WCF-E3

Epoxide injection anchor - for heaviest loads for use with cracked and non-cracked concrete zones; without styrene

ETA-17/0234

ETA-15/0681
for rebars
calculations in accordance
with EC2
EN 1992-1-1

Description

Epoxide, dual components injection anchor 1:3 For professional use in most reliable, durable connections. Anchor used to set in threaded rods and rebars into concrete substrates.
Content: 585 ml
Working temperatures for hardened anchor: -40˚C to +80˚C

Substrate material

- Cracked and non-cracked concrete (option 1) C20/25 through C50/60;
- Reinforced and non-reinforced concrete;
- Dry, wet concrete and flooded holes (Cat 2);
- Deep anchoring - rebars, calculations in accordance with EC2 EN 1992-1-1;
- Non-cracked concrete (option 7) C12/15 through C50/60;
- Reinforced and non-reinforced concrete;
- Dry and wet concrete;

Related rods

- Threaded rods M8-M30 made of galvanized steel grades: 4.6, 5.8, 8.8, 10.9;
- Threaded rods M8-M30 made of stainless steel grades: A2-70, A4-70, A4-80;
- Threaded rods M8-M30 made of HCR steel: 1.4529, 1.4565;
- Galvanized or hot-dip galvanized rods;
- Rebars: Ø8, Ø10, Ø12, Ø16, Ø20, Ø25, Ø32, grade: B,C;
- Rebars (post installed in accordance with TR023/EC2): Ø8, Ø10, Ø12, Ø14, Ø16, Ø20, Ø25, Ø28, Ø32, class: B, C;

Application temperatures

5°C ÷ 40°C

WCF-E3-585

Features and advantages

Wide range of applications	Connection of steel structures (railings, handrails); reinforcement of building elements, bridges and other construction structures; post installing rebars; structural connections to anchored rebars (connections to walls, pillars, foundations); overlapping rebar systems; calculation method according to TR 029, CEN/TS 1992-4 and to EC2 EN 1992-1-1;
High loading parameters	Suitable for even most reliable and stronger connections
Ability to work in higher temperatures	WCF-E3 - installation temperature +5˚C to +40˚C;
Installation in cracked concrete	Ability to install threaded rods in the tension zone of the reinforced concrete, cracked concrete, such as slabs, beams,
Long curing time	Increased flexibility during installation, ability to correct bar position after injection, deep anchorage length;
Long life	Valid for use within **18** months in normal storage conditions
Content - 585 ml	Large volume allows for large number of applications while maintaining low costs
Side-by-side cartridge	Double cartridge eliminates problems during application and allows for use of every cm^3 of the product

WCF-E3

Epoxide injection anchor - for heaviest loads for use with cracked and non-cracked concrete zones; without styrene

TABLE 1. Ordering list

	Code	[°C]	Szt.
585ml	WCF-E3-585	5 ÷ 40	12

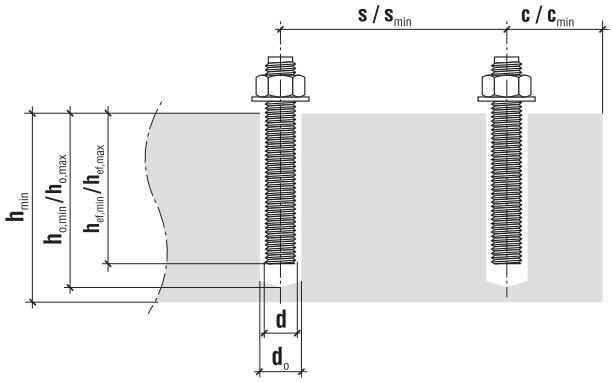

TABLE 2. Installation parameters - threaded rods

Parameters			ROD SIZE							
			M8	M10	M12	M16	M20	M24	M27	M30
Threaded rod diameter	d	[mm]	8	10	12	16	20	24	27	30
Hole diameter	d_0	[mm]	10	12	14	18	22	26	30	35
Min. embedment depth	$h_{ef,min}$	[mm]	60	60	70	80	90	96	108	120
Min. hole depth	$h_{0,min}$	[mm]	65	65	75	85	95	101	113	125
Min. distance from the edge	c_{min}	[mm]	40	40	40	40	50	50	50	60
Min. spacing between connector centres	s_{min}	[mm]	40	40	40	40	50	50	50	60
Max. embedment depth	$h_{ef,max}$	[mm]	160	200	240	320	400	480	540	600
Max. crevice depth	$h_{0,max}$	[mm]	165	205	245	325	405	485	545	605
Min. distance from the edge	c_{min}	[mm]	80	100	120	160	200	240	270	300
Min. spacing between connector centres	s_{min}	[mm]	80	100	120	160	200	240	270	300
Min. base material thickness	h_{min}	[mm]	h_{ef}+30 mm > 100 mm			$h_{ef}+2*d_0$				
Torque	T_{inst}	[Nm]	10	20	40	80	120	160	180	200

TABLE 3. Curing time

Substrate temp [°C]	5	5 ÷ 10	10 ÷ 15	15 ÷ 20	20 ÷ 25	25 ÷ 30	30 ÷ 35	35 ÷ 40
Working time [min.]	300	150	40	25	18	12	8	6
Hardening time [min]	24	24	18	12	8	6	4	2

Setting instruction

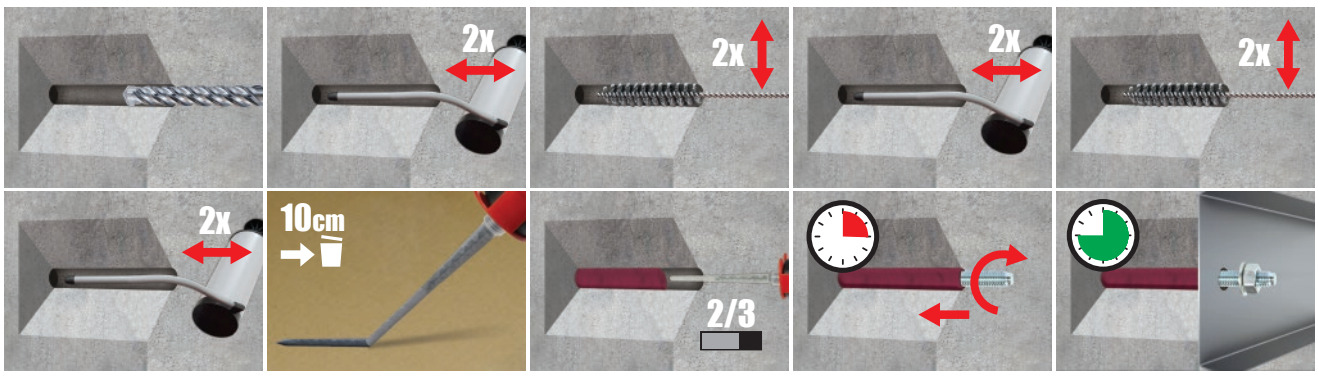

TABLE 4A. Loading resistances for tension in non-cracked concrete - threaded rods

