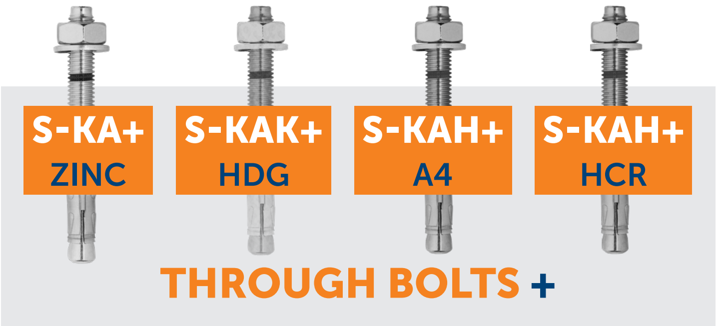
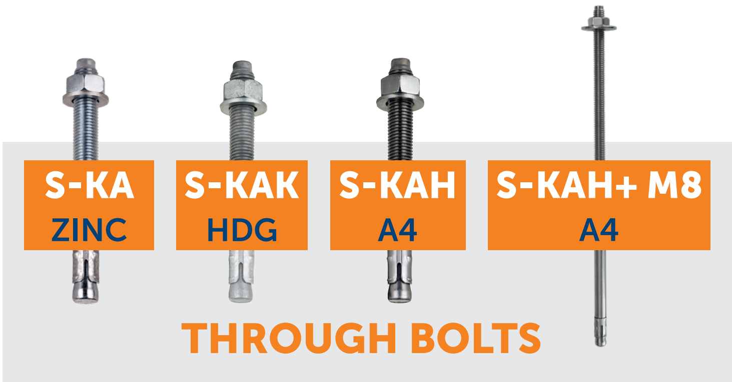
SORMAT

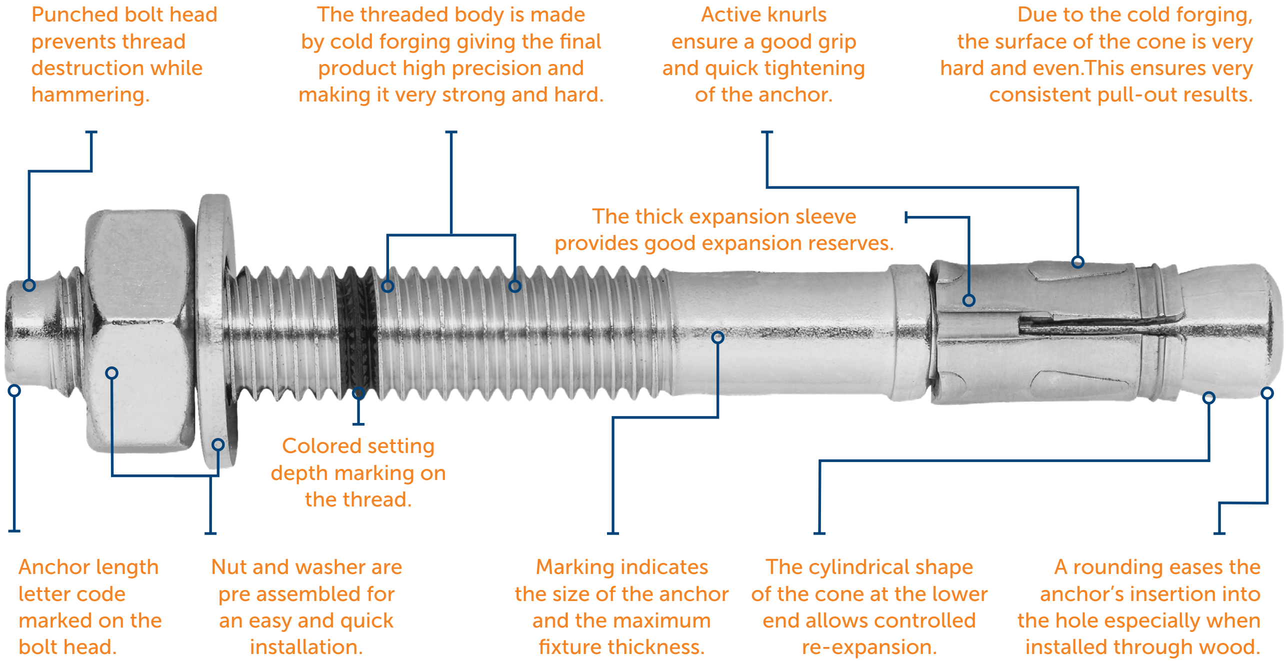
THROUGH BOLTS

PRODUCT DATA SHEET





High performance through bolts+ for fixing in cracked and non-cracked concrete



THROUGH BOLTS

The through bolt is a torque-controlled expansion anchor for use in cracked and non-cracked concrete. The anchor is preassembled and can be installed directly through the fixture.

