Deutsches Institut für Bautechnik

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Approval body for construction products and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and Laender Governments

Designated according to Article 29 of Regulation (EU) No 305/2011 and member of EOTA (European Organisation for Technical Assessment)

European Technical Assessment ETA-08/0230 of 14 May 2018

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the European Technical Assessment:	Deutsches Institut für Bautechnik
Trade name of the construction product	Highload Anchor SL
Product family to which the construction product belongs	Torque controlled expansion anchor made of galvanised steel of size M10 for use in non-cracked concrete
Manufacturer	MKT Metall-Kunststoff-Technik GmbH & Co. KG Auf dem Immel 2 67685 Weilerbach DEUTSCHLAND
Manufacturing plant	MKT Metall-Kunststoff-Technik GmbH & Co. KG Auf dem Immel 2 67685 Weilerbach Germany
This European Technical Assessment contains	11 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	EAD 330232-00-0601
This version replaces	ETA-08/0230 issued on 14 May 2013

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Specific Part

1 Technical description of the product

The Highload Anchor SL is an anchor made of galvanised steel which is placed into a drilled hole and anchored by torque-controlled expansion. The following anchor types are covered:

- Anchor type SL-B with threaded bolt,
- Anchor type SL-S with hexagon head screw,

The product description is given in Annex A.

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

The performances given in Section 3 are only valid if the anchor is used in compliance with the specifications and conditions given in Annex B.

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the anchor of at least 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, 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 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic resistance for static and quasi-static loading, displacements	See Annex C1 and C2
Characteristic resistance for seismic performance category C1 and C2, displacements	No performance assessed

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1
Resistance to fire	No performance assessed

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

In accordance with the European Assessment Document EAD 330232-00-0601 the applicable European legal act is: [96/582/EC].

