



Extreme pure epoxy anchor X150-PLUS



X CHEMICALS



SYMPAFIX
serious fixings

X150-PLUS

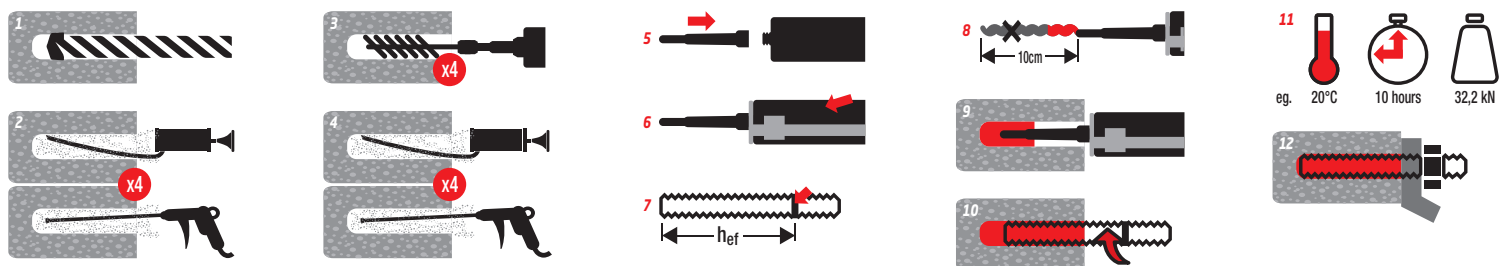
PROPERTIES

- **Seismic category C1** approved
- **ETA option 1 approval** for threaded rods and rebar in cracked and non-cracked concrete
- **ETA approval for post installed rebar**
- **ETA option 7** approval for use in **diamond drilled drill holes**
- Approved for use in **combination with commercially standard threaded rods diameter 8-30 and rebar diameter 8-32**
- Approved for **overhead installation**
- **Pure epoxy** mortar for extreme applications
- Developed for **extreme applications**, f.e. rebar or threaded rods in waterfilled diamond drilled drill holes
- **Approved** for diamond drilled drill holes as well as **waterfilled drill holes**
- **Shrinkage free**

APPROVALS AND TEST REPORTS



INSTALLATION INSTRUCTIONS ACCORDING TO ETA-12/0168



Instructions valid for installation of applications acc. to ETA-12/0168. For different applications, please refer to the relevant ETA certificate

ASSORTMENT OVERVIEW



Extreme pure epoxy resin anchor X150-PLUS

Type	Art. Nr.	QTY	QTY	QTY	ML
X150-PLUS 385ML	71098	1	15	1	385
X150-PLUS 585ML	71100	1	15	1	585
X150-PLUS 1400ML	71102	1	5	1	1400

TECHNICAL DATA

Installation data threaded rods for cracked and non-cracked concrete, ETA-12/0168

		M8	M10	M12	M16	M20	M24	M27	M30
Nominal drill hole diameter Ø	d ₀ (mm)	10	12	14	18	24	28	32	35
Cleaning brush Ø	D min (mm)	12	14	16	20	26	30	34	37
Min. effect. anchorage depth	h _{ef, min} (mm)	60	60	70	80	90	96	108	120
Max. effect. anchorage depth	h _{ef, max} (mm)	96	120	144	192	240	288	324	360
Min. edge distance / spacing	s _{min} / c _{min} (mm)	40	50	60	80	100	120	135	150
Torque moment	T _{inst} (Nm)	10	20	40	80	120	160	180	200
Min. member thickness	h _{min} (mm)	h _{ef} +30mm., ≥100 mm.			h _{ef} + 2d ₀				
Ø diameter of clearance hole in fixture	df (mm) ≤	9	12	14	18	22	26	30	33

serious fixings

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Load values threaded rods for non-cracked concrete, ETA-12/0168, hammereddrilled drill holes

		M8	M10	M12	M16	M20	M24	M27	M30
Min. effect. anchorage depth	h_{ef} , min (mm)	60	60	70	80	90	96	108	120
Dry concrete									
Design value for h_{ef} min, 8.8 steel grade, C20/25	Tension N Rd (kN)	12,6	13,0	16,4	20,0	20,5	22,6	27,0	31,6
Design value for h_{ef} min, 8.8 steel grade, C20/25	Shear V Rd (kN)	12,0	18,4	27,2	48,2	57,5	63,3	75,6	88,5
Waterfilled drill holes									
Design value for h_{ef} min, 8.8 steel grade, C20/25	Tension N Rd (kN)	10,8	11,2	14,1	17,2	20,5	22,6	27,0	31,6
Design value for h_{ef} min, 8.8 steel grade, C20/25	Shear V Rd (kN)	12,0	18,4	27,2	48,2	57,5	63,3	75,6	88,5
Max. effect. anchorage depth	h_{ef} , max (mm)	96	120	144	192	240	288	324	360
Dry concrete									
Design value for h_{ef} max, 8.8 steel grade, C20/25	Tension N Rd (kN)	19,3	30,7	44,7	74,5	89,4	117,5	140,3	164,3
Design value for h_{ef} max, 8.8 steel grade, C20/25	Shear V Rd (kN)	12,0	18,4	27,2	50,4	78,4	112,8	147,2	179,2
Waterfilled drill holes									
Design value for h_{ef} max, 8.8 steel grade, C20/25	Tension N Rd (kN)	17,2	25,1	33,6	46,0	68,2	87,9	98,2	113,1
Design value for h_{ef} max, 8.8 steel grade, C20/25	Shear V Rd (kN)	12,0	18,4	27,2	50,4	78,4	112,8	147,2	179,2

