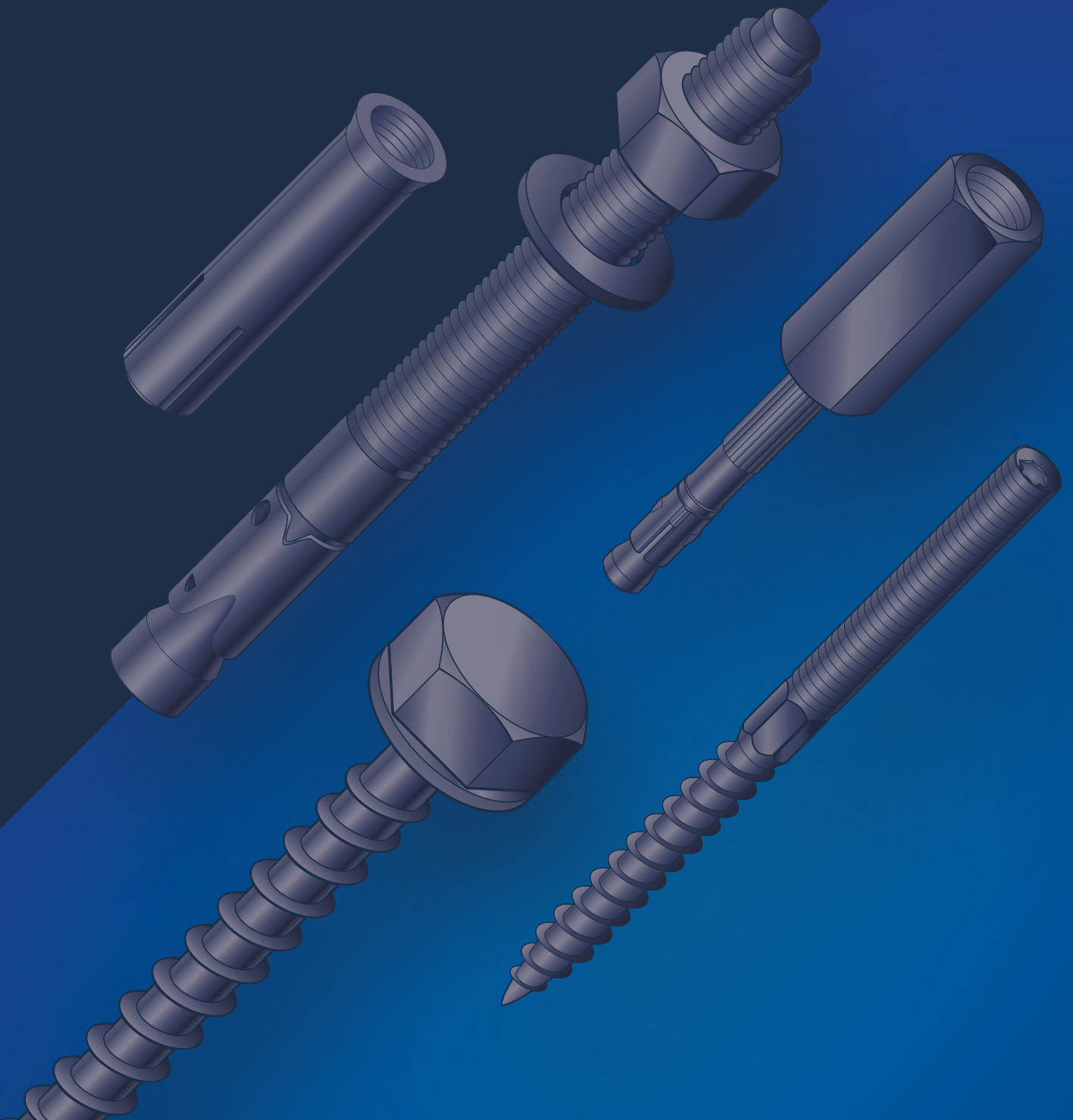


Metal anchor

Technical data
and application



Product selection guide

Feature	Bolt anchor BZ plus / A4	Drop-in anchor AN ES / AN VA	TSM screwbolt	Nail anchor AN
Borehole diameter	8 - 16 mm ¹⁾	10 - 20 mm ¹⁾	6 - 12 mm ¹⁾	6 mm ²⁾
Connection thread	-	M8 - M16	M8 - M10 ³⁾	M8 / M10
Load range tensile load (concrete C20 / 25) ²⁾	2,4 - 16,7 kN	1,9 - 10,2 kN	1,0 - 16,8 kN	2,14 - 2,81 kN
Cracked concrete	✓	✗	✓	✗
Uncracked concrete	✓	✓	✓	✗
Multiple fastening in concrete ⁴⁾	✗	✓	✓	✓
Prestressed ceiling slabs	✗	✓ ²⁾	✓	✗
ETA approval	✓	✓	✓	✓
Fire test	✓	✓	✓	✓
Seismic approval	✓	✗	✓	✗
VdS approval	✓	✓	✗	✓
FM approval	✓	✓	✗	✗
Shock approval	✓	✗	✗	✗
Galvanized steel	✓	✓	✓	✓
Hot Dip Galvanised steel	✓ ⁵⁾	✗	✗	✗
Stainless steel A4	✓	✓	✗	✗
Stainless steel HCR, 1.4529	✓	✓	✗	✗
Design software	✓	✓	✓	✗

¹⁾ Other anchor diameters on request

²⁾ Steel, galvanised

³⁾ TSM-ST: M8; TSM-IM: M8; & M10; all other TSM variants have no connection thread

⁴⁾ in cracked and Uncracked concrete

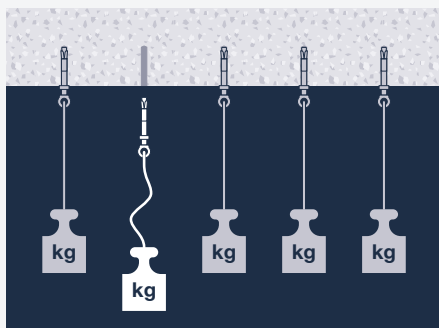
⁵⁾ Bright zinc galvanising

Functional principle of anchorages

Functional principle	Description	Representation	Advantages / disadvantages
Frictional connection	<p>During the installation process, the Mesh sleeve is expanded in a controlled manner to ensure a secure fixation in the drill hole through friction between the anchor and the concrete.</p> <p>A distinction is made between displacement-controlled expansion, in which the assembly process is ensured by targeted deformation using a rod fitting accessory, and torque-controlled expansion, in which an applied torque is used to expand the expansion sleeve using the conical geometry of the anchorage.</p>		<ul style="list-style-type: none"> + Anchor can be used and loaded immediately after installation + Easy installation + Self-locking fixation by spreading the expanding sleeve - High expansion forces in the concrete lead to larger centre and edge distance - No dismantling of the anchor - Frictional connection does not work in conjunction with building materials that are sensitive to expansion pressure (e.g. perforated brickwork)
	<p>During installation, a positive fit is created between the anchorage and the concrete. The special toothing on the cutting edges of the TSM screwbolt forms the threads in the concrete. The resulting positive fit fixes the TSM screwbolt securely in the concrete.</p>		<ul style="list-style-type: none"> + TSM screwbolt can be used and loaded immediately after installation + Low expansion forces enable use close to edges and axles + Complete disassembly/vollständige Demontage + The positive fit is created by screwing in the TSM screw anchor (no special tools required)
Closure	<p>The resin injection cartridge used to fill the drill hole firmly connects the anchorage to the concrete. The chemical anchor forms a material connection with the anchoring base that is difficult to release.</p>		<ul style="list-style-type: none"> + Highest load-bearing capacity + Expansion-free fastening ensures small edge and centre distances + also works in conjunction with the mesh sleeve in hollow building materials - Curing time depends on humidity and temperature - Assembly-sensitive in the area of drill hole cleaning - No dismantling possible

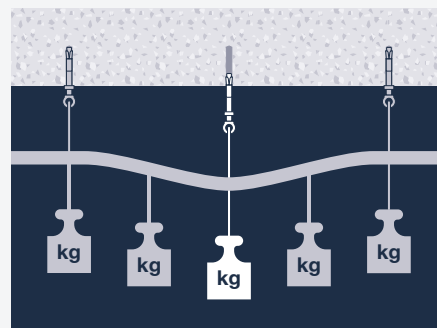
Single / multiple fastening

Single fastening



If an anchor fails, the stability of the system is jeopardised. impaired.

Multiple fastening



If an anchor fails, the standard safety of the system is not impaired (redundant systems). The load is redistributed to neighbouring anchorages. However, the serviceability may no longer be guaranteed (e.g. visible changes to the anchor).

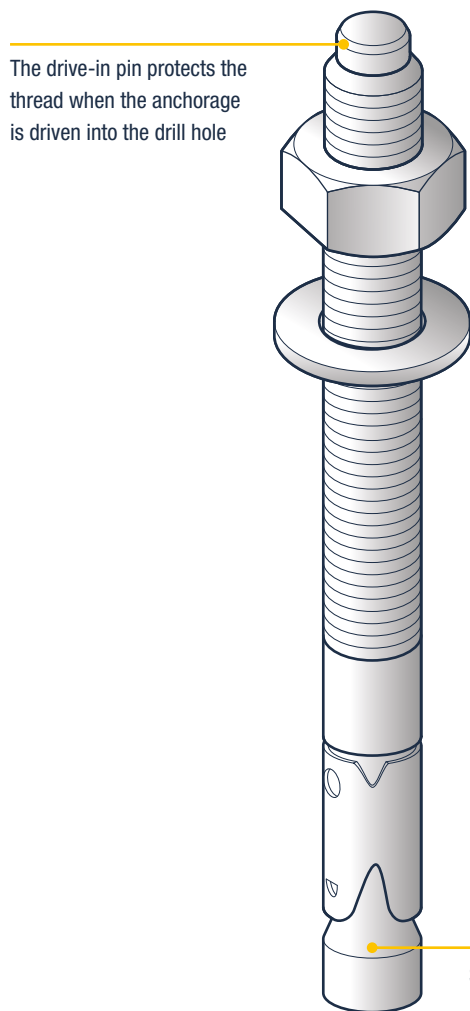
According to ETAG1, Part 6, a multiple fastening of non-load-bearing systems exists if a pipeline has **at least 3 fastenings** and the load **per point** is a **maximum of 2kN**.

