Anchor Overview

Identification			Approval				Anchorage											
		Page	Pressure area proofed (uncracked concrete)	Tensile area, (cracked concrete)	With approval ETA or DIBt	Stainless steel	Concrete	Dense natural stone	Solid brick	Lime-sand-brick	Pumice	Porous concrete	Plasterboard	Vertical coring brick	Lime-sand plate	Hollow block	fiber-cement, chipboard, plasterboard	Metal profile, trapeze sheet metal
General anchoring																		
MEFA nylon dowel K2		7/3					■	■	■	■	■	■	■	□	□	□		
Brass expansion anchor		7/3					■	■	■	■	■			□	□	□		
Heavy-duty anchors																		
TSM concrete screw		7/4	●	●	●	x	■	□	□	□								
Bolt anchor BZ plus		7/6	●	●	●	x	■	□										
Nail anchor N		7/7		●	●[3]	x	■	□										
Zykon hammerset anchor FZEA II		7/8	●	●	●	x	■	□	□	□								
Impact anchor E / ES and E A4		7/9	●	●	●[3]	x	■	□										
Cavity fixing																		
Hollow core anchor Easy		7/10	●	●	●[2]		■											
Toggle bolt		7/11													□	□	■	■
Toggle bolt BIG M		7/11													□	□	■	■

■ **well suited** □ **suited to a limited extend** ● **available**

[1] available in brickwork [2] prestressed concrete, false ceiling plate [3] min 3 running anchorage points

Overview

Overview for the fixing of single and paired anchors Loads N_{zul}: according to the general technical approval for tensile area [1) 2)] (permanent loads)	Clearance hole on the copmponent	Thread	Execution: Galvanized steel	Execution: Stainless steel	Drill-Ø [mm]	min. drill hole depth [mm]	Clamping strength [mm]	characteristic wall clearance $C_{cr,N}$ [mm]	characteristic axial distance $S_{cr,N}$ [mm]	Centric tensile load N_{zul} [kN]	N_{zul} in tensile area for 2 anchors with standadised axial distance of MEFA-components: 150 mm [kN]	100 mm [kN]	80 mm [kN]	reduced tensile loads N_{zul} single anchor with [kN]	possible min. axial distance S_{min} [mm]	needed anchorage-concrete (tensile area)	min. component thickness [mm]
Zykon hammerset anchor FZEA II																	
FZEA II 10 x 40		M8	x	x	10	40	-	60	120	1,6	3,2	3,2	3,2	1,6	40	≥ C20/25 or ≥B25	80
FZEA II 12 x 40		M10	x	x	12	40	-	60	120	3,0	6,1	6,1	6,1	2,5	45		80
FZEA II 14 x 40		M12	x	x	14	40	-	60	120	3,7	7,4	6,8	6,2	2,6	50		80
Bolt anchor BZ plus																	
BZ 8-10/75	9	M8	x	x	8	60	10	69,0	138	2,5	4,9	4,9	4,9	2,5	40	≥ C20/25 or ≥ B25	80
BZ 8-30/95	9	M8	x	x	8	60	30	69,0	138	2,5	4,9	4,9	4,9	2,5	40		80
BZ 10-10/90	12	M10	x	x	10	75	10	90,0	180	4,4	8,9	8,9	8,9	4,4	50		100
BZ 10-30/110	12	M10	x	x	10	75	30	90,0	180	4,4	8,9	8,9	8,9	4,4	50		100
BZ 10-50/130	12	M10	x	x	10	75	50	90,0	180	4,4	8,9	8,9	8,9	4,4	50		100
BZ 12-15/110	14	M12	x	x	12	90	15	97,5	195	5,9	11,8	11,8	11,8	5,9	60		110
BZ 12-30/125	14	M12	x	x	12	90	30	97,5	195	5,9	11,8	11,8	11,8	5,9	60		110
BZ 12-50/145	14	M12	x	x	12	90	50	97,5	195	5,9	11,8	11,8	11,8	5,9	60		110
BZ 12-105/200	14	M12	x		12	90	105	97,5	195	5,9	11,8	11,8	11,8	5,9	60		110
BZ 16-25/145	18	M16	x	x	16	110	25	127,5	255	12,3	22,1	19,4	18,3	8,6	60		170 (140) [4)]
BZ 16-100/220	18	M16	x	x	16	110	100	127,5	255	12,3	22,1	19,4	18,3	8,6	60		170 (140) [4)]
Hollow core anchor Easy																	
Easy M8	9	M8	x		12	55	by screw length	150	300	0,70	0,94	0,79	0,73	0,35	70	Prestressed concrete- ≥C45/55 or ≥B55	thickness ≥ 25mm
Easy M10	12	M10	x		16	60		150	300	1,20	2,13	2,04	2,00	1,00	80		≥ 30mm
Impact anchor E (for multiple use of non-structural systems) [5)]																	
E M6	7	M6	x	x	8	30	selectable by screw length	65	130	1,2	2,2	2,1	2,0	0,9	55	≥ C20/25 or ≥ B25	100
E M8	9	M8	x	x	10	30		90	180	1,7	2,2	2,2	2,2	1,1	60		100
E M8x40	9	M8	x	x	10	40		105	210	2,1	2,2	2,2	2,2	1,1	80		100
E M10	12	M10	x	x	12	40		85	170	2,1	2,2	2,2	-	1,1	100		120
E M12	14	M12	x	x	15	50		85	170	2,5	2,2	-	-	1,1	120		130
TSM concrete screw																	
TSM 6x60 [5)]		-	x	-	6	65	5	100	200	0,8	1,6	1,6	1,6	0,8	40	≥ C20/25 or ≥ B25	110
TSM 6x80 [5)]		-	x	-	6	65	25	100	200	0,8	1,6	1,6	1,6	0,8	40		110
TSM 6x100 [5)]		-	x	-	6	65	45	100	200	0,8	1,6	1,6	1,6	0,8	40		110
TSM 8x70		-	x	-	8	85	5	76,5	153	1,5	3,4	3,4	3,4	1,5	50		120
TSM 8x100		-	x	-	8	85	35	76,5	153	1,5	3,4	3,4	3,4	1,5	50		120
TSM 10x90		-	x	-	10	95	5	102	204	2,5	5,1	5,1	5,1	2,5	70		130
TSM 10x120		-	x	-	10	95	25	102	204	2,5	5,1	5,1	5,1	2,5	70		130
TSM 10x150		-	x	-	10	95	50	102	204	2,5	5,1	5,1	5,1	2,5	70		130
TSM 10x105 A4		-	-	x	10	95	20	102	204	4,0	7,4	7,4	7,4	4,0	70		130

[1)] Live load or load-mix has to be considered special.
[2)] All loading capacities are determined without influence of wall distances.
[3)] Pre-positioned installation.
[4)] Wall- and axial distance for reduced min. component thickness see approval
[5)] 3 running anchorage points; max. load per anchorage point max. 2,0 kN

MEFA nylon dowel K2

MEFA nylon dowel K2

Specification:

Application area: concrete- and masonry material, perforated brick, porous concrete, gas concrete

Mounting method: Wood- and chipboard screw

Technical data:

Material: plastic

Material type: polyamide PA 6 / nylon

Color: yellow

Temperature resistance: - 40 °C up to + 100 °C

Installation advise: The screw should drive through the end of dowel

Size [mm]	Length [mm]	drill diameter [mm]	min. drilling depth [mm]	screw OD [mm]	Weight [kg/100]	Packing [pcs.]	Part-no.
5	25	5,0 - 5,5	30	2,5 - 4,0	0,038	100	2010011
6	33	6,0 - 6,5	40	3,5 - 5,0	0,076	100	2010038
8	44	8,0 - 8,5	64	4,5 - 6,0	0,162	100	2010046
10	44	10,0 - 10,5	64	6,0 - 8,0	0,246	50	2010054
10	60	10,0 - 10,5	80	6,0 - 8,0	0,304	50	2010062
12	60	12,0 - 13,0	80	8,0 - 10,0	0,472	25	2010070
14	80	14,0	100	8,0 - 12,0	0,748	25	2010089

ⓘ Loads see on page 7/12

Brass expansion anchor

Brass expansion anchor

Specification:

Application area: concrete, solid brick, natural stone, lime sand brick

Mounting method: machine screw, threaded bolt

Technical data:

Material: brass

Installation advise: Length of screw should correspond exactly with length of anchor plus material thickness of attaching part.

