DESIGN TABLES – JANUARY 2021

Isolink®
For insulated precast concrete walls

ℹ Notes

- The design tables serve the design of core insulated concrete walls using Schöck Isolink®.
- Sources of the design table are the Schöck Thermoanker Approval Z-21.8-1894 and the Schöck Combar® Approval Z-1.6-238.
- For submission to the inspecting structural engineer use the design software or contact the engineers of the Schöck Application Engineering Dept.
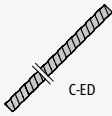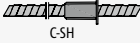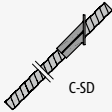
ℹ Software

- The design software Schöck Isolink® for insulated precast concrete walls serves the rapid design of the Schöck Isolink® in core insulated reinforced concrete walls. This design can be used as verifiable structural analysis.
- The design software can be obtained under www.schoeck.de/download.
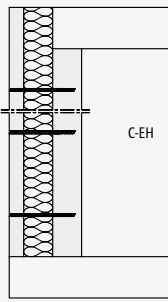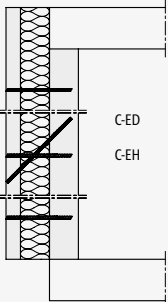
Contents
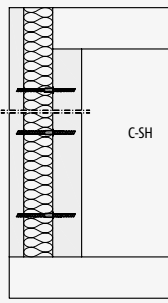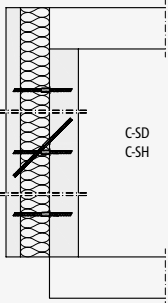
Overview

Type overview

Schöck Isolink® type		Schöck Isolink® type	
C-EH	**Cover layer** Supported Freely-suspended	C-ED	**Cover layer** Freely-suspended
C-SH	**Cover layer** Supported Freely-suspended	C-SD	**Cover layer** Freely-suspended

Application overview

Supported cover layer		Freely-suspended cover layer	
C-EH	**Wall type** Sandwich wall Element wall **Schöck Isolink®** Type C-EH	C-ED C-EH	**Wall type** Sandwich wall Element wall **Schöck Isolink®** Type C-EH Type C-ED
C-SH	In facing concrete with special requirements **Wall type** Sandwich wall Element wall **Schöck Isolink®** Type C-SH	C-SD C-SH	In facing concrete with special requirements **Wall type** Sandwich wall Element wall **Schöck Isolink®** Type C-SH Type C-SD

Basic principles

Core insulated concrete walls

Core insulated concrete walls are produced as sandwich or element walls.

Fig. 1: Section through a sandwich wall

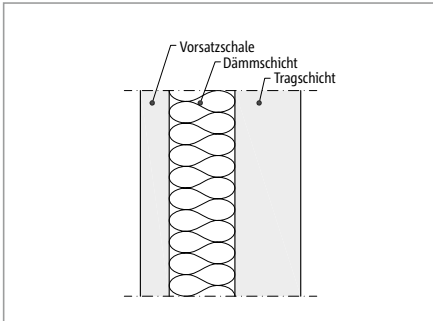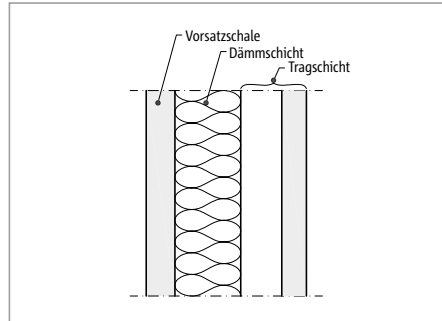Fig. 2: Section through an element wall; structural layer with in-situ concrete infill
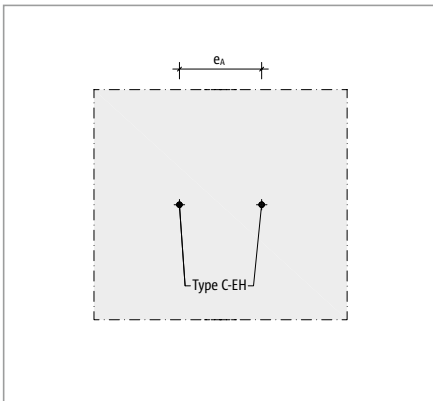
Centre to centre distance

Fig. 3: Schöck Isolink® type C-EH: Centre to centre distance
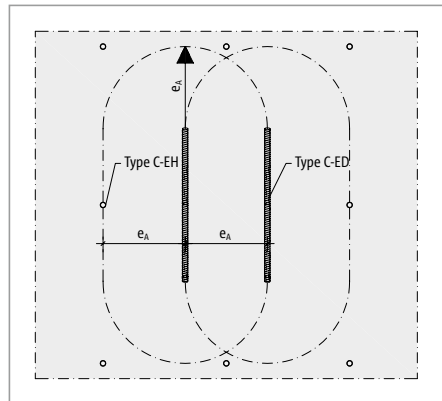
Fig. 4: Schöck Isolink® type C-EH, C-ED: Centre to centre distance

Schöck Isolink® type	C-EH, C-SH, C-ED, C-SD	
Minimum centre to centre distance	e_A [mm]	
	200	

Basic principles

Edge distance
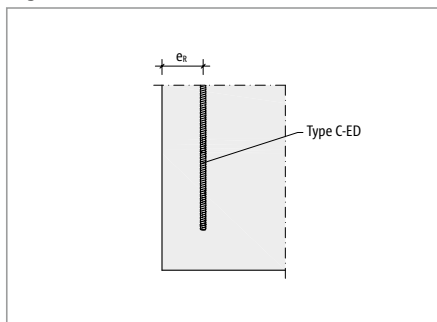
Fig. 5: Schöck Isolink® type C-ED: Edge distance e_R in the wall elevation
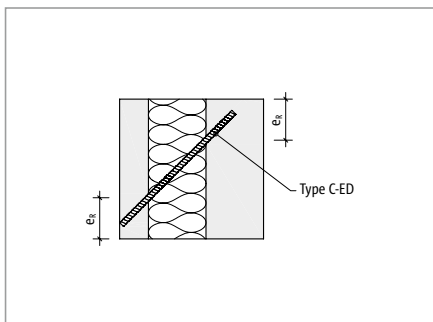
Fig. 6: Schöck Isolink® type C-ED: Edge distances e_R in the wall cross-section

