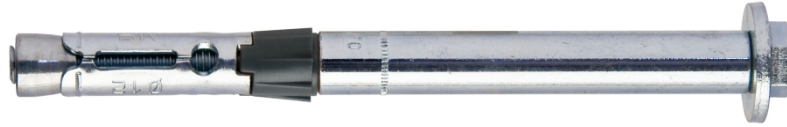


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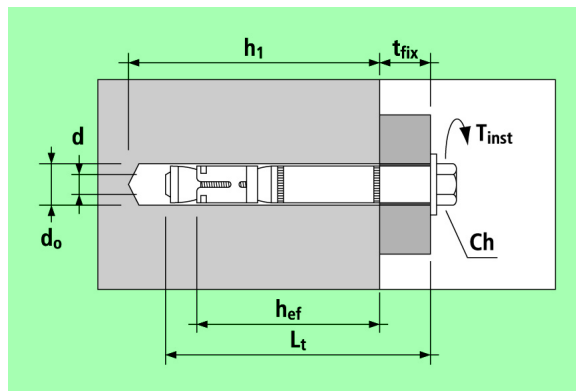


Certificates

ETA-11/0181 Certification according to EAD 330232-00-0601 (former ETAG 001 Parts 1-5) for non-cracked and cracked concrete (Option 1); design category C1 and C2 for seismic actions; Fire Resistance 120 min

Base material

certified use	specific use
non-cracked concrete	natural stone
cracked concrete	



- d_0 = anchor diameter = hole diameter
- L_t = anchor length
- t_{fix} = fixable thickness
- h_1 = minimum hole depth
- h_{nom} = overall embedment depth
- h_{ef} = effective anchorage depth
- d = screw diameter
- L_v = screw length
- d_f = hole diameter in fixture
- Ch = spanner
- T_{inst} = tightening torque

GAMMA Steel Anchor CE 1

hex head bolt, steel class 8.8 and washer



art.	descr.	d_0 mm	L_t mm	d mm	L_v mm	t_{fix} mm	h_1 mm	h_{nom} mm	h_{ef} mm	d_f mm	Ch mm	T_{inst} Nm
44077	HG10/70V	10	70	M6	70	5	80	65	55	12	10	15
44078	HG10/100V		100		35							
44079	HG12/100V	12	100	M8	100	30	90	70	60	14	13	30
44080	HG12/120V		120		50							
44081	HG16/120V	16	120	M10	120	40	100	80	70	18	17	50
44082	HG16/140V		140		60							
44083	HG18/120V	18	120	M12	120	20	120	100	90	20	19	100
44084	HG18/150V		150		50							
44085	HG24/140V	24	140	M16	140	20	140	120	105	26	24	160
44086	HG24/170V		170		50							

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GAMMA Steel Anchor CE 1

countersunk bolt with hex slot, steel class 8.8

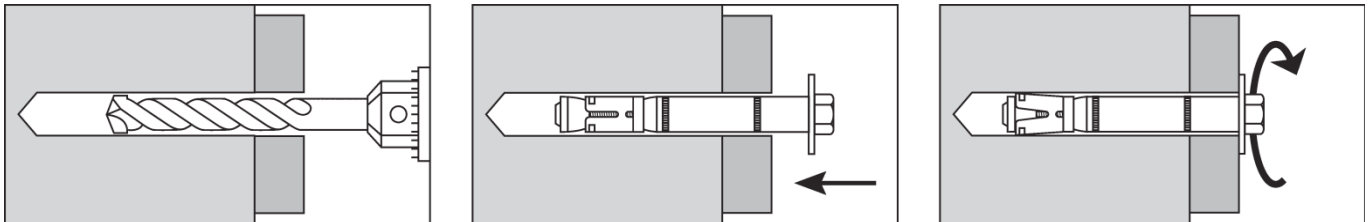


art.	descr.	d ₀ mm	L _t mm	d mm	L _v mm	t _{fix} mm	h ₁ mm	h _{nom} mm	h _{ef} mm	d _f mm	Ch mm	T _{inst} Nm
44112	HG10/85VTS	10	85	M6	85	20	80	65	55	12	4	15
44113	HG10/105VTS		105		105	40						
44114	HG12/105VTS	12	105	M8	105	35	90	70	60	14	5	30
44115	HG12/125VTS		125		125	55						
44116	HG16/110VTS	16	110	M10	110	30	100	80	70	18	6	50
44117	HG16/130VTS		130		130	50						
44118	HG18/120VTS	18	120	M12	120	20	120	100	90	20	8	100
44119	HG18/140VTS		140		140	40						

GAMMA Steel Anchor CE1 is also available on request with threaded bar and nut.