Size	Length [mm]	drill diameter [mm]	drilling depth [mm]	depth of anchoring [mm]	Weight [kg/100]	Packing [pcs.]	Part-no.
M6	22,0	8,0	26	23	0,360	100	2060035
M8	27,5	11,0	34	30	0,790	100	2060043
M10	32,0	13,0	38	34	1,300	100	2060051
M12	40,0	18,0	44	40	2,360	50	2060078

TSM concrete screws

Cheese-head screw VZ 30

Combi-hexagon head

Hexagon head

ETA-10/0114

ETA-10/0115

ETA-06/0124

Brandschutz-geprüft

Specification

Application area: concrete

Suitable for: profile rails, consoles, pipe clamps, duct holder

Technical data:

Material TSM-B: steel
Surface: zinc-lamella coating
Material TSM-BS: stainless steel V4A

Approval:

ETA-10/0114 (TSM-B)
for multiple fastening
(TSM-B 6 for pre-stressed hollow concrete slabs)
ETA-10/0115 (TSM-B 6)
for single fixation
ETA-06/0124 (TSM-B 8 and 10)
for single fixation

Application example: Drilling holes have to be drilled vertically to the mounting plane and with the predefined minimum drilling depth. The drilling dust has to be removed from the drilling hole. When turning in the screw - put pressure onto the impact driver.

Maschinen: The TSM concrete screw has to be screwed with an impact driver with a torque control (direction of rotation has to proofed). Impact drilling machines are not allowed!!

07

Type / thread	Length L [mm]	Drill-Ø d [mm]	WS	min. drill hole t [mm]	min. anchoring-depth [mm]	Clamping-thickness d_a, t_{fix} [mm]	max. head-Ø [mm]	Weight [kg/100]	Packing [pcs.]	Part-no.
Allen-head screw VZ 30										
TSM-B 6	**60**	6	-	65	55	5	15,0	1,50	100	2230660
TSM-B 6	**100**	6	-	65	55	45	15,0	2,00	100	2230700
Combi-hexagon head VZ 40										
TSM-B 8	**70**	8	13	75	65	5	14,5	3,00	100	2230875
TSM-B 8	**100**	8	13	75	65	35	14,5	4,75	50	2230900
Hexagon head										
TSM-B 6	**60**	6	13	65	55	5	14,5	1,60	100	2230663
TSM-B 10	**90**	10	15	95	85	5	17,0	6,69	50	22310090
TSM-B 10	**120**	10	15	95	85	25	17,0	8,40	50	22310120
Hexagon head Stainless steel V4A										
TSM-BS 10	**105**	10	17	95	85	20	21,8	7,60	50	2231240
TSM-BS 10	**115**	10	17	95	85	30	21,8	8,20	50	2231245

Edelstahl Rostfrei

Delivery time: 2 working days

Loads see on page 7/12

TSM concrete screws

Countersunk head VZ 30

Shoulder screw

Sleeve

ETA-10/0114

ETA-10/0115

Brandschutz-geprüft

Specification

Application area:	concrete
Suitable for:	profile rails, consoles, pipe clamps, duct holder

Technical data:

Material TSM-B:	steel
Surface:	zinc-lamella coating
Approval:	**ETA-10/0114** (TSM-B 5 and 6) for multiple fastening (TSM-B 6 for pre-stressed hollow concrete slabs) **ETA-10/0115** (TSM-B 6) for single fixation

Application example: The screw head is designed for fixing of MEFA-profile rails trough the slot of C-Profile. Drilling holes have to be drilled vertically to the mounting plane and with predefined minimum drilling depth. The drilling dust has to be removed from the drilling hole. When turning in screw - put pressure onto impact driver.

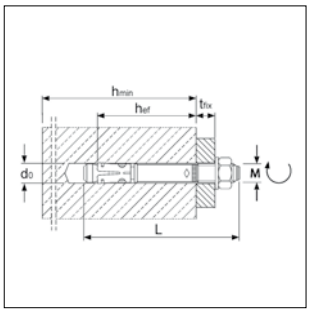
Machines: The TSM concrete screw has to be screwed with impact driver with torque control (direction of rotation has to proofed). Impact drilling machines are not allowed!!

07

Type / thread	Length L [mm]	Drill-Ø d [mm]	min. drill hole t [mm]	Male-thread	Female-thread	Weight [kg/100]	Packing [pc.]	Part-no.
Countersunk head VZ 30								
TSM-B 6	**80**	6	65	-	-	2,00	100	2230681
Shoulder screw SW 10								
TSM-B 6	**55**	6	65	M8x16	-	1,70	100	2230002
Sleeve SW 13								
TSM-B 6	**55**	6	65	-	M8/M10	3,75	50	2230001

Loads see on page 7/12

Bolt anchor BZ plus



ETA-99/0010

approved M10-M16

M 8 - M 20

Brandschutz-geprüft

Bolt anchor BZ plus
Bolt anchor BZ plus 4A

Specification:

Application area: cracked and non-cracked concrete C20/25 up to C50/60,

installation advise: bolt anchor for pre-fabrication and push-through-assembling

Technical data:

Material BZ plus: steel
Surface: galvanized
Material BZ plus A4: stainless steel V4A

Approval: ETA-99/0010

Application example: Anchorage for moderately heavy up to heavy loads in cracked and uncracked concrete: Pillars, steel girder, handrail fittings, cable routes, wooden construction, consoles.

Bolt anchor BZ plus, galvanized

Identification	Drill Ø d_0 [mm]	Drillhole depth [mm]	Minimum. component thickness h_{min} [mm]	Setting-depth [mm]	max. clamping strength t_{fix} [mm]	effective anchoring depth h_{ef} [mm]	Anchor-length L [mm]	Thread M [mm]	Weight [kg/pack.]	Packing [pcs.]	Part no.
BZ 8 - 10/75	8	60	80	52	10	46	75	M8x20	2,99	100	221108010
BZ 8 - 30/95	8	60	80	52	30	46	95	M8x40	3,60	100	221108030
BZ 10 - 10/90	10	75	100	68	10	60	90	M10x20	2,94	50	221110010
BZ 10 - 30/110	10	75	100	68	30	60	110	M10x40	3,44	50	221110030
BZ 10 - 50/130	10	75	100	68	50	60	130	M10x60	3,95	50	221110050
BZ 12 - 15/110	12	90	120	80	15	70	110	M12x30	2,55	25	221112015
BZ 12 - 30/125	12	90	120	80	30	70	125	M12x45	2,84	25	22111203001
BZ 12 - 50/145	12	90	120	80	50	70	145	M12x65	3,23	25	221112050
BZ 12 - 105/200	12	90	120	80	105	70	200	M12x115	4,21	25	221112105
BZ 16 - 25/145	16	110	140	97	25	85	145	M16x45	4,60	20	221116025
BZ 16 - 100/220	16	110	140	97	100	85	220	M16x80	3,50	10	221116100