Schöck Isolink® type	C-ED, C-SD
Minimum edge distance	e_R [mm]
	100

Schöck Isolink® type	C-EH, C-SH
Load cases 1+2 and load case 4	Concrete strength class ≥ C20/25
Edge distance e_R [mm]	Centric compressive force $N_{Rd,x}$ [kN/element]
50 ≤ e_R < 100	6,7
e_R ≥ 100	No reduction required, see design tables for Schöck Isolink® calculation

Schöck Isolink® type	C-EH, C-SH				
Load case 1 to Load case 3	Concrete strength class ≥ C20/25				
	Bond length of the Isolink® in the concrete h_{nom} [mm]				
	60	70	80	90	100
Edge distance e_R [mm]	Centric tension force $N_{Rd,x}$ [kN/element]				
50 ≤ e_R < 100	3,8	4,0	4,2	4,3	4,5
e_R ≥ 100	No reduction required, see design tables for Schöck Isolink® calculation				

ℹ️ **Edge distance**

- The minimum edge distances also apply to openings such as doors or windows.
- Element wall: The employment of prefabricated stirrup cages as starter bars requires a careful planning of the edge distance of the Schöck Isolink®.
- Type C-EH, C-SH: Edge distance e_R < 50 mm is not permitted!

Basic principles

Element configuration Schöck Isolink® type C-EH, C-SH
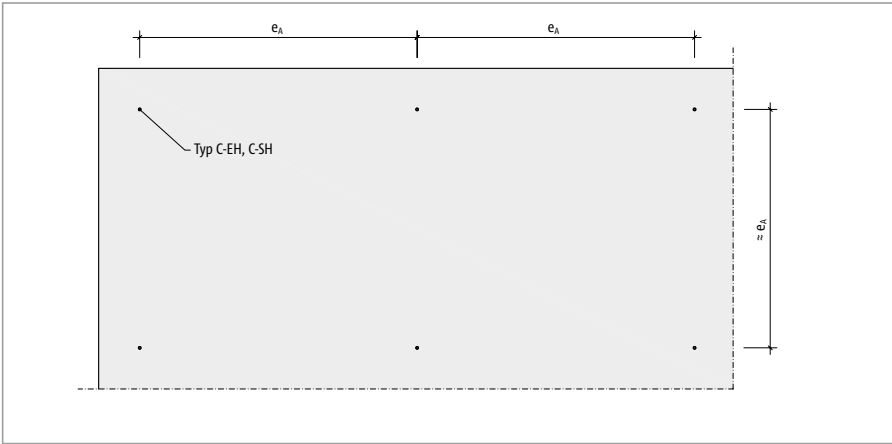
Fig. 7: Schöck Isolink®: Detail of the cover layer; type C-EH, C-SH is configured in a square grid

ℹ️ Element configuration Schöck Isolink® type C-EH, C-SH
- The Schöck Isolink® type C-EH, C-SH are to be configured preferably in a square grid.

Element configuration Schöck Isolink® type C-ED, C-SD
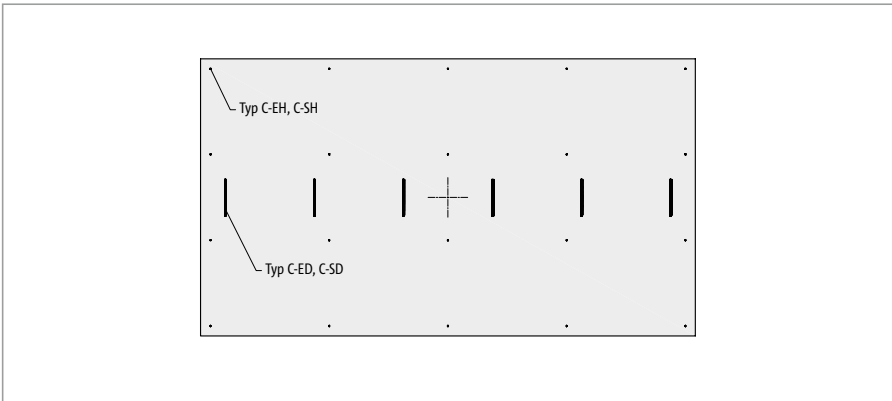
Fig. 8: Schöck Isolink®: Freely-suspended cover layer; type C-ED, C-SD is configured on the horizontal centre line of the cover layer

Basic principles
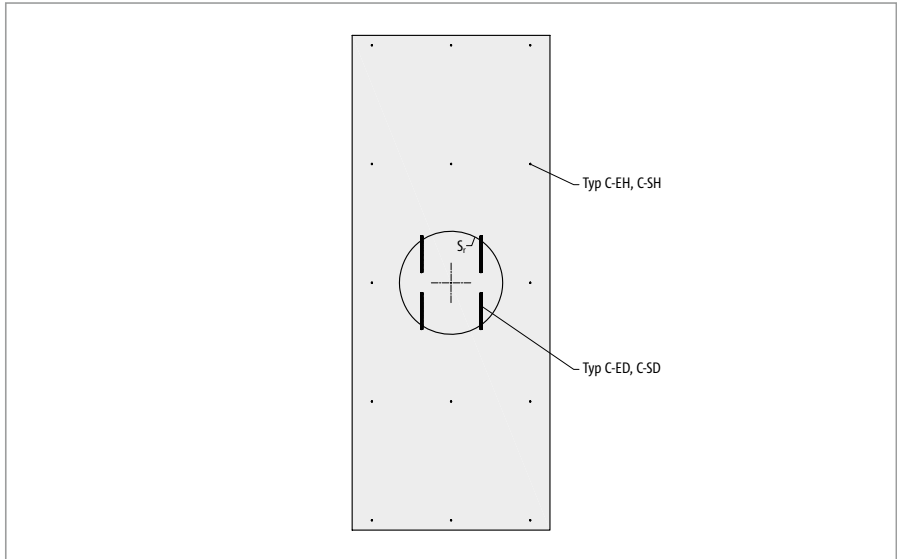
Fig. 9: Schöck Isolink®: Freely-suspended cover layer; type C-ED, C-SD is configured within a circle around the deformation fix point of the cover layer

Schöck Isolink® type	C-ED, C-SD		
Thickness of the thermal insulation layer h_D [mm]	< 80	80–100	> 100
Radius S_r [mm]	300	550	900