Materials

part	material	coating
cone	steel class 8 EN ISO 898-2	white zinc plating ≥ 5 µm EN ISO 4042
expansion sleeve	steel EN 10130, EN 10111	
distance sleeve	steel EN 10263	
screw	steel class 8.8 ISO 898-1	
countersunk washer	steel EN 10083	
plastic ring	polyamide	-

Installation

Setting parameters

size		M6/Ø10	M8/Ø12	M10/Ø16	M12/Ø18	M16/Ø24
minimum spacing	s _{min} mm	55	110	80	135	130
	c ≥ mm	110	145	120	220	240
minimum edge distance	c _{min} mm	70	100	90	175	180
	s ≥ mm	110	160	175	255	290
minimum thickness of base material	h _{min} mm	110	120	140	180	210

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Strength data

Valid for a single anchor, isolated, far from the edges and from reinforcement bars, on a thick concrete member of class C20/25

o Non-cracked concrete
Characteristic resistance (kN)

size		M6/Ø10	M8/Ø12	M10/Ø16	M12/Ø18	M16/Ø24
tension	N_{Rk}	16.0	16.0	20.0	35.0	45.0
shear	V_{Rk}	16.0	25.0	43.0	58.0	107.0

Design resistance (kN)

size		M6/Ø10	M8/Ø12	M10/Ø16	M12/Ø18	M16/Ø24
tension	N_{Rd}	10.7	10.7	13.3	23.3	30.0
shear	V_{Rd}	11.0	17.2	29.7	40.0	72.4

Recommended load (kN)

size		M6/Ø10	M8/Ø12	M10/Ø16	M12/Ø18	M16/Ø24
tension	N_{rec}	7.6	7.6	9.5	16.7	21.4
shear	V_{rec}	7.9	12.3	21.2	28.6	51.6

 1 kN ≈ 100 kg
 steel failure

o Cracked concrete
Characteristic resistance (kN)

size		M6/Ø10	M8/Ø12	M10/Ø16	M12/Ø18	M16/Ø24
tension	N_{Rk}	5.0	6.0	16.0	25.0	35.0
shear	V_{Rk}	14.7	25.0	42.2	58.0	77.5

Design resistance (kN)

size		M6/Ø10	M8/Ø12	M10/Ø16	M12/Ø18	M16/Ø24
tension	N_{Rd}	3.3	4.0	10.7	16.7	23.3
shear	V_{Rd}	9.8	17.2	28.1	40.0	51.6

Recommended load (kN)

size		M6/Ø10	M8/Ø12	M10/Ø16	M12/Ø18	M16/Ø24
tension	N_{rec}	2.4	2.9	7.6	11.9	16.7
shear	V_{rec}	7.0	12.3	20.1	28.6	36.9

 1 kN ≈ 100 kg
 steel failure

 Characteristic resistances N_{Rk} e V_{Rk} derive from values certified in European Technical Assessment ETA-11/0181. Design resistances N_{Rd} e V_{Rd} include partial safety factors on resistances. Recommended loads N_{rec} e V_{rec} include the further safety factor 1.4.

For the design of anchors with reduced spacing, with reduced edge distance, or for fixing on concrete with higher strength or with reduced thickness, refer to ETA-11/0181 or Declaration of Performances DPGE1002 and use design method outlined in prEN 1992-4 or in CEN/TS 1992-4 or in Annex C of ETAG 001 (issued by EOTA).

For the design of anchors under fire exposure refer to ETA-11/0181 and Technical Report TR 020 issued by EOTA.

Data for design
Critical spacing and distances

size		M6/Ø10	M8/Ø12	M10/Ø16	M12/Ø18	M16/Ø24
critical spacing	$s_{cr,N}$ mm	165	180	210	270	315
	$s_{cr,sp}$ mm	220	320	240	370	390
critical edge distance	$c_{cr,N}$ mm	85	90	105	135	160
	$c_{cr,sp}$ mm	110	160	120	185	195

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Increasing factors for tension resistance (excluding steel failure)

Ψ_c	C30/37	1.22
	C40/50	1.41
	C50/60	1.55

Seismic actions

The anchor can be used under seismic actions, for performance category C1 and for performance category C2.

For the design of strength of anchors under seismic actions refer to ETA-11/0181 and use the design method outlined in EOTA's *Technical Report 045*.