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TECHNICAL DATASHEET

Gebofix EPO PLUS RE high performance epoxy chemical anchor

Certificates

ETA 17/0347 Certification Option 1 for anchoring of threaded bars and reinforcing bars on non-cracked and cracked concrete. Performance category C2 for seismic actions, threaded bars M12, M16, M20
ETA 17/0368 Certification for reinforcing bars, design according to Eurocode 2 (EN 1992-1-1)
Class A+ for emission of volatile organic compounds (VOCs) in living spaces

Base material

certified use	specific use
non-cracked concrete cracked concrete	natural stone solid, perforated and hollow masonry wood

Sizes

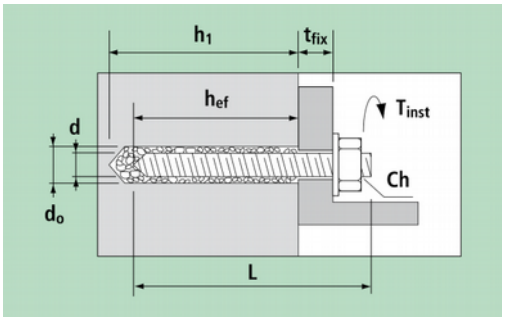
art.	content	mixer	gun
CCPE585	585 ml	03064	CP19
CCPE385	385 ml	03064	CP18, CP19

Intended use

Dry or wet concrete
Flooded holes on concrete
Installation temperature: between +5 and +40 °C
Work temperature: I between -40 and +40 °C (maximum short term temperature +40 °C; long term +24 °C)
II between -40 and +60 °C (maximum short term temperature +60 °C; long term +43 °C)
II between -40 and +72 °C (maximum short term temperature +72 °C; long term +43 °C)
Shelf life: 24 months (storage temperature between +5 and +25 °C)

Time and temperatures

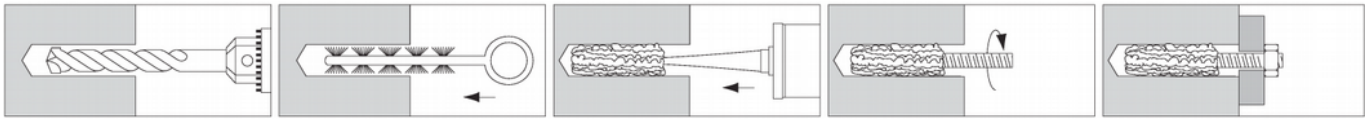
temperature of base material	working time	full curing dry base material	full curing wet base material
+5 ÷ +9 °C	120 min	50 h	100 h
+10 ÷ +14 °C	45 min	30 h	60 h
+15 ÷ +19 °C	25 min	18 h	36 h
+20 ÷ +29 °C	12 min	10 h	20 h
+30 ÷ +39 °C	6 min	6 h	12 h
+40 °C	5 min	4 h	8 h



d = bar diameter
L = bar length
t_{fix} = fixable thickness
d_0 = hole diameter
h_1 = minimum hole depth
h_{nom} = setting depth
h_{ef} = effective anchorage depth
d_f = diameter of clearance hole in fixture
T_{inst} = tightening torque

$h_{ef} = h_1 = h_{nom}$

Installation



- **Use on non-cracked and cracked concrete with threaded bars**

Setting parameters

bar size		**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
hole diameter	d_0 mm	10	12	14	18	22	26	30	35
hole depth = effective anchorage depth	$h_{ef,min}$ mm	60	60	70	80	90	96	108	120
	$h_{ef,max}$ mm	160	200	240	320	400	480	540	600
diameter of clearance hole in fixture	d_f (mm)	9	12	14	18	22	26	30	33
minimum spacing	s_{min} mm	$\max(h_{ef} / 2; 5d)$							
minimum edge distance	c_{min} mm	$\max(h_{ef} / 2; 5d)$							
min. base material thickness	h_{min} mm	$h_{ef} + 30 \geq 100$			$h_{ef} + 2d_0$				
tightening torque	T_{inst} Nm	10	20	40	80	120	160	180	200

Strength data

For installation on dry or wet concrete and work temperature I (minimum temperature -40 °C, maximum short term temperature +40 °C; long term +24 °C)
Valid for a single anchor far from the edges, on a thick concrete member of class C20/25 with sparse reinforcing.