Rod size	Hole diameter [mm]	Torque T_{inst} [Nm]	Loading resistances of individual anchors installed into non-cracked concrete C20/25 maintaining basic installation conditions - characteristic and designed values																								
			Minimal value of {pull-out failure - $N_{R,p}$ [kN] ; concrete cone failure - $N_{R,c}$ [kN]}																		Steel wear - $N_{R,s}$ [kN]						
			Safety factor - γ_{Mc} = 1,8 - M8-M24, γ_{Mc} = 2,1 - M27-M30																		γ_{Ms}=2	γ_{Ms}=1,5	γ_{Ms}=1,4	γ_{Ms}=1,87		γ_{Ms}=1,6	
			Embedment depth h_{ef} [mm]																		Steel grade						
			60	80	100	120	140	160	180	200	220	240	280	320	360	400	440	480	540	600	4,6	5,8	8,8	10,9	A2-70	A4-70	A4-80
M8	10	10	21,11	28,15	35,19	42,22	49,26	56,30	-	-	-	-	-	-	-	-	-	-	-	-	14,64	18,30	29,28	36,60	25,62	25,62	29,28
			11,73	15,64	19,55	23,46	27,37	31,28	-	-	-	-	-	-	-	-	-	-	-	-	7,32	12,20	19,52	26,14	13,73	13,73	18,30
M10	12	20	23,47	32,67	40,84	49,01	57,18	65,35	73,51	81,68	-	-	-	-	-	-	-	-	-	-	23,20	29,00	46,40	58,00	40,60	40,60	46,40
			13,04	18,15	22,69	27,23	31,76	36,30	40,84	45,38	-	-	-	-	-	-	-	-	-	-	11,60	19,33	30,93	41,43	21,75	21,75	29,00
M12	14	40	-	36,13	49,01	58,81	68,61	78,41	88,22	98,02	107,82	117,62	-	-	-	-	-	-	-	-	33,72	42,15	67,44	84,30	59,01	59,01	67,44
			-	20,07	27,23	32,67	38,12	43,56	49,01	54,45	59,90	65,35	-	-	-	-	-	-	-	-	16,86	28,10	44,96	60,21	31,61	31,61	42,15
M16	18	80	-	36,13	50,50	66,38	83,65	96,51	108,57	120,64	132,70	144,76	168,89	193,02	-	-	-	-	-	-	62,80	78,50	125,60	157,00	109,90	109,90	125,60
			-	20,07	28,06	36,88	46,47	53,62	60,32	67,02	73,72	80,42	93,83	107,23	-	-	-	-	-	-	31,40	52,33	83,73	112,14	58,88	58,88	78,50
M20	22	120	-	-	50,50	66,38	83,65	102,20	121,96	142,84	164,79	180,96	211,12	241,27	271,43	301,59	-	-	-	-	98,00	122,50	196,00	245,00	171,50	171,50	196,00
			-	-	28,06	36,88	46,47	56,78	67,75	79,35	91,55	100,53	117,29	134,04	150,80	167,55	-	-	-	-	49,00	81,67	130,67	175,00	91,88	91,88	122,50
M24	26	160	-	-	50,50	66,38	83,65	102,20	121,96	142,84	164,79	187,76	232,23	265,40	298,58	331,75	364,93	398,10	-	-	141,20	176,50	282,40	353,00	247,10	247,10	282,40
			-	-	28,06	36,88	46,47	56,78	67,75	79,35	91,55	104,31	129,01	147,45	165,88	184,31	202,74	221,17	-	-	70,60	117,67	188,27	252,14	132,38	132,38	176,50
M27	30	180	-	-	-	66,38	83,65	102,20	121,96	142,84	164,79	187,76	236,61	271,43	305,36	339,29	373,22	407,15	458,04	-	183,60	229,50	367,20	459,00	321,30	321,30	367,20
			-	-	-	31,61	39,83	48,67	58,07	68,02	78,47	89,41	112,67	129,25	145,41	161,57	177,72	193,88	218,12	-	91,80	153,00	244,80	327,86	172,13	172,13	229,50
M30	35	200	-	-	-	66,38	83,65	102,20	121,96	142,84	164,79	187,76	236,61	271,43	305,36	339,29	373,22	407,15	458,04	508,94	224,40	280,50	448,80	561,00	392,70	392,70	448,80
			-	-	-	31,61	39,83	48,67	58,07	68,02	78,47	89,41	112,67	129,25	145,41	161,57	177,72	193,88	218,12	242,35	112,20	187,00	299,20	400,71	210,38	210,38	280,50

Data for a single anchor without influence of distance or effects of spacing between the anchors.
As the spacing and distance decreases, the values given should be multiplied by reduction coefficients from tables 7 and 8

Characteristic values Design values

WCF-E3

Epoxide injection anchor - for heaviest loads for use with cracked and non-cracked concrete zones; without styrene

TABLE 5A. Loading resistances for shearing in non-cracked concrete - threaded rods

Rod size	Hole diameter [mm]	Torque T_{inst} [Nm]	Loading resistances of individual anchors installed into non-cracked concrete C20/25 affected by shearing force maintaining basic installation conditions - characteristic and designed values																								
			Minimal value of {pry-out - $V_{R,p}$ [kN] ; concrete edge failure - $V_{R,c}$ [kN]}																		Steel failure - $V_{R,s}$ [kN]						
			Safety factor - $\gamma_{Mc} = 1,5$																		γ_{Ms}=1,67	γ_{Ms}=1,25	γ_{Ms}=1,5	γ_{Ms}=1,56		γ_{Ms}=1,33	
			Embedment depth h_{ef} [mm]																		Steel grade						
			60	80	100	120	140	160	180	200	220	240	280	320	360	400	440	480	540	600	4,6	5,8	8,8	10,9	A2-70	A4-70	A4-80
M8	10	10	15,63	24,12	33,76	44,40	55,96	68,37	-	-	-	-	-	-	-	-	-	-	-	-	7,32	9,15	14,64	18,30	12,81	12,81	14,64
			10,42	16,08	22,50	29,60	37,31	45,58	-	-	-	-	-	-	-	-	-	-	-	-	4,39	7,32	11,71	12,20	8,24	8,24	10,98
M10	12	20	16,10	24,85	34,78	45,75	57,66	70,45	84,05	98,41	-	-	-	-	-	-	-	-	-	-	11,60	14,50	23,20	29,00	20,30	20,30	23,20
			10,73	16,57	23,19	30,50	38,44	46,97	56,03	65,61	-	-	-	-	-	-	-	-	-	-	6,96	11,60	18,56	19,33	13,05	13,05	17,40
M12	14	40	-	25,48	35,65	46,90	59,12	72,22	86,17	100,89	116,36	132,53	-	-	-	-	-	-	-	-	16,86	21,08	33,72	42,15	29,51	29,51	33,72
			-	16,98	23,77	31,27	39,41	48,15	57,44	67,26	77,57	88,35	-	-	-	-	-	-	-	-	10,12	16,86	26,98	28,10	18,97	18,97	25,29
M16	18	80	-	26,51	37,11	48,81	61,53	75,17	89,68	105,01	121,10	137,93	173,65	211,96	-	-	-	-	-	-	31,40	39,25	62,80	78,50	54,95	54,95	62,80
			-	17,68	24,74	32,54	41,02	50,11	59,79	70,00	80,73	91,95	115,77	141,30	-	-	-	-	-	-	18,84	31,40	50,24	52,33	35,33	35,33	47,10
M20	22	120	-	-	38,30	50,38	63,51	77,59	92,57	108,38	124,99	142,36	179,22	218,75	260,76	305,09	-	-	-	-	49,00	61,25	98,00	122,50	85,75	85,75	98,00
			-	-	25,53	33,59	42,34	51,73	61,71	72,26	83,33	94,91	119,48	145,83	173,84	203,39	-	-	-	-	29,40	49,00	78,40	81,67	55,13	55,13	73,50
M24	26	160	-	-	39,32	51,73	65,20	79,66	95,04	111,28	128,33	146,15	183,99	224,56	267,68	313,18	360,94	410,84	-	-	70,60	88,25	141,20	176,50	123,55	123,55	141,20
			-	-	26,21	34,49	43,47	53,11	63,36	74,18	85,55	97,44	122,66	149,71	178,45	208,78	240,62	273,90	-	-	42,36	70,60	112,96	117,67	79,43	79,43	105,90
M27	30	180	-	-	-	52,63	66,34	81,05	96,69	113,21	130,56	148,69	187,19	228,45	272,30	318,58	367,16	417,92	497,94	-	91,80	114,75	183,60	229,50	160,65	160,65	183,60
			-	-	-	35,09	44,23	54,03	64,46	75,47	87,04	99,13	124,79	152,30	181,54	212,39	244,77	278,61	331,96	-	55,08	91,80	146,88	153,00	103,28	103,28	137,70
M30	35	200	-	-	-	53,46	67,38	82,32	98,21	114,99	132,61	151,02	190,12	232,02	276,55	323,55	372,87	424,41	505,66	591,38	112,20	140,25	224,40	280,50	196,35	196,35	224,40
			-	-	-	35,64	44,92	54,88	65,47	76,66	88,40	100,68	126,74	154,68	184,37	215,70	248,58	282,94	337,11	394,25	67,32	112,20	179,52	187,00	126,23	126,23	168,30

Data for a single anchor without accounting for distance from the edge or effects of spacing between centres of the anchors.
As the spacing and distance from the edge decreases, the values given should be multiplied by reduction coefficients from tables 7 and 9.

