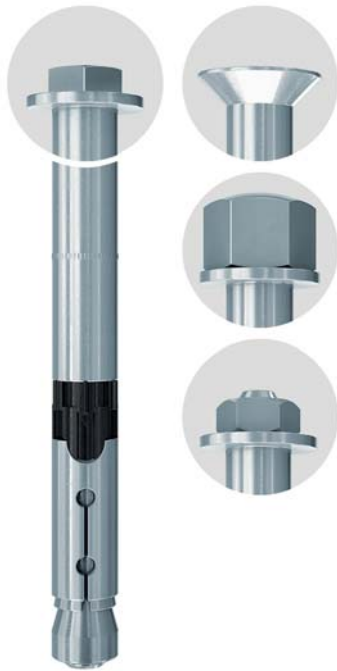


## Strong, secure and aesthetic anchoring



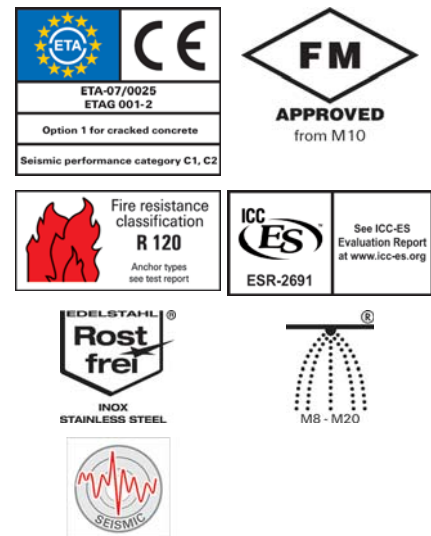
### VERSIONS

- Zinc-plated steel
- Stainless steel

### BUILDING MATERIALS

- Concrete C20/25, cracked and non-cracked

### CERTIFICATES



### ADVANTAGES

- The international approvals guarantee maximum safety and the best performance. These approvals even cover use in earthquake zones (seismic C1 and C2).
- The anchor is designed with different head styles for fixing points with aesthetic design.
- The design between the bolt and the sleeve ensures high shear load-bearing capacity. Thus, fewer fixing points are required.
- The optimised geometry minimises the energy required for installation and thus allows for fast installation.
- The use of hollow drills is included in the approval.

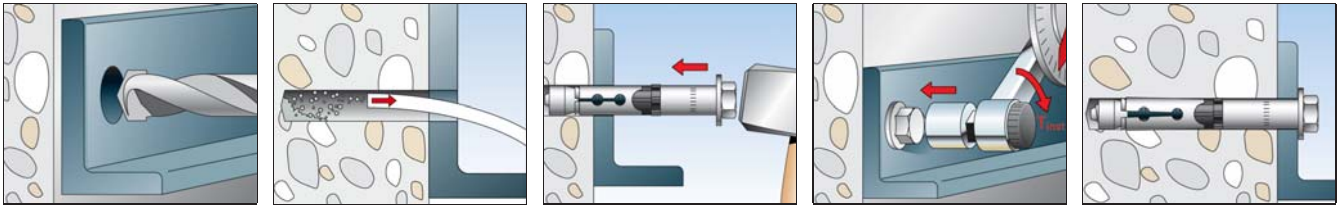
### APPLICATIONS

- Guard rails
- Staircases
- Consoles
- Steel constructions
- Ladders
- Cable trays
- Machines
- Gates
- Façades
- Gratings

### FUNCTIONING

- The FH II is suitable for push-through installation.
- When the torque is applied, the cone is pulled into the expansion sleeve which is forced against the drill hole wall.
- The black plastic ring prevents rotation when tightening the anchor and acts as a crumple zone to take the torque slippage, so that the fixture of pulled onto the substrate.
- Alternative head designs for flexible design solutions:  
Hexagon head (type S), countersunk head (type SK), bolt version with nut and washer (type B) and cap nut (type H).