Available in

- Zinc electroplated steel for indoor and dry applications.
- Hot dip galvanized steel anchors may be used indoor and outdoor in concrete subject to dry internal conditions and to external atmospheric condition C1 - CX according to EAD 330232-01-0601-v01.
- Stainless steel for outdoor applications subject to humidity, as well as installation in industrial and maritime environments.
- HCR stainless steel for aggressive conditions, chloride atmosphere and atmosphere with chemical pollution such as tunnels, swimming pools etc.

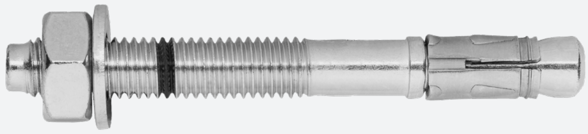
Benefits

- Fixing in cracked and non-cracked concrete, also suitable for natural stone
- Torque-controlled expansion anchors for pre-, push-through and distance installations
- When torque is applied the expansion clip expands developing frictional grip into the hole.
- Anchor diameter and max. fixture thickness marked on the body (optional).
- Anchor length letter code marked on the bolt head.
- Colored setting depth marking for the deeper anchorage depth on the thread.
- Variable range of coatings and materials such a ZP, HDG, A4 and HCR 1.4529 which supports for anchor selecting in different applications
- Sormat Through bolts are manufactured reliably in Finland since 1970s

High performance through bolts+ for fixing in cracked and non-cracked concrete

S-KA+ carbon steel

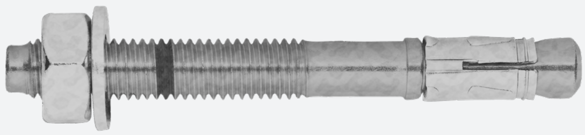
Zinc electroplated acc. EN ISO 4042, t ≥ 5 µm



Dry indoor conditions, indoor with temporary condensation.

S-KAK+ carbon steel

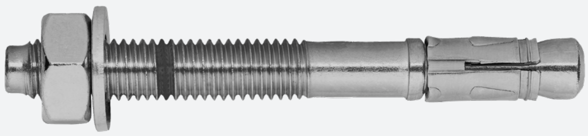
Hot dip galvanized acc. EN ISO 10684, t ≥ 50 µm



Indoor and outdoor use, durability based on corrosivity category C1 – CX (ETA 16/0934, Table B1)

S-KAH+ A4 stainless steel

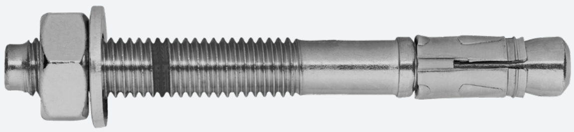
for indoor, outdoor, industrial use and maritime climate,



subject to external atmospheric exposure or exposure in permanently damp internal conditions.

S-KAH+ HCR stainless steel

for extremely corrosive conditions,

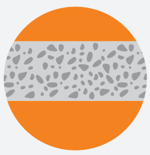


such as high chlorine concentrations (swimming halls), road tunnels and desulphurization plants.

BASE MATERIALS

Assessed for

Cracked concrete



Non-cracked concrete

Also suitable for

Natural stone

Standard M6, M8 and M20 through bolts for fixing in concrete

S-KA carbon steel

Zinc electroplated acc. EN ISO 4042, t ≥ 5 µm

Dry indoor conditions, indoor with temporary condensation

S-KAK carbon steel

Hot dip galvanized acc. EN ISO 10684, t ≥ 40 µm

Humid indoor use, outdoor inland rural areas only

S-KAH A4 stainless steel

for indoor, outdoor, industrial use and maritime climate,

subject to external atmospheric exposure or exposure in permanently damp internal conditions.

S-KAH+ M8 facade anchor A4 stainless steel

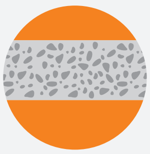
for indoor, outdoor, industrial use and maritime climate.

Suitable for fixing thick fixtures, such as thermal insulation and wood structures to concrete. S-KAH+ M8 length above 180 mm without ETA assessment.

BASE MATERIALS

Assessed for

Cracked concrete



Non-cracked concrete

Also suitable for

Solid clay brick (M8 max)

Natural stone

Throught bolt Assessments / Certifications / Applications

Description of document		Authority/ Laboratory	ID	Additional info
European Technical Assessment		ZAG -National Building and Civil Engineering Institute, Slovenia	ETA-16/0934	EAD 330232-01-0601-v01
Fire resistance		ZAG -National Building and Civil Engineering Institute, Slovenia	ETA-16/0934	EOTA TR 020 / EN 1992-4:2018
Seismic resistance		ZAG -National Building and Civil Engineering Institute, Slovenia	ETA-16/0934	EOTA TR 045
European Technical Assessment		ZAG -National Building and Civil Engineering Institute, Slovenia	ETA-18/0971	EAD 330747-00-0601
Fire resistance		ZAG -National Building and Civil Engineering Institute, Slovenia	ETA-18/0971	EOTA TR 020 / EN 1992-4:2018
Sormat Trustfix anchor calculation software		EJOT Sormat Oy / S&P Software Consulting		TrustFIX anchor calculation
Through bolts CAD-blocks for AutoCAD		EJOT Sormat Oy		Blocks installation instructions for AutoCAD
YouTube installation videos		EJOT Sormat Oy		

Additional information concerning all given data in the product data sheet

S-KAH+ M8 length above 180 mm without ETA assessment.

