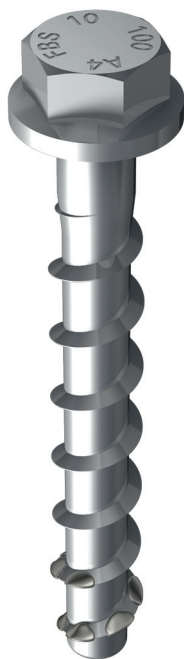


The powerful concrete screw for outdoor use



Steel girders



Banisters

VERSIONS

- Stainless steel

BUILDING MATERIALS

Approved for:

- Concrete C20/25 to C50/60, cracked and non-cracked

Also suitable for:

- Natural stone with dense structure

CERTIFICATES



ADVANTAGES

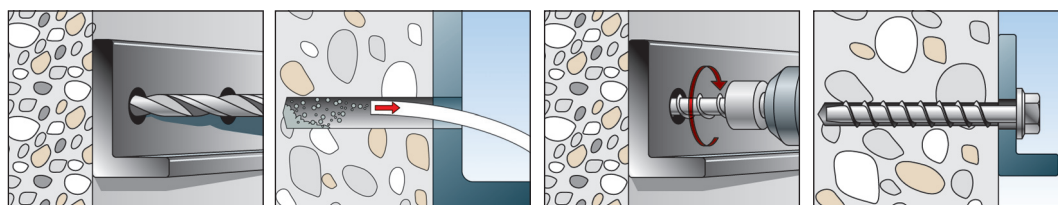
- The FBS A4 ensures very high loads, thus resulting in fewer anchoring points.
- The FBS A4 can be installed in a single step, which saves energy and time.
- The enhanced stainless steel version A4 now also allows anchoring applications in outdoor and damp areas.
- The version type SK (countersunk head) offers expanded use for applications with challenging designs.
- The ETA assessment Option 1 governs the use of single-point fixings in cracked and non-cracked concrete.

APPLICATIONS

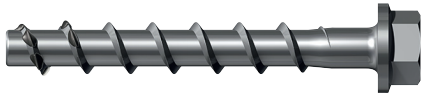
- Guard rails
- Consoles/Base plates
- Steel constructions
- Metal profiles
- Guardrails
- Ladders
- Gates

FUNCTIONING

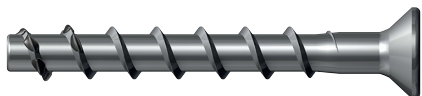
- The FBS is suitable for push-through installation.
- When the concrete screw is screwed into the drill hole, the thread flanks cut positively into the concrete.
- For installation, a tangential impact screw driver with a socket suited to impact wrenches is recommended.
- Use FBS A4 for external applications and those in a damp environment.



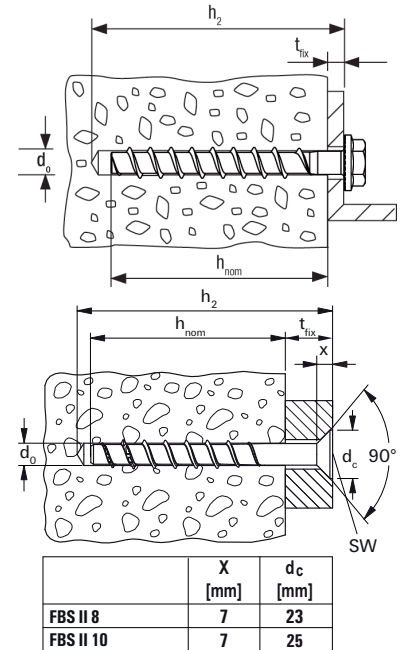
TECHNICAL DATA



Concrete screw **FBS-US A4** with hexagon head and molded washer, stainless steel A4



Concrete screw **FBS-US A4** - with hexagon head and molded washer, stainless steel A4



	stainless steel	Approval	Drill hole diameter	Min. drill hole depth for through fixings	Screw length	Screw-in depth	Max. fixture thickness	Drive	Sales unit
	Art.-No.	ETA	d ₀ [mm]	h ₂ [mm]	l _s [mm]	h _{nom} [mm]	t _{fix} [mm]		[pcs]
Item	A4								
FBS 8 x 70/5 US A4	523899	■	8	80	70	65	5	SW 13	25
FBS 8 x 80/15 US A4	523900	■	8	90	80	65	15	SW 13	25
FBS 8 x 90/25 US A4	523901	■	8	100	90	65	25	SW 13	25
FBS 10 x 90/5 US A4	523902	■	10	100	90	85	5	SW 15	25
FBS 10 x 100/15 US A4	523903	■	10	110	100	85	15	SW 15	25
FBS 10 x 120/35 US A4	523904	■	10	130	120	85	35	SW 15	25
FBS 12 x 110/10 US A4	523905	■	12	120	110	100	10	SW 17	20
FBS 12 x 130/30 US A4	523906	■	12	140	130	100	30	SW 17	20
FBS 8 x 90/25 SK A4	534064	■	8	100	90	65	25	T40	20

INSTALLATION OF CONCRETE SCREWS (USE A CORDLESS OR CABLED IMPACT WRENCH)

Concrete Screw FBS 8-14 zinc plated steel/stainless steel A4	Recommended nominal torque of the tangential impact wrench ^{*)} [Nm]	Maximum nominal torque wrench of the tangential impact wrench ^{*)} [Nm]
FBS 8	250	350
FBS 10	300	600
FBS 12	450	650
FBS 14	450	650

^{*)} The values apply to concrete strength of approx. 40N/mm², for other concrete strength classes the values may differ.
The conversion of nominal output into effective tightening torque varies from machine to machine - always therefore use torque control.