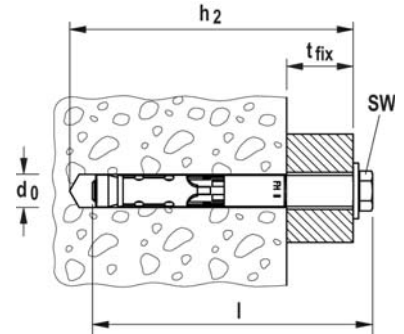
## INSTALLATION



## TECHNICAL DATA



High performance anchor **FH II-S**  
with hexagonal head

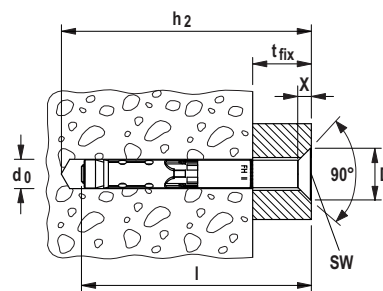


Item	Zinc-plated steel	Stainless steel	Approval		Seismic-Approval	Drill hole diameter $d_0$ [mm]	Min. drill hole depth for through fixings $h_2$ [mm]	Anchor length $l$ [mm]	Max. fixture thickness $t_{fix}$ [mm]	Thread M	Width across nut $\varnothing$ SW [mm]	Sales unit [pcs]
	Art.-No.	Art.-No.	ETA	ICC								
	gvz	A4										
FH II 10/10 S	503133	—	■	—	—	10	65	70	10	M 6	10	50
FH II 10/10 S	—	510923	■	—	—	10	65	69	10	M 6	10	50
FH II 10/25 S	503134	—	■	—	—	10	80	85	25	M 6	10	50
FH II 10/25 S	—	510924	■	—	—	10	80	84	25	M 6	10	50
FH II 10/50 S	503135	—	■	—	—	10	105	110	50	M 6	10	50
FH II 12/10 S	044884	—	■	▲	C1 / C2	12	90	90	10	M 8	13	50
FH II 12/10 S	—	510925	■	—	C1 / C2	12	90	90	10	M 8	13	50
FH II 12/25 S	044885	—	■	▲	C1 / C2	12	105	105	25	M 8	13	50
FH II 12/25 S	—	510926	■	—	C1 / C2	12	105	105	25	M 8	13	20
FH II 12/50 S	044886	—	■	▲	C1 / C2	12	130	130	50	M 8	13	25
FH II 15/10 S	044887	—	■	▲	C1 / C2	15	100	106	10	M 10	17	25
FH II 15/10 S	—	510927	■	—	C1 / C2	15	100	107	10	M 10	17	50
FH II 15/25 S	044888	—	■	▲	C1 / C2	15	115	121	25	M 10	17	25
FH II 15/25 S	—	510928	■	—	C1 / C2	15	115	122	25	M 10	17	20
FH II 15/50 S	044889	—	■	▲	C1 / C2	15	140	146	50	M 10	17	25
FH II 18/10 S	046847	—	■	▲	C1 / C2	18	115	118	10	M 12	19	20
FH II 18/25 S	044894	—	■	▲	C1 / C2	18	130	132	25	M 12	19	20
FH II 18/25 S	—	510929	■	—	C1 / C2	18	130	133	25	M 12	19	10
FH II 18/50 S	044896	—	■	▲	C1 / C2	18	155	157	50	M 12	19	20
FH II 24/25 S	044898	—	■	▲	C1 / C2	24	150	160	25	M 16	24	10
FH II 24/25 S	—	502711	■	—	C1 / C2	24	150	160	25	M 16	24	8
FH II 24/50 S	044900	—	■	▲	C1 / C2	24	175	185	50	M 16	24	10
FH II 28/30 S	044901	—	■	▲	C1 / C2	28	185	192	30	M 20	30	4
FH II 28/60 S	044902	—	■	▲	C1 / C2	28	215	222	60	M 20	30	4
FH II 32/30 S	044903	—	■	▲	C1 / C2	32	210	215	30	M 24	36	4
FH II 32/60 S	044904	—	■	▲	C1 / C2	32	240	245	60	M 24	36	4

## TECHNICAL DATA



High performance anchor **FH II-SK**  
with countersunk head



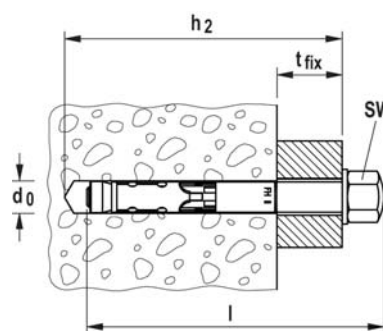
	X [mm]	ØD [mm]
FH II 10/... SK	5,0	19,5
FH II 12/... SK	5,8	22
FH II 15/... SK	5,8	25
FH II 18/... SK	8,0	32

Item	Zinc-plated steel	Stainless steel	Approval		Seismic-Approval	Drill hole diameter $d_0$ [mm]	Min. drill hole depth for through fixings $h_2$ [mm]	Anchor length $l$ [mm]	Max. fixture thickness $t_{fix}$ [mm]	Thread M	Width across nut (hexagon socket) ○ SW [mm]	Sales unit [pcs]
	Art.-No.	Art.-No.	ETA	ICC								
	gvz	A4										
FH II 10/15 SK	503136	—	■	—	—	10	70	65	15	M 6	4	50
FH II 10/25 SK	503137	—	■	—	—	10	80	75	25	M 6	4	50
FH II 10/50 SK	503138	—	■	—	—	10	105	100	50	M 6	4	50
FH II 12/15 SK	—	510931	■	—	—	12	95	90	15	M 8	5	25
FH II 12/15 SK	044917	—	■	—	C1 / C2	12	95	90	15	M 8	5	25
FH II 12/25 SK	044918	—	■	—	C1 / C2	12	105	100	25	M 8	5	25
FH II 12/30 SK	—	510932	■	—	C1 / C2	12	110	105	30	M 8	5	25
FH II 12/50 SK	044919	510933	■	—	C1 / C2	12	130	125	50	M 8	5	25
FH II 15/15 SK	044920	510934	■	▲	C1 / C2	15	105	100	15	M 10	6	25
FH II 15/25 SK	044921	—	■	▲	C1 / C2	15	115	110	25	M 10	6	25
FH II 15/50 SK	044922	—	■	▲	C1 / C2	15	140	135	50	M 10	6	25
FH II 18/15 SK	044923	—	■	▲	C1 / C2	18	120	115	15	M 12	8	20
FH II 18/25 SK	044924	—	■	▲	C1 / C2	18	130	125	25	M 12	8	20
FH II 18/30 SK	—	510935	■	—	C1 / C2	18	135	130	30	M 12	8	20
FH II 18/50 SK	044925	—	■	▲	C1 / C2	18	155	150	50	M 12	8	20