Load values threaded rods for cracked concrete, ETA-12/0168, hammereddrilled drill holes

		M12	M16	M20	M24	M27	M30
Min. effect. anchorage depth	h_{ef} , min (mm)	70	80	90	96	108	120
Dry concrete							
Design value for h_{ef} min, 8.8 steel grade, C20/25	Tension N Rd (kN)	11,0	14,3	14,6	16,1	19,2	22,5
Design value for h_{ef} min, 8.8 steel grade, C20/25	Shear V Rd (kN)	26,4	34,3	41,0	45,2	53,9	63,1
Waterfilled drill holes							
Design value for h_{ef} min, 8.8 steel grade, C20/25	Tension N Rd (kN)	9,4	11,5	13,5	15,5	17,5	21,5
Design value for h_{ef} min, 8.8 steel grade, C20/25	Shear V Rd (kN)	26,4	32,2	37,7	43,4	48,9	60,3
Max. effect. anchorage depth	h_{ef} , max (mm)	144	192	240	288	324	360
Dry concrete							
Design value for h_{ef} max, 8.8 steel grade, C20/25	Tension N Rd (kN)	22,6	34,9	43,1	56,9	72,0	88,9
Design value for h_{ef} max, 8.8 steel grade, C20/25	Shear V Rd (kN)	27,2	50,4	78,4	112,8	147,2	179,2
Waterfilled drill holes							
Design value for h_{ef} max, 8.8 steel grade, C20/25	Tension N Rd (kN)	19,4	27,6	35,9	46,5	52,4	64,6
Design value for h_{ef} max, 8.8 steel grade, C20/25	Shear V Rd (kN)	27,2	50,4	78,4	112,8	146,6	179,2

Installation data rebar for cracked and non-cracked concrete, ETA-12/0168

		Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
Nominal drill hole diameter Ø	d_o (mm)	12	14	16	18	20	24	32	35	40
Cleaning brush Ø	D min (mm)	14	16	18	20	22	26	34	37	41,5
Min. effect. anchorage depth	h_{ef} , min (mm)	60	60	70	75	80	90	100	112	128
Max. effect. anchorage depth	h_{ef} , max (mm)	96	120	144	168	192	240	300	336	384
Min. edge distance / spacing	smin / cmin (mm)	40	50	60	70	80	100	125	140	160
Min. member thickness	h_{min} (mm)	$h_{ef}+30\text{mm.}, \geq 100\text{ mm.}$					$h_{ef} + 2d_0$			

Load values rebar for non-cracked concrete, ETA-12/0168, hammereddrilled drill holes

		Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 25	Ø 28	Ø 32
Min. effect. anchorage depth	h_{ef} , min (mm)	60	60	70	75	80	90	100	112	128
Dry concrete										
Design value for h_{ef} min, BSt500, C20/25	Tension N Rd (kN)	10,1	12,6	16,4	18,2	20,1	20,5	24,0	28,5	34,8
Design value for h_{ef} min, BSt500, C20/25	Shear V Rd (kN)	9,3	14,7	20,7	28,0	36,7	57,3	67,3	79,8	97,5
Waterfilled drill holes										
Design value for h_{ef} min, BSt500, C20/25	Tension N Rd (kN)	5,4	7,6	10,7	15,6	17,2	20,5	24,0	28,5	34,8
Design value for h_{ef} min, BSt500, C20/25	Shear V Rd (kN)	9,3	14,7	20,7	28,0	36,7	57,3	67,3	79,8	97,5
Max. effect. anchorage depth	h_{ef} , max (mm)	96	120	144	168	192	240	300	336	384
Dry concrete										
Design value for h_{ef} max, BSt500, C20/25	Tension N Rd (kN)	15,1	25,1	36,2	53,4	64,3	85,3	123,4	148,1	181,0
Design value for h_{ef} max, BSt500, C20/25	Shear V Rd (kN)	9,3	14,7	20,7	28,0	36,7	57,3	90,0	112,7	147,3
Waterfilled drill holes										
Design value for h_{ef} max, BSt500, C20/25	Tension N Rd (kN)	8,1	15,3	21,9	35,2	43,6	61,0	84,2	99,5	110,3
Design value for h_{ef} max, BSt500, C20/25	Shear V Rd (kN)	9,3	14,7	20,7	28,0	36,7	57,3	90,0	112,7	147,3

