



LA+



LAL+



LAH

PRODUCT DATA SHEET

DROP IN ANCHORS

SINGLE ANCHOR USE FOR NON-CRACKED CONCRETE

LA+, LAL+, LAH DROP IN ANCHORS



www.sormat.com



facebook.com/sormat



youtube.com/sormatfixing

ETA-approved drop in anchors ideal for suspension systems

Internal thread for metric bolts and rods

Internal thread for
metric bolts and rods

Zinc plated

Drop in anchor
with ETA approval

For medium
heavy loads

Sormat mark
in anchor

Suitable for
pre-installations

DROP IN ANCHORS LA, LA+, LAL+ AND LAH

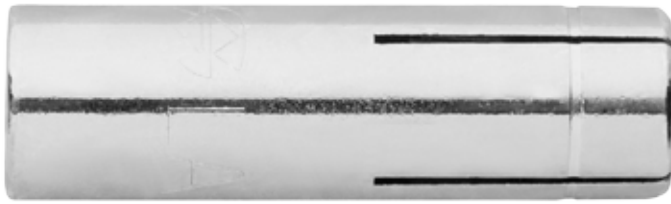
Description

- Drop in anchors for pre-installations with an installation tool
- Internal thread for metric bolts and rods
- Suitable bolt length is 1-1,5 x the nominal size of the anchor + fixture thickness
- Suitable for medium heavy loads
- Displacement controlled expansion anchors
- Fixing screws or anchor rods
 - Steel grade categories 4.6, 5.6, 5.8 or 8.8 acc. EN ISO 898-1
 - Stainless steel A4-50, A4-70, A4-80

ETA/CE

LA / LA+

Zinc plated drop in anchor without a collar



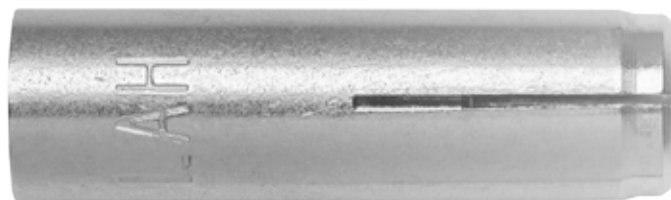
LAL+

Zinc plated drop in anchor with a collar



LAH

Stainless steel drop in anchor without a collar



Base materials

Approved for



Non-cracked
concrete



Cracked
concrete
(See PDS of
multiple use)

Also suitable for



Solid
clay brick



Natural
stone



Hollow
concrete slab
(LAL+)

Approvals / Cerfications / Applications

Description of document		Authority/ Laboratory	ID	Additional info
European Technical Approval		Deutsches Institut für Bautechnik	ETA-13/0442	ETAG 001-1
Sormat Trustfix anchor calculation software		Sormat Oy / S&P Software Consulting		TrustFIX anchor calculation
Drop in anchors CAD-blocks for AutoCAD		Sormat Oy		Blocks installation instructions for AutoCAD
Drop in anchor components for TEKLA Structures		Sormat Oy		Tekla structures components + instructions video
YouTube installation videos		Sormat Oy		Drop in anchor presentation video

Static and quasi-static loads for LA, LA+, LAL+

The data of these tables is based on:

- ETA-13/0442
- Non-cracked concrete C20/25, $f_{ck,cube} = 25 \text{ N/mm}^2$
- Installation has been done correctly (see page 8)
- No influence of edge- and spacing distances (see page 11)
- Respect of minimum base material thickness (see page 11)
- Load values are based on screw or rod with steel grade 4.6

Characteristic resistances

Anchor size	LA+ / LAL+					LA
	M6 x 25	M8 x 30	M10 x 40	M12 x 50	M16 x 65	M20 x 80
Approval	-	OPT 7	OPT 7	OPT 7	OPT 7	-
Effective anchorage depth h_{ef} [mm]	25	30	40	50	65	80
Non-cracked concrete						
Tensile N_{Rk} [kN]	5,8	7,5	12,0	16,0	26,5	36,1
Shear V_{Rk} [kN]	4,0*	7,3*	9,5*	15,4*	25,7*	49,0*

* Failure mode = STEEL

Design resistances

Anchor size	LA+ / LAL+					LA
	M6 x 25	M8 x 30	M10 x 40	M12 x 50	M16 x 65	M20 x 80
Approval	-	OPT 7	OPT 7	OPT 7	OPT 7	-
Effective anchorage depth h_{ef} [mm]	25	30	40	50	65	80
Non-cracked concrete						
Tensile N_{Rd} [kN]	2,7	5,0	6,7	8,8	14,7	16,7
Shear V_{Rd} [kN]	2,4*	4,3*	6,3*	10,2*	17,1*	29,4*