Characteristic values Design values

TABLE 4B Carrying capacity for tension in cracked concrete - threaded rods

Rod size	Hole diameter [mm]	Torque T_{inst} [Nm]	Loading resistance of individual connectors installed into cracked concrete C20/25 maintaining basic installation conditions - characteristic and designed values																								
			Minimal value of {pull-out failure - $N_{R,p}$ [kN] ; concrete cone failure - $N_{R,c}$ [kN]}																		Steel failure - $N_{R,s}$ [kN]						
			Safety factor - γ_{Mc} = 1,8 - M8-M24; γ_{Mc} = 2,1 - M27-M30																		γ_{Ms}=2	γ_{Ms}=1,5		γ_{Ms}=1,4	γ_{Ms}=1,87		γ_{Ms}=1,6
			Embedment depth h_{ef} [mm]																		Steel grade						
			60	80	100	120	140	160	180	200	220	240	280	320	360	400	440	480	540	600	4,6	5,8	8,8	10,9	A2-70	A4-70	A4-80
M8	10	10	12,06	16,08	20,11	24,13	28,15	32,17	-	-	-	-	-	-	-	-	-	-	-	-	14,64	18,30	29,28	36,60	25,62	25,62	29,28
			6,70	8,94	11,17	13,40	15,64	17,87	-	-	-	-	-	-	-	-	-	-	-	-	7,32	12,20	19,52	26,14	13,73	13,73	18,30
M10	12	20	15,08	20,11	25,13	30,16	35,19	40,21	45,24	50,27	-	-	-	-	-	-	-	-	-	-	23,20	29,00	46,40	58,00	40,60	40,60	46,40
			8,38	11,17	13,96	16,76	19,55	22,34	25,13	27,93	-	-	-	-	-	-	-	-	-	-	11,60	19,33	30,93	41,43	21,75	21,75	29,00
M12	14	40	-	22,62	28,27	33,93	39,58	45,24	50,89	56,55	62,20	67,86	-	-	-	-	-	-	-	-	33,72	42,15	67,44	84,30	59,01	59,01	67,44
			-	12,57	15,71	18,85	21,99	25,13	28,27	31,42	34,56	37,70	-	-	-	-	-	-	-	-	16,86	28,10	44,96	60,21	31,61	31,61	42,15
M16	18	80	-	25,76	36,00	45,24	52,78	60,32	67,86	75,40	82,94	90,48	105,56	120,64	-	-	-	-	-	-	62,80	78,50	125,60	157,00	109,90	109,90	125,60
			-	14,31	20,00	25,13	29,32	33,51	37,70	41,89	46,08	50,27	58,64	67,02	-	-	-	-	-	-	31,40	52,33	83,73	112,14	58,88	58,88	78,50
M20	22	120	-	-	36,00	47,32	59,63	70,37	79,17	87,96	96,76	105,56	123,15	140,74	158,34	175,93	-	-	-	-	98,00	122,50	196,00	245,00	171,50	171,50	196,00
			-	-	20,00	26,29	33,13	39,10	43,98	48,87	53,76	58,64	68,42	78,19	87,96	97,74	-	-	-	-	49,00	81,67	130,67	175,00	91,88	91,88	122,50
M24	26	160	-	-	36,00	47,32	59,63	72,86	86,94	101,82	116,11	126,67	147,78	168,89	190,00	211,12	232,23	253,34	-	-	141,20	176,50	282,40	353,00	247,10	247,10	282,40
			-	-	20,00	26,29	33,13	40,48	48,30	56,57	64,51	70,37	82,10	93,83	105,56	117,29	129,01	140,74	-	-	70,60	117,67	188,27	252,14	132,38	132,38	176,50
M27	30	180	-	-	-	47,32	59,38	67,86	76,34	84,82	93,31	101,79	118,75	135,72	152,68	169,65	186,61	203,58	229,02	-	183,60	229,50	367,20	459,00	321,30	321,30	367,20
			-	-	-	22,53	28,27	32,31	36,35	40,39	44,43	48,47	56,55	64,63	72,71	80,78	88,86	96,94	109,06	-	91,80	153,00	244,80	327,86	172,13	172,13	229,50
M30	35	200	-	-	-	47,32	59,63	72,86	84,82	94,25	103,67	113,10	131,95	150,80	169,65	188,50	207,35	226,19	254,47	282,74	224,40	280,50	448,80	561,00	392,70	392,70	448,80
			-	-	-	22,53	28,40	34,69	40,39	44,88	49,37	53,86	62,83	71,81	80,78	89,76	98,74	107,71	121,18	134,64	112,20	187,00	299,20	400,71	210,38	210,38	280,50

Data for a single anchor without influence of distance or effects of spacing between the anchors.
As the spacing and distance from the edge decreases, the values given should be multiplied by reduction coefficients from tables 7 and 8.

Characteristic values Design values

WCF-E3

Epoxide injection anchor - for heaviest loads for use with cracked and non-cracked concrete zones; without styrene

WCF-E3

Epoxide injection anchor - for heaviest loads for use with cracked and non-cracked concrete zones; without styrene

TABLE 5B Loading resistance for shearing in cracked concrete - threaded rods

Rod size	Hole diameter [mm]	Torque T_{inst} [Nm]	Carrying capacity of individual connectors installed into cracked concrete C20/25 affected by cutting force maintaining basic installation conditions - specific values and calculated values																							
			Minimal value of {pry-out - $V_{R,p}$ [kN] ; concrete edge failure - $V_{R,c}$ [kN]}																		Steel wear - $V_{R,s}$ [kN]						
			Safety factor - γ_{Mc} = 1,5																		γ_{Ms}=1,67	γ_{Ms}=1,25		γ_{Ms}=1,5	γ_{Ms}=1,56		γ_{Ms}=1,33
			Embedment depth h_{ef} [mm]																		Steel grade						
			60	80	100	120	140	160	180	200	220	240	280	320	360	400	440	480	540	600	4,6	5,8	8,8	10,9	A2-70	A4-70	A4-80
M8	10	10	11,07	17,09	23,91	31,45	39,64	48,43	-	-	-	-	-	-	-	-	-	-	-	-	7,32	9,15	14,64	18,30	12,81	12,81	14,64
			7,38	11,39	15,94	20,97	26,43	32,29	-	-	-	-	-	-	-	-	-	-	-	-	4,39	7,32	11,71	12,20	8,24	8,24	10,98
M10	12	20	11,40	17,60	24,64	32,41	40,84	49,90	59,54	69,71	-	-	-	-	-	-	-	-	-	-	11,60	14,50	23,20	29,00	20,30	20,30	23,20
			7,60	11,74	16,42	21,60	27,23	33,27	39,69	46,47	-	-	-	-	-	-	-	-	-	-	6,96	11,60	18,56	19,33	13,05	13,05	17,40
M12	14	40	-	18,05	25,26	33,22	41,87	51,16	61,03	71,46	82,42	93,87	-	-	-	-	-	-	-	-	16,86	21,08	33,72	42,15	29,51	29,51	33,72
			-	12,03	16,84	22,15	27,92	34,11	40,69	47,64	54,95	62,58	-	-	-	-	-	-	-	-	10,12	16,86	26,98	28,10	18,97	18,97	25,29
M16	18	80	-	18,78	26,28	34,58	43,58	53,25	63,52	74,38	85,78	97,70	123,00	150,13	-	-	-	-	-	-	31,40	39,25	62,80	78,50	54,95	54,95	62,80
			-	12,52	17,52	23,05	29,05	35,50	42,35	49,59	57,19	65,13	82,00	100,09	-	-	-	-	-	-	18,84	31,40	50,24	52,33	35,33	35,33	47,10
M20	22	120	-	-	27,13	35,69	44,99	54,96	65,57	76,77	88,54	100,84	126,95	154,95	184,70	216,11	-	-	-	-	49,00	61,25	98,00	122,50	85,75	85,75	98,00
			-	-	18,09	23,79	29,99	36,64	43,71	51,18	59,03	67,23	84,63	103,30	123,13	144,07	-	-	-	-	29,40	49,00	78,40	81,67	55,13	55,13	73,50
M24	26	160	-	-	27,85	36,64	46,19	56,43	67,32	78,82	90,90	103,53	130,33	159,07	189,60	221,83	255,66	291,01	-	-	70,60	88,25	141,20	176,50	123,55	123,55	141,20
			-	-	18,57	24,43	30,79	37,62	44,88	52,55	60,60	69,02	86,89	106,04	126,40	147,89	170,44	194,01	-	-	42,36	70,60	112,96	117,67	79,43	79,43	105,90
M27	30	180	-	-	-	37,28	46,99	57,41	68,49	80,19	92,48	105,32	132,59	161,82	192,88	225,66	260,07	296,03	352,70	-	91,80	114,75	183,60	229,50	160,65	160,65	183,60
			-	-	-	24,85	31,33	38,27	45,66	53,46	61,65	70,22	88,39	107,88	128,59	150,44	173,38	197,35	235,14	-	55,08	91,80	146,88	153,00	103,28	103,28	137,70
M30	35	200	-	-	-	37,86	47,73	58,31	69,57	81,45	93,93	106,98	134,67	164,35	195,89	229,18	264,12	300,63	358,17	418,89	112,20	140,25	224,40	280,50	196,35	196,35	224,40
			-	-	-	25,24	31,82	38,87	46,38	54,30	62,62	71,32	89,78	109,57	130,60	152,79	176,08	200,42	238,78	279,26	67,32	112,20	179,52	187,00	126,23	126,23	168,30

Data for a single anchor without influence of distance or effects of spacing between the anchors.
As the spacing and distance from the edge decreases, the values given should be multiplied by reduction coefficients from tables 7 and 9.

