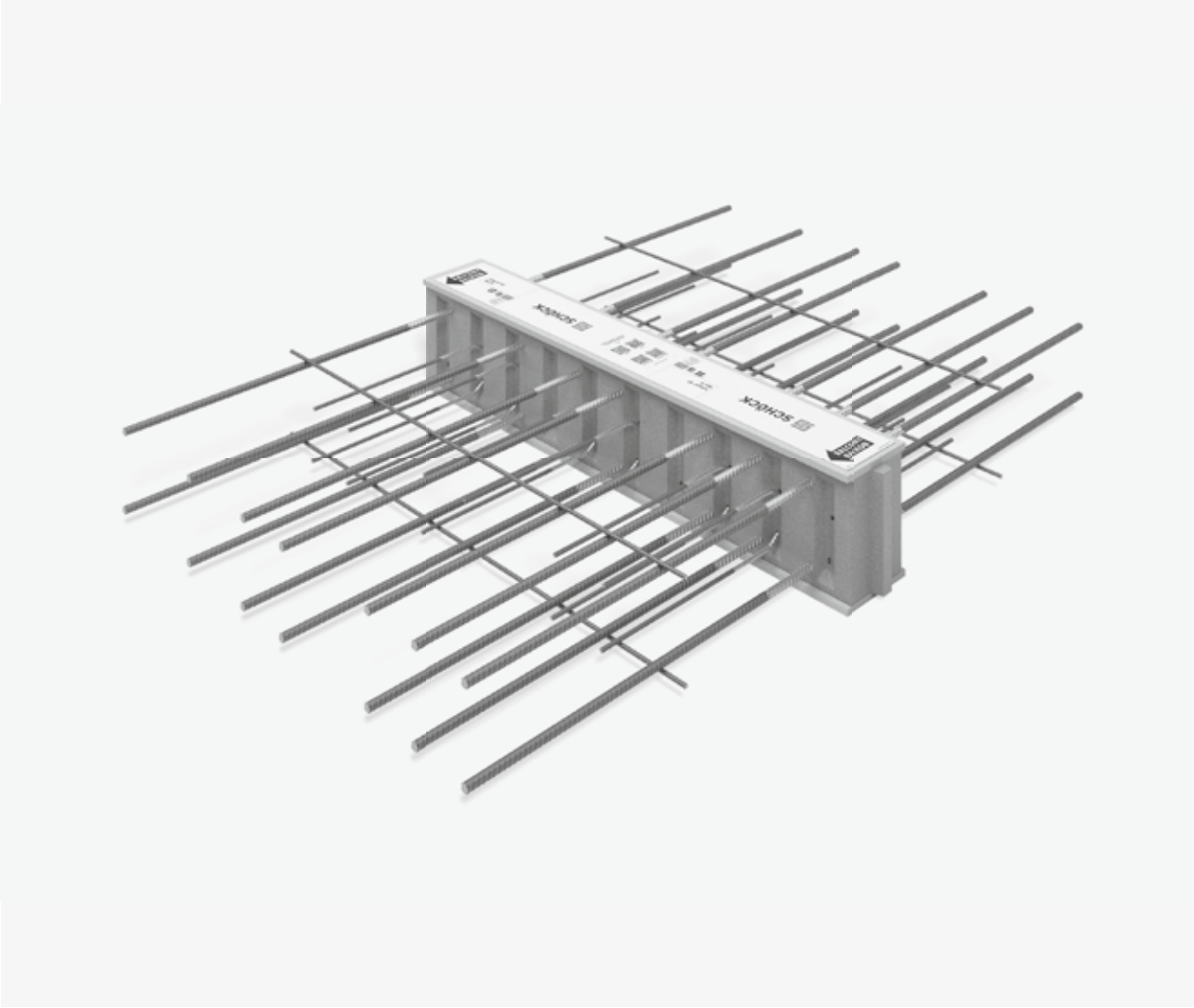
Schöck Isokorb® XT type D



Schöck Isokorb® XT type D
Load-bearing thermal insulation element for continuous flooring. The element transfers moments and shear forces.

