Schöck Isokorb® T type K

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

Element arrangement | Installation cross sections

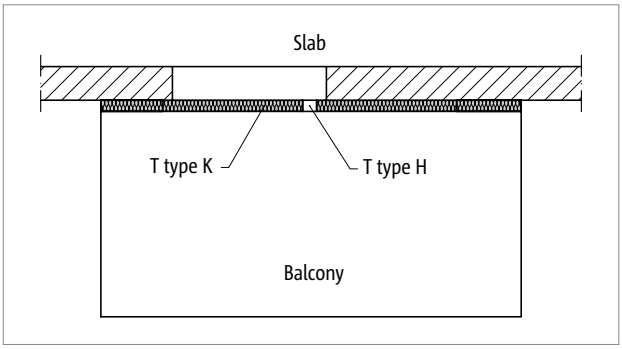


Fig. 25: Schöck Isokorb® T type K: Balcony freely cantilevered; optional with T type H with planned horizontal loads e.g. closed balustrades

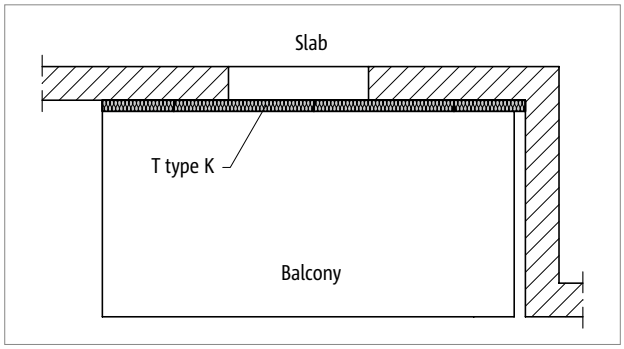


Fig. 26: Schöck Isokorb® T type K: Balcony with facade offset

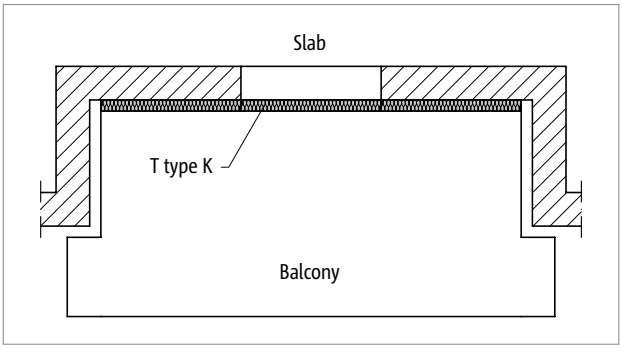


Fig. 27: Schöck Isokorb® T type K: Balcony with facade recess

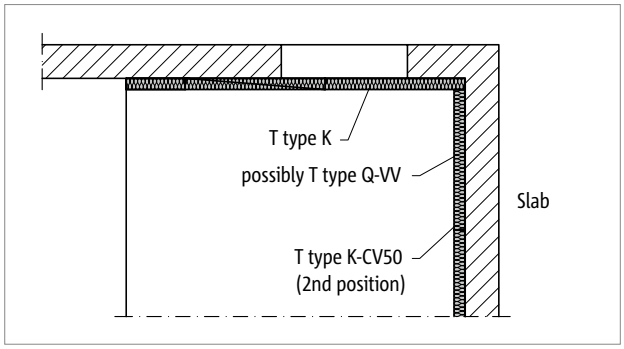


Fig. 28: Schöck Isokorb® T type K, Q-VV: Balcony with inside corner, freely supported on two sides

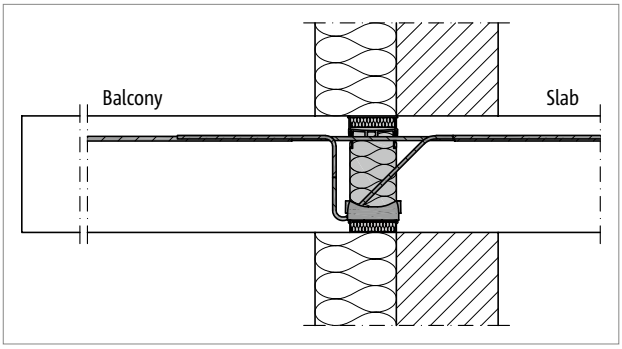


Fig. 29: Schöck Isokorb® T type K: Connection with thermal insulation composite system (TICS)

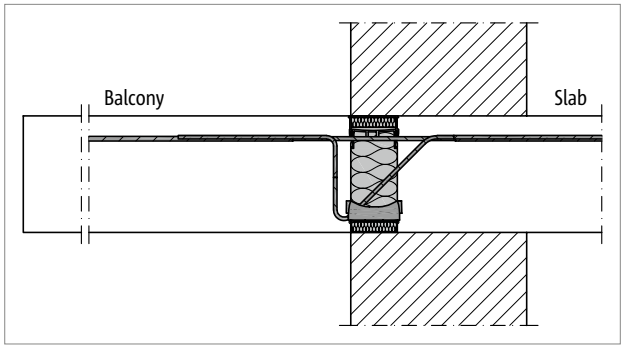


Fig. 30: Schöck Isokorb® T type K: Connection with single-leaf masonry

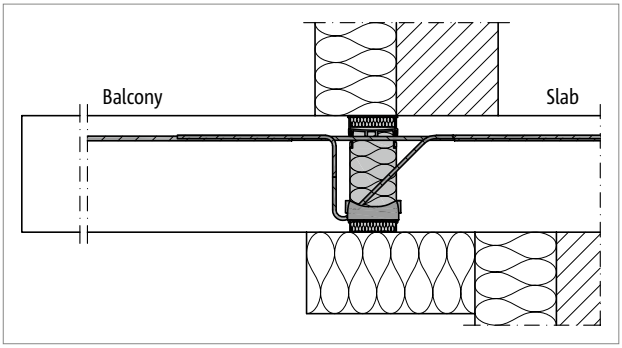


Fig. 31: Schöck Isokorb® T type K: Connection with indirectly positioned floor and TICS

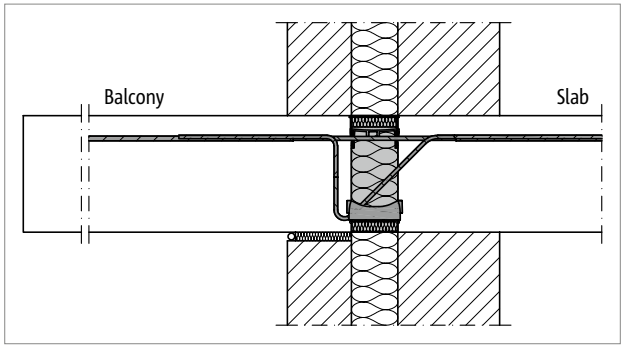


Fig. 32: Schöck Isokorb® T type K: Cavity wall with a balcony at inner slab level

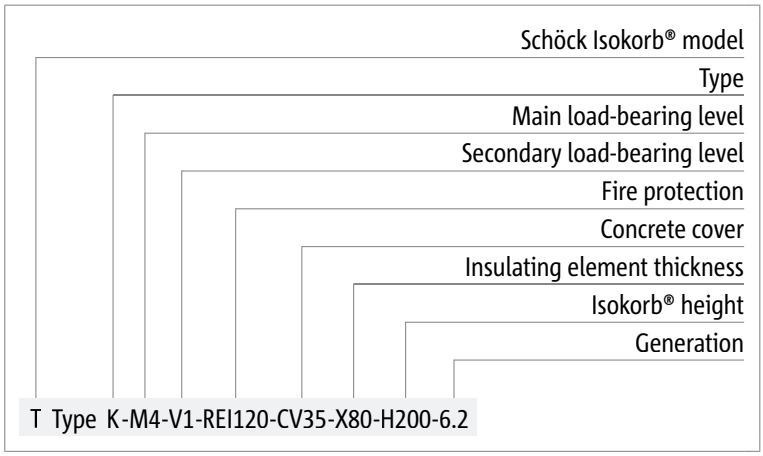
Product selection | Type designations | Special designs

Schöck Isokorb® T type K variants

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

- Main load-bearing level:
  M1 to M14
- Secondary load-bearing level:
  V1 to V3, VV1
- Fire resistance class:
  REI120: M1 to M11
  REI120: M12 to M14: Projection upper fire protection board, both sides 10 mm
- Concrete cover of the tension bars:
  CV30 = 30 mm, CV35 = 35 mm, CV50 = 50 mm
- Insulating element thickness:
  X80 = 80 mm
- Isokorb® height:
  H = 160 to 250 mm for Schöck Isokorb® T type K-M1 to M11 and concrete cover CV30, CV35
  H = 180 to 250 mm for Schöck Isokorb® T type K-M1 to M11 and concrete cover CV50
  H = H_{min} to 250 mm for Schöck Isokorb® T type K-M12 to M14
- Isokorb® length:
  1000 mm for M1 to M11
  500 mm for M12 to M14 – required in the type designation: T type K-M12-V1-REI120-CV35-X80-H200-**L500**-6.1
- Generation:
  6.2: M1 to M11
  6.1: M12 to M14

Type designations in planning documents



Special designs

Please contact the Technical Design Department if you cannot make connections using the standard product variants shown in this Technical Information (contact details on page 3).
In accordance with approval heights up to 500 mm are possible.
This also applies with additional requirements as a result of precast concrete construction. For additional requirements determined by manufacturing or transportation there are solutions available with coupler bars.

Design

Notes on design

- Minimum height H_{min} Schöck Isokorb® T type K-M1 to M11 for CV50: H_{min}=180mm, T type K-M12 to K-M14, see page 34.
- For cantilever slab constructions without live load, stressed from moment loading without direct shear force effectiveness or lightweight constructions, please use the Schöck design software or contact our Technical Design Department.