## TECHNICAL DATA



High performance anchor **FH II-H**  
with cap nut

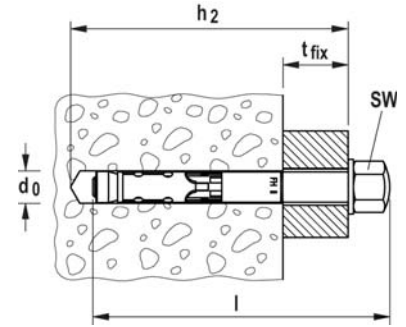


Item	Zinc-plated steel	Approval		Seismic-Approval	Drill hole diameter $d_0$ [mm]	Min. drill hole depth for through fixings $h_2$ [mm]	Anchor length $l$ [mm]	Max. fixture thickness $t_{fix}$ [mm]	Thread M	Width across nut ○ SW [mm]	Sales unit [pcs]
	Art.-No.	ETA	ICC								
	gvz										
FH II 10/10 H	503139	■	—	—	10	65	75	10	M 6	13	50
FH II 10/25 H	503140	■	—	—	10	80	90	25	M 6	13	50
FH II 10/50 H	503141	■	—	—	10	105	115	50	M 6	13	50
FH II 12/10 H	044905	■	—	C1 / C2	12	90	100	10	M 8	17	50
FH II 12/25 H	044906	■	—	C1 / C2	12	105	115	25	M 8	17	50
FH II 12/50 H	044907	■	—	C1 / C2	12	130	140	50	M 8	17	25
FH II 15/10 H	044908	■	▲	C1 / C2	15	100	115	10	M 10	17	25

## TECHNICAL DATA



High performance anchor **FH II-H** with cap nut

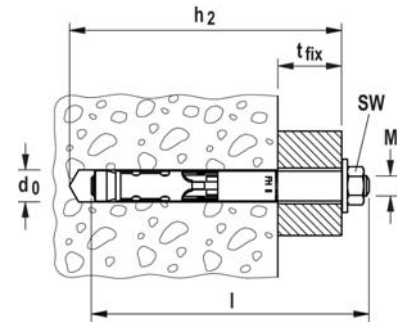


Item	Zinc-plated steel	Approval		Seismic-Approval	Drill hole diameter $d_0$ [mm]	Min. drill hole depth for through fixings $h_2$ [mm]	Anchor length $l$ [mm]	Max. fixture thickness $t_{fix}$ [mm]	Thread M	Width across nut $\varnothing$ SW [mm]	Sales unit [pcs]
	Art.-No.	ETA	ICC								
	gvz										
<b>FH II 15/25 H</b>	<b>044909</b>	■	▲	C1 / C2	15	115	130	25	M 10	17	25
<b>FH II 15/50 H</b>	<b>044910</b>	■	▲	C1 / C2	15	140	155	50	M 10	17	25
<b>FH II 18/25 H</b>	<b>044915</b>	■	▲	C1 / C2	18	130	145	25	M 12	19	20
<b>FH II 18/50 H</b>	<b>044916</b>	■	▲	C1 / C2	18	155	170	50	M 12	19	20

