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European Technical Assessment

**ETA-16/0545
of 30/09/2016**

General Part

Technical Assessment Body issuing the European Technical Assessment

Instytut Techniki Budowlanej

Trade name of the construction product

Schöck LD

Product family to which the construction product belongs

Dowel for structural joints

Manufacturer

Schöck Bauteile GmbH
Vimbucher Straße 2
D-76534 Baden-Baden
Germany

Manufacturing plant(s)

Schöck Bauteile GmbH
Vimbucher Straße 2
D-76534 Baden-Baden
Germany

This European Technical Assessment contains

22 pages including 3 Annexes which form an integral part of this Assessment

This European Technical Assessment is issued in accordance with regulation (EU) No 305/2011, on the basis of

Guideline for European Technical Approval of "Dowels for structural joints", ETAG 030, Part 1: General, Edition April 2013 used as European Assessment Document (EAD)

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Specific Part

1 Technical description of the product

The Schöck LD dowel connectors (dowels for structural joints) consists of a dowel and a sleeve. The dowel is a round bar made of stainless or hot-dip galvanized steel, the corresponding sleeve is made of stainless steel or polypropylene (Annex A1, Annex A2, Annex A3).

The two components of a dowel connector are manufactured separately in the factory and assembled on the construction site into an expansion joint between concrete elements.

The dowel is inserted into a sleeve on the one side of the joint and embedded in concrete on the opposite side. Such setting allows free expansion of the joint and shear stress transmission.

The possible combination of dowels and sleeves and the corresponding combination type according to ETAG 030-1 are listed in Table A4 (Annex A4)

The used materials are listed in Annexes A1 to A5.

If the construction of the expansion joint has to fulfill further fire resistance requirements, the fire protection collars LD BSM or LD-Q BSM can be used (Annex A5). The collar is plugged on the dowel between the concrete elements. In the case of fire the collar will expand and protect the dowel against heating. The thickness of the fire protection collar is selected according to Table A7 in Annex A6. Arrangement of fire protection collars are given in Annex A6.

2 Specification of the intended use in accordance with the applicable European Assessment Document (EAD)

The performance given in clause 3 are only valid if the dowel connectors are used in compliance with the specifications and conditions given in Annex B.

The provisions made in this European Technical Assessment are based on an assumed working life of the connectors of 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer or Technical Assessment Body, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3 Performance of the product and references to the methods used for its assessment

3.1 Performance of the product

3.1.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Ultimate limit state	Annex C1
Serviceability limit state	Annex C1

3.1.2 Safety in case of fire (BWR 2)

Essential characteristic	Type of element, connector	Performance
Reaction to fire	Stainless steel dowel bar	A1
	Galvanized steel dowel bar	A1
	Stainless steel sleeve	A1
	Polypropylene sleeve	No performance assessed
Resistance to fire	Dowel connector with collar LD BSM or LD-Q BSM plugged on the dowel between the concrete elements	Annex C2

3.1.3 Hygiene, health and the environment (BWR 3)

The Schöck LD dowel connectors do not contain and/or release dangerous substances listed in Regulation (EC) No 1907/2006 of the European Parliament.

In order to meet the provisions of the Regulation (EU) No 305/2011), other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, Regulations and administrative provisions), need also to be complied with, when and where they apply.

3.1.4 Safety and accessibility in use (BWR 4)

When connecting floor slabs, the surface unevenness between the two sides of the joint has to be less than 5 mm.

3.1.5 Sustainable use of natural resources (BWR 7)

No performance assessed.

3.1.6 General aspects relating to fitness for use

Durability and serviceability are only ensured if the specifications of intended use according to Annex B1 are kept.

3.2 Methods used for the assessment

The assessment of the product for the declared intended use in relation to the requirements for mechanical resistance and stability and safety in use in the sense of the Basic Requirements 1 and 4 has been made in accordance with Guideline for European Technical Approval of "Dowels for structural joints", ETAG 030, Part 1: General, Edition April 2013.

4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

According to the Decision 98/214/EC of the European Commission the systems of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) given in the following table applied.

Product	Intended use	Level or class	System
Dowels for structural joints	For uses subject to structural performance regulations	–	2+
	For uses subject to regulations on reaction to fire	(A1 to E) ¹⁾ , F	4

¹⁾ Products/materials that do not require to be tested for reaction to fire

5 Technical details necessary for the implementation of the AVCP system, as provided in the applicable European Assessment Document (EAD)

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited in Instytut Techniki Budowlanej.

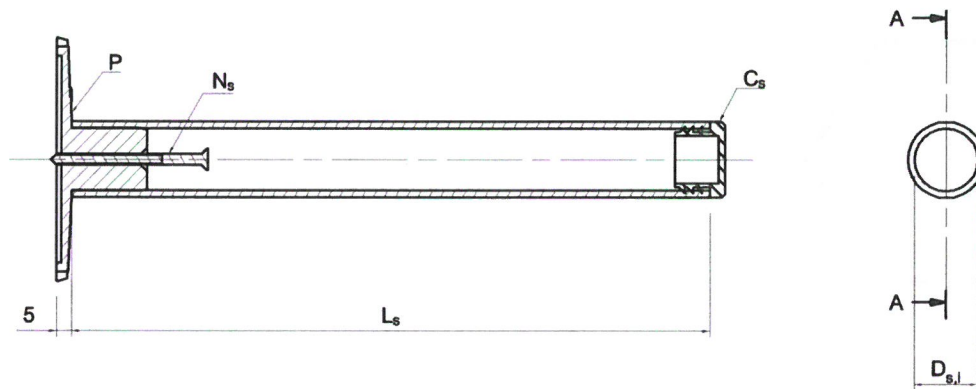
For the type testing the results of the tests performed as part of the assessment for the European Technical Assessment shall be used unless there are changes in the production line or plant. In such cases the necessary type testing has to be agreed between Instytut Techniki Budowlanej and the notified body.