1. Load figures include the partial safety factors as per approvals and a partial safety factor on the action of γ_F= 1.4. Load figures apply for a rebar spacing s $\geq$ 15 cm or alternatively for a rebar spacing s $\geq$ 10 cm in combination with a rebar diameter of $d_s \leq 10$ mm.

2. If spacings or edge distances become smaller than the characteristic figures ($s_{cr,N}$ / $c_{cr,N}$) a calculation as per EOTA TR 055 needs to be carried out. For more details, see ETA-16/0934.

3. Concrete is considered non-cracked when the value of tension within the concrete is $\sigma_L + \sigma_R \leq 0$. In the absence of detailed verification σ_R = 3 N/mm^2 can be assumed (σ_L equals the tension within the concrete as a result of external loads, forces on anchor included; σ_R equals the tension coming from shrinkage or creep of the concrete, as well as displacements of supports or temperature variations).

4. Shear load figures apply for an anchor without influence of a concrete edge. For shear loads close to an edge ($c \leq 10 \times h_{ef}$), concrete edge failure has to be checked as per EOTA TR 055.

Static and quasi-static loads

The data of these tables is based on:

- ETA-16/0934
- ETA-18/0971 : M6 for multiple use for non-structural applications in concrete.
- Concrete C20/25, $f_{ck,cube}$ = 25 N/mm^2.
- Installation has been done correctly (page 10).
- No influence of edge distances and spacings.
- Respect of minimum base material thickness (page 11).

Characteristic resistances

Anchor size				M6		M8		M10		M12		M16		M20
■ ETA-16/0934 ● ETA-18/0971				●	●	■	■	■	■	■	■	■	■	-
Effective anchorage depth h_{ef}			[mm]	25	35	35	48	40	60	50	70	65	85	110
Non-cracked concrete	*Tensile* N_{Rk}	ZINC / HDG	[kN]	2,0	3,5	8,0	11,0	12,0	19,0	17,4	25,0	25,8	36,0	41,6
		A4 / HCR	[kN]	3,0	5,0	8,0	11,0	12,0	19,0	17,4	25,0	25,8	36,0	41,6
	Shear V_{Rk}	ZINC / HDG	[kN]	4,3	4,3*	12,6*	12,6*	20,4*	20,4*	30,0*	30,0*	54,1*	54,1*	58,2*
		A4 / HCR	[kN]	4,3	7,1	15,8*	15,8*	20,4*	20,4*	34,4*	34,4*	69,9	68,6*	58,2*
Cracked concrete	*Tensile* N_{Rk}	ZINC / HDG	[kN]	2,0	3,5	5,0	8,5	8,7	12,0	12,2	16,0	18,0	24,0	-
		A4 / HCR	[kN]	3,0	5,0	5,0	8,5	8,7	12,0	12,2	16,0	18,0	24,0	-
	Shear V_{Rk}	ZINC / HDG	[kN]	4,3	4,3*	12,6*	12,6*	20,4*	20,4*	34,6	30,0*	48,9	54,1*	-
		A4 / HCR	[kN]	4,3	7,1	15,8*	15,8*	20,4*	20,4*	34,6	34,4*	48,9	73,1	-

Design resistances

Anchor size				M6		M8		M10		M12		M16		M20
■ ETA-16/0934 ● ETA-18/0971				●	●	■	■	■	■	■	■	■	■	-
Effective anchorage depth h_{ef}			[mm]	25	35	35	48	40	60	50	70	65	85	110
Non-cracked concrete	*Tensile* N_{Rd}	ZINC / HDG	[kN]	1,3	2,3	5,3	7,3	8,0	12,7	11,6	16,7	17,2	24,0	27,7
		A4 / HCR	[kN]	2,0	3,3	5,3	7,3	8,0	12,7	11,6	16,7	17,2	24,0	27,7
	Shear V_{Rd}	ZINC / HDG	[kN]	2,9	3,4*	10,1*	10,1*	16,3*	16,3*	24,0*	24,0*	43,3*	43,3*	38,8*
		A4 / HCR	[kN]	2,9	4,7	12,6*	12,6*	16,3*	16,3*	27,5*	27,5*	46,6	54,9*	38,8*
Cracked concrete	*Tensile* N_{Rd}	ZINC / HDG	[kN]	1,3	2,3	3,3	5,7	5,8	8,0	8,1	10,7	12,0	16,0	-
		A4 / HCR	[kN]	2,0	3,3	3,3	5,7	5,8	8,0	8,1	10,7	12,0	16,0	-
	Shear V_{Rd}	ZINC / HDG	[kN]	2,9	3,4*	10,1*	10,1*	16,3*	16,3*	23,1	24,0*	32,6	43,3*	-
		A4 / HCR	[kN]	2,9	4,7	10,5	12,6*	16,3*	16,3*	23,1	27,5*	32,6	48,8	-