¹⁾ ETAG = Guideline for European Technical Approvals (ETA)

Bolt anchor AN BZ plus

The universal genius

- Approved for use under seismic conditions of categories C1 and C2 (M8 - M20 and max. anchor length 210mm)
- Suitable for front, through and spacer mounting
- Wide range of applications (use with siFramo, Siconnect, pipe supports, etc.)

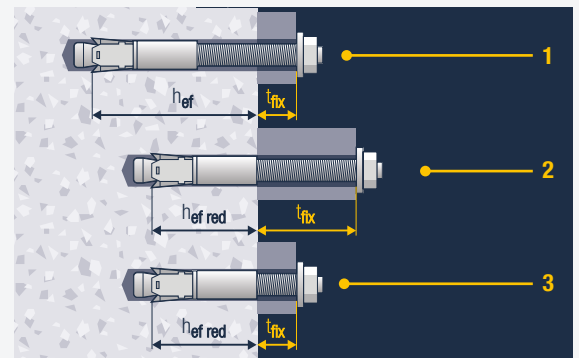


Spreading the expanding sleeve through the cone leads to a significant increase in the Tensile load capacity

ADVANTAGES

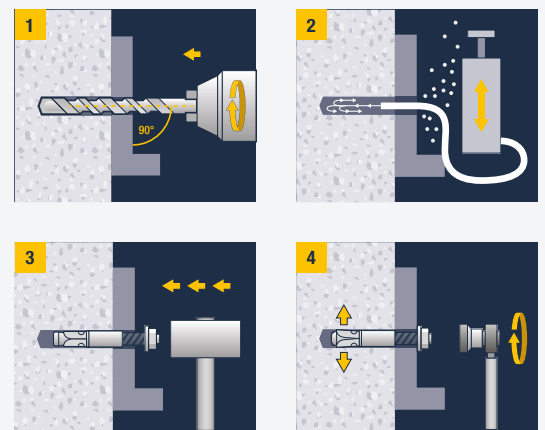
- ✓ Cost and time savings when installing with reduced anchoring depth
- ✓ Highest loads (up to 11.9 kN for M16) when installed with standard anchoring depth
- ✓ When using a suction cup, it is no longer necessary to blow out the drill hole

Installation example



1. **AN BZ plus:** mounted with standard anchoring depth and small clamping thickness
2. **AN BZ plus:** mounted with reduced anchoring depth and large clamping strength
3. **AN BZ plus s:** only with reduced anchoring depth and small clamping thickness

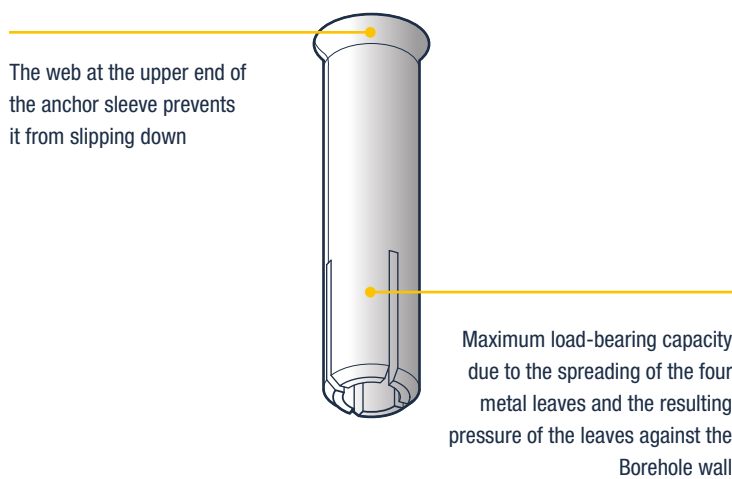
Installation



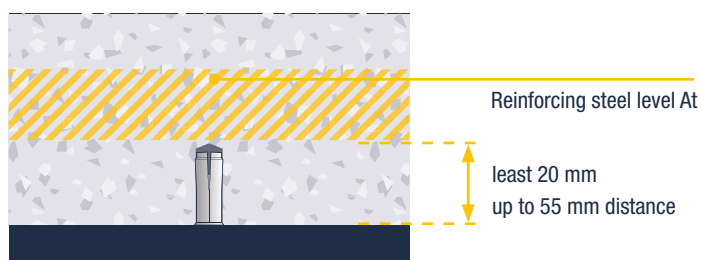
Drop-in anchor AN ES

The Standard

- Suitable for front mounting
- Installation is carried out by hammering the anchorage into the drill hole using a hand or machine expansion tool



Fewer reinforcement hits

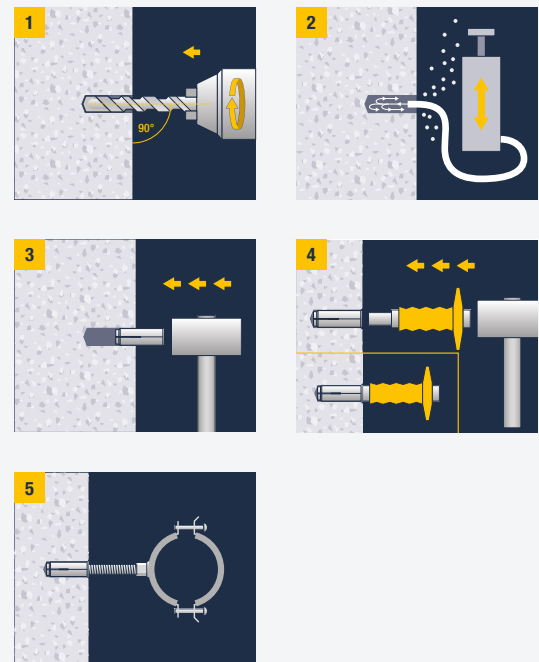


Reinforcing steel is covered with at least 20 mm of concrete. With an anchoring depth of 25 mm, reinforcement hits are significantly reduced.

ADVANTAGES

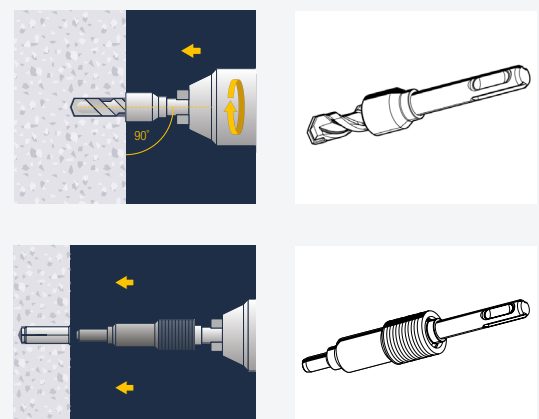
- ✓ Quick and effortless installation when using drill bits
- ✓ Visual assembly check using marking setting tool

Installation

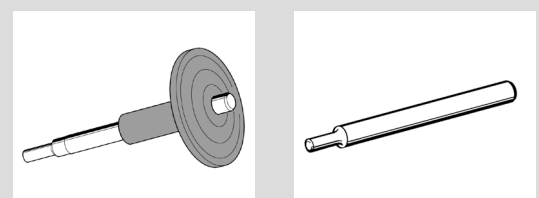


Easier installation

Force-saving assembly when using the ASW plug-on setting tool.



Rod fitting



Expansion mandrel
ANT MSH

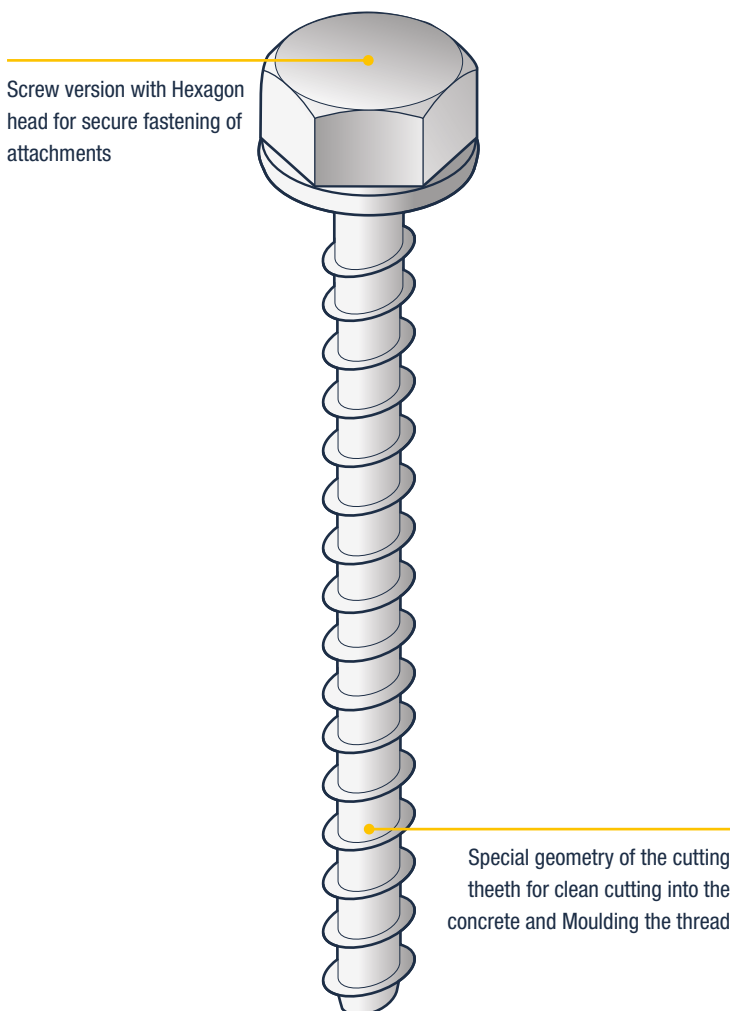
Setting Tool for Drop-In
Anchor ANT



Screwbolt TSM-S

The flexible one

- Cuts a thread when screwed into the concrete to create a positive-locking connection
- Enables fastenings close to the edge thanks to the expansion pressure-free operating principle
- Various head shapes enable versatile application options