Issued in Warsaw on 30/09/2016 by Instytut Techniki Budowlanej



Marcin M. Kruk, PhD
Director of ITB

Figure A1: Dimensions of sleeve LD Part S / P



- P - mounting plate
- N_s - nail
- D_{s,i} - inside diameter
- C_s - tube plug
- L_s - length of the sleeve

Table A1: Dimensions and materials of sleeve LD Part S / P

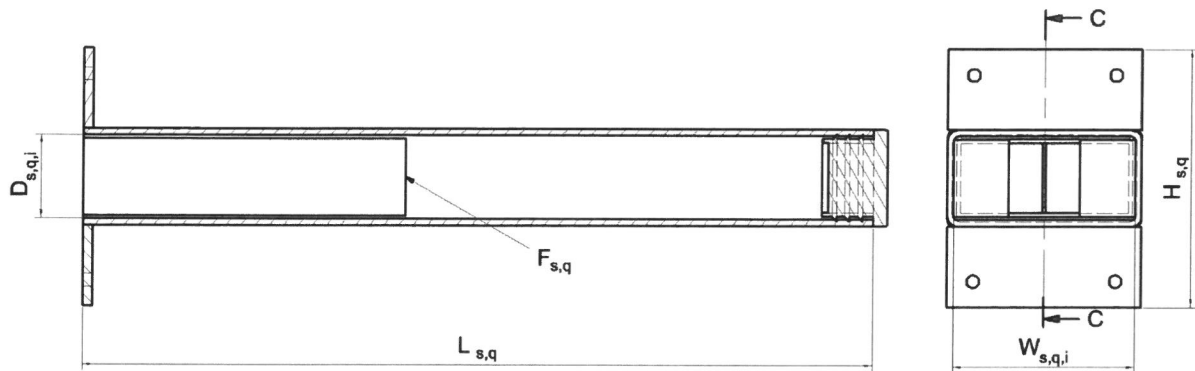
Type of sleeve	Material	L _s [mm]	D _{s,i} [mm]
LD 16 Part S	1.4362 / 1.4404 / 1.4571	185	17
LD 20 Part S	1.4362 / 1.4404 / 1.4571	210	21
LD 22 Part S	1.4362 / 1.4404 / 1.4571	225	23
LD 25 Part S	1.4362 / 1.4404 / 1.4571	245	26
LD 27 Part S	1.4362 / 1.4404 / 1.4571	255	28
LD 30 Part S	1.4362 / 1.4404 / 1.4571	275	31
LD 35 Part S	1.4362 / 1.4404 / 1.4571	310	36
LD 40 Part S	1.4362 / 1.4404 / 1.4571	340	41
LD 16 Part P	polypropylene (PP)	185	17
LD 20 Part P	polypropylene (PP)	210	21
LD 22 Part P	polypropylene (PP)	225	23
LD 25 Part P	polypropylene (PP)	245	26
LD 27 Part P	polypropylene (PP)	255	28
LD 30 Part P	polypropylene (PP)	275	31
LD 35 Part P	polypropylene (PP)	310	36
LD 40 Part P	polypropylene (PP)	340	41

Schöck LD

Product description
Dimensions and materials of sleeve LD Part S/P

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Figure A2: Dimensions of sleeve LD-Q Part S



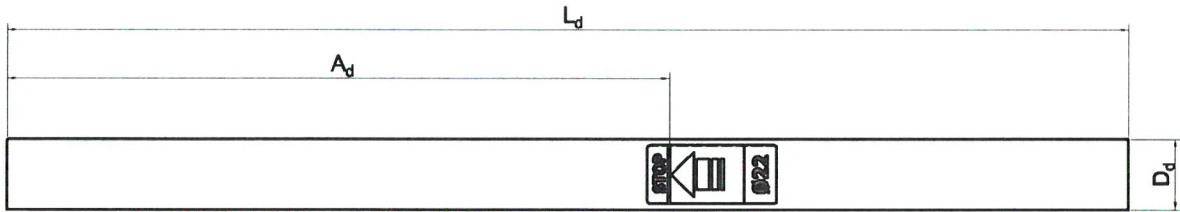
- F_{s,q} - foam strip
- L_{s,q} - length of the rectangular sleeve
- H_{s,q} - height of the front plate
- W_{s,q,i} - inside width of the rectangular sleeve
- D_{s,q,i} - inside height of the rectangular sleeve