ℹ Element alignment Schöck Isolink® type C-ED, C-SD
- Isolink® type C-ED, C-SD with two options of element configuration:
  Configure type C-ED, C-SD side by side on the horizontal centre line of the cover layer or type C-ED, C-SD within a circle with radius S_r about the deformation fixed point

Basic principles

Structural component geometry sandwich wall
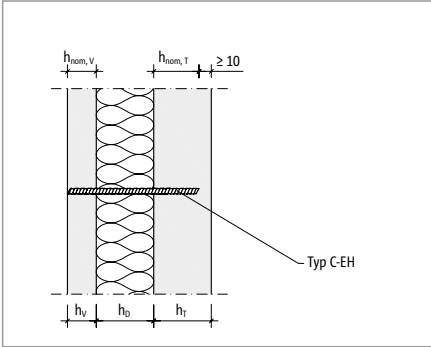
Fig. 10: Schöck Isolink® type C-EH: Cross-section details for the sandwich wall; $h_{nom,V} = h_V$
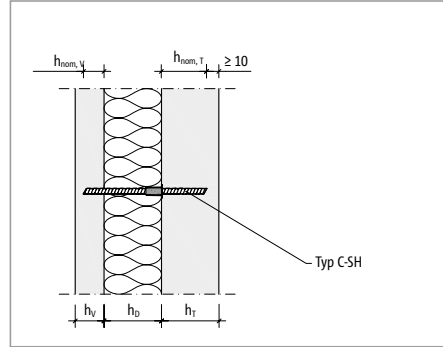
Fig. 11: Schöck Isolink® type C-SH: Cross-section details for the sandwich wall; $h_{nom,V} < h_V$
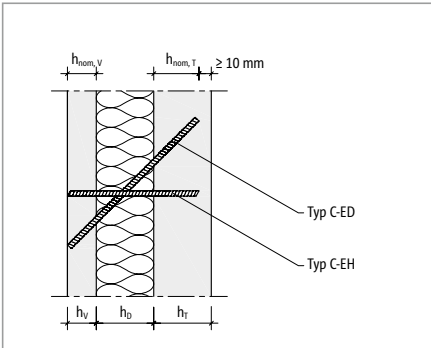
Fig. 12: Schöck Isolink® type C-EH, C-ED: Cross-section details for the sandwich wall; $h_{nom,V} = h_V$
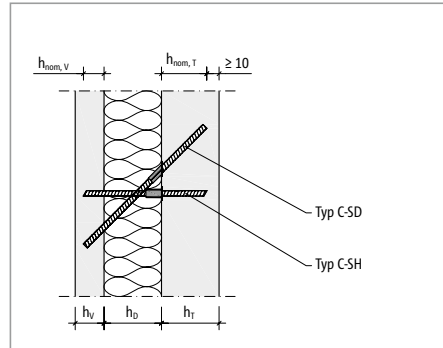
Fig. 13: Schöck Isolink® type C-SH, C-SD: Cross-section details for the sandwich wall; $h_{nom,V} < h_V$

Schöck Isolink® type	C-EH, C-SH
Bond length of the Isolink® in the concrete h_{nom} [mm]	≥ 40
Thickness of the facing shell h_V [mm]	50–200
Thickness of the thermal insulation layer h_D [mm]	60–350
Thickness of the structural layer h_T [mm]	≥ 50

Basic principles

Structural component geometry element wall
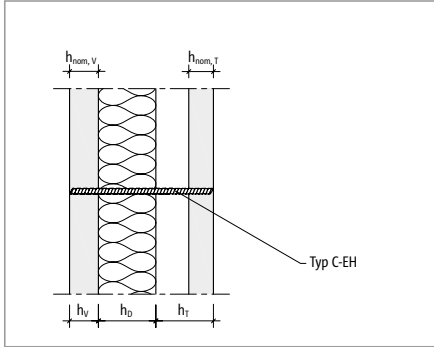
Fig. 14: Schöck Isolink® type C-EH: Cross-section details for the element wall $h_{nom,V} = h_V$
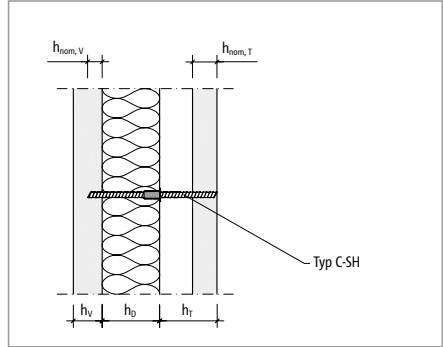
Fig. 15: Schöck Isolink® type C-SH: Cross-section details for the element wall $h_{nom,V} < h_V$
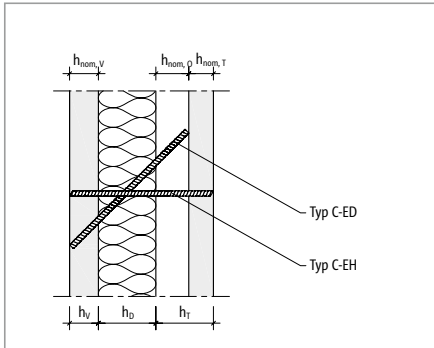
Fig. 16: Schöck Isolink® type C-EH, C-ED: Cross-section details for the element wall $h_{nom,V} = h_V$
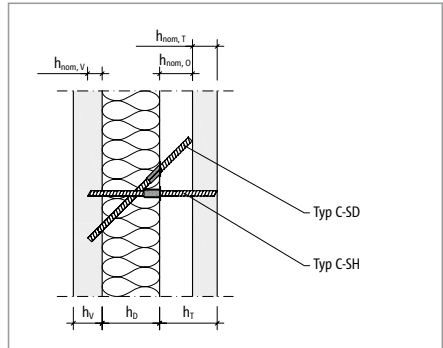
Fig. 17: Schöck Isolink® type C-SH, C-SD: Cross-section details for the element wall; $h_{nom,V} < h_V$

Schöck Isolink® type		C-EH	C-SH
Bond length of the Isolink® in the concrete h_{nom} [mm]		min {h_V; 100}	40–100
Thickness of the cover layer h_V [mm]		60–200	
Thickness of the thermal insulation layer h_D [mm]		60–350	
Thickness of the structural layer	Overall h_T [mm]	≥ 140	
	Thickness of the in-situ concrete layer [mm]	≥ 80	
	Thickness of the precast element [mm]	≥ 60	

ℹ Structural component geometry

- With the design of the Schöck Isolink® the allowable length in the concrete is limited to $h_{nom} ≤ 100$ mm.
- Solutions for the design of the Schöck Isolink® with cover layers with the thickness $h_V > 200$ mm can be requested from the Application Engineering Dept.