## TECHNICAL DATA



High performance anchor **FH II-B** with hexagon nut and threaded bolt



Item	Zinc-plated steel	Approval		Seismic-Approval	Drill hole diameter $d_0$ [mm]	Min. drill hole depth for through fixings $h_2$ [mm]	Anchor length $l$ [mm]	Max. fixture thickness $t_{fix}$ [mm]	Thread M	Width across nut $\varnothing$ SW [mm]	Sales unit [pcs]
	Art.-No.	ETA	ICC								
	gvz										
<b>FH II 10/10 B</b>	<b>503142</b>	■	—	—	10	65	70	10	M 6	10	50
<b>FH II 10/25 B</b>	<b>503143</b>	■	—	—	10	80	85	25	M 6	10	50
<b>FH II 10/50 B</b>	<b>503144</b>	■	—	—	10	105	110	50	M 6	10	50
<b>FH II 12/10 B</b>	<b>048773</b>	■	▲	C1 / C2	12	90	95	10	M 8	13	50
<b>FH II 12/100 B</b>	<b>046832</b>	■	▲	C1 / C2	12	180	185	100	M 8	13	25
<b>FH II 12/25 B</b>	<b>048774</b>	■	▲	C1 / C2	12	105	110	25	M 8	13	50
<b>FH II 12/50 B</b>	<b>048775</b>	■	▲	C1 / C2	12	130	135	50	M 8	13	25
<b>FH II 15/10 B</b>	<b>048776</b>	■	▲	C1 / C2	15	100	110	10	M 10	17	25
<b>FH II 15/100 B</b>	<b>046835</b>	■	▲	C1 / C2	15	190	200	100	M 10	17	20
<b>FH II 15/25 B</b>	<b>048777</b>	■	▲	C1 / C2	15	115	125	25	M 10	17	25
<b>FH II 15/50 B</b>	<b>048778</b>	■	▲	C1 / C2	15	140	150	50	M 10	17	25
<b>FH II 18/100 B</b>	<b>046841</b>	■	▲	C1 / C2	18	205	215	100	M 12	19	10
<b>FH II 18/25 B</b>	<b>048779</b>	■	▲	C1 / C2	18	130	140	25	M 12	19	20
<b>FH II 18/50 B</b>	<b>048780</b>	■	▲	C1 / C2	18	155	165	50	M 12	19	20
<b>FH II 24/100 B</b>	<b>046842</b>	■	▲	C1 / C2	24	225	242	100	M 16	24	5
<b>FH II 24/25 B</b>	<b>048886</b>	■	▲	C1 / C2	24	150	167	25	M 16	24	10
<b>FH II 24/50 B</b>	<b>048887</b>	■	▲	C1 / C2	24	175	192	50	M 16	24	10
<b>FH II 28/30 B</b>	<b>047547</b>	■	▲	C1 / C2	28	185	199	30	M 20	30	4
<b>FH II 28/60 B</b>	<b>047548</b>	■	▲	C1 / C2	28	215	229	60	M 20	30	4
<b>FH II 32/30 B</b>	<b>047549</b>	■	▲	C1 / C2	32	210	231	30	M 24	36	4
<b>FH II 32/60 B</b>	<b>047550</b>	■	▲	C1 / C2	32	240	261	60	M 24	36	4

### LOADS

#### High performance anchor FH II-S

zinc plated steel / stainless steel A4

Permissible loads of a single anchor in cracked normal concrete (concrete tension zone) of strength class C20/25 (~B25) <sup>1) 2) 3) 8)</sup>										Minimum spacings while reducing the load	
Type	Material fixing element	Minimum member thickness	Effective anchorage depth	Installation torque	Permissible tensile load	Permissible shear load	Required edge distance (with one edge) for		Required spacing for	Min. spacing	Min. edge distance
							Max. tension load c	Max. shear load c			
		h <sub>min</sub> [mm]	h <sub>ef</sub> [mm]	T <sub>inst</sub> [Nm]	N <sub>perm</sub> <sup>5)</sup> [kN]	V <sub>perm</sub> <sup>5)</sup> [kN]	[mm]	[mm]	[mm]	[mm]	[mm]
FH II 10 S	gvz	80	40	10	3,6	4,3	50	105	120	40	40
	A4			15							
FH II 12 S	gvz	120	60	22,5	5,7	15,9	60	320	180	50	50
	A4			25							
FH II 15 S	gvz	140	70	40	7,6	20,1	75	365	210	60	60
	A4										
FH II 18 S	gvz	160	80	80	11,9	24,5	120	410	240	70	70
	A4			100							
FH II 24 S	gvz	200	100	160	17,1	34,3	150	495	300	80	80
	A4										
FH II 28 S <sup>4)</sup>	gvz	250	125	180	24,0	47,9	190	610	375	100	100
FH II 32 S <sup>4)</sup>	gvz	300	150	200	31,5	63,0	225	720	450	120	120

For the design the complete assessment ETA-07/0025 has to be considered.<sup>7)</sup>

- The partial safety factors for material resistance as regulated in the ETA-07/0025 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  $s \geq 3 \cdot h_{ef}$  and an edge distance  $c \geq 1,5 \cdot h_{ef}$ . Accurate data see ETA-07/0025.
- For higher concrete strength classes up to C50/60 higher permissible loads may be possible.
- Drill method hammer drilling resp. hollow drilling.
- Drill method hollow drilling is not permitted for this size.
- For combinations of tensile loads and shear loads or for shear loads with lever arm (bending moments) as well as reduced edge distances or spacings (anchor groups) we recommend to use our anchor design software C-FIX.
- Minimum possible spacing resp. edge distance while reducing the permissible load for the required minimum member thickness. The combination of minimum edge distance and minimum spacing is not possible. One of both values has to be increased acc. ETA-07/0025.
- The given loads refer to the European Technical Assessment ETA-07/0025, issue date 28.08.2018. Design of the loads according to FprEN 1992-4:2016 and EOTA Technical Report TR 055 (for static resp. quasi-static loads).
- A reinforcement in the concrete to prevent splitting is required. The width of the cracks has to be limited under consideration of the splitting forces at  $w_k \sim 0,3\text{mm}$ .

