

HIGH-PERFORMANCE HYBRID CHEMICAL ANCHOR

- Urethane-methacrylate based resin
- CE option 1 for cracked and uncracked concrete
- C2 Seismic performance category (M12-M24)
- Certified fire resistance F120
- Comply with LEED® v4.1 BETA
- A+ Class: emission of volatile organic compounds (VOC) in living environments
- Ideal for extra-heavy anchors and post-installed reinforcement rods
- Excellent long-term creep behaviour
- Dry or wet concrete
- Concrete with submerged holes
- Overhead application allowed
- Certified installation also with hollow drill bit



USA, Canada and more design values available online.

CODES AND DIMENSIONS

CODE	format		pcs
	[ml]	[US fl oz]	
HYB280	280	9.47	12
HYB420	420	14.20	12

Expiry from date of manufacturing: 18 months.

Storage temperature between +5 and +25° C.

ADDITIONAL PRODUCTS - ACCESSORIES

type	description	format	pcs
MAM400	gun for cartridge	420 ml	1
FLY	gun for cartridge	280 ml	1
STING	nozzle	-	12
STINGEXT	extension tube for nozzle	-	1
STINGRED	nozzle tip reducer	-	1
PLU	injection nozzle	M12 - M30	-
FILL	filling washer	M8 - M24	-
BRUH	steel pipe cleaner	M8 - M30	-
BRUHAND	grip and extension for pipe cleaner	-	1
IR (INTERNAL THREADED ROD)	bushing with internal metric thread	M8 - M16	-
PONY	blow pump	-	1
CAT	compressed air tool	-	1
HDE	hollow drill bit for concrete	M8 - M30	-
DUXHA	hollow drill bit for concrete	M16 - M30	-
DUISPS	class M suction system	-	1

■ INSTALLATION TIME AND TEMPERATURE

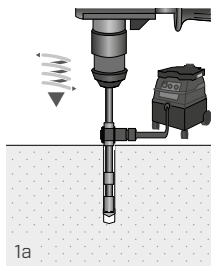
support temperature	workability time	curing time before loading	
		dry support	wet support
-5 ÷ -1 °C	50 min	5 h	10 h
0 ÷ +4 °C	25 min	3,5 h	7 h
+5 ÷ +9 °C	15 min	2 h	4 h
+10 ÷ +14 °C	10 min	1 h	2 h
+15 ÷ +19 °C	6 min	40 min	80 min
+20 ÷ +29 °C	3 min	30 min	60 min
+30 ÷ +40 °C	2 min	30 min	60 min

Cartridge storage temperature +5 - +40°.

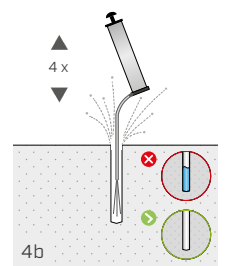
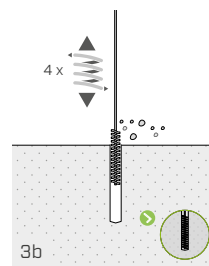
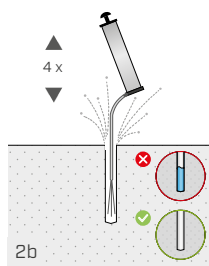
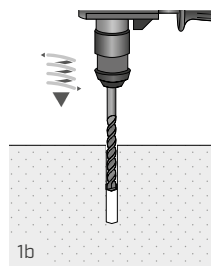
■ MOUNTING

Hole execution: three different installation possibilities.

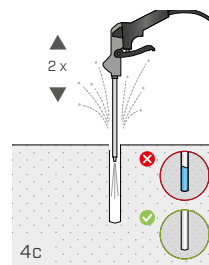
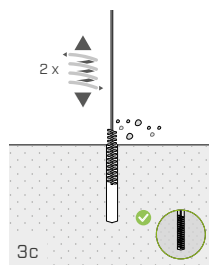
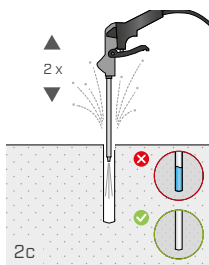
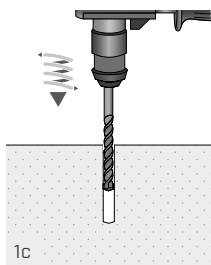
a. INSTALLATION WITH HOLLOW DRILL BIT (HDE)