Table A2: Dimensions and materials of sleeve LD-Q Part S

Type of sleeve	Material	L _{s,q} [mm]	D _{s,q,i} [mm]	W _{s,q,i} [mm]	H _{s,q} [mm]
LD-Q 16 Part S	1.4362 / 1.4404 / 1.4571	185	17	47	70
LD-Q 20 Part S	1.4362 / 1.4404 / 1.4571	210	21	46	75
LD-Q 22 Part S	1.4362 / 1.4404 / 1.4571	225	23	46	77
LD-Q 25 Part S	1.4362 / 1.4404 / 1.4571	245	26	56	80
LD-Q 27 Part S	1.4362 / 1.4404 / 1.4571	255	28	56	82
LD-Q 30 Part S	1.4362 / 1.4404 / 1.4571	275	31	56	85
LD-Q 35 Part S	1.4362 / 1.4404 / 1.4571	310	36	76	90
LD-Q 40 Part S	1.4362 / 1.4404 / 1.4571	340	41	76	95

Schöck LD	Annex A2 of European Technical Assessment ETA-16/0545
Product description Dimensions and materials of sleeve LD-Q Part S	

Figure A3: Dimensions of dowel LD Part A4 / Zn



A_d - insertion length
 L_d - dowel length
 D_d - dowel diameter

Table A3: Dimensions and materials of dowel LD Part A4 / Zn

Type of dowel	Material	L_d [mm]	D_d [mm]
LD 16 Part A4	stainless steel 1.4362 / 1.4462	270	16
LD 20 Part A4	stainless steel 1.4362 / 1.4462	320	20
LD 22 Part A4	stainless steel 1.4362 / 1.4462	350	22
LD 25 Part A4	stainless steel 1.4362 / 1.4462	390	25
LD 27 Part A4	stainless steel 1.4362 / 1.4462	420	27
LD 30 Part A4	stainless steel 1.4362 / 1.4462	450	30
LD 35 Part A4	stainless steel 1.4362 / 1.4462	520	35
LD 40 Part A4	stainless steel 1.4362 / 1.4462	580	40
LD 16 Part Zn	hot-dip galvanised steel 1.7225 / 1.7227	270	16
LD 20 Part Zn	hot-dip galvanised steel 1.7225 / 1.7227	320	20
LD 22 Part Zn	hot-dip galvanised steel 1.7225 / 1.7227	350	22
LD 25 Part Zn	hot-dip galvanised steel 1.7225 / 1.7227	390	25
LD 27 Part Zn	hot-dip galvanised steel 1.7225 / 1.7227	420	27
LD 30 Part Zn	hot-dip galvanised steel 1.7225 / 1.7227	450	30
LD 35 Part Zn	hot-dip galvanised steel 1.7225 / 1.7227	520	35
LD 40 Part Zn	hot-dip galvanised steel 1.7225 / 1.7227	580	40

Schöck LD

Product description
 Dimensions and materials of dowel LD Part A4 / Zn

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Table A4: Possible combinations of Schöck LD dowel connector elements and the corresponding combination type

Type of connector	Type of sleeve	Type of dowel	Combination type
LD ø P-Zn	LD ø Part P	LD ø Part Zn	A1
LD ø P-A4	LD ø Part P	LD ø Part A4	A1
LD ø S-A4	LD ø Part S	LD ø Part A4	A1
LD-Q ø S-A4	LD-Q ø Part S	LD ø Part A4	A2

Table A5: Materials of the elements of the Schöck LD dowel connector elements

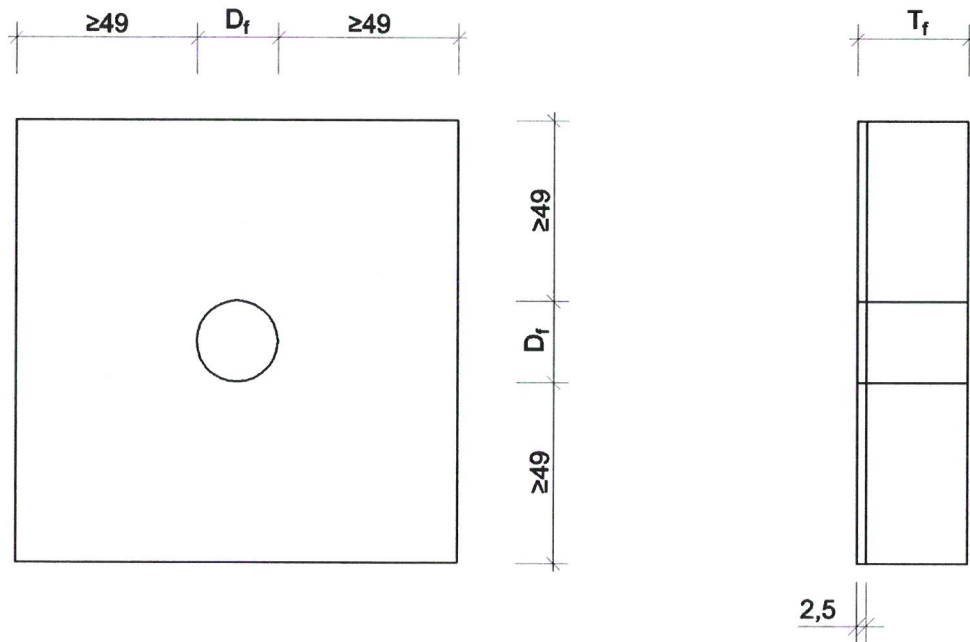
Type of element	Element	Material
LD ø Part P	sleeve	polypropylene (PP)
LD ø Part S	sleeve	stainless steel 1.4362 / 1.4404 / 1.4571
LD-Q ø Part S	sleeve	stainless steel 1.4362 / 1.4404 / 1.4571
LD ø Part Zn	dowel	hot-dip galvanised steel 1.7225 / 1.7227
LD ø Part A4	dowel	stainless steel 1.4362 / 1.4462

