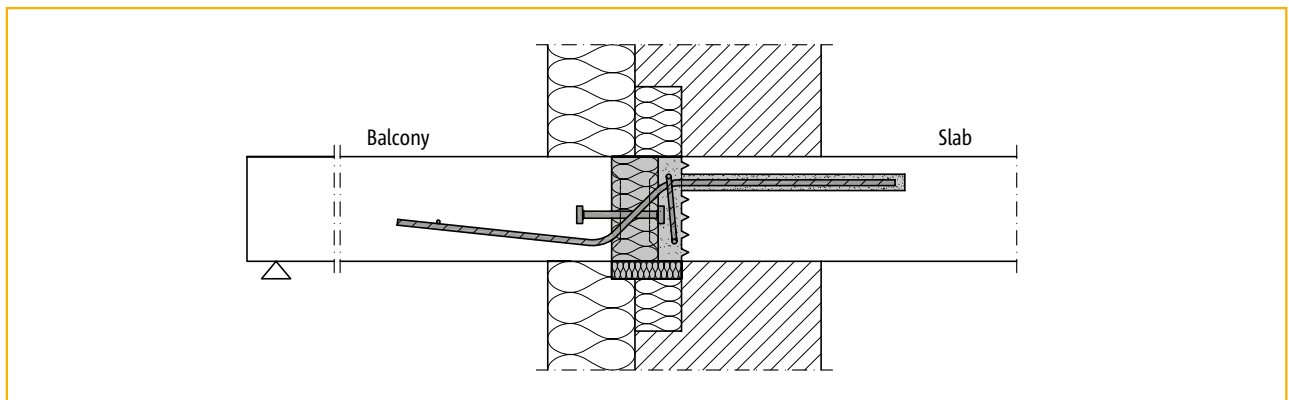


Fig.107: Masonry with external insulation with support bearing and type RQP

RQP

Structural engineering

# Schöck Isokorb® type RQP

## Product description

RQP10

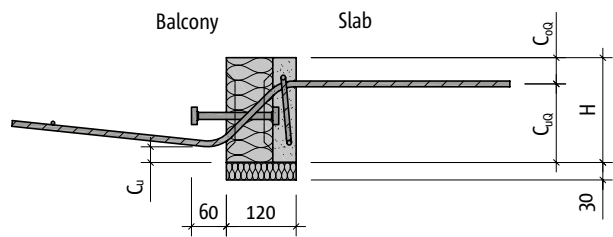


Fig.108: Section: Schöck Isokorb® type RQP10

RQP10

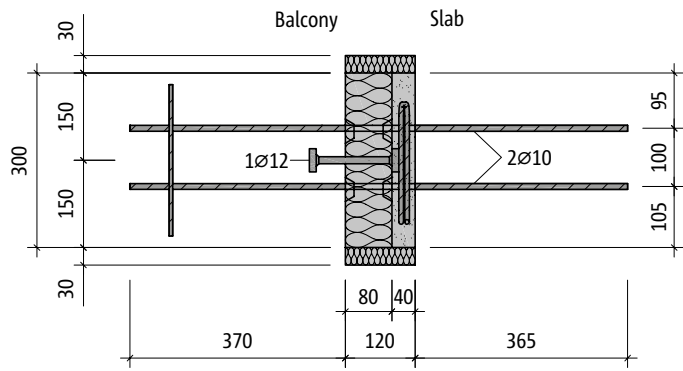


Fig.109: Plan view: Schöck Isokorb® type RQP10

RQP

RQP40

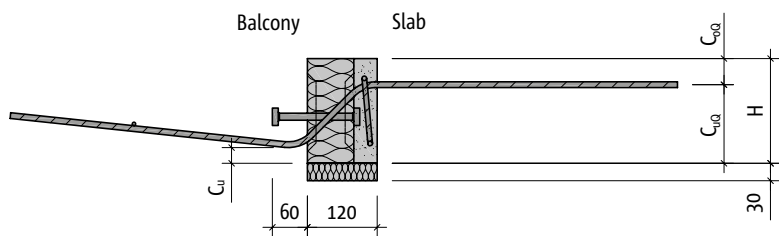


Fig.110: Section: Schöck Isokorb® type RQP40

RQP40

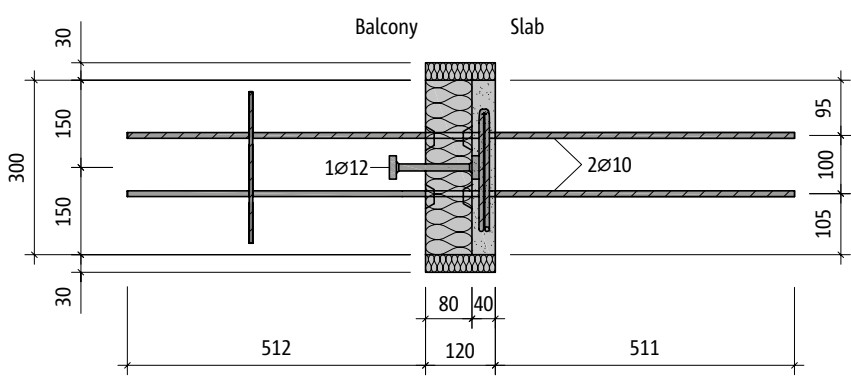


Fig.111: Plan view: Schöck Isokorb® type RQP40

Structural engineering

# Schöck Isokorb® type RQP

## Product description

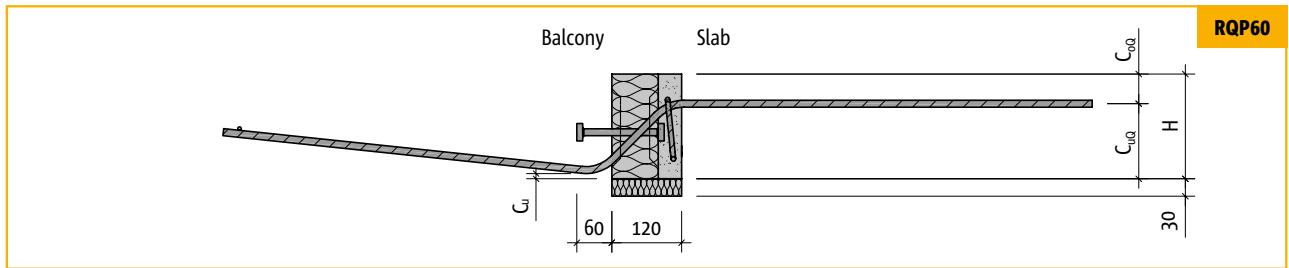


Fig.112: Section: Schöck Isokorb® type RQP60

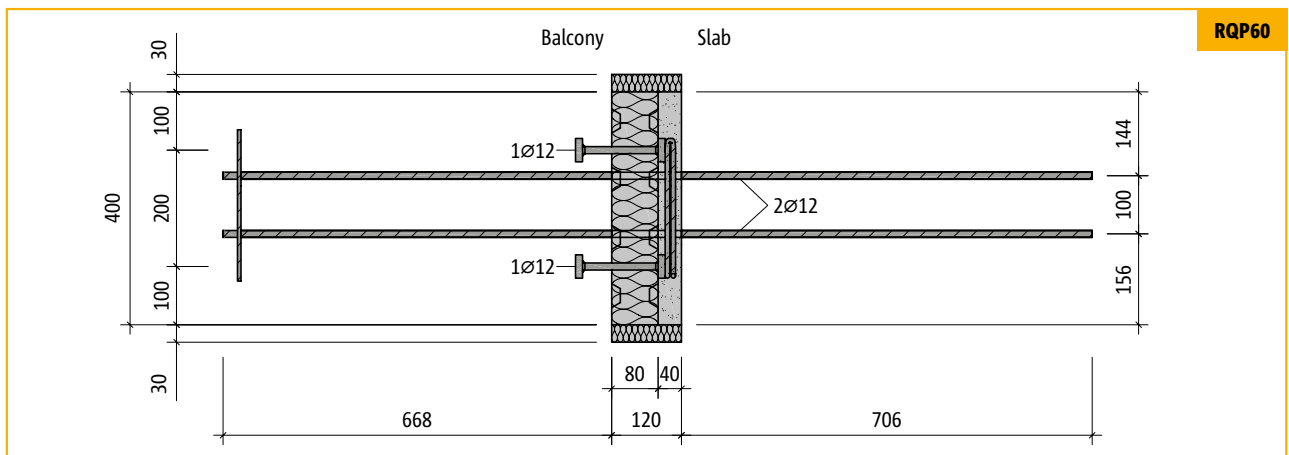


Fig.113: Plan view: Schöck Isokorb® type RQP60

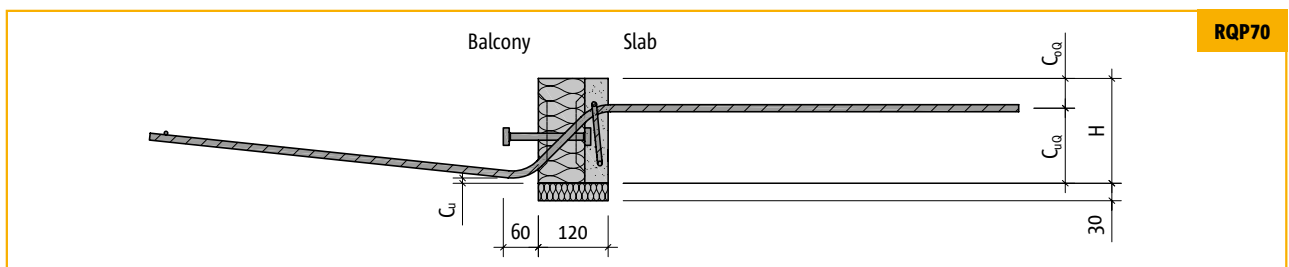


Fig.114: Section: Schöck Isokorb® type RQP70

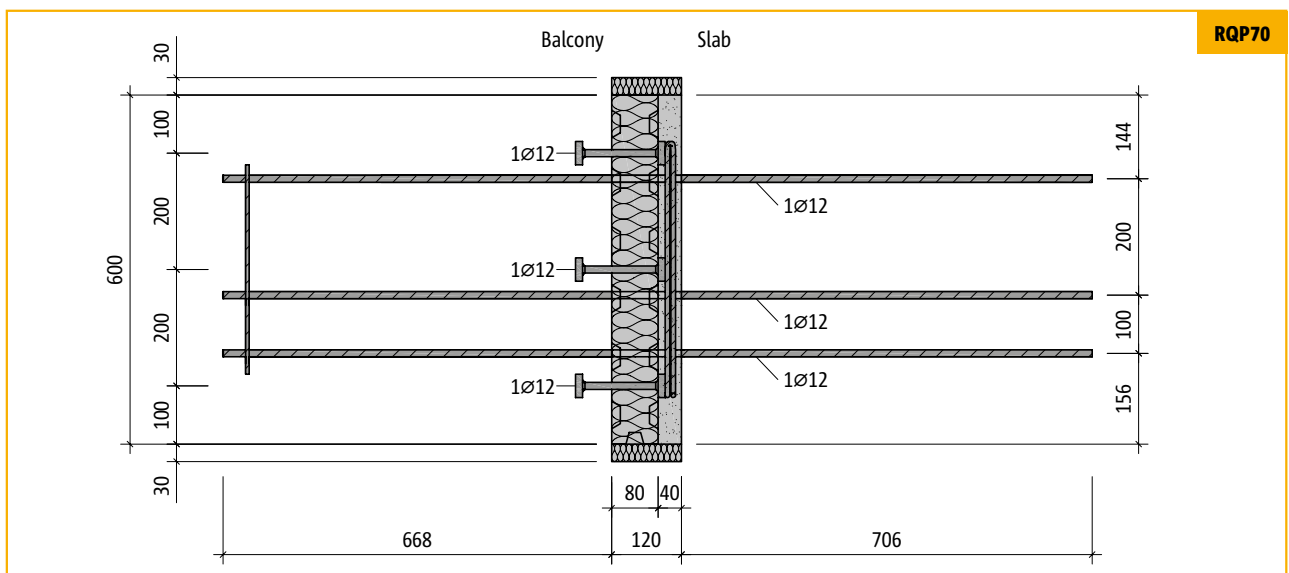


Fig.115: Plan view: Schöck Isokorb® type RQP70

# Schöck Isokorb® type RQP+RQP

## Product description

RQP10+RQP10

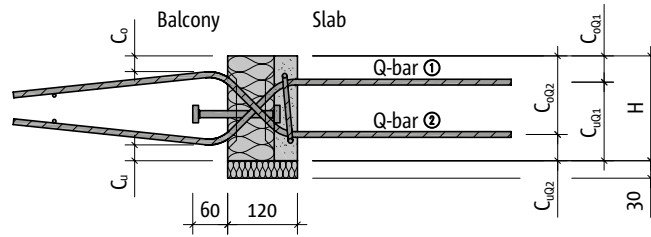


Fig.116: Section: Schöck Isokorb® type RQP10+RQP10

RQP10+RQP10

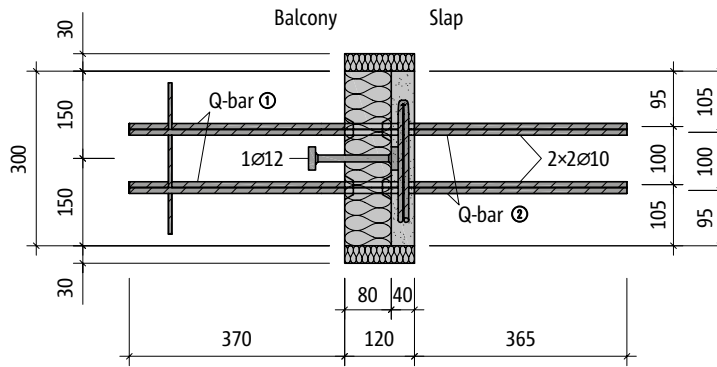


Fig.117: Plan view: Schöck Isokorb® type RQP10+RQP10

RQP40+RQP40

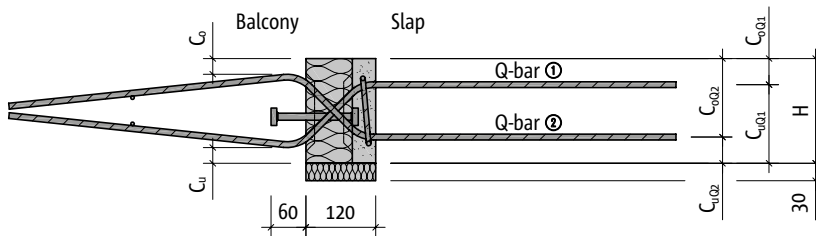


Fig.118: Section: Schöck Isokorb® type RQP40+RQP40

RQP40+RQP40

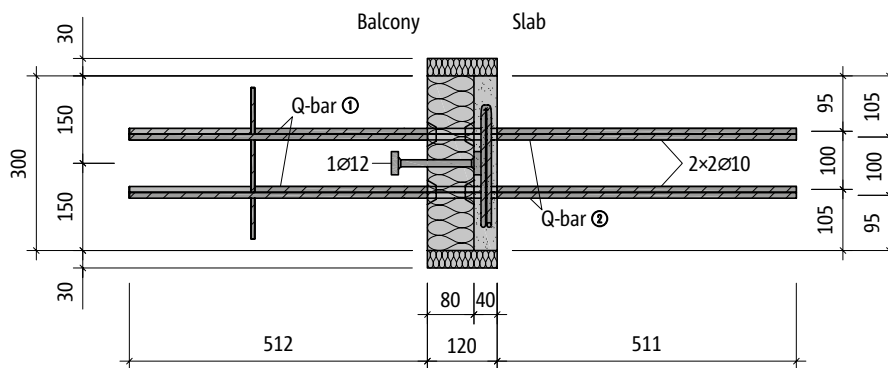


Fig.119: Plan view: Schöck Isokorb® type RQP40+RQP40

# Schöck Isokorb® type RQP+RQP

## Product description

**RQP60+RQP60**

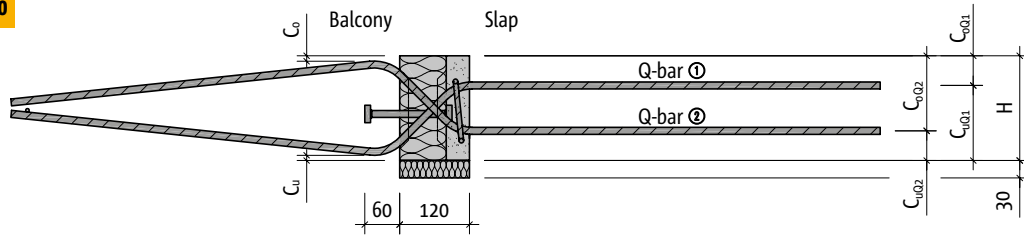


Fig.120: Section: Schöck Isokorb® type RQP60+RQP60

**RQP60+RQP60**

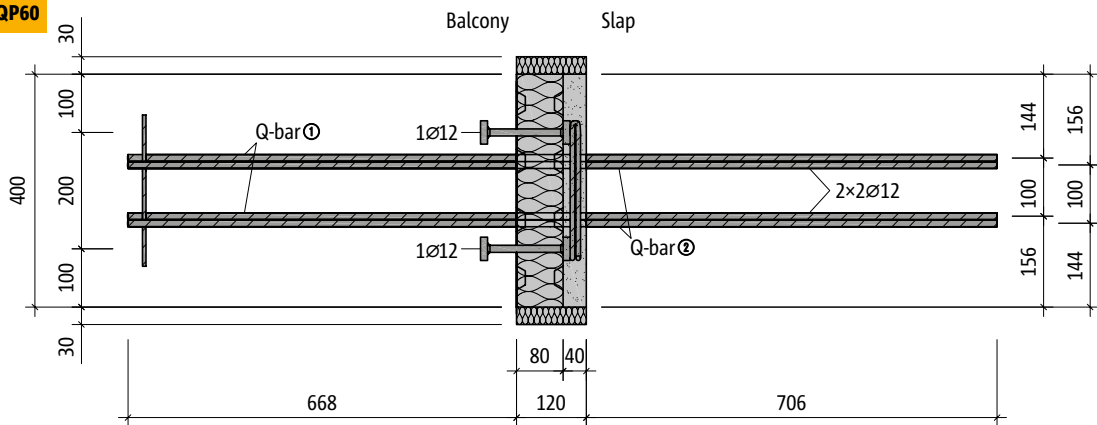


Fig.121: Plan view: Schöck Isokorb® type RQP60+RQP60

**RQP70+RQP70**

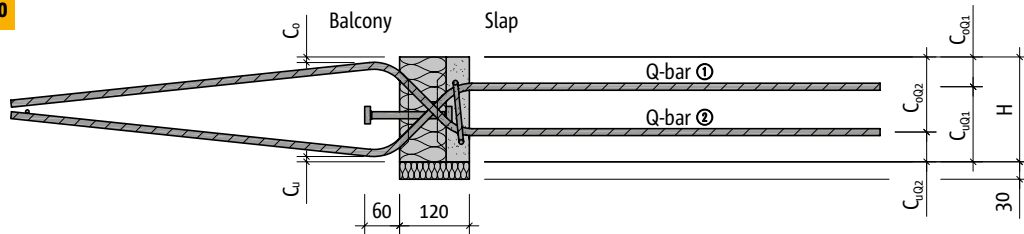


Fig.122: Section: Schöck Isokorb® type RQP70+RQP70

**RQP70+RQP70**

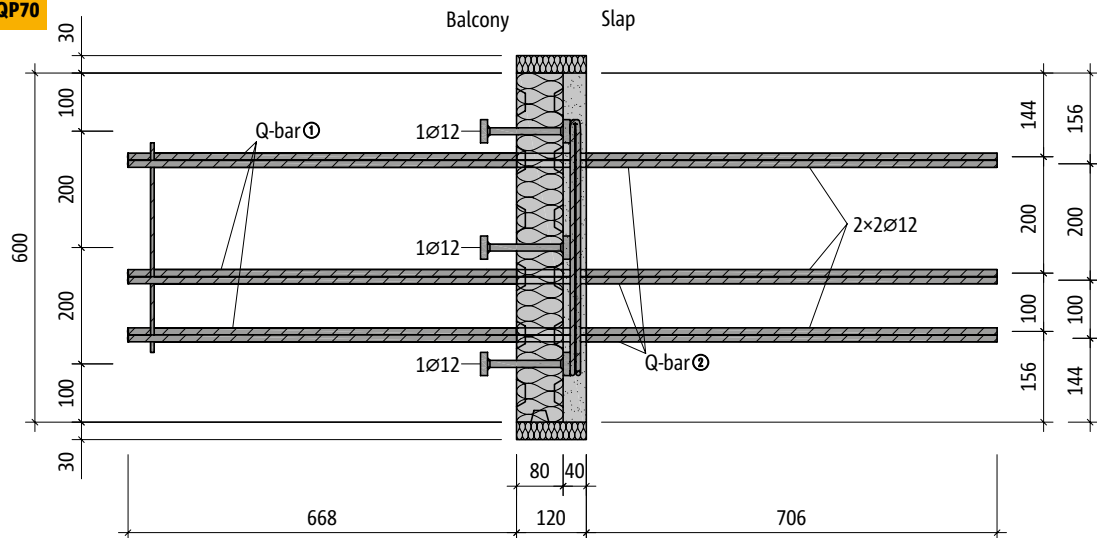


Fig.123: Plan view: Schöck Isokorb® type RQP70+RQP70

RQP

Structural engineering

# Schöck Isokorb® type RQP, RQP+RQP

## Product description

Schöck Isokorb® type		RQP10			RQP40			RQP60		RQP70	
Isokorb® height H [mm]		160	180	200	160	180	200	180	200	180	200
Product Description	Isokorb® length [mm]	360			360			460		660	
	Shear force bars [ $l_{v, floor}$ in mm]	2 $\varnothing$ 10 (365)			2 $\varnothing$ 10 (511)			2 $\varnothing$ 12 (706)		3 $\varnothing$ 12 (706)	
	Pressure bearing	1 $\varnothing$ 12			1 $\varnothing$ 12			2 $\varnothing$ 12		3 $\varnothing$ 12	
	$C_u$ [mm]	10	27	27	10	27	27	10	10	10	10
	$C_{oQ}$ [mm]	45	45	65	45	45	65	51	71	51	71
	$C_{uQ}$ [mm]	115	135	135	115	135	135	129	129	129	129

Schöck Isokorb® type		RQP10+RQP10			RQP40+RQP40			RQP60+RQP60		RQP70+RQP70	
Isokorb® height H [mm]		160	180	200	160	180	200	180	200	180	200
Product Description	Isokorb® length [mm]	360			360			460		660	
	Shear force bars [ $l_{v, floor}$ in mm]	2 $\varnothing$ 10 (365)			2 $\varnothing$ 10 (511)			2 $\varnothing$ 12 (706)		3 $\varnothing$ 12 (706)	
	Pressure bearing	1 $\varnothing$ 12			1 $\varnothing$ 12			2 $\varnothing$ 12		3 $\varnothing$ 12	
	$C_u$ [mm]	10	27	27	10	27	27	10	10	10	10
	$C_o$ [mm]	10	27	47	10	27	47	10	30	10	30
	$C_{oQ1}$ [mm]	45	45	65	45	45	65	51	71	51	71
	$C_{uQ1}$ [mm]	115	135	135	115	135	135	129	129	129	129
	$C_{uQ2}$ [mm]	45	45	45	45	45	45	51	51	51	51
$C_{oQ2}$ [mm]	115	135	155	115	135	155	129	149	129	149	

- $l_v$  settlement depth
- $C_u$  lower balcony side concrete cover of the shear force bars
- $C_o$  upper balcony side concrete cover of the shear force bars
- $C_{oQ}$  centre-to centre distance shear force bars from upper edge Isokorb®
- $C_{uQ}$  centre-to-centre distance shear force bars from lower edge Isokorb®(floor edge)

RQP



# Schöck Isokorb® type RQP, RQP+RQP

## Design tables / Notes

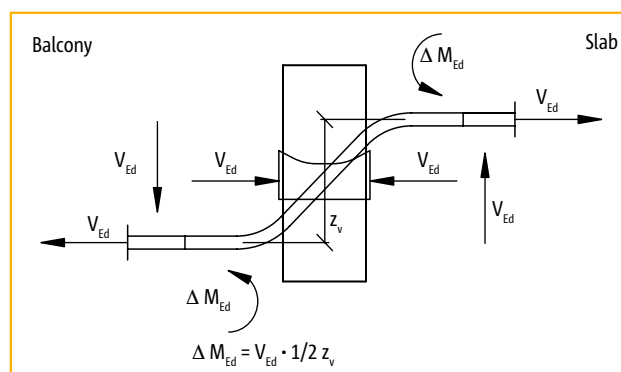
Schöck Isokorb® type		RQP10	RQP40	RQP60	RQP70
Design values for	Concrete strength	≥ C20/25			
	Surface floor front face	rough	rough	rough	rough
Isokorb® height H [mm]	Shear force $V_{rd}$ [kN]				
	160	+26.3	+37.8	–	–
	180/200			+59.1	+88.6
	$\Delta M_{Ed}$ [kNm]				
	160/180/200	1.3	1.9	3.2	5.0
	max. expansion joint spacing e [m]				
160	9.4	9.4	–	–	
180/200	10.4	10.4	8.5	8.5	

Schöck Isokorb® type		RQP10+RQP10	RQP40+RQP40	RQP60+RQP60	RQP70+RQP70
Design values for	Concrete strength	≥ C20/25			
	Surface floor front face	rough	rough	rough	rough
Isokorb® height H [mm]	Shear force $V_{rd}$ [kN]				
	160	±26.3	±37.8	–	–
	180/200			±59.1	±88.6
	$\Delta M_{Ed}$ [kNm]				
	160/180/200	1.3	1.9	3.2	5.0
	max. expansion joint spacing e [m]				
160	9.4	9.4	–	–	
180/200	10.4	10.4	8.5	8.5	

The information on load-bearing structure planning on pages 26 - 29 are to be observed.