Load values rebar for cracked concrete, ETA-12/0168, hammerdrilled drill holes

		Ø 12	Ø 14	Ø 16	Ø 20	Ø 25	Ø 28	Ø 32
Min. effect. anchorage depth	h_{ef} , min (mm)	70	75	80	90	100	112	128
Dry concrete								
Design value for h_{ef} min, BSt500, C20/25	Tension N Rd (kN)	11,0	12,8	14,3	14,6	17,1	20,3	24,8
Design value for h_{ef} min, BSt500, C20/25	Shear V Rd (kN)	20,7	28,0	34,3	41,0	48,0	56,9	69,5
Waterfilled drill holes								
Design value for h_{ef} min, BSt500, C20/25	Tension N Rd (kN)	9,4	10,2	11,5	13,5	16,8	18,8	24,5
Design value for h_{ef} min, BSt500, C20/25	Shear V Rd (kN)	20,7	28,0	32,2	37,7	47,1	52,5	68,6
Max. effect. anchorage depth	h_{ef} , max (mm)	144	168	192	240	300	336	384
Dry concrete								
Design value for h_{ef} max, BSt500, C20/25	Tension N Rd (kN)	22,6	28,7	34,9	43,1	61,7	77,4	101,1
Design value for h_{ef} max, BSt500, C20/25	Shear V Rd (kN)	20,7	28,0	36,7	57,3	90,0	112,7	147,3
Waterfilled drill holes								
Design value for h_{ef} max, BSt500, C20/25	Tension N Rd (kN)	19,4	22,9	27,6	35,9	50,5	56,3	73,5
Design value for h_{ef} max, BSt500, C20/25	Shear V Rd (kN)	20,7	28,0	36,7	57,3	90,0	112,7	147,3

Load values threaded rods for non-cracked concrete, ETA-12/0300, diamond drilled drill holes

		M10	M12	M16	M20	M24
Min. effect. anchorage depth	h_{ef} , min (mm)	60	70	80	90	96
Dry concrete						
Design value for h_{ef} min, 8.8 steel grade, C20/25	Tension N Rd (kN)	13,8	14,7	20,0	24,0	26,4
Design value for h_{ef} min, 8.8 steel grade, C20/25	Shear V Rd (kN)	18,4	27,2	48,2	57,5	63,3
Waterfilled drill holes						
Design value for h_{ef} min, 8.8 steel grade, C20/25	Tension N Rd (kN)	11,3	14,7	20,0	24,0	26,4
Design value for h_{ef} min, 8.8 steel grade, C20/25	Shear V Rd (kN)	18,4	27,2	48,2	57,5	63,3
Max. effect. anchorage depth	h_{ef} , max (mm)	200	240	320	400	480
Dry concrete						
Design value for h_{ef} max, 8.8 steel grade, C20/25	Tension N Rd (kN)	30,7	44,7	83,3	130,7	180,9
Design value for h_{ef} max, 8.8 steel grade, C20/25	Shear V Rd (kN)	18,4	27,2	50,4	78,4	112,8
Waterfilled drill holes						
Design value for h_{ef} max, 8.8 steel grade, C20/25	Tension N Rd (kN)	30,7	44,7	83,3	130,7	170,9
Design value for h_{ef} max, 8.8 steel grade, C20/25	Shear V Rd (kN)	18,4	27,2	50,4	78,4	112,8

Load values rebar for non-cracked concrete, ETA-12/0300 - diamond drilled drill holes

		Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 25
Min. effect. anchorage depth	h_{ef} , min (mm)	60	70	75	80	90	100
Dry concrete							
Design value for h_{ef} min, BSt500, C20/25	Tension N Rd (kN)	13,8	14,7	18,2	20,1	24,0	28,1
Design value for h_{ef} min, BSt500, C20/25	Shear V Rd (kN)	14,7	20,6	28,0	36,7	57,3	67,3
Waterfilled drill holes							
Design value for h_{ef} min, BSt500, C20/25	Tension N Rd (kN)	11,3	14,7	18,2	20,1	24,0	28,1
Design value for h_{ef} min, BSt500, C20/25	Shear V Rd (kN)	14,7	20,6	28,0	36,7	57,3	67,3
Max. effect. anchorage depth	h_{ef} , max (mm)	200	240	280	320	400	500
Dry concrete							
Design value for h_{ef} max, BSt500, C20/25	Tension N Rd (kN)	30,7	44,3	60,7	79,3	123,6	192,9
Design value for h_{ef} max, BSt500, C20/25	Shear V Rd (kN)	14,7	20,6	28,0	36,7	57,3	90,0
Waterfilled drill holes							
Design value for h_{ef} max, BSt500, C20/25	Tension N Rd (kN)	30,7	44,3	60,7	79,3	123,6	185,5
Design value for h_{ef} max, BSt500, C20/25	Shear V Rd (kN)	14,7	20,6	28,0	36,7	57,3	90,0

Curing and gel time

Temp.	Geltime	Curing time dry concrete	Curing time wet concrete
5° C	120 min.	50 hours	100 hours
10° C	90 min.	30 hours	60 hours
20° C	30 min.	10 hours	20 hours
30° C	20 min.	6 hours	12 hours
40° C	12 min.	4 hours	8 hours

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All values and formulas are based on the ETA reports