Schöck LD

Product description
Possible combinations, type and materials
of the Schöck LD dowel connector elements

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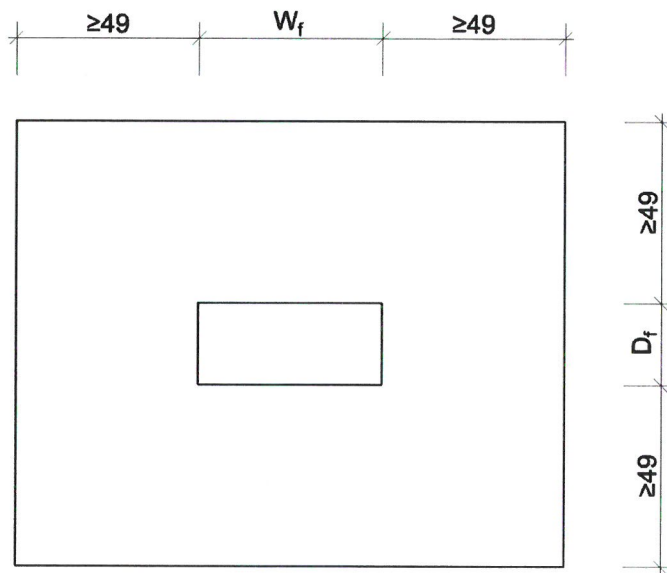
Figure A4: Dimensions of fire protection collar LD BSM



D_f - hole diameter

T_f - thickness of the collar

Figure A5: Dimensions of fire protection collar LD-Q BSM



D_f - height of the opening

W_f - width of the opening

Schöck LD	Annex A5 of European Technical Assessment ETA-16/0545
Product description Dimensions and materials of LD BSM / LD-Q BSM fire protection collars	

Table A6: Dimensions and materials of LD BSM / LD-Q BSM fire protection collars

Type of product	Material	D _f [mm]	W _f [mm]	T _f [mm]
LD 16-22 BSM 20	mineral wool / Promaseal PL	22	-	20
LD 25-30 BSM 20	mineral wool / Promaseal PL	30	-	20
LD 35-40 BSM 20	mineral wool / Promaseal PL	40	-	20
LD 16-22 BSM 30	mineral wool / Promaseal PL	22	-	30
LD 25-30 BSM 30	mineral wool / Promaseal PL	30	-	30
LD 35-40 BSM 30	mineral wool / Promaseal PL	40	-	30
LD-Q 16-22 BSM 20	mineral wool / Promaseal PL	22	48	20
LD-Q 25-30 BSM 20	mineral wool / Promaseal PL	30	56	20
LD-Q 35-40 BSM 20	mineral wool / Promaseal PL	40	76	20
LD-Q 16-22 BSM 30	mineral wool / Promaseal PL	22	48	30
LD-Q 25-30 BSM 30	mineral wool / Promaseal PL	30	56	30
LD-Q 35-40 BSM 30	mineral wool / Promaseal PL	40	76	30

The LD BSM or LD-Q BSM collar is made of:

- 2,5 mm Promaseal[®] PL intumescent fire protection plate produced by PROMAT GmbH, with B-s1, d0 reaction to fire class according to EN 13501-1.
- 17,5 mm or 27,5 mm mineral fibre board of A1 reaction to fire class according to EN 13501-1.

Schöck LD

Product description

Dimensions and materials of LD BSM / LD-Q BSM fire protection collars

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Figure A6: Arrangement of the LD BSM / LD-Q BSM fire protection collars for joint width smaller or equal to 30 mm