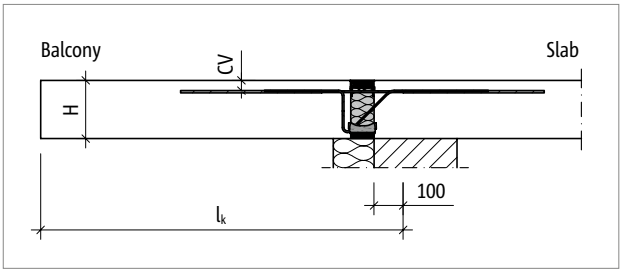


Fig. 33: Schöck Isokorb® T type K-M1 to M11: Static system

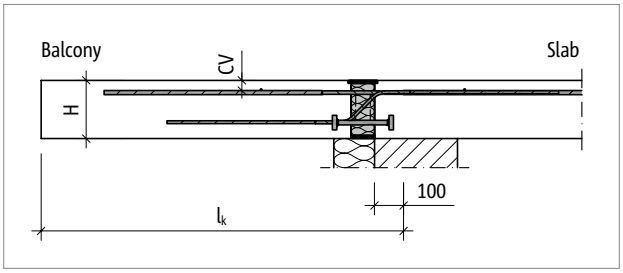


Fig. 34: Schöck Isokorb® T type K-M12: Static system

Design C25/30

Schöck Isokorb® T type K 6.2				M1	M2	M3	M4	M5	M6
Design values with	Concrete cover CV [mm]			Concrete strength class ≥ C25/30					
	CV30	CV35	CV50	$m_{Rd,y}$ [kNm/m]					
Isokorb® height H [mm]		160		-8.0	-15.7	-20.5	-23.8	-26.1	-28.7
	160		180	-8.5	-16.6	-21.7	-25.2	-27.7	-30.4
		170		-8.9	-17.5	-23.0	-26.5	-29.3	-32.3
	170		190	-9.4	-18.4	-24.2	-27.9	-30.8	-34.0
		180		-9.9	-19.3	-25.5	-29.2	-32.4	-35.9
	180		200	-10.3	-20.2	-26.7	-30.6	-34.0	-37.7
		190		-10.8	-21.1	-27.9	-31.9	-35.6	-39.6
	190		210	-11.3	-22.0	-29.1	-33.3	-37.1	-41.4
		200		-11.8	-23.0	-30.3	-34.6	-38.7	-43.2
	200		220	-12.2	-23.9	-31.5	-36.0	-40.3	-45.1
		210		-12.7	-24.8	-32.7	-37.3	-41.9	-47.0
	210		230	-13.2	-25.7	-33.8	-38.7	-43.4	-48.8
		220		-13.7	-26.6	-35.0	-40.0	-45.0	-50.7
	220		240	-14.2	-27.5	-36.2	-41.4	-46.6	-52.6
		230		-14.7	-28.5	-37.4	-42.7	-48.2	-54.5
	230		250	-15.1	-29.4	-38.6	-44.1	-49.7	-56.4
		240		-15.6	-30.3	-39.8	-45.4	-51.3	-58.3
	240			-16.1	-31.2	-40.9	-46.8	-52.9	-60.2
		250		-16.6	-32.2	-42.1	-48.1	-54.4	-62.2
	250			-17.1	-33.1	-43.3	-49.5	-56.0	-64.0
				$v_{Rd,z}$ [kN/m]					
Secondary load-bearing level			V1	34.8	34.8	43.5	43.5	43.5	43.5
			V2	61.8	61.8	77.3	77.3	77.3	77.3
			V3	-	-	123.6	123.6	123.6	123.6
			VV1	-	-	-	±61.8	±61.8	±61.8

Schöck Isokorb® T type K 6.2	M1	M2	M3	M4	M5	M6
Placement with	Isokorb® length [mm]					
	1000	1000	1000	1000	1000	1000
Tension bars V1/V2	4 ⌀ 8	8 ⌀ 8	10 ⌀ 8	12 ⌀ 8	14 ⌀ 8	15 ⌀ 8
Tension bars V3	-	-	10 ⌀ 8	12 ⌀ 8	14 ⌀ 8	7 ⌀ 12
Tension bars VV1	-	-	-	14 ⌀ 8	15 ⌀ 8	8 ⌀ 12
Shear force bars V1	4 ⌀ 6	4 ⌀ 6	5 ⌀ 6	5 ⌀ 6	5 ⌀ 6	5 ⌀ 6
Shear force bars V2	4 ⌀ 8	4 ⌀ 8	5 ⌀ 8	5 ⌀ 8	5 ⌀ 8	5 ⌀ 8
Shear force bars V3	-	-	8 ⌀ 8	8 ⌀ 8	8 ⌀ 8	8 ⌀ 8
Shear force bars VV1	-	-	-	4 ⌀ 8 + 4 ⌀ 8	4 ⌀ 8 + 4 ⌀ 8	4 ⌀ 8 + 4 ⌀ 8
Pressure bearing V1/V2 [piece]	4	6	7	8	7	8
Pressure bearing V3 [piece]	-	-	8	8	8	10
Pressure bearing VV1 [piece]	-	-	-	11	12	13
Special stirrup VV1 [Stk.]	-	-	-	-	-	4

Notes on design

- Static system and information on the design see page 31.
- Schöck Isokorb® T type K for balconies with height offset, for design internal forces see page 66.

Design C25/30

Schöck Isokorb® T type K 6.2				M7	M8	M9	M10	M11	M11
Design values with	Concrete cover CV [mm]			Concrete strength class ≥ C25/30					≥ C30/37
	CV30	CV35	CV50	$m_{Rd,y}$ [kNm/m]					
Isokorb® height H [mm]		160		-32.5	-36.4	-40.4	-46.4	-46.4	-50.2
	160		180	-34.5	-38.7	-43.0	-49.2	-49.2	-53.3
		170		-36.7	-41.1	-45.6	-52.1	-52.1	-56.4
	170		190	-38.7	-43.4	-48.1	-55.0	-55.0	-59.4
		180		-40.9	-45.8	-50.8	-57.8	-57.8	-62.5
	180		200	-42.9	-48.1	-53.3	-60.7	-60.7	-65.6
		190		-45.1	-50.6	-56.0	-63.5	-63.5	-68.7
	190		210	-47.2	-52.9	-58.6	-66.4	-66.4	-71.8
		200		-49.4	-55.3	-61.3	-69.3	-69.3	-74.9
	200		220	-51.5	-57.7	-63.9	-72.1	-72.1	-78.0
		210		-53.7	-60.1	-66.6	-75.0	-75.0	-81.1
	210		230	-55.8	-62.5	-69.2	-77.9	-77.9	-84.2
		220		-58.0	-65.0	-71.8	-80.7	-80.7	-87.3
	220		240	-60.1	-67.4	-74.3	-83.6	-83.6	-90.4
		230		-62.4	-69.9	-76.8	-86.4	-86.4	-96.5
	230		250	-64.5	-72.3	-79.4	-89.3	-89.3	-96.6
		240		-66.8	-74.7	-81.9	-92.2	-92.2	-99.7
	240			-68.9	-77.1	-84.5	-95.0	-95.0	-102.8
		250		-71.2	-79.4	-87.0	-97.9	-97.9	-105.9
	250			-73.4	-81.7	-89.6	-100.7	-100.7	-109.0
				$v_{Rd,z}$ [kN/m]					
Secondary load-bearing level		V1		92.7	108.2	108.2	123.6	139.1	139.1
		V2		123.6	123.6	123.6	139.1	-	-
		VV1		108.2/–61.8	108.2/–61.8	108.2/–61.8	123.6/–61.8	123.6/–61.8	123.6/–61.8

Schöck Isokorb® T type K 6.2	M7	M8	M9	M10	M11	M11
Placement with	Isokorb® length [mm]					
	1000	1000	1000	1000	1000	1000
Tension bars V1/V2	8 ⌀ 12	9 ⌀ 12	10 ⌀ 12	12 ⌀ 12	13 ⌀ 12	13 ⌀ 12
Tension bars VV1	9 ⌀ 12	10 ⌀ 12	11 ⌀ 12	12 ⌀ 12	13 ⌀ 12	13 ⌀ 12
Shear force bars V1	6 ⌀ 8	7 ⌀ 8	7 ⌀ 8	8 ⌀ 8	9 ⌀ 8	9 ⌀ 8
Shear force bars V2	8 ⌀ 8	8 ⌀ 8	8 ⌀ 8	9 ⌀ 8	-	-
Shear force bars VV1	7 ⌀ 8 + 4 ⌀ 8	7 ⌀ 8 + 4 ⌀ 8	7 ⌀ 8 + 4 ⌀ 8	8 ⌀ 8 + 4 ⌀ 8	8 ⌀ 8 + 4 ⌀ 8	8 ⌀ 8 + 4 ⌀ 8
Pressure bearing V1/V2 [piece]	11	12	16	18	18	18
Pressure bearing VV1 [piece]	16	17	16	18	18	18
Special stirrup [piece]	4	4	4	4	4	4

Notes on design

- Static system and information on the design see page 31.
- Schöck Isokorb® T type K for balconies with height offset, for design internal forces see page 66.
- The indicative minimum concrete strength class of the external structural component is C32/40.
- 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®.
- Note FEM guidelines if a FEM program is to be used for design.

Design C25/30

Schöck Isokorb® T type K-M12 to M14 is only available in the length L = 500 mm

Schöck Isokorb® T type K 6.1				M12	M13	M14
Design values with	Concrete cover CV [mm]			Concrete strength class ≥ C25/30		
	CV30	CV35	CV50	$M_{Rd,y}$ [kNm/element]		
Isokorb® height H [mm]		180		-29.9	-43.3	-50.5
	180		200	-31.7	-45.4	-53.0
		190		-33.5	-47.6	-55.5
	190		210	-35.3	-49.7	-58.0
		200		-37.1	-51.9	-60.6
	200		220	-38.9	-54.1	-63.1
		210		-40.7	-56.2	-65.6
	210		230	-42.5	-58.4	-68.1
		220		-44.3	-60.6	-70.7
	220		240	-46.1	-62.7	-73.2
		230		-47.9	-64.9	-75.7
	230		250	-49.7	-67.1	-78.2
		240		-51.6	-69.2	-80.8
	240			-53.4	-71.4	-83.3
		250		-55.2	-73.5	-85.8
	250			-57.0	-75.7	-88.3
				$V_{Rd,z}$ [kN/element]		
Secondary load-bearing level		V1		72.4	72.4	72.4
		V2		104.3	104.3	104.3
		V3		142.0	142.0	142.0

Schöck Isokorb® T type K 6.1	M12	M13	M14
Placement with	Isokorb® length [mm]		
	500	500	500
Tension bars	6 ⌀ 14	7 ⌀ 14	8 ⌀ 14
Compression bars	-	6 ⌀ 16	7 ⌀ 16
Shear force bars V1	3 ⌀ 10	3 ⌀ 10	3 ⌀ 10
Shear force bars V2	3 ⌀ 12	3 ⌀ 12	3 ⌀ 12
Shear force bars V3	3 ⌀ 14	3 ⌀ 14	3 ⌀ 14
Pressure bearing	5 ⌀ 16	-	-
H_{min} for V1-CV30/35 [mm]	180	180	180
H_{min} for V2-CV30/35 [mm]	190	190	190
H_{min} for V3-CV30 / V1-CV50 [mm]	200	200	200
H_{min} for V3-CV35 / V2-CV50 [mm]	210	210	210
H_{min} for V3-CV50 [mm]	220	220	220

Notes on design

- Static system and information on the design see page 31.
- The Schöck Isokorb® T type K-M12 and M13 Generation 6.0 with length L1000 has been replaced by the Schöck Isokorb® T type K-M12 to M14 Generation 6.1 with length L500.
- The indicative minimum concrete strength class of the external structural component is C32/40.
- 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®.
- Note FEM guidelines if a FEM program is to be used for design.