* Failure mode = STEEL

Recommended loads

Anchor size	LA+ / LAL+					LA
	M6 x 25	M8 x 30	M10 x 40	M12 x 50	M16 x 65	M20 x 80
Approval	-	OPT 7	OPT 7	OPT 7	OPT 7	-
Effective anchorage depth h_{ef} [mm]	25	30	40	50	65	80
Non-cracked concrete						
Tensile N_{rec} [kN]	1,9	3,6	4,8	6,3	10,5	11,9
Shear V_{rec} [kN]	1,7*	3,1*	4,5*	7,3*	12,2*	21,0*

* Failure mode = STEEL

The partial safety factor for action is $\gamma = 1.4$.

Static and quasi-static loads for single anchor LAH

The data of these tables is based on:

- Non-cracked concrete C20/25, $f_{ck,cube} = 25 \text{ N/mm}^2$
- Installation has been done correctly (see page 8)
- No influence of edge- and spacing distances (see page 11)
- Respect of minimum base material thickness (see page 11)
- Load values are based on screw or rod with steel strength A4-50

Characteristic resistances

Anchor size	LAH					
	M6 x 25	M8 x 30	M10 x 40	M12 x 50	M16 x 65	M20 x 80
Approval	-	-	-	-	-	-
Effective anchorage depth h_{ef} [mm]	25	30	40	50	65	80
Non-cracked concrete						
Tensile N_{Rk} [kN]	6,3	8,3	9,2	17,8	24,8	36,1
Shear V_{Rk} [kN]	5,0*	9,2*	14,5*	21,1*	39,3*	61,3*

* Failure mode = STEEL

Design resistances

Anchor size	LAH					
	M6 x 25	M8 x 30	M10 x 40	M12 x 50	M16 x 65	M20 x 80
Approval	-	-	-	-	-	-
Effective anchorage depth h_{ef} [mm]	25	30	40	50	65	80
Non-cracked concrete						
Tensile N_{Rd} [kN]	2,9	3,8	4,2	8,2	11,5	16,7
Shear V_{Rd} [kN]	2,1*	3,9*	6,1*	8,9*	16,5*	25,8*

* Failure mode = STEEL

Recommended loads

Anchor size	LAH					
	M6 x 25	M8 x 30	M10 x 40	M12 x 50	M16 x 65	M20 x 80
Approval	-	-	-	-	-	-
Effective anchorage depth h_{ef} [mm]	25	30	40	50	65	80
Non-cracked concrete						
Tensile N_{rec} [kN]	2,1	2,7	3,0	5,9	8,2	11,9
Shear V_{rec} [kN]	1,5*	2,8*	4,4*	6,3*	11,8*	18,4*

* Failure mode = STEEL

The partial safety factor for action is $\gamma = 1.4$.

Material quality and coating

Anchor	
LA / LA+ / LAL+	Cold formed steel, Zinc electroplated min. 5 µm
LAH	Stainless steel A4

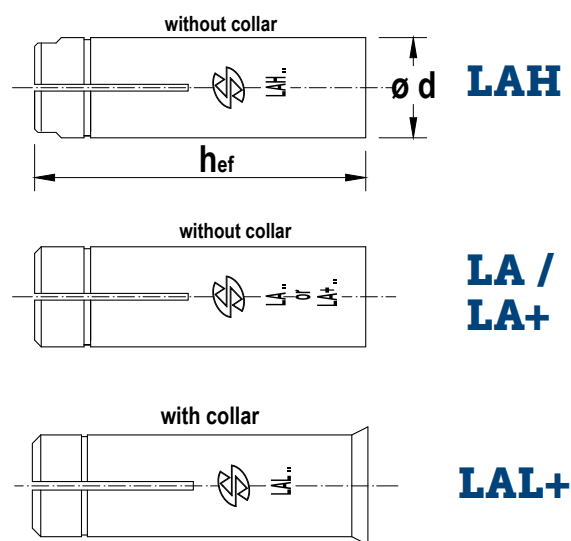
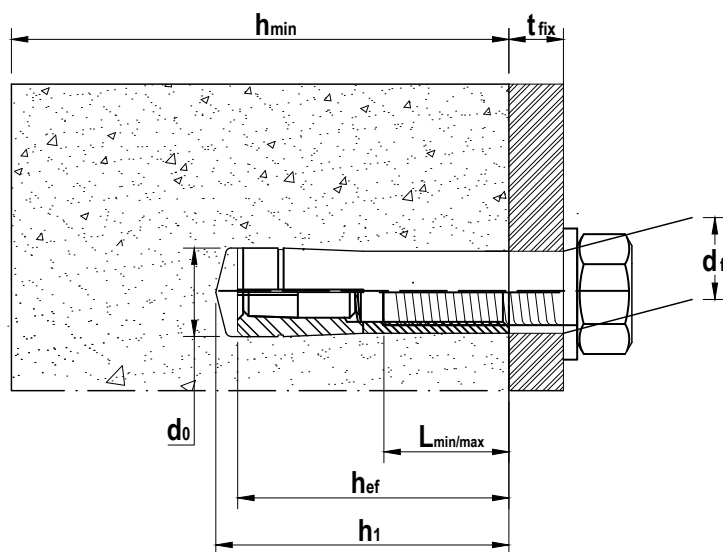
Mechanical properties