Bolt anchor BZ plus A4, stainless steel

BZ 8 - 10/75	**A4**	8	60	80	52	10	46	75	M8x20	3,02	100	222108010
BZ 8 - 30/95	**A4**	8	60	80	52	30	46	95	M8x40	3,68	100	222108030
BZ 10 - 10/90	**A4**	10	75	100	68	10	60	90	M10x20	2,97	50	222110010
BZ 10 - 30/110	**A4**	10	75	100	68	30	60	110	M10x40	3,48	50	222110030
BZ 10 - 50/130	**A4**	10	75	100	68	50	60	130	M10x60	4,02	50	222110050
BZ 12 - 15/110	**A4**	12	90	120	80	15	70	110	M12x30	2,55	25	222112015
BZ 12 - 30/125	**A4**	12	90	120	80	30	70	125	M12x45	2,84	25	222112030
BZ 12 - 50/145	**A4**	12	90	120	80	50	70	145	M12x65	3,23	25	222112050
BZ 12 - 125/220	**A4**	12	90	120	80	125	70	220	M12x80	4,93	25	222112125

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Delivery time: 3 working days

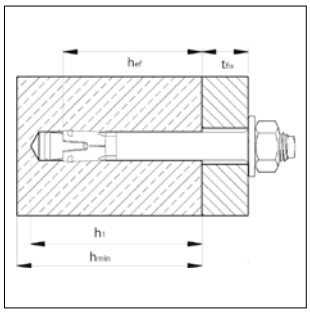
Loads see on page 7/13

assembly instruction see chapter 15

Nail anchor N

Nail anchor N
Nail anchor N A4

Nail anchor N-M



Specification:

Application area: cracked concrete with redundant fastening C12/15 - C50/60

installation advise: hammer Nail anchor N trought fixture into concrete. When load is applied Nail anchor expands automatically

Technical data:

Material: steel/ stainless steel

Surface: galvanized / A4

Approval: ETA-11/0240

Application example: ceiling constructions, piping, cladding etc.

Nail anchor N, galvanized

Identification	Drill Ø	Drillhole depth		effective-anchoring depth		max. clamping strength		Washer-Ø	Anchor-length	Weight	Packing	Part no.
	d [mm]	h_1 [mm]	$h_{1, red\ 1)}$ [mm]	h_{ef} [mm]	$h_{ef, red\ 1)}$ [mm]	t_{fix} [mm]	$t_{fix, red\ 1)}$ [mm]	[mm]	L [mm]	[kg/pack.]	[pcs.]	
N 6-5-10/49	6	40	35	30	25	5	10	18	49	2,8	200	221861010701

Nail anchor N A4, stainless steel

N 6-5/49 A4	6	40	40	30	30	5	5	18	49	2,8	200	222861010541

Nail anchor N-M, galvanized

Identification	Drill Ø	Drillhole depth	effective-anchoring depth	SW	female thread	Anchor-length	Weight	Packing	Part no.
	d [mm]	h_1 [mm]	h_{ef} [mm]			L [mm]	[kg/pack.]	[pcs.]	
N-M 6-25 M8/M10	6	35	25	13	M8/M10	58	2,75	100	221860310101
N-M 6-30 M8/M10	6	40	30	13	M8/M10	63	2,85	100	221860315101

Rostfrei

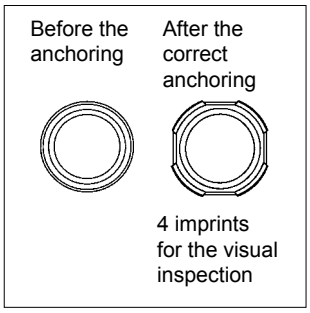
Delivery time: 3 working days

Loads see on page 7/15

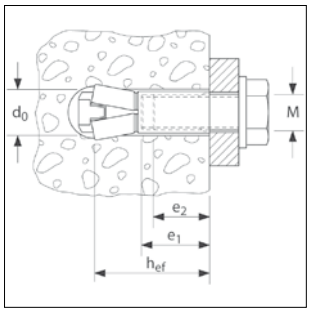
assembly instruction see chapter 15

Zykon hammerset anchor FZEA II and FZEA II A4

Zykon hammerset anchor FZEA II
Zykon hammerset anchor FZEA II A4



FZEA II-imprint



ETA-06/0271

Feuerwiderstandsklasse R 120
Dübelgrößen siehe Prüfbericht

M 8 - M 20

FM approved up to M10

Specification:

Application area: cracked and non-cracked concrete B25 up to B55 / C20/25 up to C50/60, concrete B15, natural stone with dense structure, solid brick, solid sand-lime brick.

Application: undercut anchor with female thread pre-positioned installation

Technical data:

Material FZEA II: steel
Surface: galvanized
Material FZEA II A4: stainless steel V4A

Approval: ETA-06/0271

Application example: When the internal expansion pin is driven in with setting tool, anchor sleeve expands to fill undercut hole with a positive fit. Therefore assembly defects can be avoided.

Steel, galvanized								
Identification	Drill hole-Ø d_0 [mm]	Anchorage depth h_{ef} [mm]	min. screw in depth e_2 [mm]	max. screw in depth e_1 [mm]	Thread M	Weight [kg/100]	Packing [pcs.]	Part no.
FZEA II 10 x 40	10	40	11	17	M8	1,50	100	21721040
FZEA II 12 x 40	12	40	13	19	M10	2,06	100	21721240
FZEA II 14 x 40	14	40	15	21	M12	2,78	50	21721440
Stainless steel, V4A								
FZEA II 10 x 40 A4	10	40	11	17	M8	1,50	100	2176042
FZEA II 12 x 40 A4	12	40	13	19	M10	2,06	100	2176242
FZEA II 14 x 40 A4	14	40	15	21	M12	2,78	50	2176442

Please regard delivery times

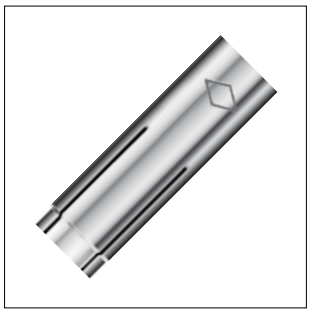
Rost frei

Delivery time: 3 working days

Loads see on page 7/16

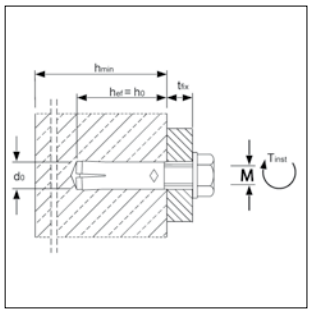
assembly instruction see chapter 15

Impact anchor E / ES and E A4



Impact anchor E
Impact anchor E A4

Impact anchor ES



ETA-05/0116

FM approved M10-M16

M 8 - M 12

Brandschutz-geprüft

Specification:
Application area: cracked concrete (multiple fastening), non-cracked concrete C20/25 up to C50/60

Technical data:
Material E / ES: steel
Surface: galvanized
Material E A4: stainless steel V4A

Approval: ETA-05/0116

Application example: Attaching suspended ceilings, ventilation and sprinkler systems, structural steel, brackets, threaded rods.