### Moments from eccentric connection [ $\Delta M_{Ed}$ ]

For the design of the connection reinforcement on both sides of the Schöck Isokorb® type RQP and RQP+RQP moments from eccentric connection are additionally to be taken into account. These moments are in each case to be superimosed with the moments from the standard stressing if they have the same sign.



RQP

Structural engineering

# Schöck Isokorb® type RQP, RQP+RQP

## Notes

### Design

A static verification is to be presented for slabs connecting on both sides of the Schöck Isokorb®. Here, for the determination of the reinforcement of the floor and balcony slabs, which connect to the Schöck Isokorb® type RQP, a free bearing is to be assumed as, through the Schöck Isokorb® type RQP, only shear forces can be transmitted. The shear force bars in the tension zone of the connecting slab are to be adjoined with the tension reinforcement.

### Edge spacings

With the Schöck Isokorb® type RQP and RQP+RQP in the installed condition the following centre-to-centre distances of the individual Isokorb® components to the free edge or to the expansion joint must be observed:

Compression elements:	≥ 50 mm
Shear force bars:	≥ 100 mm
	≤ 150 mm

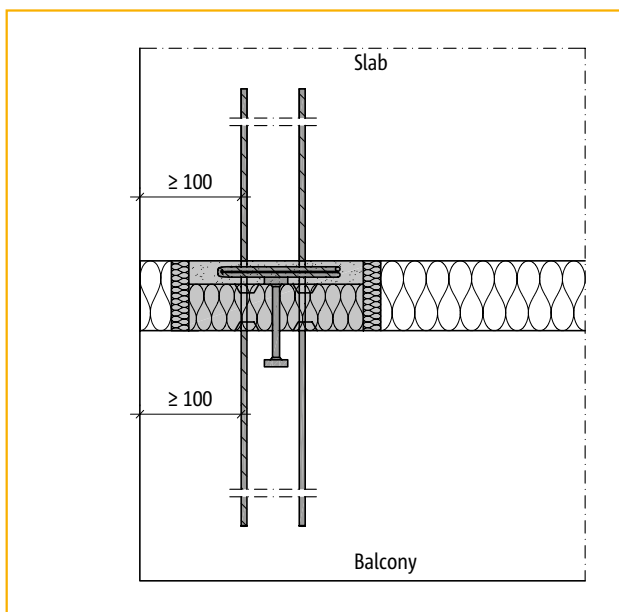


Fig.124: Schöck Isokorb® type RQP elevation edge spacings

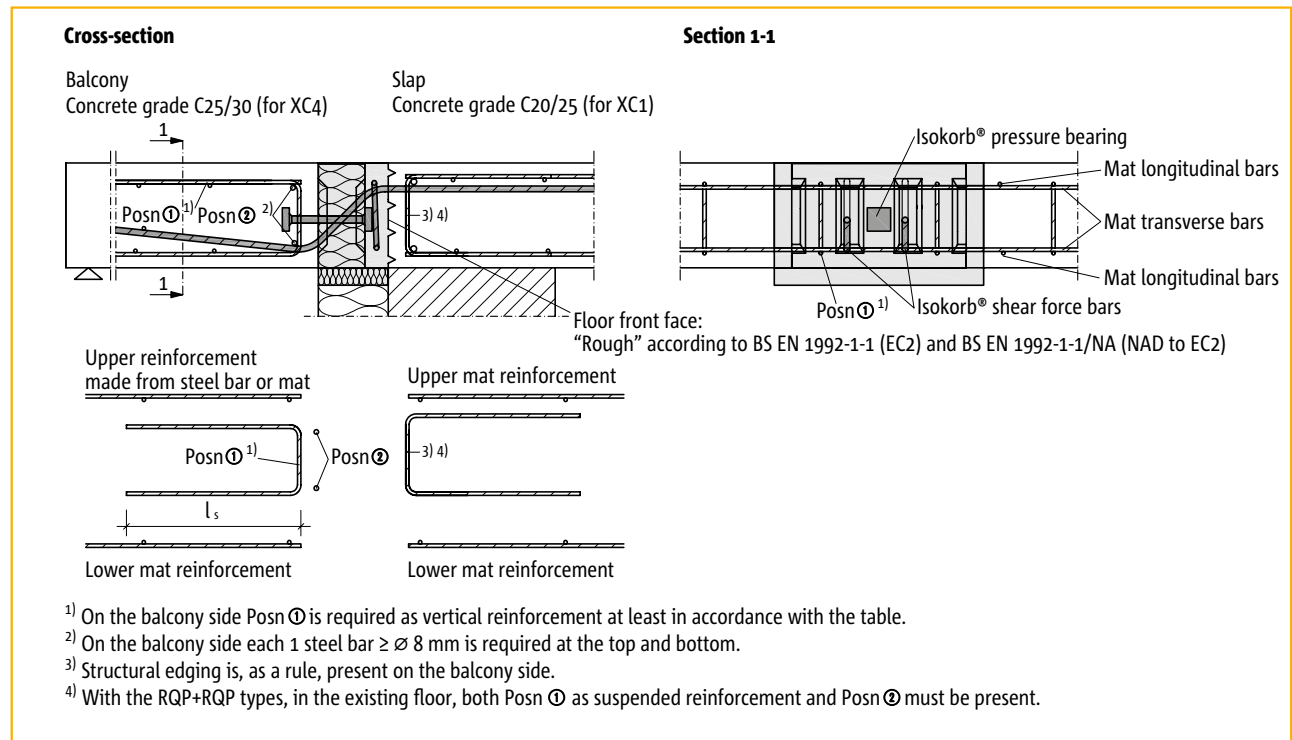
RQP

Structural engineering

# Schöck Isokorb® type RQP, RQP+RQP

## On-site reinforcement

### Connection using stirrups



RQP

On-site reinforcement	Schöck Isokorb® type			
	RQP10 RQP10+RQP10	RQP40 RQP40+RQP40	RQP60 RQP60+RQP60	RQP70 RQP70+RQP70
Posn (1) Vertical reinforcement [cm <sup>2</sup> /Isokorb®]	0.61	0.87	1.36	2.04
Posn (2) Bar steel	2 $\varnothing 8$			

Structural engineering

# Schöck Isokorb® type RQP, RQP+RQP Checklist



- Was the Schöck Isokorb® type matching the static system selected? Type RQP and Type RQP+RQP count as pure shear force connection (not a moment joint).
- Are the internal forces on the Schöck Isokorb® determined at the design level?
- Was the system supporting width applied with this?
- Has the concrete quality been analysed and is it the basis for design?
- Are the maximum expansion joint spacings taken into account?
- Are the allowable edge and element spacings observed?
- With VRd has the limiting value of the slab load-bearing capacity been checked?
- Is the respectively necessary connection reinforcement available in the existing floor?
- Are the position and spacings of the existing reinforcement and of the existing electrical lines and sanitary pipes in the existing floor known?
- Have the overall length and overall height of the insulation element been taken into account for the formwork plans?
- Have the system components to be used with Schöck Isokorb® R been pointed out in the implementation plans?  
Grouting mortar: Hilti HIT-RE 500 V3 or fischer FIS EM  
Grouting concrete: Pagel V1/50  
For this see Chapter Building construction (page 85ff).
- Are the requirements on the engineering drawings from the Schöck Isokorb® R approval documents Z-15.7-297 and Z-15.7-298 observed? (see page 26)

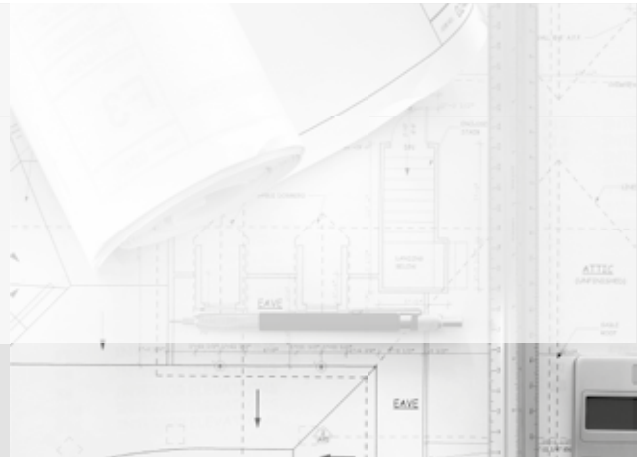
RQP

**Building physics**

**Planning principles**

**Structural planning**

**Building construction**



# Schöck Isokorb® R

## Installation process building site

The installation of the Schöck Isokorb® R types should take place in close agreement with the architect and structural engineer on the basis of the associated Schöck Isokorb® R Installation Instructions (pages 89 - 135). The following list represents the installation process on the building site type-dependent in roughly in steps.

- If required: Detach existing balcony.
- Take note of existing reinforcement as well as existing electrical lines and sanitary pipelines with regard to planning.
- Mark drilling holes on the front face of the existing floor with the aid of the drilling template provided.
- The drilling hole diameter and the seating depth are dependent on the Schöck Isokorb® R type.
- Observe Hilti HIT-RE 500 V3 setting instruction for reinforcement bars "Retrospective reinforcement connection HIT-RE 500 V3", or assembly instruction fischer FIS EM ( $d_0$  = bar diameter + 4 mm).
- According to approval documents a drilling aid is to be used, permitted drilling methods are hammer or diamond drilling, in each case using drilling aid. If existing reinforcement is met during drilling, the drilling is to be discontinued. The mis-drilling hole (diameter  $\Phi_{s0}$ ) is to be grouted using HIT-RE 500 V3 or fischer FIS EM and a new drill hole is to be created with a clear separation of at least  $2d_0$ .
- Depending on the Schöck Isokorb® R type a rough or toothed joint according to DIN EN 1992-1-1 (EC2) and DIN EN 1992-1-1/NA is to be made on the front face of the existing floor. This means: V-grooves in defined depth and spacing are cut in the front face of the existing floor using a cutting wheel.
- Drill hole cleaning, drill hole filling and placing of the reinforcement bars of the Schöck Isokorb® R type according to setting instruction Hilti HIT-RE 500 V3 "Retrospective reinforcement connection HIT-RE 500 V3" or according to the assembly instruction "Reinforcement connection fischer FIS EM".
- Support of the Schöck Isokorb® R during the hardening time of the grouting mortar, in order that no undesired deformation arises due to play in the hole.
- The insulation element of the Schöck Isokorb® R types RKS, RQS, RQP and RQP+RQP form a "lost shuttering" for the production of the required poured joint.
- With type RK the erection of the balcony shuttering is necessary before the production of the pouring joint.
- Filling of the pouring joint using grouting concrete PAGEL VERGUSS V1/50. The processing instructions of the firm of PAGEL are to be observed.
- Following the hardening of the grouting concrete the production of the reinforced concrete balcony slab (type RK, type RQP, type RQP+RQP) and the connection of the steel girder (type RKS, type RQS) take place.

# Schöck Isokorb® R

## Grouting mortar

### Hilti HIT-RE 500 V3 Injection system

- Hilti HIT-RE 500 V3 is one of the two approved injection systems for the cementing of the Schöck® Isokorb R in the existing floor. The regulations from the Schöck Isokorb® R approval documents Z-15.7-297 and Z-15.7-298 are to be observed.
- The firm entrusted with the fabrication of the retrospectively mortared slab connections must possess a valid proof of suitability with regard to the "Requirements on the firm for the production of reinforcement connections using retrospectively mortared in reinforcement bars" in accordance with the general building supervisory approval document Z-21.8-2064, Section 4.1 as well as Annexes 10-12.

The handling of the injection systems for Hilti HIT-RE 500 V3 takes place according to the approval documents:

- ETA-16/0142, injection system Hilti HIT-RE 500 V3 for reinforcement connections and
- Z-21.8-2064, application approval for the reinforcement connection using grouting mortar Hilti HIT-RE 500 V3
- The Hilti HIT-RE 500 V3 setting instruction "Retrospective reinforcement connection using Hilti HIT-RE 500 V3" is to be observed.
- An assembly protocol is to be kept (Pattern: Form Assembly Protocol Hilti HIT-RE 500 V3).
- Permitted drilling methods: hammer or diamond drilling, in each case using drilling aid.)

Advice on the Hilti HIT-RE 500 V3 injection system with regard to the required proof of suitability; current documents etc. are on offer also from the Hilti Customer Service:

Hilti Customer service  
Tel. +49 (0)800-888 55 22 (toll-free)  
Fax. +49 (0)800-888 55 23  
de.kundenservice@hilti.com  
www.hilti.de

Hilti Deutschland GmbH  
Hiltistraße 2  
86916 Kaufering  
Germany

# Schöck Isokorb® R

## Grouting mortar / Grouting concrete

### fischer FIS EM injection system

- fischer FIS EM is one of the two permitted injection systems for the cementing of the Schöck® Isokorb R in the existing floor. The regulations from the Schöck Isokorb® R approval documents Z-15.7-297 and Z-15.7-298 are to be observed.
- The firm entrusted with the fabrication of the retrospectively mortared slab connections must possess a valid proof of suitability with regard to the "Requirements on the firm for the production of reinforcement connections using retrospectively mortared in reinforcement bars" in accordance with the general building supervisory approval document Z-21.8-1874, Section 4.1 as well as Annexes 10-12 or Z-21.8-1874, Section 4.1, Annexes 9-11.

The handling of the FIS EM injection system takes place according to the approval documents:

- ETA-09/0089, reinforcement connection using the fischer grouting mortar FIS EM and
- Z-21.8-1874, application approval for the reinforcement connection using grouting mortar fischer FIS EM
- The assembly instruction "Reinforcement connection using fischer grouting mortar FIS EM" is to be observed.
- An assembly protocol is to be kept (Pattern: Form Assembly Protocol fischer FIS EM).
- Permitted drilling methods are hammer or diamond drilling, in each case using drilling aid.

Advice on the fischer FIS EM injection system with regard to the required proof of suitability; current documents etc. are on offer also from fischer Application Engineering :

fischer Application Engineering  
Tel. +49 (0)7443 12-4000  
Fax. +49 (0)7443 12-4568  
anwendungstechnik@fischer.de  
www.fischer.de

fischer Deutschland Vertriebs GmbH  
Klaus-Fischer-Straße 1  
72178 Waldachtal  
Germany

### PAGEL VERGUSS grouting cement V1/50

- The 4 cm width joint between existing floor and insulation material of the slab connection is to be filled with PAGEL VERGUSS V1/50 grouting concrete.
- PAGEL VERGUSS V1/50 conforms with the DAfStb Directive "Production and application of cement-bound grouting concrete and grouting mortar".
- The grouting concrete is to be mixed and carefully applied in accordance with the PAGEL processing information.
- The PAGEL processing information on hardening times must at all costs be observed.
- For the later verification of the quality the charge number of the processed grouting concrete sack is to be recorded. The appropriate strength with professional installation on the building site can be guaranteed through strict quality controls with the production of the grouting concrete.

Request for and download of data sheets and test certificates for PAGEL VERGUSS V1/50 at:

PAGEL SPEZIAL-BETON GmbH & Co. KG  
Wolfsbankring 9  
D-45355 Essen  
Germany

Tel. +49 (0)201/68504-0  
Fax. +49 (0)201/68504-31  
info@pagel.com  
www.pagel.com



# Schöck Isokorb® type RKS

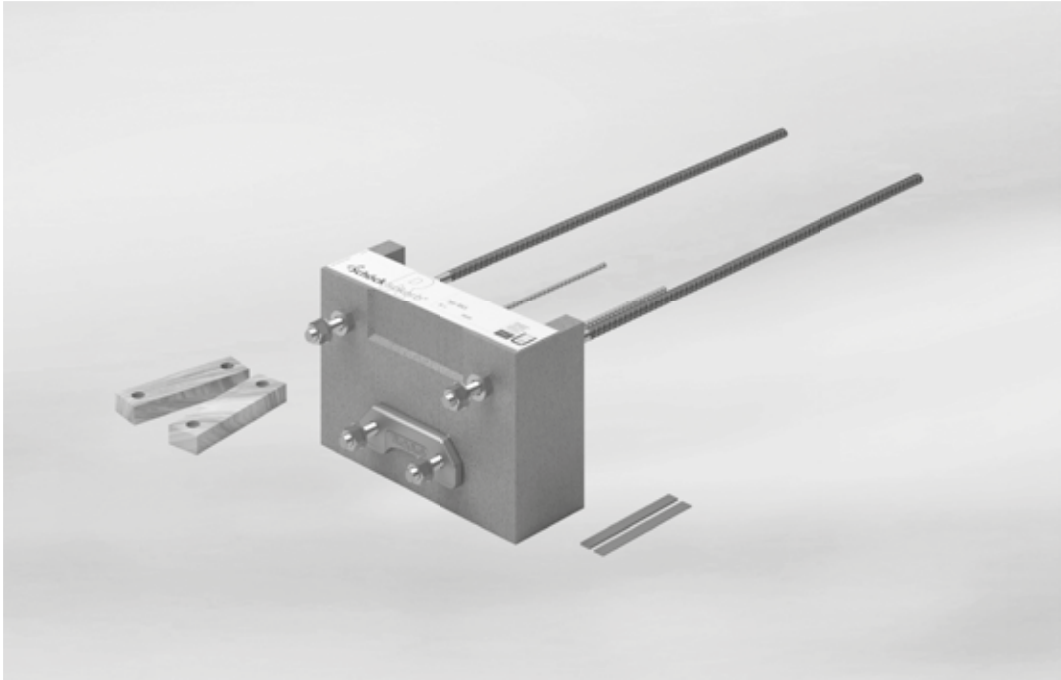


Fig.125: Schöck Isokorb® type RKS

RKS

# Schöck Isokorb® type RKS

## Table for building contractors / Installation information

Schöck Isokorb® type		RKS10		RKS14	
		shear force bars	Tension bars	shear force bars	Tension bars
Number of drill holes		2	2	2	2
Drill hole diameter $d_0$ [mm]		12	14	12	18
Required seating depth $l_v$ [mm]		510	500	287	755
Reqd surface floor front face		rough	rough	rough	rough
Quantity grouting mortar (according to setting instruction) [ml]		185		240	
Quantity of grouting concrete [l] with Isokorb® height H [mm]	160	1.8			
	180	2.0			
	200	2.2			
	220	2.5			

Information on the grouting mortar Hilti HIT-RE 500 V3, fischer FIS EM and grouting concrete Pagel VERGUSS V1/50 see page 87.

### Installation details

The installation of the Schöck Isokorb® R should take place in close coordination with the architect and structural engineer.

The Schöck Isokorb® type RKS installation instructions are to be observed.

1. Installation instruction without text (available on all Isokorb® R types)
2. Installation instruction with written installation details (simply supplied with every delivery)

The position and spacings of the existing reinforcement are to be checked (in case not known).

The position and spacings of the existing electrical lines and sanitary pipelines are to be checked (in case not known).

The front face of the existing floor in the area of the connection of the Schöck Isokorb® R is to be formed as rough or toothed (depending on Isokorb® type).

The implementation of the reinforcement connections with grouting mortar according to approval document Z- 21.8-2064 or Z-21.8-1874 can take place only through firms with qualifying examination.

The Hilti HIT-RE 500 V3 setting instruction "Retrospective reinforcement connection using Hilti HIT-RE 500 V3" or the assembly instruction "Reinforcement connection using fischer FIS EM" are to be observed. (Permitted drilling methods are hammer or diamond drilling, in each case using drilling aid.)

The appropriate Schöck Isokorb® R drilling template is to be used.

If existing reinforcement is met during drilling, the drilling is to be discontinued. The mis-drilling (drill hole diameter  $d_0$ ) is to be grouted using HIT-RE 500 V3 or FIS EM and a new drill hole is to be created with a clear separation of at least  $2d_0$ .