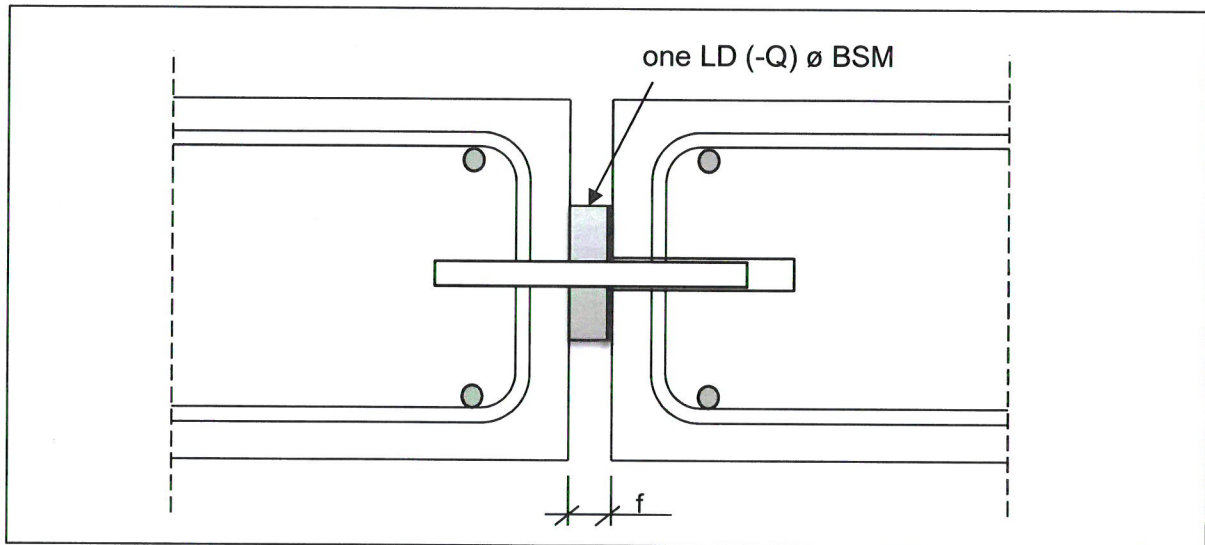
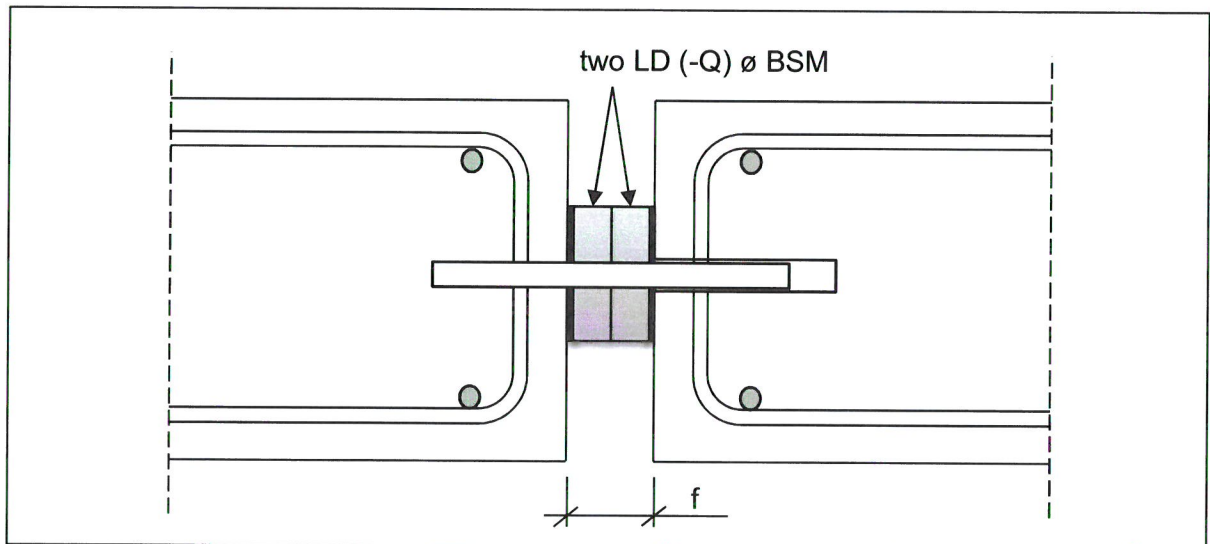


Figure A7: Arrangement of the LD BSM / LD-Q BSM fire protection collars for joint width wider than 30 mm



Schöck LD	Annex A6 of European Technical Assessment ETA-16/0545
Product description Arrangement of the LD BSM / LD-Q BSM fire protection collars	

Table A7: Arrangement of the LD BSM / LD-Q BSM fire protection collars in dependence on the planned joint width

Initial joint width f during construction	Fire protection collar	Permitted additional joint width
20 mm	LD (-Q) Ø BSM 20	10 mm
30 mm	LD (-Q) Ø BSM 30	10 mm
40 mm	2 x LD (-Q) Ø BSM 20	20 mm
50 mm	LD (-Q) Ø BSM 20 + LD (-Q) Ø BSM 30	10 mm
60 mm	2 x LD (-Q) Ø BSM 30	0 mm

Schöck LD

Product description

Arrangement of the LD BSM / LD-Q BSM fire protection collars

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Specification of intended use

Dowel connectors subjected to:

- Static and quasi-static loads.
- Reinforced normal weight concrete of strength classes C20/25 at minimum and C50/60 at maximum according to EN 206.
- Nominal joint width from 10 to 60 mm.
- The minimal slab thickness and the upper and lower corresponding maximal concrete cover in-dependence of the dowel diameter are given in Table B1 (Annex B2)

Use conditions (environmental conditions):

- Dowel connectors made of stainless steel grade 1.4462 and 1.4362 may be used in environmental category C3 according to EN ISO 12944-2.
- Dowel connectors made of stainless steel grade 1.4571 may be used in environmental category C2 according to EN ISO 12944-2.
- Dowel connectors with the elements made of galvanized steel may be used in environmental category C1 (dry internal conditions) according to EN ISO 12944-2.