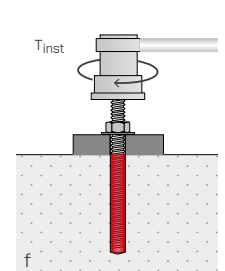
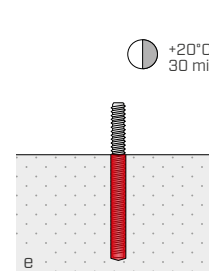
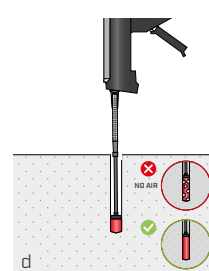
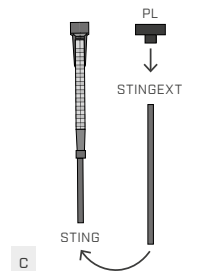
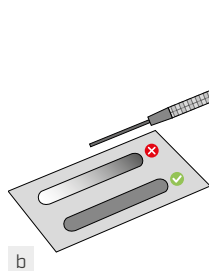
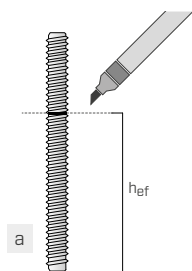
b. ASSEMBLY WITH HP + BRUH [only valid in non-cracked concrete]



c. ASSEMBLY WITH CAT + BRUH



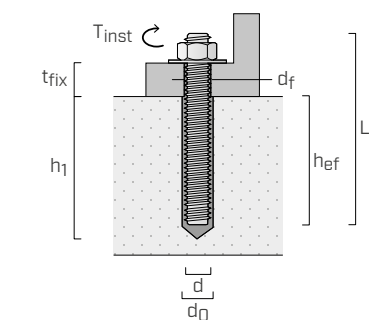
Rod installation:



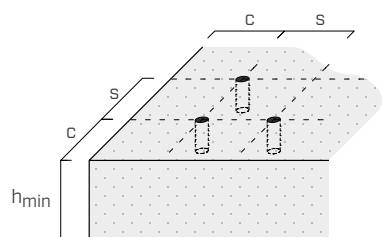
■ INSTALLATION

INSTALLATION GEOMETRY FEATURES ON CONCRETE

THREADED RODS (INA or MGS TYPE)



d	anchor diameter
d₀	hole diameter in the concrete support
h_{ef}	effective anchoring depth
d_f	hole diameter in the element to be fastened
T_{inst}	maximum tightening torque
L	anchor length
t_{fix}	maximum fastening thickness
h₁	minimum hole depth

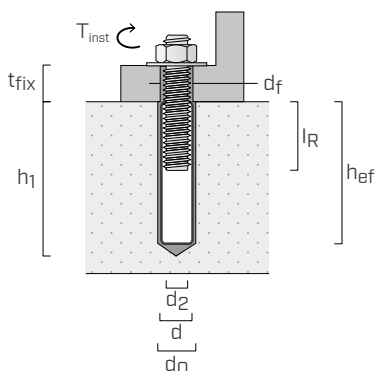


d	[mm]	M8	M10	M12	M16	M20	M24	M27	M30
d₀	[mm]	10	12	14	18	22	28	30	35
h_{ef,min}	[mm]	60	60	70	80	90	96	108	120
h_{ef,max}	[mm]	160	200	240	320	400	480	540	600
d_f	[mm]	9	12	14	18	22	26	30	33
T_{inst}	[Nm]	10	20	40	60	100	170	250	300

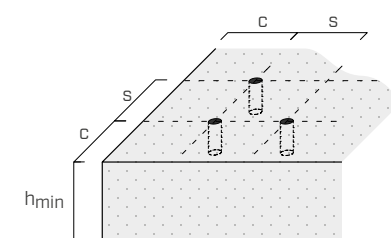
			M8	M10	M12	M16	M20	M24	M27	M30
Minimum spacing	s _{min}	[mm]	40	50	60	75	95	115	125	140
Minimum edge distance	c _{min}	[mm]	35	40	45	50	60	65	75	80
Minimum thickness of concrete support	h _{min}	[mm]	h _{ef} + 30 ≥ 100 mm			h _{ef} + 2 d ₀				

For spacing and distances smaller than the critical ones, strength values have to be reduced depending on the installation parameters.