Recommended loads

Anchor size				M6		M8		M10		M12		M16		M20
■ ETA-16/0934 ● ETA-18/0971				●	●	■	■	■	■	■	■	■	■	-
Effective anchorage depth h_{ef}			[mm]	25	35	35	48	40	60	50	70	65	85	110
Non-cracked concrete	*Tensile* N_{Rec}	ZINC / HDG	[kN]	1,0	1,7	3,8	5,2	5,7	9,0	8,3	11,9	12,3	17,1	19,8
		A4 / HCR	[kN]	1,4	2,4	3,8	5,2	5,7	9,0	8,3	11,9	12,3	17,1	19,8
	Shear V_{Rec}	ZINC / HDG	[kN]	2,0	2,5*	7,2*	7,2*	11,7*	11,7*	17,1*	17,1*	30,9*	30,9*	27,7*
		A4 / HCR	[kN]	2,0	3,4	9,0*	9,0*	11,7*	11,7*	19,7*	19,7*	33,3	39,2*	27,7*
Cracked concrete	*Tensile* N_{Rec}	ZINC / HDG	[kN]	1,0	1,7	2,4	4,0	4,1	5,7	5,8	7,6	8,6	11,4	-
		A4 / HCR	[kN]	1,4	2,4	2,4	4,0	4,1	5,7	5,8	7,6	8,6	11,4	-
	Shear V_{Rec}	ZINC / HDG	[kN]	2,0	2,5*	7,2*	7,2*	11,7*	11,7*	16,5	17,1*	23,3	30,9*	-
		A4 / HCR	[kN]	2,0	3,4	7,5	9,0*	11,7*	11,7*	16,5	19,7*	23,3	34,8	-

■ ETA-16/0934 ● ETA-18/0971 * Failure mode = steel

SORMAT

Seismic resistance

Design acc. EOTA TR 045: Performance category C2

The data of these tables is based on:

- Concrete C20/25, $f_{ck,cube}$ = 25 N/mm^2.
- Installation has been done correctly (see page 10).
- No influence of edge distances and spacings.
- Respect of minimum base material thickness (see page 11).

Characteristic resistances

Anchor size			M8	M10	M12	M16
Effective anchorage depth h_{ef}		[mm]	**48**	**60**	**70**	**85**
Cracked concrete						
Tensile $N_{Rk, seis}$	S-KA+	[kN]	**1,7**	**4,6**	**6,7**	**15,9**
	S-KAH+	[kN]	**3,6**	**4,5**	**7,6**	**19,3**
Shear $V_{Rk, seis}$	S-KA+	[kN]	**4,8***	**4,3***	**6,9***	**15,4***
	S-KAH+	[kN]	**4,2***	**4,7***	**7,2***	**15,4***

Design resistances

Anchor size			M8	M10	M12	M16
Effective anchorage depth h_{ef}		[mm]	**48**	**60**	**70**	**85**
Cracked concrete						
Tensile $N_{Rd, seis}$	S-KA+	[kN]	**1,1**	**3,1**	**4,5**	**10,6**
	S-KAH+	[kN]	**2,4**	**3,0**	**5,1**	**12,9**
Shear $V_{Rd, seis}$	S-KA+	[kN]	**3,8***	**3,4***	**5,5***	**12,3***
	S-KAH+	[kN]	**3,4***	**3,8***	**5,8***	**12,3***

Recommended loads

Anchor size			M8	M10	M12	M16
Effective anchorage depth h_{ef}		[mm]	**48**	**60**	**70**	**85**
Cracked concrete						
Tensile $N_{Rec, seis}$	S-KA+	[kN]	**0,8**	**2,2**	**3,2**	**7,6**
	S-KAH+	[kN]	**1,7**	**2,1**	**3,6**	**9,2**
Shear $V_{Rec, seis}$	S-KA+	[kN]	**2,7***	**2,4***	**3,9***	**8,8***
	S-KAH+	[kN]	**2,4***	**2,7**	**4,1***	**8,8***

α_{seis} and α_{gap} included as per EOTA TR 045. The values don't consider any filling of the annular gap between the anchor and the fixture.

* Failure mode = steel

Fire resistance

The data of these tables is based on:

- ETA-16/0934 (M8, M10, M12, M16)
- ETA-18/0971 (M6)
- In the absence of other national regulations the partial safety factor for resistance under fire exposure $\gamma_{M,fi}$ = 1,0 is recommended
- Concrete C20/25, $f_{ck,cube}$ = 25 N/mm^2
- Installation has been done correctly (see page 10).
- No influence of edge distances and spacings.
- Respect of minimum base material thickness (see page 11).