Basic principles

Load case 1: Wind pressure, wind suction
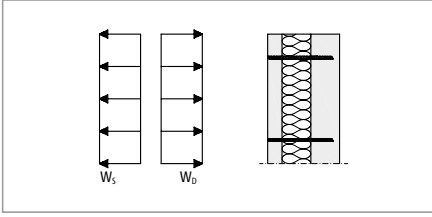
Fig. 18: Schöck Isolink® type C-EH, C-SH: Load case wind; wind suction, wind pressure
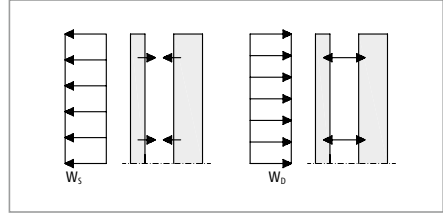
Fig. 19: Schöck Isolink® type C-EH, C-SH: Wind suction creates a tension force, wind pressure a compressive force in the Isolink®

Load case 2: Temperature gradient over the thickness of the facing shell
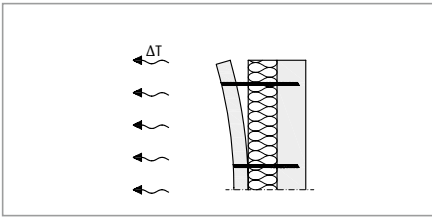
Fig. 20: Schöck Isolink® type C-EH, C-SH: Load case temperature gradient over the thickness of the cover layer
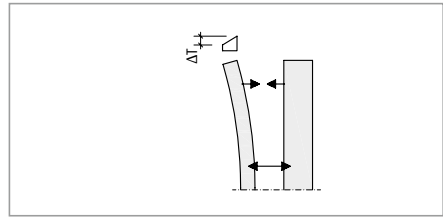
Fig. 21: Schöck Isolink® type C-EH, C-SH: Tension or compressive force, depending on the position of the Isolink®

Load case 3: Fresh concrete creates pressure, in the construction state only
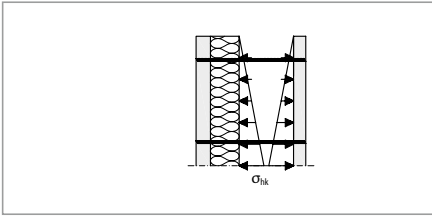
Fig. 22: Schöck Isolink® type C-EH, C-SH: Load case fresh concrete pressure; element wall in the construction state
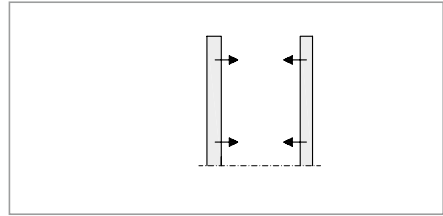
Fig. 23: Schöck Isolink® type C-EH, C-SH: Tension force in the Isolink®

Load case 4: Self-weight of the cover layer
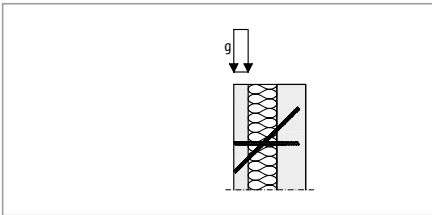
Fig. 24: Schöck Isolink® type C-EH, C-SH, C-ED, C-SD: Load case self-weight of the cover layer
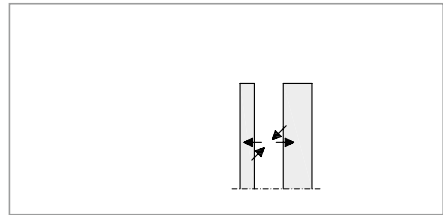
Fig. 25: Schöck Isolink® type C-EH, C-SH, C-ED, C-SD: Tension force in type C-ED and compressive force in type C-EH

Basic principles

Load case 5: Temperature difference between cover layer and structural layer (fatigue)
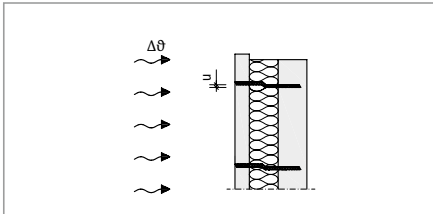
Fig. 26: Schöck Isolink® type C-EH, C-SH, C-ED, C-SD: Load case temperature difference between cover layer and structural layer
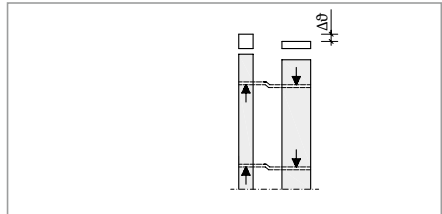
Fig. 27: Schöck Isolink® type C-EH, C-SH, C-ED, C-SD: Lateral displacement of the Isolink® through shear force load

Fatigue

Load case 5 "Temperature difference between cover layer and structural layer" is the basis for the verification of the fatigue safety of the Isolink®. This verification is effected through the maximum distance S (see table page 12).
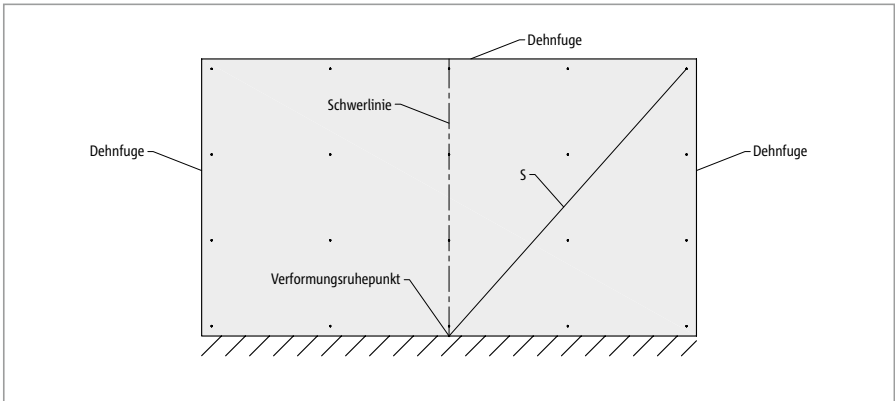
Fig. 28: Schöck Isolink®: Distance S between the deformation fix point and the outermost Isolink® type C-EH, C-SH

Basic principles

Schöck Isolink® type	C-EH, C-SH, C-ED, C-SD
Insulation thickness h_D [mm]	max. S [mm]
60	4400
80	5900
100–350	7400

ℹ Expansion joints
- The edges of the freely-suspended cover layer are to be constructed as expansion joints.

