



Epoxy-Tie® SET Adhesive - Rebar Yield and Tensile Strength Embedments

Tests have been performed to establish load capacities for rebar dowels installed at multiple embedment depths with Epoxy-Tie SET adhesive. Using these results, the embedment depths required to develop the yield or tensile strengths of Grade 60 rebar have been calculated and are presented below.

Tension Loads and Development Lengths for Rebar Dowels in Normal-Weight Concrete

Rebar Size No. (mm)	Drill Bit Dia. In.	Embed. Depth in. (mm)	f'c ≥ 2000 psi (13.8 MPa) Concrete			f'c ≥ 4000 psi (27.6 MPa) Concrete			ASTM A615 Grade 60 Rebar	
			Ultimate Bond Strength lbs. (kN)	Embed. To Develop Yield Strength in. (mm)	Embed. To Develop Tensile Strength in. (mm)	Ultimate Bond Strength lbs. (kN)	Embed. To Develop Yield Strength in. (mm)	Embed. To Develop Tensile Strength in. (mm)	Yield Strength lbs. (kN)	Tensile Strength lbs. (kN)
#4 (12.7)	5/8	4 1/4 (108)	16,480 (73.3)	4 1/4 (108)	5 1/4 (133)	18,320 (81.5)	4 1/4 (108)	4 1/4 (108)	12,000 (53.4)	18,000 (80.1)
		6 (152)	19,360 (86.1)			19,360 (86.1)				
#5 (15.9)	3/4	5 (127)	24,600 (109)	5 (127)	5 3/4 (146)	26,040 (116)	5 (127)	5 1/2 (140)	18,600 (82.7)	27,900 (124)
		9 3/8 (238)	48,380 (215)			48,380 (215)				
#6 (19.1)	7/8	6 3/4 (171)	38,380 (171)	6 3/4 (171)	7 (178)	40,500 (180)	6 3/4 (171)	6 3/4 (171)	26,400 (117)	39,600 (176)
		11 1/4 (286)	65,020 (289)			65,020 (289)				
#7 (22.2)	1	7 3/4 (197)	47,760 (212)	7 3/4 (197)	8 3/4 (222)	47,760 (212)	7 3/4 (197)	8 3/4 (222)	36,000 (160)	54,000 (240)
		13 3/8 (333)	81,560 (363)			81,560 (363)				
#8 (25.4)	1 1/8	9 (229)	53,680 (239)	9 (229)	11 3/4 (298)	53,680 (239)	9 (229)	11 3/4 (298)	47,400 (211)	71,100 (316)
		15 (381)	94,240 (419)			94,240 (419)				
#9 (28.6)	1 1/4	10 3/8 (257)	53,680 (239)	11 (279)	14 1/2 (368)	53,680 (239)	11 (279)	14 1/2 (368)	60,000 (267)	90,000 (400)
		16 7/8 (429)	111,460 (496)			111,460 (496)				
#10 (31.8)	1 1/2	11 1/4 (286)	76,000 (338)	11 1/2 (292)	17 3/4 (438)	76,000 (338)	11 1/2 (292)	17 3/4 (438)	76,200 (339)	114,300 (509)
		18 3/4 (476)	125,840 (560)			125,840 (560)				
#11 (34.9)	1 5/8	12 3/8 (314)	87,500 (389)	13 3/4 (349)	—	87,500 (389)	13 3/4 (292)	—	93,600 (416)	140,400 (625)
		20 3/8 (524)	132,080 (588)			132,080 (588)				

- Development lengths are based on comparison of average ultimate bond strengths from testing in unreinforced concrete to minimum yield and tensile strengths of rebar.
- Critical edge distance is 1.5 times embedment depth and critical spacing is 4 times embedment depth for unreinforced concrete. Refer to our *Anchoring and Fastening Systems for Concrete and Masonry* catalog for load adjustment factors for lesser spacings and edge distances. Critical edge distance and critical spacing may be reduced when anchoring into reinforced concrete members.
- Refer to our *Anchoring and Fastening Systems for Concrete and Masonry* catalog for load adjustment factors for in-service temperature.
- Development lengths may be interpolated for concrete compressive strengths between 2,000 psi and 4,000 psi.
- Anchors are not permitted to support fire-resistive construction. Where not otherwise prohibited by code, anchors are permitted for installation in fire-resistive construction provided that at least one of the following conditions is fulfilled: a) Anchors are used to resist wind or seismic forces only. b) Anchors that support gravity load-bearing structural elements are within a fire-resistive envelope or a fire-resistive membrane, are protected by approved fire-resistive materials, or have been evaluated for resistance to fire exposure in accordance with recognized standards. c) Anchors are used to support nonstructural elements.

This technical bulletin is effective until December 31, 2013, and reflects information available as of October 1, 2011. This information is updated periodically and should not be relied upon after December 31, 2013; contact Simpson Strong-Tie for current information and limited warranty or see www.strongtie.com.