Deflection/Camber

Deformation

The deformation factors given in the table (tan α [%]) result solely from the deformation of the Schöck Isokorb® in the serviceability limit state. They are used to estimate the required camber. The total arithmetic camber of the balcony slab formwork is calculated as specified in BS EN 1992-1-1 (EC2) and BS EN 1992-1-1/NA and from the deflection from Schöck Isokorb®. The camber of the balcony slab formwork specified by the structural engineer/designer in the working drawings (Basis: calculated total deflection obtained from cantilever slab + floor rotation angle + Schöck Isokorb®) should be such that the planned drainage direction is complied with (round up: when drainage is towards the façade, round down: when drainage is towards the cantilever slab end).

Deformation ($w_ü$) as result of Schöck Isokorb®

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

Factors to be incorporated:

$\tan \alpha$ =insert table value

l_k = cantilever length [m]

$m_{üd}$ = decisive bending moment [kNm/m] in ultimate limit state for determining the deformation $w_ü$ [mm] caused by the Schöck Isokorb®.
The structural engineer specifies the load combination to be used when calculating the deformation.
(Recommendation: Determine the load combination required to determine the camber $w_ü$: g+q/2, $m_{üd}$in the ultimate limit state)

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

10 = conversion factor for units

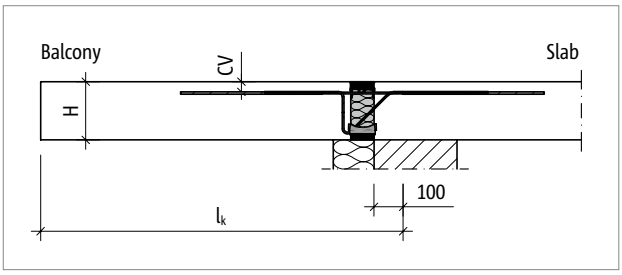


Fig. 35: Schöck Isokorb® T type K-M1 to M11: Static system

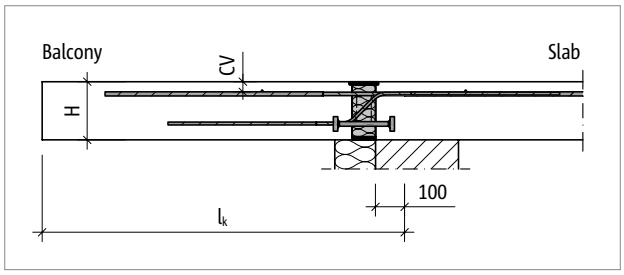


Fig. 36: Schöck Isokorb® T type K-M12: Static system

Deflection/Camber

Schöck Isokorb® T type K 6.2		M1–M5, M6-V1/V2			M6-V3/VV1, M7–M11		
Deflection factors when		CV30	CV35	CV50	CV30	CV35	CV50
		tan α [%]					
Isokorb® height H [mm]	160	0.9	0.9	-	1.2	1.2	-
	170	0.8	0.8	-	1.0	1.0	-
	180	0.8	0.8	0.9	0.9	0.9	1.1
	190	0.7	0.7	0.8	0.9	0.9	1.0
	200	0.6	0.6	0.7	0.8	0.8	0.9
	210	0.6	0.6	0.7	0.7	0.7	0.8
	220	0.6	0.6	0.6	0.7	0.7	0.8
	230	0.5	0.5	0.6	0.6	0.6	0.7
	240	0.5	0.5	0.5	0.6	0.6	0.7
	250	0.5	0.5	0.5	0.6	0.6	0.6

Schöck Isokorb® T type K 6.1		M12			M13–M14		
Deflection factors when		CV30	CV35	CV50	CV30	CV35	CV50
		tan α [%]					
Isokorb® height H [mm]	180	1.2	1.3	-	1.5	1.6	-
	190	1.1	1.2	-	1.4	1.4	-
	200	1.0	1.0	1.2	1.3	1.3	1.5
	210	0.9	1.0	1.1	1.2	1.2	1.4
	220	0.8	0.9	1.0	1.1	1.1	1.3
	230	0.8	0.8	0.9	1.0	1.1	1.2
	240	0.7	0.8	0.8	1.0	1.0	1.1
	250	0.7	0.7	0.8	0.9	0.9	1.0

Vibration

Vibration

Vibrations can be induced in accessible and freely cantilevered balconies during use by “slow walking” and “slow jumping”. In accordance with BS 8579 - Guide to the design of balconies and terraces, a minimum vertical natural frequency of 5 Hz should be adopted for the design of balconies. To comply with this value, the recommended maximum cantilever lengths in the serviceability limit state are shown below, taking into account the product-specific properties of the Schöck Isokorb® and the specified loads.

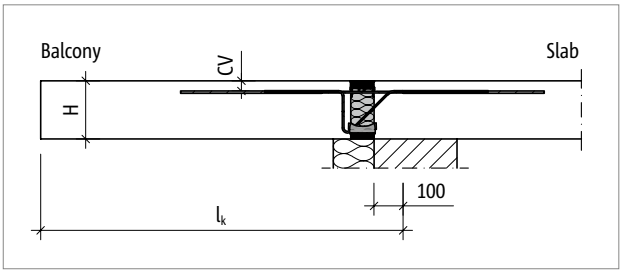


Fig. 37: Schöck Isokorb® T type K-M1 to M11: Static system

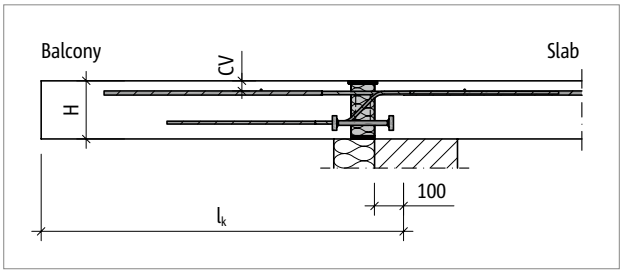


Fig. 38: Schöck Isokorb® T type K-M12: Static system

Vibration

Schöck Isokorb® T type K 6.2				M1	M2	M3	M4	M5	M6
				V1/V2	V1/V2	V1/V2/V3	V1/V2/V3	V1/V2/V3	V1/V2/V3
Maximum cantilever length with	Concrete cover CV [mm]			Concrete strength class ≥ C25/30					
	CV30	CV35	CV50	$l_{k,max}$ [m]					
Isokorb® height H [mm]		160		1.25	1.53	1.64	1.73	1.76	1.80
			180	1.27	1.55	1.66	1.75	1.79	1.83
	160			1.29	1.59	1.70	1.79	1.82	1.87
		170		1.32	1.62	1.73	1.83	1.87	1.91
			190	1.34	1.64	1.75	1.85	1.89	1.94
	170			1.36	1.67	1.79	1.89	1.93	1.98
		180		1.39	1.71	1.82	1.93	1.97	2.02
			200	1.40	1.72	1.84	1.94	1.99	2.04
	180			1.43	1.75	1.88	1.98	2.03	2.08
		190		1.45	1.78	1.91	2.02	2.07	2.12
			210	1.46	1.80	1.92	2.03	2.09	2.14
	190			1.49	1.83	1.96	2.07	2.13	2.18
		200		1.51	1.86	1.99	2.10	2.16	2.22
			220	1.52	1.87	2.00	2.11	2.18	2.23
	200			1.55	1.90	2.04	2.15	2.22	2.27
		210		1.57	1.93	2.07	2.18	2.25	2.31
			230	1.58	1.94	2.07	2.19	2.26	2.32
	210			1.60	1.97	2.11	2.23	2.30	2.36
		220		1.62	2.00	2.14	2.26	2.34	2.39
			240	1.63	2.01	2.15	2.27	2.34	2.40
	220			1.66	2.04	2.18	2.31	2.39	2.45
		230		1.68	2.06	2.21	2.34	2.42	2.47
			250	1.68	2.07	2.21	2.34	2.42	2.48
	230			1.71	2.11	2.25	2.38	2.47	2.53
		240		1.73	2.13	2.28	2.41	2.49	2.55
	240			1.76	2.17	2.32	2.45	2.54	2.60
		250		1.78	2.19	2.34	2.48	2.57	2.63
	250			1.81	2.23	2.38	2.52	2.61	2.68

Maximum cantilever length

The tabular values are based on the following assumptions:

- Accessible rectangular cantilevered balcony
- Concrete weight density $\gamma = 25$ kN/m³
- Dead weight of the balcony covering $g_2 \leq 1.5$ kN/m², balcony railing $g_R \leq 1.0$ kN/m
- Service load $q = 4.0$ kN/m² with the coefficient $\psi_{2,i} = 0.3$ for the quasi-permanent combination
- The stiffnesses in the area where the load-bearing structure (inner slab/wall) is supported are assumed to be infinite.
- The maximum cantilever length when using the Schöck Isokorb® can be limited by the load-bearing capacity of the selected type.
- For the cantilever length l_k and static system see page 37.

Vibration

Schöck Isokorb® T type K 6.2				M7	M8	M9	M10	M11
				V1/V2	V1/V2	V1/V2	V1/V2	V1
Maximum cantilever length with	Concrete cover CV [mm]			Concrete strength class ≥ C25/30				
	CV30	CV35	CV50	$l_{k,max}$ [m]				
Isokorb® height H [mm]		160		1.80	1.86	1.93	2.05	2.09
			180	1.83	1.89	1.97	2.08	2.13
	160			1.86	1.93	2.01	2.13	2.18
		170		1.91	1.98	2.06	2.18	2.23
			190	1.94	2.01	2.09	2.21	2.26
	170			1.98	2.05	2.13	2.25	2.31
		180		2.02	2.10	2.18	2.30	2.36
			200	2.04	2.12	2.20	2.33	2.38
	180			2.08	2.16	2.24	2.38	2.43
		190		2.12	2.20	2.29	2.42	2.48
			210	2.14	2.22	2.31	2.44	2.50
	190			2.18	2.26	2.35	2.49	2.55
		200		2.22	2.30	2.39	2.53	2.59
			220	2.23	2.32	2.41	2.55	2.61
	200			2.28	2.36	2.45	2.60	2.66
		210		2.31	2.40	2.49	2.64	2.70
			230	2.32	2.41	2.50	2.65	2.72
	210			2.37	2.46	2.55	2.70	2.77
		220		2.40	2.49	2.59	2.74	2.80
			240	2.41	2.50	2.60	2.75	2.82
	220			2.45	2.55	2.64	2.80	2.87
		230		2.48	2.58	2.68	2.84	2.90
			250	2.49	2.59	2.69	2.84	2.91
	230			2.54	2.63	2.73	2.90	2.96
		240		2.56	2.66	2.76	2.93	3.00
	240			2.62	2.71	2.82	2.99	3.06
		250		2.64	2.74	2.85	3.02	3.09
	250			2.69	2.79	2.90	3.07	3.15

Maximum cantilever length

The tabular values are based on the following assumptions:

- Accessible rectangular cantilevered balcony
- Concrete weight density $\gamma = 25$ kN/m³
- Dead weight of the balcony covering $g_2 \leq 1.5$ kN/m², balcony railing $g_R \leq 1.0$ kN/m
- Service load $q = 4.0$ kN/m² with the coefficient $\psi_{2,i} = 0.3$ for the quasi-permanent combination
- The stiffnesses in the area where the load-bearing structure (inner slab/wall) is supported are assumed to be infinite.
- The maximum cantilever length when using the Schöck Isokorb® can be limited by the load-bearing capacity of the selected type.
- For the cantilever length l_k and static system see page 37.