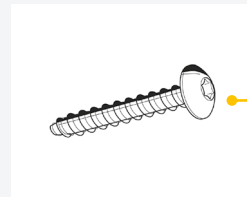


ADVANTAGES

- ✓ Can be used flexibly thanks to up to three different screw-in depths
- ✓ Quick push-through assembly with impact wrench without torque control
- ✓ Adjustable to compensate for unevenness (Ø8-14 mm)

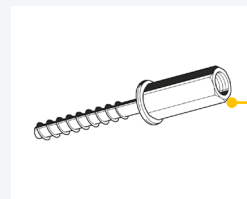
Diversity

In addition to the TSM-S screwbolt, we also have other screwbolts in our range:



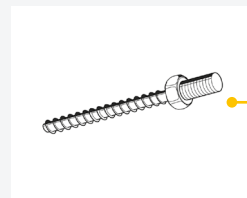
TSM-LP

With lens head for fastening in the rail slot



TSM-IM

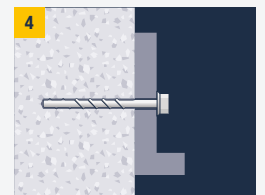
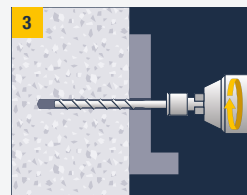
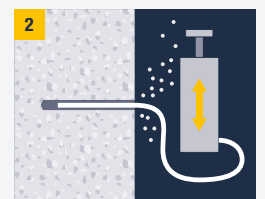
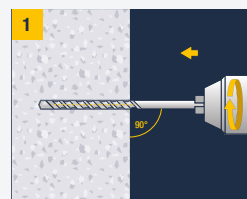
With internal thread for direct connection of threaded rods



TSM-ST

With M8 external thread for direct connection of additional components

Installation



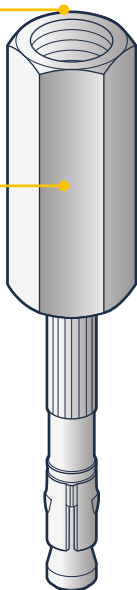
Nail anchor AN

The fast one

- Installation is carried out by hammering the anchorage into the drill hole
- Reliable frictional connection due to re-spreading of the perfo sleeve
- Suitable for pre-assembly

Open-end spanner 13

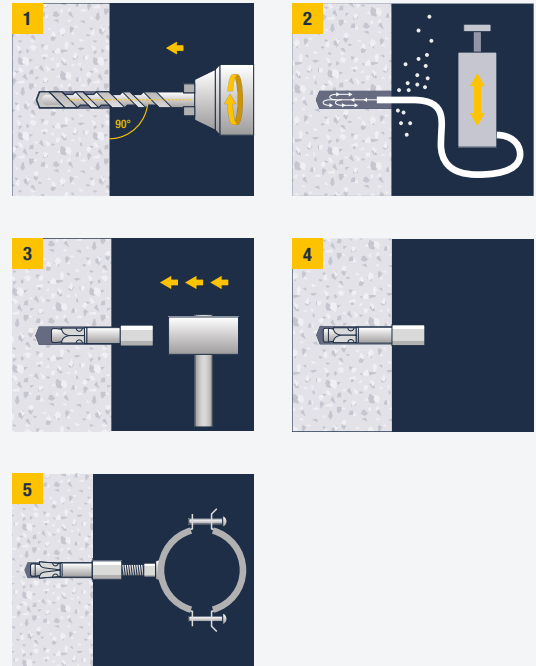
Combination thread M8 / M10



ADVANTAGES

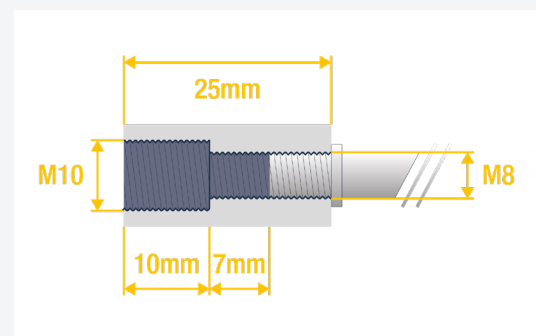
- ✓ Quick and efficient installation of the anchorage
- ✓ Small drill hole depth (35mm) reduces the risk of hitting the reinforcement
- ✓ Flexible connection options thanks to the M8 / M10 combination thread

Installation



Sectional view

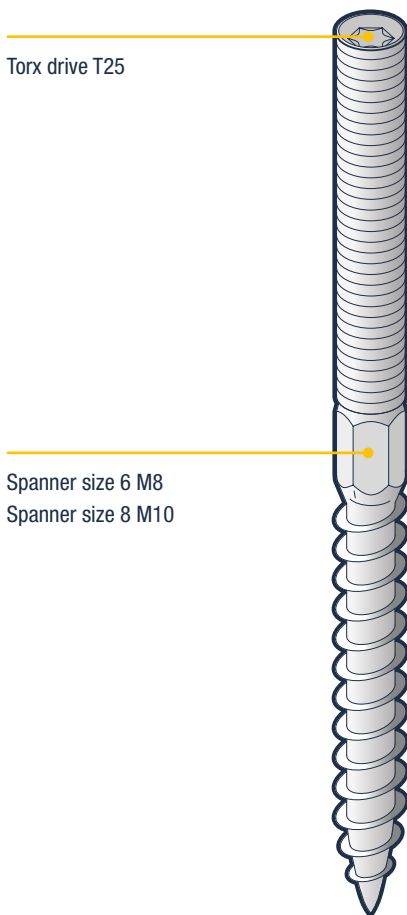
Visualisation of the existing threaded connections of the Coupling Cross Section



Bolt screw BSCR

The Solid

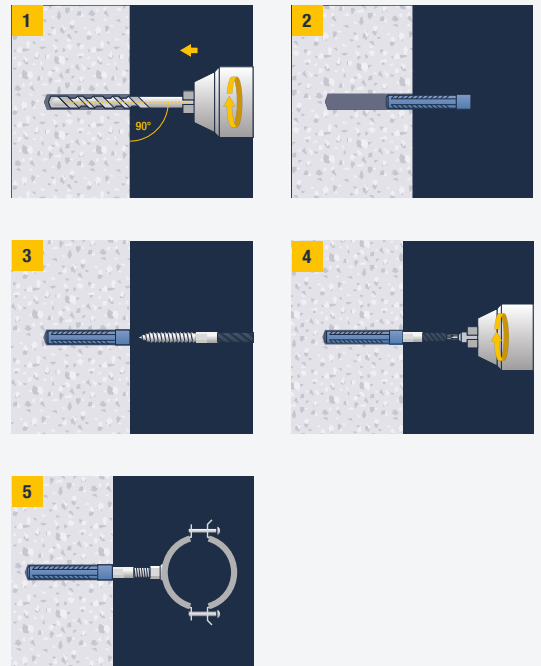
- Suitable for pre-assembly
- Simple screwing in using Torx T25 drive
- Further mounting options using an open-end spanner:
M8 = Spanner size 6 and M10 = Spanner size 8
- Reuse of the BSCR bolt screws is possible



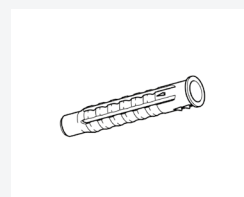
VORTEILE

- ✓ Quick and easy installation
- ✓ Direct connection options thanks to the metric connection thread (M8 or M10; depending on version)
- ✓ Enables wood applications

Installation



ANA universal plug for every building material



For bolt screw M8

ANA 10 x 50, art. no. 402432

For bolt screw M10


ANA 12 x 60, art. no. 402433

Assortment overview

Bolt anchor AN BZ plus



The values listed here refer to the standard anchoring depth ¹

Type	Item no.	Item no. A4 	Clamp thickness t_{fix}	Drill hole \emptyset x depth	Setting depth h_{nom}	Anchoring depth h_{ef}	Seismic C1 / C2	Length L	Thread	Quantity
			mm	mm	mm	mm		mm	mm	Pack
8/6/60 s	114134	114159	6	8x49	41	35	- / -	60	M8x16	100
8/10/21/75	114135	114160	10	8x60	52	46	☑ / ☑	75	M8x32	100
8/30/41/95	114136	114161	30	8x60	52	46	☑ / ☑	95	M8x52	100
8/50/61/115	114137	114162	50	8x60	52	46	☑ / ☑	115	M8x72	100
8/100/111/165 ²	114138	- ³	100	8x60	52	46	☑ / ☑	165	M8x122	50
10/10/70 s	114139	114163	10	10x55	48	40	- / -	70	M10x22	50
10/10/30/90	114140	114164	10	10x75	68	60	☑ / ☑	90	M10x42	50
10/15/35/95 ²	- ³	114165	15	10x75	68	60	☑ / ☑	95	M10x47	50
10/20/40/100 ²	114141	- ³	20	10x75	68	60	☑ / ☑	100	M10x52	50
10/30/50/110	114142	114166	30	10x75	68	60	☑ / ☑	110	M10x62	50
10/50/70/130	114143	114167	50	10x75	68	60	☑ / ☑	130	M10x82	50
10/75/95/155	114144	- ³	75	10x75	68	60	☑ / ☑	155	M10x107	50
10/100/120/180 ²	114145	114168	100	10x75	68	60	☑ / ☑	180	M10x132	50
12/10/85 s	114146	- ³	10	12x70	60	50	- / -	85	M12x26	25
12/15/35/110	114147	114169	15	12x90	80	70	☑ / ☑	110	M12x51	25
12/20/40/115 ²	- ³	114170	20	12x90	80	70	☑ / ☑	115	M12x56	25
12/30/50/125	114148	114171	30	12x90	80	70	☑ / ☑	125	M12x66	25
12/50/70/145	114149	114172	50	12x90	80	70	☑ / ☑	145	M12x86	25
12/65/85/160 ²	114150	- ³	65	12x90	80	70	☑ / ☑	160	M12x101	25
12/85/105/180	114151	114173	85	12x90	80	70	☑ / ☑	180	M12x121	25
12/105/125/200 ²	114152	- ³	105	12x90	80	70	☑ / ☑	200	M12x141	25
12/160/255 ²	114153	- ³	160	12x90	80	70	- / -	255	M12x80	20
16/5/105 s ²	114154	- ³	5	16x90	77	65	- / -	105	M16x26	20
16/25/45/145	114155	114174	25	16x110	97	85	☑ / ☑	145	M16x66	20
16/50/70/170 ²	114156	114175	50	16x110	97	85	☑ / ☑	170	M16x91	20
16/100/220 ²	114157	- ³	80	16x110	97	85	- / -	220	M16x80	10

¹ The values for the reduced anchoring depths can be found in the technical data.