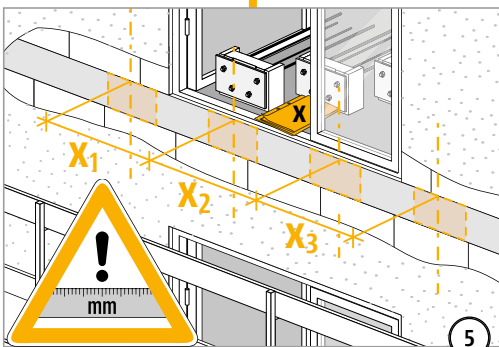
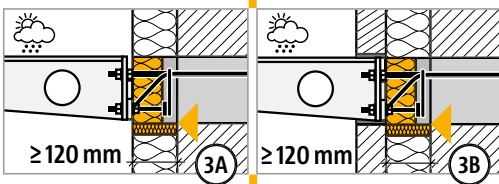
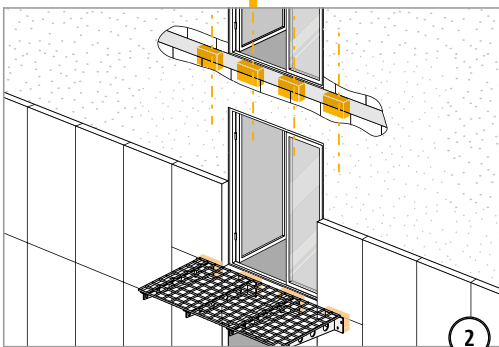
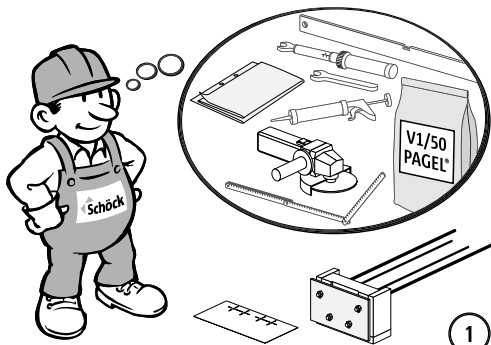
With the filling of the grouting joint with PAGEL VERGUSS V1/50 grouting concrete the DAfStb Directive "production and application of cement-bound grouting concrete and grouting mortar" is to be observed.

#### Important:

Design-related, with the assembly of the steel girder, only tolerances in the vertical direction can be compensated via the Schöck Isokorb® type RKS. The tolerance is: +10 mm vertical and  $\pm 0$  mm horizontal. The Isokorb® type RKS therefore must be placed according to precise measurement details.

# Schöck Isokorb® type RKS

## Installation instructions



The Schöck Isokorb® connection must be planned on an engineering basis; the planning documents must be available on the construction site.

The firm entrusted with the production of the subsequently mortared in slab connections must possess a valid proof of suitability.

- ▶ Check Schöck Isokorb® type for freedom from damage and on agreement with the planning documents.
- ▶ Check materials' structural properties required for the installation of the Schöck Isokorb® completeness.

① + ② The following are required for the installation of the Schöck Isokorb®:

- ▶ Schöck Isokorb® type RKS
- ▶ Schöck installation instruction
- ▶ Drill template for Schöck Isokorb®
- ▶ Planning documents of the construction object including that of the holdings
- ▶ PAGEL V1/50 grouting concrete
- ▶ Hilti HIT-RE 500 V3 injection system or fischer FIS EM for reinforcement connections
- ▶ Approval document Hilti HIT-RE 500 V3 ETA-16/0142 / DIBt Z-21.8-2064
- ▶ Approval document FIS EM ETA-09/0089 / DIBt Z-21.8-1874
- ▶ Angle grinder to roughen floor front face
- ▶ Sealant to seal grouting frame
- ▶ Tools for the installation:

③ Installation details for Schöck Isokorb®: The Schöck Isokorb® is to be configured with an insulation  $\geq 80$  mm and 40 mm grouting joint with a total width  $\geq 120$  mm. Attention is to be paid that the lower edge of the grouting recess of the Schöck Isokorb® closes flush with the lower edge of the existing floor.

④ The following must as a minimum be indicated on the construction drawing:

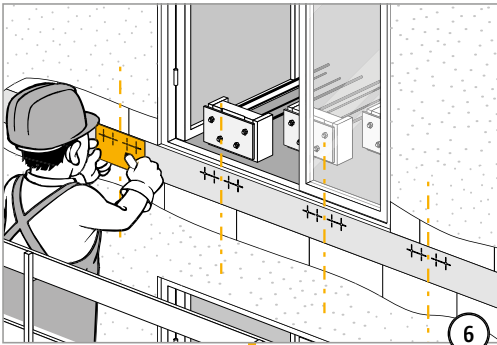
- ▶ Concrete strength class of the existing floor
- ▶ Hammer drilling process with drilling aid.
- ▶ Diameter, concrete cover, centre-to-centre distance and seating depth of the mortared in reinforcement bars depending on the Isokorb® type used.
- ▶ Marking lengths dimension  $l_m$  and  $l_v$  respectively  $l_{e,ges}$  on the combined elongation for Hilti HIT-RE 500 V3 in accordance with ETA-16/0142, Annex B17, for fischer FIS EM in accordance with ETA-09/0089, Annex B 9.
- ▶ Type of preparation of the front face of the existing structural component including thickness of the concrete layer which, if necessary, has to be removed, and specifying the surface roughness of the front face.

⑤ Marking of the installation position

With regard to the drilling holes to be produced, the position of the existing floor reinforcement must be known before drilling.

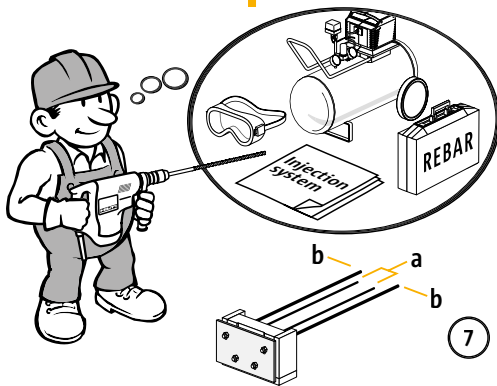
# Schöck Isokorb® type RKS

## Installation instructions



6

- ⑥ Marking of the drill hole  
With the aid of the Schöck drill template the position of the drill holes are marked on the front face of the existing floor according to the details of the construction drawing.



7

- ⑦ The cementing of the Schöck Isokorb® R in the existing floor is to be carried out using the Hilti HIT-RE 500 V3 or fischer FIS EM injection systems.  
The handling of the injection systems for Hilti HIT-RE 500 V3 und fischer FIS EM reinforcement connections takes place according to the approval documents:
- ▶ ETA-16/0142, injection system Hilti HIT-RE 500 V3; ETA-09/0089, injection system fischer FIS EM and
  - ▶ Z-21.8-2064, Z-21.8-1874, application approvals for the reinforcement connection using grouting mortar Hilti HIT-RE 500 V3 or fischer FIS EM

- ⑧ The drill hole diameter and the seating depth are dependent on the Isokorb® type. Please note table:  
With drilling and with the use of the injection systems for reinforcement connections the the person carrying these out must possess a valid proof of suitability

		$\varnothing$	$\varnothing$	$l_v$
RKS10	a	2 × 8 mm	12 mm	510 mm
	b	2 × 10 mm	14 mm	500 mm
RKS14	a	2 × 8 mm	12 mm	287 mm
	b	2 × 14 mm	18 mm	755 mm

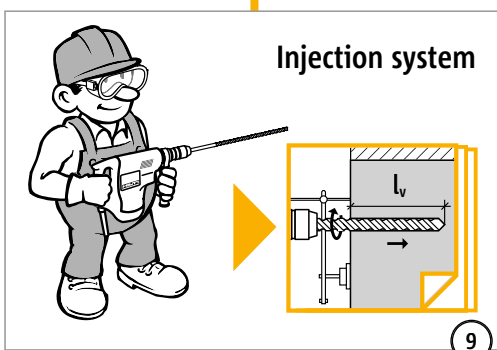
- ⑨ With drilling the existing reinforcement as well as the electrical lines and sanitary pipelines in the floor are to be noted. The drilling must be carried out using the hammer or diamond poring method with drilling aid according to the setting instructions of the ETA-16/0142 for Hilti or ETA-09/0089 for fischer.

The drill holes must be placed without damage to the reinforcement. In the case of a reinforcement hit or a mis-drilling, the responsible site manager and, if necessary, the structural engineer are to be informed without delay and suitable correction measures are to be agreed.  
In the case of mis-drillings these are to be professionally filled with mortar.

### INJECTION:



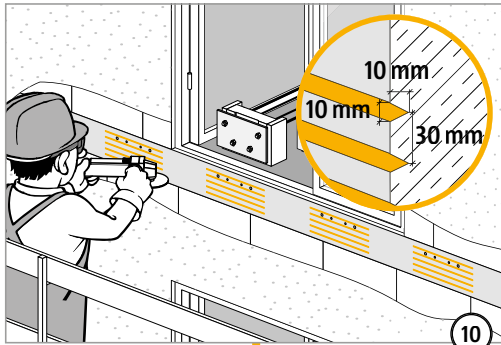
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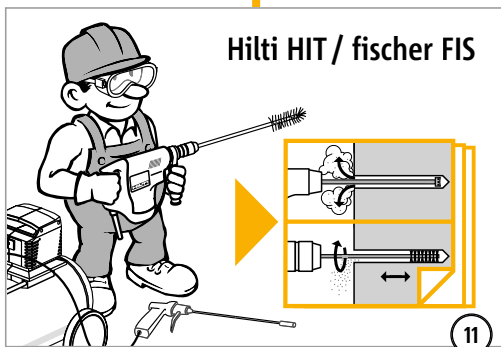
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# Schöck Isokorb® type RKS

## Installation instructions



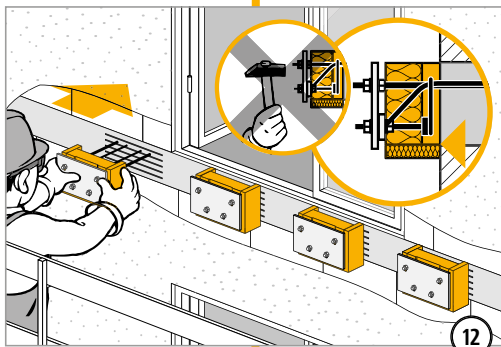
⑩ In the area of the Schöck Isokorb® the front face of the existing floor must be worked according to the adjacent sketch or according to DIN EN 1992-1-1 (EC2) and DIN EN 1992-1-1/NA. The surface roughened  $R_f$  must be  $\geq 1.5$  mm.



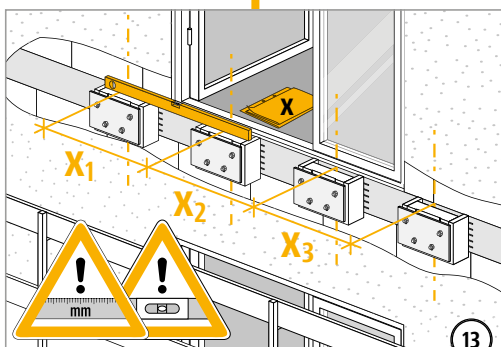
⑪ Each drill hole must be cleaned according to the technical instructions of the ETA-16/0142, Z-21.8-2064 for Hilti and ETA-09/0089, Z-21.8-1874 for fischer.

⑫ For control purposes the dry installation of the Schöck Isokorb® takes place following drill hole cleaning. The Schöck Isokorb® must be capable of being placed without large mechanical effort.

⑬ The appropriate flush and height position as well as the spacings of all Schöck Isokorb® elements to each other must be checked in accordance with the specifications from the construction plan. The maximum allowable measurement tolerances are, without fail, to be observed.

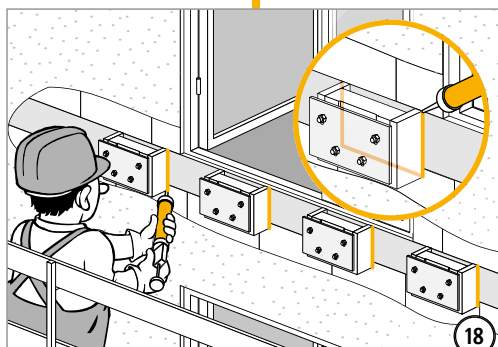
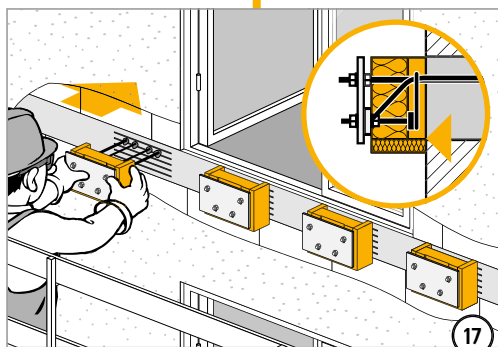
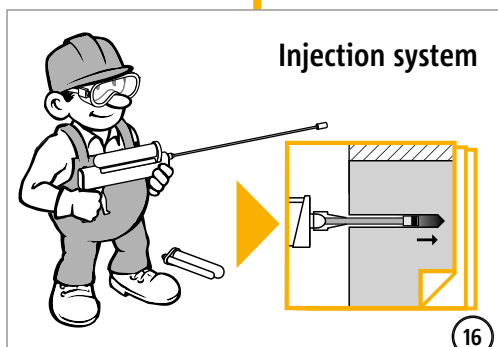
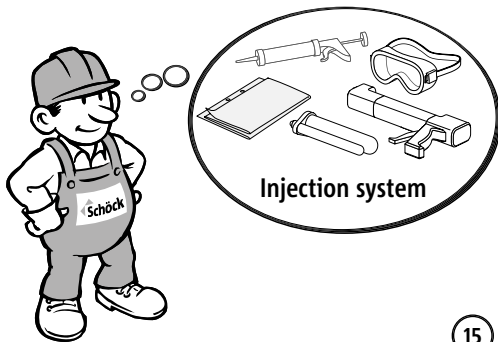


⑭ Following the check of the position of the Schöck Isokorb® the Schöck Isokorb® is again dismantled.



# Schöck Isokorb® type RKS

## Installation instructions



⑮ The preparation of the plastic film packaging and/or cartridges of the Hilti HIT-RE 500 V3 or fischer FIS EM injection systems has, for Hilti, to take place according to the technical instructions of the ETA-16/0142 and Z-21.8-2064. For fischer the ETA-09/0089 and Z-21.8-1874 apply.

⑯ The drill hole must be filled free of air bubbles with Hilti HIT-RE 500 V3 or fischer FIS EM grouting mortar. With this, for HIT-RE 500 V3, the technical instructions of the ETA-16/0142 and the Z-21.8-2064 are to be observed. For FIS EM the instructions of the ETA-09/0089 and Z-21.8-1874 apply.

⑰ Sequence of the installation of the Schöck Isokorb®:

- ▶ As required set up assembly support for the duration of the hardening time of the grouting mortar.
- ▶ Fill the drill holes (in each case for one Schöck Isokorb® element only).
- ▶ Immediately following this the Schöck Isokorb® must be placed in the prepared drill hole.

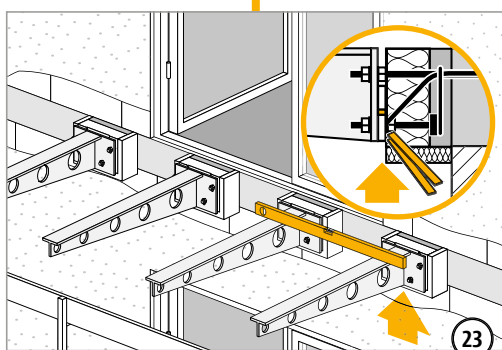
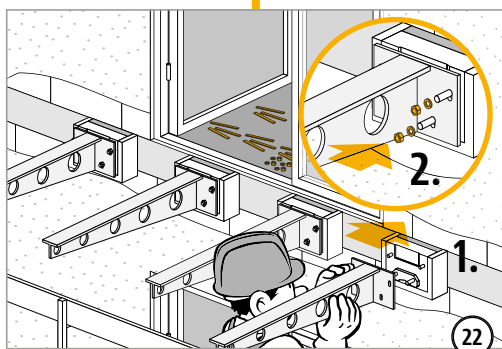
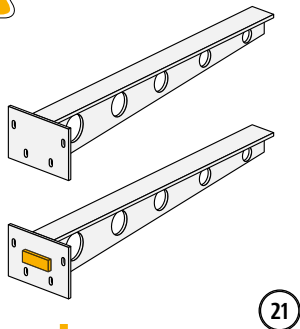
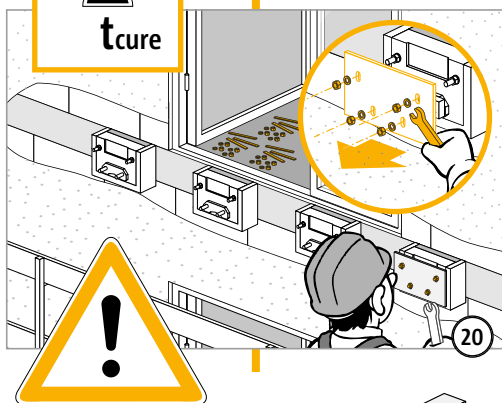
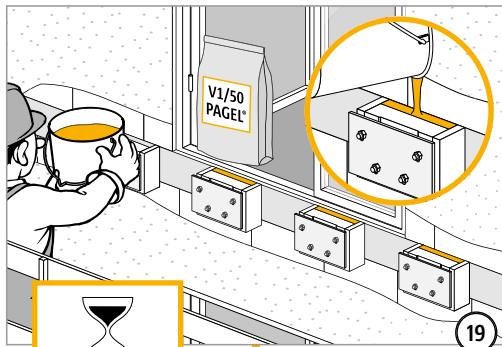
Attention is to be paid that the lower edge of the grouting recess of the Schöck Isokorb® closes flush with the lower edge of the existing floor.

⑱ After expiry of the hardening time " $t_{cure}$ " according to the technical instructions of the ETA-16/0142 and the Z-21.8-2064, or the ETA-09/0089 and the Z-21.8-1874, work can continue on the Schöck Isokorb®.

The connection joint between the Schöck Isokorb® and the existing facade is to be formed absolutely leakproof, so that with the grouting of the joint the grouting concrete cannot run out.

# Schöck Isokorb® type RKS

## Installation instructions



⑰ The grouting joint must be filled with grouting concrete PAGEL VERGUSS V1/50. Manufacturer's details for the processing are to be observed.  
Following the hardening of the grouting concrete the connection of the steel structure of the balcony can take place according to the following instruction.

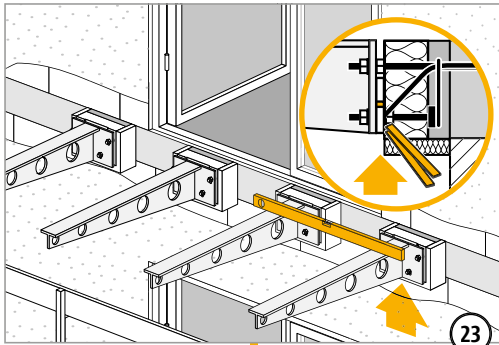
⑳ + ㉑ With the connection of the in-situ steel structure to the Schöck Isokorb® the following is to be noted:

- ▶ Dismantling of transport protection timber.
- ▶ Steel girder with welded-on face plate according to static requirement.
- ▶ Position and size of the drill holes in the face plate in accordance with the general building supervisory approval of the Schöck Isokorb®.
- ▶ A flat steel dog,  $h = 40 \text{ mm}$ ,  $l = 120 \text{ mm}$ ,  $t = 15 \text{ mm}$ , welded on to the face plate is absolutely necessary for the secure transmission of the shear forces in the Schöck Isokorb®!

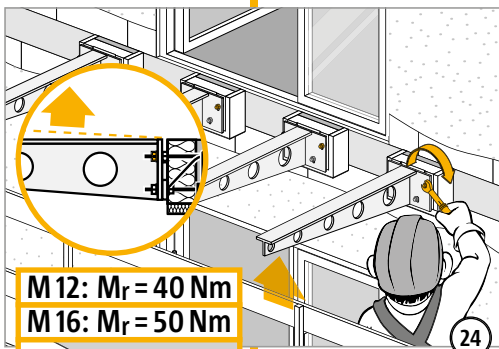
㉒ Connect steel girder with the face plate to the 4 threaded bolts of the Schöck Isokorb® using nuts and washers.

# Schöck Isokorb® type RKS

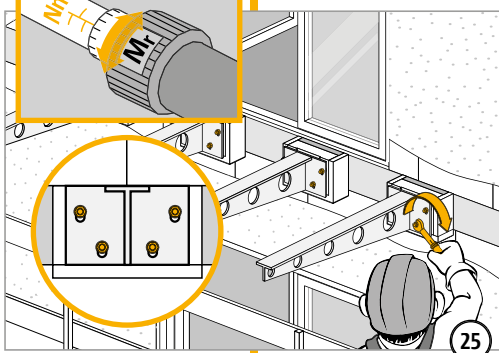
## Installation instructions



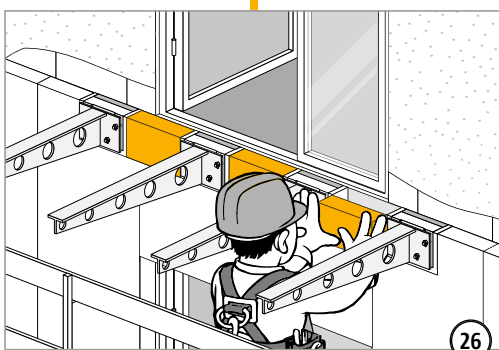
⑳ Fine adjustment to match the height of the steel girder between bearing plate of the Schöck Isokorb® and the welded-on dog on the face plate of the steel girder using the steel shims provided.



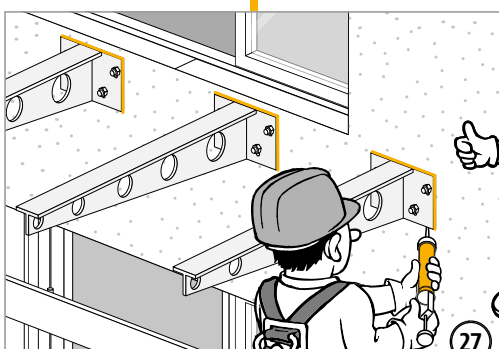
㉑ + ㉒ Adjust required camber of the steel girder according to specification from planning documents.  
The nuts of the Schöck Isokorb® are to be tightened, without normal pre-torque, using the torque wrench;  
The following torques apply:  
M12:  $M_r = 40 \text{ Nm}$   
M16:  $M_r = 50 \text{ Nm}$



㉓ Connection of the in-situ TICS close-packed to the Schöck Isokorb® elements.  
Between the individual Schöck Isokorb® elements the TICS are to be connected equally close-packed to the Schöck Isokorb® elements.



㉔ The joint between Schöck Isokorb® element and the neighbouring TICS is to be professionally formed using permanently elastic sealant.