Vibration

Schöck Isokorb® T type K 6.2				M4	M5	M6	M7	M8	M9	M10	M11
				VV1	VV1	VV1	VV1	VV1	VV1	VV1	VV1
Maximum cantilever length with	Concrete cover CV [mm]			Concrete strength class ≥ C25/30							
	CV30	CV35	CV50	$l_{k,max}$ [m]							
Isokorb® height H [mm]		160		1.78	1.82	1.80	1.87	1.94	2.00	2.05	2.09
			180	1.81	1.85	1.83	1.91	1.97	2.03	2.08	2.13
	160			1.85	1.89	1.87	1.95	2.01	2.08	2.13	2.18
		170		1.89	1.94	1.92	2.00	2.06	2.13	2.18	2.23
			190	1.92	1.96	1.94	2.02	2.09	2.16	2.21	2.26
	170			1.96	2.00	1.99	2.06	2.13	2.20	2.25	2.31
		180		2.00	2.04	2.03	2.11	2.18	2.25	2.30	2.36
			200	2.02	2.07	2.05	2.13	2.20	2.28	2.33	2.38
	180			2.06	2.11	2.09	2.18	2.25	2.32	2.38	2.43
		190		2.10	2.15	2.13	2.22	2.29	2.37	2.42	2.48
			210	2.12	2.16	2.15	2.24	2.31	2.39	2.44	2.50
	190			2.16	2.21	2.19	2.28	2.36	2.43	2.49	2.55
		200		2.19	2.24	2.23	2.32	2.40	2.48	2.53	2.59
			220	2.21	2.26	2.24	2.33	2.41	2.49	2.55	2.61
	200			2.25	2.30	2.29	2.38	2.46	2.54	2.60	2.66
		210		2.28	2.33	2.32	2.42	2.49	2.58	2.64	2.70
			230	2.29	2.35	2.33	2.43	2.51	2.59	2.65	2.72
	210			2.34	2.39	2.38	2.47	2.56	2.64	2.70	2.77
		220		2.37	2.42	2.41	2.51	2.59	2.68	2.74	2.80
			240	2.38	2.43	2.42	2.52	2.60	2.69	2.75	2.82
	220			2.42	2.47	2.46	2.56	2.65	2.74	2.80	2.87
		230		2.45	2.50	2.49	2.60	2.68	2.77	2.84	2.90
			250	2.46	2.51	2.50	2.60	2.69	2.78	2.84	2.91
	230			2.50	2.56	2.55	2.65	2.74	2.83	2.90	2.96
		240		2.53	2.58	2.58	2.68	2.77	2.86	2.93	3.00
	240			2.58	2.63	2.63	2.73	2.82	2.92	2.99	3.06
		250		2.60	2.66	2.65	2.76	2.85	2.95	3.02	3.09
	250			2.65	2.71	2.70	2.81	2.91	3.00	3.07	3.15

Maximum cantilever length

The tabular values are based on the following assumptions:

- Accessible rectangular cantilevered balcony
- Concrete weight density $\gamma = 25$ kN/m³
- Dead weight of the balcony covering $g_2 \leq 1.5$ kN/m², balcony railing $g_R \leq 1.0$ kN/m
- Service load $q = 4.0$ kN/m² with the coefficient $\psi_{2,i} = 0.3$ for the quasi-permanent combination
- The stiffnesses in the area where the load-bearing structure (inner slab/wall) is supported are assumed to be infinite.
- The maximum cantilever length when using the Schöck Isokorb® can be limited by the load-bearing capacity of the selected type.
- For the cantilever length l_k and static system see page 37.

Vibration

Schöck Isokorb® T type K 6.1				M12	M13	M14
Maximum cantilever length with	Concrete cover CV [mm]			Concrete strength class ≥ C25/30		
	CV30	CV35	CV50	$l_{k,max}$ [m]		
Isokorb® height H [mm]		180		2.06	2.17	2.27
			200	2.10	2.20	2.29
	180			2.14	2.24	2.34
		190		2.19	2.28	2.39
			210	2.22	2.30	2.41
	190			2.27	2.35	2.45
		200		2.32	2.39	2.50
			220	2.34	2.41	2.51
	200			2.39	2.45	2.56
		210		2.43	2.49	2.60
			230	2.46	2.50	2.62
	210			2.50	2.55	2.66
		220		2.54	2.59	2.70
			240	2.56	2.60	2.71
	220			2.61	2.64	2.76
		230		2.65	2.68	2.80
			250	2.67	2.69	2.81
	230			2.71	2.73	2.86
		240		2.75	2.77	2.89
	240			2.81	2.82	2.95
		250		2.85	2.85	2.98
	250			2.91	2.90	3.03

Maximum cantilever length

The tabular values are based on the following assumptions:

- Accessible rectangular cantilevered balcony
- Concrete weight density $\gamma = 25$ kN/m³
- Dead weight of the balcony covering $g_2 \leq 1.5$ kN/m², balcony railing $g_R \leq 1.0$ kN/m
- Service load $q = 4.0$ kN/m² with the coefficient $\psi_{2,i} = 0.3$ for the quasi-permanent combination
- The stiffnesses in the area where the load-bearing structure (inner slab/wall) is supported are assumed to be infinite.
- The maximum cantilever length when using the Schöck Isokorb® can be limited by the load-bearing capacity of the selected type.
- For the cantilever length l_k and static system see page 37.

Expansion joint spacing

Maximum expansion joint spacing

If the structural element length exceeds the maximum expansion joint spacing e, then expansion joints must be incorporated into the external concrete components at right angles to the insulating layer in order to limit the effect as a result of temperature changes. The maximum expansion joint spacing e/2 applies to fixed points such as balcony corners or to the use of the Schöck Isokorb® T type H.

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

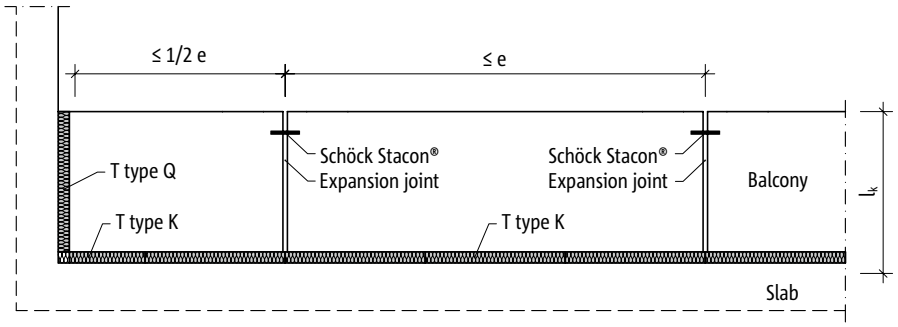


Fig. 39: Schöck Isokorb® T type K: Expansion joint layout

Schöck Isokorb® T type K 6.2		M1–M6-V1/V2	M6-V3 – M11
Maximum expansion joint spacing when		e [m]	
Insulating element thickness [mm]	80	13.0	13.5

Schöck Isokorb® T type K 6.1		M12-V1/V2 – M14-V1/V2	M12-V3 – M14-V3
Maximum expansion joint spacing when		e [m]	
Insulating element thickness [mm]	80	9.2	8.3

Edge distances

The Schöck Isokorb® must be positioned at the expansion joint in a way 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 elements from the free edge or 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 joints the following applies: $e_R \geq 100$ mm and $e_R \leq 150$ mm.

