SET-XP™ Epoxy Anchor Installation Information and Additional Data for Threaded Rod and Rebar in Normal-Weight Concrete[1]

Characteristic		Symbol	Units	Nominal Anchor Diameter				
				½ / #4	⅝ / #5	¾ / #6	⅞ / #7	1 / #8
Installation Information								
Drill Bit Diameter		d	in.	⅝	¾	⅞	1	1⅛
Maximum Tightening Torque		T_{inst}	ft-lb	40	90	130	200	300
Permitted Embedment Depth (h_{ef}) Range[2]	Minimum	-	in.	2¾	3⅛	3½	3¾	4
	Maximum	-	in.	10	12½	15	17 1/2	20
Minimum Concrete Thickness		h_{min}	in.	2.25 x h_{ef}				
Critical Edge Distance		c_{ac}	in.	3 x h_{ef}				
Minimum Edge Distance		c_{min}	in.	1¾				
Minimum Anchor Spacing		s_{min}	in.	3				

1. The information presented in this table is to be used in conjunction with the design criteria of ICC-ES AC308. See pages 18–19.
2. Minimum and maximum embedment depths are set so as to fit the ICC-ES AC308 design model.

*See page 10 for an explanation of the load table icons

SET-XP™ Epoxy Tension Design Data for Threaded Rod and Rebar in Normal-Weight Concrete[1,12]

Characteristic			Symbol	Units	Nominal Anchor Diameter (inch) / Rebar Size				
					½ / #4	⅝ / #5	¾ / #6	⅞ / #7	1 / #8
Steel Strength in Tension									
Threaded Rod	Minimum Tensile Stress Area		A_{se}	in²	0.142	0.226	0.334	0.462	0.606
	Tension Resistance of Steel - ASTM A193, Grade B7		N_{sa}	lb.	17,750	28,250	41,750	57,750	75,750
	- ASTM A307, Grade C				8,235	13,110	19,370	26,795	35,150
	- Type 410 Stainless (ASTM A193, Grade B6)				15,620	24,860	36,740	50,820	66,660
	- Type 304 Stainless (ASTM A193, Grade B8)				10,650	16,950	25,050	34,650	45,450
	Strength Reduction Factor - Steel Failure		ϕ	-	0.75[9]				
Rebar	Minimum Tensile Stress Area		A_{se}	in²	0.20	0.31	0.44	0.60	0.79
	Tension Resistance of Steel - Rebar (ASTM A615, Grade 60)		N_{sa}	lb.	18,000	27,900	39,600	54,000	71,100
	Strength Reduction Factor - Steel Failure		ϕ	-	0.65[9]				
Concrete Breakout Strength in Tension									
Effectiveness Factor - Uncracked Concrete			k_{uncr}	-	24				
Effectiveness Factor - Cracked Concrete			k_{cr}	-	17				
Strength Reduction Factor - Breakout Failure			ϕ	-	0.65[11]				
Bond Strength in Tension (2,500 psi ≤ f'c ≤ 8,000 psi)									
Temp. Range 1 for Uncracked Concrete[2,4,5]	Characteristic Bond Strength[8]		$\tau_{k,uncr}$	psi	2,422	2,263	1,942	1,670	2,003
	Permitted Embedment Depth Range	Minimum	h_{ef}	in	2¾	3⅛	3½	3¾	4
		Maximum			10	12½	15	17½	20
Temp. Range 1 for Cracked Concrete[2,4,5]	Characteristic Bond Strength[8,13,14]		$\tau_{k,cr}$	psi	1,040	718	1,003	619	968
	Permitted Embedment Depth Range	Minimum	h_{ef}	in	4	5	6	7	8
		Maximum			10	12½	15	17½	20
Temp. Range 2 for Uncracked Concrete[3,4,5]	Characteristic Bond Strength[6,8]		$\tau_{k,uncr}$	psi	1,250	1,170	1,005	860	1,035
	Permitted Embedment Depth Range	Minimum	h_{ef}	in	2¾	3⅛	3½	3¾	4
		Maximum			10	12½	15	17½	20
Temp. Range 2 for Cracked Concrete[3,4,5]	Characteristic Bond Strength[6,8,13,14]		$\tau_{k,cr}$	psi	537	371	518	320	500
	Permitted Embedment Depth Range	Minimum	h_{ef}	in	4	5	6	7	8
		Maximum			10	12½	15	17½	20
Bond Strength in Tension - Bond Strength Reduction Factors for Continuous Special Inspection									
Strength Reduction Factor - Dry Concrete		$\phi_{dry, ci}$	-	0.65[10]					
Strength Reduction Factor - Water-saturated Concrete		$\phi_{sat, ci}$	-	0.45[10]					
Additional Factor for Water-saturated Concrete[7]		$K_{sat, ci}$	-	0.57					
Bond Strength in Tension - Bond Strength Reduction Factors for Periodic Special Inspection									
Strength Reduction Factor - Dry Concrete		$\phi_{dry, pi}$	-	0.55[10]					
Strength Reduction Factor - Water-saturated Concrete		$\phi_{sat, pi}$	-	0.45[10]					
Additional Factor for Water-saturated Concrete[7]		$K_{sat, pi}$	-	0.48					

1. The information presented in this table is to be used in conjunction with the design criteria of ICC-ES AC308, except as modified below. See pages 18–19.
2. Temperature Range 1: Maximum short-term temperature of 110°F. Maximum long-term temperature of 75°F.
3. Temperature Range 2: Maximum short-term temperature of 150°F. Maximum long-term temperature of 110°F.
4. Short-term concrete temperatures are those that occur over short intervals (diurnal cycling).
5. Long-term concrete temperature are constant temperatures over a significant time period.
6. For anchors that only resist wind or seismic loads, bond strengths may be increased by 72%.
7. In water-saturated concrete, multiply $\tau_{k,uncr}$ and $\tau_{k,cr}$ by K_{sat}.
8. For anchors installed in overhead and subjected to tension resulting from sustained loading, multiply the value calculated for N_a according to ICC-ES AC308 by 0.75. See page 18.
9. The value of ϕ applies when the load combinations of ACI 318 Section 9.2 are used. If the load combinations of ACI 318 Appendix C are used, refer to Section D4.5 to determine the appropriate value of ϕ.
10. The value of ϕ applies when both the load combinations of ACI 318 Section 9.2 are used and the requirements of Section D4.4(c) for Condition B are met. If the load combinations of ACI 318 Appendix C are used, refer to Section D4.5 to determine the appropriate value of ϕ.
11. The value of ϕ applies when both the load combinations of ACI 318 Section 9.2 are used and the requirements of Section D4.4(c) for Condition B are met. If the load combinations of ACI 318 Section 9.2 are used and the requirements of Section D4.4(c) for Condition A are met, refer to Section D4.4 to determine the appropriate value of ϕ. If the load combinations of ACI 318 Appendix C are used, refer to Section D4.5 to determine the appropriate value of ϕ.
12. Sand-lightweight and all-lightweight concrete are beyond the scope of this table.
13. For anchors installed in regions assigned to Seismic Design Category C, D, E or F, the bond strength values for 7/8" anchors or #7 rebar anchors must be multiplied by $\alpha_{N,seis}$ = 0.80.
14. For anchors installed in regions assigned to Seismic Design Category C, D, E or F, the bond strength values for 1" anchors or #8 rebar anchors must be multiplied by $\alpha_{N,seis}$ = 0.92