The system to be applied is: 1

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

Issued in Berlin on 14 May 2018 by Deutsches Institut für Bautechnik

BD Dipl.-Ing. Andreas Kummerow
Head of Department

beglaubigt:
Lange

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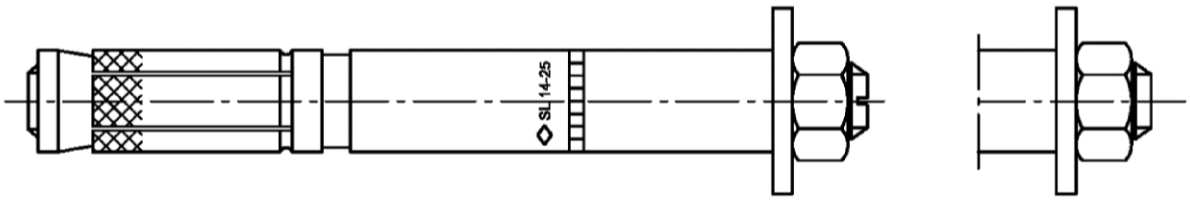
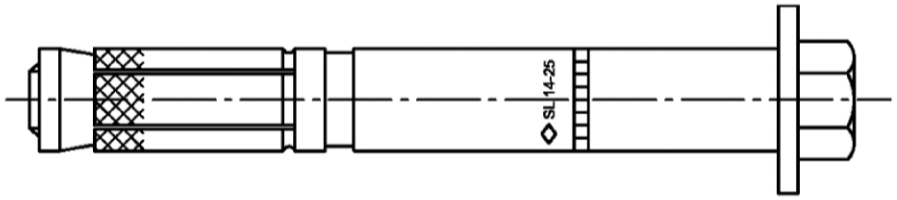
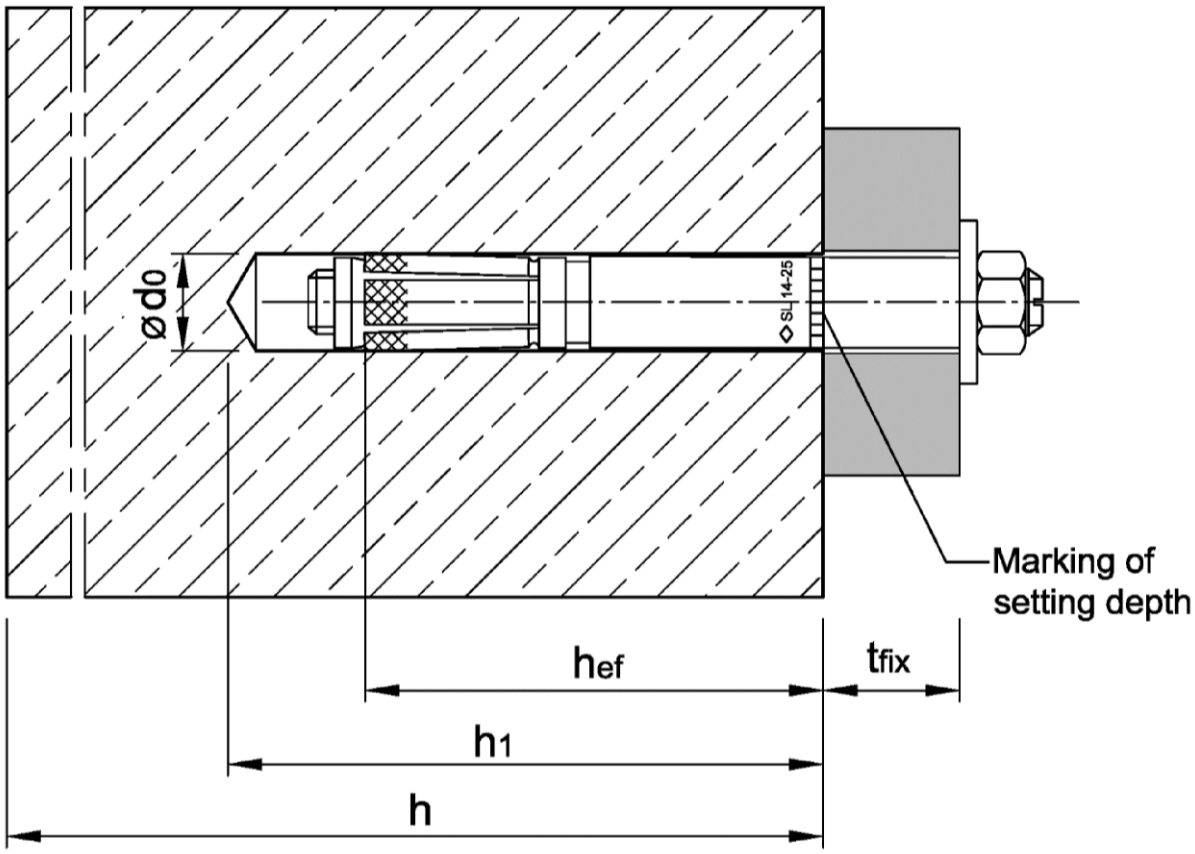
Anchor type SL-B with threaded bolt