# Schöck Isokorb® type RK

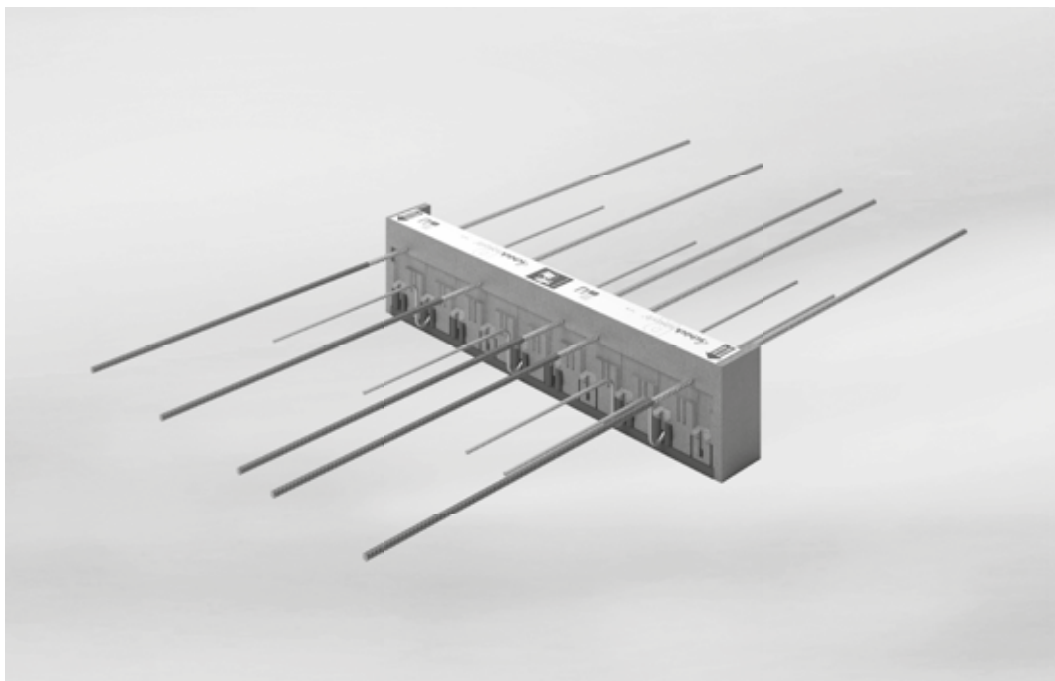


Fig.126: Schöck Isokorb® type RK

# Schöck Isokorb® type RK

## Table for building contractors / Installation information

Schöck Isokorb® type		RK25		RK45	
		Shear force bars	Tension bars	Shear force bars	Tension bars
Number of drill holes		4	5	6	8
Drill hole diameter d <sub>0</sub> [mm]		12	16	12	16
Required seating depth l <sub>v</sub> [mm]		456	872	456	872
Posn 5 Req. surface of the floor front face		rough	rough	rough	rough
Quantity grouting mortar (according to setting instruction) [ml]		640		1010	
Quantity of grouting concrete [l] with Isokorb® height H [mm]	180	6.9			
	200	7.7			
	220	8.5			
	240	9.2			
	250	9.6			

Information on the grouting mortar Hilti HIT-RE 500 V3, fischer FIS EM and grouting concrete Pagel VERGUSS V1/50 see page 87

### Installation details

The installation of the Schöck Isokorb® R should take place in close coordination with the architect and structural engineer, the Schöck Isokorb® type RK installation instruction (see following pages) is to be observed

The Schöck Isokorb® type RK installation instructions are to be observed:

1. Installation instruction without text (available on all Isokorb® R types)
2. Installation instruction with written installation details (simply supplied with every delivery)

The position and spacings of the existing reinforcement are to be checked (in case not known).

The position and spacings of the existing electrical lines and sanitary pipelines are to be checked (in case not known).

The front face of the existing floor in the area of the connection of the Schöck Isokorb® R is to be formed as rough or toothed (depending on Isokorb® type).

The implementation of the reinforcement connections with grouting mortar according to approval document Z- 21.8-2064 or Z-21.8-1874 can take place only through firms with qualifying examination.

The setting instruction "Retrospective reinforcement connection using Hilti HIT-RE 500 V3" or the assembly instruction "Reinforcement connection using fischer FIS EM" are to be observed. (Permitted drilling methods are hammer or diamond drilling, in each case using drilling aid.)

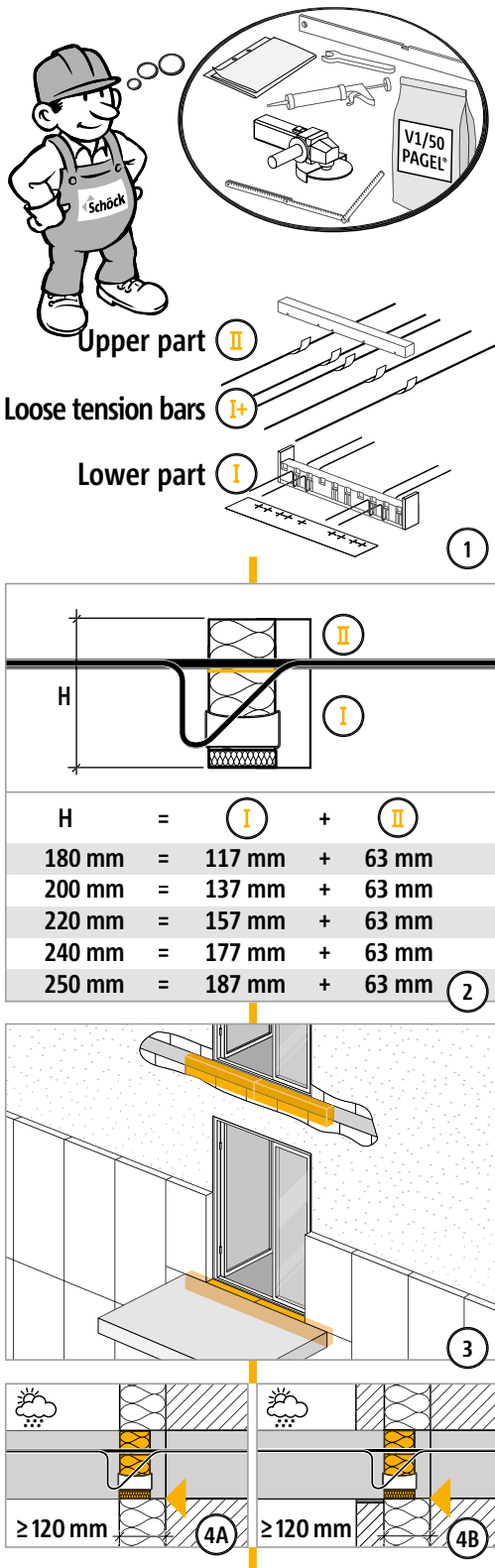
The appropriate Schöck Isokorb® R drilling template is to be used.

If, with drilling, an existing reinforcement is contacted, drilling is to be broken off. The mis-drilling (diameter d<sub>0</sub>) is to be mortared using HIT-RE 500 V3 or FIS EM and a new drill hole is to be created at a clear distance of at least 2d<sub>0</sub>.

With the filling of the grouting joint with PAGEL VERGUSS V1/50 grouting concrete the DAfStb Directive "Production and application of cement-bound grouting concrete and grouting mortar" is to be observed.

# Schöck Isokorb® type RK

## Installation instructions



The Schöck Isokorb® connection must be planned on an engineering basis; the planning documents must be available on the construction site.

The firm entrusted with the production of the subsequently mortared in slab connections must possess a valid proof of suitability.

- ▶ Check Schöck Isokorb® type for freedom from damage and on agreement with the planning documents.
- ▶ Check materials' structural properties required for the installation of the Schöck Isokorb® completeness.

① + ② The Schöck Isokorb® connection must be planned on an engineering basis; the planning documents must be available on the construction site. The following are required for the installation of the Schöck Isokorb®:

- ▶ Schöck Isokorb® type RK
- ▶ Schöck installation instruction
- ▶ Drill template for Schöck Isokorb®
- ▶ Planning documents of the construction object including that of the holdings
- ▶ PAGEL V1/50 grouting concrete
- ▶ Hilti HIT-RE 500 V3 injection system or fischer FIS EM for reinforcement connections
- ▶ Approval document Hilti HIT-RE 500 V3 ETA-16/0142 / DIBt Z-21.8-2064 or approval document FIS EM, ETA-09/0089 / DIBt Z-21.8-1874
- ▶ Angle grinder to roughen floor front face
- ▶ Sealant to seal grouting frame
- ▶ Tools for the installation:

The Schöck Isokorb® type RK is made up from the following components:

- ▶ Schöck Isokorb® lower part with shear force bars and pressure bearings ①
- ▶ Loose tension bars ①+
- ▶ Schöck Isokorb® upper part ②

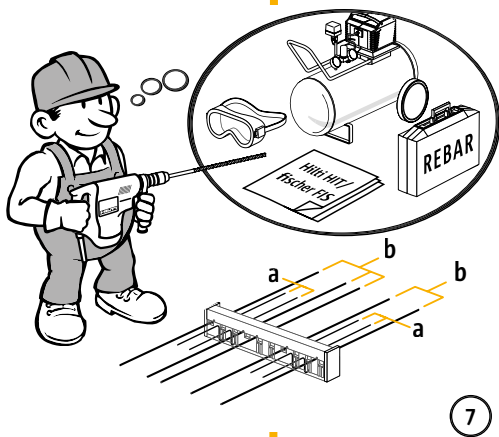
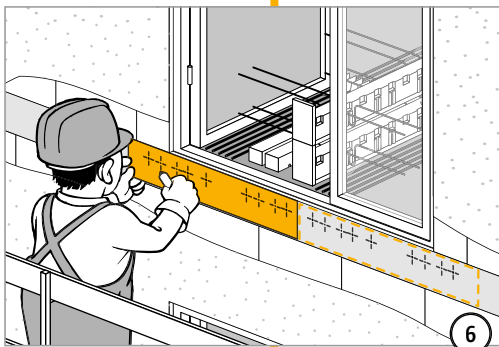
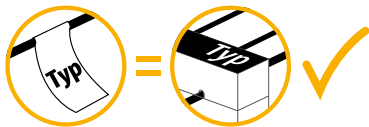
The type designations of Schöck Isokorb® lower part ①, individual tension bars ①+ and Schöck Isokorb® upper part ② must agree.

④ Installation details for Schöck Isokorb®:

- ▶ The Schöck Isokorb® is to be configured with an insulation  $\geq 80$  mm and 40 mm grouting joint with a total width  $\geq 120$  mm.

# Schöck Isokorb® type RK

## Installation instructions



- ⑤ The following must be entered as a minimum on the design drawing:
- ▶ Concrete strength class of the existing floor
  - ▶ Hammer or diamond process, respectively with drilling aid
  - ▶ Diameter, concrete cover, centre-to-centre distance and setting depth of the mortared reinforcement bars depending on the Isokorb® type used (see ff.).
  - ▶ Marking lengths dimension  $l_m$  and  $l_v$  respectively  $l_{e,tot}$  on the combined elongation for Hilti HIT-RE 500 V3 in accordance with ETA-16/0142, Annex B17, for fischer FIS EM in accordance with ETA-09/0089, Annex B 9.
  - ▶ Type of preparation of the front face of the existing structural component including thickness of the concrete layer which, if necessary, has to be removed, and specifying the surface roughness of the front face.
- The type markings of Schöck Isokorb® lower part ①, individual tension bars ①+ and Schöck Isokorb® upper part ② must agree with each other.

- ⑥ Marking of installation position and drill holes:
- ▶ With the aid of the Schöck drill template the position of the drill holes are marked on the front face of the existing floor according to the details of the construction drawing.
  - ▶ Before drilling the position of the existing floor reinforcement in relation to the drill holes to be made must be known.

- ⑦ The cementing of the Schöck Isokorb® R in the existing floor is to be carried out using the Hilti HIT-RE 500 V3 or fischer FIS EM injection systems.
- The handling of the injection systems for Hilti HIT-RE 500 V3 and fischer FIS EM reinforcement connections takes place according to the approval documents:
- ▶ ETA-16/0142, injection system Hilti HIT-RE 500 V3; ETA-09/0089, injection system fischer FIS EM and
  - ▶ Z-21.8-2064, Z-21.8-1874, application approvals for the reinforcement connection using grouting mortar Hilti HIT-RE 500 V3 or fischer FIS EM

The drill hole diameter and the seating depth are dependent on the Isokorb® type. Please note table.

		$\varnothing$	$\varnothing$	$l_v$
RK25	a	4 x 8 mm	12 mm	456 mm
	b	5 x 12 mm	16 mm	872 mm
RK45	a	6 x 8 mm	12 mm	456 mm
	b	8 x 12 mm	16 mm	872 mm

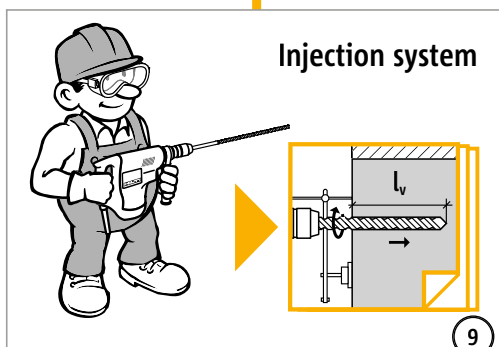
# Schöck Isokorb® type RK

## Installation instructions

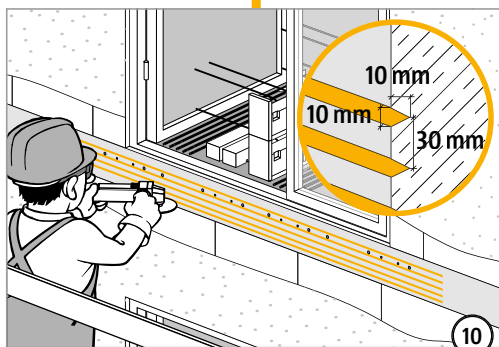
### INJECTION:



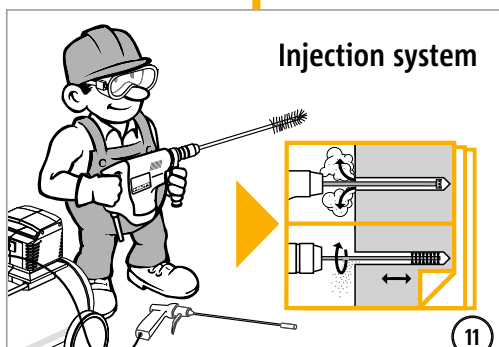
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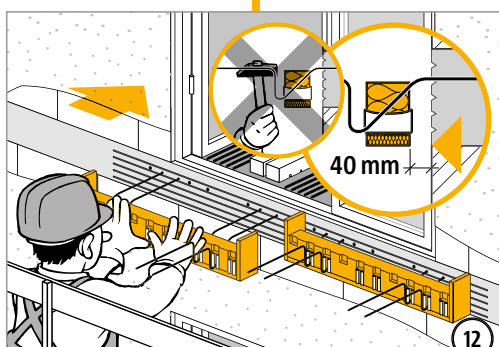
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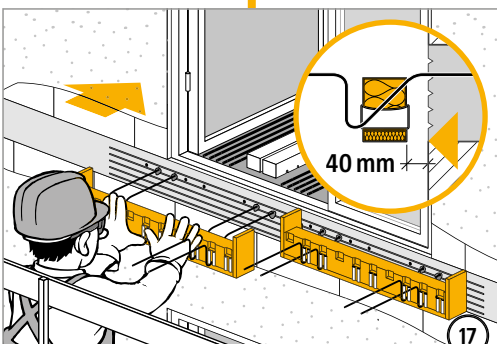
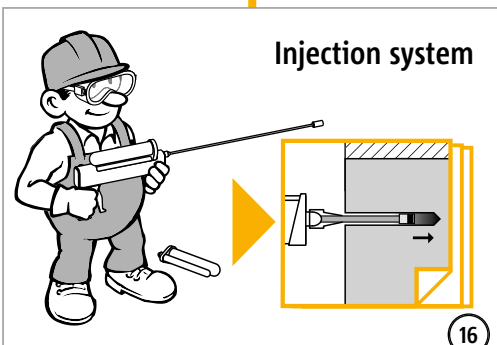
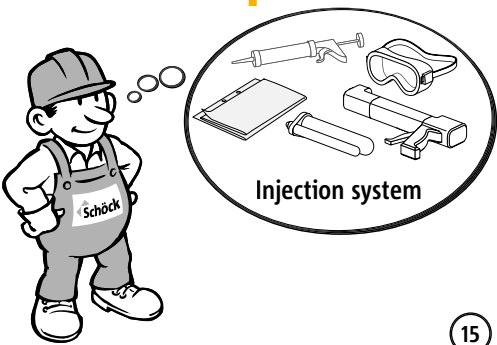
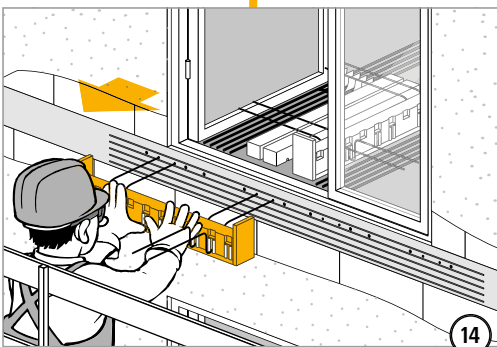
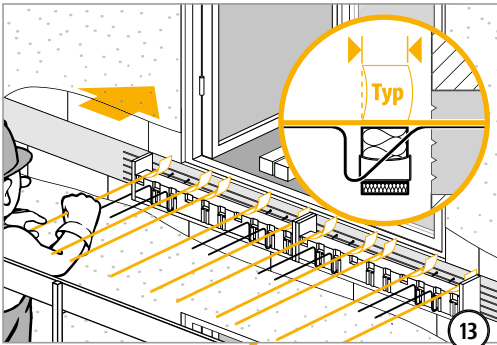


12

- ⑧ With drilling and with the use of the injection systems for reinforcement connections the person carrying these out must possess a valid proof of suitability
- ⑨ If existing reinforcement is met while drilling, the drilling is to be discontinued. The drilling must be carried out using the hammer or diamond drilling method with drilling aid according to the setting instructions of the ETA-16/0142 for Hilti or ETA-09/0089 for fischer. The drill holes must be placed without damage to the reinforcement. In the case of a reinforcement hit or a mis-drilling, the responsible site manager and, if necessary, the structural engineer, are to be informed without delay and suitable corrective measures are to be agreed. In the case of mis-drillings these are to be professionally filled with mortar.
- ⑩ In the area of the Schöck Isokorb® the front face of the existing floor must be worked according to the adjacent sketch or according to DIN EN 1992-1-1 (EC2) and DIN EN 1992-1-1/NA. The surface roughened depth must be  $\geq 1.5$  mm.
- ⑪ Each drill hole must be cleaned according to the technical instructions of the ETA-16/0142, Z-21.8-2064 for Hilti and ETA-09/0089, Z-21.8-1874 for fischer.
- ⑫ Following cleaning of the drill holes the dry installation of the Schöck Isokorb® takes place for control purposes. The Schöck Isokorb® must be capable of being placed without large mechanical effort. The height fitting position of all Schöck Isokorb® elements of a balcony slab must be checked.

# Schöck Isokorb® type RK

## Installation instructions



⑬ The dry installation of the tension bars must be carried out for control purposes.  
For this the tension bars are to be fed into the drill hole. The tension bars have reached their correct position when the type marking of the tension bars, with the arrow direction towards the floor, is congruent with the Schöck Isokorb® lower part.

⑭ Following the checking of the position of the Schöck Isokorb® the Schöck Isokorb® is again dismantled.

⑮ The preparation of the film packaging respectively the cartridges of the Hilti HIT-RE 500 V3 or fischer FIS EM injection systems is to take place for Hilti according to the technical instructions of the ETA-16/0142 and Z-21.8-2064. For fischer the ETA-09/0089 and Z-21.8-1874 apply.

⑯ The drill hole must be filled free of air bubbles with grouting mortar Hilti HIT-RE 500 V3 or fischer FIS EM. With this, for HIT-RE 500 V3 the technical instructions of the ETA-16/0142 and of the Z-21.8-2064 are to be noted. For FIS EM the instructions of the ETA-09/0089 and of the Z-21.8-1874.

⑰ + ⑱ Sequence of the installation of the Schöck Isokorb®:

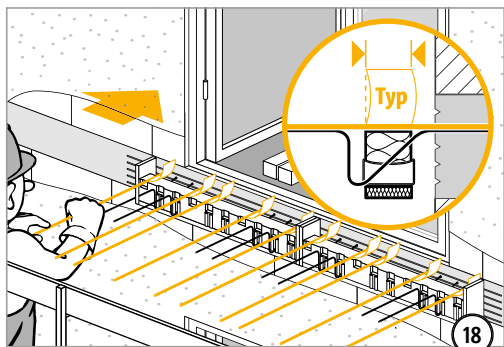
- ▶ 1. As required assemble support for the duration of the hardening time of the grouting mortar.
- ▶ 2. Fill the drill hole of the Schöck Isokorb® lower part (shear force bars) respectively per metre Schöck Isokorb® element only. Immediately thereafter, the lower part of the Schöck Isokorb® must be placed in the prepared drill holes. Attention is to be paid that the Schöck Isokorb® lower part closes flush with the lower edge of the existing floor.
- ▶ 3. Fill the drill holes of the tension bars of the Schöck Isokorb® element. Immediately thereafter, the tension bars must be placed in the prepared drill holes. The tension bars have reached their correct position, when the type marking of the tension bars with the arrow direction towards the floor, is congruent with the Schöck Isokorb® lower part.

Attention: Exchange of the grouting spigot incl. mixing extension is required after filling the drill holes of the shear force bars and before the filling of the drill holes for the tension bars.

After completion of the hardening timing " $t_{cure}$ " according to the technical instructions of the ETA-16/0142 and Z-21.8-2064, or of the ETA-09/0089 and the Z-21.8-1874, the Schöck Isokorb® can be further processed.