BUSHING WITH INTERNAL METRIC THREAD (IR TYPE)



d₂	internal threaded rod diameter
d	diameter of the element anchored on concrete
d₀	hole diameter in the concrete support
h_{ef}	effective anchoring depth
d_f	hole diameter in the element to be fastened
T_{inst}	maximum tightening torque
t_{fix}	maximum fastening thickness
h₁	minimum hole depth
l_R	length of internal threaded rod



		IR-M8	IR-M10	IR-M12	IR-M16
d₂	[mm]	8	10	12	16
d	[mm]	12	16	20	24
d₀	[mm]	14	18	22	28
h_{ef,min}	[mm]	70	80	90	96
h_{ef,max}	[mm]	240	320	400	480
d_f	[mm]	9	12	14	18
T_{inst}	[mm]	10	20	40	60
l_{R,min}	[mm]	8	10	12	16
l_{R,max}	[mm]	20	25	30	32

			IR-M8	IR-M10	IR-M12	IR-M16
Minimum spacing	s_{min}	[mm]	60	75	95	115
Minimum edge distance	c_{min}	[mm]	45	50	60	65
Minimum thickness of concrete support	h_{min}	[mm]	h _{ef} + 30 ≥ 100 mm		h _{ef} + 2 d ₀	

For spacing and distances smaller than the critical ones, strength values have to be reduced depending on the installation parameters.

STRUCTURAL CHARACTERISTIC VALUES

Valid for a single threaded rod (INA or MGS) in very thick C20/25 grade concrete with a thin reinforcing layer when spacing and edge-distance are not limiting parameters.

UNCRACKED CONCRETE⁽¹⁾

TENSION

rod	h _{ef,standard} [mm]	N _{Rk,p} /N _{Rk,s} [kN]				h _{ef} [mm]	N _{Rk,s} ⁽²⁾ [kN]			
		5.8 steel	γ _M	8.8 steel	γ _M		5.8 steel	γ _{Ms}	8.8 steel	γ _{Ms}
M8	80	18,0	γ _{Ms} = 1,5 ⁽²⁾	29,0	γ _{Ms} = 1,5 ⁽²⁾	≥ 80	18,0	1,5	29,0	1,5
M10	90	29,0		42,0		≥ 100	29,0		46,0	
M12	110	42,0		56,8		≥ 130	42,0		67,0	
M16	128	71,2	γ _{Mc} = 1,5 ⁽⁴⁾⁽⁵⁾	71,2	γ _{Mc} = 1,5 ⁽⁴⁾⁽⁵⁾	≥ 180	78,0		125,0	
M20 ⁽³⁾	170	109,0		109,0		≥ 250	122,0		196,0	
M24 ⁽³⁾	210	149,7		149,7		≥ 325	176,0		282,0	
M27 ⁽³⁾	240	182,9		182,9		≥ 390	230,0		368,0	
M30 ⁽³⁾	270	218,2		218,2		≥ 440	280,0		449,0	

SHEAR

rod	h _{ef} [mm]	V _{Rk,s} ⁽²⁾ [kN]			
		5.8 steel	γ _{Ms}	8.8 steel	γ _{Ms}
M8	≥ 60	11,0	1,25	15,0	1,25
M10	≥ 60	17,0		23,0	
M12	≥ 70	25,0		34,0	
M16	≥ 80	47,0		63,0	
M20 ⁽³⁾	≥ 100	74,0		98,0	
M24 ⁽³⁾	≥ 130	106,0		141,0	
M27 ⁽³⁾	≥ 155	138,0		184,0	
M30 ⁽³⁾	≥ 175	168,0		224,0	

