Bolt FBN

The heavyweight.

OVERVIEW

Bolt **FBN II**, zinc-plated steel

Bolt **FBN A4**, stainless steel A4

Bolt **FBN-GS** (with large washer), zinc-plated steel

Approved for:
- Non-cracked concrete C20/25 to C50/60

European Technical Approval- Option 7 for non-cracked concrete

Also suitable for:
- Concrete C12/15
- Natural stone with dense structure

Fire resistance classification R 120 Anchor types see test report

For fixing of:
- Steel constructions
- Railings
- Consoles
- Ladders
- Cable trays
- Machines
- Staircases
- Gates
- Facades
- Window elements
- Wood constructions

DESCRIPTION

- Anchor bolt for push-through and pre-positioned installation.
- When the hexagon nut is tightened, the tapered bolt is pulled into the expansion clip and expands it against the drill hole wall.
- A4 stainless steel version for outdoor use and in damp conditions.
- GS version with large washer for wood constructions in accordance with DIN 440.

Advantages/benefits

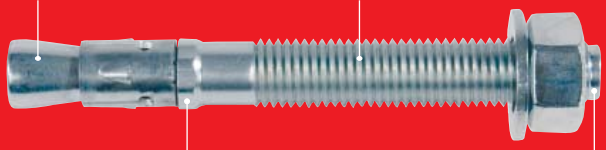
- FBN II gvz offers maximum load-bearing capacity in non-cracked concrete – anchoring base can not bear higher loads - is totally utilised.
- Reduced anchorage depth reduces drill time – this saves time and reduces reinforcement hits during drilling.
- Long thread allows stand-off installations and variable usable lengths.
- 8 to 16 mm diameter also for reduced anchorage depths, e.g. for small loads or if reinforcement is hit.
- Embossed letter on the head for subsequent control of the installation as it indicates the setting depth.

FBN II - ADVANTAGES AT A GLANCE

NEW

Twice as good. Every size of anchor can be installed to the standard anchorage depth or with a second reduced anchorage depth.

The long thread is suitable for stand-off installations and provides the best adjustment.



The identification feature of the new FBN II is the faceted collar.

The drive-in pin avoids the damage of the thread. It is stamped to indicate the anchorage depth.

- High loads: The standard anchorage depth utilises the maximum performance of the anchor and the concrete.
- Optimum flexibility: The anchor allows a reduced anchorage depth. This is ideal when larger useable lengths are required or the drilling depth is limited (e.g. with existing reinforcement).
- European Technical Approval (Option 7) for non-cracked concrete. European Technical Approval (Option 7) for non-cracked concrete.
- Fire resistance class R 120.
- Ease of installation: The anchor is installed with only a few hammer blows. A small displacement of the anchor while tightening conveys a sense of reliability while setting the anchor.
- More possible applications: Smaller axial spacings and edge distances allow installation close to the edge and the fastening of smaller anchor plates.

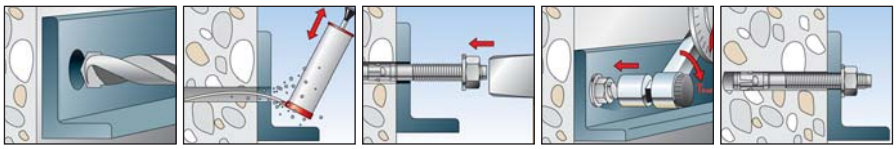
STANDARDS

You will find everything that has standards on page 34 under the keyword approvals.

INSTALLATION

Type of installation

- Pusch-trough and pre-positioned installation



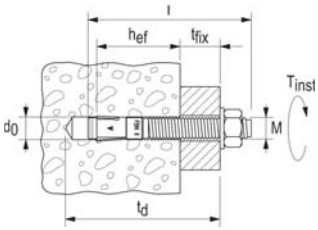
Installation tips

- For series installation we recommend the Anchor bolt setting tool FABS (see page 119) to reduce installation time.
- Before driving in, the hexagon nut should be brought into the optimal installation position (the bolt projects by 2 to 3 mm).