# Schöck Isokorb® type RK

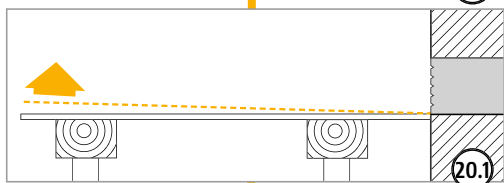
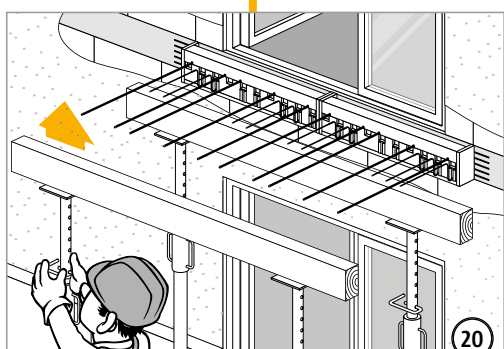
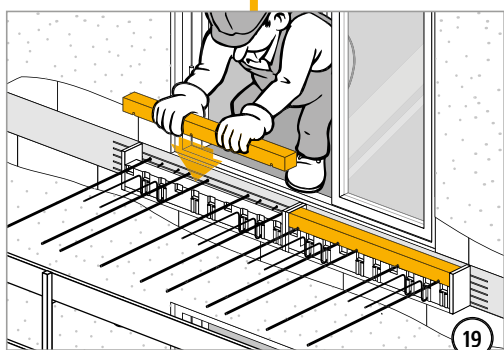
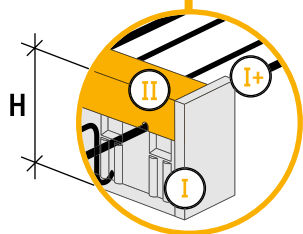
## Installation instructions



18 Setting up of the Schöck Isokorb® upper part on the Schöck Isokorb® lower part.

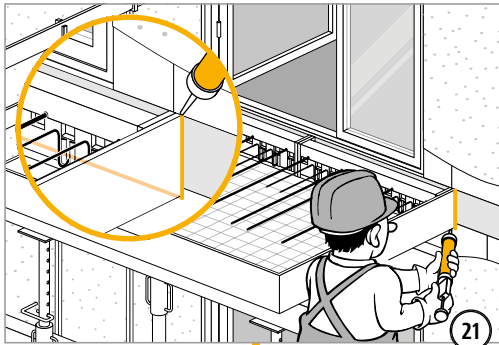
20 Following installation of the Schöck Isokorb® elements the balcony formwork as well as its support are constructed.

Adjust required framework camber according to specifications of the planning documents.

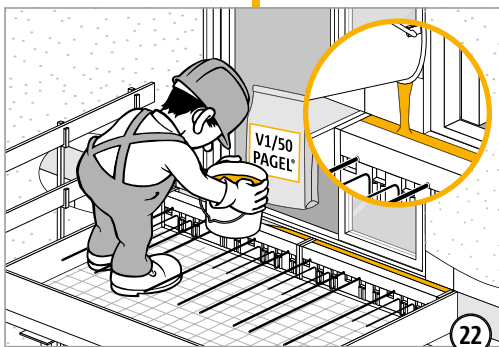


# Schöck Isokorb® type RK

## Installation instructions



⑲ The balcony formwork against the existing facade is to be formed absolutely watertight so that during grouting of the joint the concrete grout does not run out.



⑳ The grouting joint must be filled with PAGEL V1/50 grouting concrete. Manufacturer's details on the processing are to be observed. Following the hardening of the grouting concrete the fabrication of the balcony can take place.

㉓ + ㉔ The required in-situ connection reinforcement is to be checked for completeness in accordance with the reinforcement plan of the structural engineer.

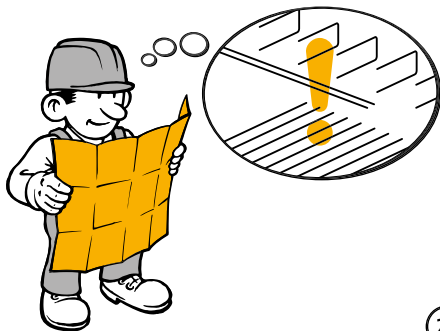
▶ Stirrups in accordance with the reinforcement plan are required as suspension reinforcement on the balcony side.

▶ On the balcony side at the top and bottom 1 each bar steel  $\geq \varnothing 8$  mm is required.

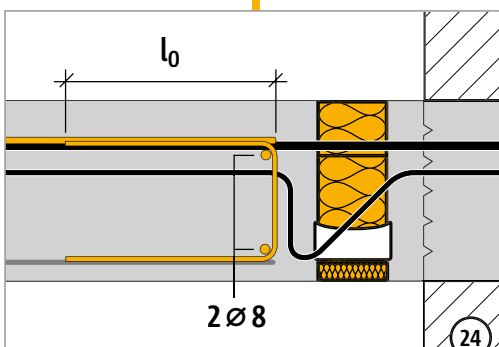
The installation of the connection reinforcement for the Schöck Isokorb® in the balcony slab is to take place according to the details of the construction drawing.



RK



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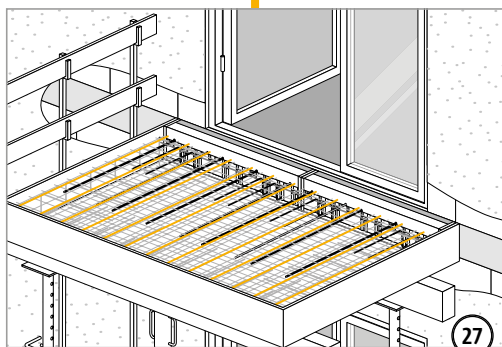
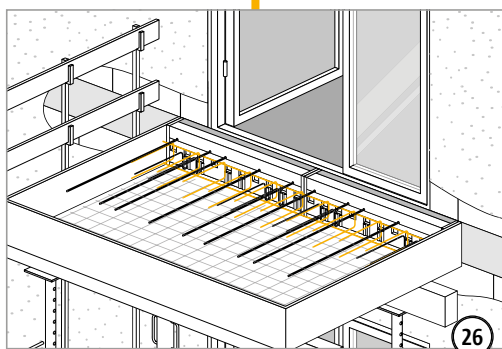
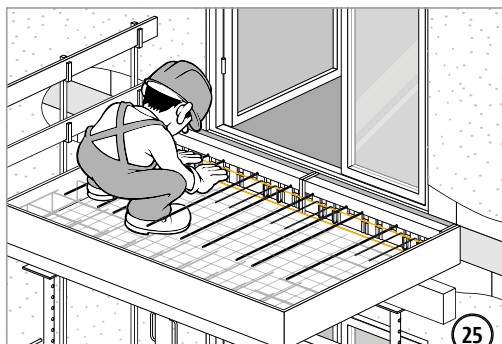


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# Schöck Isokorb® type RK

## Installation instructions



⑳ + ㉑ + ㉒ The in-situ connection reinforcement is to be lapped correctly with the Schöck Isokorb®.

Before concreting check:

- ▶ Connection reinforcement
- ▶ Concrete cover
- ▶ Cantilever slab camber

㉓ Ensure the concrete is fully compacted.

Concrete quality according to details in the construction plan.





## Schöck Isokorb® type KST

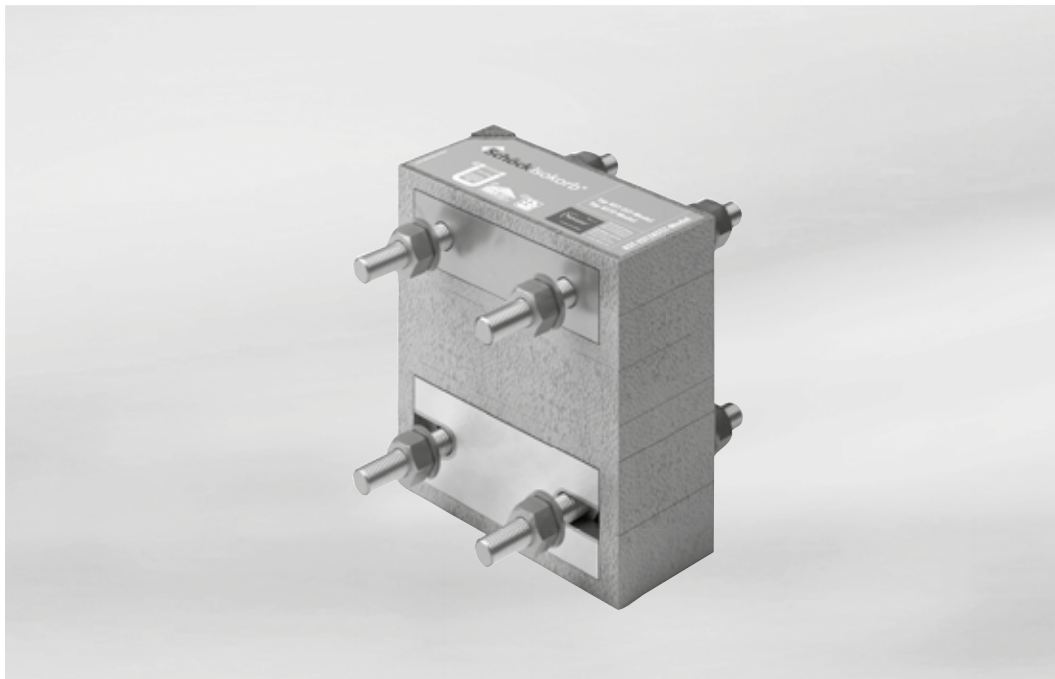
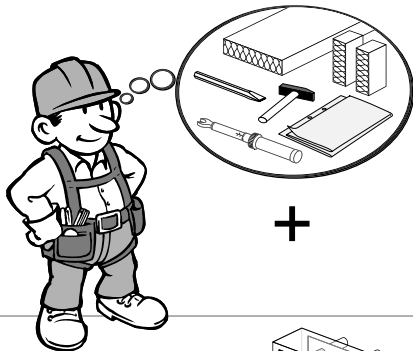


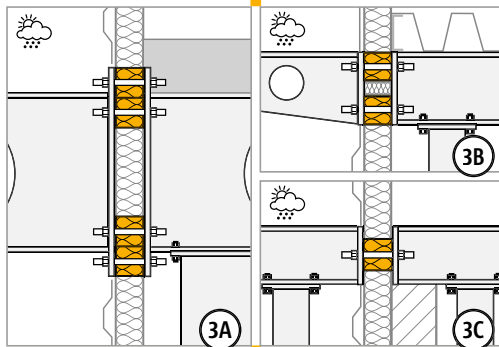
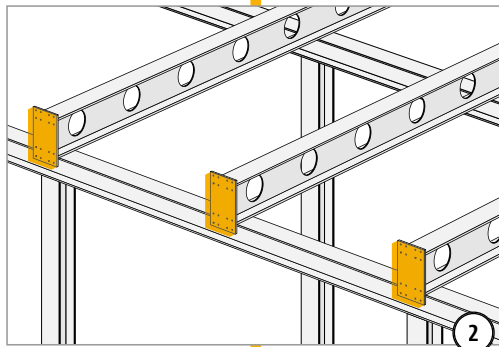
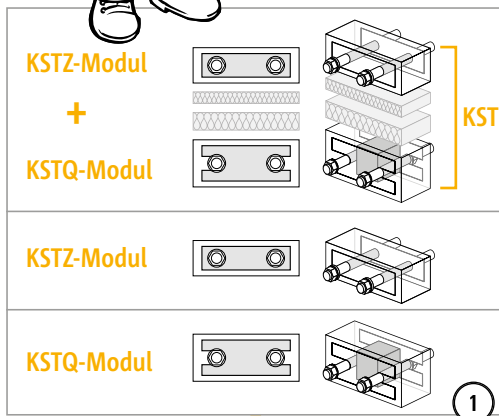
Fig.127: Schöck Isokorb® type KST

# Schöck Isokorb® type KST

## Installation instructions



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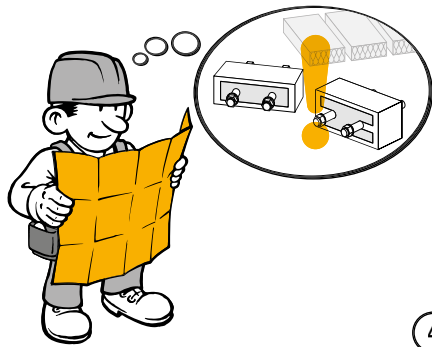


- ①+② Check Schöck Isokorb® for freedom from damage and agreement with the planning documents.  
Check required materials with regard to the structural conditions for the installation of the Schöck Isokorb® for completeness.  
Check required personal protection equipment for the installation of the Schöck Isokorb® according to the statutory standards for completeness.
- ③ Position of the Schöck Isokorb® in accordance with implementation plan.

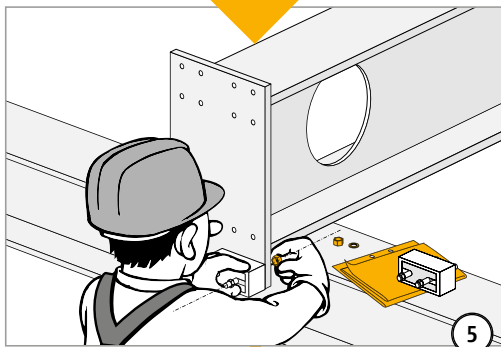
KST

# Schöck Isokorb® type KST

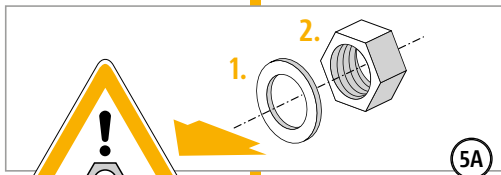
## Installation instructions



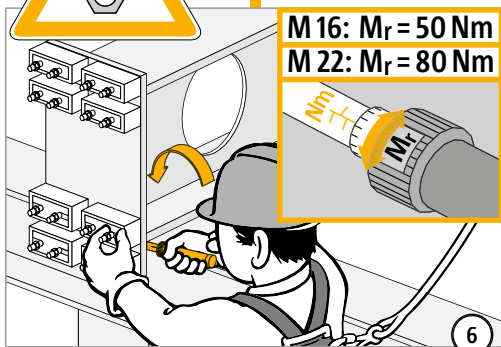
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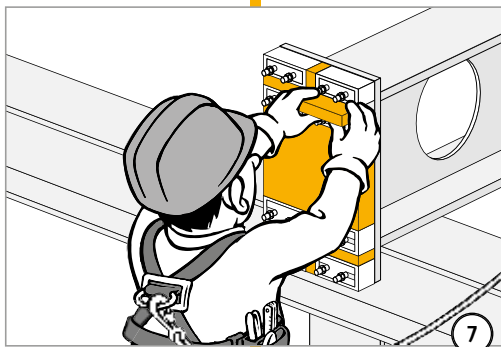
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5A



6

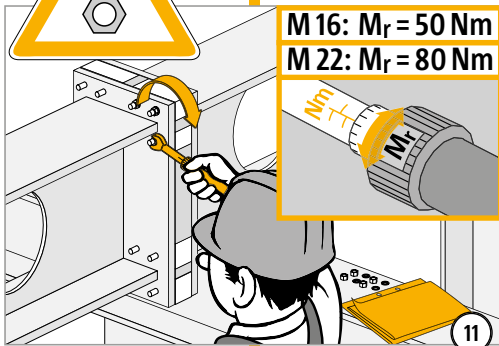
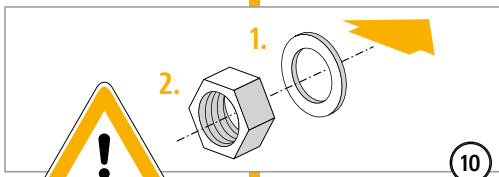
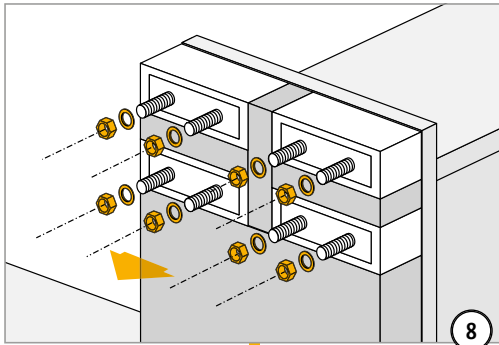


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- ④ Check required Schöck Isokorb® modules and thermal insulation extension blocks for completeness in accordance with implementation plan.
- ⑤ Installation of the Schöck Isokorb® modules in accordance with implementation plan on the face plate within the building shell.
- ⑤A Secure the Schöck Isokorb® modules using the washers and nuts supplied in the sequence in accordance with figure.
- ⑥ Tighten the nuts on the face plate without normal preloading using a torque wrench according to the specified tightening torque of the bolts.
- ⑦ Mount the thermal insulation extension pieces on the face plate of the steel girder between the individual Schöck Isokorb® modules.

# Schöck Isokorb® type KST

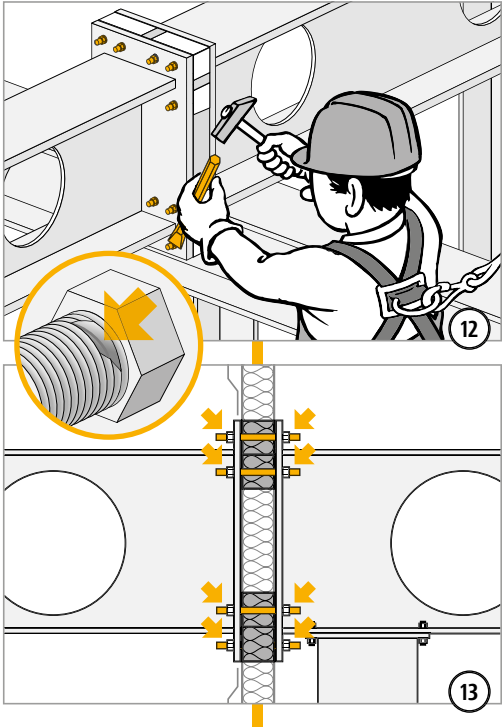
## Installation instructions



- ⑧ Remove nuts and washers before connecting the external steel girder.
- ⑨ Bring up the external steel girder to the steel girder connection prepared with Schöck Isokorb® modules and thermal insulation unit so that with this, with the fitting into place in the bolts of the Schöck Isokorb® no restraints arise.
- ⑩ Securing of steel girder on the Schöck Isokorb® modules using the washers and nuts supplied in the sequence according to the figure.
- ⑪ Tighten the nuts on the face plate without normal preloading using a torque wrench in accordance with the specified tightening torque of the bolts.

# Schöck Isokorb® type KST

## Installation instructions



12 + 13 Peen all threaded rods to secure the position of the nuts.



KST

Building instruction





# Schöck Isokorb® type RQS

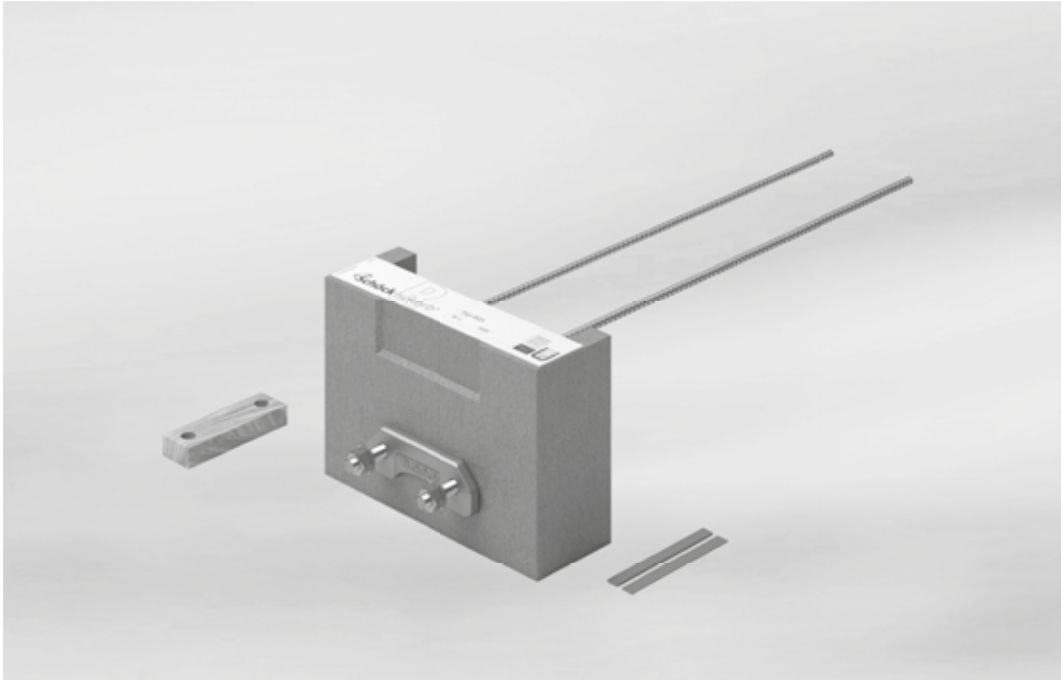


Fig.128: Schöck Isokorb® type RQS

# Schöck Isokorb® type RQS

## Table for building contractors / Installation details

Schöck Isokorb® type		RQS8	RQS10	RQS12
		Shear force bars	Shear force bars	Shear force bars
Number of drill holes		2	2	2
Drill hole diameter $d_0$ [mm]		12	14	16
Required seating depth $l_v$ [mm]		510	695	825
Reqd surface of the floor front face		rough	toothed	toothed
Quantity grouting mortar (according to setting instruction) [ml]		85	140	180
Quantity of grouting concrete [l] with Isokorb® height H [mm]	160	1.8		
	180	2.0		
	200	2.2		
	220	2.5		

Information on the grouting mortar Hilti HIT-RE 500 V3, fischer FIS EM and grouting concrete Pagel VERGUSS V1/50 see page 87.

### Installation details

The installation of the Schöck Isokorb® R should take place in close coordination with the architect and structural engineer, the Schöck Isokorb® type RQS installation instruction (see following pages) is to be observed.

The Schöck Isokorb® type RQS installation instructions are to be observed:

1. Installation instruction without text (available on all Isokorb® R types)
2. Installation instruction with written installation details (simply supplied with every delivery)

The position and spacings of the existing reinforcement are to be checked (where not known).

The position and spacings of the existing electrical lines and sanitary pipelines are to be checked (where not known).

The front face of the existing floor in the area of the connection of the Schöck Isokorb® R is to be formed as rough or toothed (depending on Isokorb® type).

The implementation of the reinforcement connections with grouting mortar according to approval document Z- 21.8-2064 or Z-21.8-1874 can take place only through firms with qualifying examination.

The Hilti HIT-RE 500 V3 setting instruction „Retrospective reinforcement connection using Hilti HIT-RE 500 V3“ or the assembly instruction "Reinforcement connection using fischer FIS EM" are to be observed. (Permitted drilling methods are hammer or diamond drilling, in each case using drilling aid.)

The appropriate Schöck Isokorb® R drilling template is to be used.

If existing reinforcement is met during drilling, the drilling is to be discontinued. The abandoned drill hole (drill hole diameter  $d_0$ ) is to be grouted using HIT-RE 500 V3 or FIS EM and a new drill hole is to be created with a clear separation of at least  $2d_0$ .