Design:

- The design is based on the design method in EN 1992-1-1 under the responsibility of an engineer experienced in concrete building.
- Verifiable calculation notes and drawings are prepared taking into account the loads to be transferred. The transfer of the loads to the concrete member is verified.
- Single dowels or groups of dowels are used.
- The position of the product is indicated on the design drawings (e.g. position of the dowels with respect to the reinforcement).

Installation:

- Installation carried out by suitably experienced personnel and under the supervision of the person responsible for technical matters on site.
- Use of the product only as supplied by the manufacturer without exchanging the components.
- Installation in accordance with the manufacturer's specifications and the design drawings with exact position and dimensions as described in this ETA.
- The dowel fixed to the formwork or auxiliary constructions in a way that no movement of the product will occur during placing of reinforcement or during placing and compacting of the concrete.
- The concrete surrounding the reinforcement and under the dowel properly compacted (no cavities).
- Observation of the prescribed values of installations.
- Welding-on of the intended and designed steel components to the product performed by companies meeting the corresponding quality requirements for welding according to EN 1090.

Schöck LD	Annex B1 of European Technical Assessment ETA-16/0545
Intended use Specifications	

Table B1: Minimal slab thickness and maximum concrete cover for each dowel diameter

Dowel diameter [mm]	Minimal slab thickness [mm]	Maximum concrete cover at the minimal slab thickness [mm]
LD 16	160	20
LD 20	160	20
LD 22	160	20
LD 25	180	20
LD 27	190	30
LD 30	210	30
LD 35	250	30
LD 40	280	30

Schöck LD

Intended use

Minimal slab thickness and maximum concrete cover

Annex B2

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Ultimate limit state

The ultimate limit state of the Schöck LD dowel connector shall be calculated in accordance to the qualification class 2 of ETAG 030-1. Therefore the following requirements have to be met:

$$V_{Ed} \leq \begin{cases} V_{Rd,ce} \\ V_{Rd,ct} \\ V_{Rd,s} \end{cases} \quad \text{[Equation C1]}$$

With: $V_{Rd,ce}$ design value of resistance against concrete edge failure
 $V_{Rd,ct}$ design value of resistance against through-the-thickness failure
 $V_{Rd,s}$ design value of resistance of the steel dowel

$V_{Rd,ct}$ through-the-thickness failure

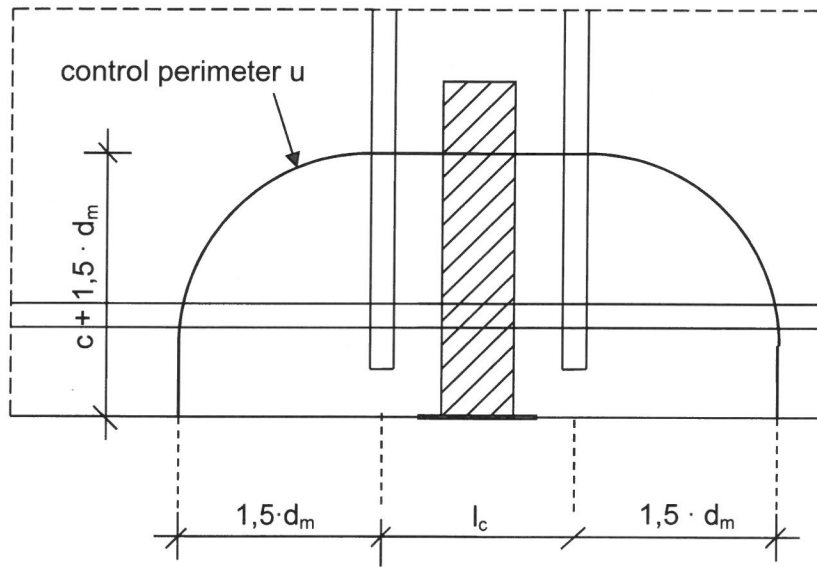
The design value of resistance against through-the-thickness failure results from the following equation:

$$V_{Rd,ct} = 0,14 \cdot \kappa \cdot (100 \cdot \rho_l \cdot f_{ck})^{\frac{1}{3}} \cdot u \cdot d_m / \beta \quad \text{[Equation C2]}$$

with: κ scaling factor
 $\kappa = 1 + (200/d_m)^{0,5}$
 d_m mean of the effective height of the slab
 ρ_l mean reinforcement ratio in x- and y-direction
 $\rho_l = \sqrt{\rho_{lx} \cdot \rho_{ly}} \leq \begin{cases} 0,5 \cdot f_{cd} / f_{yd} \\ 0,02 \end{cases}$
 f_{cd} design concrete compression strength
 f_{yd} design reinforcement yield strength
 f_{ck} characteristic concrete compression strength
 β load increasing factor
 $\beta = 1,4$ for dowels installed at the edge of the slab
 $\beta = 1,5$ for dowels installed at the corner of the slab
 u basic control perimeter according to Figure C1
 $u = 2 \cdot c + l_c + \pi \cdot d_m \cdot 1,5$
 c concrete cover at the edge of the slab
 l_c distance between the first stirrups at the left and right side of the dowel (see Figure C1)

Schöck LD	Annex C1 of European Technical Assessment ETA-16/0545
Performances Mechanical resistance and stability of Schöck LD dowel connectors	

Figure C1: Basic control perimeter



<p style="text-align: center;">Schöck LD</p>	<p style="text-align: center;">Annex C1 of European Technical Assessment ETA-16/0545</p>
<p style="text-align: center;">Performances Mechanical resistance and stability of Schöck LD dowel connectors</p>	

$V_{Rd,s}$ steel resistance of the dowel

The steel load bearing capacity of the Schöck dowel connectors LD shown in Table C1 and Table C2 is assessed according to EN 1993-1-1:2005 + AC 2009, EN 1993-1-4:2007 and ETAG 030-1.