TECHNICAL DATA

Bolt **FBN II**, zinc-plated steel

Type	Art.-No.	ID	approval	imprint on head	drill diameter	max. usable length	anchoring depth	min. drill-hole depth for through fixings	total length	thread	Washer (outer diameter x thickness)	Qty. per box
			■ ETA		d_0	t_{fix}	h_{ef}	t_d	l			
					[mm]	[mm]	[mm]	[mm]	[mm]	[Ø x length]	[mm]	pcs.
FBN 6/5	**45130**	4		-	6	5/-	20/-	45	40	M 6 x 16	12 x 1,6	100
FBN 6/10	**45136**	6		-	6	10/-	20/-	50	55	M 6 x 30	12 x 1,6	100
FBN 6/30	**45137**	3		-	6	30/-	20/-	70	75	M 6 x 30	12 x 1,6	100
FBN II 8/5 (8x66)	**40662**	5	■	A	8	5/15	40/30	61	66	M 8 x 34	16 x 1,6	50
FBN II 8/10 (8x71)	**40664**	9	■	B	8	10/20	40/30	66	71	M 8 x 39	16 x 1,6	50
FBN II 8/20 (8x81)	**40669**	4	■	D	8	20/30	40/30	76	81	M 8 x 49	16 x 1,6	50
FBN II 8/30 (8x91)	**40700**	4	■	F	8	30/40	40/30	86	91	M 8 x 59	16 x 1,6	50
FBN II 8/50 (8x111)	**40771**	4	■	K	8	50/60	40/30	106	111	M 8 x 79	16 x 1,6	50
FBN II 8/70 (8x131)	**40777**	6	■	M	8	70/80	40/30	126	131	M 8 x 99	16 x 1,6	20
FBN II 8/100 (8x161)	**40783**	7	■	P	8	100/110	40/30	156	161	M 8 x 100	16 x 1,6	20
FBN II 10/10 (10x86)	**40827**	8	■	B	10	10/20	50/40	78	86	M 10 x 46	20 x 2	50
FBN II 10/20 (10x96)	**40851**	3	■	D	10	20/30	50/40	88	96	M 10 x 56	20 x 2	50
FBN II 10/30 (10x106)	**40854**	4	■	F	10	30/40	50/40	98	106	M 10 x 66	20 x 2	50
FBN II 10/50 (10x126)	**40855**	1	■	K	10	50/60	50/40	118	126	M 10 x 86	20 x 2	20
FBN II 10/70 (10x146)	**40931**	2	■	M	10	70/80	50/40	138	146	M 10 x 100	20 x 2	20
FBN II 10/140 (10x216)	**40944**	2	■	S	10	140/150	50/40	208	216	M 10 x 100	20 x 2	20
FBN II 10/160 (10x236)	**40945**	9	■	T	10	160/170	50/40	228	236	M 10 x 100	20 x 2	20
FBN II 12/10 (12x106)	**40950**	3	■	B	12	10/25	65/50	95	106	M 12 x 59	24 x 2,5	20
FBN II 12/20 (12x116)	**44558**	7	■	D	12	20/35	65/50	105	116	M 12 x 69	24 x 2,5	20
FBN II 12/30 (12x126)	**45263**	9	■	F	12	30/45	65/50	115	126	M 12 x 79	24 x 2,5	20
FBN II 12/50 (12x146)	**45264**	6	■	K	12	50/65	65/50	135	146	M 12 x 99	24 x 2,5	20
FBN II 12/80 (12x176)	**45265**	3	■	N	12	80/95	65/50	165	176	M 12 x 129	24 x 2,5	20
FBN II 12/100 (12x196)	**45266**	0	■	P	12	100/115	65/50	185	196	M 12 x 149	24 x 2,5	20
FBN II 12/120 (12x216)	**45267**	7	■	R	12	120/135	65/50	205	216	M 12 x 169	24 x 2,5	20
FBN II 12/140 (12x236)	**45268**	4	■	S	12	140/155	65/50	225	236	M 12 x 189	24 x 2,5	20
FBN II 12/160 (12x256)	**45269**	1	■	T	12	160/175	65/50	245	256	M 12 x 100	24 x 2,5	20
FBN II 16/25 (16x145)	**45564**	7	■	E	16	25/40	80/65	129	145	M 16 x 89	30 x 3	10
FBN II 16/50 (16x170)	**45565**	4	■	K	16	50/65	80/65	154	170	M 16 x 114	30 x 3	10
FBN II 16/80 (16x200)	**45566**	1	■	N	16	80/95	80/65	184	200	M 16 x 144	30 x 3	10
FBN II 16/100 (16x220)	**45567**	8	■	P	16	100/115	80/65	204	220	M 16 x 164	30 x 3	10
FBN II 16/140 (16x260)	**45568**	5	■	S	16	140/155	80/65	244	260	M 16 x 100	30 x 3	10
FBN II 16/160 (16x280)	**45569**	2	■	T	16	160/175	80/65	264	280	M 16 x 100	30 x 3	10
FBN II 16/200 (16x320)	**45570**	8	■	V	16	200/215	80/65	304	320	M 16 x 100	30 x 3	10
FBN II 20/30 (20x184)	**45573**	9	■	F	20	30/55	105/80	165	184	M 20 x 50	37 x 3	10
FBN II 20/60 (20x214)	**45574**	6	■	L	20	60/85	105/80	195	214	M 20 x 90	37 x 3	10
FBN II 20/80 (20x234)	**45575**	3	■	M	20	80/105	105/80	215	234	M 20 x 90	37 x 3	10
FBN II 20/120 (20x274)	**45576**	0	■	R	20	120/145	105/80	255	274	M 20 x 90	37 x 3	10