² Delivery date on request - goods are procured on an order-related basis.

³ Other steel grades and anchorage dimensions on request

Drop-in anchor AN ES



Type	Item no.	Item no. A4 	Drill hole \emptyset x depth	Thread- \emptyset x length	Quantity
			mm	mm	Pack
M8 x 25	116618	-	10 x 25	M8 x 12	100
M8 x 30	110467	104906	10 x 30	M8 x 13	100
M8 x 40	110468	153593	10 x 40	M8 x 20	100
M10 x 25	116619	-	12 x 25	M10 x 12	50
M10 x 30	110506	-	12 x 30	M10 x 12	50
M10 x 40	110469	104915	12 x 40	M10 x 15	50
M12 x 25	116620	-	15 x 25	M12 x 12	50
M12 x 50	110470	104924	15 x 50	M12 x 18	50
M16 x 65	110471	104933	20 x 65	M16 x 23	25

TSM-S screwbolt



Screw-in depth h_{nom1} ¹

Type	Item no.	Clamp thickness t_{fix}	Drill hole \emptyset x depth	Screw-in depth h_{nom1}	Seismic C1/C2 ²	Length L	Pressed disc \emptyset	Open-end spanner	Quantity
		mm	mm	mm		mm	mm	mm	Pack
6 x 40 ³	115737	5	6x40	35	–	40	15	13	100
6 x 50	115720	15	6x40	35	☑ / –	50	15	13	100
6 x 60	115723	25	6x40	35	☑ / –	60	15	13	100
6 x 80	115738	45	6x40	35	☑ / –	80	15	13	100
6 x 100 ⁴	115739	65	6x40	35	☑ / –	100	15	13	100
8 x 50	115731	5	8x55	45	–	50	16	13	50
8 x 60	115732	15	8x55	45	–	60	16	13	50
8 x 70	115734	25	8x55	45	☑ / ☑	70	16	13	50
8 x 80	115735	35	8x55	45	☑ / ☑	80	16	13	50
8 x 90 ⁴	115736	45	8x55	45	☑ / ☑	90	16	13	50
8 x 100 ⁴	115728	55	8x55	45	☑ / ☑	100	16	13	50
8 x 120 ⁴	115729	75	8x55	45	☑ / ☑	120	16	13	50
8 x 140 ⁴	115730	95	8x55	45	☑ / ☑	140	16	13	50
10 x 60	115740	5	10x65	55	☑ / –	60	20	15	50
10 x 70	115741	15	10x65	55	☑ / –	70	20	15	50
10 x 80 ⁴	115743	25	10x65	55	☑ / –	80	20	15	50
10 x 90 ⁴	115744	35	10x65	55	☑ / ☑	90	20	15	50
10 x 100 ⁴	115745	45	10x65	55	☑ / ☑	100	20	15	50
10 x 140 ⁴	115746	85	10x65	55	☑ / ☑	140	20	15	50
12 x 110 ⁴	115747	45	12x75	65	☑ / ☑	110	23,5	17	25
12 x 130	115748	65	12x75	65	☑ / ☑	130	23,5	17	25
12 x 150	115749	85	12x75	65	☑ / ☑	150	23,5	17	25

¹ The values for the other anchoring depths can be found in the technical data.

² Observe installation parameters for seismic applications in accordance with ETA 016/0655.

³ Only for use as a multiple fixing for non-load-bearing systems in concrete and prestressed concrete hollow core slabs.

⁴ Delivery date on request - goods are procured on an order-related basis.

Screwbolt TSM LP VZ 30



Screw-in depth h_{nom1} ¹

Type	Item no.	Clamp thickness t_{fix}	Drill hole \emptyset x Depth	Screw-in depth h_{nom1}	Seismic C1	Length L	Head \emptyset	Drive unit	Quantity
		mm	mm	mm		mm	mm		Pack
6 x 40 ²	115026	5	6x40	35	–	40	18	T30	100
6 x 60	115722	25	6x40	35	☑	60	18	T30	100
LPS 6 x 40 ²	116691	5	6x40	35	–	40	14,5	T30	100
LPS 6 x 60	116692	25	6x40	35	☑	60	14,5	T30	100

¹ The values for the other anchoring depths can be found in the technical data.

² Only for use as a multiple fixing for non-load-bearing systems in concrete and prestressed concrete hollow core slabs.

TSM-IM screwbolt



Screw-in depth h_{nom1} ¹

Type	Item no.	Clamp thickness t_{fix}	Drill hole \emptyset x Depth	Einschraub-tiefe h_{nom1}	Seismic C1	Length L	StufenThread	Schieben \emptyset	Spanner size	Quantity
		mm	mm	mm		mm			mm	Pack
6 x 35 K ²	115028	0	6x40	35	–	35	M8 / 10 IG	25	13	50
6 x 55	115721	20	6x40	35	☑	55	M8 / 10 IG	25	13	50
6 x 40 K A4 ³	–	5	6x40	35	–	40	M8 / 10 IG	25	13	50

¹ The values for the other anchoring depths can be found in the technical data.

² Delivery date on request - goods are procured on an order-related basis.

³ Only for use as a multiple fixing for non-load-bearing systems in concrete and prestressed concrete hollow core slabs.

TSM-ST screwbolt



Screw-in depth h_{nom1} ^{1, 2}

Type	Item no.	Clamp thickness t_{fix}	Drill hole \emptyset x Depth	Screw-in depth h_{nom1}	Seismic C1	Length L	Connection thread	Open-end spanner	Quantity
		mm	mm	mm		mm		mm	Pack
6 x 35 K ³	115030	0	6x40	35	–	35	M8x16	10	100
6 x 55 ⁴	115725	20	6x40	35	☑	55	M8x16	10	100
6 x 75 ⁴	115726	40	6x40	35	☑	75	M8x16	10	100
6 x 95 ⁴	115727	60	6x40	35	☑	95	M8x16	10	100
6 x 135 ⁴	117835	100	6x40	35	☑	135	M8x16	10	100
6 x 155 ⁴	117836	120	6x40	35	☑	155	M8x16	10	100
6 x 175	117837	140	6x40	35	☑	175	M8x16	10	100
6 x 195 ⁴	117838	160	6x40	35	☑	195	M8x16	10	100

¹ For screw-in depth $h_{nom1} = 35$ mm: Only for use as multiple fastening for non-load-bearing systems in concrete and prestressed concrete hollow core slabs.

² The values for the other anchoring depths can be found in the technical data.

³ Only for use as a multiple fixing for non-load-bearing systems in concrete and prestressed concrete hollow core slabs.

⁴ Delivery date on request - goods are procured on an order-related basis.

Nail anchor AN



Type	Item no.	Drill hole \emptyset	Borehole depth	Anchoring depth h_{ef}	Length	Quantity	Weight / package
		mm	mm	mm	mm	Pack	kg
M8/M10 6x25	112152	6	35	25	58	100	2.75
M8/M10 6x30	117561	6	50	30	63	100	2.85

Bolt screw BSCR without collar



Type	Item no.	Cutting thread length	Connection thread	Length	Open-end spanner	Quantity	Weight / package
		mm		mm	mm	Pack	kg
M8 / 50 mm	124434	30	M8 x 10	50	6	100	1.00
M8 / 80 mm	124443	37	M8 x 30	80	6	100	2.00
M8 / 100 mm	124610	50	M8 x 40	100	6	100	2.00
M8 / 120 mm	124595	62	M8 x 50	120	6	100	3.00
M8 / 140 mm	124629	62	M8 x 50	140	6	50	1.50
M8 / 160 mm	124601	62	M8 x 50	160	6	50	2.00
M10 / 60 mm	153469	37	M10 x 20	60	-	100	2.00
M10 / 80 mm	124452	47	M10 x 20	80	8	100	3.00
M10 / 100 mm	129554	57	M10 x 30	100	8	100	4.00
M10 / 120 mm	124461	57	M10 x 50	120	8	50	2.50
M10 / 140 mm	124470	57	M10 x 50	140	8	50	3.00
M10 / 180 mm	131522	57	M10 x 50	180	8	50	4.00

DIN EN 1992-4

and the history of the design procedures

The introduction of DIN EN 1992-4 has made it possible to merge the various design guidelines from the field of subsequent fixing in concrete. As a result, there is now only one standard that regulates the design of fixings in concrete.

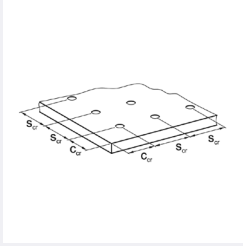


Anchor verification with our design software

As part of our anchor design software, it is still possible to carry out a design in accordance with ETAG 001. This option only applies to the subsequent or control design of existing buildings or to the verification of construction projects abroad, in accordance with the building regulations in the respective country.