Required verifications

Schöck Isolink® type	C-EH, C-SH		C-EH, C-SH, C-ED, C-SD	
Load	Cover layer supported		Cover layer freely-suspended	
	Element wall	Sandwich wall	Element wall	Sandwich wall
	Ultimate limit state			
Load case 1: Wind pressure, wind suction	x	x	x	x
Load case 2: Temperature gradient over the thickness of the cover layer	x	x	x	x
Load case 3: Fresh concrete pressure, in the construction state only	x		x	
Load case 4: Self-weight of the cover layer			x	x
	Serviceability limit state			
Load case 5 Temperature difference between cover layer and structural layer	x	x	x	x

ℹ Required verifications
- For the design of the Schöck Isolink® type C-EH, C-SH the maximum value from the design tables load case 1+2 or load case 3 is relevant.
- For the design of the Schöck Isolink® type C-ED, C-SD design table load case 3 is relevant.

Design

Load case 1 + 2: Wind pressure, wind suction and temperature gradient cover layer

Schöck Isolink® type			C-EH, C-SH				
Combination of Load case 1: Wind + Load case 2: $\Delta T = 5$ [K]			Concrete strength class $\geq$ C20/25				
			Bond length of the Isolink® in the concrete h_{nom} [mm]				
			40	50	60	80	100
			Quantity [piece/m²]				
Characteristic wind load w_k [kN/m²]	$\leq$ 1.0	Thickness of the cover layer h_V [mm] — 60	1.8	0.9	0.6	-	-
		70	4.1	1.6	0.9	-	-
		80	7.9	3.3	1.5	0.6	-
		90	10.5	5.6	2.9	0.9	-
		100	11.9	7.2	4.4	1.6	0.7
		200	10.1	7.6	6.1	4.2	3.0
	$\leq$ 2.0	60	3.3	1.9	1.3	-	-
		70	6.1	2.9	1.7	-	-
		80	9.4	4.7	2.6	1.2	-
		90	11.7	6.7	4.0	1.7	-
		100	12.8	8.1	5.3	2.4	1.3
		200	10.7	8.1	6.5	4.5	3.3
	$\leq$ 3.0	60	4.7	2.7	1.9	-	-
		70	7.7	4.0	2.5	-	-
		80	10.7	5.9	3.6	1.8	-
		90	12.7	7.7	4.9	2.3	-
		100	13.7	9.0	6.1	3.0	1.8
		200	11.3	8.6	6.9	4.8	3.6

Load case 3: Fresh concrete creates pressure, in the construction state only

Schöck Isolink® type	C-EH, C-SH				
Load case 3: Fresh concrete pressure	Concrete strength class $\geq$ C30/37				
	Bond length of the Isolink® in the concrete h_{nom} [mm]				
	60	70	80	90	100
Maximum fresh concrete pressure $\sigma_{hk,max}$ [kN/m²]	Quantity [piece/m²]				
25	4.0	3.1	2.5	2.1	1.8
35	5.7	4.3	3.5	3.0	2.6

ℹ Design Schöck Isolink® type C-EH, C-SH

- Load case 1: Characteristic wind load w_k according to details of the structural engineer
- Load case 2: $\Delta T = 5$ K according to approval No. Z-21.8-1894
- Load case 3: For the design of the Schöck Isolink® type C-EH, C-SH the maximum fresh concrete pressure according to DIN 18218 is to be calculated.
- Load case 3: Consistancy classes according to DIN EN 206 and DIN 1045-2 are to be specified by the structural engineer.
- Load case 3: The concrete strength class refers to the precast parts. Taking into account the higher concrete strength class leads to an efficient design of the Schöck Isolink® type C-EH, C-SH.

Design

- Load case 3 "Fresh concrete pressure" takes into account the construction state. It occurs with the element wall only.

Load case 4: Self-weight of the cover layer

Schöck Isolink® type	C-ED, C-SD				
Load case 4: Self-weight of the cover layer	Concrete strength class ≥ C20/25				
	Bond length of the Isolink® in the concrete h_{nom} [mm]				
	40	50	60	80	100
Thickness of the cover layer h_V [mm]	Quantity [piece/m²]				
60	0.83	0.65	0.53	-	-
70	0.97	0.76	0.62	-	-
80	1.11	0.86	0.71	0.52	-
90	1.25	0.97	0.80	0.59	-
100	1.39	1.08	0.89	0.65	0.51
200	2.77	2.16	1.77	1.30	1.03

Schöck Isolink® type	C-ED, C-SD				
Load case 4: Self-weight of the cover layer	Concrete strength class ≥ C30/37				
	Bond length of the Isolink® in the concrete h_{nom} [mm]				
	40	50	60	80	100
Thickness of the cover layer h_V [mm]	Quantity [piece/m²]				
60	0.76	0.59	0.49	-	-
70	0.89	0.69	0.57	-	-
80	1.02	0.79	0.65	0.48	-
90	1.14	0.89	0.73	0.54	-
100	1.27	0.99	0.81	0.60	0.47
200	2.54	1.98	1.62	1.19	0.94

ℹ Design Schöck Isolink® type C-ED, C-SD

- The Schöck Isolink® type C-ED, C-SD is employed according to approval No. Z-21.8-1894 in conjunction with the Isolink® type C-EH, C-SH for the load transfer with freely-suspended cover layers.
- Isolink® type C-ED, C-SD with two options of element configuration:
  Configure type C-ED, C-SD side by side on the horizontal centre line of the cover layer or type C-ED, C-SD within a circle with radius S_r about the deformation fixed point
- For the anchoring of the Schöck Isolink® type C-ED, C-SD with the element wall the quality of the concrete is relevant. Therefore, here in addition, concrete strength class C20/25 is designated.