FIRE PREVENTION

Red hot: You will find fire prevention information on page 31.

CORROSION

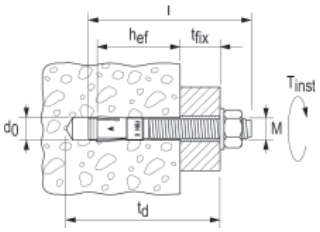
Rust prevention tips: Everything you need to know about corrosion and how to prevent it is on page 32.

Bolt FBN

TECHNICAL DATA

Bolt **FBN II**, zinc-plated steel

Bolt **FBN II-GS** (with large washer), zinc-plated steel

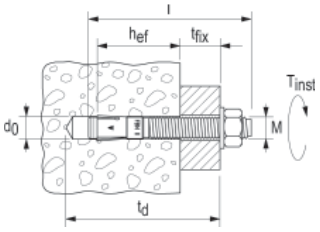


Type		Art.-No.	ID	approval	imprint on head	drill diameter	max. usable length $h_{ef,stand}$/ $h_{ef,red}$	anchoring depth $h_{ef,stand}$/ $h_{ef,red}$	min. drill-hole depth for through fixings	total length	thread	Washer (outer diameter x thickness)	Qty. per box
				■ ETA		d_0	t_{fix}	h_{ef}	t_d	l			
						[mm]	[mm]	[mm]	[mm]	[mm]	[Ø x length]	[mm]	pcs.
FBN II 8/5 K (8x56)	1)	**40806**	3	■	-A-	8	- /5	- /30	51	56	M 8 x 24	16 x 1,6	50
FBN II 8/10 K (8x61)	1)	**40807**	0	■	-B-	8	- /10	- /30	56	61	M 8 x 29	16 x 1,6	50
FBN II 8/30 K (8x81)	1)	**40826**	1	■	-F-	8	- /30	- /30	76	81	M 8 x 49	16 x 1,6	50
FBN II 10/5 K (10x71)	1)	**40946**	6	■	-A-	10	- /5	- /40	63	71	M 10 x 31	20 x 2	50
FBN II 10/10 K (10x76)	1)	**40947**	3	■	-B-	10	- /10	- /40	68	76	M 10 x 36	20 x 2	50
FBN II 10/30 K (10x96)	1)	**40948**	0	■	-F-	10	- /30	- /40	88	96	M 10 x 56	20 x 2	50
FBN II 12/5 K (12x86)	1)	**45272**	1	■	-A-	12	- /5	- /50	75	86	M 12 x 39	24 x 2,5	20
FBN II 12/10 K (12x91)	1)	**45273**	8	■	-B-	12	- /10	- /50	80	91	M 12 x 44	24 x 2,5	20
FBN II 12/30 K (12x111)	1)	**45274**	5	■	-F-	12	- /30	- /50	100	111	M 12 x 64	24 x 2,5	20
FBN II 16/15 K (16x120)	1)	**45571**	5	■	-C-	16	- /15	- /65	104	120	M 16 x 64	30 x 3	10
FBN II 16/25 K (16x130)	1)	**45572**	2	■	-E-	16	- /25	- /65	114	130	M 16 x 74	30 x 3	10