### LOADS

#### High performance anchor FH II-SK

zinc plated steel / stainless steel A4

Permissible loads of a single anchor in cracked normal concrete (concrete tension zone) of strength class C20/25 (~B25) <sup>1) 2) 3) 8)</sup>										Minimum spacings while reducing the load	
Type	Material fixing element	Minimum member thickness	Effective anchorage depth	Installation torque	Permissible tensile load	Permissible shear load	Required edge distance (with one edge) for		Required spacing for	Min. spacing	Min. edge distance
							Max. tension load c	Max. shear load c			
		h <sub>min</sub> [mm]	h <sub>ef</sub> [mm]	T <sub>inst</sub> [Nm]	N <sub>perm</sub> <sup>5)</sup> [kN]	V <sub>perm</sub> <sup>5)</sup> [kN]	[mm]	[mm]	[mm]	[mm]	[mm]
FH II 10 SK <sup>4)</sup>	gvz	80	40	10	3,6	4,3	50	105	120	40	40
FH II 12 SK	gvz	120	60	22,5	5,7	15,9	60	320	180	50	50
	A4										
FH II 15 SK	gvz	140	70	40	7,6	20,1	75	365	210	60	60
	A4										
FH II 18 SK	gvz	160	80	80	11,9	24,5	120	410	240	70	70
	A4			100							

For the design the complete assessment ETA-07/0025 has to be considered.<sup>7)</sup>

- The partial safety factors for material resistance as regulated in the ETA-07/0025 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  $s \geq 3 \cdot h_{ef}$  and an edge distance  $c \geq 1,5 \cdot h_{ef}$ . Accurate data see ETA-07/0025.
- For higher concrete strength classes up to C50/60 higher permissible loads may be possible.
- Drill method hammer drilling resp. hollow drilling.
- Drill method hollow drilling is not permitted for this size.
- For combinations of tensile loads and shear loads or for shear loads with lever arm (bending moments) as well as reduced edge distances or spacings (anchor groups) we recommend to use our anchor design software C-FIX.
- Minimum possible spacing resp. edge distance while reducing the permissible load for the required minimum member thickness. The combination of minimum edge distance and minimum spacing is not possible. One of both values has to be increased acc. ETA-07/0025.
- The given loads refer to the European Technical Assessment ETA-07/0025, issue date 28.08.2018. Design of the loads according to FprEN 1992-4:2016 and EOTA Technical Report TR 055 (for static resp. quasi-static loads).
- A reinforcement in the concrete to prevent splitting is required. The width of the cracks has to be limited under consideration of the splitting forces at  $w_k \sim 0,3\text{mm}$ .

## LOADS

### High performance anchor FH II-H

zinc plated steel

Permissible loads of a single anchor in cracked normal concrete (concrete tension zone) of strength class C20/25 (~B25) <sup>1) 2) 3) 7)</sup>										Minimum spacings while reducing the load	
Type	Material fixing element	Minimum member thickness	Effective anchorage depth	Installation torque	Permissible tensile load	Permissible shear load	Required edge distance (with one edge) for		Required spacing for	Min. spacing	Min. edge distance
							Max. tension load c	Max. shear load c			
		$h_{min}$ [mm]	$h_{ef}$ [mm]	$T_{inst}$ [Nm]	$N_{perm}^{4)}$ [kN]	$V_{perm}^{4)}$ [kN]	[mm]	[mm]	$s_{scr}$ [mm]	$s_{min}^{5)}$ [mm]	$c_{min}^{5)}$ [mm]
<b>FH II 10 H</b>	gvz	80	40	10	3,6	4,3	50	105	120	40	40
<b>FH II 12 H</b>	gvz	120	60	22,5	5,7	15,5	60	315	180	50	50
<b>FH II 15 H</b>	gvz	140	70	40	7,6	20,1	75	365	210	60	60
<b>FH II 18 H</b>	gvz	160	80	80	11,9	24,5	120	410	240	70	70

For the design the complete assessment ETA-07/0025 has to be considered.<sup>8)</sup>

<sup>1)</sup> The partial safety factors for material resistance as regulated in the ETA-07/0025 as well as a partial safety factor for load actions of  $\gamma_L = 1,4$  are considered. As a single anchor counts e.g. an anchor with a spacing  $s \geq 3 \cdot h_{ef}$  and an edge distance  $c \geq 1,5 \cdot h_{ef}$ . Accurate data see ETA-07/0025.

<sup>2)</sup> For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

<sup>3)</sup> Drill method hammer drilling resp. hollow drilling.

<sup>4)</sup> For combinations of tensile loads and shear loads or for shear loads with lever arm (bending moments) as well as reduced edge distances or spacings (anchor groups) we recommend to use our anchor design software C-FIX.

<sup>5)</sup> Minimum possible spacing resp. edge distance while reducing the permissible load for the required minimum member thickness. The combination of minimum edge distance and minimum spacing is not possible. One of both values has to be increased acc. ETA-07/0025.