Steel, galvanized

Identification	Drill hole Ø x depth [mm]	Thread Ø x length [mm]	Minimum screwing depth L_{sd} [mm]	Maximum screwing depth L_{th} [mm]	Weight [kg/pack.]	Packing [pcs.]	Part no.
E M6	8 x 30	M6 x 13	7	13	0,84	100	210805005101
ES M8x30	10 x 30	M8 x 13	9	13	1,15	100	210805130101
ES M8x40	10 x 40	M8 x 20	9	20	1,53	100	210805155101
ES M10x40	12 x 40	M10 x 15	11	15	1,10	50	210805240101
ES M12	15 x 50	M12 x 18	13	18	2,15	50	210805330101
E M16	20 x 65	M16 x 23	18	23	2,55	25	210805500101

Stainless steel V4A

E M8 A4	10 x 30	M8 x 13	9	13	1,16	100	211805100501
E M10 A4	12 x 40	M10 x 15	11	15	1,08	50	211805200501
E M12 A4	15 x 50	M12 x 18	13	18	2,19	50	211805300501
E M16 A4	20 x 65	M16 x 23	18	23	2,57	25	211805500501

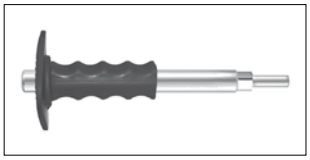
Rostfrei

Delivery time: 2 working days

Loads see on page 7/17

assembly instruction see chapter 15

Setting tool



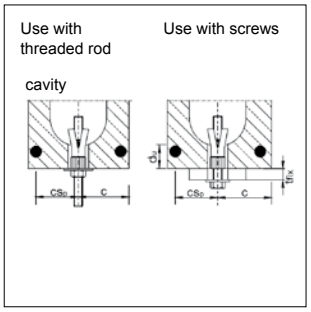
Setting tool E SW and E MSH

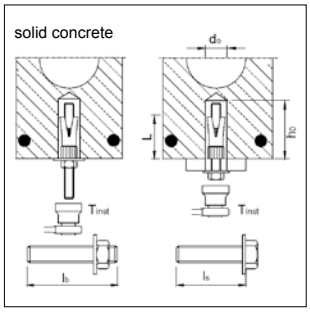
Identification	Fits anchor	Packing [pc.]	Part no.
E SW 6* (without hand guard)	E M6	1	531809005150
E MSH 8x30	ES M8 / E M8 A4	1	531809100180
E MSH 8x40	ES M8 x 40	1	531809105180
E MSH 10	ES M10 / E M10 A4	1	531809200180
E MSH 12	ES M12 / E M12 A4	1	531809300180
E MSH 16	E M16 / E M16 A4	1	531809500180

* without placing mark

Hollow core anchor Easy

Hollow core acnhor Easy





Brandschutz-geprüft

VdS

Specification:
Application area: pre-stressed hollow concrete slabs
Concrete B55 / C45/55

Technical data:
Material: steel
Surface: galvanized

Mounting: The Hollow-Core Anchor Easy is a one -piece unit, specially designed in pre-stressed hollow concrete slabs. Tightening the screw or nut pulls the expansion cone inside the anchor sleeve which keys into in the cavity or provides strong expansion in solid concrete.The approval Z-21.1-1785 allows the anchor to be installed even if the drill hole does not hit the cavity.

Approval: Z-21.1-1785

!! The anchor may also be used, if the expansion area ins´t located in a hollow chamber !!

Application example: Suspension of ventilation, sprinkler system, false ceilings, brackets with threaded studs or screws, ducts, anchoring prefabricated panelson hollow concrete floors/ceilings.

Identificatioin	Drill-Ø	Thread Ø	Drill hole-depth	Sleeve length (without cone)	min. screw length	Tightening torque	Packing	Weight	Part-no.
			h_0	L	l_s	T_{inst}			
	[mm]	[mm]	[mm]	[mm]		[Nm]	[pc.]	[kg/packing]	
Easy M8	12	M8	55	35	47 + t_{fix}	20	50	0,72	221851100101
Easy M10	16	M10	60	40	55 + t_{fix}	30	50	1,66	221851200101

Loads see on page 7/18

assembly instruction see chapter 15

Toggle bolts

KV 8* Toggle bolt
(with VdS-apporval)

K 8 Toggle bolt

K 10 Heavy-duty-toggel bolt

BIG M Heavy-duty-toggel bolt

Specification:
Application area: cavity walls, ceilings, suspended ceilings

Technical Data:
Material: steel
Surface: galvanized, chromatiert

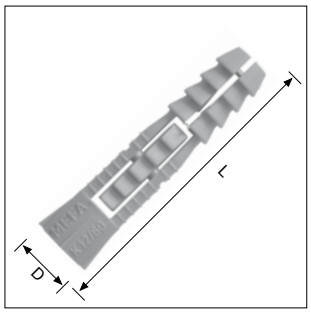
Approval: G 4890027*

Mounting: The required cavity depth and hollow depth must be observed.
Min. hollo depth = Lenth of the anchor

KV 8: For stationary fire protection systems apply guidelines of VdS or FM (for pipes up DN 2“).
Nominal load per fixing point for pipes on profiled sheeting is max. 0,8 kN, for other fixation objects on profiled sheeting 1,0 kN. It is recommended to mount every 4th or 5th fixation on a higher static load-bearing position.

Typ	Threaded rod	Drill-Ø [mm]	min. Hollow depth [mm]	Breaking load [kN]	Weight [kg/pc]	Packing [pcs.]	Part-no.
Toggle bolt KV 8							
KV 8 x 100 Toggle bolt	**M8 x 100**	22	90	20	0,110	50	2120081
KV 8 x 200 Toggle bolt	**M8 x 200**	22	90	20	0,138	25	2120082
KV 8 x 300 Toggle bolt	**M8 x 300**	22	90	20	0,170	25	2120083
KV 8 x 500 Toggle bolt	**M8 x 500**	22	90	20	0,229	25	2120085
K 8 Toggle bolt							
K 8 Toggle bolt	**M8 x 100**	20	75	13	0,081	100	2128306
K 10 Toggle bolt - Heavy-duty							
K 10 Toggle bolt	**M10 x 180**	30	140	12	0,205	25	2120518
BIG M Toggle bolt - Heavy-duty							
BIG M Toggle bolt	**M10 x 180**	30	90	11	0,232	25	2123517

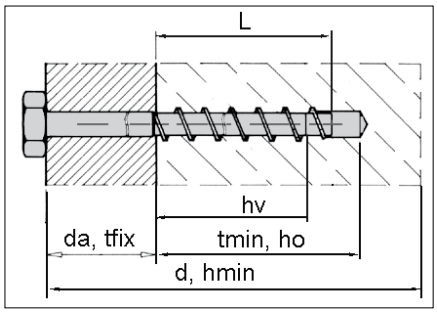
Load values MEFA nylon dowel K2



Allowable tensile load and shear stress (in pressure zone)						
type of dowel / length of dowel	[mm]	**8/44**	**10/44**	**10/60**	**12/60**	**14/80**
Screw size	[mm]	6/80	8/80	8/110	10/110	12/140
drilling hole depth	[mm]	64	64	80	80	100
Min. depth of anchoring	[mm]	44	44	60	60	80
Tensile load						
min. thickness of the component	[mm]	8,5	8,5	10,0	10,0	12,0
admissible load (concrete quality B 25)	[kN]	0,65	1,30	2,00	2,40	3,40
shear stress						
min. thickness of the component	[mm]	20	20	20	20	20
admissible load (concrete quality B 25)	[kN]	1,75	2,30	2,70	3,60	5,50

Inspected: Official research and material test establishment for building industry
Otto-Graf-Institut at university Stuttgart