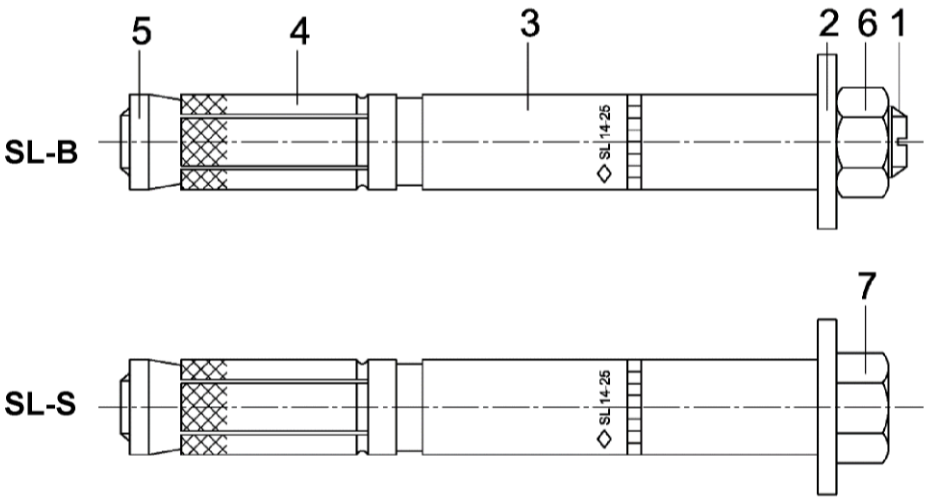


Anchor type SL-S with hexagon head screw





Highload Anchor SL	
Product description Installation situation	**Annex A1**



Marking (Distance sleeve):

e.g.: ◇ SL 14-25

◇ Identifying mark of Manufacturing plant

SL Anchor identity

14 Diameter

25 thickness of fixture

Table A1: Designation of anchor parts and materials

Part	Designation	Materials galvanised ≥ 5 µm, acc. to EN ISO 4042:1999
1	Threaded bolt	Steel, Strength class 8.8, EN ISO 898-1:2013
2	Washer	Steel, EN 10139:2016
3	Distance sleeve	Steel tube EN 10305-2:2016; EN 10305-3:2016;
4	Expansion sleeve	Steel tube EN 10305-2:2016; EN 10305-3:2016;
5	Threaded cone	Steel, EN 10083-2:2006
6	Hexagon nut	Steel, Strength class 8, EN ISO 898-2:2012
7	Hexagon head screw	Steel, Strength class 8.8, EN ISO 898-1:2013

Highload Anchor SL	**Annex A2**
Product description Anchor dimensions, marking and materials	

Specifications of intended use

Anchorages subject to:

- Static or quasi-static action

Base materials:

- Reinforced or unreinforced normal weight concrete without fibres of strength classes C20/25 to C50/60 according to EN 206:2013
- Uncracked concrete

Use conditions (Environmental conditions):

- Structures subject to dry internal conditions (zinc plated steel).

Design:

- Anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete work.
- Verifiable calculation notes and drawings are prepared taking account of the loads to be anchored. The position of the anchor is indicated on the design drawings (e.g. position of the anchor relative to reinforcement or to supports, etc.).
- Anchorages are designed according to FprEN 1992-4: 2016 and EOTA Technical Report TR 055.

Installation:

- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- Positioning of the drill holes without damaging the reinforcement
- In case of aborted hole: new drilling at a minimum distance away of twice the depth of the aborted hole or smaller distance if the aborted drill hole is filled with high strength mortar and if under shear or oblique tension load it is not in the direction of load application.
- Anchor installation such that the effective anchorage depth is complied with. This compliance is ensured, when the embedment mark of the anchor does no more exceed the concrete surface
- Drilling by hammer drill bit (use of vacuum drill bit is admissible)

Highload Anchor SL	
Intended use Specifications	**Annex B1**

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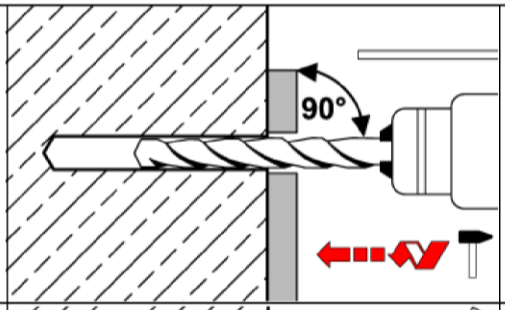
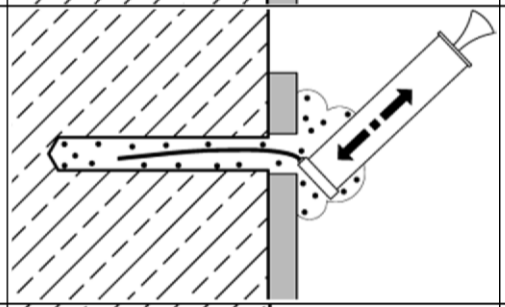
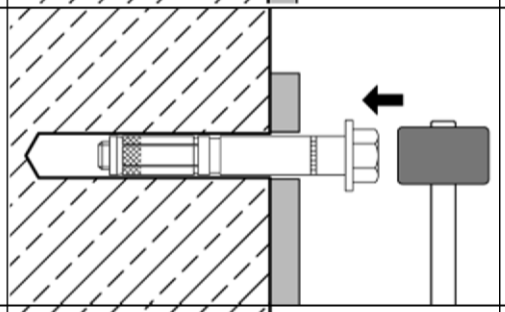
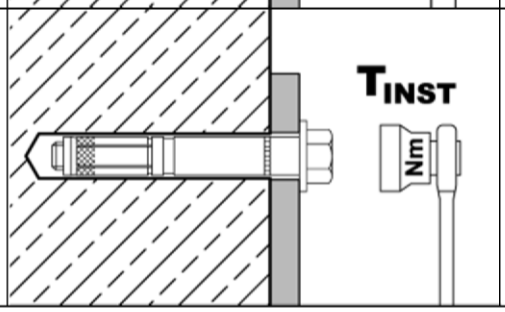
Installation instructions