Specification					M6	M8	M10	M12	M16	M20
Characteristic bending resistance	$M_{Rk,s}^0$	Screw/ Rod	4.6	[Nm]	6,1	15,0	29,9	52,4	132,8	259,6
			A4-50		7,6	18,7	37,4	65,5	166,5	324,5
Design bending resistance	$M_{Rd,s}$	Screw/ Rod	4.6	[Nm]	3,7	9,0	17,9	31,4	79,5	155,8
			A4-50		3,2	7,9	15,7	27,5	69,9	136,3
Recommended bending resistance	M_{rec}	Screw/ Rod	4.6	[Nm]	2,6	6,4	12,8	22,5	56,8	111,3
			A4-50		2,3	5,6	11,2	19,7	49,9	97,4

Installation

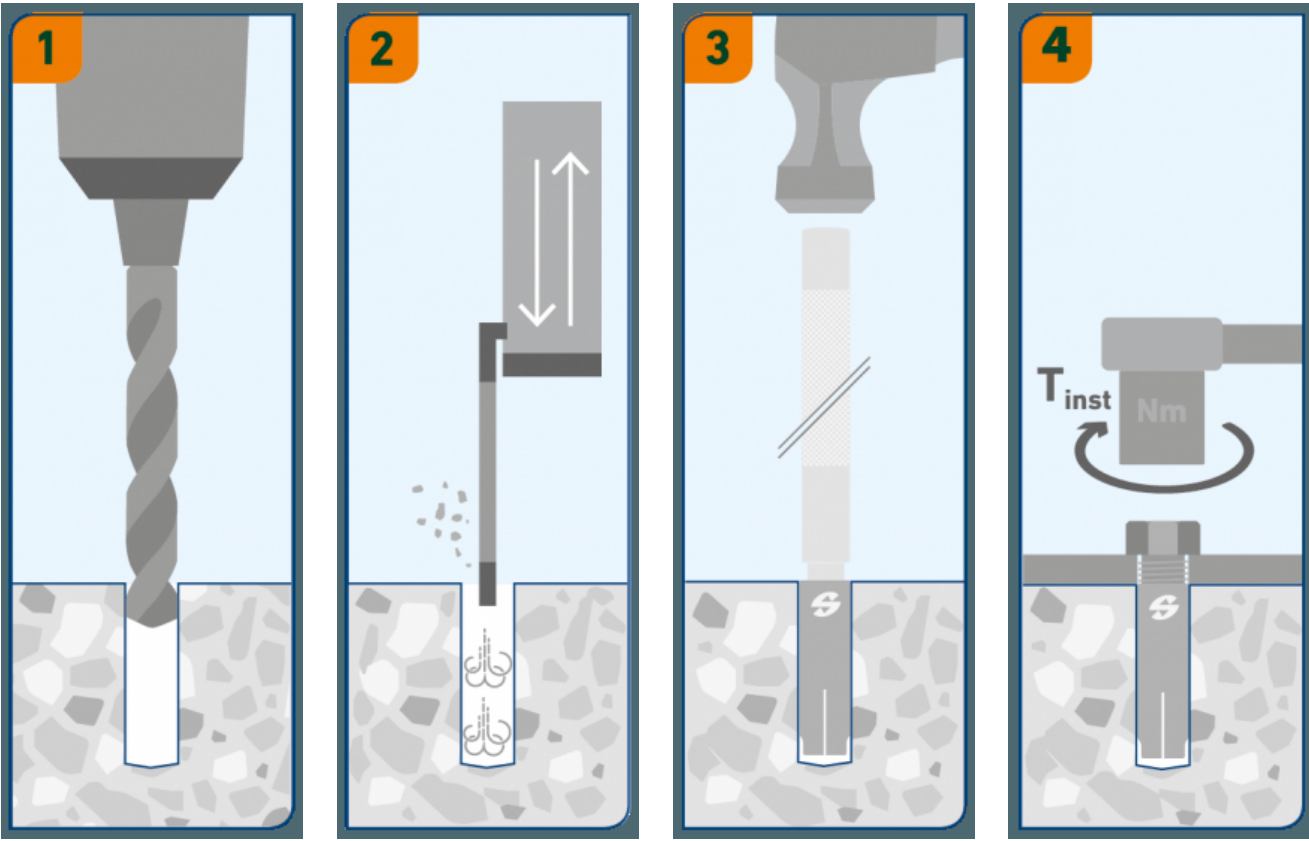
Installation data and anchor dimensions

Parameters and anchors sizes			M6 x 25	M8 x 30	M10 x 40	M12 x 50	M16 x 65	M20 x 80
Anchor outer diameter	d	[mm]	8	10	12	15	20	25
Drill hole diameter	d ₀	[mm]	8	10	12	15	20	25
Anchorage depth	h_{ef} / h_{nom}	[mm]	25	30	40	50	65	80
Depth of drilled hole to deepest point	$h_1 \geq$	[mm]	27	32	43	54	70	84
Diameter of the drill bit at the upper tolerance limit	$d_{cut,max} \leq$	[mm]	8,45	10,45	12,50	16,50	20,55	25,55
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	7	9	12	14	18	22