Element arrangement | Installation cross sections

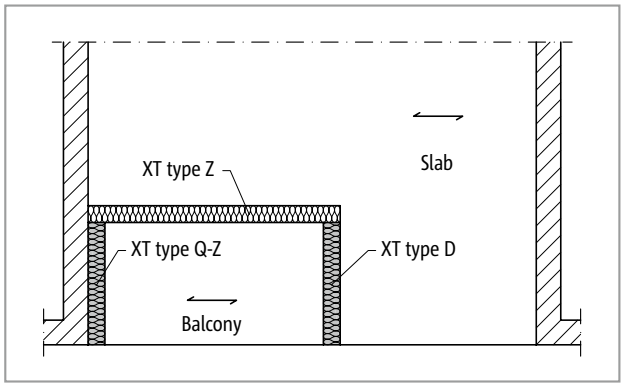


Fig. 244: Schöck Isokorb® XT type D, Q-Z: One-way spanning

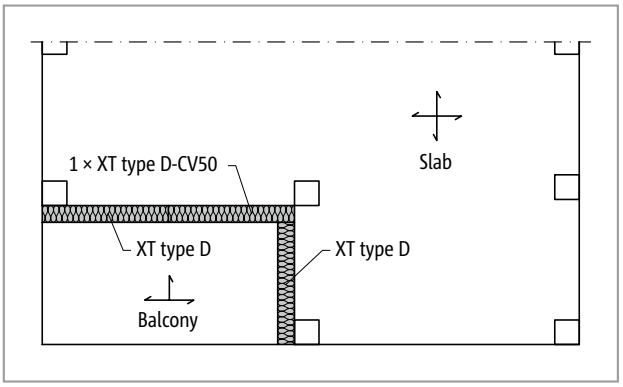


Fig. 245: Schöck Isokorb® XT type D: Two-way spanning

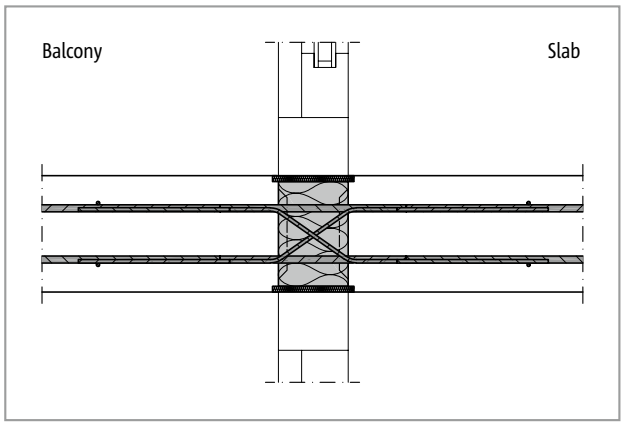


Fig. 246: Schöck Isokorb® XT type D: One-way spanning

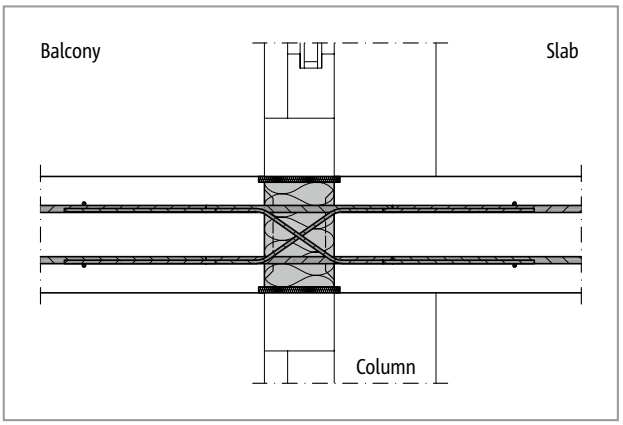


Fig. 247: Schöck Isokorb® XT type D: Two-way spanning

Element arrangement

- With connection across the corner with Schöck Isokorb® XT type D, a type D-CV50 (2nd position) is required in one axial direction Therefore a minimum slab thickness of 200 mm.
- The Schöck Isokorb® transmits moments vertically to the insulation joint, it transmit no moments parallel to the insulation joint. Therefore it is not suitable for employment within point supported floor bays or in balconies with 4 columns.

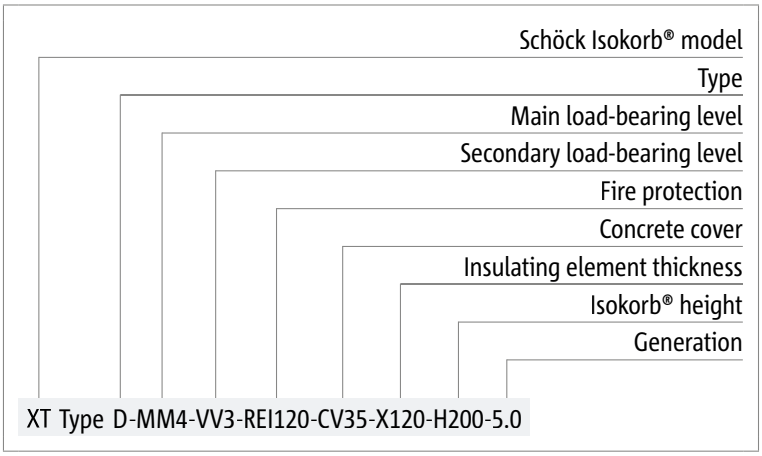
Product selection | Type designations | Special designs