LOADS

Concrete screw FBS US A4 and FBS SK A4

Highest permissible loads for a single anchor¹⁾ in cracked concrete (concrete tension zone) C20/25⁴⁾

Type	Screw-in depth h_{nom} [mm]	Min. member thickness h_{min} [mm]	Torque moment $T_{inst, max}$ [Nm]	Permissible tensile load $N_{perm}^{3)}$ [kN]	Permissible shear load $V_{perm}^{3)}$ [kN]	Required edge distance (with one edge) for		Required spacing for Max. Load s [mm]	Min. spacing $s_{min}^{2)}$ [mm]	Min. edge distance $c_{min}^{2)}$ [mm]
						Max. tension load c [mm]	Max. shear load c [mm]			
FBS 8 A4	65	120	≤ 20	4,3	6,2	50	120	155	50	50
FBS 10 A4	85	130	≤ 40	7,6	19,0	75	375	205	70	70
FBS 12 A4	100	150	≤ 60	12,3	23,3	120	420	240	80	80

For the design the complete approval ETA - 11/0095 has to be considered.

¹⁾ The partial safety factors for material resistance as regulated in the approval as well as a partial safety factor for load actions of $\gamma_L = 1,4$ are considered. As an single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1,5 \times h_{ef}$.

²⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

³⁾ For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see approval.

⁴⁾ For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

LOADS

Concrete screw FBS US A4 and FBS SK A4

Highest permissible loads for a single anchor¹⁾ in non-cracked concrete (concrete compression zone) C20/25⁴⁾

Type	Screw-in depth h_{nom} [mm]	Min. member thickness h_{min} [mm]	Torque moment $T_{inst, max}$ [Nm]	Permissible tensile load $N_{perm}^{3)}$ [kN]	Permissible shear load $V_{perm}^{3)}$ [kN]	Required edge distance (with one edge) for		Required spacing for Max. Load s [mm]	Min. spacing $s_{min}^{2)}$ [mm]	Min. edge distance $c_{min}^{2)}$ [mm]
						Max. tension load c [mm]	Max. shear load c [mm]			
FBS 8 A4	65	120	≤ 20	5,7	8,8	50	120	155	50	50
FBS 10 A4	85	130	≤ 40	13,5	19,0	75	375	205	70	70
FBS 12 A4	100	150	≤ 60	17,2	23,3	120	420	240	80	80

For the design the complete approval ETA - 11/0095 has to be considered.

¹⁾ The partial safety factors for material resistance as regulated in the approval as well as a partial safety factor for load actions of $\gamma_L = 1,4$ are considered. As an single anchor counts e.g. an anchor with a spacing $s \geq 3 \times h_{ef}$ and an edge distance $c \geq 1,5 \times h_{ef}$.

²⁾ Minimum possible axial spacings resp. edge distance while reducing the permissible load.

³⁾ For combinations of tensile loads, shear loads, bending moments as well as reduced edge distances or spacings (anchor groups) see approval.

⁴⁾ For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

LOADS

Concrete screw FBS US A4 and FBS SK A4

Highest recommended loads¹⁾ for each fixing point^{5) 6)} in solid brick masonry.

Type	FBS 8 A4		
Minimum member thickness	h_{min}	[mm]	115
Embedment depth	h_{nom}	[mm]	65
Minimum spacing within anchor groups of 2 or 4 anchors	$s_{min}^{2)}$	[mm]	70
Minimum edge distance	$c_{min}^{2)}$	[mm]	200
Minimum distance to the horizontal joint	s_{min}^{\perp}	[mm]	20
Minimum distance to the vertical joint	s_{min}^{\parallel}	[mm]	40
Minimum distance between anchor groups	a	[mm]	⁷⁾
Minimum brick dimensions			240x115x71
Recommended total load for a single anchor resp. anchor group $F_{rec}^{3) 6)}$			
Recommended load ³⁾ in solid brick Mz ⁴⁾	$f_{ck} \geq 12 \text{ N/mm}^2$	[kN]	1,14
Recommended load ³⁾ in Solid sand-lime brick KS ⁴⁾	$f_{ck} \geq 12 \text{ N/mm}^2$	[kN]	0,90

¹⁾ An appropriate safety factor is considered.

²⁾ Smallest possible spacing resp. edge distance without reducing the recommended load.

³⁾ Valid for tensile load, shear load and oblique load under any angle.

⁴⁾ Solid bricks acc. EN 771-1 resp. EN 772-2.

⁵⁾ The given data are valid for multiple fixings of non-structural applications. If the joints are not visible 100% anchor testing is recommended.

⁶⁾ A fixing point can be a single anchor, 2 anchors or 4 anchors with a minimum spacing s_{min} . Anchor groups of 4 anchors are arranged in rectangular disposition.

⁷⁾ The fixing points have to be arranged in this way that there will be always maximum one fixing point arranged in one brick.