TECHNICAL DATASHEET

Chemical Anchor Ultra Tropical

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Product description

Chemical Anchor Ultra Tropical is a universal anchoring system for use in hollow and solid substrates in dry, wet or even flooded conditions/surfaces. Because Chemical Anchor Ultra Tropical is styrene-free it gives off little odor, making it well suited for indoor and enclosed applications. Chemical Anchor Polyester Tropical is a slow gel and has a fast cure time in high temperature environments.

Material

Polyester Epoxy resin.

Advantages

- Anchors can be placed close to free edges.
- Suitable for dry, wet and flooded holes without loss of performance.
- Reduced drilling diameters.
- Variable embedment depths.

Application areas

Zettex Chemical Anchor can be used to anchor awnings, ventilation systems, balustrades, hand rails, masonry, signs, safety barriers, racks and machinery.

Utilization

It is important not to use the first 10 centimeters of the adhesive and wait until the color is homogeneous. If the application time is exceeded, change the mixing nozzle. Subfloors should be free of dust and grease. Dust and other dirt located in the joints can be removed with the Zettex Airjet Economy. After use, hands should be thoroughly cleaned with soap, water and a moisturizing hand cream.

Packaging

- Tube 300 ml

Color

White, gray and stone.

Safety recommendations

Always read the safety information before use.

Shelf life

12 months in unopened packaging. Store at temperatures between 5°C and 25°C.

Certificates

- 0756-CPD-0434 15
- ETA 11/0445
- ETAG 001-1 en 5, option
- DoP: Z-495321-13

CE

Temperature	T Work	Temperature substrate	T Load
5°C	18 Minutes	5°C	145 Minutes
5°C to 10°C	10 Minutes	5°C to 10°C	
10°C to 20°C	6 Minutes	10°C to 20°C	85 Minutes
20°C to 25°C	5 Minutes	20°C to 25°C	50 Minutes
25°C to 30°C	4 Minutes	25°C to 30°C	40 Minutes
30°C		30°C	35 Minutes

Note: T Work is the typical gel time at the highest base material temperature in the range.
T Load is the minimum setup time required until load can be applied at the lowest base material temperature in the range.

Property		Value	Unit	Test Standard
Density		1.7	g/cm^3	ASTM D 1875 @ +20°C
Compressive strength	24 h	60	N/mm^2	BS6319
	7 days	70		
Tensile strength	24 h	11.5	N/mm^2	ASTM D 638 @ +20°C
	7 days	12.2		
Elongation at Break	24 h	0.1	%	ASTM D 638 @ +20°C
	7 days	0.1		
Tensile strength	24 h	3.4	GN/m^2	ASTM D 638 @ +20°C
	7 days	4.5		
Bending strength	7 days	28.3	N/mm^2	ASTM D 790 @ +20°C
HDT	7 days	80.8	°C	ASTM D 648 @ +20°C

Installation parameters - threaded ends								
Size			M8	M10	M12	M16	M20	M24
Diameter of nominal drill hole	d_o	mm	10	12	14	18	22	26
Diameter of cleaning brush	d_b	mm	14	14	20	20	29	29
Torque Moment	T_{inst}	Nm	10	20	40	80	150	200
Minimum embedment depth	h_{ef}	mm	64	80	96	128	160	192
Maximum embedment depth	h_{ef}	mm	96	120	144	192	240	288
Minimum edge distance	c_{min}	mm	35	40	50	65	80	96
Minimum distance	s_{min}	mm	35	40	50	65	80	96
Minimum thickness	h_{min}	mm	h_{ef} + 30 mm ≥ 100mm			h_{ef} + $2d_o$		

Resistance properties - Combined pullout & collapse of concrete cone with threaded rods						
Size	M8	M10	M12	M16	M20	M24

Characteristic resistance to adhesive bonding in uncracked concrete -40°C to 80°C	$\tau_{Rk,ucr}$	N/mm²	8.5	8.0	9.0	9.0	8.0	7.5
Partial safety factor Dry/saturated concrete	γ_{mc}	[-]	1.8					
Factor for concrete	ψ_c							
		C30/37	1.12					
		C35/45	1.19					
		C50/60	1.30					

Splitting Failure								
Size			M8	M10	M12	M16	M20	M24
Distance edges	$c_{cr,sp}$	mm	2hef / 1.5hef					
Distance	$s_{cr,sp}$	mm	4hef / 3hef					

Resistance values for threaded rod in uncracked concrete Combined pullout and failure of concrete cone and failure of concrete cone Temperature range: -40°C to 80°C								
Property	Unit		Anchor Diameter					
			M8	M10	M12	M16	M20	M24
Effective anchoring depth = 8d	h_{ef}	mm	64	80	96	128	160	192
Design resistance	N_{Rd}	kN	7.5	11	18.0	32.0	44.5	66.0
Effective anchoring depth = STD	h_{ef}	mm	80	100	120	160	200	240
Design resistance	N_{Rd}	kN	9.0	13.5	22.5	40.0	55.5	75.0
Effective embedment depth = 12d	h_{ef}	mm	96	120	144	192	240	288
Design resistance	N_{Rd}	kN	11	16.5	27.0	48.0	67.0	90.0

1.Resistance values are based on combined pullout & concrete taper collapse and concrete taper collapse according to EC2-4 Design. Resistance to steel failure should also be considered - the lowest value is decisive.