Schöck Isokorb® XT type D variants

The configuration of the Schöck Isokorb® XT type D can vary as follows:

- Main load-bearing level:
  MM1 to MM5
- Secondary load-bearing level:
  VV1 to VV5
- Fire resistance class:
  REI120 (standard): Top and bottom fire protection projecting by 10mm on both sides
- Concrete cover of the tension bars:
  CV35: Top CV = 35 mm, bottom CV = 30 mm
  CV50: Top CV = 50 mm, bottom CV = 50 mm
- Insulating element thickness:
  X120 = 120 mm
- Isokorb® height:
  H = H_{min} to 250 mm (H_{min} depends on the concrete cover and shear force load-bearing level, see page 160)
- Generation:
  5.0

Type designations in planning documents



Special designs

Please contact the design support department if you have connections that are not possible with the standard product variants shown in this information (contact details on page 3).
In accordance with approval heights up to 500 mm are possible.

C25/30 design

Schöck Isokorb® XT type D			MM1			MM2		
			VV1	VV2	VV3	VV1	VV2	VV3
Design values with	Concrete cover CV [mm]		Concrete strength class ≥ C25/30					
	CV35	CV50	$m_{Rd,y}$ [kNm/m]					
Isokorb® height H [mm]	160		±14.7	±13.8	-	±17.9	-	-
		200	±15.5	±14.7	-	±19.0	-	-
	170		±16.4	±15.5	±13.3	±20.1	±17.9	-
		210	±17.3	±16.3	±14.0	±21.1	±18.8	-
	180		±18.2	±17.1	±14.7	±22.2	±19.8	±16.7
		220	±19.1	±18.0	±15.4	±23.3	±20.8	±17.5
	190		±20.0	±18.8	±16.2	±24.4	±21.7	±18.3
		230	±20.8	±19.6	±16.9	±25.4	±22.7	±19.1
	200		±21.7	±20.5	±17.6	±26.5	±23.6	±19.9
		240	±22.6	±21.3	±18.3	±27.6	±24.6	±20.7
	210		±23.5	±22.1	±19.0	±28.7	±25.6	±21.5
		250	±24.4	±23.0	±19.7	±29.8	±26.5	±22.3
	220		±25.2	±23.8	±20.4	±30.8	±27.5	±23.2
	230		±27.0	±25.5	±21.9	±33.0	±29.4	±24.8
	240		±28.8	±27.1	±23.3	±35.2	±31.3	±26.4
	250		±30.5	±28.8	±24.7	±37.3	±33.2	±28.0
			$v_{Rd,z}$ [kN/m]					
Secondary load-bearing level		VV1 – VV3	±28.2	±42.3	±75.2	±42.3	±75.2	±117.5

Schöck Isokorb® XT type D	MM1			MM2		
	VV1	VV2	VV3	VV1	VV2	VV3
Placement with	Isokorb® length [mm]					
	1000					
Tension bars/compression members	2 × 4 ⌀ 12			2 × 5 ⌀ 12		
Shear force bars	2 x 4 ⌀ 6	2 x 6 ⌀ 6	2 x 6 ⌀ 8	2 x 6 ⌀ 6	2 x 6 ⌀ 8	2 x 6 ⌀ 10
H_{min} with CV35 [mm]	160	160	170	160	170	180
H_{min} with CV50 [mm]	200	200	210	200	210	220