Load values TSM concrete screws



ETA-10/0114

ETA-10/0115

ETA-06/0124

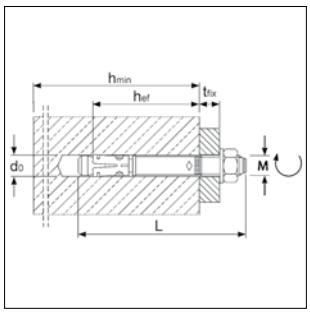
Brandschutz-geprüft

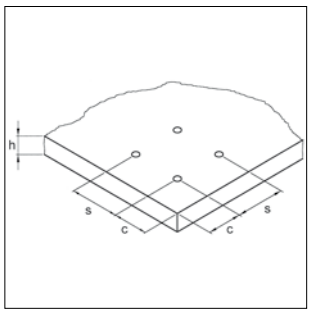
Allowable load per dowel in [kN]				
dowel size		**ø 6**	**ø 8**	**ø 10**
	B 25 / C 20/25	1,4	4,3	7,6
in cracked concrete (tensile zone),	B 35 / C 30/37	1,7	5,2	9,3
for centrical tensile load, in the concrete strength class	B 45 / C 40/50	2,0	6,0	10,7
[also valid for Ø 10 V4A]	B 55 / C 50/60	2,2	6,6	11,8
max. Tragfähigkeit beim Feuerwiderstand in [kN]	**R 30** **R 60** **R 90** **R 120**	**0,9** **0,8** **0,6** **0,4**	**2,3** **1,7** **1,1** **0,8**	**4,0** **3,3** **2,2** **1,7**
nominal dimension of drill	[mm]	6,00	8,00	10,00
dimension of drilling blades	≤ [mm]	6,40	8,45	10,45
drilling hole depth	min. t, h_o [mm]	65	75	95
depth of anchoring	h_v, h_{nom} ≥ [mm]	55	65	85
pass hole of the connecting component	d_f ≥ [mm]	9	12	14
add-on part-, clamping thickness	d_a, t_{fix} [mm]	L-55	L-65	L-85
min. thickness of the component	d, h_{min} ≥ [mm]	100	120	130
center distance, single mounting	a, s_{cr} ≥ [mm]	132	144	204
edge distance	a_r, c_{cr} ≥ [mm]	66	77	102
min. center distance, mounting in pairs	a_{min},s_{min} [mm]	40	50	70
min. edge distance	ar_{min},c_{min} [mm]	40	50	70
max. fastening torque for the connected accessory	T_{inst} [Nm]	10	20	40

Specifications of each valid approval have to be considered.

[1] The anchor may be used for suspended ceilings and false ceilings acc. to DIN 18168 as well as for statically comparable systems up to 1,0 kN/m² at predominantly static load in reinforced and nonreinforced normal concrete.

Load values Bolt anchor BZ plus





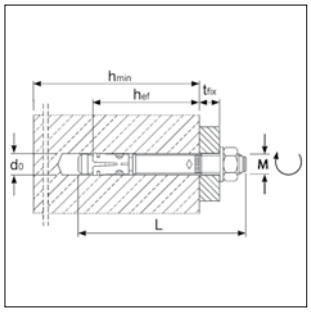
ETA-99/0010

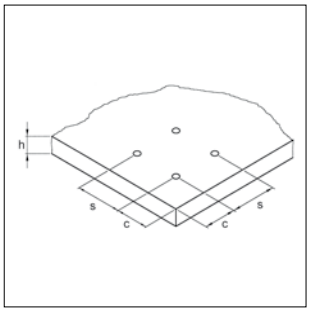
Extract from Permissible Service Conditions of ETA-99/0010

Approved loads for single anchor without influence of spacing and edge distance.
Total safety factor as per ETAG 001 included (γ_M und γ_F).

Loads and performance data	bolt anchor BZ plus		M 8	M 10	M 12	M 16	M 20	M 24
					cracked concrete			
Mean ultimate loads, tension	C20/25 appr. N	[kN]	2,4	4,3	7,6	11,9	17,1	21,1
	C25/30 appr. N	[kN]	2,6	4,7	8,3	13,1	18,9	23,3
	C30/37 appr. N	[kN]	2,9	5,2	9,3	14,5	20,9	25,8
	C40/50 appr. N	[kN]	3,4	6,0	10,8	16,8	24,2	29,8
	C50/60 appr. N	[kN]	3,7	6,6	11,8	18,5	26,6	32,8
					non-cracked concrete			
Approved loads, tension	C20/25 appr. N	[kN]	5,7	7,6	11,9	16,7	24,0	29,6
	C25/30 appr. N	[kN]	6,3	8,4	13,0	18,3	26,4	32,6
	C30/37 appr. N	[kN]	7,0	9,3	14,5	20,3	29,3	36,1
	C40/50 appr. N	[kN]	7,5	10,7	16,8	23,5	33,8	41,7
	C50/60 appr. N	[kN]	7,5	11,8	18,4	25,8	37,2	45,9
					cracked / non-cracked concrete			
Approved loads, shear	C20/25 appr. V	[kN]	8,6	12,6	17,1	26,9/34,3	34,3/37,1	42,3/59,2
	≥ C25/30 appr. V	[kN]	8,6	12,6	17,1	29,6/34,3	37,1	46,5/65,1
Approved bending moments	appr. M	[Nm]	13,1	26,9	46,9	119,4	195,0	513,1
Spacing and edge distance								
Effective anchorage depth	h_{ef}	[mm]	46	60	70	85	100	115
Characteristic spacing	$s_{cr,N}$	[mm]	138	180	210	255	300	345
Characteristic edge distance	$c_{cr,N}$	[mm]	69	90	105	127,5	150	172,5
Respective minimum spacing and edge distance for standard thickness of concrete member								
					cracked concrete			
Minimum spacing / for edge distance c	s_{min} / c	[mm]	40 / 70	45 / 70	60 / 100	60 / 100	95 / 150	100 / 180
Minimum edge distance / for spacing s	c_{min} / s	[mm]	40 / 80	45 / 90	60 / 140	60 / 180	95 / 200	100 / 220
					ungerissener Beton			
Minimum spacing / for edge distance c	s_{min} / c	[mm]	40 / 80	45 / 70	60 / 120	65 / 120	90 / 180	100 / 180
Minimum edge distance / for spacing s	c_{min} / s	[mm]	50 / 100	50 / 100	75 / 150	80 / 150	130 / 240	100 / 220
Standard thickness of concrete slab	h_{std}	[mm]	100	120	140	170	200	230
Respective minimum spacing and edge distance for minimum thickness of concrete member								
					cracked concrete			
Minimum spacing / for edge distance c	s_{min} / c	[mm]	40 / 70	45 / 90	60 / 100	70 / 160	-	-
Minimum edge distance / for spacing s	c_{min} / s	[mm]	40 / 80	50 / 115	60 / 140	80 / 180	-	-
					non-cracked concrete			
Minimum spacing / for edge distance c	s_{min} / c	[mm]	40 / 80	60 / 140	60 / 120	80 / 180	-	-
Minimum edge distance / for spacing s	c_{min} / s	[mm]	50 / 100	90 / 140	75 / 150	90 / 200	-	-
Standard thickness of concrete slab	h_{min}	[mm]	80	100	120	140	-	-
Installation parameters								
Drill hole diameter	d_o	[mm]	8	10	12	16	20	24
Diameter of clearance hole in the fixture	d_f	[mm]	9	12	14	18	22	26
Depth of drill hole	h_1	[mm]	60	75	90	110	125	145
Installation torque	T_{inst}	[Nm]	20	25	45	90	160	200
Width across nut	SW	[mm]	13	17	19	24	30	36

Load values Bolt anchor BZ plus A4





ETA-99/0010

Extract from Permissible Service Conditions of ETA-99/0010

Approved loads for single anchor without influence of spacing and edge distance.
Total safety factor as per ETAG 001 included (γ_M und γ_F).