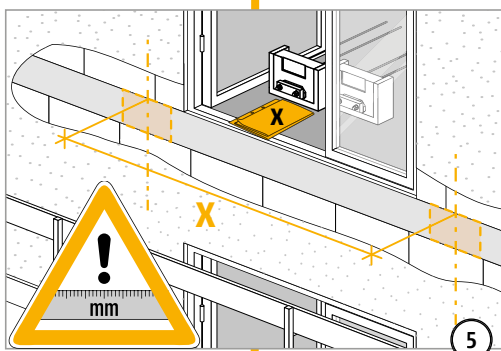
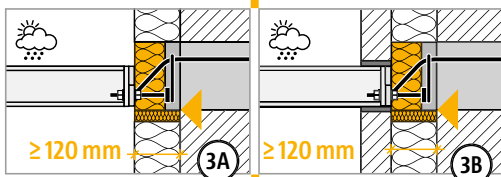
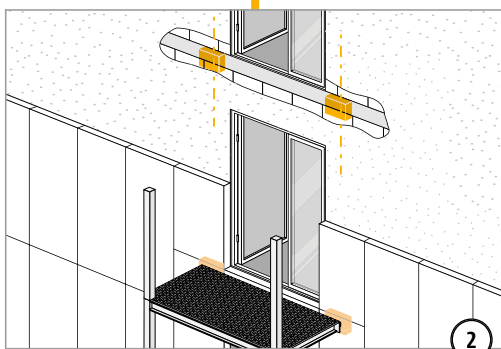
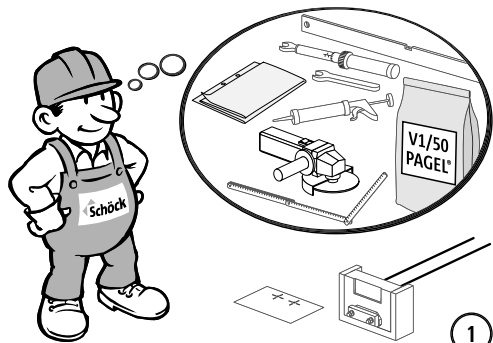
With the filling of the grouting joint with PAGEL VERGUSS V1/50 grouting concrete the DAfStb Directive "production and application of cement-bound grouting concrete and grouting mortar" is to be observed.

#### Important:

Design-related, with the assembly of the steel girder, only tolerances in the vertical direction can be compensated via the Schöck Isokorb® type RQS. The tolerance is: +10 mm vertical and  $\pm 0$  mm horizontal. The Isokorb® type RQS therefore must be placed according to precise measurement details.

# Schöck Isokorb® type RQS

## Installation instructions



The Schöck Isokorb® connection must be planned on an engineering basis; the planning documents must be available on the construction site.

The firm entrusted with the production of the subsequently mortared in slab connections must possess a valid proof of suitability.

- ▶ Check Schöck Isokorb® type for freedom from damage and on agreement with the planning documents.
- ▶ Check materials' structural properties required for the installation of the Schöck Isokorb® completeness.

① + ② The following are required for the installation of the Schöck Isokorb®:

- ▶ Schöck Isokorb® type RQS
- ▶ Schöck installation instruction
- ▶ Drill template for Schöck Isokorb®
- ▶ Planning documents of the construction object including that of the holdings
- ▶ PAGEL V1/50 grouting concrete
- ▶ Hilti HIT-RE 500 V3 injection system or fischer FIS EM for reinforcement connections
- ▶ Approval document Hilti HIT-RE 500 V3 ETA-16/0142 / DIBt Z-21.8-2064 or approval document FIS EM, ETA-09/0089 / DIBt Z-21.8-1874
- ▶ Angle grinder to roughen floor front face
- ▶ Sealant to seal grouting frame
- ▶ Tools for the installation:

③ Installation details for Schöck Isokorb®:

- ▶ The Schöck Isokorb® is to be configured with an insulation  $\geq 80$  mm and 40 mm grouting joint with a total width  $\geq 120$  mm.
- ▶ Attention is to be paid that the lower edge of the grouting recess of the Schöck Isokorb® closes flush with the lower edge of the existing floor.

④ The following must as a minimum be indicated on the construction drawing:

- ▶ Concrete strength class of the existing floor
- ▶ Hammer or diamond process, respectively with drilling aid
- ▶ Diameter, concrete cover, centre-to-centre distance and seating depth of the mortared in reinforcement bars depending on the Isokorb® type used.
- ▶ Marking lengths dimension  $l_m$  and  $l_v$  respectively  $l_{e,tot}$  on the combined elongation for Hilti HIT-RE 500 V3 in accordance with ETA-16/0142, Annex B17, for fischer FIS EM in accordance with ETA-09/0089, Annex B 9.
- ▶ Type of preparation of the front face of the existing structural component including thickness of the concrete layer which, if necessary, has to be removed, and specifying the surface roughness of the front face.

⑤ Marking of the installation position

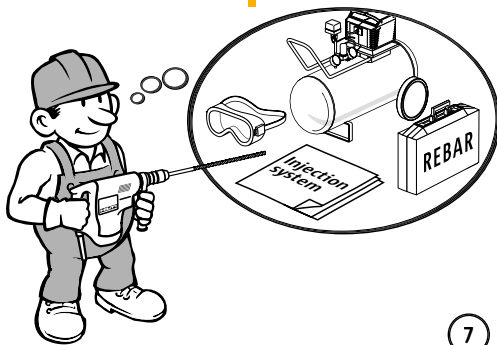
Before drilling the position of the existing floor reinforcement in relation to the drill holes to be made must be known.

# Schöck Isokorb® type RQS

## Installation instructions



- ⑥ Marking of drill holes:  
With the aid of the Schöck drill template the position of the drill holes are marked on the front face of the existing floor according to the details of the construction drawing.



- ⑦ The bonding of the Schöck Isokorb® R in the existing floor is to be carried out using the Hilti HIT-RE 500 V3 or fischer FIS EM injection systems.  
The handling of the injection systems for Hilti HIT-RE 500 V3 und fischer FIS EM reinforcement connections takes place according to the approval documents:
- ▶ ETA-16/0142, injection system Hilti HIT-RE 500 V3; ETA-09/0089, injection system fischer FIS EM and
  - ▶ Z-21.8-2064, Z-21.8-1874, application approvals for the reinforcement connection using grouting mortar Hilti HIT-RE 500 V3 or fischer FIS EM

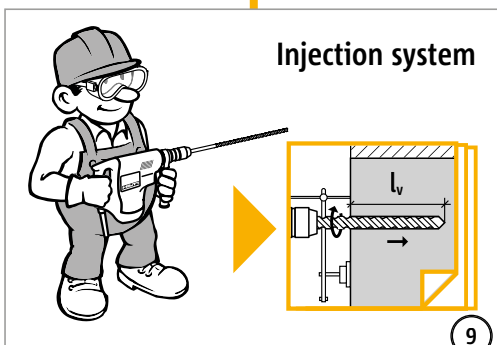
The drill hole diameter and the seating depth are dependent on the Isokorb® type. Please note table:

	$\varnothing$	$\varnothing$	$l_v$
RQS 8	8 mm	12 mm	510 mm
RQS 10	10 mm	14 mm	692 mm
RQS 12	12 mm	16 mm	825 mm

- ⑧ With drilling and with the use of the injection systems for reinforcement connections the the person carrying these out must possess a valid proof of suitability

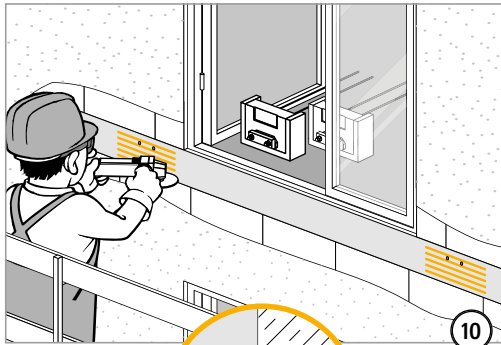
- ⑨ With drilling, the existing reinforcement as well as the electrical lines and sanitary pipelines in the floor are to be noted. The drilling must be carried out using the hammer or diamond drilling method with drilling aid according to the setting instructions of the ETA-16/0142 for Hilti or ETA-09/0089 for fischer.  
The drill holes must be placed without damage to the reinforcement. In the case of a reinforcement hit or a mis-drilling, the responsible site manager and, if necessary, the structural engineer, are to be informed without delay and suitable corrective measures are to be agreed.  
In the case of abandoned drill-holes these are to be correctly filled with mortar.

### INJECTION:

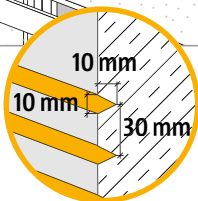


# Schöck Isokorb® type RQS

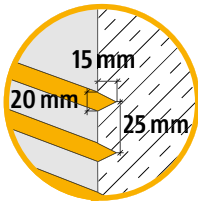
## Installation instructions



rough:  
RQS 8



toothed:  
RQS 10  
RQS 12

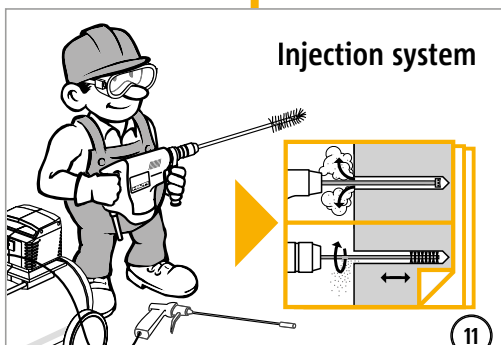


⑩ In the area of the Schöck Isokorb® the front face of the existing floor must be worked according to the adjacent sketch or according to DIN EN 1992-1-1 (EC2) and DIN EN 1992-1-1/NA. The surface roughened depth for RQS 8  $R_f$  must be  $\geq 1.5$  mm. The surface roughened depth for RQS 10 and RQS 12  $R_f$  must be  $\geq 3.0$  mm.

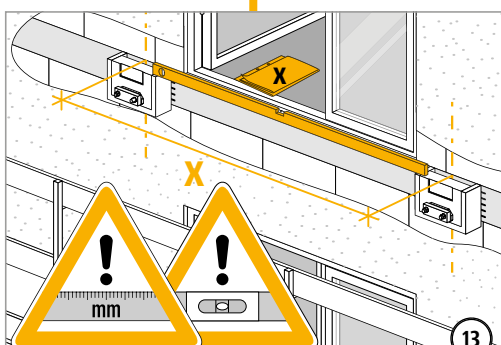
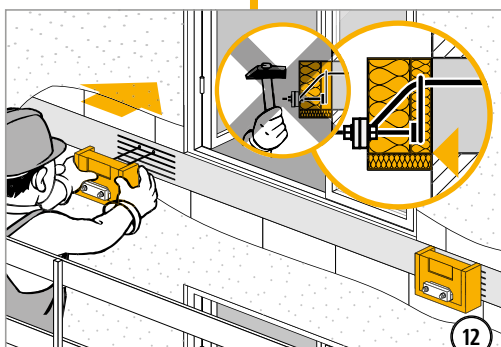
⑪ Each drill hole must be cleaned according to the technical instructions of the ETA-16/0142, Z-21.8-2064 for Hilti and ETA-09/0089, Z-21.8-1874 for Fischer.

⑫ Following cleaning of the drill holes the dry installation of the Schöck Isokorb® takes place for control purposes. The Schöck Isokorb® must be capable of being placed without large mechanical effort.

⑬ The flush and height fitting position as well as the spacing of all Schöck Isokorb® elements among themselves must again be checked in accordance with the specifications given in the construction plan. The maximum allowable measurement tolerances are, without fail, to be observed.

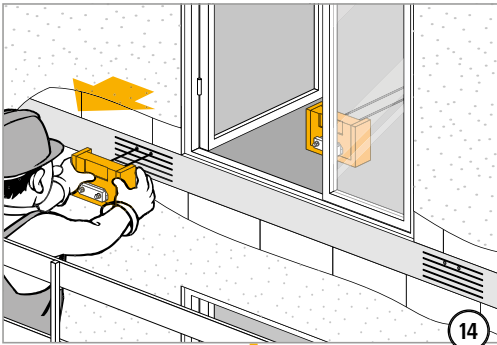


Injection system

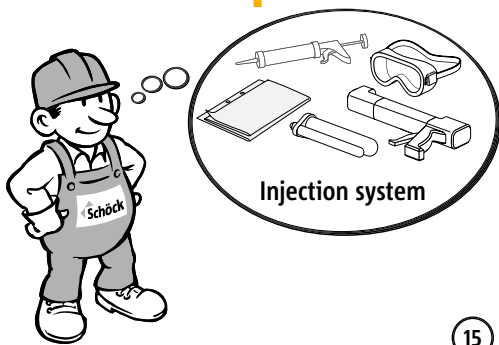


# Schöck Isokorb® type RQS

## Installation instructions



⑭ Following the checking of the position of the Schöck Isokorb® the Schöck Isokorb® is removed.



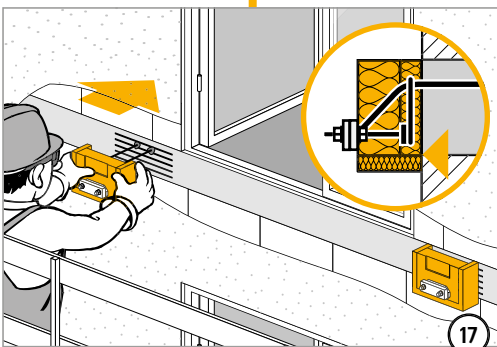
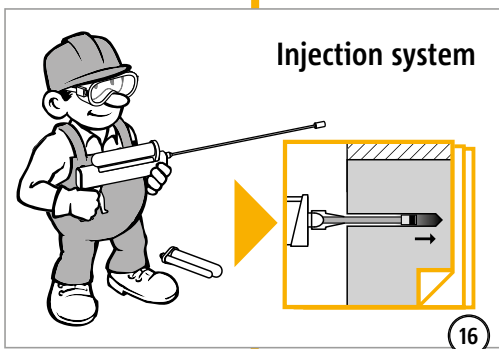
⑮ The preparation of the film packaging respectively the cartridges of the Hilti HIT-RE 500 V3 or fischer FIS EM injection systems is to take place for HITI according to the technical instructions of the ETA-16/0142 and Z-21.8-2064. For fischer the ETA-09/0089 and Z-21.8-1874 apply.

⑯ The drill hole must be filled free of air bubbles with grouting mortar Hilti HIT-RE 500 V3 or fischer FIS EM. With this, for HIT-RE 500 V3 the technical instructions of the ETA-09/0143 and of the Z-21.8-2064 are to be noted. For FIS EM the instructions of the ETA-09/0089 and of the Z-21.8-1874.

⑰ The sequence of the installation of the Schöck Isokorb®:

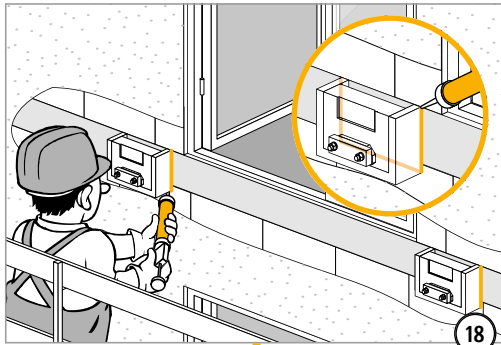
- ▶ As required assemble support for the duration of the hardening time of the grouting mortar.
- ▶ Fill the drill hole, (in each case for one Schöck Isokorb® element only).
- ▶ Immediately thereafter, the Schöck Isokorb® must be placed in the prepared drill hole.

Attention is to be paid that the lower edge of the grouting recess of the Schöck Isokorb® closes flush with the lower edge of the existing floor.



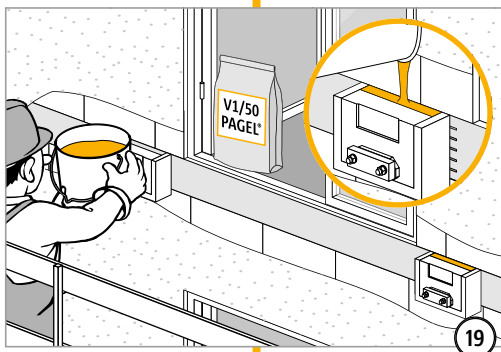
# Schöck Isokorb® type RQS

## Installation instructions



- ⑩ After completion of the hardening timing " $t_{cure}$ " according to the technical instructions of the ETA-16/0164 and Z-21.8-2064, or of the ETA-09/0089 and the Z-21.8-1874, the Schöck Isokorb® can be further processed.

The connection joint between Schöck Isokorb® and the existing facade is to be formed absolutely watertight so that during grouting of the joint the concrete grout does not run out.

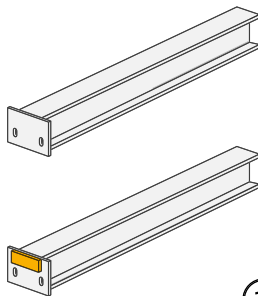


- ⑪ The grouting joint must be filled with PAGEL V1/50 grouting concrete. Manufacturer's details on the processing are to be observed. Following the hardening of the grouting concrete the connection of the steel structure of the balcony is to take place according to the following instruction.



- ⑫ + ⑬ With connection of the in-situ steel structure to the Schöck Isokorb® the following is to be noted:

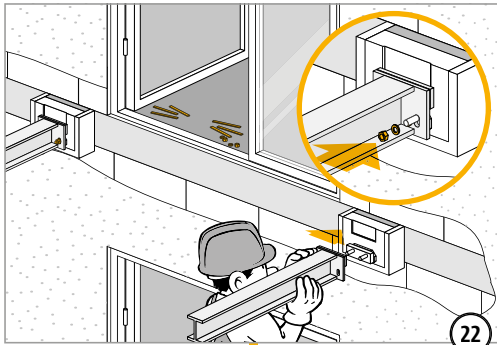
- ▶ Dismantling of the transport timber.
- ▶ Steel girder with welded-on face plate according to static requirement.
- ▶ Position and size of the drill holes in the face plate in accordance with the general building supervisory approval of the Schöck Isokorb®.
- ▶ A flat steel dog  $h = 40 \text{ mm}$ ,  $l = 120 \text{ mm}$ ,  $t = 15 \text{ mm}$ , welded on the face plate for the secure transmission of the shear forces in the Schöck Isokorb® is absolutely necessary!



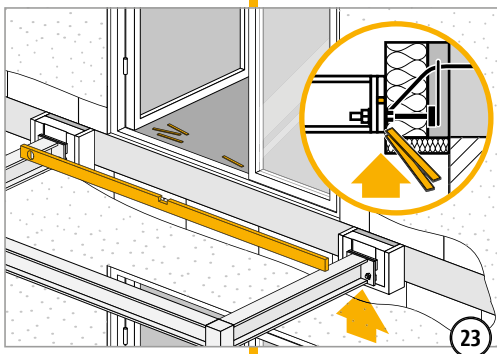
⑭

# Schöck Isokorb® type RQS

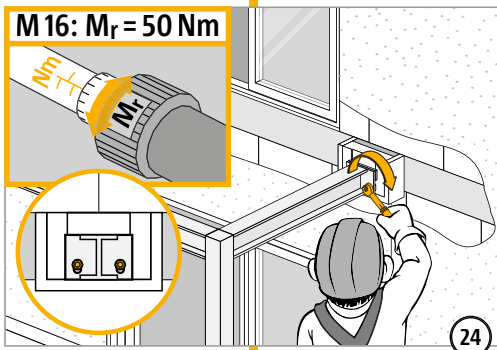
## Installation instructions



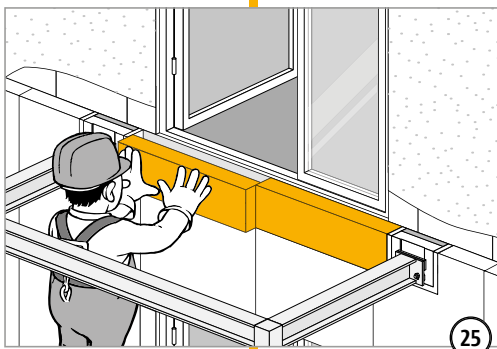
22 Connect steel girder with the face plate to the 2 threaded bolts of the Schöck Isokorb® using nuts and washers.



23 Fine adjustment to match the height of the steel girder between bearing plates of the Schöck Isokorb® and the welded-on dog on the face plate of the steel girder using the steel shims provided.



24 The nuts of the Schöck Isokorb® are to be tightened, without normal pre-torque, using the torque wrench;  
The following torques apply:  
M16:  $M_r = 50 \text{ Nm}$



25 Connection of the in-situ TICS close-packed to the Schöck Isokorb® elements.  
Between the individual Schöck Isokorb® elements the TICS are to be connected equally close-packed to the Schöck Isokorb® elements.



26 The joint between Schöck Isokorb® element and the neighbouring TICS is to be professionally formed using permanently elastic sealant.

RQS

Building construction



# Schöck Isokorb® type RQP, type RQP+RQP

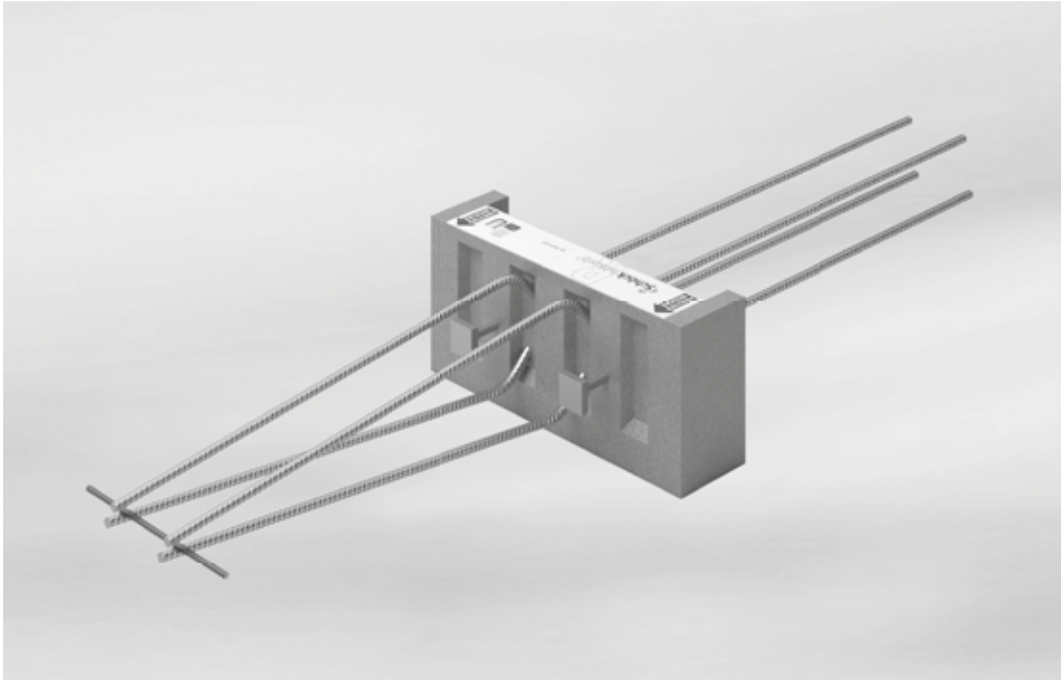


Fig.129: Schöck Isokorb® type RQP+RQP

# Schöck Isokorb® type RQP, type RQP+RQP

## Tables for building contractors / Installation details

Schöck Isokorb® type		RQP10	RQP40	RQP60	RQP70
		Shear force bars	Shear force bars	Shear force bars	Shear force bars
Number of drill holes		2	2	2	3
Drill hole diameter $d_0$ [mm]		14	14	16	16
Required seating depth $l_v$ [mm]		365	511	706	706
Required surface of the floor front face		rough	rough	rough	rough
Quantity grouting mortar (according to setting instruction) [ml]		75	105	160	240
Quantity of grouting concrete [l] with Isokorb® height H [mm]	160	1.90			
	180	2.15			
	200	2.40			

Schöck Isokorb® type		RQP10+RQP10	RQP40+RQP40	RQP60+RQP60	RQP70+RQP70
		Shear force bars	Shear force bars	Shear force bars	Shear force bars
Number of drill holes		4	4	4	6
Drill hole diameter $d_0$ [mm]		14	14	16	16
Required seating depth $l_v$ [mm]		365	511	706	706
Required Surface floor front face		rough	rough	rough	rough
Quantity grouting mortar (according to setting instruction) [ml]		150	210	320	480
Quantity of grouting concrete [l] with Isokorb® height H [mm]	160	1.90			
	180	2.15			
	200	2.40			

Information on the grouting mortar Hilti HIT-RE 500 V3, fischer FIS EM and grouting concrete Pagel VERGUSS V1/50 see page 87

### Installation details

The installation of the Schöck Isokorb® R should take place in close coordination with the architect and structural engineer, the Schöck Isokorb® type RQP and RQP+RQP installation instructions (see following pages) is to be observed.