<sup>6)</sup> The given loads refer to the European Technical Assessment ETA-07/0025, issue date 28.08.2018. Design of the loads according to FprEN 1992-4:2016 and EOTA Technical Report TR 055 (for static resp. quasi-static loads).

<sup>7)</sup> A reinforcement in the concrete to prevent splitting is required. The width of the cracks has to be limited under consideration of the splitting forces at  $w_k \sim 0,3\text{mm}$ .

## LOADS

### High performance anchor FH II-B

zinc plated steel

Permissible loads of a single anchor in cracked normal concrete (concrete tension zone) of strength class C20/25 (~B25) <sup>1) 2) 3) 8)</sup>										Minimum spacings while reducing the load	
Type	Material fixing element	Minimum member thickness	Effective anchorage depth	Installation torque	Permissible tensile load	Permissible shear load	Required edge distance (with one edge) for		Required spacing for	Min. spacing	Min. edge distance
							Max. tension load c	Max. shear load c			
		$h_{min}$ [mm]	$h_{ef}$ [mm]	$T_{inst}$ [Nm]	$N_{perm}^{5)}$ [kN]	$V_{perm}^{5)}$ [kN]	[mm]	[mm]	$s_{scr}$ [mm]	$s_{min}^{6)}$ [mm]	$c_{min}^{6)}$ [mm]
<b>FH II 10 B</b>	gvz	80	40	10	3,6	4,3	50	105	120	40	40
<b>FH II 12 B</b>	gvz	120	60	17,5	5,7	15,5	60	315	180	50	50
<b>FH II 15 B</b>	gvz	140	70	38	7,6	20,1	75	365	210	60	60
<b>FH II 18 B</b>	gvz	160	80	80	11,9	24,5	120	410	240	70	70
<b>FH II 24 B</b>	gvz	200	100	120	17,1	34,3	150	495	300	80	80
<b>FH II 28 B<sup>4)</sup></b>	gvz	250	125	180	24,0	47,9	190	610	375	100	100
<b>FH II 32 B<sup>4)</sup></b>	gvz	300	150	200	31,5	63,0	225	720	450	120	120

For the design the complete assessment ETA-07/0025 has to be considered.<sup>7)</sup>

<sup>1)</sup> The partial safety factors for material resistance as regulated in the ETA-07/0025 as well as a partial safety factor for load actions of  $\gamma_L = 1,4$  are considered. As a single anchor counts e.g. an anchor with a spacing  $s \geq 3 \cdot h_{ef}$  and an edge distance  $c \geq 1,5 \cdot h_{ef}$ . Accurate data see ETA-07/0025.

<sup>2)</sup> For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

<sup>3)</sup> Drill method hammer drilling resp. hollow drilling.

<sup>4)</sup> Drill method hollow drilling is not permitted for this size.

<sup>5)</sup> For combinations of tensile loads and shear loads or for shear loads with lever arm (bending moments) as well as reduced edge distances or spacings (anchor groups) we recommend to use our anchor design software C-FIX.

<sup>6)</sup> Minimum possible spacing resp. edge distance while reducing the permissible load for the required minimum member thickness. The combination of minimum edge distance and minimum spacing is not possible. One of both values has to be increased acc. ETA-07/0025.

<sup>7)</sup> The given loads refer to the European Technical Assessment ETA-07/0025, issue date 28.08.2018. Design of the loads according to FprEN 1992-4:2016 and EOTA Technical Report TR 055 (for static resp. quasi-static loads).

<sup>8)</sup> A reinforcement in the concrete to prevent splitting is required. The width of the cracks has to be limited under consideration of the splitting forces at  $w_k \sim 0,3\text{mm}$ .



## LOADS

### High performance anchor FH II-S

zinc plated steel / stainless steel A4

Permissible loads of a single anchor in non-cracked normal concrete (concrete compression zone) of strength class C20/25 (~B25) <sup>1)2)3)</sup>										Minimum spacings while reducing the load	
Type	Material fixing element	Minimum member thickness	Effective anchorage depth	Installation torque	Permissible tensile load	Permissible shear load	Required edge distance (with one edge) for		Required spacing for	Min. spacing	Min. edge distance
							Max. tension load c	Max. shear load c			
		$h_{min}$ [mm]	$h_{ef}$ [mm]	$T_{inst}$ [Nm]	$N_{perm}^{5)}$ [kN]	$V_{perm}^{5)}$ [kN]	[mm]	[mm]	$s_{cr}$ [mm]	$s_{min}^{6)}$ [mm]	$c_{min}^{6)}$ [mm]
FH II 10 S	gvz	80	40	10	6,1	6,1	95	100	120	40	40
	A4			15							
FH II 12 S	gvz	120	60	22,5	11,2	18,9	150	265	180	60	60
	A4			25							
FH II 15 S	gvz	140	70	40	14,1	28,2	160	365	210	70	70
	A4										
FH II 18 S	gvz	160	80	80	17,2	34,4	170	405	240	80	80
	A4			100							
FH II 24 S	gvz	200	100	160	24,0	48,1	190	495	300	100	100
	A4										
FH II 28 S <sup>4)</sup>	gvz	250	125	180	33,6	67,2	240	605	375	120	120
FH II 32 S <sup>4)</sup>	gvz	300	150	200	44,2	88,4	285	715	450	160	180