Characteristic values Design values

WCF-E3

Epoxide injection anchor - for heaviest loads for use with cracked and non-cracked concrete zones; without styrene

TABLE 6. Base installation conditions allowing for maintaining loading resistances from tables 4AB - 5AB

Parameter	Rod size	Formula	Embedment depth h_{ef} [mm]																	
			60	80	100	120	140	160	180	200	220	240	280	320	360	400	440	480	540	600
Distance from the edge - c[mm]	M8-M30	c=1,5*hef	90	120	150	180	210	240	270	300	330	360	420	480	540	600	660	720	810	900
Anchor spacing - s[mm]	M8-M30	s=3*hef	180	240	300	360	420	480	540	600	660	720	840	960	1080	1200	1320	1440	1620	1800

TABLE 7. Reduction factors for tension and shearing - effects of anchor spacing, "s"

Effects of anchor spacing (reduction coefficient) - $\Psi_{sn,v}$																										
s/h_{ef}	0,5	0,6	0,7	0,8	0,9	1	1,1	1,2	1,3	1,4	1,5	1,6	1,7	1,8	1,9	2	2,1	2,2	2,3	2,4	2,5	2,6	2,7	2,8	2,9	≥3
M8-M30	0,58	0,6	0,62	0,63	0,65	0,67	0,68	0,7	0,72	0,73	0,75	0,77	0,78	0,8	0,82	0,83	0,85	0,87	0,88	0,9	0,92	0,93	0,95	0,97	0,98	1

Spacing between anchors cannot be lower than 0.5 of embedment depth (h_{ef})

$0,5\ h_{ef} < s < 3\ h_{ef}$	M8-M30

TABLE 8. Reduction factors for tension - effects of distance from the edge "c"

Effects of anchor distance from the edge (reduction coefficient) - $\Psi_{sn,v}$											
c/h_{ef}	0,5	0,6	0,7	0,8	0,9	1	1,1	1,2	1,3	1,4	≥1,5
M8-M30	0,53	0,57	0,62	0,67	0,71	0,76	0,81	0,85	0,90	0,95	1,00

Distance from the edge cannot be lower than 0,5 of embedment depth (h_{ef})

$0,5\ h_{ef} < c < 1,5\ h_{ef}$	M8-M30

TABLE 9. Reduction factors for shearing - effects of distance from the edge "c"

Effects of anchor distance from the edge (reduction coefficient) - Ψ_{cv}											
c/h_{ef}	0,5	0,6	0,7	0,8	0,9	1,0	1,1	1,2	1,3	1,4	≥1,5
M8-M30	0,23	0,29	0,36	0,43	0,50	0,58	0,66	0,74	0,82	0,91	1,00

Distance from the edge cannot be lower than 0,5 of embedment depth (h_{ef})

$0,5\ h_{ef} < c < 1,5\ h_{ef}$	M8-M30

TABLE 10. Consumption - threaded rods

Rod size	Hole diameter [mm]	Torque T_{inst} [Nm]	Estimated number of anchors made from one cartridge 585ml																	
			Embedment depth h_{ef} [mm]																	
			60	80	100	120	140	160	180	200	220	240	280	320	360	400	440	480	540	600
M8	10	10	166	124	99	83	71	62	-	-	-	-	-	-	-	-	-	-	-	-
M10	12	20	115	86	69	57	49	43	38	34	-	-	-	-	-	-	-	-	-	-
M12	14	40	-	63	51	42	36	32	28	25	23	21	-	-	-	-	-	-	-	-
M16	18	80	-	38	31	26	22	19	17	15	14	13	11	10	-	-	-	-	-	-
M20	22	120	-	-	21	17	15	13	11	10	9	9	7	6	6	5	-	-	-	-
M24	26	160	-	-	15	12	10	9	8	7	7	6	5	5	4	4	3	3	-	-
M27	30	180	-	-	-	9	8	7	6	6	5	5	4	3	3	3	3	2	2	-
M30	35	200	-	-	-	7	6	5	5	4	4	3	3	3	2	2	2	2	2	1

WCF-E3

Epoxide injection anchor - for heaviest loads for use with cracked and non-cracked concrete zones; without styrene

TABLE 1. Ordering list

	Code	[°C]	Szt.
585ml	WCF-E3-585	5 ÷ 40	12

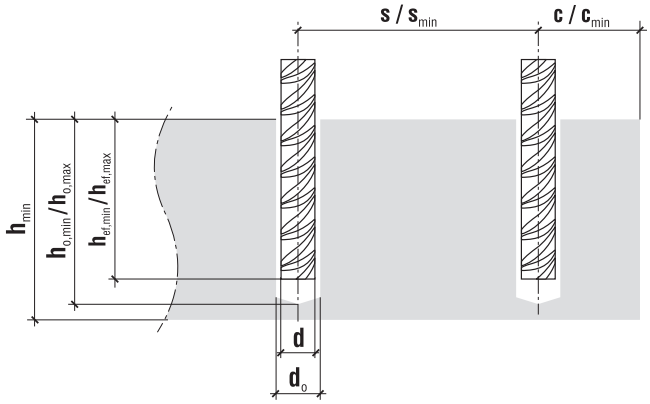

TABLE 2. Installation parameters - rebars according to the TR029 standard

Parameters			ROD SIZE						
			Ø8	Ø10	Ø12	Ø16	Ø20	Ø25	Ø32
Rebar diameter	d	[mm]	8	10	12	16	20	25	32
Hole diameter	d_0	[mm]	12	14	16	20	25	32	40
Min. embedment depth	$h_{ef,min}$	[mm]	60	60	70	80	90	100	128
Min. hole depth	$h_{0,min}$	[mm]	65	65	75	85	95	105	133
Min. distance from the edge	c_{min}	[mm]	40	40	40	40	50	50	70
Min. spacing between connector centres	s_{min}	[mm]	40	40	40	40	50	50	70
Max. embedment depth	$h_{ef,max}$	[mm]	160	200	240	320	400	500	640
Max. crevice depth	$h_{0,max}$	[mm]	165	205	245	325	405	505	645
Min. distance from the edge	c_{min}	[mm]	80	100	120	160	200	250	320
Min. spacing between connector centres	s_{min}	[mm]	80	100	120	160	200	250	320
Min. base material thickness	h_{min}	[mm]	h_{ef}+30 mm > 100 mm			h_{ef}+2*d_0			

TABLE 3. Curing time

Substrate temp [°C]	5	5 ÷ 10	10 ÷ 15	15 ÷ 20	20 ÷ 25	25 ÷ 30	30 ÷ 35	35 ÷ 40
Working time [min.]	300	150	40	25	18	12	8	6
Hardening time [min]	24	24	18	12	8	6	4	2

Setting instruction

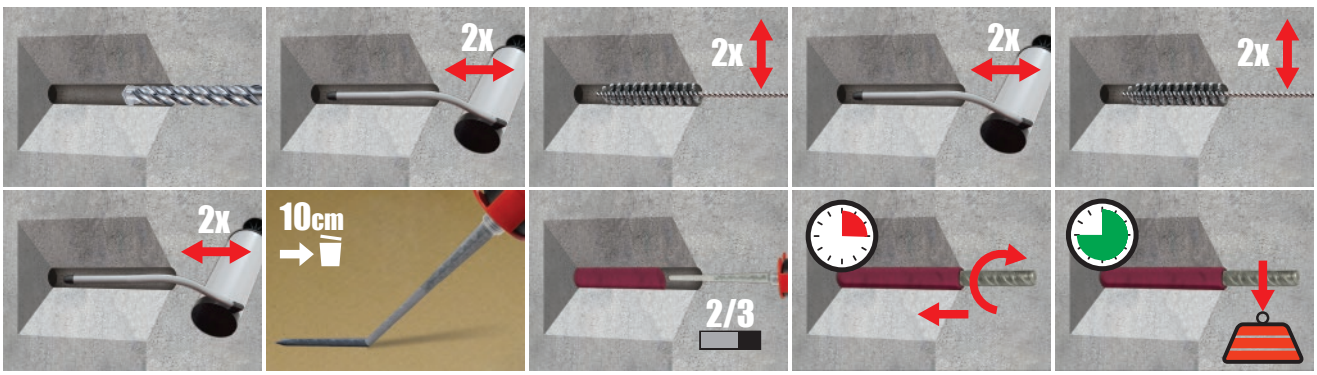

TABLE 4A Loading resistances for tension on non-cracked concrete - rebars in accordance with TR029