The Schöck Isokorb® type RQP and RQP+RQP installation instructions are to be observed:

1. Pictorial installation instructions without text (available on all Isokorb® R types)
2. Detailed written installation instructions (simply supplied with every delivery)

The position and spacings of the existing reinforcement are to be checked (where not known).

The position and spacings of the existing electrical lines and sanitary pipelines are to be checked (in case not known).

The front face of the existing floor in the area of the connection of the Schöck Isokorb® R is to be formed as rough or toothed (depending on Isokorb® type).

The implementation of the reinforcement connections with grouting mortar according to approval document Z- 21.8-2064 or Z-21.8-1874 can take place only through firms with qualifying examination.

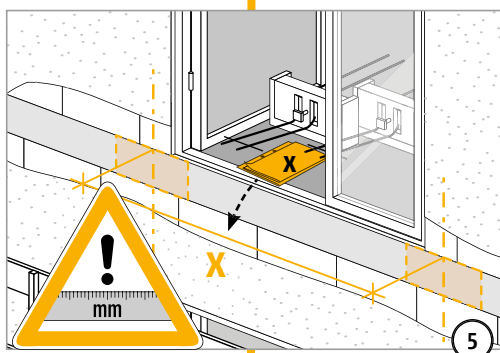
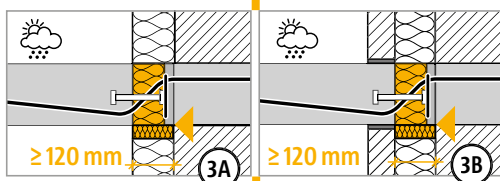
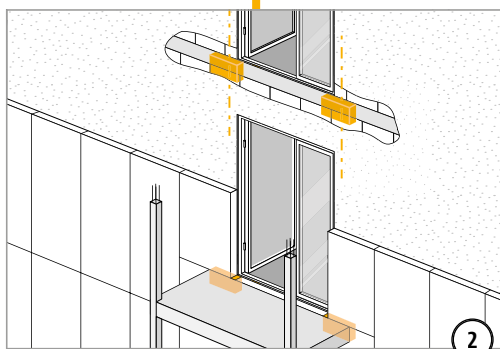
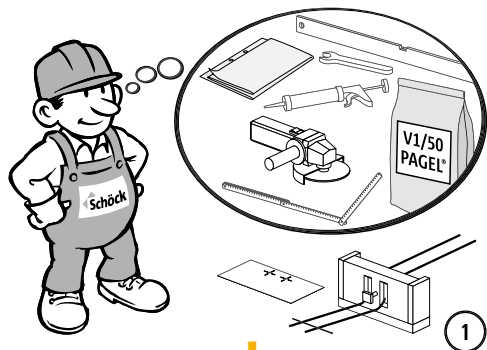
The Hilti HIT-RE 500 V3 setting instruction „Retrospective reinforcement connection using Hilti HIT-RE 500 V3“ or the assembly instruction "Reinforcement connection using fischer FIS EM" are to be observed. (Permitted drilling methods are hammer or diamond drilling, in each case using drilling aid.) The appropriate Schöck Isokorb® R drilling template is to be used.

If existing reinforcement is met during drilling, the drilling is to be discontinued. The abandoned drill hole (drill hole diameter  $d_0$ ) is to be grouted using HIT-RE 500 V3 or FIS EM and a new drill hole is to be created with a clear separation of at least  $2d_0$ .

With the filling of the grouting joint with PAGEL VERGUSS V1/50 grouting concrete the DAfStb Directive "Production and application of cement-bound grouting concrete and grouting mortar" is to be observed.

# Schöck Isokorb® type RQP

## Installation instructions



The Schöck Isokorb® connection must be planned on an engineering basis; the planning documents must be available on the construction site.

The firm entrusted with the production of the subsequently mortared in slab connections must possess a valid proof of suitability.

- ▶ Check Schöck Isokorb® type for freedom from damage and on agreement with the planning documents.
- ▶ Check materials' structural properties required for the installation of the Schöck Isokorb® completeness.

① + ② The following are required for the installation of the Schöck Isokorb®:

- ▶ Schöck Isokorb® type RQP
- ▶ Schöck installation instruction
- ▶ Drill template for Schöck Isokorb®
- ▶ Planning documents of the construction object including that of the holdings
- ▶ PAGEL V1/50 grouting concrete
- ▶ Grouting mortar Hilti HIT-RE 500 V3 or fischer FIS EM 87
- ▶ Approval document Hilti HIT-RE 500 V3 ETA-16/0142 / DIBt Z-21.8-2064 or approval document FIS EM, ETA-09/0089 / DIBt Z-21.8-1874
- ▶ Angle grinder to roughen floor front face
- ▶ Sealant to seal grouting frame
- ▶ Tools for the installation:

③ Installation details for Schöck Isokorb®:

- ▶ The Schöck Isokorb® is to be configured with an insulation  $\geq 80$  mm and 40 mm grouting joint with a total width  $\geq 120$  mm.
- ▶ Attention is to be paid that the lower edge of the grouting recess of the Schöck Isokorb® closes flush with the lower edge of the existing floor.

④ The following must be entered as a minimum on the design drawing:

- ▶ Concrete strength class of the existing floor
- ▶ Hammer or diamond process, respectively with drilling aid
- ▶ Diameter, concrete cover, centre-to-centre distance and seating depth of the mortared in reinforcement bars depending on the Isokorb® type used.
- ▶ Marking lengths dimension  $l_m$  and  $l_v$  respectively  $l_{e,tot}$  on the combined elongation for Hilti HIT-RE 500 V3 in accordance with ETA-16/0142, Annex B17, for fischer FIS EM in accordance with ETA-09/0089, Annex B 9.
- ▶ Type of preparation of the front face of the existing structural component including thickness of the concrete layer which, if necessary, has to be removed, and specifying the surface roughness of the front face.

⑤ Marking of the installation position

With regard to the drilling holes to be produced, the position of the existing floor reinforcement must be known before drilling.

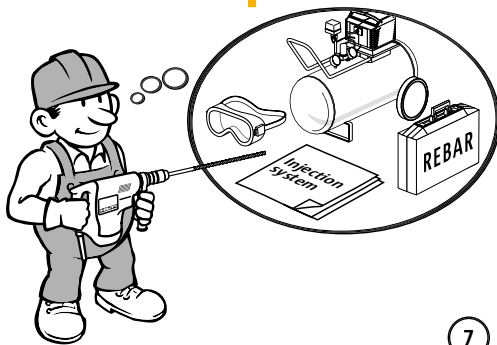
# Schöck Isokorb® type RQP

## Installation instructions



6

⑥ Marking of drill holes:  
With the aid of the Schöck drill template the position of the drill holes are marked on the front face of the existing floor according to the details of the construction drawing.



7

⑦ The cementing of the Schöck Isokorb® in the existing floor is to be carried out using the Hilti HIT-RE 500 V3 or fischer FIS EM injection systems.  
The handling of the injection systems for Hilti HIT-RE 500 V3 and fischer FIS EM reinforcement connections takes place according to the approval documents:

- ▶ ETA-16/0142, injection system Hilti HIT-RE 500 V3; ETA-09/0089, injection system fischer FIS EM and
- ▶ Z-21.8-2064, Z-21.8-1874, application approvals for the reinforcement connection using grouting mortar Hilti HIT-RE 500 V3 or fischer FIS EM

The drill hole diameter and the seating depth are dependent on the Isokorb® type. Please note table:

	Ø	Ø	l <sub>v</sub>
RQP10	2 × 10 mm	14 mm	365 mm
RQP40	2 × 10 mm	14 mm	511 mm
RQP60	2 × 12 mm	16 mm	706 mm
RQP70	3 × 12 mm	16 mm	706 mm

⑧ With drilling and with the use of the injection systems for reinforcement connections the the person carrying these out must possess a valid proof of suitability

⑨ With drilling, the existing reinforcement as well as the electrical lines and sanitary pipelines in the floor are to be noted. The drilling must be carried out using the hammer or diamond drilling method with drilling aid according to the setting instructions of the ETA-16/0142 for Hilti or ETA-09/0089 for fischer.

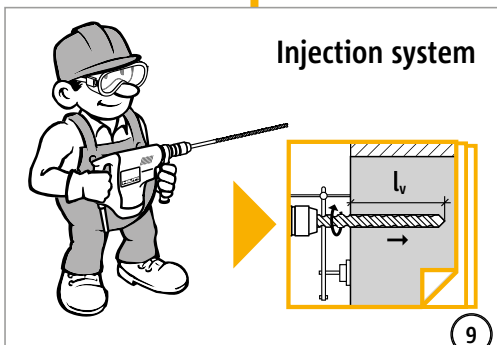
The drill holes must be placed without damage to the reinforcement. In the case of a reinforcement hit or a mis-drilling, the responsible site manager and, if necessary, the structural engineer, are to be informed without delay and suitable corrective measures are to be agreed.

In the case abandoned drill-holes these are to be correctly filled with mortar.

### INJECTION:



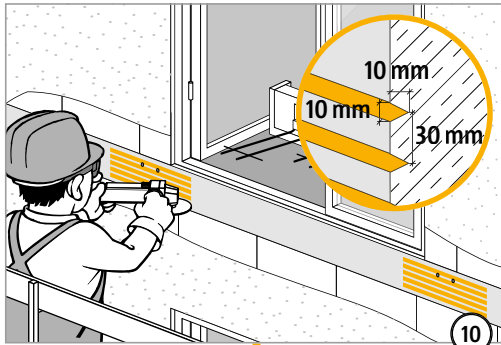
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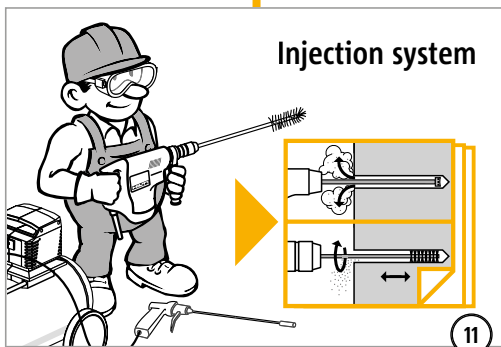
9

# Schöck Isokorb® type RQP

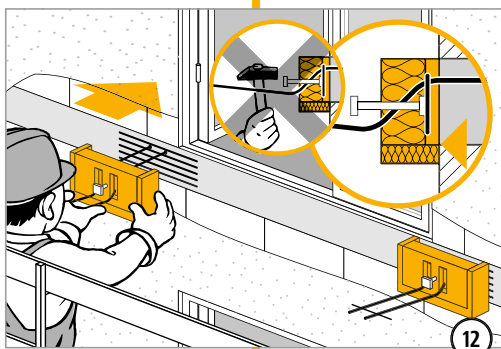
## Installation instructions



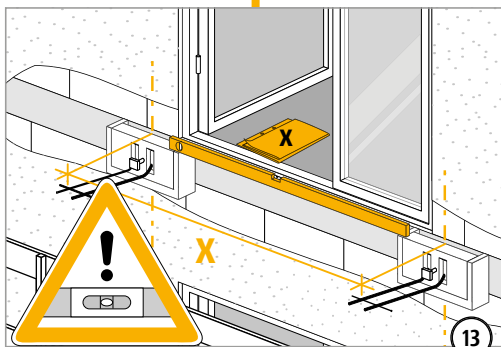
⑩ In the area of the Schöck Isokorb® the front face of the existing floor must be worked according to the adjacent sketch or according to DIN EN 1992-1-1 (EC2) and DIN EN 1992-1-1/NA. The surface roughened depth must be  $\geq 1.5$  mm.



⑪ Each drill hole must be cleaned according to the technical instructions of the ETA-16/0142, Z-21.8-2064 for Hilti and ETA-09/0089, Z-21.8-1874 for fischer.



⑫ Following cleaning of the drill holes the dry installation of the Schöck Isokorb® takes place for control purposes. The Schöck Isokorb® must be capable of being placed without large mechanical effort. The height fitting position of all Schöck Isokorb® elements of a balcony slab must again be checked.



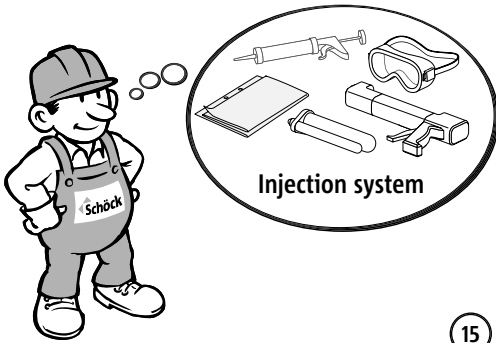
⑬ Flush fittings and positional heights as well as the spacing between all Schöck Isokorb® elements must again be checked in accordance with the specifications given in the construction plan.



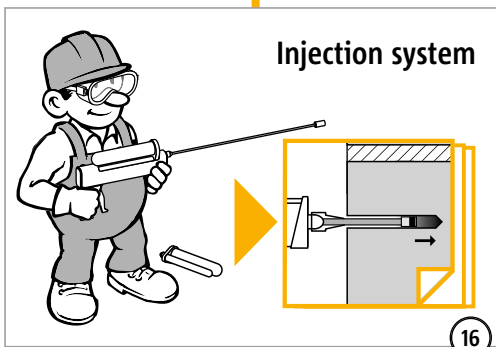
⑭ Following the checking of the position of the Schöck Isokorb® the Schöck Isokorb® is removed.

# Schöck Isokorb® type RQP

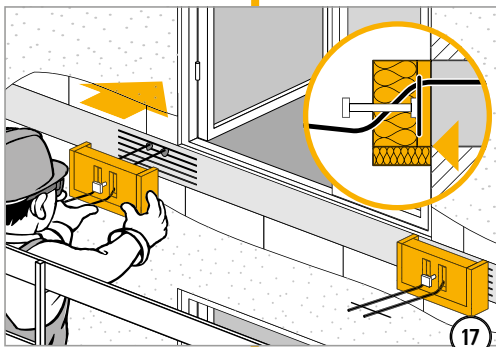
## Installation instructions



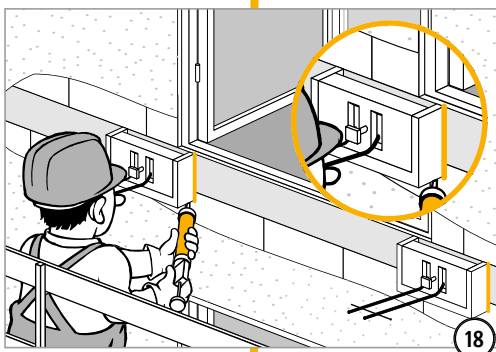
15



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18

15 The preparation of the film packaging respectively the cartridges of the Hilti HIT-RE 500 V3 or fischer FIS EM injection systems is to take place for Hilti the ETA-16/0142 and Z-21.8-2064. For fischer the ETA-09/0089 and Z-21.8-1874 apply.

16 The drill hole must be filled free of air bubbles with grouting mortar Hilti HIT-RE 500 V3 or fischer FIS EM. With this, for HIT-RE 500 V3 the technical instructions of the ETA-16/0142 and of the Z-21.8-2064 are to be noted. For FIS EM the instructions of the ETA-09/0089 and of the Z-21.8-1874.

17 The sequence of the installation of the Schöck Isokorb®:

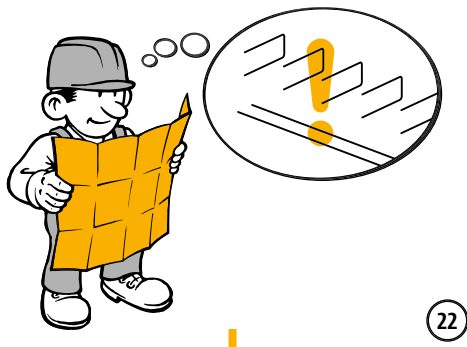
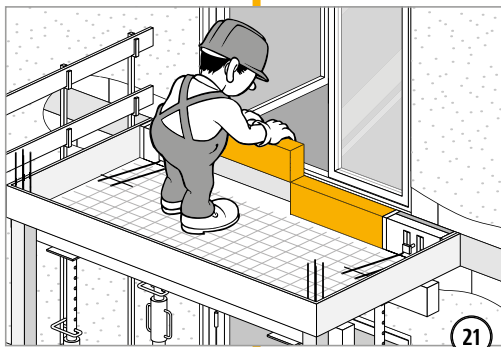
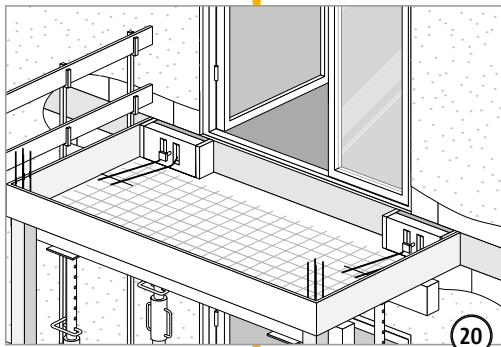
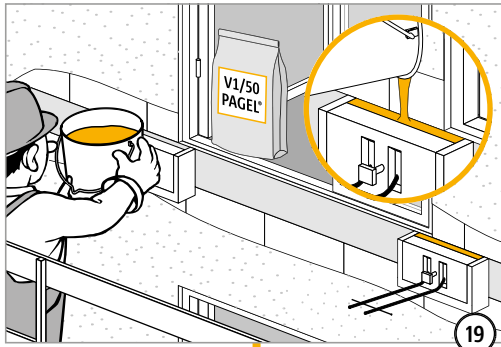
- ▶ As required assemble support for the duration of the hardening time of the grouting mortar.
- ▶ Fill the drill hole, (in each case for one Schöck Isokorb® element only).
- ▶ Immediately thereafter, the Schöck Isokorb® must be placed in the prepared drill hole.  
Attention is to be paid that the lower edge of the grouting recess of the Schöck Isokorb® closes flush with the lower edge of the existing floor.

18 After completion of the hardening timing „ $t_{cure}$ “ according to the technical instructions of the ETA-16/0142 and Z-21.8-2064, or of the ETA-09/0089 and the Z-21.8-1874, the Schöck Isokorb® can be further processed.

The connection joint between Schöck Isokorb® and the existing facade is to be formed absolutely watertight so that with grouting of the joint the grouting concrete does not run out.

# Schöck Isokorb® type RQP

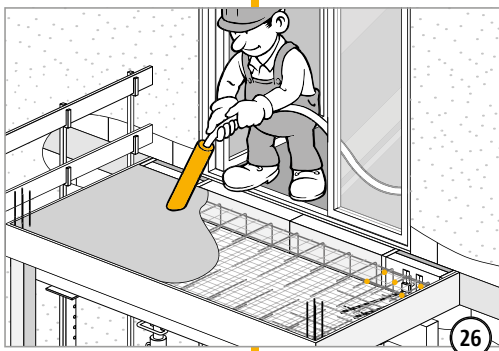
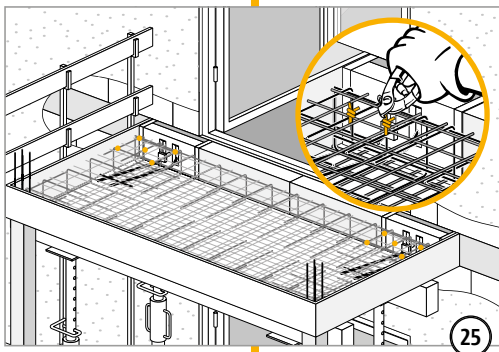
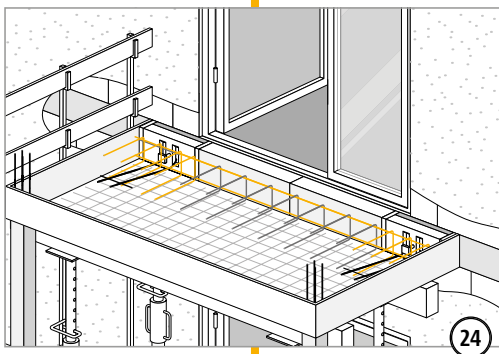
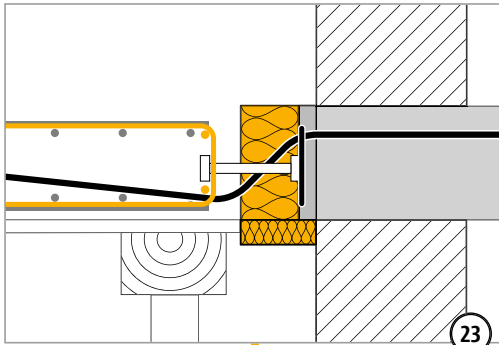
## Installation instructions



- ⑱ the grouting joint must be filled with PAGEL V1/50 grouting concrete. Manufacturer's details on the processing are to be observed. Following the hardening of the grouting concrete the fabrication of the balcony slab can take place.
- ⑳ Following the installation of the Schöck Isokorb® elements the balcony formwork as well as its support are set up.
- ㉑ Install in-situ thermal insulation strips according to construction plan.  
The working faces of the thermal insulation strips and the connection to the Schöck Isokorb® are to be formed absolutely tight.
- ㉒ Check required in-situ connection reinforcement in accordance with the reinforcement plan of the structural engineer for completeness.