Characteristic resistances

Anchor size			M6	M8		M10		M12		M16	
Effective anchorage depth h_{ef}		[mm]	35	35	48	40	60	50	70	65	85
R30											
Tensile $N_{Rk,fi}$	ZINC / HDG	[kN]	0,16	1,25	1,31	1,82	2,09	3,05	3,05	5,69	5,69
	A4 / HCR	[kN]	0,16	1,25	2,13	1,82	3,00	3,18	4,00	6,00	6,00
Shear $V_{Rk,fi}$	ZINC / HDG	[kN]	0,16	1,31	1,31	2,09	2,09	3,05	3,05	5,69	5,69
	A4 / HCR	[kN]	0,16	2,76	3,92	6,02	6,66	9,03	10,25	19,09	19,09
R60											
Tensile $N_{Rk,fi}$	ZINC / HDG	[kN]	0,14	1,05	1,05	1,66	1,66	2,40	2,40	4,47	4,47
	A4 / HCR	[kN]	0,14	1,25	2,13	1,82	3,00	3,18	4,00	6,00	6,00
Shear $V_{Rk,fi}$	ZINC / HDG	[kN]	0,14	1,05	1,05	1,66	1,66	2,40	2,40	4,47	4,47
	A4 / HCR	[kN]	0,14	2,70	2,70	4,59	4,59	7,07	7,07	13,16	13,16
R90											
Tensile $N_{Rk,fi}$	ZINC / HDG	[kN]	0,11	0,80	0,80	1,24	1,24	1,74	1,74	3,25	3,25
	A4 / HCR	[kN]	0,11	1,25	1,48	1,82	2,52	3,18	3,88	6,00	6,00
Shear $V_{Rk,fi}$	ZINC / HDG	[kN]	0,11	0,80	0,80	1,24	1,24	1,74	1,74	3,25	3,25
	A4 / HCR	[kN]	0,11	1,48	1,48	2,52	2,52	3,88	3,88	7,23	7,23
R120											
Tensile $N_{Rk,fi}$	ZINC / HDG	[kN]	0,08	0,67	0,67	1,02	1,02	1,41	1,41	2,64	2,64
	A4 / HCR	[kN]	0,08	0,87	0,87	1,46	1,48	2,29	2,29	4,26	4,26
Shear $V_{Rk,fi}$	ZINC / HDG	[kN]	0,08	0,67	0,67	1,02	1,02	1,41	1,41	2,64	2,64
	A4 / HCR	[kN]	0,08	0,87	0,87	1,48	1,48	2,29	2,29	4,26	4,26