Rod size	Hole diameter [mm]	Loading resistances of individual anchors installed into non-cracked concrete C20/25 maintaining basic installation conditions - characteristic and designed values																						
		Minimal value of {pull-out failure - $N_{R,p}$ [kN] ; concrete cone failure - $N_{R,c}$ [kN]}																			Steel failure - $N_{R,s}$ [kN]			
		Safety factor - γ_{Mc} = 1,8																			γ_{Ms}=1,4	γ_{Ms}=1,4	γ_{Ms}=1,46	γ_{Ms}=1,62
		Embedment depth h_{ef} [mm]																			Steel grade			
		60	80	100	120	140	160	180	200	220	240	280	320	360	400	450	500	550	600	640	BSt 500 S	B 500 SP	34 GS	18 G2
Ø8	12	18,10	24,13	30,16	36,19	42,22	48,25	-	-	-	-	-	-	-	-	-	-	-	-	-	27,67	28,92	25,15	24,14
		10,05	13,40	16,76	20,11	23,46	26,81	-	-	-	-	-	-	-	-	-	-	-	-	-	19,76	20,66	17,19	14,88
Ø10	14	22,62	30,16	37,70	45,24	52,78	60,32	67,86	75,40	-	-	-	-	-	-	-	-	-	-	-	43,18	45,14	39,25	37,68
		12,57	16,76	20,94	25,13	29,32	33,51	37,70	41,89	-	-	-	-	-	-	-	-	-	-	-	30,84	32,24	26,82	23,22
Ø12	16	-	36,13	45,24	54,29	63,33	72,38	81,43	90,48	99,53	108,57	-	-	-	-	-	-	-	-	-	62,15	64,98	56,50	54,24
		-	20,07	25,13	30,16	35,19	40,21	45,24	50,27	55,29	60,32	-	-	-	-	-	-	-	-	-	44,39	46,41	38,61	33,43
Ø16	20	-	36,13	50,50	66,35	77,41	88,47	99,53	110,58	121,64	132,70	154,82	176,93	-	-	-	-	-	-	-	110,55	115,58	100,50	96,48
		-	20,07	28,06	36,86	43,00	49,15	55,29	61,44	67,58	73,72	86,01	98,30	-	-	-	-	-	-	-	78,96	82,55	68,68	59,46
Ø20	25	-	-	50,50	66,38	83,65	102,20	121,96	138,23	152,05	165,88	193,52	221,17	248,81	276,46	-	-	-	-	-	172,70	180,55	157,00	150,72
		-	-	28,06	36,88	46,47	56,78	67,75	76,79	84,47	92,15	107,51	122,87	138,23	153,59	-	-	-	-	-	123,36	128,96	107,28	92,89
Ø25	32	-	-	50,50	66,38	83,65	102,20	121,96	142,84	164,79	187,76	236,61	276,46	311,02	345,58	388,77	431,97	-	-	-	270,05	282,33	245,50	235,68
		-	-	28,06	36,88	46,47	56,78	67,75	79,35	91,55	104,31	131,45	153,59	172,79	191,99	215,98	239,98	-	-	-	192,89	201,66	167,76	145,25
Ø32	40	-	-	-	-	83,65	102,20	121,96	140,74	154,82	168,89	197,04	225,19	253,34	281,49	316,67	351,86	387,04	422,23	450,38	442,20	462,30	402,00	385,92
		-	-	-	-	46,47	56,78	67,75	78,19	86,01	93,83	109,47	125,11	140,74	156,38	175,93	195,48	215,02	234,57	250,21	315,86	330,21	274,70	237,85

Data for a single anchor without accounting for distance from the edge or effects of spacing between centres of the anchors.
As the spacing and distance decreases, the values given should be multiplied by reduction coefficients from tables 7 and 8

Characteristic values Design values

WCF-E3

Epoxide injection anchor - for heaviest loads for use with cracked and non-cracked concrete zones; without styrene

TABLE 5A Loading resistance for shearing in non-cracked concrete - rebars in accordance with TR029

Rod size	Hole diameter [mm]	Carrying capacity of individual connectors installed into non-cracked concrete C20/25 affected by cutting force maintaining basic installation conditions - specific values and calculated values																						
		Minimal value of {pry-out - $V_{R,p}$ [kN] ; concrete edge failure - $V_{R,c}$ [kN]}																			Steel failure - $V_{R,s}$ [kN]			
		Safety factor - γ_{Mc} = 1,5																			γ_{Ms}=1,5	γ_{Ms}=1,5	γ_{Ms}=1,5	γ_{Ms}=1,5
		Embedment depth h_{ef} [mm]																			Steel grade			
		60	80	100	120	140	160	180	200	220	240	280	320	360	400	450	500	550	600	640	BSt 500 S	B 500 SP	34 GS	18 G2
Ø8	12	15,63	24,12	33,76	44,40	55,96	68,37	-	-	-	-	-	-	-	-	-	-	-	-	-	13,83	14,46	12,58	12,07
		10,42	16,08	22,50	29,60	37,31	45,58	-	-	-	-	-	-	-	-	-	-	-	-	-	9,22	9,64	8,38	8,05
Ø10	14	16,10	24,85	34,78	45,75	57,66	70,45	84,05	98,41	-	-	-	-	-	-	-	-	-	-	-	21,59	22,57	19,63	18,84
		10,73	16,57	23,19	30,50	38,44	46,97	56,03	65,61	-	-	-	-	-	-	-	-	-	-	-	14,39	15,05	13,08	12,56
Ø12	16	-	25,48	35,65	46,90	59,12	72,22	86,17	100,89	116,36	132,53	-	-	-	-	-	-	-	-	-	31,08	32,49	28,25	27,12
		-	16,98	23,77	31,27	39,41	48,15	57,44	67,26	77,57	88,35	-	-	-	-	-	-	-	-	-	20,72	21,66	18,83	18,08
Ø16	20	-	26,51	37,11	48,81	61,53	75,17	89,68	105,01	121,10	137,93	173,65	211,96	-	-	-	-	-	-	-	55,28	57,79	50,25	48,24
		-	17,68	24,74	32,54	41,02	50,11	59,79	70,00	80,73	91,95	115,77	141,30	-	-	-	-	-	-	-	36,85	38,53	33,50	32,16
Ø20	25	-	-	38,30	50,38	63,51	77,59	92,57	108,38	124,99	142,36	179,22	218,75	260,76	305,09	-	-	-	-	-	86,35	90,28	78,50	75,36
		-	-	25,53	33,59	42,34	51,73	61,71	72,26	83,33	94,91	119,48	145,83	173,84	203,39	-	-	-	-	-	57,57	60,18	52,33	50,24
Ø25	32	-	-	39,56	52,04	65,59	80,14	95,61	111,94	129,09	147,03	185,09	225,90	269,27	315,03	375,43	439,15	-	-	-	135,03	141,16	122,75	117,84
		-	-	26,37	34,69	43,73	53,43	63,74	74,63	86,06	98,02	123,39	150,60	179,51	210,02	250,28	292,77	-	-	-	90,02	94,11	81,83	78,56
Ø32	40	-	-	-	-	68,03	83,12	99,16	116,10	133,89	152,48	191,95	234,26	279,21	326,65	389,25	455,29	524,60	597,01	657,07	221,10	231,15	201,00	192,96
		-	-	-	-	45,36	55,41	66,11	77,40	89,26	101,65	127,96	156,17	186,14	217,77	259,50	303,53	349,73	398,01	438,05	147,40	154,10	134,00	128,64

Data for a single anchor without influence of distance or effects of spacing between the anchors.
As the spacing and distance from the edge decreases, the values given should be multiplied by reduction coefficients from tables 7 and 9.