1		Drill hole perpendicular to concrete surface. Using a vacuum drill bit, proceed with step 3.
2		Blow out dust. Alternatively vacuum clean down to the bottom of the hole.
3		Drive in anchor.
4		Apply tightening torque T_{inst} by using torque wrench.

Highload Anchor SL	
Intended use Installation instructions	**Annex B2**

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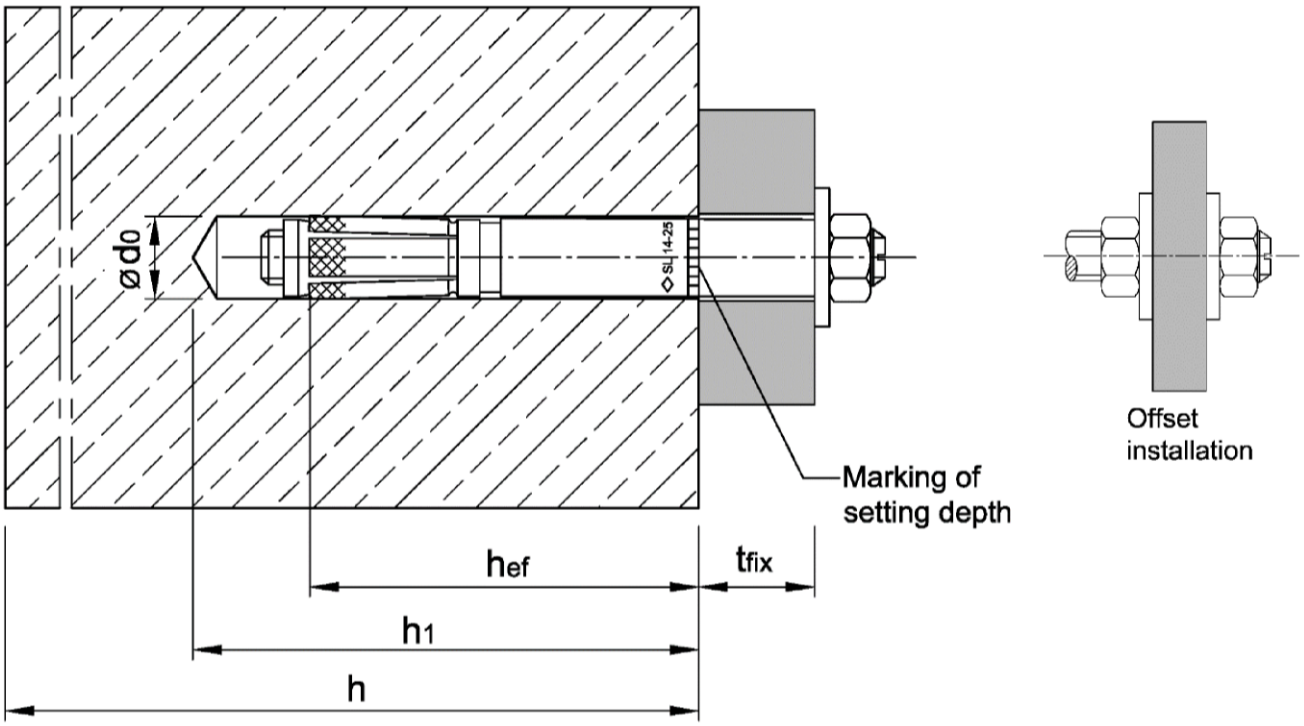
Table B1: Installation parameters