Table C1: Steel load bearing capacities of Schöck dowel connectors LD

Load bearing capacity of dowel LD $V_{Rd,s}$ [kN]	Joint width [mm]					
	10	20	30	40	50	60
LD 16	24,9	18,8	15,1	12,6	10,9	9,5
LD 20	43,0	33,5	27,4	23,2	20,1	17,7
LD 22	54,2	42,6	35,2	29,9	26,0	23,0
LD 25	73,5	58,8	49,0	42,0	36,8	32,7
LD 27	88,2	71,2	59,7	51,4	45,2	40,3
LD 30	112,9	92,4	78,2	67,7	59,8	53,5
LD 35	161,4	134,5	115,3	100,9	89,6	80,7
LD 40	219,0	185,3	160,6	141,7	126,8	114,7

Table C2: Steel load bearing capacities of Schöck dowel connectors LD-Q

Load bearing capacity of dowel LD-Q $V_{Rd,s}$ [kN]	Joint width [mm]					
	10	20	30	40	50	60
LD-Q 16	13,8	10,4	8,4	7,0	6,0	5,3
LD-Q 20	23,9	18,6	15,2	12,9	11,2	9,8
LD-Q 22	30,1	23,7	19,5	16,6	14,5	12,8
LD-Q 25	40,8	32,7	27,2	23,3	20,4	18,2
LD-Q 27	49,0	39,6	33,2	28,6	25,1	22,4
LD-Q 30	62,7	51,3	43,4	37,6	33,2	29,7
LD-Q 35	89,6	74,7	64,0	56,0	49,8	44,8
LD-Q 40	121,7	102,9	89,2	78,7	70,4	63,7

Schöck LD	Annex C1 of European Technical Assessment ETA-16/0545
Performances Mechanical resistance and stability of Schöck LD dowel connectors	

$V_{Rd,ce}$ concrete edge failure

The design value of resistance against concrete edge failure results from the following equation:

$$V_{Rd,ce} = V_{Rd,1} + V_{Rd,2} \leq A_s \cdot f_{yd} \quad \text{[Equation C3]}$$

$$\text{with: } V_{Rd,1} = X_1 \cdot X_2 \cdot \sum \psi_i \cdot A_s \cdot f_{yk} \cdot (f_{ck}/30)^{0,5} / \gamma_c \quad \text{[Equation C4]}$$

X_1 product specific factor from Table C3

X_2 statistical factor from Table C3

Ψ factor taking into account the distance $l_{c,i}$ of the considered stirrup to the dowel

$$\psi = 1 - 0,2 \cdot \left(\frac{l_{c,i}}{c_1} \right)$$

$$c_1 = h/2$$

A_s cross section area of the stirrups

f_{yd} design value of yield strength of the stirrups

f_{yk} characteristic yield strength of the stirrups

f_{ck} characteristic compressive strength of the concrete (set to 30 for all concrete classes)

γ_c partial safety factor for concrete

$$V_{Rd,2} = \pi \cdot d_s \cdot \sum l'_i \cdot f_{bd} \quad \text{[Equation C5]}$$

d_s diameter of the stirrup

f_{bd} design value of the bond strength according to EN 1992-1-1:2004

l'_i effective anchorage length of the considered stirrup

$$l'_i = H_{spec} - (0,5 \cdot d_b + d_s + c_{nom}) - l_{c,i} \cdot \tan \alpha$$

H_{spec} height of the concrete cone from Table C3

d_b mandrel diameter of the stirrup

d_s bar diameter of the stirrup

$l_{c,i}$ distance between center of the dowel and considered stirrup

c_{nom} nominal concrete cover of the considered stirrup

$\tan \alpha$ angle of the concrete cone from Table C3

Table C3: Product specific parameters of Schöck LD dowel connectors

Parameter	Type of product	Product specific parameters
X_1	For all types	0,61
X_2	For all types	0,92 ¹⁾
H_{spec}	For all types	The concrete cone starts from the centre of the dowel to the edge of the slab h/2
α	For all types	33°

¹⁾ X_2 value was obtained in order to reach $V_{Rd,ce} \geq 1,5 V_{U,test}$ as a 5%-fractile with a confidence level of 75%

The product specific parameters are determined by tests. These tests showed a very small influence of the concrete strength. Therefore the concrete strength f_{ck} in Equation C4 is set to 30 N/mm² for all concrete classes.

Schöck LD	Annex C1 of European Technical Assessment ETA-16/0545
Performances Mechanical resistance and stability of Schöck LD dowel connectors	

Requirements for the reinforcement layout

In order to ensure the load bearing capacity of the concrete the following requirements for the reinforcement layout have to be considered:

The diameter of the longitudinal reinforcement bar parallel to the edge of the slab has to be at least the bar diameter of the stirrups close to the dowel.