Load values



Information on edge and centre distances

c_{cr} Describes the characteristic edge distance according to the approval - i.e. from the edge of the component to the fixing point

s_{cr} Describes the characteristic centre distance regulated in the approval - i.e. the distance between two fixing points.

Bolt anchor AN BZ plus



Extract from the conditions of use of the European Technical Assessment ETA-10/0259

Permissible loads according to EN 1992-4 without influence of centre and edge distances. Overall safety factor is taken into account (γ_M and γ_F).

Technical data	Bolt anchor BZ plus		M8		M10		M12		M16	
Standard anchoring depth	h_{ef}	mm	46	–	60	–	70	–	85	–
Reduced anchoring depth	$h_{ef, red}$	mm	–	35	–	40	–	50	–	65
Cracked concrete										
Permissible tensile load (extract)	C20/25 per. N.	kN	2.4	2.4	4.3	3.6	7.6	5.8	11.9	8.6
Uncracked concrete										
Permissible tensile load (extract)	C20/25 per. N.	kN	5.7	3.6	7.6	4.3	11.9	8.3	16.7	12.3
Cracked / Uncracked concrete										
Permissible shear load (Extract)	C20/25 per. N.	kN	7	7	11.5	10.0/11.5	17.1	13.9/17.1	30.8/31.4	20.6/29.5
Permissible bending moment	Permitted. M	Nm	13.1	13.1	26.9	26.9	46.9	46.9	123.4	123.4
Centre and edge distances										
Anchoring depth	h_{ef}	mm	46	35	60	40	70	50	85	65
Characteristic centre distance	$s_{cr, N}$	mm	138	105	180	120	210	150	255	195
Characteristic edge distance	$c_{cr, N}$	mm	69	52,5	90	60	105	75	127,5	97,5
Minimum centre and edge distances for standard component thickness										
Cracked concrete										
Standard component thickness	$h_{min,1}$	mm	100	-	120	-	140	-	170	-
Minimum centre distance / for edge distance c	s_{min} / c	mm	40/70	-	45/70	-	60/100	-	60/100	-
Minimum edge distance / for centre distance s	c_{min} / s	mm	40/80	-	45/90	-	60/140	-	60/180	-
Uncracked concrete										
Minimum centre distance / for edge distance c	s_{min} / c	mm	40/80	-	45/70	-	60/120	-	65/120	-
Minimum edge distance / for centre distance s	c_{min} / s	mm	50/100	-	50/100	-	75/150	-	80/150	-
Minimum centre and edge distances for standard component thickness										
Cracked concrete										
Minimum component thickness	$h_{min,2} / h_{min,3}$	mm	80	80	100	80	120	100	140	140
Minimum centre distance / for edge distance c	s_{min} / c	mm	40/70	50/60	45/90	50/100	60/100	50/160	70/160	65/170
Minimum edge distance / for centre distance s	c_{min} / s	mm	40/80	40/185	50/115	65/180	60/140	65/250	80/180	100/250
Uncracked concrete										
Minimum centre distance / for edge distance c	s_{min} / c	mm	40/80	50/60	60/140	50/100	60/120	50/160	80/180	65/170
Minimum edge distance / for centre distance s	c_{min} / s	mm	50/100	40/185	90/140	65/180	75/150	100/185	90/200	170/65
Assembly data										
Borehole diameter	d_o	mm	8	8	10	10	12	12	16	16
Through hole in the attachment	d_f	mm	9	9	12	12	14	14	18	18
Borehole depth	h_1	mm	60	49	75	55	90	70	110	90
Torque when anchoring, galvanised steel	T_{inst}	Nm	20	20	25	25	45	45	90	90
Torque when anchoring, diffusion galvanised steel	T_{inst}	Nm	16	16	22	22	40	40	90	90
Open-end spanner	SW	mm	13	13	17	17	19	19	24	24
Fire loads										
Maximum tensile load kN in case of fire for fire resistance classes										
	Document	Size	R 30 (30 min)	R 60 (60 min)	R 90 (90 min)	R 120 (120 min)				
Bolt anchor BZ plus galvanised steel	ETA 10/0259	M8 $h_{ef,red} / h_{ef,std}$	1.25/1.25	1.10/1.10	0.80/0.80	0.60/0.70				
		M10 $h_{ef,red} / h_{ef,std}$	1.74/2.25	1.74/1.90	1.30/1.40	1.00/1.20				
		M12 $h_{ef,red} / h_{ef,std}$	3.04/4.00	3.00/3.00	1.90/2.40	1.30/2.20				
		M16 $h_{ef,red} / h_{ef,std}$	4.51/6.25	4.51/5.60	3.50/4.40	2.50/4.00				

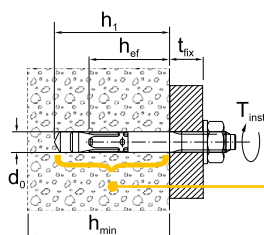
Bolt anchor AN BZ plus A4



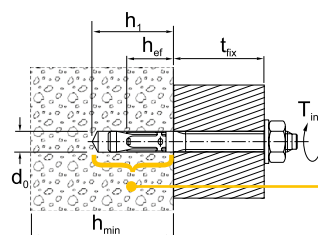
Extract from the conditions of use of the European Technical Assessment ETA-10/0259

Permissible loads according to EN 1992-4 without influence of centre and edge distances. Overall safety factor is taken into account (γ_M and γ_F).

Technical data	Bolt anchor BZ plus		M8		M10		M12		M16		
Standard anchoring depth	h_{ef}	mm	46	–	60	–	70	–	85	–	
Reduced anchoring depth	$h_{ef,red}$	mm	–	35	–	40	–	50	–	65	
Cracked concrete											
Permissible tensile load	C20/25 per. N.	kN	2.4	2.4	4.3	3.6	7.6	5.8	11.9	8.6	
Uncracked concrete											
Permissible tensile load	C20/25 per. N.	kN	5.7	3.6	7.6	4.3	11.9	8.3	16.7	12.3	
Cracked / Uncracked concrete											
Permissible shear load	C20/25 per. N.	kN	7.4	7.4	11.4	10.0/11.4	17.1	13.9/17.1	30.8/31.4	20.6/29.5	
Permissible bending moment	per. M	Nm	14.9	14.9	29.7	29.7	52.6	52.6	114.3	114.3	
Centre and edge distances											
Anchoring depth	h_{ef}	mm	46	35	60	40	70	50	85	65	
Characteristic centre distance	$s_{cr, N}$	mm	138	105	180	120	210	150	255	195	
Characteristic edge distance	$c_{cr, N}$	mm	69	52,5	90	60	105	75	127,5	97,5	
Minimum centre and edge distances for standard component thickness											
Cracked concrete											
Standard component thickness	$h_{min,1}$	mm	100	–	120	–	140	–	160	–	
Minimum centre distance / for edge distance c	s_{min} / c	mm	40/70	–	50/75	–	60/100	–	60/100	–	
Minimum edge distance / for centre distance s	c_{min} / s	mm	40/80	–	55/90	–	60/140	–	60/180	–	
Uncracked concrete											
Minimum centre distance / for edge distance c	s_{min} / c	mm	40/80	–	50/75	–	60/120	–	65/120	–	
Minimum edge distance / for centre distance s	c_{min} / s	mm	50/100	–	60/120	–	75/150	–	80/150	–	
Minimum centre and edge distances for minimum component thickness											
Cracked concrete											
Minimum component thickness	$h_{min,2} / h_{min,3}$	mm	80	80	100	80	120	100	140	140	
Minimum centre distance / for edge distance c	s_{min} / c	mm	40/70	50/60	45/90	50/100	60/100	50/160	70/160	65/170	
Minimum edge distance / for centre distance s	c_{min} / s	mm	40/80	40/185	50/115	65/180	60/140	65/250	80/180	100/250	
Uncracked concrete											
Minimum centre distance / for edge distance c	s_{min} / c	mm	40/80	50/60	60/140	50/100	60/120	50/160	80/180	65/170	
Minimum edge distance / for centre distance s	c_{min} / s	mm	50/100	40/185	90/140	65/180	75/150	100/185	90/200	170/65	
Assembly data											
Borehole diameter	d_o	mm	8	8	10	10	12	12	16	16	
Through hole in the attachment part	d_f	mm	9	9	12	12	14	14	18	18	
Borehole depth	h_1	mm	60	49	75	55	90	70	110	90	
Torque when anchoring	T_{inst}	Nm	20	20	35	35	50	50	110	110	
Open-end spanner	SW	mm	13	13	17	17	19	19	24	24	
Fire loads											
			Maximum tensile load kN in case of fire for fire resistance classes								
	Document	Size	R 30 (30 min)	R 60 (60 min)	R 90 (90 min)	R 120 (120 min)					
Bolt anchor BZ plus Stainless steel A4, Stainless steel 1.4529	ETA 10/0259	M8 $h_{ef,red} / h_{ef,std}$	1.25/1.25	1.25/1.25	1.25/1.25	1.00/1.00					
		M10 $h_{ef,red} / h_{ef,std}$	1.74/2.25	1.74/2.25	1.74/2.25	1.39/1.80					
		M12 $h_{ef,red} / h_{ef,std}$	3.04/4.00	3.04/4.00	3.04/4.00	2.43/3.20					
		M16 $h_{ef,red} / h_{ef,std}$	4.51/6.25	4.51/6.25	4.51/6.25	3.61/5.00					



Standard anchoring depth



Reduced anchoring depth

Drop-in anchor AN ES



Extract from the conditions of use of the European Technical Assessment ETA-10/0257

Permissible loads according to EN 1992-4 without influence of centre and edge distances. Overall safety factor is taken into account (γ_M and γ_F).