FBN II 20/10 K (20x139)	1)	**45577**	7	■	-B-	20	- /10	- /80	120	139	M 20 x 50	37 x 3	10
FBN II 12/80 GS (12x176)	2)	**45578**	4	■	N	12	80/95	65/50	165	176	M 12 x 129	44 x 2,5	20
FBN II 12/100 GS (12x196)	2)	**45579**	1	■	P	12	100/115	65/50	185	196	M 12 x 149	44 x 2,5	20
FBN II 12/120 GS (12x216)	2)	**45580**	7	■	R	12	120/135	65/50	205	216	M 12 x 169	44 x 2,5	20
FBN II 12/140 GS (12x236)	2)	**45581**	4	■	S	12	140/155	65/50	225	236	M 12 x 189	44 x 2,5	10
FBN II 12/160 GS (12x256)	2)	**45583**	8	■	T	12	160/175	65/50	245	256	M 12 x 100	44 x 2,5	10
FBN II 12/180 GS (12x276)	2)	**45584**	5	■	U	12	180/195	65/50	265	276	M 12 x 100	44 x 2,5	10
FBN II 12/200 GS (12x296)	2)	**45585**	2	■	V	12	200/215	65/50	285	296	M 12 x 100	44 x 2,5	10
FBN II 12/250 GS (12x346)	2)	**45586**	9	■	W	12	250/265	65/50	335	346	M 12 x 100	44 x 2,5	10
FBN II 16/80 GS (16x200)	2)	**45587**	6	■	N	16	80/95	80/65	184	200	M 16 x 144	56 x 3	10
FBN II 16/100 GS (16x220)	2)	**45588**	3	■	P	16	100/115	80/65	204	220	M 16 x 164	56 x 3	10
FBN II 16/120 GS (16x240)	2)	**45589**	0	■	R	16	120/135	80/65	224	240	M 16 x 184	56 x 3	10
FBN II 16/140 GS (16x160)	2)	**45590**	6	■	S	16	140/155	80/65	244	260	M 16 x 100	56 x 3	10
FBN II 16/160 GS (16x280)	2)	**45591**	3	■	T	16	160/175	80/65	264	280	M 16 x 100	56 x 3	10
FBN II 16/180 GS (16x300)	2)	**45592**	0	■	U	16	180/195	80/65	284	300	M 16 x 100	56 x 3	10
FBN II 16/200 GS (16x320)	2)	**45593**	7	■	V	16	200/215	80/65	304	320	M 16 x 100	56 x 3	10
FBN II 16/250 GS (16x370)	2)	**52192**	2	■	W	16	250/265	80/65	354	370	M 16 x 100	56 x 3	10
FBN II 16/300 GS (16x420)	2)	**52204**	2	■	X	16	300/315	80/65	404	420	M 16 x 100	56 x 3	10

1) Bolt FBN II K (for reduced anchorage depth only)