Loads and performance data	bolt anchor BZ plus A4		M 8	M 10	M 12	M 16	M 20
					cracked concrete		
Mean ultimate loads, tension	C20/25 appr. N	[kN]	2,4	4,3	7,6	11,9	17,1
	C25/30 appr. N	[kN]	2,6	4,7	8,3	13,1	18,9
	C30/37 appr. N	[kN]	2,9	5,2	9,3	14,5	20,9
	C40/50 appr. N	[kN]	3,4	6,0	10,8	16,8	24,2
	C50/60 appr. N	[kN]	3,7	6,6	11,8	18,5	26,6
					non-cracked concrete		
Approved loads, tension	C20/25 appr. N	[kN]	5,7	7,6	11,9	16,7	24,0
	C25/30 appr. N	[kN]	6,3	8,4	13,0	18,3	26,4
	C30/37 appr. N	[kN]	7,0	9,3	14,5	20,3	29,3
	C40/50 appr. N	[kN]	7,6	10,7	16,8	23,5	33,8
	C50/60 appr. N	[kN]	7,6	11,8	18,4	25,8	37,2
					cracked / non-cracked concrete		
Approved loads, shear	C20/25 appr. V	[kN]	7,4	11,4	17,1	26,9/31,4	34,3/43,9
	≥ C25/30 appr. V	[kN]	7,4	11,4	17,1	29,6/31,4	37,7/43,9
Approved bending moments	appr. M	[Nm]	14,9	29,7	52,6	133,1	231,6
Spacing and edge distance							
Effective anchorage depth	h_{ef}	[mm]	46	60	70	85	100
Characteristic spacing	s_{cr}, N	[mm]	138	180	210	255	300
Characteristic edge distance	c_{cr}, N	[mm]	69	90	105	127,5	150
Respective minimum spacing and edge distance for standard thickness of concrete member							
					cracked concrete		
Minimum spacing / for edge distance c	s_{min} / c	[mm]	40 / 70	50 / 75	60 / 100	60 / 100	95 / 150
Minimum edge distance / for spacing s	c_{min} / s	[mm]	40 / 80	55 / 90	60 / 140	60 / 180	95 / 200
					non-cracked concrete		
Minimum spacing / for edge distance c	s_{min} / c	[mm]	40 / 80	50 / 75	60 / 120	65 / 120	90 / 180
Minimum edge distance / for spacing s	c_{min} / s	[mm]	50 / 100	60 / 120	75 / 150	80 / 150	130 / 240
Standard thickness of concrete slab	h_{std}	[mm]	100	120	140	160	200
Respective minimum spacing and edge distance for minimum thickness of concrete member							
					cracked concrete		
Minimum spacing / for edge distance c	s_{min} / c	[mm]	40 / 70	45 / 90	60 / 100	70 / 160	95 / 150
Minimum edge distance / for spacing s	c_{min} / s	[mm]	40 / 80	50 / 115	60 / 140	80 / 180	95 / 200
					non-cracked concrete		
Minimum spacing / for edge distance c	s_{min} / c	[mm]	40 / 80	60 / 140	60 / 120	80 / 180	90 /180
Minimum edge distance / for spacing s	c_{min} / s	[mm]	50 / 100	90 / 140	75 / 150	90 / 200	130 / 240
Standard thickness of concrete slab	h_{min}	[mm]	80	100	120	140	200
Installation parameters							
Drill hole diameter	d_o	[mm]	8	10	12	16	20
Diameter of clearance hole in the fixture	d_f	[mm]	9	12	14	18	22
Depth of drill hole	h_1	[mm]	60	75	90	110	125
Installation torque	T_{inst}	[Nm]	20	35	50	110	200
Width across nut	SW	[mm]	13	17	19	24	30

Load values Nail anchor N

ETA-11/0240

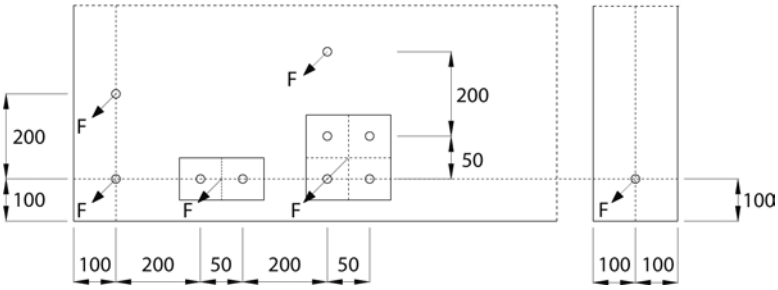
Extract from Permissible Service Conditions of ETA-11/0240

Multiple use for non-structural systems.
Total safety factor as per ETAG 001 included (γ_M and γ_F).

Loads and performance data	Nail Anchor steel galvanized, stainless steel A4		N		N-M	
Effective anchorage depth	h_{ef}	[mm]	25	30	25	30
Approved loads (picture 1)	C12/15 appr. F	[kN]	1,43	1,90	1,43 [1)]	1,90 [1)]
	C20/25 - C50/60 appr. F	[kN]	2,14	2,81	2,14 [1)]	2,81 [1)]
Approved loads (picture 2)	C12/15 appr. F	[kN]	0,71	0,95	0,71 [1)]	0,95 [1)]
	C20/25 - C50/60 appr. F	[kN]	0,95	1,19	0,95 [1)]	1,19 [1)]
Approved bending moments	appr. M	[Nm]	5,3	5,3	7,3	7,3
Minimum thickness of concrete slab	h_{min}	[mm]	80	80	80	80
Installation parameters						
Drill hole diameter	d_o	[mm]	6	6	6	6
Diameter of clearance hole in the fixture	d_f	[mm]	7	7	7	7
Diameter nailhead		[mm]	-	-	-	-
Depth of drill hole	h_1	[mm]	35	40	35	40
Installation torque	≥ T_{inst}	[Nm]	4	4	-	-

[1)] When applying a shear load to anchor version N-M, shear load with lever arm must be proven.

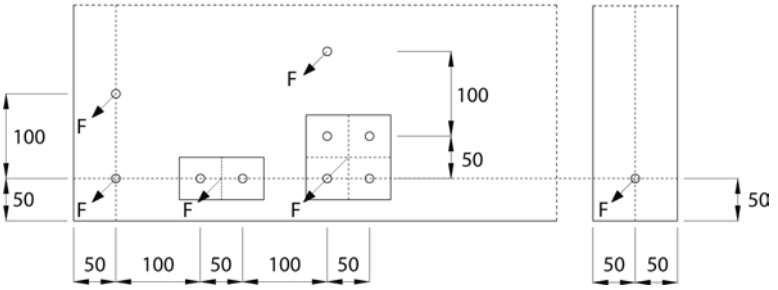
Picture 1: maximum loads



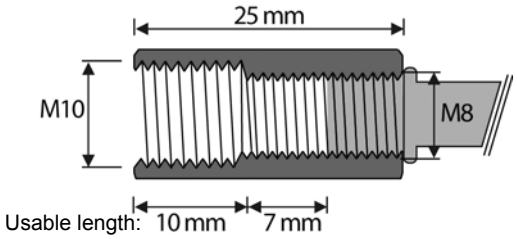
The approved load F is for one fixing point.
One fixing point can be:
- **Single anchor,**
- **Pair of anchors** with spacing s ≥ 50 mm or
- **Group of four anchors** with s ≥ 50 mm

If spacing in fixing point is above or equal to respective spacing between fixing points, characteristic resistances apply to every single anchor.