For the design the complete assessment ETA-07/0025 has to be considered.<sup>7)</sup>

- <sup>1)</sup> The partial safety factors for material resistance as regulated in the ETA-07/0025 as well as a partial safety factor for load actions of  $\gamma_L = 1,4$  are considered. As a single anchor counts e.g. an anchor with a spacing  $s \geq 3 \cdot h_{ef}$  and an edge distance  $c \geq 1,5 \cdot h_{ef}$ . Accurate data see ETA-07/0025.
- <sup>2)</sup> For higher concrete strength classes up to C50/60 higher permissible loads may be possible.
- <sup>3)</sup> Drill method hammer drilling resp. hollow drilling.
- <sup>4)</sup> Drill method hollow drilling is not permitted for this size.
- <sup>5)</sup> For combinations of tensile loads and shear loads or for shear loads with lever arm (bending moments) as well as reduced edge distances or spacings (anchor groups) we recommend to use our anchor design software C-FIX.
- <sup>6)</sup> Minimum possible spacing resp. edge distance while reducing the permissible load for the required minimum member thickness. The combination of minimum edge distance and minimum spacing is not possible. One of both values has to be increased acc. ETA-07/0025.
- <sup>7)</sup> The given loads refer to the European Technical Assessment ETA-07/0025, issue date 28.08.2018. Design of the loads according to FprEN 1992-4:2016 and EOTA Technical Report TR 055 (for static resp. quasi-static loads).

## LOADS

### High performance anchor FH II-SK

zinc plated steel / stainless steel A4

Permissible loads of a single anchor in non-cracked normal concrete (concrete compression zone) of strength class C20/25 (~B25) <sup>1)2)3)</sup>										Minimum spacings while reducing the load	
Type	Material fixing element	Minimum member thickness	Effective anchorage depth	Installation torque	Permissible tensile load	Permissible shear load	Required edge distance (with one edge) for		Required spacing for	Min. spacing	Min. edge distance
							Max. tension load c	Max. shear load c			
		$h_{min}$ [mm]	$h_{ef}$ [mm]	$T_{inst}$ [Nm]	$N_{perm}^{5)}$ [kN]	$V_{perm}^{5)}$ [kN]	[mm]	[mm]	$s_{cr}$ [mm]	$s_{min}^{6)}$ [mm]	$c_{min}^{6)}$ [mm]
FH II 10 SK <sup>4)</sup>	gvz	80	40	10	6,1	6,1	95	100	120	40	40
FH II 12 SK	gvz	120	60	22,5	11,2	18,9	150	265	180	60	60
	A4										
FH II 15 SK	gvz	140	70	40	14,1	28,2	160	365	210	70	70
	A4										
FH II 18 SK	gvz	160	80	80	17,2	34,4	170	405	240	80	80
	A4			100							

For the design the complete assessment ETA-07/0025 has to be considered.<sup>7)</sup>

- <sup>1)</sup> The partial safety factors for material resistance as regulated in the ETA-07/0025 as well as a partial safety factor for load actions of  $\gamma_L = 1,4$  are considered. As a single anchor counts e.g. an anchor with a spacing  $s \geq 3 \cdot h_{ef}$  and an edge distance  $c \geq 1,5 \cdot h_{ef}$ . Accurate data see ETA-07/0025.
- <sup>2)</sup> For higher concrete strength classes up to C50/60 higher permissible loads may be possible.
- <sup>3)</sup> Drill method hammer drilling resp. hollow drilling.
- <sup>4)</sup> Drill method hollow drilling is not permitted for this size.
- <sup>5)</sup> For combinations of tensile loads and shear loads or for shear loads with lever arm (bending moments) as well as reduced edge distances or spacings (anchor groups) we recommend to use our anchor design software C-FIX.
- <sup>6)</sup> Minimum possible spacing resp. edge distance while reducing the permissible load for the required minimum member thickness. The combination of minimum edge distance and minimum spacing is not possible. One of both values has to be increased acc. ETA-07/0025.
- <sup>7)</sup> The given loads refer to the European Technical Assessment ETA-07/0025, issue date 28.08.2018. Design of the loads according to FprEN 1992-4:2016 and EOTA Technical Report TR 055 (for static resp. quasi-static loads).