Characteristic values Design values

TABLE 4B Loading resistances for tension on cracked concrete - rebars in accordance with TR029

Rod size	Hole diameter [mm]	Loading resistance of individual connectors installed into cracked concrete C20/25 maintaining basic installation conditions - characteristic and designed values																						
		Minimal value of {pull-out failure - $N_{R,p}$ [kN] ; concrete cone failure - $N_{R,c}$ [kN]}																			Steel failure - $N_{R,s}$ [kN]			
		Safety factor - γ_{Mc} = 1,8																			γ_{Ms} =1,4	γ_{Ms} =1,4	γ_{Ms} =1,46	γ_{Ms} =1,62
		Embedment depth h_{ef} [mm]																			Steel grade			
		60	80	100	120	140	160	180	200	220	240	280	320	360	400	450	500	550	600	640	BSt 500 S	B 500 SP	34 GS	18 G2
Ø8	12	10,56	14,07	17,59	21,11	24,63	28,15	-	-	-	-	-	-	-	-	-	-	-	-	-	27,67	28,92	25,15	24,14
		5,86	7,82	9,77	11,73	13,68	15,64	-	-	-	-	-	-	-	-	-	-	-	-	-	19,76	20,66	17,19	14,88
Ø10	14	16,73	25,13	31,42	37,70	43,98	50,27	56,55	62,83	-	-	-	-	-	-	-	-	-	-	-	43,18	45,14	39,25	37,68
		9,30	13,96	17,45	20,94	24,43	27,93	31,42	34,91	-	-	-	-	-	-	-	-	-	-	-	30,84	32,24	26,82	23,22
Ø12	16	-	25,76	33,93	40,72	47,50	54,29	61,07	67,86	74,64	81,43	-	-	-	-	-	-	-	-	-	62,15	64,98	56,50	54,24
		-	14,31	18,85	22,62	26,39	30,16	33,93	37,70	41,47	45,24	-	-	-	-	-	-	-	-	-	44,39	46,41	38,61	33,43
Ø16	20	-	25,76	36,00	47,32	59,63	72,38	81,43	90,48	99,53	108,57	126,67	144,76	-	-	-	-	-	-	-	110,55	115,58	100,50	96,48
		-	14,31	20,00	26,29	33,13	40,21	45,24	50,27	55,29	60,32	70,37	80,42	-	-	-	-	-	-	-	78,96	82,55	68,68	59,46
Ø20	25	-	-	36,00	47,32	59,63	72,86	86,94	100,53	110,58	120,64	140,74	160,85	180,96	201,06	-	-	-	-	-	172,70	180,55	157,00	150,72
		-	-	20,00	26,29	33,13	40,48	48,30	55,85	61,44	67,02	78,19	89,36	100,53	111,70	-	-	-	-	-	123,36	128,96	107,28	92,89
Ø25	32	-	-	36,00	47,32	59,63	72,86	86,94	101,82	117,47	133,85	168,67	201,06	226,19	251,33	282,74	314,16	-	-	-	270,05	282,33	245,50	235,68
		-	-	20,00	26,29	33,13	40,48	48,30	56,57	65,26	74,36	93,71	111,70	125,66	139,63	157,08	174,53	-	-	-	192,89	201,66	167,76	145,25
Ø32	40	-	-	-	-	59,63	72,86	86,94	100,53	110,58	120,64	140,74	160,85	180,96	201,06	226,19	251,33	276,46	301,59	321,70	442,20	462,30	402,00	385,92
		-	-	-	-	33,13	40,48	48,30	55,85	61,44	67,02	78,19	89,36	100,53	111,70	125,66	139,63	153,59	167,55	178,72	315,86	330,21	274,70	237,85

Data for a single anchor without accounting for distance from the edge or effects of spacing between centres of the anchors.
As the spacing and distance decreases, the values given should be multiplied by reduction coefficients from tables 7 and 8

Characteristic values Design values

WCF-E3

Epoxide injection anchor - for heaviest loads for use with cracked and non-cracked concrete zones; without styrene

WCF-E3

Epoxide injection anchor - for heaviest loads for use with cracked and non-cracked concrete zones; without styrene

TABLE 5B Loading resistance for shearing in cracked concrete - rebars in accordance with TR029

Rod size	Hole diameter [mm]	Carrying capacity of individual connectors installed into cracked concrete C20/25 affected by cutting force maintaining basic installation conditions - specific values and calculated values																						
		Minimal value of {pry-out - $V_{R,p}$ [kN] ; concrete edge failure - $V_{R,c}$ [kN]}																			Steel wear - $V_{R,s}$ [kN]			
		Safety factor - γ_{Mc} = 1,5																			γ_{Ms}=1,5	γ_{Ms}=1,5	γ_{Ms}=1,5	γ_{Ms}=1,5
		Embedment depth h_{ef} [mm]																			Steel grade			
		60	80	100	120	140	160	180	200	220	240	280	320	360	400	450	500	550	600	640	BSt 500 S	B 500 SP	34 GS	18 G2
Ø8	12	11,07	17,09	23,91	31,45	39,64	48,43	-	-	-	-	-	-	-	-	-	-	-	-	-	13,83	14,46	12,58	12,07
		7,38	11,39	15,94	20,97	26,43	32,29	-	-	-	-	-	-	-	-	-	-	-	-	-	9,22	9,64	8,38	8,05
Ø10	14	11,40	17,60	24,64	32,41	40,84	49,90	59,54	69,71	-	-	-	-	-	-	-	-	-	-	-	21,59	22,57	19,63	18,84
		7,60	11,74	16,42	21,60	27,23	33,27	39,69	46,47	-	-	-	-	-	-	-	-	-	-	-	14,39	15,05	13,08	12,56
Ø12	16	-	18,05	25,26	33,22	41,87	51,16	61,03	71,46	82,42	93,87	-	-	-	-	-	-	-	-	-	31,08	32,49	28,25	27,12
		-	12,03	16,84	22,15	27,92	34,11	40,69	47,64	54,95	62,58	-	-	-	-	-	-	-	-	-	20,72	21,66	18,83	18,08
Ø16	20	-	18,78	26,28	34,58	43,58	53,25	63,52	74,38	85,78	97,70	123,00	150,13	-	-	-	-	-	-	-	55,28	57,79	50,25	48,24
		-	12,52	17,52	23,05	29,05	35,50	42,35	49,59	57,19	65,13	82,00	100,09	-	-	-	-	-	-	-	36,85	38,53	33,50	32,16
Ø20	25	-	-	27,13	35,69	44,99	54,96	65,57	76,77	88,54	100,84	126,95	154,95	184,70	216,11	-	-	-	-	-	86,35	90,28	78,50	75,36
		-	-	18,09	23,79	29,99	36,64	43,71	51,18	59,03	67,23	84,63	103,30	123,13	144,07	-	-	-	-	-	57,57	60,18	52,33	50,24
Ø25	32	-	-	28,02	36,86	46,46	56,77	67,72	79,29	91,44	104,14	131,11	160,01	190,73	223,15	265,93	311,07	-	-	-	135,03	141,16	122,75	117,84
		-	-	18,68	24,57	30,98	37,84	45,15	52,86	60,96	69,43	87,40	106,67	127,15	148,77	177,28	207,38	-	-	-	90,02	94,11	81,83	78,56
Ø32	40	-	-	-	-	48,19	58,88	70,24	82,24	94,84	108,01	135,96	165,93	197,77	231,38	275,72	322,50	371,59	422,88	465,43	221,10	231,15	201,00	192,96
		-	-	-	-	32,13	39,25	46,83	54,82	63,22	72,00	90,64	110,62	131,85	154,25	183,81	215,00	247,73	281,92	310,29	147,40	154,10	134,00	128,64

Data for a single anchor without influence of distance or effects of spacing between the anchors.
As the spacing and distance from the edge decreases, the values given should be multiplied by reduction coefficients from tables 7 and 9.

Characteristic values Design values

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Epoxide injection anchor - for heaviest loads for use with cracked and non-cracked concrete zones; without styrene

TABLE 6. Base installation conditions allowing for maintaining loading resistances from tables 4AB - 5AB

Parameter	Rod size	Formula	Embedment depth h_{ef} [mm]																		
			60	80	100	120	140	160	180	200	220	240	280	320	360	400	440	480	540	600	640
Distance from the edge - c[mm]	Ø8-Ø32	c=1,5*hef	90	120	150	180	210	240	270	300	330	360	420	480	540	600	660	720	810	900	960
Anchor spacing - s[mm]	Ø8-Ø32	s=3*hef	180	240	300	360	420	480	540	600	660	720	840	960	1080	1200	1320	1440	1620	1800	1920

TABLE 7. Reduction factors for tension and shearing - effects of anchor spacing, "s"

Effects of anchor spacing (reduction coefficient) - $\Psi_{sn,v}$																										
s/h_{ef}	0,5	0,6	0,7	0,8	0,9	1	1,1	1,2	1,3	1,4	1,5	1,6	1,7	1,8	1,9	2	2,1	2,2	2,3	2,4	2,5	2,6	2,7	2,8	2,9	≥3
Ø8-Ø32	0,58	0,6	0,62	0,63	0,65	0,67	0,68	0,7	0,72	0,73	0,75	0,77	0,78	0,8	0,82	0,83	0,85	0,87	0,88	0,9	0,92	0,93	0,95	0,97	0,98	1

Spacing between anchors cannot be lower than 0.5 of embedment depth (h_{ef})

