Deutsches Institut für Bautechnik

Approval body for construction products and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and Laender Governments

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

European Technical Assessment

ETA-13/0441 of 14 July 2014

General Part

Technical Assessment Body issuing the European Technical Assessment:	Deutsches Institut für Bautechnik
Trade name of the construction product	Sormat Drop in anchor LA+ and LAL+
Product family to which the construction product belongs	Deformation-controlled expansion anchor in the size of M6, M8 and M10 for multiple use for non-structural applications in concrete
Manufacturer	Sormat Oy Harjutie 5 21290 RUSKO FINNLAND
Manufacturing plant	Sormat Werk 7
This European Technical Assessment contains	13 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 "Metal anchors for use in concrete", ETAG 001 Part 6: "Anchors for multiple use for non-structural applications", Edition August 2010, used as European Assessment Document (EAD) according to Article 66 Paragraph 3 of Regulation (EU) No 305/2011.
This version replaces	ETA-13/0441 issued on 21 June 2013

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Specific Part

1 Technical description of the product

The Sormat Drop in anchor LA+ and LAL+ in sizes M6, M8 and M10 is an anchor made of zinc-plated steel which is placed into a drilled hole and anchored by deformation-controlled expansion.

The description of the product 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 tension and shear loads	See Annex C1
Edge distances and spacing	See Annex C1
Characteristic resistance for bending moments	See Annex C1

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Anchorages satisfy requirements for Class A1
Resistance to fire	See Annex C2

3.3 Hygiene, health and the environment (BWR 3)

Regarding dangerous substances there may be requirements (e.g. transposed European legislation and national laws, regulations and administrative provisions) applicable to the products falling within the scope of this European Technical Assessment. In order to meet the provisions of Regulation (EU) No 305/2011, these requirements need also to be complied with, when and where they apply.

3.4 Safety and accessibility (BWR 4)

The essential characteristics regarding Safety in use are included under the Basic Works Requirement Mechanical resistance and stability.

3.5 Protection against noise (BWR 5)

Not applicable.

3.6 Energy economy and heat retention (BWR 6)

Not applicable.

3.7 Sustainable use of natural resources (BWR 7)

The sustainable use of natural resources was not investigated.

3.8 General aspects

The verification of durability is part of testing the essential characteristics. Durability is only ensured if the specifications of intended use according to Annex B are taken into account.

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

According to Decision of the Commission of 24 June 1996 (96/582/EC) (Official Journal of the European Communities L 254 of 08.10.1996, p. 62–65) the system of assessment and verification of constancy of performance (see Annex V and Article 65 Paragraph 2 to Regulation (EU) No 305/2011) given in the following table applies.

Product	Intended use(s)	Level or class	System
Metal anchors for use in concrete	For fixing and/or supporting concrete structural elements or heavy units such as cladding and suspended ceilings	—	2+