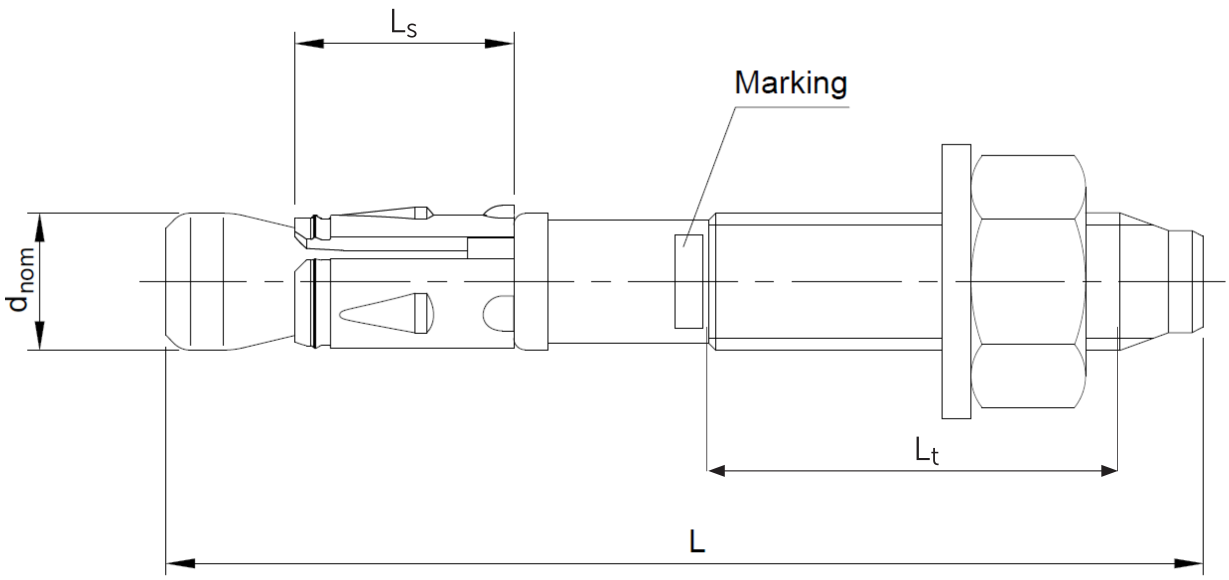
Recommended loads

Anchor size			M6	M8		M10		M12		M16	
Effective anchorage depth h_{ef}		[mm]	35	35	48	40	60	50	70	65	85
R30											
Tensile $N_{Rec,fi}$	ZINC / HDG	[kN]	0,16	1,25	1,31	1,82	2,09	3,05	3,05	5,69	5,69
	A4 / HCR	[kN]	0,16	1,25	2,13	1,82	3,00	3,18	4,00	6,00	6,00
Shear $V_{Rec,fi}$	ZINC / HDG	[kN]	0,16	1,31	1,31	2,09	2,09	3,05	3,05	5,69	5,69
	A4 / HCR	[kN]	0,16	2,76	3,92	6,02	6,66	9,03	10,25	19,09	19,09
R60											
Tensile $N_{Rec,fi}$	ZINC / HDG	[kN]	0,14	1,05	1,05	1,66	1,66	2,40	2,40	4,47	4,47
	A4 / HCR	[kN]	0,14	1,25	2,13	1,82	3,00	3,18	4,00	6,00	6,00
Shear $V_{Rec,fi}$	ZINC / HDG	[kN]	0,14	1,05	1,05	1,66	1,66	2,40	2,40	4,47	4,47
	A4 / HCR	[kN]	0,14	2,70	2,70	4,59	4,59	7,07	7,07	13,16	13,16
R90											
Tensile $N_{Rec,fi}$	ZINC / HDG	[kN]	0,11	0,80	0,80	1,24	1,24	1,74	1,74	3,25	3,25
	A4 / HCR	[kN]	0,11	1,25	1,48	1,82	2,52	3,18	3,88	6,00	6,00
Shear $V_{Rec,fi}$	ZINC / HDG	[kN]	0,11	0,80	0,80	1,24	1,24	1,74	1,74	3,25	3,25
	A4 / HCR	[kN]	0,11	1,48	1,48	2,52	2,52	3,88	3,88	7,23	7,23
R120											
Tensile $N_{Rec,fi}$	ZINC / HDG	[kN]	0,08	0,67	0,67	1,02	1,02	1,41	1,41	2,64	2,64
	A4 / HCR	[kN]	0,08	0,87	0,87	1,46	1,48	2,29	2,29	4,26	4,26
Shear $V_{Rec,fi}$	ZINC / HDG	[kN]	0,08	0,67	0,67	1,02	1,02	1,41	1,41	2,64	2,64
	A4 / HCR	[kN]	0,08	0,87	0,87	1,48	1,48	2,29	2,29	4,26	4,26

Materials and dimensions

Anchor dimensions

Anchor size		M6	M8	M10	M12	M16	M20
Total length	L [mm]	**40...100**	**57...400**	**72...162**	**88...178**	**103...178**	**170...280**
Sleeve length	L_s [mm]	**14,5**	**14,8**	**17,9**	**19,1**	**26,0**	**32,4**
Thread length	L_t [mm]	**18...60**	**28...110**	**27...115**	**38...115**	**45...115**	**55**
Bolt body	d_{nom} [mm]	**6**	**8**	**10**	**12**	**16**	**20**
Hexagonal nut	SW [mm]	**10**	**13**	**17**	**19**	**24**	**30**



Mechanical properties

Specification			M6	M8	M10	M12	M16	M20
Nominal tensile strength $F_{uk,thread}$	ZINC / HDG	[N/mm²]	**500**	**700**	**690**	**690**	**660**	**475**
	A4 / HCR	[N/mm²]	**620**	**670**	**690**	**690**	**645**	**475**
Char. bending resistance $M0_{Rk,s}$	ZINC / HDG	[Nm]	**7**	**26,3**	**51**	**90**	**219,8**	**308**
	A4 / HCR	[Nm]	**9**	**25,1**	**51**	**90**	**214,8**	**308**
Design bending resistance $M_{Rd,s}$	ZINC / HDG	[Nm]	**5,6**	**21,0**	**40,8**	**72,0**	**175,8**	**205,3**
	A4 / HCR	[Nm]	**7,2**	**20,1**	**40,8**	**72,0**	**171,8**	**205,3**
Recommended bending moment M_{Rec}	ZINC / HDG	[Nm]	**4,0**	**15,0**	**29,1**	**51,4**	**125,6**	**146,7**
	A4 / HCR	[Nm]	**5,1**	**14,3**	**29,1**	**51,4**	**122,7**	**146,7**