Technical data	Drop-in anchor AN ES		M8x30 ¹	M8x40	M10x30 ¹	M10x40	M12x50 M12x80	M16x65
Uncracked concrete								
Permissible tensile load (Screw 5.6 bis 8.8)	C20/25 per. N.	kN	3.2	3.6	3.2	4.9	6.9	10.2
	C25/30 per. N.	kN	3.6	3.8	3.6	5.5	7.7	11.4
	C30/37 per. N.	kN	3.9	4.0	3.9	6.0	8.5	12.5
	C40/50 per. N.	kN	4.5	4.4	4.5	7.0	9.8	14.5
	C50/60 per. N.	kN	5.1	4.7	5.1	7.8	10.9	16.2
Permissible shear load (Screw 5.6)	≥ C20/25 per. V.	kN	3.8	3.9	3.8	4.1	9.0	16.8
Permissible shear load (Screw 5.8)	≥ C20/25 per. V.	kN	3.8	3.9	3.8	4.1	11.1/12.1	18.0
Permissible shear load (Screw 8.8)	≥ C20/25 per. V.	kN	3.8	3.9	3.8	4.1	11.1/12.3	18.0
Permissible bending moment (Screw 5.6)	Permitted M	Nm	8.1	8.1	15.8	15.8	27.8	71.0
Permissible bending moment (Screw 5.8)	Permitted M	Nm	10.9	10.9	21.1	21.1	37.1	94.9
Permissible bending moment (Screw 8.8)	Permitted M	Nm	17.1	17.1	33.7	34.3	60.0	152.0
Centre and edge distances								
Anchoring depth	h_{ef}	mm	30	40	30	40	50	65
Characteristic centre distance	$s_{cr,N}$	mm	90	120	90	120	150	195
Characteristic edge distance	$c_{cr,N}$	mm	45	60	45	60	75	97.5
Minimum centre distance	s_{min}	mm	60	80	100	100	120	150
Minimum edge distance	c_{min}	mm	95	95	115	135	165	200
Minimum component thickness	h_{min}	mm	100	100	120	120	130	160
Assembly data								
Borehole diameter	d_o	mm	10	10	12	12	15	20
Through hole in the attachment part	d_f	mm	9	9	12	12	14	18
Borehole depth	h_o	mm	30	40	30	40	50 / 80 ²	65
Torque when anchoring	$T_{inst} \leq$	Nm	8	8	15	15	35	60
Minimum screw-in depth		mm	9	9	10	11	13	18
Maximum screw-in depth		mm	13	20	12	15	18 / 45 ²	23

¹⁾ Application only for statically indeterminate systems

²⁾ ES M12x50 / M12x80

Fire loads (expert opinion 21725/1)	Maximum tensile load kN in case of fire for fire resistance classes				
	Type	R 30 (30 min)	R 60 (60 min)	R 90 (90 min)	R 120 (120 min)
Drop-in anchor AN ES Galvanised steel with screw ≥ Fkl. 5.6	M8x30	0.90	0.90	0.80	0.50
	M8x40	1.80	1.30	0.80	0.50
	M10x30	0.90	0.90	0.90	0.70
	M10x40	1.80	1.80	1.20	0.80
	M12x50	3.20	3.10	1.80	1.20
	M16x65	4.70	4.70	3.30	2.20

Extract from the conditions of use of the European Technical Assessment ETA-10/0258

Use as multiple fastening of non-load-bearing systems. Permissible loads according to EN 1992-4 without influence of centre and edge distances. The overall safety factor is taken into account (γ_M und γ_r). The maximum permissible load per fixing point may be less than the permissible load of the anchor, depending on national regulations.

Technical data	Drop-in anchor AN ES	M8x25	M8x30	M8x40	M10x25	M10x30	M10x40	M12x25	M12x50	M16x65	
Cracked und Uncracked concrete											
Permissible load (C12/15 und C16/20)	per. F	kN	1.2	–	–	1.7	–	–	1.7	–	–
Permissible load (C20/25 bis C50/60)	per. F	kN	1.9	1.7	2	2.1	2	2	2.1	2.4	6.3
Permissible bending moment (Screw 4.6)	per. M	Nm	6.4	6.4	6.4	12.8	12.8	12.8	22.2	22.2	56.9
Permissible bending moment (Screw 5.6)	per. M	Nm	8.1	8.1	8.1	15.8	15.8	15.8	27.8	27.8	71
Permissible bending moment (Screw 5.8)	per. M	Nm	10.9	10.9	10.9	21.1	21.1	21.1	37.1	37.1	94.9
Permissible bending moment (Screw 8.8)	per. M	Nm	17.1	17.1	17.1	34.3	33.7	34.3	60	60	152
Centre and edge distances											
Anchoring depth	h_{ef}	mm	25	30	40	25	30	40	25	50	65
Characteristic centre distance	$s_{cr,N}$	mm	75	180	210	75	230	170	75	170	400
Characteristic edge distance	$c_{cr,N}$	mm	38	90	105	38	115	85	38	85	200
Minimum centre distance ¹	s_{min}	mm	50	60	80	60	100	100	100	120	150
Minimum edge distance ¹	c_{min}	mm	100	95	95	100	115	135	110	165	200
Standard component thickness / Minimum component thickness	$h_{min 2} / h_{min 1}$	mm	100/80	100	100	100/80	120	120	100/80	130	160
Assembly data											
Borehole diameter	d_o	mm	10	10	10	12	12	12	15	15	20
Through hole in the attachment part	d_f	mm	9	9	9	12	12	12	14	14	18
Borehole depth	h_o	mm	25	30	40	25	30	40	25	50	65
Torque when anchoring	$T_{inst} \leq$	Nm	8	8	8	15	15	15	35	35	60
Minimum screw-in depth ¹	L_{sd}	mm	8	9	9	10	10	11	12	13	18
Maximum screw-in depth ¹	L_{th}	mm	12	13	20	12	12	15	12	18	23
Loads under fire exposure (C20/25 bis C50/60)											
for screw ≥ 4.8	Perm. load R30 Permitted F	kN	0.6	0.9	1.1	0.6	0.9	1.5	0.6	1.5	4
	Perm. load R60 Permitted F	kN	0.6	0.9	0.9	0.6	0.9	1.5	0.6	1.5	4
	Perm. load R90 Permitted F	kN	0.6	0.6	0.6	0.6	0.9	1.1	0.6	1.5	3
	Perm. load R120 Permitted F	kN	0.5	0.5	0.5	0.5	0.7	0.9	0.5	1.2	2.4
for screw ≥ 5.6	Per. load R30 Permitted F	kN	0.6	0.9	1.5	0.6	0.9	1.5	0.6	1.5	4
	Per. load R60 Permitted F	kN	0.6	0.9	1.5	0.6	0.9	1.5	0.6	1.5	4
	Per. load R90 Permitted F	kN	0.6	0.9	0.9	0.6	0.9	1.5	0.6	1.5	3.7
	Per. load R120 Permitted F	kN	0.5	0.5	0.5	0.5	0.7	1	0.5	1.2	2.4
Characteristic centre distance	$s_{cr,fi}$	mm	100	180	210	100	170	170	100	200	400
Characteristic edge distance	$c_{cr,fi}$	mm	50	90	105	50	85	85	50	100	200

¹⁾ Values for minimum component thickness see ETA-10/0258.

Technical data	Drop-in anchor AN ES		M8x25	M10x25	M12x25
Prestressed concrete hollow core slabs C30/37 bis C50/60					
Mirror thickness	$d_b \geq$	mm	35 (30 ¹⁾)		
Permissible load	F_{zul}	kN	1.9	2.1	2.1
Permissible bending moment (Screw 4.6)	Permitted M	Nm	6.4	12.8	22.2
Permissible bending moment (Screw 4.8)	Permitted M	Nm	8.6	17.1	29.7
Permissible bending moment (Screw 5.6)	Permitted M	Nm	8.1	15.8	27.8
Permissible bending moment (Screw 5.8)	Permitted M	Nm	10.9	21.1	37.1
Permissible bending moment (Screw 8.8)	Permitted M	Nm	17.1	34.3	60.0
Centre and edge distances					
Centre distance	$S_{cr} = s_{min}$	mm	200		
Edge distance	$C_{cr} = c_{rmin}$	mm	150		
Assembly data					
Borehole diameter	d_o	mm	10	12	15
Through hole in the attachment part	d_f	mm	9	12	14
Borehole depth	h_o	mm	25	25	25
Installation torque	$T_{inst} \leq$	Nm	8	15	35

¹⁾ Drill hole must not cut a hollow chamber.

Drop-in anchor AN ES VA



Extract from the conditions of use of the European Technical Assessment ETA-10/0257

Permissible loads according to EN 1992-4 without influence of centre and edge distances. Overall safety factor is taken into account (γ_M and γ_F).