## LOADS

### High performance anchor FH II-H

zinc plated steel

Permissible loads of a single anchor in non-cracked normal concrete (concrete compression zone) of strength class C20/25 (~B25) <sup>1) 2) 3)</sup>										Minimum spacings while reducing the load	
Type	Material fixing element	Minimum member thickness	Effective anchorage depth	Installation torque	Permissible tensile load	Permissible shear load	Required edge distance (with one edge) for		Required spacing for	Min. spacing	Min. edge distance
							Max. tension load c	Max. shear load c			
		$h_{min}$ [mm]	$h_{ef}$ [mm]	$T_{inst}$ [Nm]	$N_{perm}^{4)}$ [kN]	$V_{perm}^{4)}$ [kN]	c [mm]	c [mm]	$s_{cr}$ [mm]	$s_{min}^{5)}$ [mm]	$c_{min}^{5)}$ [mm]
<b>FH II 10 H</b>	gvz	80	40	10	6,1	6,1	95	100	120	40	40
<b>FH II 12 H</b>	gvz	120	60	22,5	11,2	15,5	150	215	180	60	60
<b>FH II 15 H</b>	gvz	140	70	40	14,1	24,5	160	310	210	70	70
<b>FH II 18 H</b>	gvz	160	80	80	17,2	34,4	170	405	240	80	80

For the design the complete assessment ETA-07/0025 has to be considered.<sup>6)</sup>

<sup>1)</sup> The partial safety factors for material resistance as regulated in the ETA-07/0025 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  $s \geq 3 \cdot h_{ef}$  and an edge distance  $c \geq 1,5 \cdot h_{ef}$ . Accurate data see ETA-07/0025.

<sup>2)</sup> For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

<sup>3)</sup> Drill method hammer drilling resp. hollow drilling.

<sup>4)</sup> For combinations of tensile loads and shear loads or for shear loads with lever arm (bending moments) as well as reduced edge distances or spacings (anchor groups) we recommend to use our anchor design software C-FIX.

<sup>5)</sup> Minimum possible spacing resp. edge distance while reducing the permissible load for the required minimum member thickness. The combination of minimum edge distance and minimum spacing is not possible. One of both values has to be increased acc. ETA-07/0025.

<sup>6)</sup> The given loads refer to the European Technical Assessment ETA-07/0025, issue date 28.08.2018. Design of the loads according to FprEN 1992-4:2016 and EOTA Technical Report TR 055 (for static resp. quasi-static loads).

## LOADS

### High performance anchor FH II-B

zinc plated steel

Permissible loads of a single anchor in non-cracked normal concrete (concrete compression zone) of strength class C20/25 (~B25) <sup>1) 2) 3)</sup>										Minimum spacings while reducing the load	
Type	Material fixing element	Minimum member thickness	Effective anchorage depth	Installation torque	Permissible tensile load	Permissible shear load	Required edge distance (with one edge) for		Required spacing for	Min. spacing	Min. edge distance
							Max. tension load c	Max. shear load c			
		$h_{min}$ [mm]	$h_{ef}$ [mm]	$T_{inst}$ [Nm]	$N_{perm}^{5)}$ [kN]	$V_{perm}^{5)}$ [kN]	c [mm]	c [mm]	$s_{cr}$ [mm]	$s_{min}^{6)}$ [mm]	$c_{min}^{6)}$ [mm]
<b>FH II 10 B</b>	gvz	80	40	10	6,1	6,1	95	100	120	40	40
<b>FH II 12 B</b>	gvz	120	60	17,5	11,2	15,5	150	215	180	60	60
<b>FH II 15 B</b>	gvz	140	70	38	14,1	24,5	160	310	210	70	70
<b>FH II 18 B</b>	gvz	160	80	80	17,2	34,4	170	405	240	80	80
<b>FH II 24 B</b>	gvz	200	100	120	24,0	48,1	190	495	300	100	100
<b>FH II 28 B<sup>4)</sup></b>	gvz	250	125	180	33,6	67,2	240	605	375	120	120
<b>FH II 32 B<sup>4)</sup></b>	gvz	300	150	200	44,2	88,4	285	715	450	160	180

For the design the complete assessment ETA-07/0025 has to be considered.<sup>7)</sup>

<sup>1)</sup> The partial safety factors for material resistance as regulated in the ETA-07/0025 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  $s \geq 3 \cdot h_{ef}$  and an edge distance  $c \geq 1,5 \cdot h_{ef}$ . Accurate data see ETA-07/0025.

<sup>2)</sup> For higher concrete strength classes up to C50/60 higher permissible loads may be possible.

<sup>3)</sup> Drill method hammer drilling resp. hollow drilling.

<sup>4)</sup> Drill method hollow drilling is not permitted for this size.

<sup>5)</sup> For combinations of tensile loads and shear loads or for shear loads with lever arm (bending moments) as well as reduced edge distances or spacings (anchor groups) we recommend to use our anchor design software C-FIX.

<sup>6)</sup> Minimum possible spacing resp. edge distance while reducing the permissible load for the required minimum member thickness. The combination of minimum edge distance and minimum spacing is not possible. One of both values has to be increased acc. ETA-07/0025.

<sup>7)</sup> The given loads refer to the European Technical Assessment ETA-07/0025, issue date 28.08.2018. Design of the loads according to FprEN 1992-4:2016 and EOTA Technical Report TR 055 (for static resp. quasi-static loads).