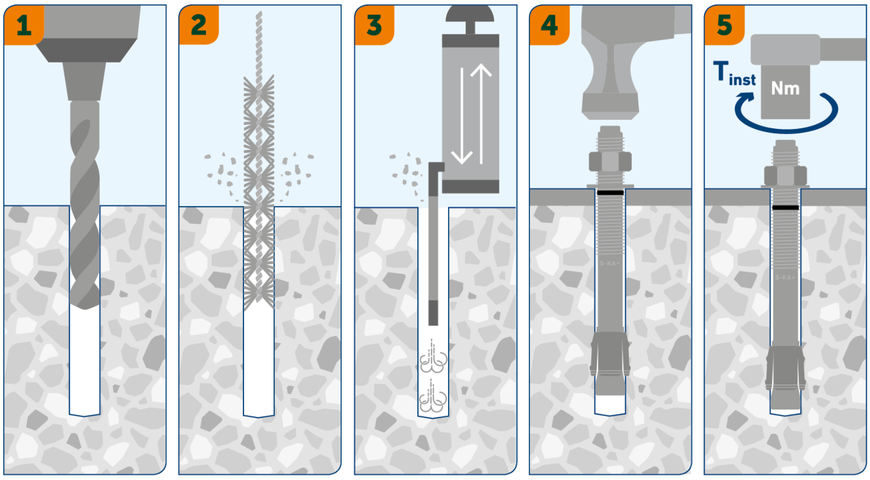
Material quality

Part of anchor		Material
Bolt	S-KA+ / S-KA	Carbon steel, zinc electroplated EN ISO 4042, min. 5 µm
	S-KAK	Carbon steel, hot dip galvanized EN ISO 10684, EN ISO 1461, min. 40 µm (M6 = min. 20 µm)
	S-KAK+	Carbon steel, hot dip galvanized EN ISO 10684, min. 50 µm
	S-KAH+ / S-KAH	Stainless steel A4
	S-KAH+ HCR	Stainless steel HCR 1.4529

SETTING INSTRUCTIONS

Installation equipment

Specification	M6	M8	M10	M12	M16	M20
Rotary hammer (recommendation)	750...1200 r.p.m / 1.8...3.3 J					
					360...550 r.p.m / 4.9...11.5 J	
Setting tool (optional)	M6 - M10 SDS+			M12 - M20 SDS+		
Drill bit	SDS+ 2-CUT/4-CUT 6 mm...20 mm					
Additional tools	brush, air pump/compressor, hammer, torque wrench					



INSTALLATION

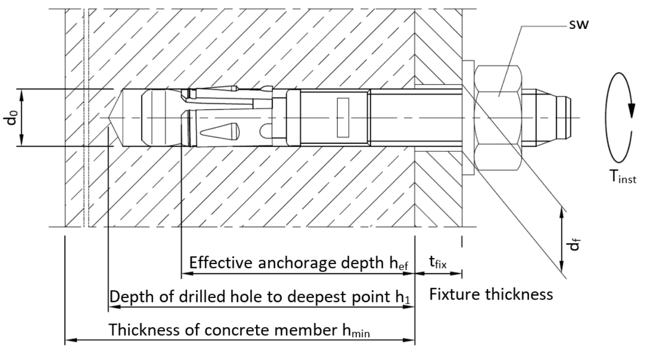
1. Drill a hole according to the product data.
2.-3. Clean the hole using a metal brush and a blow-out pump.
4. Install anchor with a hammer or a setting tool.
5. Tighten the anchor to the specified installation torque.

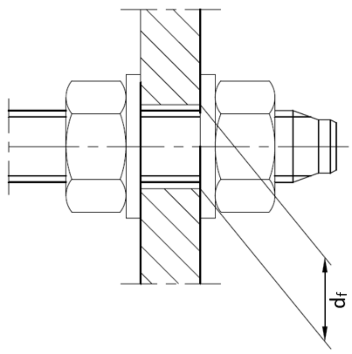
Installation data

Parameters and anchor sizes			M6		M8		M10		M12		M16		M20
Drill hole diameter	d_0	[mm]	6		8		10		12		16		20
Diameter of the drill bit at the upper tolerance limit	$d_{cut,max} \le$	[mm]	6,40		8,45		10,45		12,50		16,50		20,55
Depth of drilled hole to deepest point	$h_1 \ge$	[mm]	35	45	47	60	55	75	70	90	110	90	135
Effective anchorage depth	h_{ef}	[mm]	25	35	35	48	40	60	50	70	85	65	110
Nominal anchorage depth	h_{nom}	[mm]	30	40	40	53	48	68	61	81	97	77	125
Diameter of clearance hole in the fixture	$d_f \le$	[mm]	7		9		12		14		18		22
Width across flats	SW	[mm]	10		13		17		19		24		30
Required torque ZINC / HDG	T_{inst}	[Nm]	4	7	15		30		60		110		240
A4 / HCR			5	8	20		45		60		110		240

Installation methods

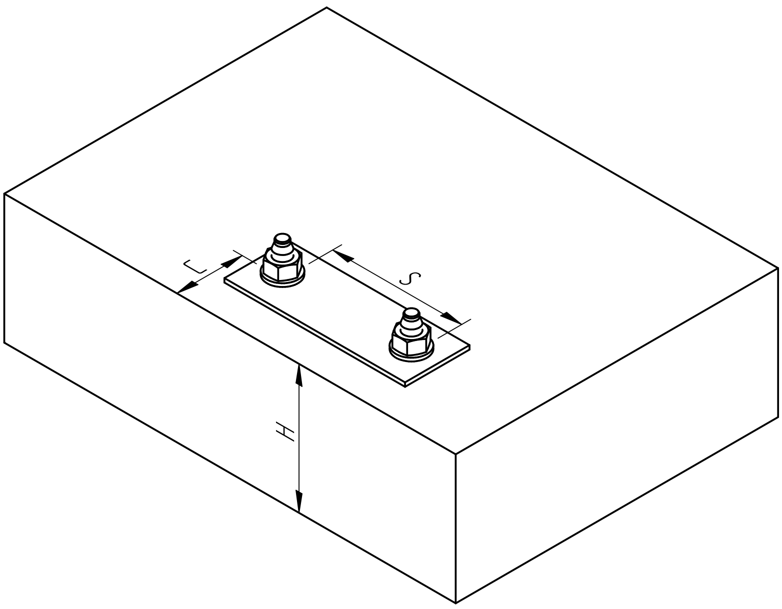
Push-through installation	Distance installation