Anchor size			**14/M10**
Size of thread			M10
Effective anchorage depth	h_{ef}	[mm]	65
Nominal diameter of drill bit	d_0	[mm]	14
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	14,5
Depth of drill hole	$h_1 \geq$	[mm]	85
Diameter of clearance hole in the fixture mounted on distance sleeve	$d_f \leq$	[mm]	16
Diameter of clearance hole in the fixture mounted on threaded bolt	$d_f \leq$	[mm]	12
Installation torque	T_{inst}	[Nm]	50
Minimum thickness of member	h_{min}	[mm]	130
Minimum spacing	s_{min}	[mm]	60
Minimum edge distance	c_{min}	[mm]	120



Highload Anchor SL

Intended use
Installation parameters

Annex B3

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Table C1: Characteristic values for tension loads

Anchor size			**14/M10**
Installation factor	γ_{inst}	[-]	1,0
Steel failure			
Characteristic resistance	$N_{Rk,s}$	[kN]	46
Partial factor	γ_{Ms}	[-]	1,5
Pull-out failure			
Characteristic resistance in uncracked concrete C20/25	$N_{Rk,p}$	[kN]	20
Increasing factor for $N_{Rk,p}$	ψ_C	[-]	$\left(\frac{f_{ck}}{20}\right)^{0,5}$
Concrete cone failure			
Effective Anchorage depth	h_{ef}	[mm]	65
Spacing	$s_{cr,N}$	[mm]	3 h_{ef}
Edge distance	$c_{cr,N}$	[mm]	1,5 h_{ef}
Factor k_1	$k_{ucr,N}$	[-]	11,0
Splitting failure			
Characteristic resistance in uncracked concrete	$N^0_{Rk,sp}$	[kN]	min $[N_{Rk,p};N^0_{Rk,c}]$
Spacing	$s_{cr,sp}$	[mm]	6 h_{ef}
Edge distance	$c_{cr,sp}$	[mm]	3 h_{ef}

Table C2: Displacements under tension loads

Anchor size			**14/M10**
Tension load in uncracked concrete	N	[kN]	9,5
Displacement	δ_{N0}	[mm]	0,3
	$\delta_{N\infty}$	[mm]	0,6

Highload Anchor SL

Performance
Characteristic values and displacements under **tension load**

Annex C1

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Table C3: Characteristic values for shear loads

Anchor size			**14/M10**
Steel failure without lever arm			
Characteristic resistance, fixture mounted on distance sleeve with $t_{fix} \leq 75$ mm	$V^0_{Rk,s}$	[kN]	32,8
Characteristic resistance, fixture mounted on distance sleeve with $t_{fix} > 75$ mm	$V^0_{Rk,s}$	[kN]	23,2
Factor	k_7	[-]	1,0
Partial factor	γ_{Ms}	[-]	1,25
Steel failure with lever arm			
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	60
Partial factor	γ_{Ms}	[-]	1,25
Concrete pry-out failure			
Factor	k_8	[-]	2,0
Concrete edge failure			
Effective length of anchor in shear loading	l_f	[mm]	65
Outside diameter of anchor	d_{nom}	[mm]	14

Table C4: Displacements under shear loads

Anchor size			**14/M10**
Shear load in uncracked concrete	V	[kN]	13,2
Displacement	δ_{V0}	[mm]	2,2
	$\delta_{V\infty}$	[mm]	3,3

Highload Anchor SL	
Performance Characteristic values and displacements under **shear load**	**Annex C2**