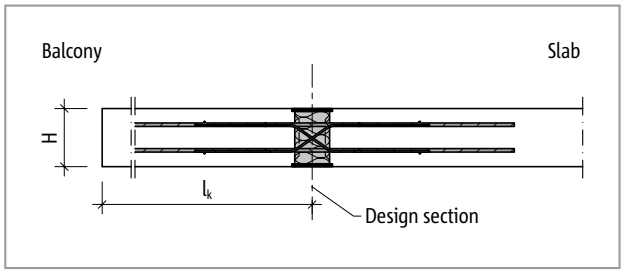


Fig. 248: Schöck Isokorb® XT type D: Static system

C25/30 design

Schöck Isokorb® XT type D			MM3				
			VV1	VV2	VV3	VV4	VV5
Design values with	Concrete cover CV [mm]		Concrete strength class ≥ C25/30				
	CV35	CV50	$m_{Rd,y}$ [kNm/m]				
Isokorb® height H [mm]	160		±26.1	-	-	-	-
		200	±27.6	-	-	-	-
	170		±29.2	±27.0	-	-	-
		210	±30.8	±28.5	-	-	-
	180		±32.3	±29.9	±26.8	±23.9	-
		220	±33.9	±31.4	±28.1	±25.1	-
	190		±35.5	±32.8	±29.4	±26.3	±20.7
		230	±37.1	±34.3	±30.7	±27.4	±21.6
	200		±38.6	±35.7	±32.0	±28.6	±22.5
		240	±40.2	±37.2	±33.3	±29.7	±23.4
	210		±41.8	±38.6	±34.6	±30.9	±24.4
		250	±43.3	±40.1	±35.9	±32.1	±25.3
	220		±44.9	±41.5	±37.2	±33.2	±26.2
	230		±48.0	±44.4	±39.8	±35.5	±28.0
	240		±51.2	±47.4	±42.4	±37.9	±29.8
	250		±54.3	±50.3	±45.0	±40.2	±31.7
			$v_{Rd,z}$ [kN/m]				
Secondary load-bearing level		VV1 – VV5	±42.3	±75.2	±117.5	±156.7	±225.6

Schöck Isokorb® XT type D	MM3				
	VV1	VV2	VV3	VV4	VV5
Placement with	Isokorb® length [mm]				
	1000				
Tension bars/compression members	2 × 7 ⌀ 12				
Shear force bars	2 x 6 ⌀ 6	2 x 6 ⌀ 8	2 x 6 ⌀ 10	2 x 8 ⌀ 10	2 x 8 ⌀ 12
H_{min} with CV35 [mm]	160	170	180	180	190
H_{min} with CV50 [mm]	200	210	220	220	230

C25/30 design

Schöck Isokorb® XT type D			MM4				
			VV1	VV2	VV3	VV4	VV5
Design values with	Concrete cover CV [mm]		Concrete strength class ≥ C25/30				
	CV35	CV50	$m_{Rd,y}$ [kNm/m]				
Isokorb® height H [mm]	160		±38.3	-	-	-	-
		200	±40.6	-	-	-	-
	170		±42.9	±40.7	-	-	-
		210	±45.2	±42.9	-	-	-
	180		±47.5	±45.1	±42.0	±39.1	-
		220	±49.8	±47.3	±44.0	±41.0	-
	190		±52.2	±49.5	±46.1	±42.9	±37.4
		230	±54.5	±51.7	±48.1	±44.8	±39.0
	200		±56.8	±53.9	±50.2	±46.7	±40.7
		240	±59.1	±56.1	±52.2	±48.6	±42.3
	210		±61.4	±58.3	±54.2	±50.5	±44.0
		250	±63.7	±60.4	±56.3	±52.4	±45.6
	220		±66.0	±62.6	±58.3	±54.3	±47.3
	230		±70.6	±67.0	±62.4	±58.1	±50.6
	240		±75.2	±71.4	±66.5	±61.9	±53.9
	250		±79.8	±75.8	±70.6	±65.7	±57.2
			$v_{Rd,z}$ [kN/m]				
Secondary load-bearing level		VV1 – VV5	±42.3	±75.2	±117.5	±156.7	±225.6

Schöck Isokorb® XT type D	MM4				
	VV1	VV2	VV3	VV4	VV5
Placement with	Isokorb® length [mm]				
	1000				
Tension bars/compression members	2 × 10 ⌀ 12				
Shear force bars	2 x 6 ⌀ 6	2 x 6 ⌀ 8	2 x 6 ⌀ 10	2 x 8 ⌀ 10	2 x 8 ⌀ 12
H_{min} with CV35 [mm]	160	170	180	180	190
H_{min} with CV50 [mm]	200	210	220	220	230