2) GS = large washer

Bolt **FBN A4**, stainless steel A4



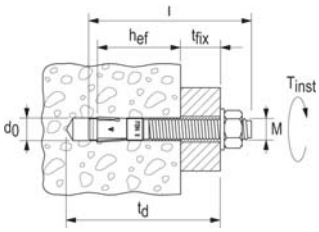
Type		Art.-No.	ID	approval	Imprint on head	drill	usable length	effect. anchoring depth	min. drill-hole depth for through fixings	total length	thread	Washer (outer diameter x thickness)	Qty. per box
				■ ETA		d_0	d_a	h_{ef}	t_d	l			
						[mm]	[mm]	[mm]	[mm]	[mm]	[Ø x length]	[mm]	pcs.
FBN 6/10 A4		**69087**	1	■	-	6	10	40	65	68	M 6 x 25	12 x 1,6	100
FBN 6/30 A4		**69088**	8	■	-	6	30	40	85	88	M 6 x 30	12 x 1,6	100
FBN 8/10 + 23 A4	1)	**69089**	5	■	B	8	10/23	48/35	73	76	M 8 x 41	16 x 1,6	50
FBN 8/30 + 43 A4	1)	**69090**	1	■	F	8	30/43	48/35	93	96	M 8 x 59	16 x 1,6	50
FBN 8/50 + 63 A4	1)	**69091**	8	■	K	8	50/63	48/35	113	116	M 8 x 81	16 x 1,6	50
FBN 10/15 + 23 A4	1)	**69092**	5	■	C	10	15/23	50/42	83	89	M 10 x 51	20 x 2	50
FBN 10/50 + 58 A4	1)	**69093**	2	■	K	10	50/58	50/42	118	125	M 10 x 87	20 x 2	20
FBN 10/100 + 108 A4	1)	**69094**	9	■	P	10	100/108	50/42	168	174	M 10 x 134	20 x 2	20
FBN 12/15 + 35 A4	1)	**69095**	6	■	C	12	15/35	70/50	105	113	M 12 x 71	24 x 2,5	20
FBN 12/45 + 65 A4	1)	**69096**	3	■	I	12	45/65	70/50	135	143	M 12 x 103	24 x 2,5	20
FBN 12/100 + 120 A4	1)	**69097**	0	■	P	12	100/120	70/50	190	202	M 12 x 157	24 x 2,5	20
FBN 16/10 A4		**69098**	7	■	-	16	10	64	98	109	M 16 x 54	30 x 3	10
FBN 16/25 + 45 A4	1)	**69099**	4	■	E	16	25/45	84/64	133	144	M 16 x 89	30 x 3	10
FBN 16/50 + 70 A4	1)	**69100**	7	■	K	16	50/70	84/64	158	169	M 16 x 114	30 x 3	10

1) Different usable lengths for the corresponding dimensions are possible.
The values for max. usable length and anchoring depth before (resp. after) the slash belong together.

TECHNICAL DATA

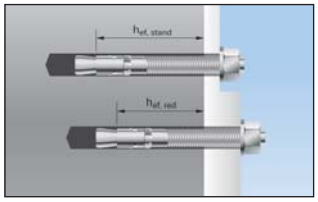
Bolt **FBN fvz**,
hot-dip galvanised steel