Product description

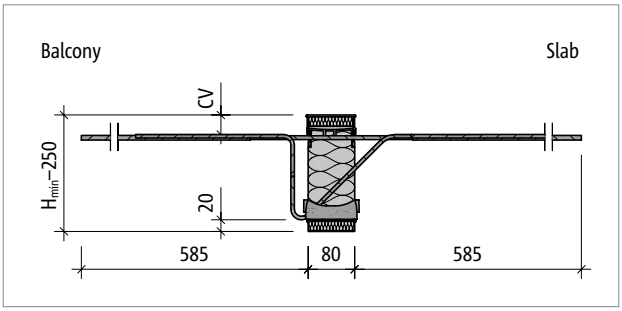


Fig. 40: Schöck Isokorb® T type K-M1 to M4: Product section

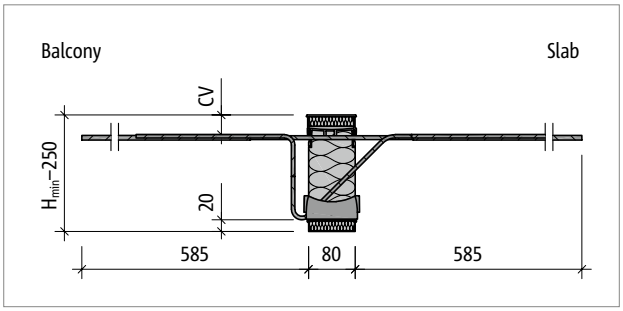


Fig. 41: Schöck Isokorb® T type K-M5 and K-M6: Product section

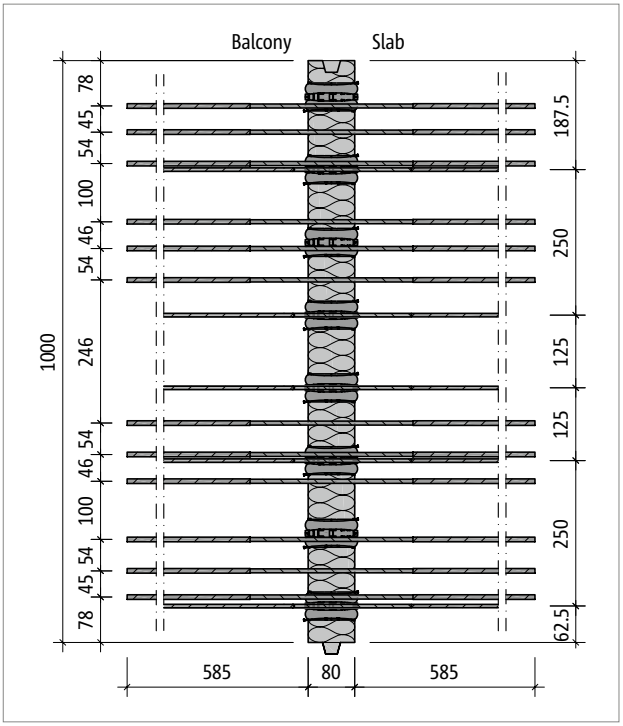


Fig. 42: Schöck Isokorb® T type K-M4-V1: Product layout

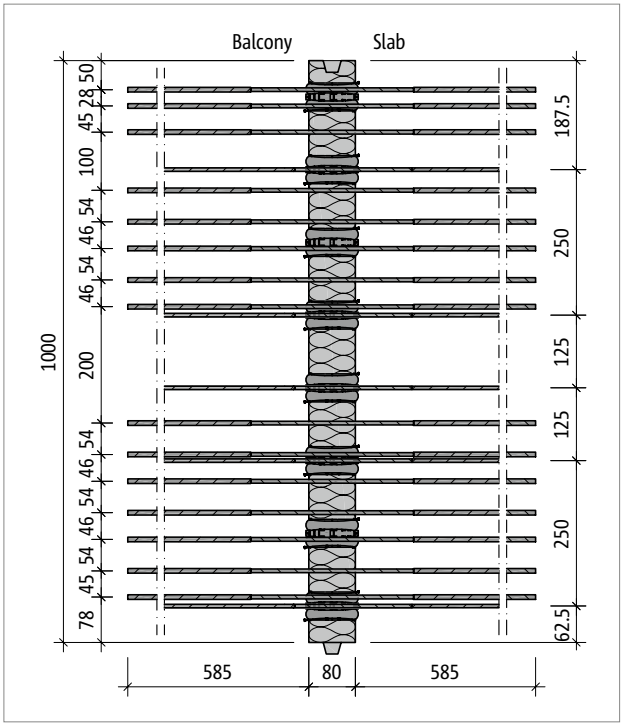


Fig. 43: Schöck Isokorb® T type K-M6-V1: Product layout

Product information

- Download further product plan views and cross-sections at https://cad.schoeck.co.uk
- Minimum height Schöck Isokorb® T type K with CV50: H_{min} = 180 mm
- On-site spacing of the Schöck Isokorb® T type K on the unreinforced positions possible; take into account the load-bearing capacity reduced due to the spacing; take into account required edge distances
- Concrete cover of the tension bars: CV30 = 30 mm, CV35 = 35 mm, CV50 = 50 mm
- Schöck Isokorb® T type K-M6-V3/VV1: Tension bar length L= 725 mm

Product description

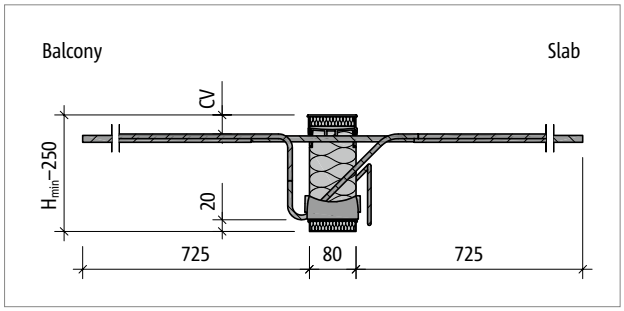


Fig. 44: Schöck Isokorb® T type K-M7 to M11: Product section

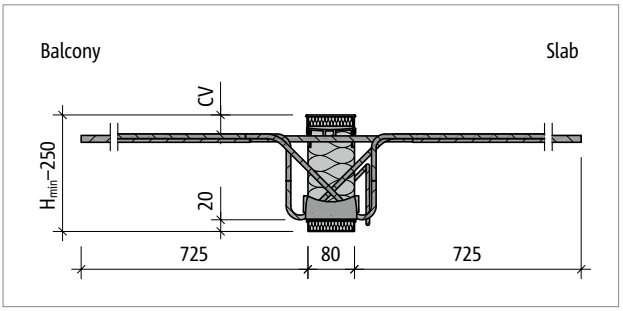


Fig. 45: Schöck Isokorb® T type K-M6-VV1: Product section

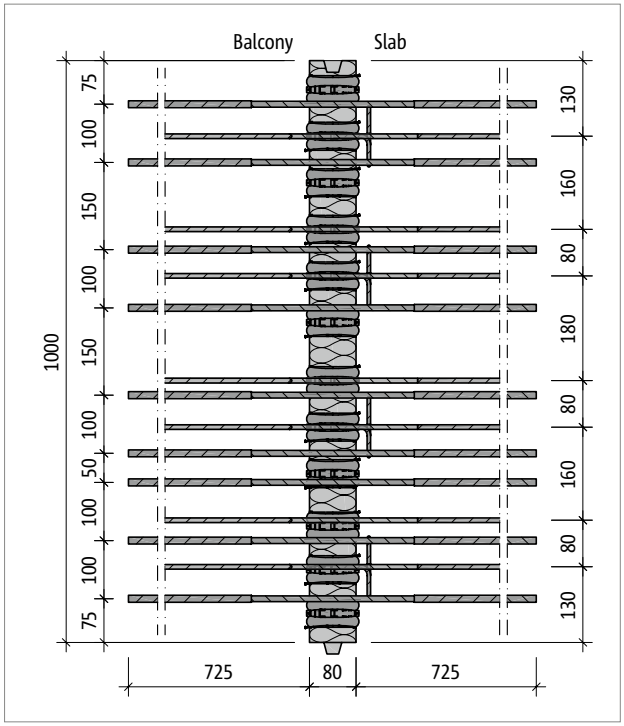


Fig. 46: Schöck Isokorb® T type K-M8-V1: Product layout

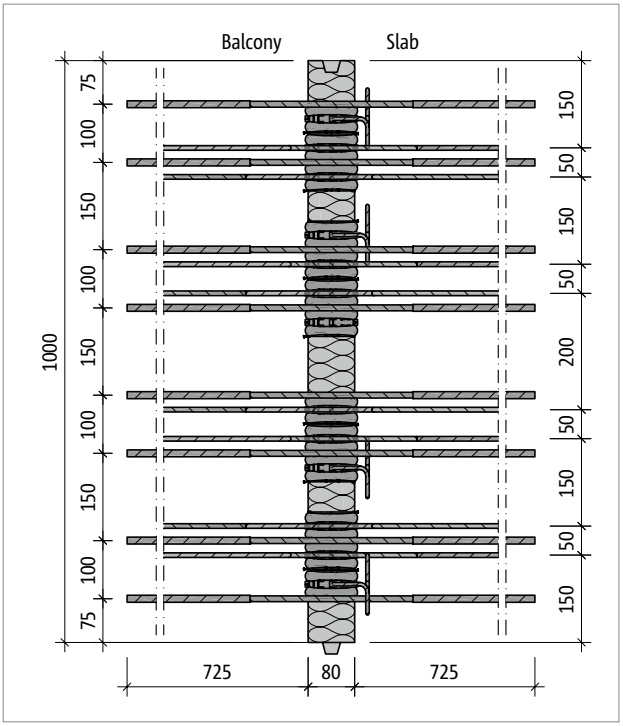


Fig. 47: Schöck Isokorb® T type K-M6-VV1: Product layout

Product information

- Download further product plan views and cross-sections at https://cad.schoeck.co.uk
- Minimum height Schöck Isokorb® T type K with CV50: H_{min} = 180 mm
- On-site spacing of the Schöck Isokorb® T type K on the unreinforced positions possible; take into account the load-bearing capacity reduced due to the spacing; take into account required edge distances
- Concrete cover of the tension bars: CV30 = 30 mm, CV35 = 35 mm, CV50 = 50 mm