Technical data	Drop-in anchor AN VA		M8x30 ¹	M8x40	M10x40	M12x50	M16x65
Uncracked concrete							
Permissible tensile load	C20/25 per. N.	kN	3.8	5.2	5.9	8.3	12.3
	C25/30 per. N.	kN	4.3	5.6	6.6	9.3	13.7
	C30/37 per. N.	kN	4.7	5.9	7.2	10.1	15.0
	C40/50 per. N.	kN	5.4	6.4	8.4	11.7	17.4
	C50/60 per. N.	kN	6.1	6.9	9.3	13.1	19.4
Permissible shear load	\geq C20/25 per. V.	kN	4.9	4.9	6.1	11.5	19.2
Permissible bending moment	per. M	Nm	11.9	11.9	23.8	42.1	106.7
Centre and edge distances							
Anchoring depth	h_{ef}	mm	30	40	40	50	65
Characteristic centre distance	$S_{cr,N}$	mm	90	120	120	150	195
Characteristic edge distance	$C_{cr,N}$	mm	45	60	60	75	97.5
Minimum centre distance	s_{min}	mm	60	80	100	120	150
Minimum edge distance	c_{min}	mm	95	95	135	165	200
Minimum component thickness	h_{min}	mm	100	100	130	140	160
Assembly data							
Borehole diameter	d_o	mm	10	10	12	15	20
Through hole in the attachment part	d_f	mm	9	9	12	14	18
Borehole depth	h_o	mm	30	40	40	50	65
Torque when anchoring	$T_{inst} \leq$	Nm	8	8	15	35	60
Minimum screw-in depth	L_{sd}	mm	9	9	11	13	18
Maximum screw-in depth	L_{th}	mm	13	20	15	18	23

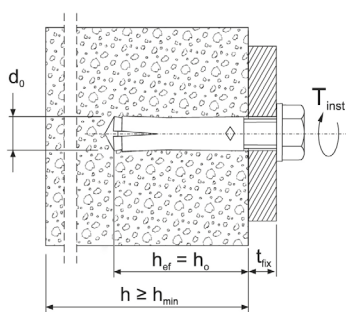
¹⁾ Application only for statically indeterminate systems

Loads under fire exposure (expert opinion 21725/1)							
	Per. load R30 per. F	kN	0.9	1.5	1.5	1.5	4.0
	Per. load R60 per. F	kN	0.9	1.5	1.5	1.5	4.0
	Per. load R90 per. F	kN	0.9	0.9	1.5	1.5	3.7
	Per. load R120 per. F	kN	0.5	0.5	1.0	1.2	2.4

Extract from the conditions of use of the European Technical Assessment ETA-10/0258

Use as multiple fastening of non-load-bearing systems. Permissible loads according to EN 1992-4 without influence of centre and edge distances. The overall safety factor is taken into account (γ_M und γ_F). The maximum permissible load per fixing point may be less than the permissible load of the anchor, depending on national regulations.

Technical data	Drop-in anchor AN VA	M8x30	M8x40	M10x40	M12x50	M16x65	
Cracked und Uncracked concrete							
Permissible load (C20/25 bis C50/60)	per. F	kN	1.7	2	2	2.4	6.3
Permissible bending moment (A4-70)	per. M	Nm	11.9	11.9	23.8	42.1	106.7
Centre and edge distances							
Anchoring depth	h_{ef}	mm	30	40	40	50	65
Characteristic centre distance	$s_{cr,N}$	mm	180	210	170	170	400
Characteristic edge distance	$c_{cr,N}$	mm	90	105	85	85	200
Minimum centre distance	s_{min}	mm	60	80	100	120	150
Minimum edge distance	c_{min}	mm	95	95	135	165	200
Minimum component thickness	h_{min}	mm	100	100	130	140	160
Assembly data							
Borehole diameter	d_o	mm	10	10	12	15	20
Through hole in the attachment part	d_f	mm	9	9	12	14	18
Borehole depth	h_o	mm	30	40	40	50	65
Torque when anchoring	$T_{inst} \leq$	Nm	8	8	15	35	60
Minimum screw-in depth	L_{sd}	mm	9	9	11	13	18
Maximum screw-in depth	L_{th}	mm	13	20	15	18	23
Loads under fire exposure							
	Per. load R30 per. F	kN	0.9	1.5	1.5	1.5	4
	Per. load R60 per. F	kN	0.9	1.5	1.5	1.5	4
	Per. load R90 per. F	kN	0.9	0.9	1.5	1.5	3.7
	Per. load R120 per. F	kN	0.5	0.5	1	1.2	2.4
Characteristic centre distance	$s_{cr,fi}$	mm	180	210	170	200	400
Characteristic edge distance	$c_{cr,fi}$	mm	90	105	85	100	200



TSM screwbolt



Extract from the conditions of use of the European Technical Assessment ETA-16/0655¹⁾

Permissible loads according to EN 1992-4 without influence of centre and edge distances. Overall safety factor is taken into account (γ_M und γ_F).

Technical data			TSM screwbolt		TSM 6		TSM 8			TSM 10			TSM 12	
Nominal screw-in depth 1	$h_{nom 1}$	mm	–	–	45	–	–	55	–	–	65	–	–	
Nominal screw-in depth 2	$h_{nom 2}$	mm	40	–	–	55	–	–	75	–	–	85	–	
Nominal screw-in depth 3	$h_{nom 3}$	mm	–	55	–	–	65	–	–	85	–	–	100	
Cracked concrete														
Permissible tensile load	C20/25 per. N.	kN	1	1.9	2.4	4.3	5.7	4.3	7.6	9.2	5.7	9.0	11.7	
	C25/30 per. N.	kN	1.1	2.1	2.7	4.8	6.4	4.8	8.5	10.3	6.4	10.1	13.1	
	C30/37 per. N.	kN	1.2	2.3	2.9	5.2	7	5.2	9.3	11.3	7	11.0	14.4	
	C40/50 per. N.	kN	1.3	2.7	3.4	6.1	8.1	6.1	10.8	13.0	8.1	12.7	16.6	
	C50/60 per. N.	kN	1.5	3	3.8	6.8	9.0	6.8	12.0	14.5	9.0	14.2	18.6	
Uncracked concrete														
Permissible tensile load	C20/25 per. N.	kN	1.9	4.3	3.6	5.7	7.6	5.7	9.5	12.4	7.6	12.8	16.8	
	C25/30 per. N.	kN	2.1	4.8	4.0	6.4	8.5	6.4	10.6	13.8	8.5	14.4	18.7	
	C30/37 per. N.	kN	2.3	5.2	4.4	7	9.3	7	11.7	15.2	9.3	15.7	20.5	
	C40/50 per. N.	kN	2.7	6.1	5.1	8.1	10.8	8.1	13.5	17.5	10.8	18.2	23.7	
	C50/60 per. N.	kN	3	6.7	5.6	9.0	12.0	9.0	15.1	19.6	12.0	20.3	26.5	
Cracked / Uncracked concrete														
Permissible shear load	C20/25 per. N.	kN	2.8/4.0	4.0/4.0	3.4/4.9	4.6/6.6	6.1/8.8	4.6/6.6	15.2/19.4	18.4/19.4	5.8/8.3	18.0/24.0	23.5/24.0	
	\geq C25/30 per. N.	kN	3.2/4.0	4.0/4.0	3.8/5.4	5.2/7.4	6.9/9.7	5.2/7.4	17.0/19.4	19.4/19.4	6.5/9.3	20.1/24.0	24.0/24.0	
Permissible bending moment	per. M	Nm	6.2	6.2	14.9	14.9	14.9	32	32	32	64.6	64.6	64.6	
Centre and edge distances														
Anchoring depth	h_{ef}	mm	31	44	35	43	52	43	60	68	50	67	80	
Characteristic centre distance	$s_{cr, N}$	mm	93	132	105	129	156	129	180	204	150	201	240	
Characteristic edge distance	$c_{cr, N}$	mm	46.5	66	52.5	64.5	78	64.5	90	102	75	100.5	120	
Minimum component thickness	h_{min}	mm	80	80	80	80	80	80	90	102	80	101	120	
Minimum centre distance	s_{min}	mm	40	40	40	50	50	50	50	50	50	50	70	
Minimum edge distance	c_{min}	mm	40	40	40	50	50	50	50	50	50	50	70	
Assembly data														
Borehole diameter	d_o	mm	6	6	8	8	8	10	10	10	12	12	12	
Through hole in the attachment part	$d_f \leq$	mm	8	8	12	12	12	14	14	14	16	16	16	
Borehole depth	$h_1 \geq$	mm	45	60	55	65	75	65	85	95	75	95	110	
Installation torque for connection thread	$T_{inst} \leq$	Nm	10	10	20	20	20	40	40	40	60	60	60	
Tangential impact wrench	T_{inst}	Nm	160	160	300	300	300	400	400	400	650	650	650	
Fire loads														
Maximum tensile load kN in case of fire for fire resistance classes														
	Document	Type	R 30 (30 min)	R 60 (60 min)	R 90 (90 min)	R 120 (120 min)								
Screw anchor TSM VA Galvanised steel	ETA 16/0655	TSM 6 h_{nom} 40	0.5	0.5	0.5	0.4								
		TSM 6 h_{nom} 55	0.9	0.8	0.6	0.4								
		TSM 8 h_{nom} 45	1.25	1.25	1.1	0.7								
		TSM 8 h_{nom} 55	2.25	1.7	1.1	0.7								
		TSM 8 h_{nom} 65	2.4	1.7	1.1	0.7								
		TSM 10 h_{nom} 55	2.25	2.25	2.25	1.7								
		TSM 10 h_{nom} 75	4.4	3.3	2.3	1.7								
		TSM 10 h_{nom} 85	4.4	3.3	2.3	1.7								
		TSM 12 h_{nom} 65	3	3	3	2.4								
		TSM 12 h_{nom} 85	4.72	4.72	4.2	3.4								
		TSM 12 h_{nom} 100	6.16	5.8	4.2	3.4								

Extract from the conditions of use of the European Technical Assessment ETA-16/0656

Use as multiple fastening of non-load-bearing systems. Permissible loads according to EN 1992-4 without influence of centre and edge distances. The total safety factor is taken into account (γ_M and γ_p). The maximum permissible load per fixing point may be less than the permissible load of the anchor, depending on national regulations.