Max installation torque moment	T _{inst}	[Nm]	4	8	15	35	60	100
Maximum screwing depth LA/LA+/LAL+	L _{max}	[mm]	10	13	17	21	27	37
Maximum screwing depth LAH	L _{max}	[mm]	11	13	17	21	30	30
Minimum screwing depth	L _{min}	[mm]	6	8	10	12	16	20



Installation equipment

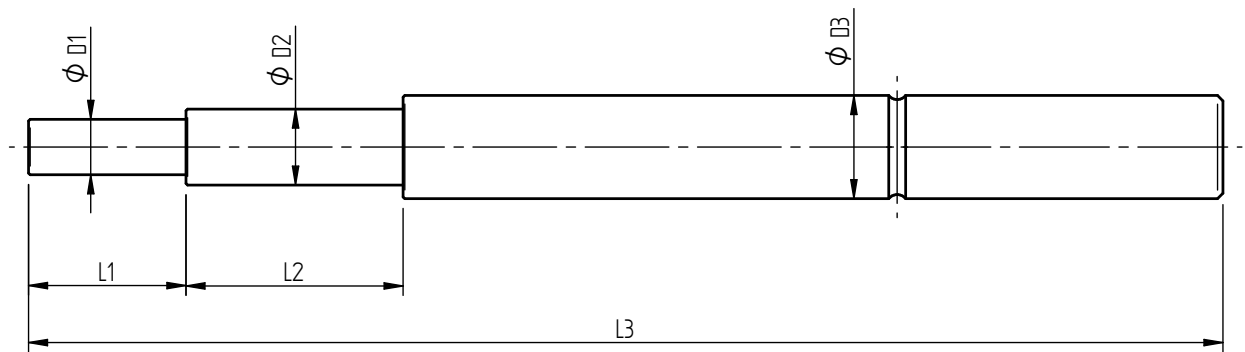
Specification	M6 x 25	M8 x 30	M10 x 40	M12 x 50	M16 x 65	M20 x 80
Drill bit	SDS+ 2-CUT or 4-CUT					
	8	10	12	15	20	25
Rotary hammer	750...1200 r.p.m / 1.8 ...3.3 J					
					360...550 r.p.m / 4,9 ...11,5 J	
Additional tools	Air pump/compressor, LT+ or LT+ PRO Punch tool, hammer, torque wrench					



Installation

Setting tools

Anchor		M6 x 25	M8 x 30	M10 x 40	M12 x 50	M16 x 65	M20 x 80
Hardened carbon steel	Tool	LT+ 6	LT+ 8	LT+ 10	LT+ 12	LT+ 16	LT 20
		LT+ 6 PRO	LT+ 8 PRO	LT+ 10 PRO	LT+ 12 PRO	LT+ 16 PRO	-
D1	[mm]	5	6,6	8,3	10,2	13,9	16,5
D2	[mm]	7,5	9,5	12	14	19	23
D3	[mm]	12	12	12	19	19	25
L1	[mm]	15	17,5	23,5	29	39	51
L2	[mm]	35	40	0	40	0	20
L3	[mm]	220	220	220	220	240	210