Design

Variant bending load Schöck Isolink® type C-EH, C-SH:
Load case combination with freely-suspended cover layer

Sandwich wall, concrete strength class ≥ C20/25:

Schöck Isolink® type				C-EH, C-SH														
Combination of Load case 1: Wind + Load case 2: $\Delta T = 5$ [K] + Load case 4: Self-weight				Concrete strength class ≥ C20/25														
				Bond length of the Isolink® in the concrete h_{nom} [mm]														
				40					50					60				
				Thickness of the insulation layer h_D [mm]														
				60	80	100	120	140	60	80	100	120	140	60	80	100	120	140
				Quantity [piece/m²]														
Characteristic wind load w_k [kN/m²]	≤ 1.0	Thickness of the cover layer h_V [mm]	60	1.8	1.7	1.8	2.0	3.0	1.2	1.5	1.8	2.1	3.0	1.2	1.5	1.8	2.1	3.0
			70	4.1	3.7	3.5	3.2	3.5	1.6	1.7	2.1	2.4	3.5	1.4	1.8	2.1	2.5	3.5
			80	7.9	6.7	5.9	5.3	4.8	3.3	3.0	2.7	2.8	4.0	1.6	2.0	2.4	2.8	4.0
			90	10.5	8.7	7.5	6.6	5.9	5.6	4.8	4.2	3.8	4.5	2.9	2.6	2.7	3.2	4.5
			100	11.9	9.8	8.3	7.3	6.5	7.2	6.0	5.2	4.6	5.0	4.4	3.7	3.3	3.5	5.0
	≤ 2.0		60	3.3	3.2	3.2	3.1	3.0	1.9	1.8	1.8	2.1	3.0	1.3	1.5	1.8	2.1	3.0
			70	6.1	5.5	5.1	4.8	4.6	2.9	2.8	2.7	2.6	3.5	1.7	1.8	2.1	2.5	3.5
			80	9.4	8.1	7.2	6.6	6.0	4.7	4.3	4.0	3.7	4.0	2.6	2.5	2.4	2.8	4.0
			90	11.7	9.8	8.6	7.7	7.0	6.8	5.8	5.2	4.7	4.5	4.0	3.6	3.3	3.2	4.5
			100	12.8	10.7	9.3	8.2	7.4	8.1	6.9	6.1	5.4	5.0	5.3	4.6	4.1	3.7	5.0
	≤ 3.0		60	4.7	4.6	4.4	4.3	4.2	2.7	2.7	2.7	2.6	3.0	1.9	1.9	1.9	2.1	3.0
			70	7.6	7.0	6.5	6.1	5.8	4.0	3.8	3.7	3.6	3.5	2.5	2.5	2.4	2.5	3.5
			80	10.7	9.4	8.4	7.7	7.1	5.9	5.4	5.0	4.7	4.4	3.6	3.4	3.2	3.1	4.0
			90	12.7	10.8	9.6	8.6	7.9	7.7	6.8	6.1	5.6	5.2	4.9	4.4	4.1	3.8	4.5
			100	13.7	11.6	10.1	9.1	8.2	9.0	7.7	6.8	6.2	5.7	6.1	5.3	4.8	4.4	5.0

▶ **Sandwich wall with freely-suspended cover layer through bending load of the Schöck Isolink® type C-EH, C-SH**

- For the design of the Schöck Isolink® type C-EH, C-SH without additional Isolink® type C-ED, C-SD, the design table load case combination 1 + 2 + 4 is relevant.
- Load case 4: The static deformation through self-weight is limited to w = 3 mm.

Design

Variant bending load Schöck Isolink® type C-EH, C-SH:
Load case combination with freely-suspended cover layer
Element wall, concrete strength class ≥ C20/25:

Schöck Isolink® type				C-EH, C-SH													
Combination of Load case 1: Wind + Load case 2: ΔT = 5 [K] + Load case 4: Self-weight or Load case 3: Fresh concrete pressure				Concrete strength class ≥ C20/25													
				Bond length of the Isolink® in the concrete h_{nom} [mm]													
				60					80					100				
				Thickness of the insulation layer h_D [mm]													
				60	80	100	120	140	60	80	100	120	140	60	80	100	120	140
				Quantity [piece/m²]													
Characteristic wind load w_k [kN/m²]	≤ 1.0	Thickness of the cover layer h_V [mm]	60	5.1	5.1	5.1	5.1	5.1	-	-	-	-	-	-	-	-	-	-
			70	5.1	5.1	5.1	5.1	5.1	-	-	-	-	-	-	-	-	-	-
			80	5.1	5.1	5.1	5.1	5.1	3.0	3.0	3.0	3.0	4.0	-	-	-	-	-
			90	5.1	5.1	5.1	5.1	5.1	3.0	3.0	3.0	3.3	4.5	-	-	-	-	-
			100	5.1	5.1	5.1	5.1	5.1	3.0	3.0	3.1	3.6	5.0	2.2	2.7	3.2	3.8	5.0
	≤ 2.0		60	5.1	5.1	5.1	5.1	5.1	-	-	-	-	-	-	-	-	-	-
			70	5.1	5.1	5.1	5.1	5.1	-	-	-	-	-	-	-	-	-	-
			80	5.1	5.1	5.1	5.1	5.1	3.0	3.0	3.0	3.0	4.0	-	-	-	-	-
			90	5.1	5.1	5.1	5.1	5.1	3.0	3.0	3.0	3.3	4.5	-	-	-	-	-
			100	5.3	5.1	5.1	5.1	5.1	3.0	3.0	3.1	3.6	5.0	2.2	2.7	3.2	3.8	5.0
	≤ 3.0		60	5.1	5.1	5.1	5.1	5.1	-	-	-	-	-	-	-	-	-	-
			70	5.1	5.1	5.1	5.1	5.1	-	-	-	-	-	-	-	-	-	-
			80	5.1	5.1	5.1	5.1	5.1	3.0	3.0	3.0	3.0	4.0	-	-	-	-	-
			90	5.1	5.1	5.1	5.1	5.1	3.0	3.0	3.0	3.3	4.5	-	-	-	-	-
			100	6.1	5.3	5.1	5.1	5.1	3.0	3.0	3.1	3.6	5.0	2.2	2.7	3.2	3.8	5.0

▶ **Element wall with freely-suspended cover layer through bending load of the Schöck Isolink® type C-EH, C-SH**

- For the design of the Schöck Isolink® type C-EH, C-SH without additional Isolink® type C-ED, C-SD the design table load case combination 1 + 2 + 4 or 3 is relevant.
- Load case 4: The static deformation through self-weight is limited to w = 3 mm.