Picture 2: minimum spacing and edge distance

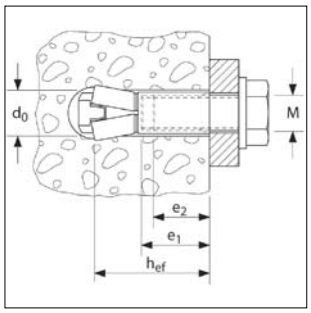


Dimensions threaded sleeve N-M:



Assembly instruction see chapter 15

Load values Zykon hammerset anchor FZEA II and FZEA II A4



Europäische Technische Zulassung – Option 1 für gerissenen Beton

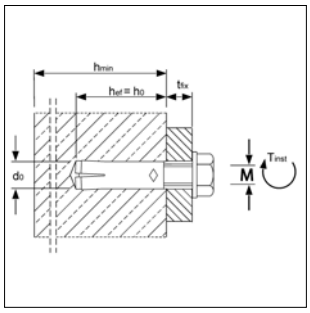
Mean ultimate loads, design resistant and recommended loads for single anchors of Zykon hammerset anchor FZEA with large axial spacing and edge distance.

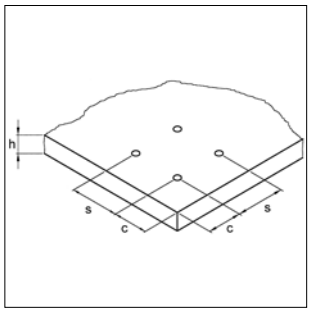
					Non-cracked concrete			Cracked concrete		
Anchor type					FZEA 10 x 40 M 8	FZEA 12 x 40 M 10	FZEA 14 x 40 M 12	FZEA 10 x 40 M 8	FZEA 12 x 40 M 10	FZEA 14 x 40 M 12
Effective anchorage depth		h_{ef}	[mm]		40	40	40	40	40	40
Mean ultimate loads N_U and V_U [kN]										
Tensile	0°	N_U	[kN]	gvz	9,6*	17,0*	17,1	9,6*	12,0	12,0
				A4/C	12,2*	17,1	17,1	12,0	12,0	12,0
Shear	90°	V_U	[kN]	gvz	10,2*	17,1*	23,4*	10,2*	17,1*	23,4*
				A4/C	15,1*	19,5*	26,0*	15,1*	19,5*	26,0*
Design resistant loads N_{Rd} and V_{Rd} [kN]										
Tensile	0°	N_{Rd}	[kN]	gvz	6,4	8,0	8,0	5,7	6,0	6,1
				A4/C	8,0 (5,5)[1]	8,0	8,0	5,7 (5,5)[1]	6,0	6,1
Shear	90°	V_{Rd}	[kN]	gvz	6,6 (5,2)[2]	10,9 (8,5)[2]	12,2 (11,9)[2]	6,6 (5,2)[2]	7,9	7,9
				A4/C	8,0 (3,8)[1]	12,0 (5,8)[1]	12,2 (7,9)[1]	7,9 (3,8)[1]	7,9 (5,8)[1]	7,9
Recommended loads N_{rec} and V_{rec} [kN]										
Tensile	0°	N_{rec}	[kN]	gvz	4,6	5,7	5,7	4,0	4,3	4,3
				A4/C	5,7 (4,0)[1]	5,7	5,7	4,0	4,3	4,3
Shear	90°	V_{rec}	[kN]	gvz	4,7 (3,7)[2]	7,8 (6,1)[2]	8,7 (8,5)[2]	4,7 (3,7)[2]	5,6	5,6
				A4/C	5,7 (2,7)[1]	8,6 (4,1)[1]	8,7 (5,7)[1]	5,6 (2,7)[1]	5,6 (4,1)[1]	5,6
Recommended bending moment M_{rec} [Nm]										
		M_{rec}	[Nm]	gvz	8,6 (7,7)[2]	13,1 (11,7)[2]	17,7 (15,8)[2]	8,6 (7,7)[2]	13,1 (11,7)[2]	17,7 (15,8)[2]
			[Nm]	A4/C	10,9 (5,4)[1]	16,6 (8,3)[1]	22,3 (11,1)[1]	10,9 (5,4)[1]	16,6 (8,3)[1]	22,3 (11,1)[1]
Component dimensions, minimum axial spacings and edge distances										
Characteristic axial spacing		$S_{cr,N}$	[mm]		= 3 x h_{ef}			= 3 x h_{ef}		
Characteristic edge distance		$S_{cr,N}$	[mm]		= 1,5 x h_{ef}			= 1,5 x h_{ef}		
Min. axial spacing [3]		S_{min}	[mm]		40	45	50	40	45	50
Min. edge distance [3]		c_{min}	[mm]		40	45	50	40	45	50
Min. structural component thickness		h_{min}	[mm]		80	80	80	80	80	80
Min. screw penetration depth		min l_s	[mm]		11	13	15	11	13	15
Max. screw penetration depth		max l_s	[mm]		17	19	21	17	19	21
Clearance-hole in fixture to be attached		d_f	[mm]		9	12	14	9	12	14
Installation torque		T_{inst}	[Nm]		≤ 10	≤ 15	≤ 20	≤ 10	≤ 15	≤ 20
Universal drill bit FZUB [4]			[-]		FZUB 10 x 40	FZUB 12 x 40	FZUB 14 x 40	FZUB 10 x 40	FZUB 12 x 40	FZUB 14 x 40
Setting mandrel FZED [5]			[-]		FZED 10 x 40	FZED 12 x 40	FZED 14 x 40	FZED 10 x 40	FZED 12 x 40	FZED 14 x 40
Machine setting tool FZEM [5]			[-]		FZEM 10 x 40	FZEM 12 x 40	FZEM 14 x 40	FZEM 10 x 40	FZEM 12 x 40	FZEM 14 x 40

* Steel failure value.
1) Values in brackets apply to the use of a fixing screw resp. threaded rod of the minimum strength class A50.
2) Values in brackets apply to the use of a fixing screw resp. threaded rod of the minimum strength class 5.6.
3) For minimum spacing and minimum edge distance the above described loads have to be reduced.
4) For drilling obligatory.
5) For installation of FZEA II the setting mandrel FZED or alternatively the setting tool FZEM is obligatory. All load values apply for concrete C20/25 without edge or spacing influences.
Design resistant loads: material safety factors γM are included. Material safety factor γM depends on type of anchor.
Permissible loads: material safety factors γM and safety factor for load γL = 1,4 are included.

Source: Fischer

Load values Impact anchor E / ES and E A4





Europäische Technische Zulassung nach ETAG 001-06
ETA-05/0116

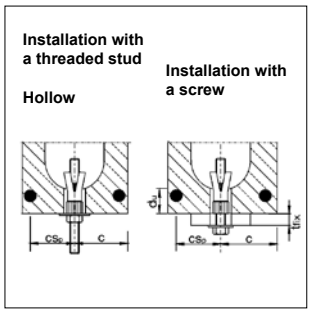
Extract from Permissible Service Conditions of ETA-05/0116

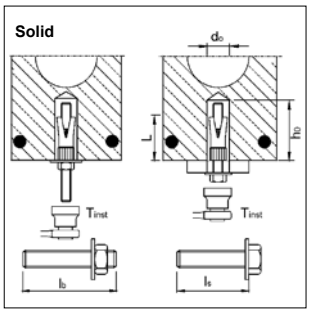
Usage as multiple fixation of non-structural systems acc. to ETAG 001, part 6. Overall safety factor considered acc. to ETAG 001 (Y_M and Y_F).