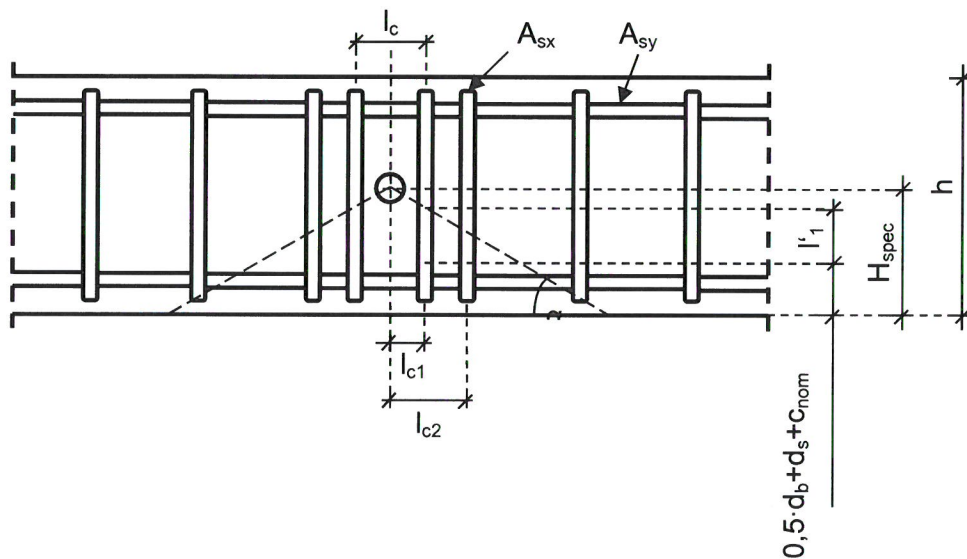
$$\phi A_{sy} \geq \phi A_{sx}$$

The maximum concrete cover c of the stirrups at the edge of the slab has to be less or equal 30 mm.

The distance of the longitudinal reinforcement bar to the edge of the slab has to be smaller than:

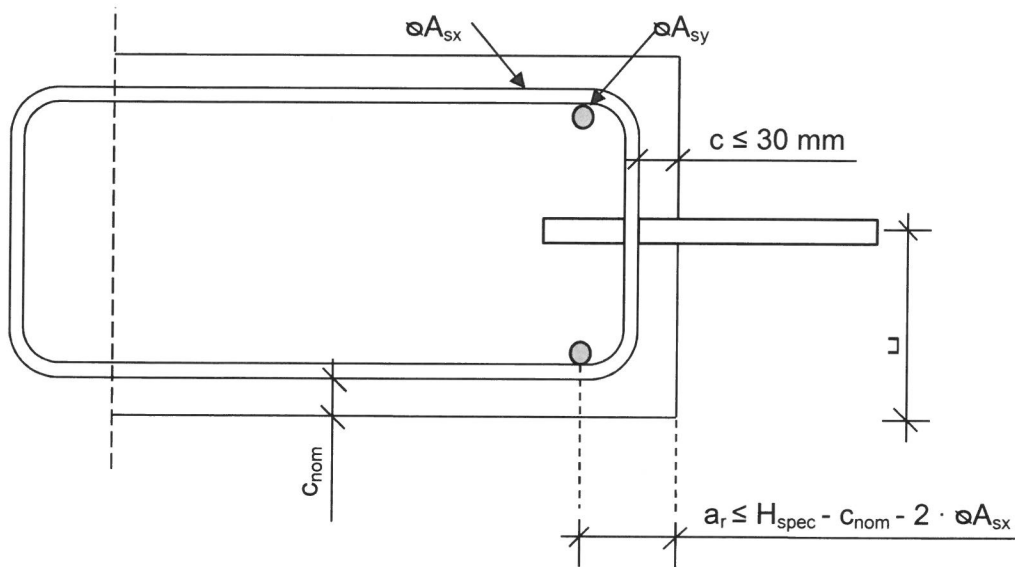
$$a_r \leq H_{spec} - c_{nom} - 2 \cdot \phi A_{sx}$$

Figure C2: Dimensions of the reinforcement close to the dowel



Schöck LD	Annex C1 of European Technical Assessment ETA-16/0545
Performances Mechanical resistance and stability of Schöck LD dowel connectors	

Figure C3: Dimensions of the reinforcement close to the dowel



Serviceability limit state

At serviceability load level the crack width in concrete is limited to 0,2 mm and the unevenness of surface between both sides of joint to 5 mm. This requirement can be fulfilled with the following equation as a 5%-fractile with a confidence level of 75%:

$$V_{Rd,SLs} = 0,78 \cdot V_{Rd,ce}$$

Schöck LD	Annex C1 of European Technical Assessment ETA-16/0545
Performances Mechanical resistance and stability of Schöck LD dowel connectors	

Classification of fire resistance in accordance with clause 7 of EN 13501-2

The element, loadbearing reinforced concrete floor or wall without separating function with Schöck LD dowels, sleeves and fire protection collars (Annex A6) is classified:

Fire resistance classification: R120

Schöck LD	Annex C2
Performances Classification of fire resistance	of European Technical Assessment ETA-16/0545