Design

Variant bending load Schöck Isolink® type C-EH, C-SH:
Load case combination with freely-suspended cover layer

Element wall, concrete strength class ≥ C30/37:

Schöck Isolink® type				C-EH, C-SH													
Combination of Load case 1: Wind + Load case 2: $\Delta T = 5$ [K] + Load case 4: Self-weight or Load case 3: Fresh concrete pressure				Concrete strength class ≥ C30/37													
				Bond length of the Isolink® in the concrete h_{nom} [mm]													
				60					80					100				
				Thickness of the insulation layer h_D [mm]													
				60	80	100	120	140	60	80	100	120	140	60	80	100	120	140
				Quantity [piece/m²]													
Characteristic wind load w_k [kN/m²]	≤ 1.0	Thickness of the cover layer h_V [mm]	60	4.0	4.0	4.0	4.0	4.0	-	-	-	-	-	-	-	-	-	-
			70	4.0	4.0	4.0	4.0	4.0	-	-	-	-	-	-	-	-	-	-
			80	4.0	4.0	4.0	4.0	4.0	2.5	2.5	2.5	2.9	4.0	-	-	-	-	-
			90	4.0	4.0	4.0	4.0	4.5	2.5	2.5	2.9	3.3	4.5	-	-	-	-	-
			100	4.1	4.0	4.0	4.0	5.0	2.5	2.7	3.2	3.7	5.0	2.3	2.8	3.3	3.8	5.0
	≤ 2.0		60	4.0	4.0	4.0	4.0	4.0	-	-	-	-	-	-	-	-	-	-
			70	4.0	4.0	4.0	4.0	4.0	-	-	-	-	-	-	-	-	-	-
			80	4.0	4.0	4.0	4.0	4.0	2.5	2.5	2.5	2.9	4.0	-	-	-	-	-
			90	4.0	4.0	4.0	4.0	4.5	2.5	2.5	2.9	3.3	4.5	-	-	-	-	-
			100	4.9	4.2	4.0	4.0	5.0	2.5	2.7	3.2	3.7	5.0	2.3	2.8	3.3	3.8	5.0
	≤ 3.0		60	4.0	4.0	4.0	4.0	4.0	-	-	-	-	-	-	-	-	-	-
			70	4.0	4.0	4.0	4.0	4.0	-	-	-	-	-	-	-	-	-	-
			80	4.0	4.0	4.0	4.0	4.0	2.5	2.5	2.5	2.9	4.0	-	-	-	-	-
			90	4.0	4.0	4.0	4.0	4.5	2.5	2.5	2.9	3.3	4.5	-	-	-	-	-
			100	5.6	4.9	4.0	4.0	5.0	2.8	2.7	3.2	3.7	5.0	2.3	2.8	3.3	3.8	5.0

▶ **Element wall with freely-suspended cover layer through bending load of the Schöck Isolink® type C-EH, C-SH**

- For the design of the Schöck Isolink® type C-EH, C-SH without additional Isolink® type C-ED, C-SD the design table load case combination 1 + 2 + 4 or 3 is relevant.
- Load case 4: The static deformation through self-weight is limited to w = 3 mm.

Design

Load case 5: Temperature difference between cover layer and structural layer (fatigue)

Component measurements with supported cover layer:

Schöck Isolink® type		C-EH, C-SH		
Load case 5 Temperature difference between cover layer and structural layer		Insulation thickness h_D [mm]		
		60	80	100–350
		Max. cover layer length l [mm]		
Cover layer height h [mm]	2500	7570	10970	12000
	3000	6810	10470	12000
	3500	5780	9840	12000
	4000	4270	9050	12000
	4500	-	8060	12000
	5000	-	6770	11290
	5500	-	4950	10310
	6000	-	-	9130
	6500	-	-	6000
	7000	-	-	5540
	7500	-	-	-

Component measurements with freely-suspended cover layer:

Schöck Isolink® type		C-EH, C-SH, C-ED, C-SD		
Load case 5 Temperature difference between cover layer and structural layer		Insulation thickness h_D [mm]		
		60	80	100–350
		Max. cover layer length l [mm]		
Cover layer height h [mm]	2500	8690	11770	12000
	3000	8540	11660	12000
	3500	8350	11520	12000
	4000	8130	11370	12000
	4500	7870	11180	12000
	5000	7570	10970	12000
	5500	7220	10740	12000
	6000	6810	10470	12000

ℹ **Component measurements**

- The representation of the table values for the maximum cover layer length and cover layer height is based on the values for max. S.
- With a freely-suspended cover layer the maximum measurements for the length and height apply also reciprocally.

Design example

Element wall, supported cover layer

Geometry:	Cover layer:		h_V = 70 mm
	Insulation layer:		h_D = 140 mm
	Structural layer:		h_T = 140 mm
	In-situ concrete layer:		h_O = 80 mm
	Bond length of the Isolink® in the concrete:		h_{nom} = 60 mm
	Wall area:		A = 5 × 3 m = 15 m²

Design loads:

Load case 1: Wind
w_K = 0.85 kN/m²

Load case 2: Temperature gradient over the thickness of the cover layer according to the approval
ΔT = 5 K

Load case 3: Fresh concrete pressure
$\sigma_{hk,max}$ = 25 kN/m²

Load case 4: Self-weight of the cover layer
not relevant

Load case 5: Temperature difference between facing layer and structural layer according to the approval
Δθ = 50 K

Selected: Concrete strength class C30/37 for the precast concrete units

Verifications in the ultimate limit state for the Schöck Isolink® type C-EH

Combination of the load cases 1 + 2:	Required quantity	= 0.6 piece/m²
Load case 3:	Required quantity	= 4 piece/m²
	See design tables page 13	

=> Relevant load case: Load case 3 (Fresh concrete pressure in the construction state)
Required quantity per cover layer: = 4 · 15 = 60 piece

Verifications in the serviceability limit state for the Schöck Isolink®

Load case 5: Maximum measurements of the cover layer, see table page 18
Cover layer height: 3000 mm
Cover layerl length: 5000 mm < 12000 mm
=> Verification fulfilled