Minimum thickness of concrete member, spacing and edge distance

Cracked and non-cracked concrete			M6		M8		M10		M12		M16		M20
Effective anchorage depth	h_{ef}	[mm]	**25**	**35**	**35**	**48**	**40**	**60**	**50**	**70**	**65**	**85**	**110**
Minimum thickness of base material	h_{min}	[mm]	80	80	80	100	100	120	100	140	120	170	180
	$h_{min-red}$	[mm]	-	-	-	80	-	100	-	-	-	-	-
Minimum spacing for h_{min}	s_{min}	[mm]	50	40	55	35	50	40	55	60	65	65	400
	c ≥	[mm]	50	40	75	50	95	60	110	70	100	95	300
Minimum edge distance for h_{min}	c_{min}	[mm]	50	40	40		50		60	55	65	65	300
	s ≥	[mm]	50	40	140	55	190	100	215	110	200	150	400
Minimum spacing for $h_{min-red}$	s_{min}	[mm]	-	-	-	35	-	40	-	-	-	-	-
	c ≥	[mm]	-	-	-	55	-	100	-	-	-	-	-
Minimum edge distance for $h_{min-red}$	c_{min}	[mm]	-	-	-	40	-	60	-	-	-	-	-
	s ≥		-	-	-	60	-	90	-	-	-	-	-
Critical spacing for splitting failure and concrete cone failure (in case characteristic loading affects)	$s_{cr,sp}$	[mm]	140	120	170	192	160	240	200	280	286	340	-
	$s_{cr,N}$	[mm]	75	105	106	144	120	180	150	210	195	254	400
Critical edge distance for splitting failure and concrete cone failure (in case characteristic loading affects)	$c_{cr,sp}$	[mm]	70	60	85	96	80	120	100	140	143	170	-
	$c_{cr,N}$	[mm]	37,5	52,5	53	72	60	90	75	105	98	127	300



Setting tool S-KA SDS+

Hammering tool to make through bolt installation quicker and smoother

- Original Sormat through bolts setting tool with designed head that does not damage the head of the anchor and keep the head from slipping.
- Besides ensuring most efficient and safe through bolt installation in general, the setting tool also significantly saves time and energy in serial installation.
- Compatible with all rotary hammer machines with SDS+ chuck.

SORMAT

THROUGH BOLTS+

				S-KA+	S-KAK+	S-KAH+ A4	S-KAH+ HCR
							
Thread size	**Type**	**t_{fix} mm**	**Length mm**	**Zinc**	**HDG**	**Stainless A4**	**HCR**
M8	M8/5/-	5	57	●	●	●	●
	M8/23/10	23/10	75	●	●	●	●
	M8/43/30	43/30	95	●	●	●	
	M8/63/50	63/50	115	●	●	●	
	M8/98/85	98/85	150	●	●	●	
M10	M10/10/-	10/-	72	●	●	●	●
	M10/30/10	30/10	92	●	●	●	●
	M10/40/20	40/20	102	●	●	●	
	M10/50/30	50/30	112	●	●	●	●
	M10/70/50	70/50	132	●	●	●	
	M10/100/80	100/80	162	●	●	●	
M12	M12/10/-	10/-	88	●	●	●	
	M12/25/5	25/5	103	●	●	●	
	M12/40/20	40/20	118	●	●	●	
	M12/50/30	50/30	128	●	●	●	
	M12/70/50	70/50	148	●	●	●	
	M12/85/65	85/65	163	●	●	●	
	M12/100/80	100/80	178	●	●	●	
M16	M16/5/-	5	103	●	●	●	
	M16/25/5	25/5	123	●	●	●	
	M16/40/20	40/20	138	●	●	●	
	M16/70/50	70/50	168	●	●	●	
	M16/80/60	80/60	178	●	●	●	

THROUGH BOLTS

				S-KA	S-KAK	S-KAH A4	S-KAH+ M8 A4
							
Thread size	**Type**	**t_{fix} mm**	**Length mm**	**Zinc**	**HDG**	**Stainless A4**	**Stainless A4**
M6	M6x40	2	40	●	●	●	
	M6/15x65	15	65	●	●	●	
	M6/50x100	50	100	●	●		
M8	M8/143/130	143/130	195				o
	M8/183/170	183/170	235				o
	M8/243/230	243/230	295				o
	M8/308/295	308/295	360				o
	M8/348/335	348/335	400				o
M20	M20/20x170	20	170	o	o	o	
	M20/70x220	70	220	o	o	o	
	M20/130x280	130	280	o	o		

● ETA assessed, option 1 • ETA assessed, part 6 o No ETA

SORMAT