Type	Art.-No.	ID	drill diameter d_0 [mm]	max. usable length d_a [mm]	effect. anchoring depth h_{ef} [mm]	min. drill-hole depth for through fixings t_d [mm]	total length l [mm]	thread [Ø x length]	Washer (outer diameter x thickness) [mm]	Qty. per box pcs.
FBN 8/5 FVZ	**57525**	3	8	5	35	55	58	M 8 x 23	16 x 1,6	100
FBN 8/10 FVZ	**57526**	0	8	10	48	73	76	M 8 x 41	16 x 1,6	50
FBN 8/50 FVZ	**57527**	7	8	50	48	113	116	M 8 x 81	16 x 1,6	50
FBN 8/100 FVZ	**57528**	4	8	100	48	163	166	M 8 x 130	16 x 1,6	25
FBN 10/5 FVZ	**57529**	1	10	5	42	65	69	M 10 x 31	20 x 2	50
FBN 10/15 FVZ	**57530**	7	10	15	50	83	89	M 10 x 51	20 x 2	50
FBN 10/50 FVZ	**57531**	4	10	50	50	118	124	M 10 x 87	20 x 2	20
FBN 10/100 FVZ	**57532**	1	10	100	50	168	174	M 10 x 134	20 x 2	20
FBN 10/140 FVZ	**57533**	8	10	140	50	208	214	M 10 x 174	20 x 2	20
FBN 12/5 FVZ	**57534**	5	12	5	50	75	83	M 12 x 41	24 x 2,5	20
FBN 12/15 FVZ	**57535**	2	12	15	70	105	113	M 12 x 71	24 x 2,5	20
FBN 12/30 FVZ	**57536**	9	12	30	70	120	128	M 12 x 86	24 x 2,5	20
FBN 12/45 FVZ	**57537**	6	12	45	70	135	143	M 12 x 103	24 x 2,5	20
FBN 12/100 FVZ	**57538**	3	12	100	70	190	202	M 12 x 137	24 x 2,5	20
FBN 16/10 FVZ	**57539**	0	16	10	64	98	109	M 16 x 54	30 x 3	10
FBN 16/25 FVZ	**57540**	6	16	25	84	133	144	M 16 x 89	30 x 3	10
FBN 16/50 FVZ	**57541**	3	16	50	84	158	169	M 16 x 114	30 x 3	10
FBN 16/100 FVZ	**57542**	0	16	100	84	208	221	M 16 x 166	30 x 3	10



EXAMPLE FBN II 12/30

- Highest Load: standard anchorage depth $h_{ef,\ stand}$ = 65 mm.
  Possible useable length up to 30 mm at a permissible tensile load of 12,6 kN.
- Reduced anchorage depth $h_{ef,\ red}$ = 50 mm.
  Longer useable fixing length up to 45 mm at a reduced tensile load of 8,5 kN.



Bolt FBN

LOADS

Mean ultimate loads. design resistant and recommended loads for single anchors of fischer Bolt FBN and FBN II with large axial spacing and edge distance