C25/30 design

Schöck Isokorb® XT type D			MM5				
			VV1	VV2	VV3	VV4	VV5
Design values with	Concrete cover CV [mm]		Concrete strength class ≥ C25/30				
	CV35	CV50	$m_{Rd,y}$ [kNm/m]				
Isokorb® height H [mm]	160		±46.5	-	-	-	-
		200	±49.3	-	-	-	-
	170		±52.1	±49.9	-	-	-
		210	±54.9	±52.6	-	-	-
	180		±57.7	±55.2	±52.1	±49.3	-
		220	±60.5	±57.9	±54.7	±51.6	-
	190		±63.3	±60.6	±57.2	±54.0	±48.5
		230	±66.1	±63.3	±59.7	±56.4	±50.6
	200		±68.9	±66.0	±62.3	±58.8	±52.8
		240	±71.7	±68.7	±64.8	±61.2	±54.9
	210		±74.5	±71.3	±67.3	±63.6	±57.1
		250	±77.3	±74.0	±69.8	±66.0	±59.2
	220		±80.1	±76.7	±72.4	±68.4	±61.3
	230		±85.7	±82.1	±77.4	±73.2	±65.6
	240		±91.3	±87.4	±82.5	±77.9	±69.9
	250		±96.9	±92.8	±87.6	±82.7	±74.2
			$v_{Rd,z}$ [kN/m]				
Secondary load-bearing level		VV1 – VV5	±42.3	±75.2	±117.5	±156.7	±225.6

Schöck Isokorb® XT type D	MM5				
	VV1	VV2	VV3	VV4	VV5
Placement with	Isokorb® length [mm]				
	1000				
Tension bars/compression members	2 × 12 ⌀ 12				
Shear force bars	2 x 6 ⌀ 6	2 x 6 ⌀ 8	2 x 6 ⌀ 10	2 x 8 ⌀ 10	2 x 8 ⌀ 12
H_{min} with CV35 [mm]	160	170	180	180	190
H_{min} with CV50 [mm]	200	210	220	220	230

Notes on design

- With different concrete strength classes (e.g. balcony C32/40, inner slab C25/30) basically the weaker concrete is relevant for the design of the Schöck Isokorb®.
- The indicative minimum concrete strength class of the external structural component is C32/40.
- A static verification is to be provided for the adjacent reinforced concrete structural component on both sides of the Schöck Isokorb®.
- The shear force loading of the slabs in the area of the insulation joint is to be limited to $V_{Rd,\,max}$, whereby $V_{Rd,\,max}$, acc. to BS EN 1992-1-1 (EC2), Exp. (6.9) is determined for $\theta = 45\,^{\circ}$ and $\alpha = 90\,^{\circ}$ (slab load-bearing capacity).
- The Schöck Isokorb® XT type D transmits only bending moments perpendicular to the insulation slab. The Schöck Isokorb® transmits no torsion moments. Therefore the arrangement of a Schöck Isokorb® XT type D is not sensible in a punctually supported slab without downstand beams.

Deflection/Camber

Deflection

The deflection factors given in the table (tan α [%]) result alone from the deflection of the Schöck Isokorb® under 100% steel utilisation. They serve for the estimation of the required camber. The total arithmetic camber of the balcony slab formwork results from the calculation according to BS EN 1992-1-1 (EC2) and BS EN 1992-1-1/NA plus the deflection from Schöck Isokorb®. The camber of the balcony slab formwork to be given by the structural engineer/designer in the implementation plans (Basis: Calculated total deflection from cantilever slab + floor rotation angle + Schöck Isokorb®) should be so rounded that the scheduled drainage direction is maintained (round up: with drainage to the building facade, round down: with drainage towards the cantilever slab end).

Deflection (p) as a result of Schöck Isokorb®

$p = \tan\alpha \cdot l_k \cdot (m_{pd} / m_{Rd}) \cdot 10$ [mm]

Factors to be applied

$\tan\alpha$ = apply value from table

l_k = cantilever length [m]

m_{pd} = relevant bending moment [kNm/m] in the ultimate limit state for the determination of the p [mm] from Schöck Isokorb®.
The load combination to be applied for the deflection is determined by the structural engineer.
(Recommendation: Load combination for the determination of the camber p : determine g+q/2, m_{pd} in the ultimate limit state)

m_{Rd} = maximum design moment [kNm/m] of the Schöck Isokorb®

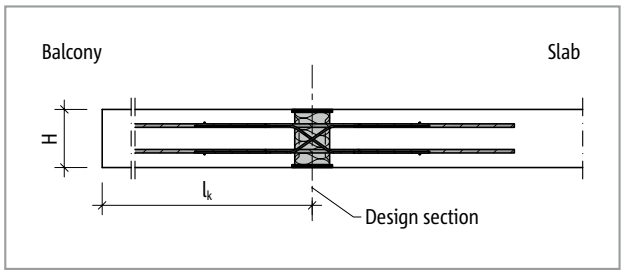


Fig. 249: Schöck Isokorb® XT type D: Static system

Schöck Isokorb® XT type D		MM1–MM5	
Deflection factor for		CV35	CV50
		tan α [%]	
Isokorb® height H [mm]	160	1.2	-
	170	1.0	-
	180	0.9	-
	190	0.8	-
	200	0.7	1.1
	210	0.6	1.0
	220	0.6	0.8
	230	0.6	0.7
	240	0.5	0.7
	250	0.5	0.6