$0,5\ h_{ef} < s < 3\ h_{ef}$	Ø8-Ø32

TABLE 8. Reduction factors for tension - effects of distance from the edge "c"

Effects of anchor distance from the edge (reduction coefficient) - $\Psi_{sn,v}$											
c/h_{ef}	0,5	0,6	0,7	0,8	0,9	1	1,1	1,2	1,3	1,4	≥1,5
Ø8-Ø32	0,53	0,57	0,62	0,67	0,71	0,76	0,81	0,85	0,90	0,95	1,00

Distance from the edge cannot be lower than 0,5 of embedment depth (h_{ef})

$0,5\ h_{ef} < c < 1,5\ h_{ef}$	M8-M30

TABLE 9. Reduction factors for shearing - effects of distance from the edge "c"

Effects of anchor distance from the edge (reduction coefficient) - Ψ_{cv}																										
c/h_{ef}	0,5	0,6	0,7	0,8	0,9	1,0	1,1	1,2	1,3	1,4	1,5	1,6	1,7	1,8	1,9	2,0	2,1	2,2	2,3	2,4	2,5	2,6	2,7	2,8	2,9	≥3,0
Ø8-Ø32	0,23	0,29	0,36	0,43	0,50	0,58	0,66	0,74	0,82	0,91	1,00	1,09	1,19	1,28	1,38	1,48	1,59	1,69	1,80	1,91	2,02	2,13	2,25	2,36	2,48	2,60

Distance from the edge cannot be lower than 0,5 of embedment depth (h_{ef})

$0,5\ h_{ef} < c < 1,5\ h_{ef}$	M8-M30

TABLE 10. Consumption - rebars

Rod size	Hole diameter [mm]	Estimated number of anchors made from one cartridge 585ml																		
		Embedment depth h_{ef} [mm]																		
		60	80	100	120	140	160	180	200	220	240	280	320	360	400	450	500	550	600	640
Ø8	12	115	86	69	57	49	43	-	-	-	-	-	-	-	-	-	-	-	-	-
Ø10	14	84	63	51	42	36	32	28	25	-	-	-	-	-	-	-	-	-	-	-
Ø12	16	-	48	39	32	28	24	22	19	18	16	-	-	-	-	-	-	-	-	-
Ø16	20	-	31	25	21	18	16	14	12	11	10	9	8	-	-	-	-	-	-	-
Ø20	25	-	-	16	13	11	10	9	8	7	7	6	5	4	4	-	-	-	-	-
Ø25	32	-	-	10	8	7	6	5	5	4	4	3	3	3	2	2	2	-	-	-
Ø32	40	-	-	-	-	4	4	3	3	3	3	2	2	2	2	1	1	1	1	1

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Epoxide injection anchor - for heaviest loads for use with cracked and non-cracked concrete zones; without styrene

TABLE 1 Ordering list

	Code	[°C]	Pcs.
585ml	WCF-E3-585	5 ÷ 40	12

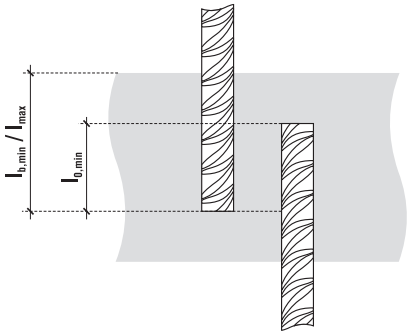


TABLE 2 Installation parameters - post install rebar connection

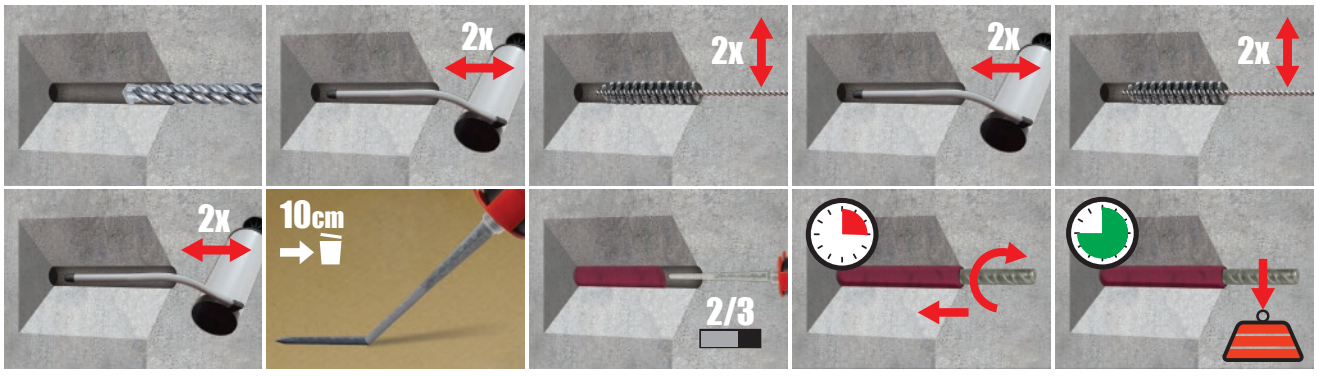
Parameters			BAR SIZE								
			Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
Rebar diameter	d	[mm]	8	10	12	14	16	20	25	28	32
Hole diameter	d_0	[mm]	12	14	16	18	20	25	32	35	40
Min. embedment depth - C20/25	$l_{b,min}$	[mm]	113	142	170	198	227	284	354	397	454
Min. embedment depth - C50/60	$l_{b,min}$	[mm]	100	100	120	140	160	200	250	280	320
Min. anchorage length for overlapping	$l_{0,min}$	[mm]	200	200	200	210	240	300	375	420	480
Max. embedment depth	l_{max}	[mm]	400	500	600	700	800	1000	1000	1000	1000

Values have been calculated for good bonding conditions and α_6=1.0
Min. embedment depth for rebar as an anchor: $l_{b,min}$=max(0,3*$l_{b,rqd}$;10*d;100 mm)
Min. anchorage length for overlapping: $l_{0,min}$=max(0,3*α_6*$l_{b,rqd}$;15*d;200 mm)

TABLE 3 Curing time (post install rebar connections)

Substrate temp [°C]	5	5 ÷ 10	10 ÷ 15	15 ÷ 20	20 ÷ 25	25 ÷ 30	30 ÷ 35	35 ÷ 40
Working time [min.]	300	150	40	25	18	12	8	6
Hardening time [h]	24	24	18	12	8	6	4	2

Setting instruction



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Epoxide injection anchor - for heaviest loads for use with cracked and non-cracked concrete zones; without styrene

TABLE 4 Ultimate limit for resin-concrete connection f_{bd} (hammering drilling)

Bond stress limit f_{bd} [N/mm²]									
Bar size	Concrete class								
	C12/15	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
Ø8	1.6	2.0	2.3	2.7	3.0	3.4	3.7	4.0	4.3
Ø10	1.6	2.0	2.3	2.7	3.0	3.4	3.7	4.0	4.3
Ø12	1.6	2.0	2.3	2.7	3.0	3.4	3.7	4.0	4.3
Ø14	1.6	2.0	2.3	2.7	3.0	3.4	3.7	4.0	4.3
Ø16	1.6	2.0	2.3	2.7	3.0	3.4	3.7	4.0	4.3
Ø20	1.6	2.0	2.3	2.7	3.0	3.4	3.7	4.0	4.3
Ø25	1.6	2.0	2.3	2.7	3.0	3.4	3.7	4.0	4.3
Ø28	1.6	2.0	2.3	2.7	3.0	3.4	3.7	4.0	4.3
Ø32	1.6	2.0	2.3	2.7	3.0	3.4	3.7	3.7	3.7

Values provided in this table are correct only for good installation conditions outlined in accordance with EN 1992-1-1. For all other conditions, these values are multiplied by 0.7.
Minimum cover: c_{min}=30 mm+0,06*lv≥2*d Minimal installed rebar spacing: a=40 mm≥4*d

TABLE 5A. Post installed rebar connections in accordance with TR023/EC2 - Design loading resistances for tension [kN] - for anchoring bars in concrete C20/25