LT+ PRO



LT+



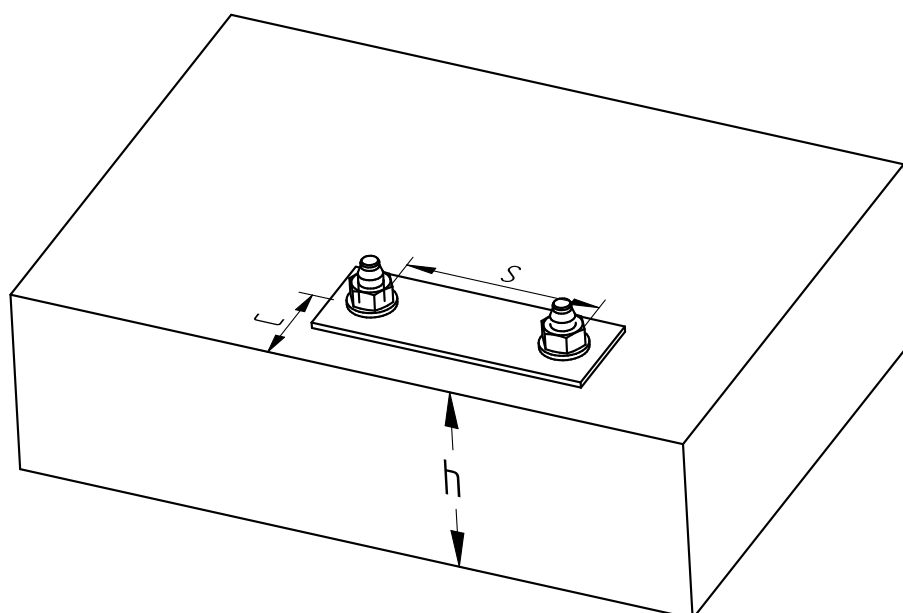
Minimum thickness of concrete member, spacing and edge distance

LA/LA+/LAL+

Non-cracked concrete			M6 x 25	M8 x 30	M10 x 40	M12 x 50	M16 x 65	M20 x 80
Approval			-	OPT 7	OPT 7	OPT 7	OPT 7	-
Anchorage depth	$h_{ef} = h_{nom}$	[mm]	25	30	40	50	65	80
Minimum thickness of base material	h_{min}	[mm]	100	100	100	120	160	120
Minimum spacing	s_{min}	[mm]	70	105	105	125	180	240
Minimum edge distance	c_{min}	[mm]	105	105	140	175	230	280
Critical spacing for splitting failure and concrete cone failure (in case characteristic loading affects)	$s_{cr, sp}$	[mm]	NA	210	280	350	460	NA
	$s_{cr, N}$	[mm]	80	90	120	150	195	240
Critical edge distance for splitting failure and concrete cone failure (in case characteristic loading affects)	$c_{cr, sp}$	[mm]	NA	105	140	175	230	NA
	$c_{cr, N}$	[mm]	40	45	60	75	98	120

LAH

Non-cracked concrete			M6 x 25	M8 x 30	M10 x 40	M12 x 50	M16 x 65	M20 x 80
Approval			-	-	-	-	-	-
Anchorage depth	$h_{ef} = h_{nom}$	[mm]	25	30	40	50	65	80
Minimum thickness of base material	h_{min}	[mm]	100	100	100	120	160	120
Minimum spacing	s_{min}	[mm]	70	130	105	125	180	240
Minimum edge distance	c_{min}	[mm]	105	105	140	175	230	280
Critical spacing for splitting failure and concrete cone failure (in case characteristic loading affects)	$s_{cr, sp}$	[mm]	NA	210	280	350	460	NA
	$s_{cr, N}$	[mm]	80	90	120	150	195	240
Critical edge distance for splitting failure and concrete cone failure (in case characteristic loading affects)	$c_{cr, sp}$	[mm]	NA	105	140	175	230	NA
	$c_{cr, N}$	[mm]	40	45	60	75	98	120



Delivery program



Size	Length	ETA		Zinc	Zinc	A4
M6 x 25	25	-	PART 6 OPT 7	LA+ 6	LAL+ 6	LAH 6 *
M8 x 30	30			LA+ 8	LAL+ 8	LAH 8 *
M10 x 40	40			LA+ 10	LAL+ 10	LAH 10 *
M12 x 50	50			LA+ 12	LAL+ 12	LAH 12 *
M16 x 65	65			LA+ 16	LAL+ 16	LAH 16 *
M20 x 80	80	-		LA 20 *		LAH 20 *

* No ETA

LT+ PRO



LT+