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

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

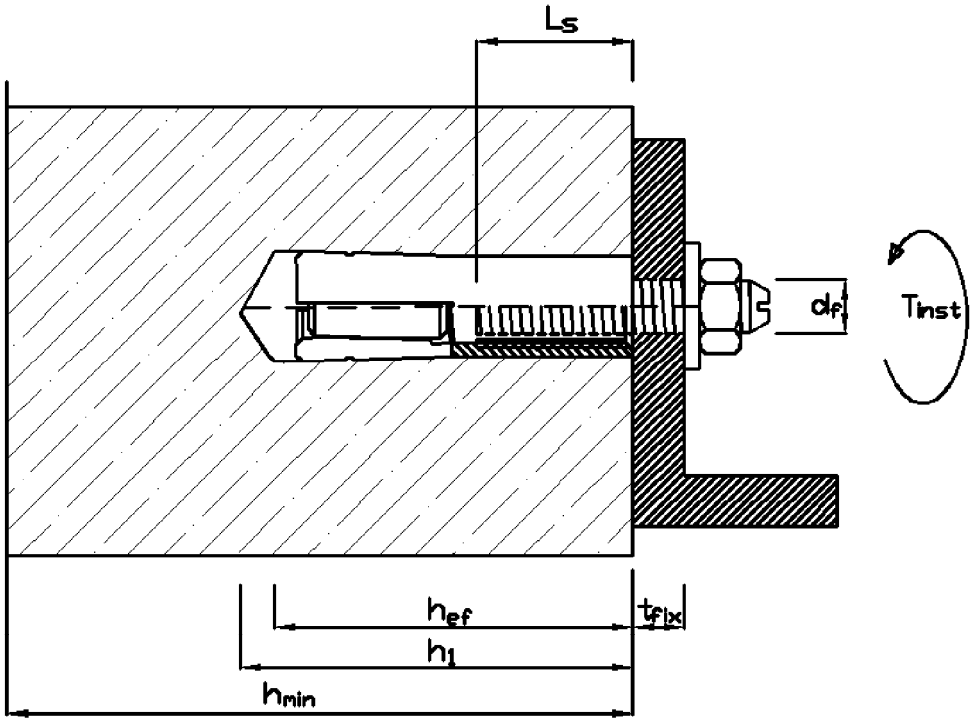
Issued in Berlin on 14 July 2014 by Deutsches Institut für Bautechnik

Uwe Bender
Head of Department

beglaubigt:
Tempel

Deutsches Institut für Bautechnik

LA+ after installation in concrete C20/25 – C50/60



h_1	=	depth of drill hole
h_{ef}	=	effective anchorage depth
t_{fix}	=	thickness of fixture
L_s	=	length of thread inside of the anchor
T_{inst}	=	max. installation torque

Sormat Drop in anchors LA+ and LAL+	**Annex A1**
Product description Installed condition	

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Sormat Drop in anchor LA+ and LAL+

LA+ without collar

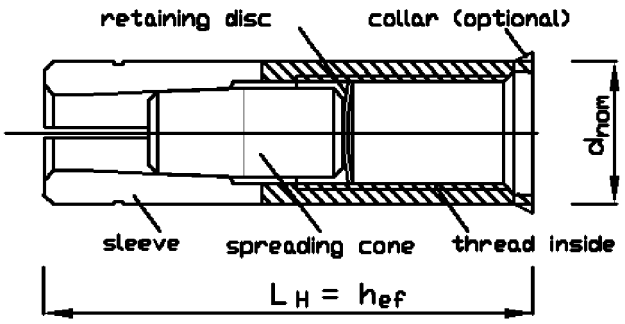
LAL+ with collar

marking: brand marking, type, size — Logo or company, LA+ / LAL+, i.e. 10

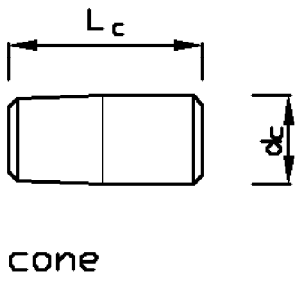
Example:

LA+ 10

LAL+ 10



Sleeve plus cone



cone

Table 1: Dimensions

Anchor		Sleeve		Cone	
	thread inside	length	outer-Ø sleeve	length	outer-Ø cone
type		L_s	d_{nom}	L_C	d_C
LA(L)+		[mm]	[mm]	[mm]	[mm]
M 6 x 25	M6	25	8	10	4,5
M 8 x 30	M8	30	10	12	6
M10 x 40	M10	40	12	16	7,5

Sormat Drop in anchors LA+ and LAL+	**Annex A2**
Procuct description Parts, marking and dimensions	

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Table 2: Designation and materials