Expansion joint spacing

Maximum expansion joint spacing

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

Schöck Isokorb® XT type D		MM1 VV1–VV3	MM2–MM5 VV1–VV2	MM2 VV3	MM3–MM5 VV3–VV4	MM3–MM5 VV5
Maximum expansion joint spacing when		e [m]				
Insulating element thickness [mm]	120	19.8	19.8	19.5	19.5	17.7

Edge distances

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

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

Product description

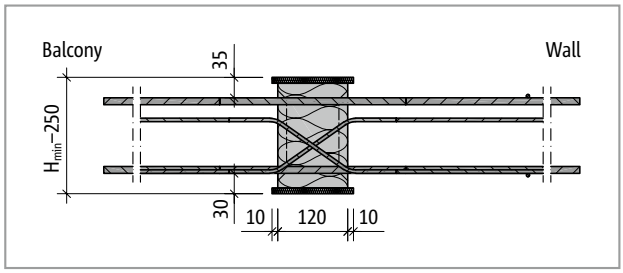


Fig. 250: Schöck Isokorb® XT type D with CV35: Product section

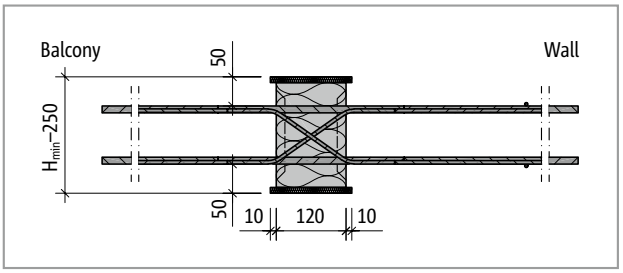


Fig. 251: Schöck Isokorb® XT type D with CV50: Product section

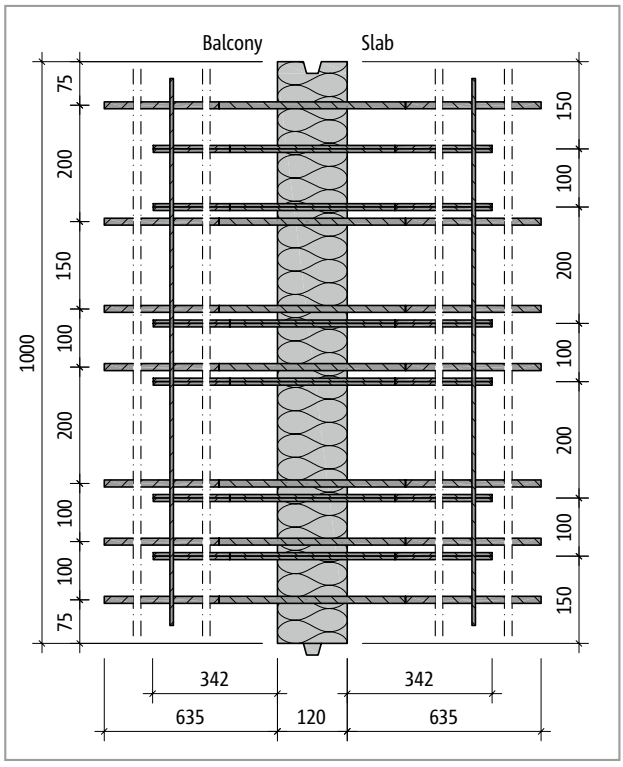


Fig. 252: Schöck Isokorb® XT type D-MM3-VV1: Plan view

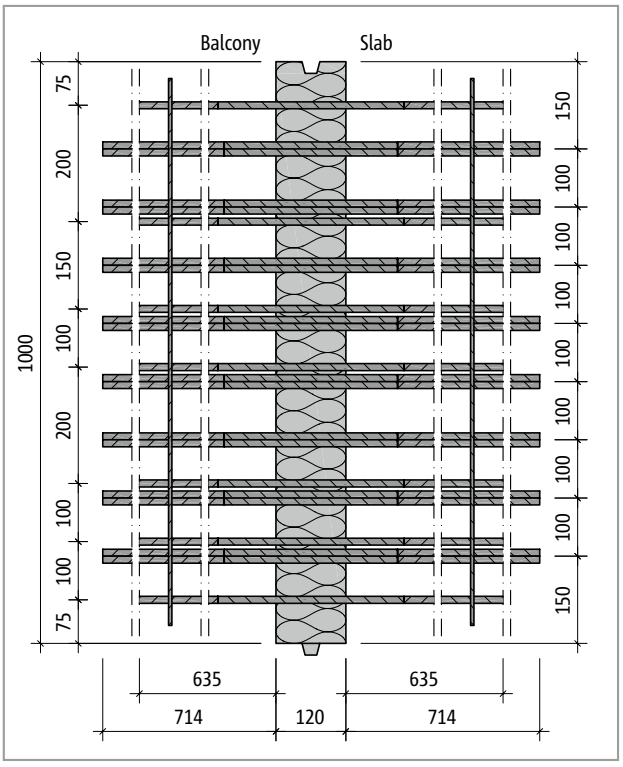


Fig. 253: Schöck Isokorb® XT type D-MM3-VV5: Layout

Product information

- Download further product plan views and cross-sections at cad.schoeck.co.uk

On-site reinforcement

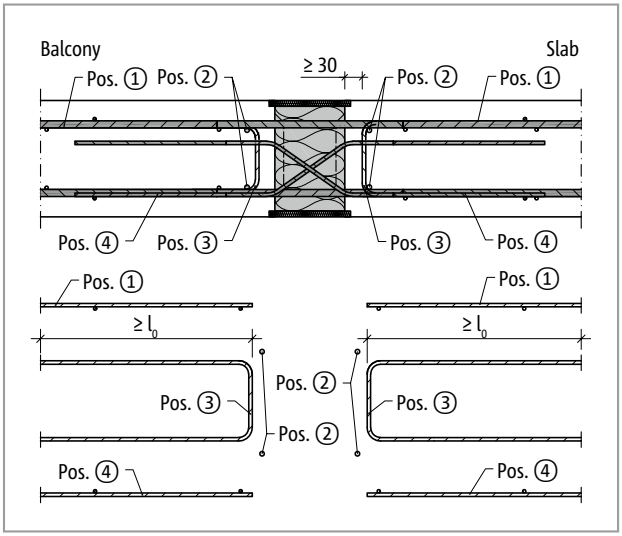


Fig. 254: Schöck Isokorb® XT type D: On-site reinforcement

Information about on-site reinforcement

- The rules according to BS EN 1992-1-1 (EC2) and BS EN 1992-1-1/NA apply for the determination of the overlap length. A reduction of the required overlap length with m_{Ed}/m_{Rd} is permitted. For the overlap (l) with the Schöck Isokorb® for the XT type D a length of the tension bars of 605 can be brought to account.