Product description

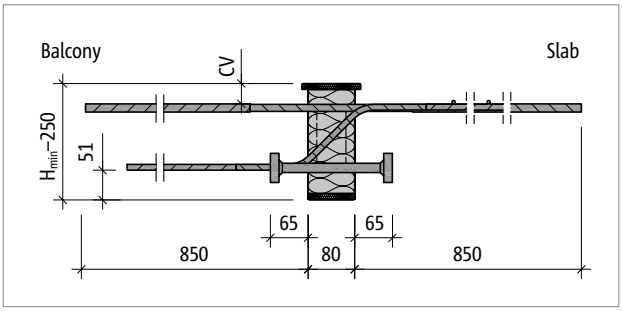


Fig. 48: Schöck Isokorb® T type K-M12: Product section

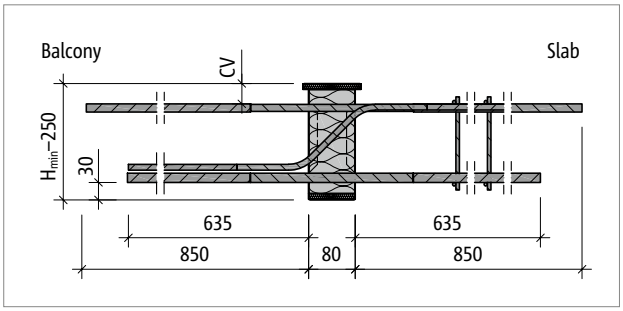


Fig. 49: Schöck Isokorb® T type K-M13 to M14: Product section

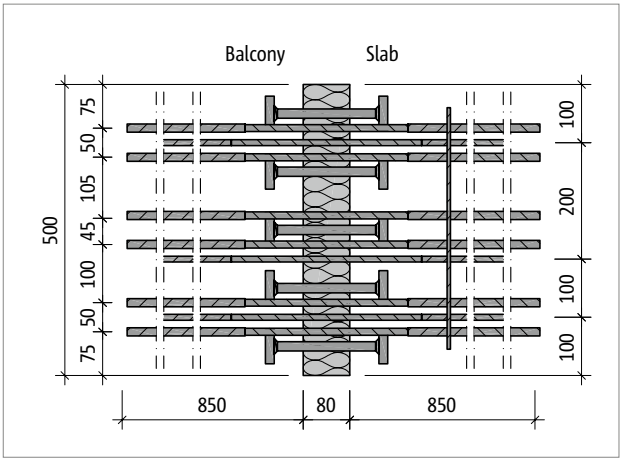


Fig. 50: Schöck Isokorb® T type K-M12-V1: Product layout

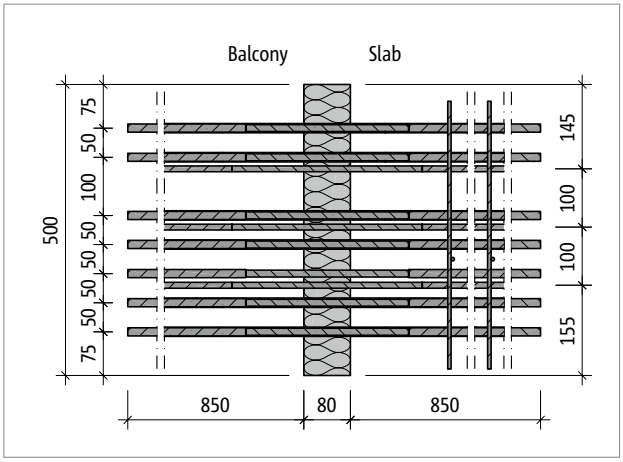


Fig. 51: Schöck Isokorb® T type K-M13-V1: Product layout

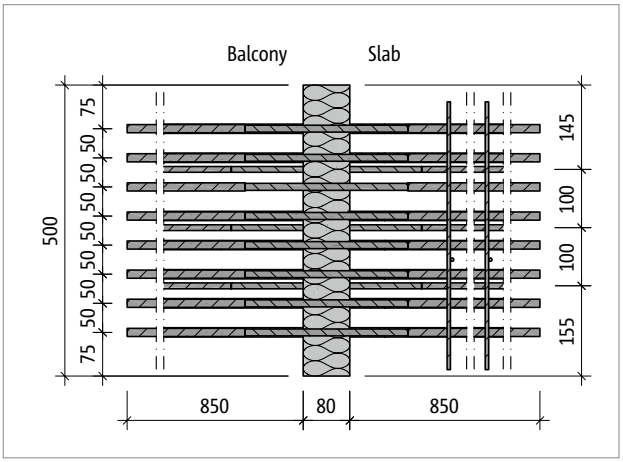


Fig. 52: Schöck Isokorb® T type K-M14-V1: Product layout

Product information

- Download further product plan views and cross-sections at https://cad.schoeck.co.uk
- Minimum height H_{min} Schöck Isokorb® T type K-M12 to T type K-M14 see page 34
- On-site spacing of the Schöck Isokorb® T type K on the unreinforced positions possible; take into account the load-bearing capacity reduced due to the spacing; take into account required edge distances
- Concrete cover of the tension bars: CV30 = 30 mm, CV35 = 35 mm, CV50 = 50 mm

On-site reinforcement

Direct support

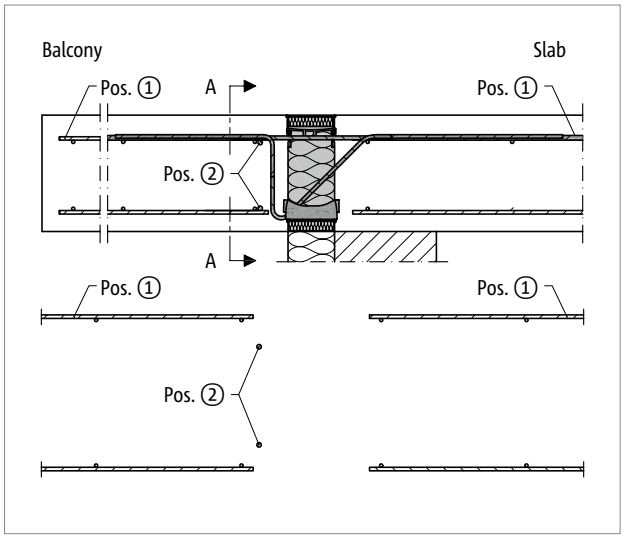


Fig. 53: Schöck Isokorb® T type K-M1 to M11: On-site reinfircement with direct support

Indirect support

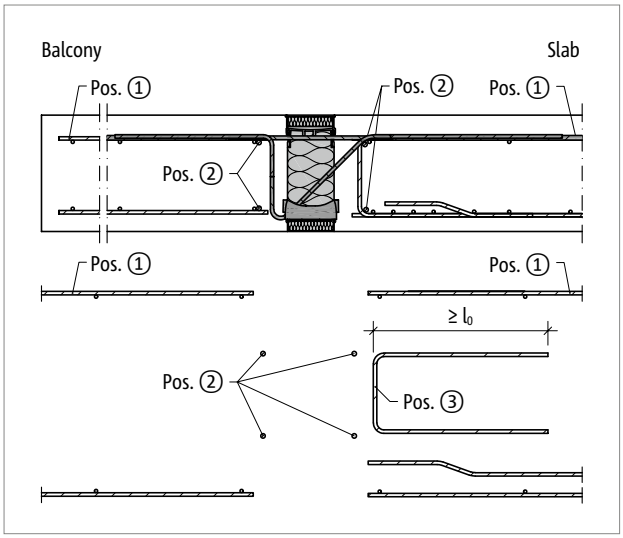


Fig. 54: Schöck Isokorb® T type K-M1 to M11: On-site reinforcement with indirect support

Direct and indirect support

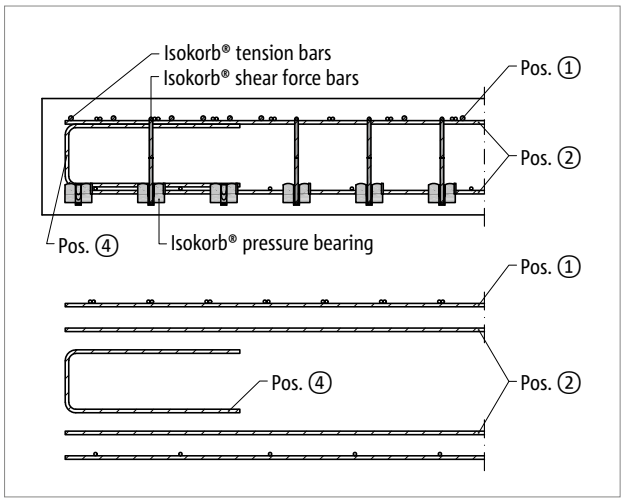


Fig. 55: Schöck Isokorb® T type K-M1 to M11: On-site reinforcement on the balcony side in the Section A-A; Pos.4 = side reinforcement on the free edge perpendicular to the Schöck Isokorb®

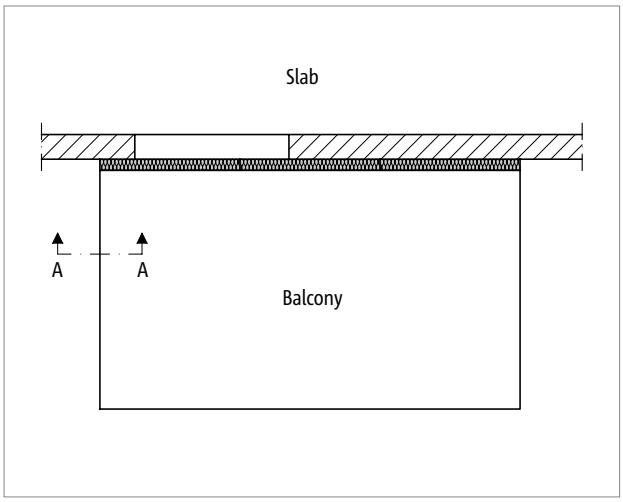


Fig. 56: Schöck Isokorb® T type K: Diagram of the position of Section A-A

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® T type K 6.2			M1		M2		M3			M4			
			V1	V2	V1	V2	V1	V2	V3	V1	V2	V3	VV1
On-site reinforcement	Type of bearing	Height [mm]	Concrete strength class ≥ C25/30										
Overlap reinforcement depending on bar diameter													
Pos. 1 with H8 [mm²/m]	direct/ indirect	160–250	242	215	443	416	578	544	564	655	622	622	704
Pos. 1 with H10 [mm²/m]			271	252	476	457	619	596	641	698	675	699	717
Pos. 1 with H12 [mm²/m]			325	302	571	548	743	715	769	838	810	839	861
Steel bars along the insulation joint													
Pos. 2	direct	160–250	2 • H8										
	indirect		4 • H8										
Vertical reinforcement													
Pos. 3 [mm²/m]	indirect	160–250	113	113	113	113	113	113	113	113	113	113	–
Supplementary edge reinforcement													
Pos. 4	direct/ indirect	160–250	according to BS EN 1992-1-1 (EC2), 9.3.1.4										

Schöck Isokorb® T type K 6.2			M5				M6				M7		
			V1	V2	V3	VV1	V1	V2	V3	VV1	V1	V2	VV1
On-site reinforcement	Type of bearing	Height [mm]	Concrete strength class ≥ C25/30										
Overlap reinforcement depending on bar diameter													
Pos. 1 with H8 [mm²/m]	direct/ indirect	160–250	757	724	775	754	861	827	844	880	959	959	990
Pos. 1 with H10 [mm²/m]			802	779	856	768	908	884	915	880	1013	1030	990
Pos. 1 with H12 [mm²/m]			963	934	1027	922	1089	1061	986	880	1066	1102	990
Steel bars along the insulation joint													
Pos. 2	direct	160–250	2 • H8										
	indirect		4 • H8										
Vertical reinforcement													
Pos. 3 [mm²/m]	indirect	160–250	113	113	120	–	125	125	130	–	113	113	–
Supplementary edge reinforcement													
Pos. 4	direct/ indirect	160–250	according to BS EN 1992-1-1 (EC2), 9.3.1.4										

On-site reinforcement

Schöck Isokorb® T type K 6.2			M8			M9		
			V1	V2	VV1	V1	V2	VV1
On-site reinforcement	Type of bearing	Height [mm]	Concrete strength class ≥ C25/30					
Overlap reinforcement depending on bar diameter								
Pos. 1 with H10 [mm²/m]	direct/ indirect	160–250	1130	1139	1100	1232	1241	1170
Pos. 1 with H12 [mm²/m]			1192	1210	1100	1295	1312	1170
Steel bars along the insulation joint								
Pos. 2	direct	160–250	2 • H8					
	indirect		4 • H8					
Vertical reinforcement								
Pos. 3 [mm²/m]	indirect	160–250	113	113	–	113	113	–
Supplementary edge reinforcement								
Pos. 4	direct/ indirect	160–250	according to BS EN 1992-1-1 (EC2), 9.3.1.4					

Schöck Isokorb® T type K 6.2			M10			M11	
			V1	V2	VV1	V1	VV1
On-site reinforcement	Type of bearing	Height [mm]	Concrete strength class ≥ C25/30				
Overlap reinforcement depending on bar diameter							
Pos. 1 with H10 [mm²/m]	direct/ indirect	160–250	1388	1396	1317	1504	1424
Pos. 1 with H12 [mm²/m]			1459	1476	1317	1584	1424
Steel bars along the insulation joint							
Pos. 2	direct	160–250	2 • H8				
	indirect		4 • H8				
Vertical reinforcement							
Pos. 3 [mm²/m]	indirect	160–250	113	113	–	113	–
Supplementary edge reinforcement							
Pos. 4	direct/ indirect	160–250	according to BS EN 1992-1-1 (EC2), 9.3.1.4				

Information about on-site reinforcement

- Alternative reinforcements are possible. Determine lap length according to BS EN 1992-1-1 (EC2) and BS EN 1992-1-1/NA.A reduction of the required lap length using m_{Ed}/m_{Rd} is permitted.For overlapping (l_0) with the Schöck Isokorb®, with T types K-M1 to K-M6-V2 a length of the tension bars of 545 mm and with T types K-M6-V3 to K-M11 a length of the tension bars of 675 mm can be input in the calculation.
- When reinforcing with different diameters the reinforcement specification for the largest diameter is relevant.
- The mixing of steel bar and wire mesh reinforcement is possible. The corresponding mesh reinforcement can be taken into account when determining the additional reinforcement.
- The reinforcement at the free edges Pos. 4 of the structural component perpendicular to the Schöck Isokorb® should be selected as low as possible so that it can be arranged between the upper and lower reinforcement layer.
- The indicative minimum concrete strength class of the external structural component is C32/40.