2. Resistance values are for single anchors without considering close edges or eccentric loading.

3. Tabulated values relate only to the above temperature range and installation conditions.

4.Long-term temperatures are those that remain approximately constant for extended periods of time. Short-term temperatures occur at short intervals, for example: daily cycle.

5.The compressive strength of the concrete (f ck,cube) is assumed to be 20 N/mm 2.

6.For the resistance values shown, it is assumed that the geometry of the anchor(s) and concrete element is sufficient to prevent splitting failure.

Threaded rods - Characteristic values for steel fracture (tensile)								
Size	**Unit**		M8	M10	M12	M16	M20	M24
Steel grade 5.8	$N_{Rk,s}$	kN	18	29	42	79	123	177
Partial safety factor	γ_{Ms}	[-]	1.50					
Steel grade 8.8	$N_{Rk,s}$	kN	29	46	67	126	196	282
Partial safety factor	γ_{Ms}	[-]	1.50					
Steel grade 10.9*	$N_{Rk,s}$	kN	37	58	84	157	245	353

Partial Safety Factor	γ_{Ms}	[-]	1.40					
Stainless Steel A4-70	$N_{Rk,s}$	kN	26	41	59	110	172	247
Partial Safety Factor	γ_{Ms}	[-]	1.90					
Stainless steel A4-80	$N_{Rk,s}$	kN	29	46	67	126	196	282
Partial Safety Factor	γ_{Ms}	[-]	1.60					
Stainless steel Grade 1.4529	$N_{Rk,s}$	kN	26	41	59	110	172	247
Partial safety factor	γ_{Ms}	[-]	1.50					

Threaded rods - Characteristic values for steel fracture (shear - without lever arm)								
Size	**Unit**		**M8**	**M10**	**M12**	**M16**	**M20**	**M24**
Steel grade 5.8	$V_{Rk,s}$	kN	9	15	21	39	61	88
Partial safety factor	γ_{Ms}	[-]	1.25					
Steel grade 8.8	$V_{Rk,s}$	kN	15	23	34	63	98	141
Partial safety factor	γ_{Ms}	[-]	1.25					
Steel Grade 10.9*	$V_{Rk,s}$	kN	18	29	42	79	123	177
Partial Safety Factor	γ_{Ms}	[-]	1.50					
Stainless steel A4-70	$V_{Rk,s}$	kN	13	20	30	55	86	124
Partial Safety Factor	γ_{Ms}	[-]	1.56					
Stainless steel A4-80	$V_{Rk,s}$	kN	15	23	34	63	98	141
Partial Safety Factor	γ_{Ms}	[-]	1.33					
Stainless steel Grade 1.4529	$V_{Rk,s}$	kN	13	20	30	55	86	124
Partial safety factor	γ_{Ms}	[-]	1.25					

**High-strength galvanized bars are susceptible to brittle fracture due to hydrogen.*

Threaded rods - Characteristic values for steel fracture (shear - with lever arm)								
Size			M8	M10	M12	M16	M20	M24
Steel grade 5.8	$M^0_{Rk,s}$	N.m	19	37	66	166	325	561
Partial safety factor	γ_{Ms}	[-]	1.25					
Steel grade 8.8	$M^0_{Rk,s}$	N.m	30	60	105	266	519	898
Partial safety factor	γ_{Ms}	[-]	1.25					
Steel Grade 10.9*	$M^0_{Rk,s}$	N.m	37	75	131	333	649	1123
Partial Safety Factor	γ_{Ms}	[-]	1.50					
Stainless steel A4-70	$M^0_{Rk,s}$	N.m	26	52	92	233	454	786
Partial Safety Factor	γ_{Ms}	[-]	1.56					
Stainless steel A4-80	$M^0_{Rk,s}$	N.m	30	60	105	266	519	898
Partial Safety Factor	γ_{Ms}	[-]	1.33					
Stainless steel Grade 1.4529	$M^0_{Rk,s}$	N.m	26	52	92	233	454	786
Partial safety factor	γ_{Ms}	[-]	1.25					
Failure of concrete prying								
Factor k **			2					
Partial safety factor	γ_{Ms}		1.50					

**High-strength galvanized bars are susceptible to brittle collapse by hydrogen.*

*** K-value from TR029 Design of anchors with connection section 5.2.3.3*