- An edge and suspension reinforcement (Pos. 3) is to be arranged on both sides of the Schöck Isokorb® XT type D. Details in the table apply for Schöck Isokorb® with a loading of 100% of the maximum design internal forces with 25/30.

On-site reinforcement

Recommendation for the on-site connection reinforcement
Information on the on-site reinforcement for Schöck Isokorb® with a loading of 100 % of the maximum design moment and the shear force with C25/30. The required reinforcement cross-section depends on the bar diameter of the steel bar or wire-mesh reinforcement – see type approval.

Schöck Isokorb® XT type D			MM1			MM2		
			VV1	VV2	VV3	VV1	VV2	VV3
On-site reinforcement	CV35	CV50	Floor (XC1) concrete strength class ≥ C25/30 Balcony (XC4) concrete strength class ≥ C25/30					
	Height [mm]							
Lap reinforcement dependent on bar diameter (necessary for negative moment)								
Pos. 1 with ⌀8 [mm²/m]			491	511	467	624	580	565
Pos. 1 with ⌀10 [mm²/m]			524	560	532	673	646	589
Pos. 1 with ⌀12 [mm²/m]			595	643	620	768	745	690
Steel bars along the insulation joint								
Pos. 2			2 • 2 • H8					
Vertical reinforcement								
Pos. 3 [mm²/m]	160–180	200–210	113					
Pos. 3 [mm²/m]	190–250	220–250	113	113	173	113	173	270
Lap reinforcement dependent on bar diameter (necessary for positive moment)								
Pos. 4 with H8 [mm²/m]			491	511	467	624	580	565
Pos. 4 with H10 [mm²/m]			524	560	532	673	646	589
Pos. 4 with H12 [mm²/m]			595	643	620	768	745	690