Information on side reinforcement

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

On-site reinforcement

Direct support

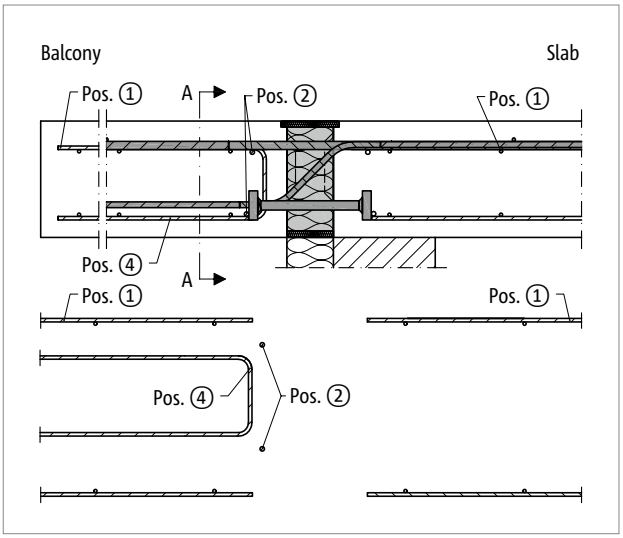


Fig. 57: Schöck Isokorb® T type K-M12: On-site reinforcement with direct support

Indirect support

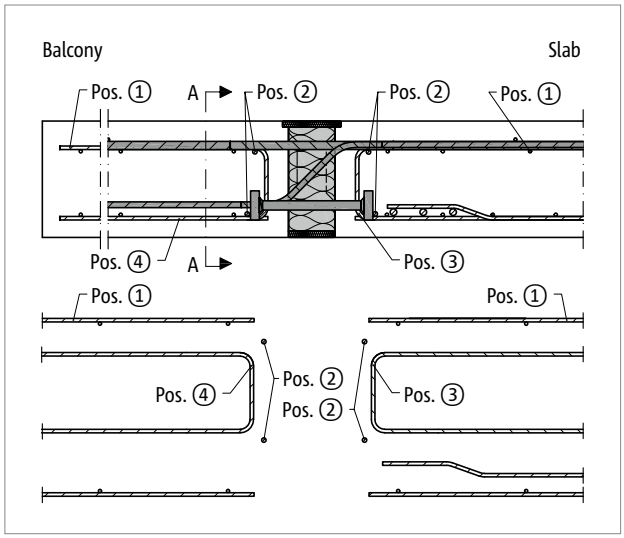


Fig. 58: Schöck Isokorb® T type K-M12: On-site reinforcement with indirect support

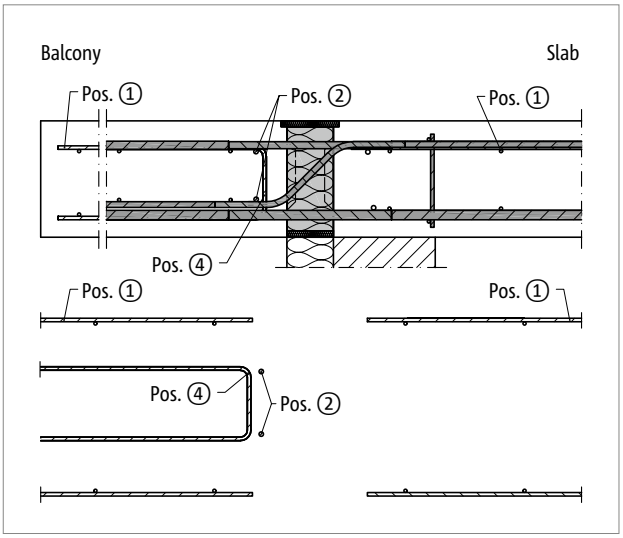


Fig. 59: Schöck Isokorb® T type K-M13 to M14: On-site reinforcement for direct support

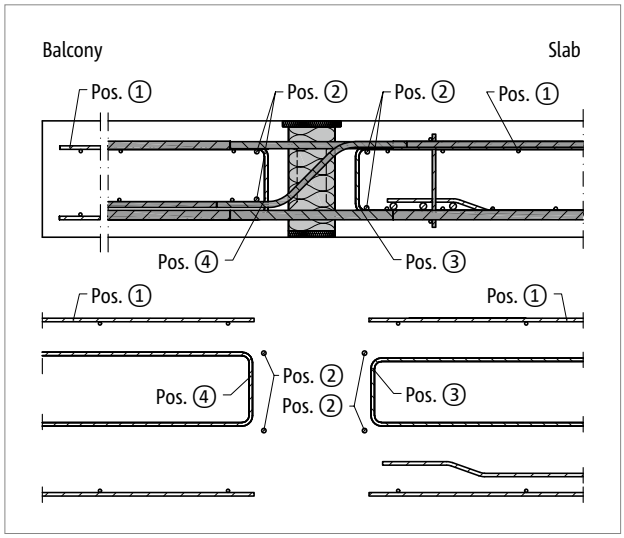


Fig. 60: Schöck Isokorb® T type K-M13 to M14: On-site reinforcement for indirect support

On-site reinforcement

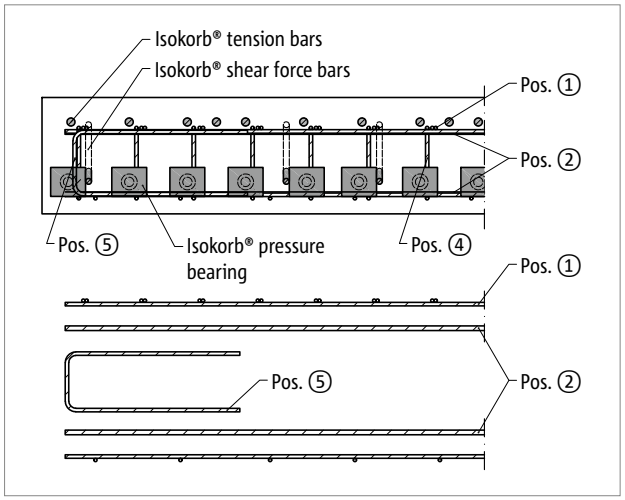


Fig. 61: Schöck Isokorb® T type K-M12: On-site reinforcement on the balcony side in section A-A; Pos.5 = supplementary edge reinforcement on the free edge

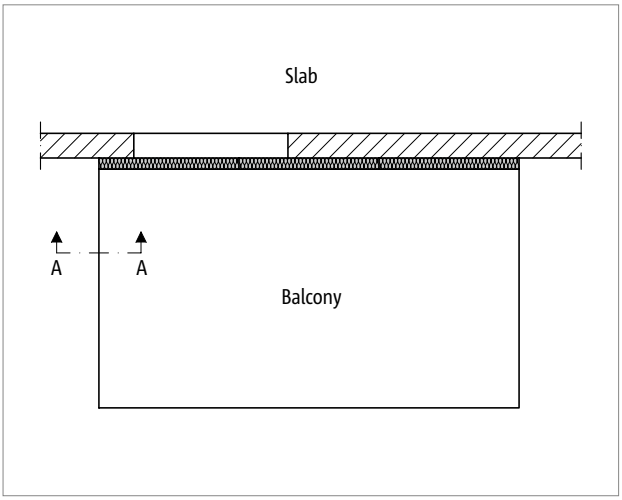


Fig. 62: Schöck Isokorb® T type K: Diagram of the position of Section A-A

On-site reinforcement

Recommendation for the on-site connection reinforcement

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

Schöck Isokorb® T type K-M12 to M14 is only available in the length L = 500 mm

Schöck Isokorb® T type K 6.1			M12			M13			M14		
			V1	V2	V3	V1	V2	V3	V1	V2	V3
On-site reinforcement for	Type of bearing	Height [mm]	Concrete strength class ≥ C25/30								
Overlapping reinforcement											
Pos. 1 with H10 [mm²/element]	direct/ indirect	180-250	829	829	829	995	995	995	1161	1161	1161
Pos. 1 with H12 [mm²/element]											
Pos. 1 with H16 [mm²/element]			1288	1288	1288	1546	1546	1546	1804	1804	1804
Steel bars along the insulation joint											
Pos. 2	direct	180-250	2 • H8								
	indirect		4 • H8								
Vertical reinforcement											
Pos. 3 [mm²/ Element]	direct	180-250	–	–	–	–	–	–	–	–	–
	indirect		113	113	113	57	57	57	57	57	57
Pos. 4 [mm²/ element]	direct/ indirect	180-200	180	209	244	83	120	163	95	137	187
		210-250	280	353	440	167	240	327	167	240	327
Side reinforcement at the free edge											
Pos. 5	direct/ indirect	180-250	according to BS EN 1992-1-1 (EC2), 9.3.1.4								

Information about on-site reinforcement

- Alternative connection reinforcements are possible. Determine lap length according to BS EN 1992-1-1 (EC2) and BS EN 1992-1-1/NA. A reduction of the required lap length with m_{Ed}/m_{Rd} is permitted. For the overlap (l_0) with the Schöck Isokorb® for the T type K-M12 to K-M14 a length of the tension bars of 820 mm can be brought to account.
- When reinforcing with different diameters the reinforcement specification for the largest diameter is relevant.
- The mixing of steel bar and wire mesh reinforcement is possible. The corresponding mesh reinforcement can be taken into account when determining the additional reinforcement.
- The side reinforcement Pos. 5 should be selected so low that it can be arranged between the upper and lower reinforcement position.
- The indicative minimum concrete strength class of the external structural component is C32/40.
- The details on the on-site reinforcement refer to the element length (L = 500 mm), if required the values per running metre can be converted.