CRACKED CONCRETE⁽¹⁾

TENSION

rod	h _{ef,standard} [mm]	N _{Rk,p} [kN]				h _{ef,max} [mm]	N _{Rk,s} /N _{Rk,p} [kN]			
		5.8 steel	γ _{Mp}	8.8 steel	γ _M		5.8 steel	γ _M	8.8 steel	γ _M
M8	80	14,1	γ _{Mp} = 1,5 ⁽⁵⁾⁽⁶⁾	14,1	γ _{Mp} = 1,5 ⁽⁵⁾⁽⁶⁾	160	18,0	γ _{Ms} = 1,5 ⁽²⁾	28,2	γ _{Mp} = 1,5 ⁽⁵⁾⁽⁶⁾
M10	90	21,2		21,2		200	29,0		46,0	
M12	110	33,2		33,2		240	42,0		67,0	
M16	128	49,9	γ _{Mc} = 1,5 ⁽⁴⁾⁽⁵⁾	49,9	γ _{Mc} = 1,5 ⁽⁴⁾⁽⁵⁾	320	78,0		125,0	γ _{Ms} = 1,5 ⁽²⁾
M20 ⁽³⁾	170	76,3		76,3		400	122,0		196,0	
M24 ⁽³⁾	210	104,8		104,8		480	176,0		253,3	
M27 ⁽³⁾	240	128,0		128,0		540	230,0		320,6	γ _{Mp} = 1,5 ⁽⁵⁾⁽⁶⁾
M30 ⁽³⁾	270	152,8		152,8		600	280,0		395,8	

SHEAR

rod	h _{ef,standard} [mm]	V _{Rk,s} ⁽²⁾ [kN]			
		5.8 steel	γ _{Ms}	8.8 steel	γ _{Ms}
M8	80	11,0	1,25	15,0	1,25
M10	90	17,0		23,0	
M12	110	25,0		34,0	
M16	128	47,0		63,0	
M20 ⁽³⁾	170	74,0		98,0	
M24 ⁽³⁾	210	106,0		141,0	
M27 ⁽³⁾	240	138,0		184,0	
M30 ⁽³⁾	270	168,0		224,0	

incremental factor for N_{Rk,p}⁽⁷⁾

ψ _c	C25/30	
	C30/37	
	C40/50	
	C50/60	
		1,02
		1,04
		1,08
		1,10

NOTES

- ⁽¹⁾ Refer to the relevant ETA document for use of rebars.
- ⁽²⁾ Steel failure mode.
- ⁽³⁾ Installation is only allowed with CAT and HDE.
- ⁽⁴⁾ Concrete cone failure method.
- ⁽⁵⁾ Valid concrete material safety coefficient value using CAT in the installation. For different installation systems, use a coefficient of γ_M equal to 1,8.
- ⁽⁶⁾ Pull-out and concrete cone failure.
- ⁽⁷⁾ Tensile-strength increment factor (excluding steel and concrete cone failure) for both cracked and uncracked concrete.

GENERAL PRINCIPLES

- The characteristic values are according to EN 1992-4:2018 with a factor α_{SUS}=0.6 and in accordance with ETA-20/1285.
 - The design values are obtained from the characteristic values as follows: R_d = R_k/γ_M. Coefficients γ_M are listed in the table in accordance with the failure characteristics and product certificates.
 - For the calculation of anchors with reduced spacing, or too close to the edge, please refer to ETA. Similarly, in case of fastening on concrete-supports with a better-grade, limited thickness or a thick reinforcing layer please see ETA.
 - For the design of anchors subjected to seismic loading refer to ETA and to EN 1992-4:2018.
 - For specifications of the diameters covered by the various certifications (cracked concrete, uncracked concrete, seismic applications), please refer to ETA.
- Component A and Component B classification: Skin Sens. 1. May cause an allergic skin reaction.

STRUCTURAL CHARACTERISTIC VALUES

Valid for a single threaded rod (INA or MGS) when installed with IR in C20/25 grade concrete with a thin reinforcing layer, considering spacing, edge-distance, and base-concrete thickness as non-limiting parameters.