Schöck Isokorb® XT type D			MM3				
			VV1	VV2	VV3	VV4	VV5
On-site reinforcement	CV35	CV50	Floor (XC1) concrete strength class ≥ C25/30 Balcony (XC4) concrete strength class ≥ C25/30				
	Height [mm]						
Lap reinforcement dependent on bar diameter (necessary for negative moment)							
Pos. 1 with ⌀8 [mm²/m]			850	806	792	792	792
Pos. 1 with ⌀10 [mm²/m]			899	872	816	823	792
Pos. 1 with ⌀12 [mm²/m]			1018	995	940	962	797
Steel bars along the insulation joint							
Pos. 2			2 • 2 • H8				
Vertical reinforcement							
Pos. 3 [mm²/m]	160–180	200–210	113	113	113	113	113
	190–250	220–250	113	173	270	360	519
Lap reinforcement dependent on bar diameter (necessary for positive moment)							
Pos. 4 with H8 [mm²/m]			850	806	792	792	792
Pos. 4 with H10 [mm²/m]			899	872	816	823	792
Pos. 4 with H12 [mm²/m]			1018	995	940	962	797

On-site reinforcement | Installation instructions

Schöck Isokorb® XT type D			MM4				
			VV1	VV2	VV3	VV4	VV5
On-site reinforcement	CV35	CV50	Floor (XC1) concrete strength class ≥ C25/30 Balcony (XC4) concrete strength class ≥ C25/30				
	Height [mm]						
Lap reinforcement dependent on bar diameter (necessary for negative moment)							
Pos. 1 with ⌀8 [mm²/m]			1189	1146	1131	1131	1131
Pos. 1 with ⌀10 [mm²/m]			1239	1211	1155	1163	1131
Pos. 1 with ⌀12 [mm²/m]			1393	1370	1315	1337	1172
Steel bars along the insulation joint							
Pos. 2			2 • 2 • H8				
Vertical reinforcement							
Pos. 3 [mm²/m]	160–180	200–210	113	113	113	113	113
	190–250	220–250	113	173	270	360	519
Lap reinforcement dependent on bar diameter (necessary for positive moment)							
Pos. 4 with H8 [mm²/m]			1189	1146	1131	1131	1131
Pos. 4 with H10 [mm²/m]			1239	1211	1155	1163	1131
Pos. 4 with H12 [mm²/m]			1393	1370	1315	1337	1172

Schöck Isokorb® XT type D			MM5				
			VV1	VV2	VV3	VV4	VV5
On-site reinforcement	CV35	CV50	Floor (XC1) concrete strength class ≥ C25/30 Balcony (XC4) concrete strength class ≥ C25/30				
	Height [mm]						
Lap reinforcement dependent on bar diameter (necessary for negative moment)							
Pos. 1 with ⌀8 [mm²/m]			1416	1372	1357	1357	1357
Pos. 1 with ⌀10 [mm²/m]			1465	1437	1381	1389	1357
Pos. 1 with ⌀12 [mm²/m]			1643	1620	1566	1587	1422
Steel bars along the insulation joint							
Pos. 2			2 • 2 • H8				
Vertical reinforcement							
Pos. 3 [mm²/m]	160–180	200–210	113	113	135	120	173
	190–250	220–250	113	173	270	360	519
Lap reinforcement dependent on bar diameter (necessary for positive moment)							
Pos. 4 with H8 [mm²/m]			1416	1372	1357	1357	1357
Pos. 4 with H10 [mm²/m]			1465	1437	1381	1389	1357
Pos. 4 with H12 [mm²/m]			1643	1620	1566	1587	1422

Installation instructions

The current installation instruction can be found online under:
www.schoeck.com/view/6424

☑ Check list

- ☐ Have the loads on the Schöck Isokorb® connection been specified at design level?
- ☐ Has the cantilevered system length or the system support width been taken as a basis?
- ☐ Are the maximum allowable expansion joint spacings taken into account?
- ☐ With the selection of the design table is the relevant concrete cover taken into account?
- ☐ Are the requirements with regard to fire protection explained and is the appropriate addendum entered in the Isokorb® type description in the implementation plans?
- ☐ Is the minimum slab thickness (≥ 200 mm) and the required concrete cover (-CV50) taken into account with connection over a corner using Schöck Isokorb® XT type D?
- ☐ With XT type D in conjunction with prefabricated floors is the required block-out (width ≥ 650 mm from insulating element) drawn into the implementation plans and is the on-site reinforcement adjusted?
- ☐ With 2- or 3-sided support is a Schöck Isokorb® selected for a connection free of constraint selected (possibly XT type Q-Z, XT type Q-PZ)?
- ☐ Have the requirements for on-site reinforcement of connections been defined in each case?