					Non-cracked concrete											
Anchor size					**M 6**	**M 8**		**M 10**		**M 12**		**M 16**		**M 20**	
Effective anchorage depth of FBN II		$h_{ef,\ FBN\ II}$	[mm]	gvz	–	**30**[2]	**40**	**40**	**50**	**50**	**65**	**65**	**80**	**80**	**105**
Effective anchorage depth of FBN		$h_{ef,\ FBN}$	[mm]	fvz/A4	**40**	**35**[2]	**48**	**42**	**50**	**50**	**70**	**64**	**84**	–	–
Drill hole depth of FBN II		$h_{1,\ FBN\ II} \geqq$	[mm]	gvz	-	46[2]	56	58	68	70	85	89	104	110	135
Drill hole depth of FBN		$h_{1,\ FBN} \geqq$	[mm]	fvz/A4	55	50	63	60	68	70	90	88	108	-	-
Drill hole diameter		d_0	[mm]		6	8		10		12		16		20	
Mean ultimate loads N_u and V_u [kN]															
Tensile	0°	N_u	[kN]	gvz	-	9.6	16.1	15.8	22.9	23.5	35.7	37.8	46.3	57.3	75.2
				fvz	-	12.5	15.2*	17.2	19.1	23.9	32.8	32.0	43.6	-	-
				A4	10.6*	14.0	17.5*	18.4	23.9	23.9	39.5	33.1	44.3	-	-
Shear	90°	V_u	[kN]	gvz	-	11.0*		17.0*		21.0*		40.0*		67.0*	
				fvz	-	11.3*		17.0*		27.6*		44.6*		-	-
				A4	9.0*	15.1*		24.0*		31.6*		56.5*		-	-
Design resistant loads N_{Rd} and V_{Rd} [kN]															
Tensile	0°	N_{Rd}	[kN]	gvz	-	4.0[2]	8.5	8.5	11.9	11.9	17.6	17.6	24.0	24.0	36.2
				fvz	-	4.7[2]	6.7	7.3	9.3	10.0	15.3	14.0	17.8	-	-
				A4	5.0	4.5[2]	6.7	7.2	9.1	11.9	16.7	14.1	20.4	-	-
Shear	90°	V_{Rd}	[kN]	gvz	-	5.5[2]	8.5	8.5	11.9	11.9	16.6	31.6		48.1	53.5
				fvz	-	7.0[2]	7.3	9.1	11.3	11.9	18.0	31.7		-	-
				A4	5.0	7.0[2]	8.4	9.1	11.9	11.9	17.5	31.4		-	-
Recommended loads N_{rec} and V_{rec} [kN]															
Tensile	0°	N_{rec}	[kN]	gvz	-	2.9[2]	6.1	6.1	8.5	8.5	12.6	12.6	17.2	17.2	25.8
				fvz	-	3.3[2]	4.8	5.2	6.7	7.1	11.0	10.0	12.7	-	-
				A4	3.6	3.2[2]	4.8	5.1	6.5	8.5	11.9	10.0	14.6	-	-
Shear	90°	V_{rec}	[kN]	gvz	-	3.9[2]	6.1	6.1	8.5	8.5	11.8	22.6		34.3	38.2
				fvz	-	5.0[2]	5.2	6.5	8.1	8.5	12.9	22.7		-	-
				A4	3.6	5.0[2]	6.0	6.5	8.5	8.5	12.5	22.4		-	-
Recommended bending moment M_{rec} [Nm]															
		M_{rec}	[Nm]	gvz	-	11.0[2]	12.9	25.2	25.6	44.9		114.3		199.4	241.1
				fvz	-	10.5		12.4		40.5		99.8		-	-
				A4	5.2	12.4		24.8		39.0		95.2		-	-
Component dimensions, minimum spacings and edge distances															
Characteristic spacing		$s_{cr,\ N}$	[mm]		= 3 x h_{ef}										
Characteristicedge spacing		$c_{cr,\ N}$	[mm]		= 1.5 x h_{ef}										
Minimum spacing		s_{min}	[mm]	gvz	-	40[2]	40	50	50	70	70	90	90	120	120
			[mm]	fvz	-	35[2]	50	45	55	100	75	140	90	-	-
			[mm]	A4	40	50[2]	50	50	60	65	80	90	90	-	-
Minimum edge distance[1]		c_{min}	[mm]	gvz	-	40[2]	40	80	50	100	70	120	90	120	120
			[mm]	fvz	-	35[2]	50	55	65	100	90	100	105	-	-
			[mm]	A4	35	45[2]	35	60	55	70	75	80	80	-	-
Minimum structural component thickness of FBN II		$h_{min,\ FBN\ II}$	[mm]	gvz	-	100[2]	100	100	100	100	120	120	160	160	200
Minimum structural component thickness of FBN		$h_{min,\ FBN}$	[mm]	fvz/A4	100	100	100	100	100	100	140	130	170	-	-
Clearance-hole in fixture to be attached		$d_f \leqq$	[mm]		9	9		12		14		18		22	
Required torque		T_{inst}	[Nm]		15	15		30		50		100		200	

* steel failure decisive

[1] For minimum spacing and minimum edge distance the above described loads have to be reduced!)

[2] Use restricted to anchoring of structural components which are statically indeterminate.

All load values apply for non-cracked concrete C20/25 without edge or spacing influences.
Design resistant loads: material safety factor γ_M is included. Material safety factor γ_M depends on type of anchor.
Recommended loads: material safety factor γ_M and safety factor for load γ_L = 1.4 are included.