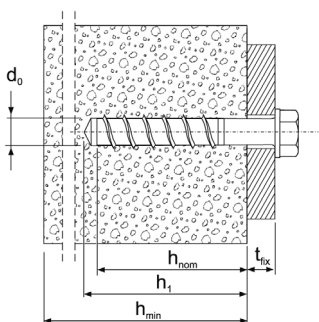
Technical data		TSM screwbolt		TSM 6		
Nominal screw-in depth 1	$h_{nom 1}$	mm	35	–		
Nominal screw-in depth 2	$h_{nom 2}$	mm	–	55		
Cracked concrete						
Permissible tensile load	C20/25 per. N.	kN	1.4	3.6		
	C25/30 per. N.	kN	1.6	4.0		
	C30/37 per. N.	kN	1.7	4.4		
	C40/50 per. N.	kN	2.0	5.1		
	C50/60 per. N.	kN	2.3	5.6		
Uncracked concrete						
Permissible tensile load	C20/25 per. N.	kN	1.4	3.6		
	C25/30 per. N.	kN	1.6	4.0		
	C30/37 per. N.	kN	1.7	4.4		
	C40/50 per. N.	kN	2.0	5.1		
	C50/60 per. N.	kN	2.3	5.6		
Cracked / Uncracked concrete						
Permissible shear load	C20/25 per. N.	kN	2.3/3.3	4.0/4.0		
	\geq C25/30 per. N.	kN	2.6/3.7	4.0/4.0		
Permissible bending moment	per. M	Nm	6.2	6.2		
Centre and edge distances						
Anchoring depth	h_{ef}	mm	27	44		
Characteristic centre distance	$s_{cr, N}$	mm	81	132		
Characteristic edge distance	$c_{cr, N}$	mm	40.5	66		
Minimum component thickness	h_{min}	mm	80	100		
Minimum centre distance	s_{min}	mm	35	40		
Minimum edge distance	c_{min}	mm	35	40		
Assembly data						
Borehole diameter	d_o	mm	6	6		
Through hole in the attachment part	$d_f \leq$	mm	8	8		
Borehole depth	$h_1 \geq$	mm	40	60		
Installation torque for connection thread	$T_{inst} \leq$	Nm	10	10		
Tangential impact wrench ¹	T_{inst}	Nm	160	160		
Fire loads	Maximum tensile load kN in case of fire for fire resistance classes in cracked and uncracked concrete C20/25 bis C50/60					
	Document	Typ	R 30 (30 min)	R 60 (60 min)	R 90 (90 min)	R 120 (120 min)
TSM screwbolt	ETA-16/0656	TSM 6 h_{nom} 35	0.65	0.65	0.6	0.4
Galvanised steel		TSM 6 h_{nom} 55	0.9	0.8	0.6	0.4

¹⁾ Installation possible with tangential impact wrench with maximum power output $T_{imp,max}$ according to manufacturer's specifications.

Extract from the conditions of use of the European Technical Assessment ETA-16/0656

Use as multiple fastening of non-load-bearing systems. Permissible loads according to EN 1992-4 without influence of centre and edge distances. The overall safety factor is taken into account (γ_M und γ_P). The maximum permissible load per fixing point may be less than the permissible load of the anchor, depending on national regulations.

Technical data	Screwbolt TSM 6		TSM 6		
Nominal screw-in depth	h_{nom}	mm	≥ 35		
Prestressed concrete hollow core slabs C30/37 bis C50/60					
Mirror thickness	$d_b \geq$	mm	25	30	35
	$F_{per.}$	kN	0.48	0.95	1.43
Centre and edge distances					
Centre distance	s_{min}	mm	100		
Edge distance	c_{min}	mm	100		
Assembly data					
Borehole diameter	d_o	mm	6		
Through hole in the attachment part	d_f	mm	8		
Borehole depth	$h_1 \geq$	mm	40		
Installation torque	$T_{inst} \leq$	Nm	10		



Nail anchor AN N



Extract from the conditions of use of the European Technical Assessment ETA-11/0240

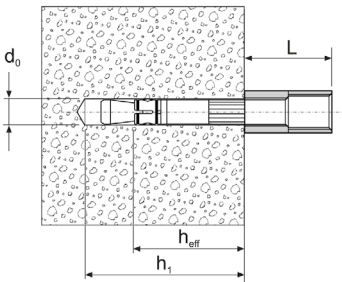
Use as multiple fastening of non-load-bearing systems. Permissible loads according to EN 1992-4 without influence of centre and edge distances. The overall safety factor is taken into account (γ_M und γ_P). The maximum permissible load per fixing point may be less than permissible load of the anchor, depending on national regulations.

Technical data		Galvanised steel nail anchor ¹			
Anchoring depth		h_{eff}	mm	25	30
Permissible load ²	C12/12	per. F	kN	1.43	1.9
	C20/25 - C50/60	per. F	kN	2.14	2.81
Permissible bending moment		per. M	Nm	5.3	5.3
Minimum component thickness		h_{min}	mm	80	80
Assembly data					
Borehole diameter		d_0	mm	6	6
Borehole depth		h_1	mm	35	40

¹) If shear force is present, a verification for shear load with lever arm must be carried out.

²) With an edge distance of $c_{or} \geq 100$ mm and a centre distance of $s_{cr} \geq 200$ mm. In the event of deviations in the centre and edge distances, the approval values must be consulted.

	Maximum tensile load [kN] in the event of fire for fire resistance classes					
	Document	Size	R 30 (30 min)	R 60 (60 min)	R 90 (90 min)	R 120 (120 min)
Nail anchor AN N	ETA 13/0048	N $h_{ef} = 25$	0.60	0.60	0.60	0.50
		N $h_{ef} = 30$	0.80	0.70	0.60	0.60



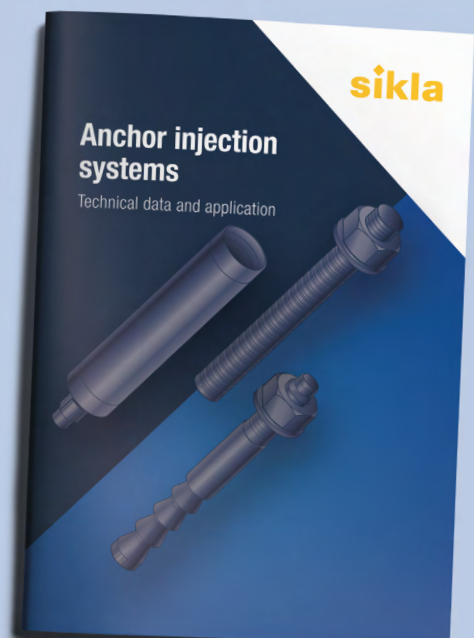
Our services

- ✓ Anchor design software
- ✓ Extraction tests on the construction site with an unsettled substrate
- ✓ Construction site
- ✓ Installation instructions
- ✓ CAD library
- ✓ Planning support



You can find our complete range of anchors in our e-catalogue **Siconnect** in the chapter "**Fixings & Fastenings**".

Further information on our Chemical anchors can be found in a separate brochure.

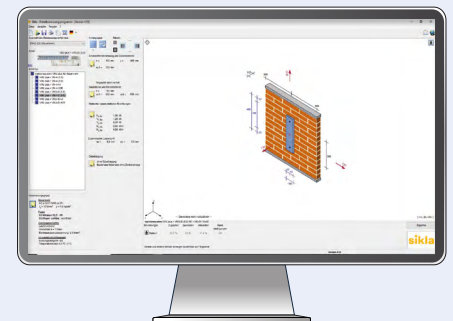
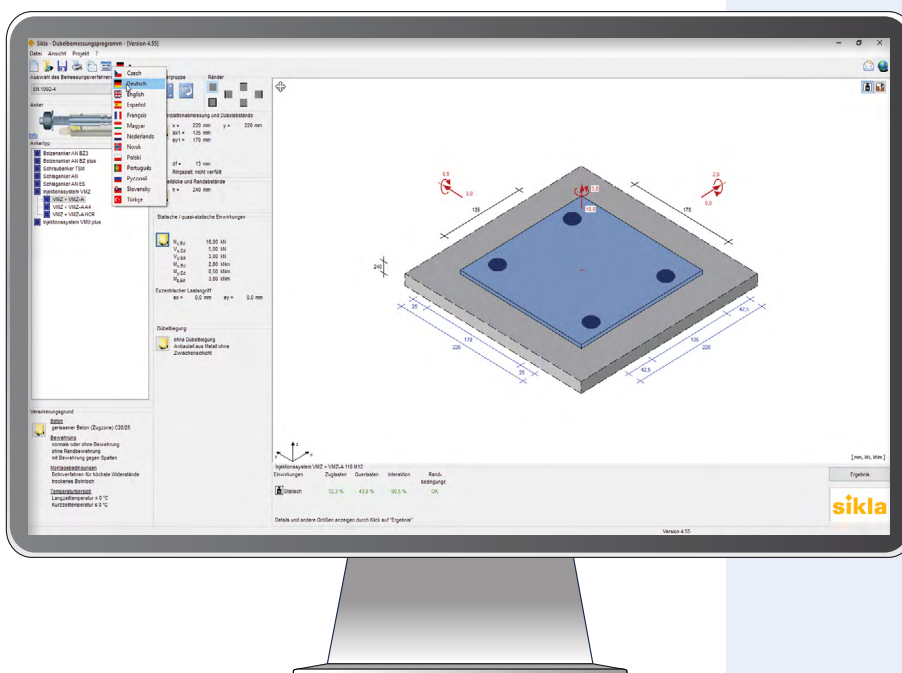




Anchor design software

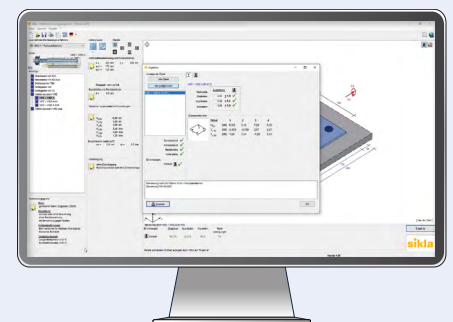
- Intuitive user interface with clear input
- Calculation of near-edge fixings and anchor groups
- Design in accordance with the European Technical Assessments of Sikla products and the European Design Methods EN 1992-4, ETAG 001 Annex C, ETAG 029 Annex C, ETAG 001 Part 6, Technical Reports TR 020,
 - TR 029, TR 045 and TR 061
- Detailed result display
- Comprehensible expression

Surface of the Sikla Anchorage measurement programme



Design in masonry

Design of chemical Sikla anchors in masonry possible without problems.



Result of dimensioning in concrete

Clear and detailed presentation of the result of the dimensioning.



Print preview

Optimised print display for passing on the design

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