Tight fit/Concreting section | Precast/Compression joints

Tight fit/Concreting section

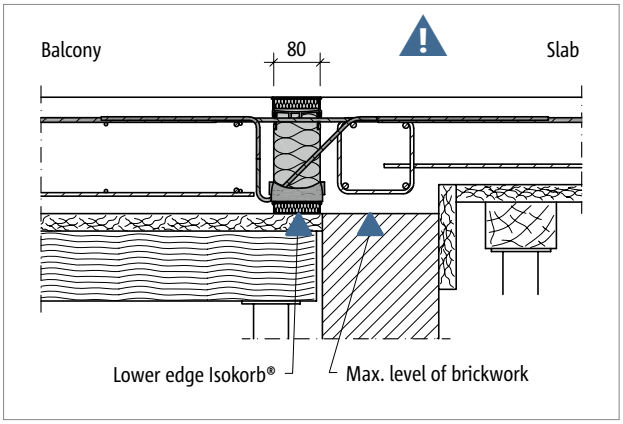


Fig. 63: Schöck Isokorb® T type K: In situ concrete with height offset floor on masonry wall

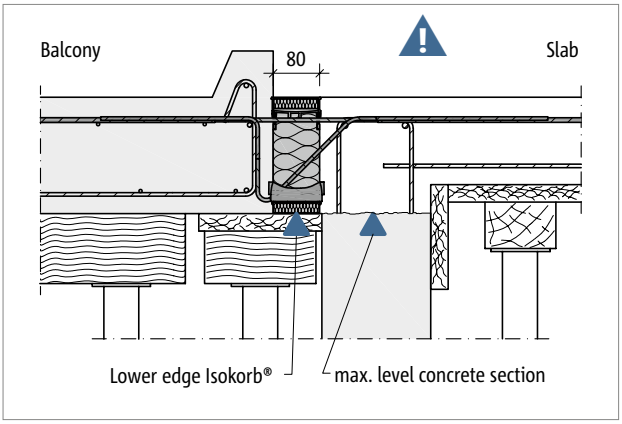


Fig. 64: Schöck Isokorb® T type K: Fully-finished balcony with height offset floor on fully-finished reinforced concrete wall

⚠ Hazard note: Tight fit with different height levels

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

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

Precast/Compression joints

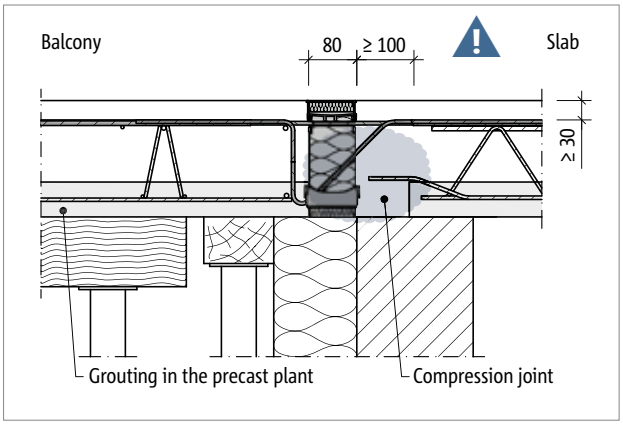


Fig. 65: Schöck Isokorb® T type K/K-F: Direct support, installation in conjunction with hybrid precast slabs (here: h ≤ 170 mm), compression joint on floor side

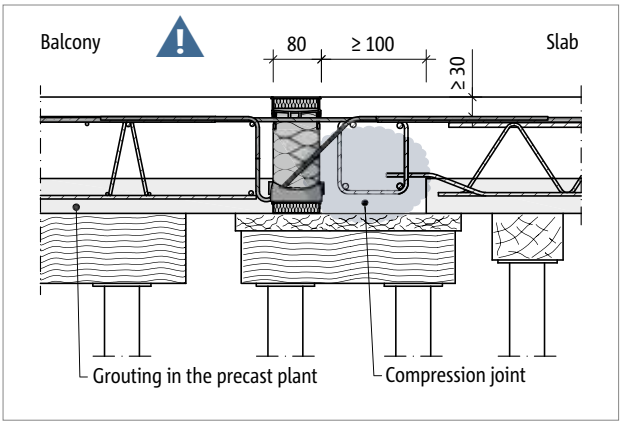


Fig. 66: Schöck Isokorb® T type K/K-F: Indirect support, installation in conjunction with hybrid precast slabs (here: h ≤ 170 mm), compression joint on floor side

⚠ Warning regarding compression joints

Compression joints always remain fully compressed (BS EN 1992-1-1/NA, NCI to 10.9.4.3(1)) when exposed to unfavourable load combinations. The underside of a cantilever balcony is always a compression zone. If the cantilever balcony is a complete precast part or a hybrid precast slab, and/or the floor is a hybrid precast slab, then the definition of the standard applies.

- Compression joints must be indicated in the formwork and reinforcement drawing!
- Compression joints between prefabricated parts must always be grouted using in-situ concrete. The same applies for compression joints with the Schöck Isokorb®.
- When compression joints are installed between prefabricated parts (on the inner slab or balcony side) and the Schöck Isokorb®, a ≥ 100 mm wide strip of in-situ concrete or grout must be placed/poured. This must be entered in the working drawings.
- We recommend installing the Schöck Isokorb® and/or the balcony-side compression joint at the precast plant.

Design example

Example calculation

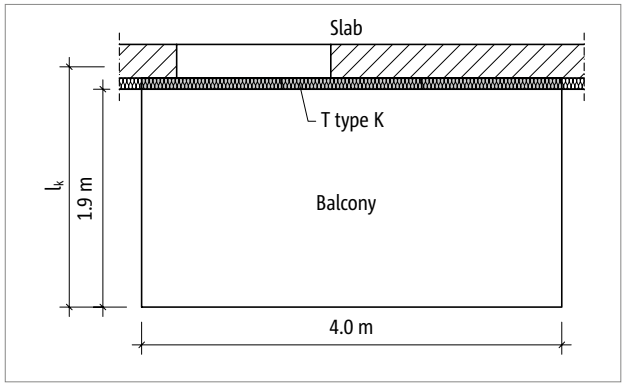


Fig. 67: Schöck Isokorb® T type K: Plan layout

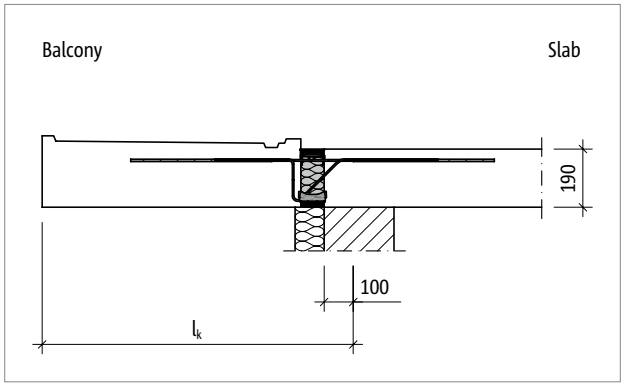


Fig. 68: Schöck Isokorb® T type K: Static system

Static system and load assumptions

Geometry:	Projection length	l_k = 2.06 m
	Balcony slab thickness	h = 190 mm
Design loads:	Balcony slab and screed	g = 6.25 kN/m²
	Service load	q = 2.5 kN/m²
	Edge load (balustrade)	g_R = 1.5 kN/m
Exposure classes:	External XC 4	
	Internal XC 1	
Selected:	Concrete strength class C25/30 for floor and C32/40 for balcony	
	Concrete cover c_v = 35 mm for Isokorb® tension bars	
Connection geometry:	No height offset, no floor downstand beam, no balcony upstand	
Support floor:	Floor edge directly supported	
Support balcony:	Restraint of cantilever slab using type K	

Recommendation on slenderness

Geometry:	Projection length	l_k = 2.06 m
	Balcony slab thickness	h = 190 mm
	Concrete cover	CV35
	Maximum projection length	$l_{k,max}$ = 2.17 m (from table, see page 38) > l_k

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

Internal forces:	m_{Ed}	$= -[(\gamma_G \cdot g_Q + \gamma \cdot q) \cdot l_k^2/2 + \gamma_G \cdot g_R \cdot l_k)]$
	m_{Ed}	$= -[(1.35 \cdot 6.25 + 1.5 \cdot 2.5) \cdot 2.06^2/2 + 1.35 \cdot 1.5 \cdot 2.06)] = -30.0$ kNm/m
	v_{Ed}	$= +(\gamma_G \cdot g + \gamma_q \cdot q) \cdot l_k + \gamma_G \cdot g_R$
	v_{Ed}	$= +(1.35 \cdot 6.25 + 1.5 \cdot 2.5) \cdot 2.06 + 1.35 \cdot 1.5 = +27.1$ kN/m
Selected:	**Schöck Isokorb® T type K-M6-V1-REI120-CV35-X80-H190**	
	m_{Rd}	$= -31.9$ kNm/m (see page 31) > m_{Ed}
	v_{Rd}	$= +43.5$ kN/m (see page 31) > v_{Ed}
	tan α	= 0.7 % (see page 35)

Design example | Installation instructions

Serviceability limit state (deflection/precamber)

Deflection factor: $\tan \alpha$ = 0.7 (from table, see page 36)

Selected load combination: g + q/2

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

Determine $m_{üd}$ in the ultimate limit state

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

m_{pd} = $-[(1.35 \cdot 6.25 + 1.5 \cdot 2.5/2) \cdot 2.06^2/2 + 1.35 \cdot 1.5 \cdot 2.06] = -26.0$ kNm/m

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

p = $[0.7 \cdot 2.06 \cdot (26.0/31.9)] \cdot 10 = 11.8$ mm

Arrangement of expansion joint Length of balcony : 4.00 m < 11.30 m

=> No expansion joints required

i Installation instructions

The current installation instruction can be found online under:
www.schoeck.com/view/6419

☑ Check list

- ☐ Have the loads on the Schöck Isokorb® connection been specified at design level?
- ☐ Has the cantilevered system length or the system support width been taken as a basis?
- ☐ Has the additional deformation due to the Schöck Isokorb® been taken into account?
- ☐ Is the drainage direction taken into account with the resulting camber information? Is the degree of camber entered in the working drawings?
- ☐ Is the required minimum slab thickness H_{min} taken into account for the respective Schöck Isokorb® type?
- ☐ Are the recommendations for limiting the susceptibility to vibration observed?
- ☐ Are the maximum allowable expansion joint spacings taken into account?
- ☐ Are the Schöck FEM guidelines taken into account with the calculation using FEM?
- ☐ With the selection of the design table is the relevant concrete cover taken into account?
- ☐ Have existing horizontal loads e.g. from wind pressure been taken into account as planned? Are additional Schöck Isokorb® T type H required for this?
- ☐ Have the fire protection requirements been clarified?
- ☐ Has the in-situ concrete strip which is required for the respective Schöck Isokorb® type in conjunction with hybrid precast slabs in the compression joint (width ≥ 100 mm from compression element) been depicted in the working drawings?
- ☐ Have the requirements for on-site reinforcement of connections been defined in each case?
- ☐ Has the minimum slab thickness (≥ 180 mm) and the required 2nd layer (-CV50) been taken into account?
  Has a T type C-CV50 element (2nd layer) been planned in the connection to the T type C subelement?
- ☐ Is the T type K-U, K-O or a special design required instead of the Schöck Isokorb® T type K for connection with height offset or to a wall?
- ☐ For fully precast balconies, are possibly necessary gaps for the frontal transport anchors and rainwater downpipes for internal drainage taken into account? Is the maximum centre distance of 300 mm of the Schöck Isokorb® bars observed?