UNCRACKED CONCRETE⁽¹⁾

TENSION

rod	h _{ef} [mm]	h _{min} ⁽²⁾ [mm]	N _{Rk,s} /N _{Rk,p} [kN]			
			5.8 steel	γ _{Ms}	8.8 steel	γ _M
IR-M8	80	110	17,0	1,5 ⁽³⁾	27,0	γ _M = 1,5 ⁽³⁾
IR-M10	80	116	29,0		35,2	γ _M = 1,5 ⁽⁵⁾⁽⁶⁾
IR-M12 ⁽⁴⁾	125	169	42,0		67,0	γ _M = 1,5 ⁽³⁾
IR-M16 ⁽⁴⁾	170	226	76,0		109,0	γ _M = 1,5 ⁽⁵⁾⁽⁶⁾

SHEAR

rod	h _{ef} [mm]	h _{min} ⁽²⁾ [mm]	V _{Rk,s} ⁽³⁾ [kN]			
			5.8 steel	γ _M	8.8 steel	γ _M
IR-M8	80	110	9,0	1,25	14,0	1,25
IR-M10	80	116	15,0		23,0	
IR-M12 ⁽⁴⁾	125	169	21,0		34,0	
IR-M16 ⁽⁴⁾	170	226	38,0		60,0	

CRACKED CONCRETE⁽¹⁾

TENSION

rod	h _{ef} [mm]	h _{min} ⁽²⁾ [mm]	N _{Rk,s} /N _{Rk,p} [kN]				h _{ef} [mm]	N _{Rk,s} ⁽³⁾ [kN]			
			5.8 steel	γ _M	8.8 steel	γ _M		5.8 steel	γ _M	8.8 steel	γ _M
IR-M8	80	110	17,0	γ _M = 1,5 ⁽³⁾	19,6	γ _M = 1,5 ⁽⁶⁾⁽⁷⁾	≥ 120	17,0	1,5	27,0	1,5
IR-M10	80	116	24,6	γ _M = 1,5 ⁽⁵⁾⁽⁶⁾	24,6	γ _M = 1,5 ⁽⁵⁾⁽⁶⁾	≥ 150	29,0		46,0	
IR-M12 ⁽⁴⁾	125	169	42,0	γ _M = 1,5 ⁽³⁾	48,1		≥ 180	42,0		67,0	
IR-M16 ⁽⁴⁾	170	226	76,0		76,3		≥ 250	76,0		121,0	

SHEAR

rod	h _{ef} [mm]	h _{min} ⁽²⁾ [mm]	V _{Rk,s} ⁽³⁾ [kN]				incremental factor for N _{Rk,p} ⁽⁸⁾		
			5.8 steel	γ _M s	8.8 steel	γ _M s			
IR-M8	80	110	9,0	1,25	14,0	1,25	ψ _c	C25/30	1,02
IR-M10	80	116	15,0		23,0			C30/37	1,04
IR-M12 ⁽⁴⁾	125	169	21,0		34,0			C40/50	1,08
IR-M16 ⁽⁴⁾	170	226	38,0		60,0			C50/60	1,10

NOTES

- ⁽¹⁾ Refer to the relevant ETA document for use of rebars.
- ⁽²⁾ Minimum thickness of concrete support.
- ⁽³⁾ Steel failure mode.
- ⁽⁴⁾ Installation is only allowed with CAC and HDE.
- ⁽⁵⁾ Concrete cone failure method.
- ⁽⁶⁾ Valid concrete material safety coefficient value using CAT in the installation. For different installation systems, use a coefficient of γ_M equal to 1,8.
- ⁽⁷⁾ Pull-out and concrete cone failure.
- ⁽⁸⁾ Tensile-strength increment factor (excluding steel failure) for both cracked and uncracked concrete.

GENERAL PRINCIPLES

- The characteristic values are according to EN 1992-4:2018 with a factor α_{SUS}=0.6 and in accordance with ETA-20/1285.
- The design values are obtained from the characteristic values as follows: R_d = R_k/γ_M. Coefficients γ_M are listed in the table in accordance with the failure characteristics and product certificates.
- For the calculation of anchors with reduced spacing, or too close to the edge, please refer to ETA. Similarly, in case of fastening on concrete-supports with a better-grade, limited thickness or a thick reinforcing layer please see ETA.
- For the design of anchors subjected to seismic loading refer to ETA and to EN 1992-4:2018.
- For specifications of the diameters covered by the various certifications (cracked concrete, uncracked concrete, seismic applications), please refer to ETA.

Component A and Component B classification: Skin Sens. 1. May cause an allergic skin reaction.