# Schöck Isokorb® type RQP

## Installation instructions



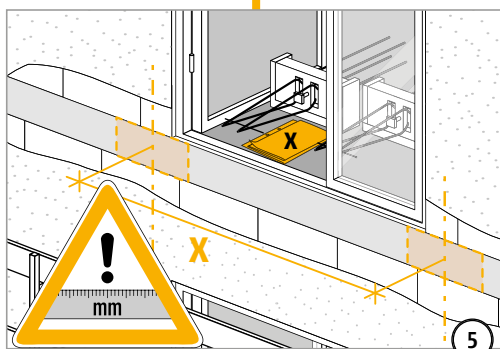
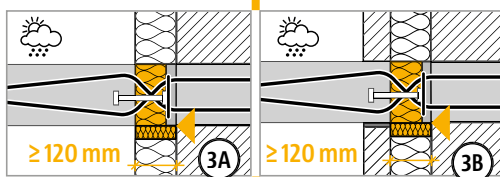
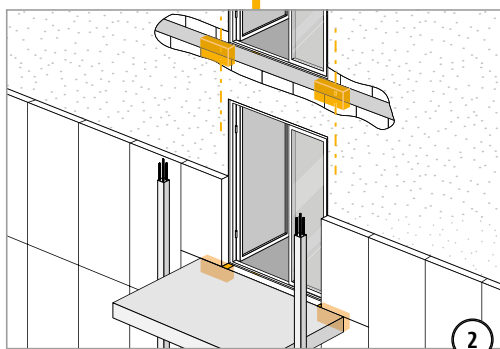
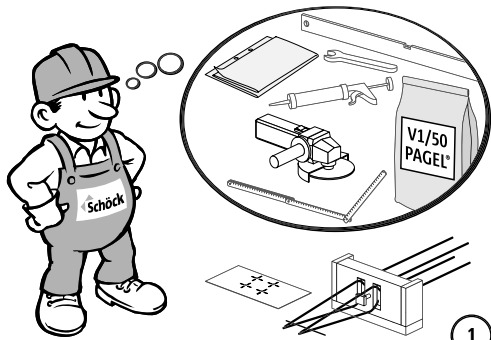
- ⑳ The installation of the connection reinforcement of the Schöck Isokorb® in the balcony slab is to take place according to details of the construction drawing.
  - ▶ On the balcony stirrups are required as suspension reinforcement in accordance with reinforcement plan.
  - ▶ On the balcony side each 1 steel bar  $\geq \varnothing 8$  mm is required at the top and bottom.
- ㉑ + ㉒ The in-situ connection reinforcement is to be joined professionally with the Isokorb®.
  - Before concreting check:
    - ▶ Connection reinforcement
    - ▶ Concrete cover
- ㉓ Concreting as well as professional compacting of the concrete slab.
  - Concrete grade according to construction plan.





# Schöck Isokorb® type RQP+RQP

## Installation instructions



The Schöck Isokorb® connection must be planned on an engineering basis; the planning documents must be available on the construction site.

The firm entrusted with the production of the subsequently mortared in slab connections must possess a valid proof of suitability.

- ▶ Check Schöck Isokorb® type for freedom from damage and on agreement with the planning documents.
- ▶ Check materials' structural properties required for the installation of the Schöck Isokorb® completeness.

① + ② The following are required for the installation of the Schöck Isokorb®:

- ▶ Schöck Isokorb® type RQP+RQP
- ▶ Schöck installation instruction
- ▶ Drill template for Schöck Isokorb®
- ▶ Planning documents of the construction object including that of the holdings
- ▶ PAGEL V1/50 grouting concrete
- ▶ Hilti HIT-RE 500 V3 injection system or fischer FIS EM for reinforcement connections
- ▶ Approval document Hilti HIT-RE 500 V3 ETA-16/0142 / DIBt Z-21.8-2064 or approval document FIS EM, ETA-09/0089 / DIBt Z-21.8-1874
- ▶ Angle grinder to roughen floor front face
- ▶ Sealant to seal grouting frame
- ▶ Tools for the installation:

③ Installation details for Schöck Isokorb®:

- ▶ The Schöck Isokorb® is to be configured with an insulation  $\geq 80$  mm and 40 mm grouting joint with a total width  $\geq 120$  mm.
- ▶ Attention is to be paid that the lower edge of the grouting recess of the Schöck Isokorb® closes flush with the lower edge of the existing floor.

④ The following must be entered as a minimum on the design drawing:

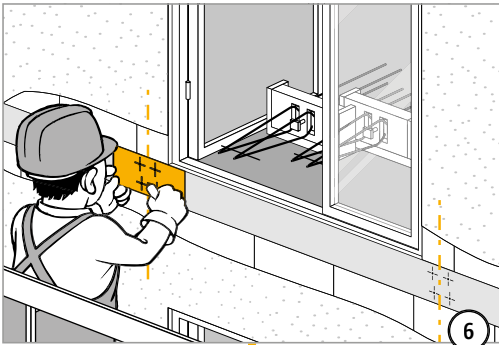
- ▶ Concrete strength class of the existing floor
- ▶ Hammer or diamond process, respectively with drilling aid
- ▶ Diameter, concrete cover, centre-to-centre distance and seating depth of the mortared-in reinforcement bars depending on the Isokorb® type used.
- ▶ Marking lengths dimension  $l_m$  and  $l_v$  respectively  $l_{e,tot}$  on the combined elongation for Hilti HIT-RE 500 V3 in accordance with ETA-16/0142, Annex B17, for fischer FIS EM in accordance with ETA-09/0089, Annex B 9.
- ▶ Type of preparation of the front face of the existing structural component including thickness of the concrete layer which, if necessary, has to be removed, and specifying the surface roughness of the front face.

⑤ Mark the installation point

With regard to the drilling holes to be produced, the position of the existing floor reinforcement must be known before drilling.

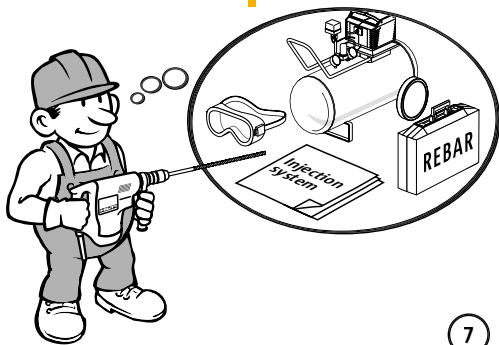
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⑥ Marking of drill holes:  
With the aid of the Schöck drill template the position of the drill holes are marked on the front face of the existing floor according to the details of the construction drawing.



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⑦ The cementing of the Schöck Isokorb® R in the existing floor is to be carried out using the Hilti HIT-RE 500 V3 or fischer FIS EM injection systems. The handling of the injection systems for Hilti HIT-RE 500 V3 und fischer FIS EM reinforcement connections takes place according to the approval documents:

- ▶ ETA-16/0142, injection system Hilti HIT-RE 500 V3; ETA-09/0089, injection system fischer FIS EM and
- ▶ Z-21.8-2064, Z-21.8-1874, application approvals for the reinforcement connection using grouting mortar Hilti HIT-RE 500 V3 or fischer FIS EM

The drill hole diameter and the seating depth are dependent on the Isokorb® type. Please note table:

	Ø	Ø	l <sub>v</sub>
RQP10 + RQP10	2 × 2 Ø 10 mm	14 mm	365 mm
RQP40 + RQP40	2 × 2 Ø 10 mm	14 mm	511 mm
RQP60 + RQP60	2 × 2 Ø 12 mm	16 mm	706 mm
RQP70 + RQP70	2 × 3 Ø 12 mm	16 mm	706 mm

⑧ With drilling and with the use of the injection systems for reinforcement connections the the person carrying these out must possess a valid proof of suitability

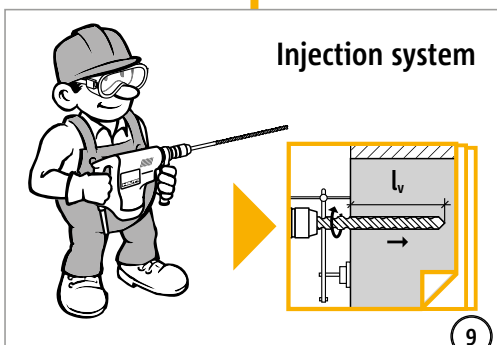
⑨ With drilling, the existing reinforcement as well as the electrical lines and sanitary pipelines in the floor are to be noted. The drilling must be carried out using the hammer or diamond drilling method with drilling aid according to the setting instructions of the ETA-16/0142 for Hilti or ETA-09/0089 for fischer.

The drill holes must be placed without damage to the reinforcement. In the case of a reinforcement hit or a mis-drilling, the responsible site manager and, if necessary, the structural engineer, are to be informed without delay and suitable corrective measures are to be agreed. In the case of mis-drillings these are to be professionally filled with mortar.

### INJECTION:



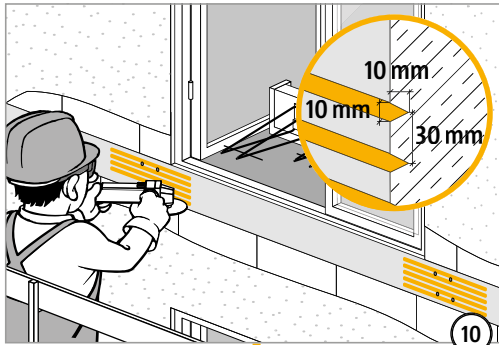
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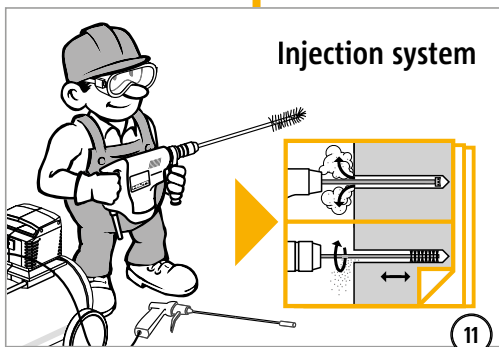
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# Schöck Isokorb® type RQP+RQP

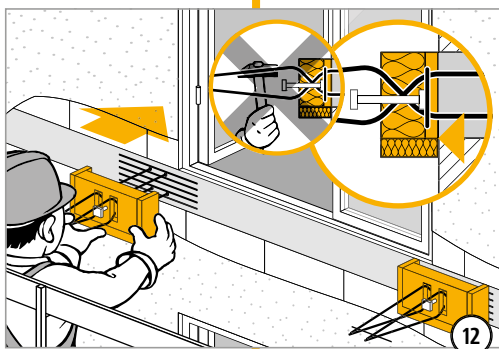
## Installation instructions



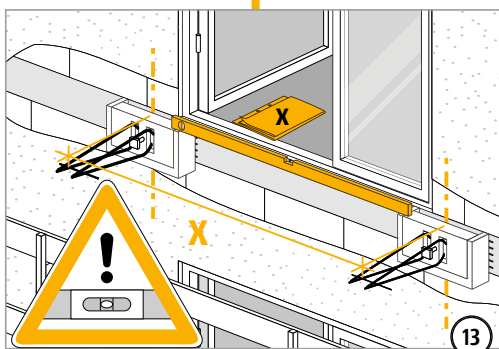
⑩ In the area of the Schöck Isokorb® the front face of the existing floor must be worked according to the adjacent sketch or according to DIN EN 1992-1-1 (EC2) and DIN EN 1992-1-1/NA. The surface roughened depth must be  $\geq 1.5$  mm.



⑪ Each drill hole must be cleaned according to the technical instructions of the ETA-16/0142, Z-21.8-2064 for Hilti and ETA-09/0089, Z-21.8-1874 for fischer.



⑫ Following cleaning of the drill holes the dry installation of the Schöck Isokorb® takes place for control purposes. The Schöck Isokorb® must be capable of being placed without large mechanical effort. The flush and height fitting position of all Schöck Isokorb® elements of a balcony slab must again be checked.



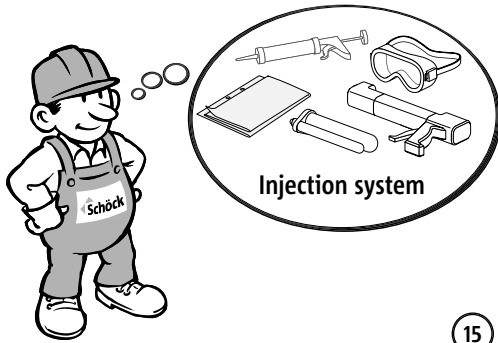
⑬ The flush and height fitting position as well as the spacing of all Schöck Isokorb® elements among themselves must again be checked in accordance with the specifications given in the construction plan.



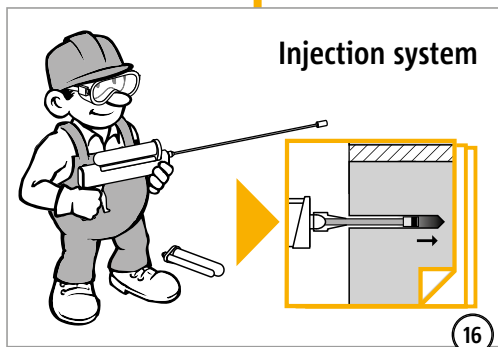
⑭ Following the checking of the position of the Schöck Isokorb® the Schöck Isokorb® is again dismantled.

# Schöck Isokorb® type RQP+RQP

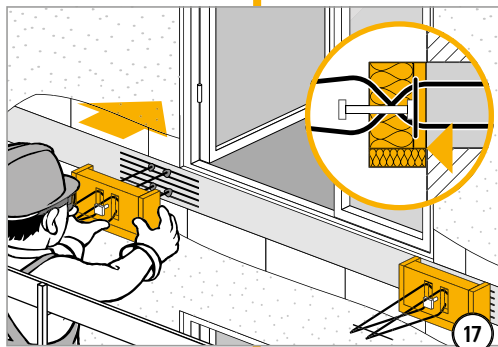
## Installation instructions



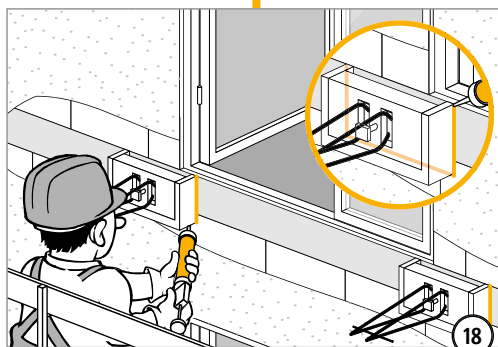
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15 The preparation of the film packaging respectively the cartridges of the Hilti HIT-RE 500 V3 or fischer FIS EM injection systems is to take place for Hilti the ETA-16/0142 and Z-21.8-2064. For fischer the ETA-09/0089 and Z-21.8-1874 apply.

16 The drill hole must be filled free of air bubbles with grouting mortar Hilti HIT-RE 500 V3 or fischer FIS EM. With this, for Hilti HIT-RE 500 V3 the technical instructions of the ETA-16/0142 and of the Z-21.8-2064 are to be noted. For FIS EM the instructions of the ETA-09/0089 and of the Z-21.8-1874.

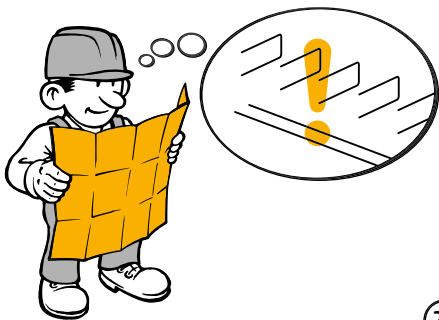
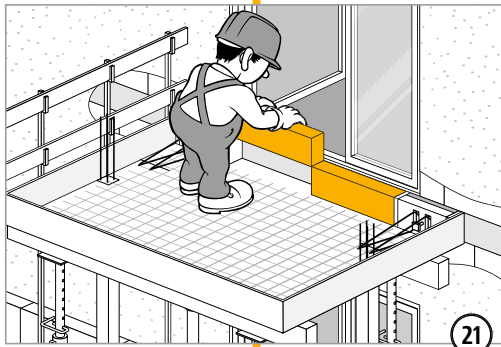
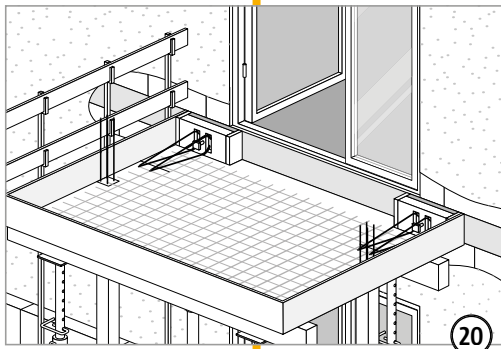
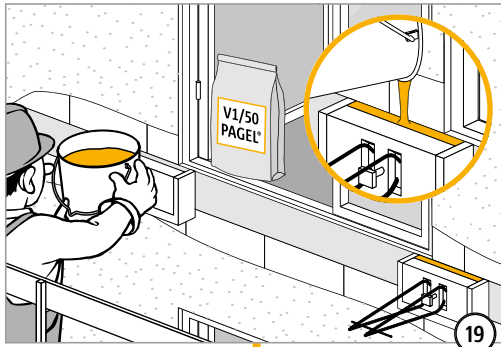
17 The sequence of the installation of the Schöck Isokorb®:

- ▶ As required assemble support for the duration of the hardening time of the grouting mortar.
- ▶ Fill the drill hole, (in each case for one Schöck Isokorb® element only).
- ▶ Immediately thereafter, the Schöck Isokorb® must be placed in the prepared drill hole. Attention is to be paid that the lower edge of the grouting recess of the Schöck Isokorb® closes flush with the lower edge of the existing floor.

18 After completion of the hardening timing „ $t_{cure}$ “ according to the technical instructions of the ETA-16/0142 and Z-21.8-2064, or of the ETA-09/0089 and the Z-21.8-1874, the Schöck Isokorb® can be further processed. The connection joint between Schöck Isokorb® and the existing facade is to be formed absolutely watertight so that with grouting of the joint the grouting concrete does not run out.

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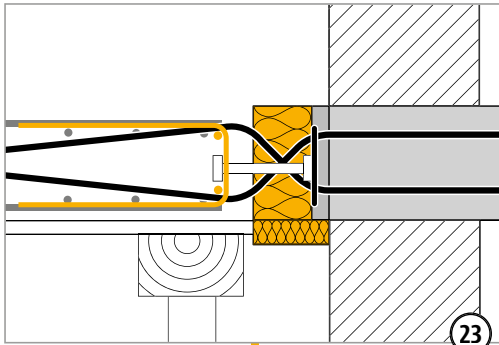
## Installation instructions



- ⑲ The grouting joint must be filled with PAGEL V1/50 grouting concrete. Manufacturer's details on the processing are to be observed. Following the hardening of the grouting concrete the connection of the steel structure of the balcony is to take place according to the following instruction.
- ⑳ Following the installation of the Schöck Isokorb® elements the balcony formwork as well as its support are set up.
- ㉑ Install in-situ thermal insulation strips according to construction plan. The working faces of the thermal insulation strips and the connection to the Schöck Isokorb® are to be formed absolutely tight.
- ㉒ Check required in-situ connection reinforcement in accordance with the reinforcement plan of the structural engineer for completeness.

# Schöck Isokorb® type RQP+RQP

## Installation instructions



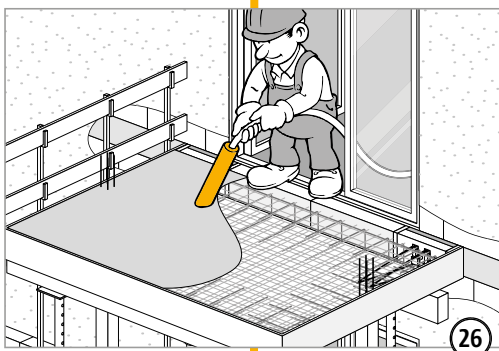
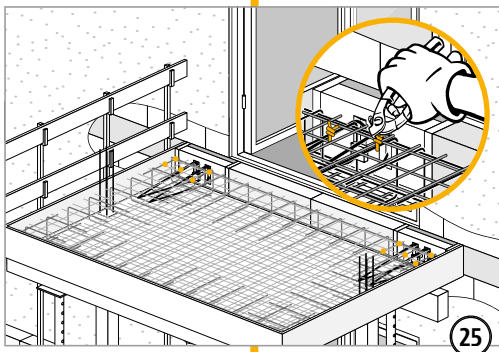
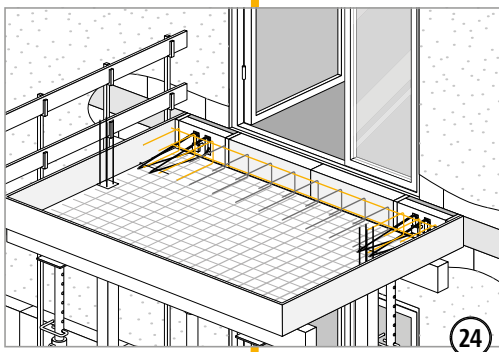
⑳ The installation of the connection reinforcement of the Schöck Isokorb® in the balcony slab is to take place according to details of the construction drawing.

- ▶ On the balcony side stirrups are required as suspension reinforcement in accordance with reinforcement plan.
- ▶ On the balcony side each 1 steel bar  $\geq \varnothing 8$  mm is required at the top and bottom.

㉑ The in-situ connection reinforcement is to be joined professionally with the Isokorb®. Before concreting check:

- ▶ Connection reinforcement
- ▶ Concrete cover

㉒ Concreting as well as professional compacting of the concrete slab. Concrete grade according to construction plan.



RQP+  
RQP

# Schöck Isokorb® R for refurbishment

## Check list building construction



- Is the installation of the Schöck Isokorb® R agreed with the architects and structural engineers?
- Are the Schöck Isokorb® R installation instructions available on the building site?
  1. Installation instruction without text (available on all Isokorb® R types)
  2. Installation instruction with text (simply available with all deliveries)
- Are position and spacings of the existing reinforcement known?
- Are position and spacings of the existing electrical lines and sanitary pipelines in the existing floor known?
- Is the Schöck Isokorb® R drill template available on the building site?
- Has it been laid down by the structural engineer, whether the front face of the existing floor is to be formed as rough or as toothed joint (depending on Isokorb® type)?
- Has the injection system for the reinforcement connection been selected and is it available on the building site? The grouting mortar Hilti HIT-RE 500 V3 and fischer FIS EM are specified in accordance with the building supervisory approval documents Z-15.7-297, Z-15.7-298 for the cementing of the Schöck Isokorb® R in the existing floor.
- Is the proof of suitability for the firm carrying out the reinforcement connection using Hilti HIT-RE 500 V3 (approval Z-21.8-2064) or using fischer FIS EM (approval Z-21.8-1874) available?
- Is the Hilti HIT-RE 500 V3 setting instruction „Retrospective reinforcement connection using Hilti HIT-RE 500 V3“ available on the building site?
- Is the die assembly instruction "Reinforcement connection using fischer grouting mortar FIS EM" available on the building site?
- Is the form: „Hilti HIT-RE 500 V3 assembly protocol"for the production of the protocol available on the building site?
- Is the form: "Installation protocol for retrospective reinforcement connection using fischer FIS grouting mortar" for the production of the protocol available on the building site?
- Is the processing information of the firm of PAGEL for the PAGEL VERGUSS V1/50 grouting cement known?









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