○ Threaded bars on non-cracked concrete

Characteristic resistance of resin
at standard embedment depth

bar size		**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
embedment depth	h_{ef} (mm)	**80**	**90**	**110**	**125**	**170**	**210**	**240**	**270**
tension	$N_{Rk,p}$ (kN)	30.2	42.4	58.3	70.6	111.9	153.7	187.8	224.0

Design resistance
at standard embedment depth, for threaded bars in steel class 5.8 and 8.8

bar size		**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
embedment depth	h_{ef} (mm)	**80**	**90**	**110**	**125**	**170**	**210**	**240**	**270**
tension	N_{Rd} (kN)	12.0 19.3	19.3 28.3	28.0 38.8	47.1	74.6	102.5	125.2	149.4
shear	V_{Rd} (kN)	7.2 12.0	12.0 18.4	16.8 27.2	31.2 50.4	48.8 78.4	70.4 112.8	92.0 147.2	112.0 179.2

Recommended load
at standard embedment depth, for threaded bars in steel class 5.8 and 8.8

bar size		**M8**	**M10**	**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
embedment depth	h_{ef} (mm)	**80**	**90**	**110**	**125**	**170**	**210**	**240**	**270**
tension	N_{rec} (kN)	8.6 13.8	13.8 20.2	20.0 27.7	33.6	53.3	73.2	89.4	106.7
shear	V_{rec} (kN)	5.1 8.6	8.6 13.1	12.0 19.4	22.3 36.0	34.9 56.0	50.3 80.6	65.7 105.1	80.0 128.0

1 kN ≈ 100 kg
steel failure class 5.8 – steel failure class 8.8

○ Threaded bars on cracked concrete

Characteristic resistance of resin
at standard embedment depth

bar size		**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
embedment depth	h_{ef} (mm)	**110**	**125**	**170**	**210**	**240**	**270**
tension	$N_{Rk,p}$ (kN)	31.1	40.8	64.1	87.1	112.0	140.0

Design resistance
at standard embedment depth, for threaded bars in steel class 5.8 and 8.8

bar size		**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
embedment depth	h_{ef} (mm)	**110**	**125**	**170**	**210**	**240**	**270**
tension	N_{Rd} (kN)	20.7	27.2	42.7	58.1	74.6	93.3
shear	V_{Rd} (kN)	16.8 27.2	31.2 50.4	48.8 78.4	70.4 112.8	92.0 147.2	112.0 179.2

Recommended load (kN)
at standard embedment depth, for threaded bars in steel class 5.8 and 8.8

bar size		**M12**	**M16**	**M20**	**M24**	**M27**	**M30**
embedment depth	h_{ef} (mm)	**110**	**125**	**170**	**210**	**240**	**270**
tension	N_{rec} (kN)	14.8	19.4	30.5	41.5	53.3	66.6
shear	V_{rec} (kN)	12.0 19.4	22.3 36.0	34.9 56.0	50.3 80.6	65.7 105.1	80.0 128.0

1 kN ≈ 100 kg
steel failure class 5.8 – steel failure class 8.8

- **Use on non-cracked and cracked concrete with reinforcing bars** (used as anchors)

Setting parameters

bar size		**Ø8**	**Ø10**	**Ø12**	**Ø16**	**Ø20**	**Ø25**	**Ø32**
hole diameter	d_0 mm	12	14	16	20	25	32	40
hole depth = effective anchorage depth	$h_{ef,min}$ mm	60	60	70	80	90	100	128
	$h_{ef,max}$ mm	160	200	240	320	400	500	640
minimum spacing	s_{min} mm	$\max(h_{ef} / 2; 40)$				$\max(h_{ef} / 2; 50)$		$\max(h_{ef} / 2; 70)$
minimum edge distance	c_{min} mm	$\max(h_{ef} / 2; 40)$				$\max(h_{ef} / 2; 50)$		$\max(h_{ef} / 2; 70)$
min. base material thickness	h_{min} mm	$h_{ef} + 30 \geq 100$			$h_{ef} + 2d_0$			

Strength data

For installation on dry or wet concrete and work temperature I (minimum temperature -40 °C, maximum short term temperature +40 °C; long term +24 °C)
Valid for a single anchor far from the edges, on a thick concrete member of class C20/25 with sparse reinforcing.