Designation	Material
sleeve M6, M8	steel for cold forming C1008-C1012 or EN 10277
sleeve M10	steel for cold forming C1015 or EN 10277
spreading cone	steel for cold forming C1006-1008
retaining disc	paper or plastics

all parts zinc plated and blue passivated ≥ 5 µm acc. EN ISO 4042

Table 3: Strength

Sormat Drop in anchor LA(L)+			Size		
			M6	M8	M10
Nominal characteristic steel ultimate strength	f_{uk}	[N/mm²]	485	485	485
Nominal characteristic steel yield strength	f_{yk}	[N/mm²]	535	535	535

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Handsetting tool

Optional: setting tool with marking and/or rubber grip possible

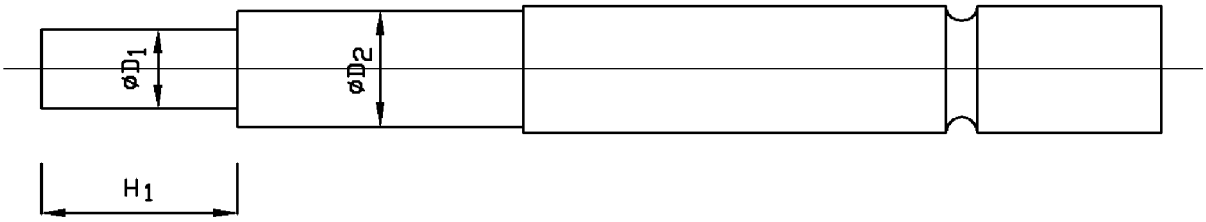

Table 4: Geometry of the setting tool

Setting tool	Setting pin		
steel HRc 38-42	dimension		
Type	D_1	D_2	H_1
	[mm]	[mm]	[mm]
ESW 6	5	7,5	15
ESW 8	6,6	9,5	17,5
ESW 10	8,3	12	23,5

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Specifications of intended use

Anchorages subject to:
- Static and quasi-static loads,
- Used only for multiple use for non-structural applications. The definition of multiple use according to the Member States is given in the informative Annex 1 of ETAG 001, Part 6,
- Used for anchorages with requirements related to resistance to fire.

Base materials:
- Reinforced or unreinforced normal weight concrete according to EN 206-1:2000-12,
- Strength classes C20/25 to C50/60 according to EN 206-1:2000-12,
- Non-cracked and cracked concrete.

Use conditions (Environmental conditions):
- Structures subject to dry internal conditions.

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 in accordance with ETAG 001, Annex C, design method B, Edition August 2010,
- In case of requirements to resistance to fire local spalling of the concrete cover must be avoided.

Installation:
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site,
- Check of concrete being well compacted, e.g. without significant voids,
- 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.

Sormat Drop in anchors LA+ and LAL+	**Annex B1**
Intended use Specifications	

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Table 5: Installation data

Fixing screws or anchor rods:
It can be used the strength categories 4.6, 5.6, 5.8 or 8.8 acc. EN ISO 898-1.

Minimal screwing depth:
The lenght of the fixing screw depends on the thickness t_{fix} on the fixed part, permissible tolerances and usable thread length $L_{s,max}$ as well as on the minimal screwing depth $L_{s,min}$.

Sormat Drop in anchor LA(L)+			Size		
			M6	M8	M10
nominal driller diameter	d_0	[mm]	8	10	12
Cutting diameter of drillbit	$d_{cut} \leq$	[mm]	8,45	10,45	12,50
diameter of thread inside	M	[mm]	6	8	10
depth of drill hole (deepest point)	$h_1 \geq$	[mm]	27	32	43
effective anchorage depth	h_{ef}	[mm]	25	30	40
Maximum screwing depth	$L_{s,max}$	[mm]	11	13	16
Minimum screwing depth	$L_{s,min}$	[mm]	6	8	10
diameter of clearance hole in the fixture	$d_f \leq$	[mm]	7	9	12
Maximum installation torque moment	max T_{inst}	[Nm]	4	8	15

Table 6: Minimum thickness of concrete member, spacing and edge distance

Sormat Drop in anchor LA(L)+			Size		
			M6	M8	M10
minimum thickness of member	h_{min}	[mm]	100	100	100
minimum spacing	s_{min}	[mm]	70	105	105
minimum edge distance	c_{min}	[mm]	105	105	140