Design example

Sandwich wall, freely-suspended cover layer

Geometry:	Cover layer:	h_V = 70 mm
	Insulation thickness:	h_D = 140 mm
	Structural layer:	h_T = 140 mm
	Bond length of the Isolink® in the concrete:	h_{nom} = 60 mm
	Wall area:	A = 5 × 3 m = 15 m^2

Design loads: Load case 1: Wind
w_K = 0.85 kN/m^2

Load case 2: Temperature gradient over the thickness of the cover layer according to the approval
ΔT = 5 K

Load case 3: Fresh concrete pressure
not relevant

Load case 4: Self-weight of the cover layer

Load casel 5: Temperature difference between cover layer and structural layer according to the approval
$\Delta\theta$ = 50 K

Selected: Concrete strength class C30/37

Verifications in the ultimate limit state for the Schöck Isolink® type C-EH

| Combination of the load cases 1 + 2: | Required quantity | = 0.9 piece/m^2 |
| | See design table page 13 | |

Required quantity per cover layer: = 0.9 · 15 = 14 piece

Verifications in the ultimate limit state for the Schöck Isolink® type C-ED

| Load case 4: | Required quantity | = 0.57 piece/m^2 |
| | See design table page 14 | |

Required quantity per cover layer: = 0.57 · 15 = 9 piece

Verifications in the serviceability limit state for the Schöck Isolink®

Load case 5:   Maximum measurements of the cover layer, see table page 18
Cover layer height: 3000 mm
Cover layerl length: 5000 mm < 12000 mm
=> Verification fulfilled

Design example

Variant bending load Schöck Isolink® type C-EH: Sandwich wall, freely-suspended cover layer

Geometry:	Cover layer:	h_V = 70 mm
	Insulation thickness:	h_D = 140 mm
	Structural layer:	h_T = 140 mm
	Bond length of the Isolink® in the concrete:	h_{nom} = 60 mm
	Wall area:	A = 5 × 3 m = 15 m^2

Design loads: Load case 1: Wind
w_K = 0.85 kN/m^2

Load case 2: Temperature gradient over the thickness of the cover layer according to the approval
ΔT = 5 K

Load case 3: Fresh concrete pressure
not relevant

Load case 4: Self-weight of the cover layer

Load casel 5: Temperature difference between cover layer and structural layer according to the approval
$\Delta\theta$ = 50 K

Selected: Concrete strength class C30/37

Verifications in the ultimate limit state for the Schöck Isolink® type C-EH

Combination of load cases 1 + 2 + 4:   Required quantity   = 3.5 piece/m^2

See design table page 15

Required quantity per cover layer: = 3.5 · 15 = 53 piece

Verifications in the serviceability limit state for the Schöck Isolink®

Load case 5:   Maximum measurements of the cover layer, see table page 18
Cover layer height: 3000 mm
Cover layerl length: 5000 mm < 12000 mm
=> Verification fulfilled

Building physics charactersitic values

U-values of the walls using Schöck Isolink® for insulated precast concrete walls

Insulation layer thickness [mm]	Heat transmission coefficient U [W/(m²·K)]												
	Wall thickness [cm]												
	20	24	25	30	32	34	36	38	40	42	46	48	50
60	-	0.322	0.321	0.319	0.318	0.317	0.316	0.315	0.315	0.314	0.312	0.311	0.310
70	-	0.279	0.279	0.277	0.277	0.276	0.275	0.275	0.274	0.273	0.272	0.271	0.271
80	-	0.247	0.247	0.245	0.245	0.244	0.244	0.243	0.243	0.242	0.241	0.241	0.240
90	-	-	0.221	0.220	0.219	0.219	0.219	0.218	0.218	0.217	0.216	0.216	0.216
100	-	-	-	0.199	0.199	0.198	0.198	0.198	0.197	0.197	0.196	0.196	0.196
110	-	-	-	0.182	0.182	0.181	0.181	0.181	0.181	0.180	0.180	0.179	0.179
120	-	-	-	0.168	0.167	0.167	0.167	0.167	0.166	0.166	0.166	0.165	0.165
130	-	-	-	0.155	0.155	0.155	0.155	0.155	0.154	0.154	0.154	0.154	0.153
140	-	-	-	0.145	0.145	0.144	0.144	0.144	0.144	0.144	0.143	0.143	0.143
150	-	-	-	-	0.135	0.135	0.135	0.135	0.135	0.135	0.134	0.134	0.134
160	-	-	-	-	0.127	0.127	0.127	0.127	0.127	0.127	0.126	0.126	0.126
170	-	-	-	-	-	0.120	0.120	0.120	0.120	0.119	0.119	0.119	0.119
180	-	-	-	-	-	0.113	0.113	0.113	0.113	0.113	0.113	0.113	0.113
190	-	-	-	-	-	-	0.108	0.108	0.107	0.107	0.107	0.107	0.107
200	-	-	-	-	-	-	0.102	0.102	0.102	0.102	0.102	0.102	0.102
210	-	-	-	-	-	-	-	0.098	0.098	0.097	0.097	0.097	0.097
220	-	-	-	-	-	-	-	0.093	0.093	0.093	0.093	0.093	0.093
230	-	-	-	-	-	-	-	-	0.089	0.089	0.089	0.089	0.089
240	-	-	-	-	-	-	-	-	0.086	0.086	0.086	0.085	0.085
250	-	-	-	-	-	-	-	-	-	0.082	0.082	0.082	0.082
260	-	-	-	-	-	-	-	-	-	0.079	0.079	0.079	0.079
270	-	-	-	-	-	-	-	-	-	-	0.076	0.076	0.076
280	-	-	-	-	-	-	-	-	-	-	0.074	0.074	0.074
290	-	-	-	-	-	-	-	-	-	-	0.071	0.071	0.071
300	-	-	-	-	-	-	-	-	-	-	0.069	0.069	0.069
310	-	-	-	-	-	-	-	-	-	-	-	0.067	0.067
320	-	-	-	-	-	-	-	-	-	-	-	0.065	0.065
330	-	-	-	-	-	-	-	-	-	-	-	-	0.063
340	-	-	-	-	-	-	-	-	-	-	-	-	0.061
350	-	-	-	-	-	-	-	-	-	-	-	-	-

- The table applies for sandwich and element walls using Schöck Isolink®.
- This table is based on using λ = 0.021 W/(m·K) insulation.
- The thickness of the cover layer is specified as 60 mm.

SCHÖCK

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