Bar size	C20/25 concrete																				Steel
	Anchorage length l_b [mm]																				BSt 500 S
	110	140	170	200	230	280	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	γ_{Ms}=1.15
Ø8	6.36	8.09	9.83	11.56	13.30	16.19	20.23	21.87	-		-	-	-	-	-	-	-	-	-	-	21.87
Ø10	-	10.12	12.28	14.45	16.62	20.23	25.29	28.90	32.52	34.13	-	-	-	-	-	-	-	-	-	-	34.13
Ø12	-	-	14.74	17.34	19.94	24.28	30.35	34.68	39.02	43.35	47.69	49.13	-	-	-	-	-	-	-	-	49.13
Ø14	-	-	-	20.23	23.27	28.32	35.41	40.46	45.52	50.58	55.64	60.70	65.75	66.96	-	-	-	-	-	-	66.96
Ø16	-	-	-	-	26.59	32.37	40.46	46.24	52.02	57.81	63.59	69.37	75.15	80.93	86.71	87.39	-	-	-	-	87.39
Ø20	-	-	-	-	-	40.46	50.58	57.81	65.03	72.26	79.48	86.71	93.93	101.16	108.38	115.61	122.84	130.06	136.52	-	136.52
Ø25	-	-	-	-	-	-	63.22	72.26	81.29	90.32	99.35	108.38	117.42	126.45	135.48	144.51	153.55	162.58	171.61	180.64	213.48
Ø28	-	-	-	-	-	-	-	80.93	91.04	101.16	111.28	121.39	131.51	141.62	151.74	161.85	171.97	182.09	192.20	202.32	267.72
Ø32	-	-	-	-	-	-	-	-	104.05	115.61	127.17	138.73	150.29	161.85	173.42	184.98	196.54	208.10	219.66	231.22	349.57

Values provided for good bonding conditions in accordance with EN 1992-1-1 and for α1-α5=1. For other anchoring conditions the values provided should be multiplied by 0.7

TABLE 5B. Post installed rebar connections in accordance with TR023/EC2 - Design loading resistances for tension [kN] - for anchoring bars in concrete C50/60

Bar size	C50/60 concrete																				Steel
	Anchorage length l_b [mm]																				BSt 500 S
	100	120	140	160	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	γ_{Ms}=1.15
Ø8	10.81	12.97	15.13	17.29	21.61	21.87	-	-	-		-	-	-	-	-	-	-	-	-	-	21.87
Ø10	13.51	16.21	18.91	21.61	27.02	33.77	34.13	-	-	-	-	-	-	-	-	-	-	-	-	-	34.13
Ø12	-	19.45	22.69	25.94	32.42	40.53	45.39	49.13	-	-	-	-	-	-	-	-	-	-	-	-	49.13
Ø14	-	-	26.48	30.26	37.82	47.28	52.95	60.52	66.96	-	-	-	-	-	-	-	-	-	-	-	66.96
Ø16	-	-	-	34.58	43.23	54.04	60.52	69.17	86.46	87.39	-	-	-	-	-	-	-	-	-	-	87.39
Ø20	-	-	-	-	54.04	67.54	75.65	86.46	108.07	121.58	135.09	136.52	-	-	-	-	-	-	-	-	136.52
Ø25	-	-	-	-	-	84.43	94.56	108.07	135.09	151.97	168.86	185.75	202.63	213.48	-	-	-	-	-	-	213.48
Ø28	-	-	-	-	-	-	105.91	121.04	151.30	170.21	189.12	208.04	226.95	245.86	264.77	267.72	-	-	-	-	267.72
Ø32	-	-	-	-	-	-	-	119.03	148.79	167.38	185.98	204.58	223.18	241.78	260.38	278.97	297.57	316.17	334.77	349.57	349.57

Values provided for good bonding conditions in accordance with EN 1992-1-1 and for α1-α5=1. For other anchoring conditions the values provided should be multiplied by 0.7

WCF-E3

Epoxide injection anchor - for heaviest loads for use with cracked and non-cracked concrete zones; without styrene

TABLE 6A. Post install rebar connections in accordance with TR023/EC2 - Design loading resistances for tension [kN] - for overlapping bars in concrete C20/25

Bar size	C20/25 concrete																				Steel
	Lap length l_b [mm]																				BSt 500 S
	200	210	240	270	300	375	400	420	480	500	550	600	650	700	750	800	850	900	950	1000	γ_{Ms}=1.15
Ø8	11.56	12.14	13.87	15.61	17.34	21.68	21.87	-	-	-	-	-	-	-	-	-	-	-	-	-	21.87
Ø10	14.45	15.17	17.34	19.51	21.68	27.10	28.90	30.35	34.13	-	-	-	-	-	-	-	-	-	-	-	34.13
Ø12	17.34	18.21	20.81	23.41	26.01	32.52	34.68	36.42	41.62	43.35	47.69	49.13	-	-	-	-	-	-	-	-	49.13
Ø14	-	21.24	24.28	27.31	30.35	37.93	40.46	42.49	48.56	50.58	55.64	60.70	65.75	66.96	-	-	-	-	-	-	66.96
Ø16	-	-	27.75	31.21	34.68	43.35	46.24	48.56	55.49	57.81	63.59	69.37	75.15	80.93	86.71	87.39	-	-	-	-	87.39
Ø20	-	-	-	-	43.35	54.19	57.81	60.70	69.37	72.26	79.48	86.71	93.93	101.16	108.38	115.61	122.84	130.06	136.52	-	136.52
Ø25	-	-	-	-	-	67.74	72.26	75.87	86.71	90.32	99.35	108.38	117.42	126.45	135.48	144.51	153.55	162.58	171.61	180.64	213.48
Ø28	-	-	-	-	-	-	-	84.97	97.11	101.16	111.28	121.39	131.51	141.62	151.74	161.85	171.97	182.09	192.20	202.32	267.72
Ø32	-	-	-	-	-	-	-	-	110.99	115.61	127.17	138.73	150.29	161.85	173.42	184.98	196.54	208.10	219.66	231.22	349.57

Values provided for good bonding conditions in accordance with EN 1992-1-1 and for α1-α5=1. For other anchoring conditions the values provided should be multiplied by 0.7

TABLE 6B. Post install rebar connections in accordance with TR023/EC2 - Design loading resistances for tension [kN] - for overlapping bars in concrete C50/60

Bar size	C50/60 concrete																				Steel
	Lap length l_b [mm]																				BSt 500 S
	200	210	240	270	300	350	375	400	420	480	500	550	600	650	700	750	800	850	900	950	γ_{Ms}= 1.15
Ø8	21.61	21.87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21.87
Ø10	27.02	28.37	32.42	34.13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34.13
Ø12	32.42	34.04	38.91	43.77	48.63	49.13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49.13
Ø14	-	39.72	45.39	51.06	56.74	66.19	66.96	-	-	-	-	-	-	-	-	-	-	-	-	-	66.96
Ø16	-	-	51.87	58.36	64.84	75.65	81.05	86.46	87.39	-	-	-	-	-	-	-	-	-	-	-	87.39
Ø20	-	-	-	-	81.05	94.56	101.32	108.07	113.47	129.68	135.09	136.52	-	-	-	-	-	-	-	-	136.52
Ø25	-	-	-	-	-	-	126.65	135.09	141.84	162.11	168.86	185.75	202.63	213.48	-	-	-	-	-	-	213.48
Ø28	-	-	-	-	-	-	-	-	158.86	181.56	189.12	208.04	226.95	245.86	264.77	267.72	-	-	-	-	267.72
Ø32	-	-	-	-	-	-	-	-	-	178.54	185.98	204.58	223.18	241.78	260.38	278.97	297.57	316.17	334.77	349.57	349.57

Values provided for good bonding conditions in accordance with EN 1992-1-1 and for α1-α5=1. For other anchoring conditions the values provided should be multiplied by 0.7

TABLE 7 Consumption - post installed rebar connections

Bar size	Hole diameter [mm]	Estimated number of anchors made from one cartridge 585ml																							
		Embedment depth h_{ef}[mm]																							
		100	120	140	160	200	250	280	300	320	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
Ø8	12	78	65	55	49	39	31	28	26	24	22	19	-	-	-	-	-	-	-	-	-	-	-	-
Ø10	14	65	54	46	40	32	26	23	22	20	18	16	14	13	-	-	-	-	-	-	-	-	-	-
Ø12	16	-	46	40	35	28	22	20	18	17	16	14	12	11	10	9	-	-	-	-	-	-	-	-
Ø14	18	-	-	35	30	24	19	17	16	15	14	12	11	10	9	8	7	7	-	-	-	-	-	-
Ø16	20	-	-	-	27	22	17	15	14	13	12	11	10	9	8	7	7	6	6	5	-	-	-	-
Ø20	25	-	-	-	-	14	11	10	9	9	8	7	6	6	5	5	4	4	4	3	3	3	3	-
Ø25	32	-	-	-	-	-	6	6	5	5	4	4	3	3	3	3	2	2	2	2	2	2	2	2
Ø28	35	-	-	-	-	-	-	5	5	4	4	4	3	3	3	2	2	2	2	2	2	2	1	1
Ø32	40	-	-	-	-	-	-	-	-	3	3	3	2	2	2	2	2	2	1	1	1	1	1	1