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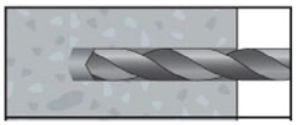
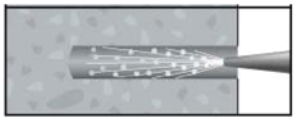
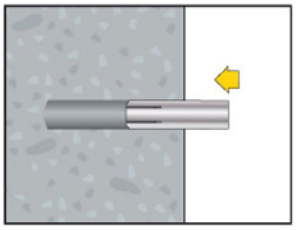
Installation instruction:



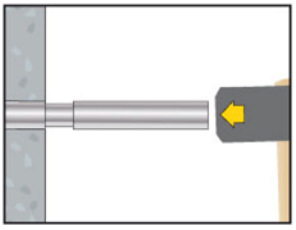
1. Drill the hole with a hammer drill



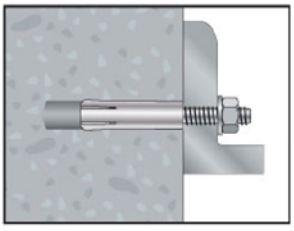
2. Clean the borehole



3. To set the anchor by hand or by hammer blows, anchor should be flush to the concrete edge



4. To spread the anchor with the setting tool. The anchor is installed correctly, if the setting pin is completely inside



5. To fix the fixture, not allowed to pass over the max. installation torque T_{inst}

Sormat Drop in anchors LA+ and LAL+	**Annex B3**
Intended use Installation instruction	

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Table 7: Design method B - Characteristic values of resistance

Sormat Drop in anchor LA+ and LAL+				Size		
Any load direction				**M6**	**M8**	**M10**
Characteristic resistance in concrete C20/25 - C 50/60	F^0_{Rk}	[kN]	≥ Steel 4.6	1,5	3,0	7,5
partial safety factor	γ_2	[-]		1,4	1,2	
Characteristic spacing	s_{cr}	[mm]		80	120	240
Characteristic edge distance	c_{cr}	[mm]		40	60	120
Steel failure with lever arm						
Characteristic bending moment	$M^0_{Rk,s}$	[Nm]	Steel 4.6	6,1	15,0	29,9
Characteristic bending moment	$M^0_{Rk,s}$	[Nm]	Steel 5.6	7,6	18,7	37,4
Characteristic bending moment	$M^0_{Rk,s}$	[Nm]	Steel 5.8	7,6	18,7	37,4
Characteristic bending moment	$M^0_{Rk,s}$	[Nm]	Steel 8.8	12,2	30,0	59,8

Sormat Drop in anchors LA+ and LAL+

Annex C1

Performances
Characteristic values of resistance (ETAG 001, Annex C, design method B)

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Table 8: Characteristic values of resistance under fire exposure in any load direction for use in concrete C20/25 – C50/60

Sormat Drop in anchor LA+ and LAL+					**Size**		
Fire resistance class					**M6**	**M8**	**M10**
R 30	Characteristic resistance	$F_{Rk,fi}$	[kN]	≥Steel 4.6	0,2	0,3	0,6
R 60	Characteristic resistance	$F_{Rk,fi}$	[kN]	≥Steel 4.6	0,2	0,3	0,5
R 90	Characteristic resistance	$F_{Rk,fi}$	[kN]	≥Steel 4.6	0,2	0,2	0,4
R 120	Characteristic resistance	$F_{Rk,fi}$	[kN]	≥Steel 4.6	0,1	0,2	0,3
Spacing and edge distance under fire exposure							
Spacing distance for R 30 – R 120		$s_{cr,fi}$	[mm]		100	120	160
Edge distance for R 30 – R 120		$c_{cr,fi}$	[mm]		50	60	80
The edge distance shall be ≥ 300 mm, in case of fire attack from more than one side.							