Loads and performance data	impact anchor E		M 6	M 8	M 8x40	M 10	M 12	M 16
			cracked and non-cracked concrete					
Approved loads (C20/25 to C50/60)	appr. F	[kN]	1,2	1,7	2,0	2,0	2,4	6,3
Approved bending moments (Steel 4.6)	appr. M	[Nm]	2,6	6,4	6,4	12,8	22,2	56,9
Approved bending moments (Steel 5.6)	appr. M	[Nm]	3,3	8,1	8,1	15,8	27,8	71,0
Approved bending moments (Steel 5.8)	appr. M	[Nm]	4,3	10,9	10,9	21,1	37,1	94,9
Approved bending moments (Steel 8.8)	appr. M	[Nm]	6,9	17,1	17,1	34,3	60,0	152,0
Spacing and edge distance								
Effective anchorage depth	hef	[mm]	30	30	40	40	50	65
Characteristic spacing	scr	[mm]	130	180	210	170	170	400
Characteristic edge distance	ccr	[mm]	65	90	105	85	85	200
Minimum spacing	smin	[mm]	55	60	80	100	120	150
Minimum edge distance	cmin	[mm]	95	95	95	135	165	200
Minimum thickness of concrete slab	hmin	[mm]	100	100	100	120	130	160
Installation parameters								
Drill hole diameter	do	[mm]	8	10	10	12	15	20
Diameter of clearance hole in the fixture	df	[mm]	7	9	9	12	14	18
Depth of drill hole	h0	[mm]	30	30	40	40	50	65
Installation torque	Tinst	[Nm]	4	8	8	15	35	60
Minimum screwing depth	Lsd	[mm]	7	9	9	11	13	18
Maximum screwing depth	Lth	[mm]	13	13	20	15	18	23
Loads under fire exposure								
Approved loads R30	zul. F	[kN]	0,2	0,4	0,4	0,9	1,5	3,1
Approved loads R60	zul. F	[kN]	0,2	0,3	0,3	0,8	1,3	2,4
Approved loads R90	zul. F	[kN]	0,1	0,3	0,3	0,6	1,1	2,0
Approved loads R120	zul. F	[kN]	0,1	0,2	0,2	0,5	0,8	1,6
Characteristic spacing	scr,fi	[mm]	130	180	210	170	200	400
Characteristic edge distance	ccr,fi	[mm]	65	90	105	85	100	200
Minimum spacing	smin	[mm]	55	60	80	100	120	150
Minimum edge distance	cmin	[mm]	95	95	95	135	165	200

Loads and performance data	impact anchor E A4		M 6	M 8	M 8x40	M 10	M 12	M 16
			cracked and non-cracked concrete					
Approved loads (C20/25 to C50/60)	zul. F	[kN]	1,2	1,7	2,0	2,0	2,4	6,3
Approved bending moments (A4-70)	zul. M	[Nm]	5,0	11,9	11,9	23,8	42,1	106,7
Spacing and edge distance								
Effective anchorage depth	hef	[mm]	30	30	40	40	50	65
Characteristic spacing	scr	[mm]	130	180	210	170	170	400
Characteristic edge distance	ccr	[mm]	65	90	105	85	85	200
Minimum spacing	smin	[mm]	50	60	80	100	120	150
Minimum edge distance	cmin	[mm]	80	95	95	135	165	200
Minimum thickness of concrete slab	hmin	[mm]	100	100	100	130	140	160
Installation parameters								
Drill hole diameter	do	[mm]	8	10	10	12	15	20
Diameter of clearance hole in the fixture	df	[mm]	7	9	9	12	14	18
Depth of drill hole	h0	[mm]	30	30	40	40	50	65
Installation torque	Tinst	[Nm]	4	8	8	15	35	60
Minimum screwing depth	Lsd	[mm]	7	9	9	11	13	18
Maximum screwing depth	Lth	[mm]	13	13	20	15	18	23
Loads under fire exposure								
Approved loads R30	zul. F	[kN]	0,8	0,9	1,5	1,5	1,5	4,0
Approved loads R60	zul. F	[kN]	0,8	0,9	1,5	1,5	1,5	4,0
Approved loads R90	zul. F	[kN]	0,4	0,9	0,9	1,5	1,5	3,7
Approved loads R120	zul. F	[kN]	0,2	0,4	0,5	1,0	1,2	2,4
Characteristic spacing	scr,fi	[mm]	130	180	210	170	200	400
Characteristic edge distance	ccr,fi	[mm]	65	90	105	85	100	200
Minimum spacing	smin	[mm]	55	60	80	100	120	150
Minimum edge distance	cmin	[mm]	95	95	95	135	165	200

Load values Hollow core anchor Easy





Extract from Permissible Service Conditions of Z-21.1-1785

Approved loads for single anchor without influence of spacing and edge distance.
Total safety factor as per ETAG 001 included (γ_M und γ_F).

t_{fix} = Fixture thickness
b_{St} = Width of web
d_u = Web thickness
c_{Sp} = Spacing to tension wire
b_H = Width of hollow
c = Edge distance

Hollow core anchor Easy			M 6				M 8				M 10				M 12			
			Pre-stressed hollow concrete slabs ≥ C45/55															
Web thickness	d_u	[mm]	≥ 25	30	40	50	25	30	40	50	25	30	40	50	25	30	40	50
Single anchor																		
approved loads[1] (for c ≥ c_{cr})	F[1]	[kN]	0,7	0,9	2,0	2,9	0,7	0,9	2,0	3,6	0,9	1,2	3,0	3,6	1,0	1,2	3,0	4,3
edge distance	c_{cr}	[mm]	150				150				150				150			
approved loads[1] (for c_{min})	F[1]	[kN]	0,35	0,8	1,8	2,4	0,35	0,8	1,8	3,0	0,8	1,0	2,7	3,0	0,8	1,0	2,7	3,6
minimum edge distance	c_{min}	[mm]	100				100				100				100			
spacing	scr	[mm]	300				300				300				300			
Pair of anchors[2]																		
approved loads[1] (for c ≥ c_{cr})	F[1]	[kN]	0,7	1,4	2,6	3,9	0,7	1,4	2,6	4,8	1,1	2,0	4,8	4,8	1,2	2,0	4,8	5,7
minimum spacing	s_{min}	[mm]	70	80	100	100	70	80	100	100	70	80	100	100	70	80	100	100
edge distance	c_{cr}	[mm]	150				150				150				150			
approved loads[1] (for c_{min})	F[1]	[kN]	0,35	1,25	2,35	3,2	0,35	1,25	2,35	4,0	0,9	1,8	4,3	4,3	1,0	1,8	4,3	4,8
minimum spacing	s_{min}	[mm]	70	80	100	100	70	80	100	100	70	80	100	100	70	80	100	100
minimum edge distance	c_{min}	[mm]	100				100				100				100			
Approved bending moments																		
stud / screw, steel 5.8		[Nm]	-				10,7				21,4				37,4			
stud / screw, steel 8.8		[Nm]	4,4				17,1				34,2				59,8			
Installation parameters																		
length of sleeve (without cone)	L	[mm]	30				35				40				45			
minimum length of screw	min l_s	[mm]	42 + tfix				47 + tfix				55 + tfix				61 +tfix			
minimum length of stud	min l_b	[mm]	47 + tfix				53 + tfix				63 + tfix				71 +tfix			
minimum strength of stud / screw			8.8				5.8				5.8				5.8			
drill hole diameter	d_o	[mm]	10				12				16				18			
clearance hole in the fixture	d_f	[mm]	7				9				12				14			
depth of drill hole	h_o	[mm]	50				55				60				70			
installation torque	T_{inst}	[Nm]	10				20				30				40			

[1] For edge distance cmin < c ≤ c_{cr} can be determined by linear interpolation.
[2] Approved loads valid for double anchorage. Recommended load of the most stressed anchor may not exceed the recommended load of a single anchor. On double anchorages with spacing smin < s < s_{cr} the recommended load my be determined by linear interpolation, assuming the limiting value s = s_{cr} for the double anchorage exposed to tension is twice the recommended load of a single anchor.