- **Reinforcing bars on non-cracked concrete**

Characteristic resistance of resin
at standard embedment depth

bar size		**Ø8**	**Ø10**	**Ø12**	**Ø16**	**Ø20**	**Ø25**	**Ø32**
embedment depth	h_{ef} (mm)	**80**	**90**	**110**	**145**	**170**	**210**	**300**
tension	$N_{Rk,p}$ (kN)	26.1	36.8	53.9	87.5	111.9	153.7	241.3

Design resistance
at standard embedment depth, for reinforcing bars with f_{uk} = 550 N/mm²

bar size		**Ø8**	**Ø10**	**Ø12**	**Ø16**	**Ø20**	**Ø25**	**Ø32**
embedment depth	h_{ef} (mm)	**80**	**90**	**110**	**145**	**170**	**210**	**300**
tension	N_{Rd} (kN)	17.4	24.5	35.9	58.3	74.6	102.5	160.8
shear	V_{Rd} (kN)	9.2	14.4	20.7	36.9	57.6	90.0	147.4

Recommended load
at standard embedment depth, for reinforcing bars with f_{uk} = 550 N/mm²

bar size		**Ø8**	**Ø10**	**Ø12**	**Ø16**	**Ø20**	**Ø25**	**Ø32**
embedment depth	h_{ef} (mm)	**80**	**90**	**110**	**145**	**170**	**210**	**300**
tension	N_{rec} (kN)	12.4	17.5	25.7	41.6	53.3	73.2	114.9
shear	V_{rec} (kN)	6.6	10.3	14.8	26.3	41.1	64.3	105.3

1 kN ≈ 100 kg
steel failure

○ Reinforcing bars on cracked concrete

Characteristic resistance of resin
at standard embedment depth

bar size		**Ø12**	**Ø16**	**Ø20**	**Ø25**	**Ø32**
embedment depth	h_{ef} (mm)	**110**	**145**	**170**	**210**	**300**
tension	$N_{Rk,p}$ (kN)	31.1	47.4	64.1	90.7	165.9

Design resistance
at standard embedment depth, for reinforcing bars with f_{uk} = 550 N/mm²

bar size		**Ø12**	**Ø16**	**Ø20**	**Ø25**	**Ø32**
embedment depth	h_{ef} (mm)	**110**	**145**	**170**	**210**	**300**
tension	N_{Rd} (kN)	20.7	31.6	42.7	60.5	110.6
shear	V_{Rd} (kN)	20.7	36.9	57.6	90.0	147.4

Recommended load
at standard embedment depth, for reinforcing bars with f_{uk} = 550 N/mm²

bar size		**Ø12**	**Ø16**	**Ø20**	**Ø25**	**Ø32**
embedment depth	h_{ef} (mm)	**110**	**145**	**170**	**210**	**300**
tension	N_{rec} (kN)	14.8	22.6	30.5	43.2	79.0
shear	V_{rec} (kN)	14.8	26.3	41.1	64.3	105.3

1 kN ≈ 100 kg
steel failure

Load values derive from parameters certified in European Technical Assessment ETA 17/0347. Characteristic resistance N_{Rk} refers uniquely to the resin resistance to failure due to pull-out and concrete cone. Design resistances N_{Rd} and V_{Rd} refer to all failure modes and include partial safety factors on strengths. Recommended loads N_{rec} and V_{rec} include the further 1.4 safety factor.

For the design of fixing with reduced spacing, near the edge or on concrete with increased resistance, reduced thickness or dense reinforcement refer to ETA 17/0347 or to Declaration of Performance DPGEB1009 and use the design method outlined in EOTA's *Technical Report 029* or in CEN/TS 1992-4-5:2009. In the same way, for anchors installed in flooded holes and for different working temperatures (II, between -40 and +60 °C, and III, between -40 and +72 °C) refer to ETA. One can also calculate and verify the fixings made with Gebofix EPO PLUS RE by means of *G&B Calculation Program* available on the website www.gebfissaggi.com.

Seismic actions

The anchor can be used under seismic actions for performance category C1 and C2, with threaded bars M12, M16, M20.

For the design of strength of anchors under seismic actions refer to ETA 17/0347 or to Declaration of Performance DPGEB1009 and use the design method outlined in EOTA's *Technical Report 045*.