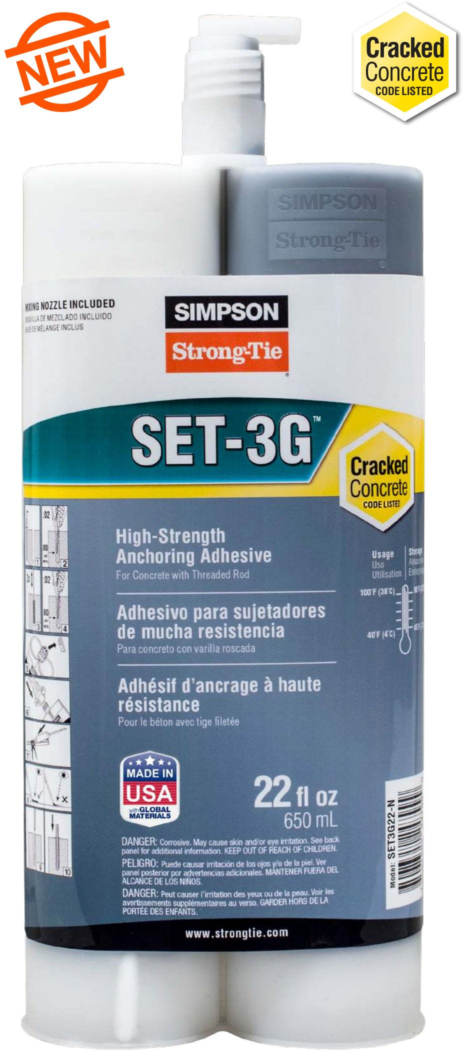
SET-3G™ High-Strength Epoxy Adhesive

SET-3G is the latest innovation in epoxy anchoring adhesives from Simpson Strong-Tie. Formulated to provide superior performance in cracked and uncracked concrete at elevated temperatures, SET-3G installs and performs in a variety of environmental conditions and temperature extremes. The exceptional bond strength of SET-3G results in high design strengths.

Features

- Exceptional performance — superior bond-strength values at even long-term elevated temperature of 110°F (43°C) using optimized drill bit diameters
- Tested in accordance with ICC-ES AC308 and ACI 355.4 for use in cracked and uncracked normal-weight and lightweight concrete
- Design flexibility — can be specified for dry or water-saturated conditions when in-service temperatures range from -40°F (-40°C) to 176°F (80°C)
- Jobsite versatility — can be installed in dry, water-saturated or water-filled holes in base materials with temperatures between 40°F (4°C) and 100°F (38°C)
- Maximized production and safety — qualified for installation using the Speed Clean™ DXS dust extraction drilling system as an alternative to the conventional blow-brush-blow hole-cleaning method
- Wire brush hole-cleaning system for conventional blow-brush-blow cleaning method
- Available in two cartridge configurations for maximum versatility — 8.5 oz. coaxial or 22 oz. side-by-side cartridges dispensed using manual, battery or pneumatic dispensing tools
- With higher bond strengths, ductile solutions can often be achieved with SET-3G in high seismic areas
- 1:1 ratio, two-component, high-strength, epoxy-based anchoring adhesive formula
- Two-year shelf life for unopened cartridges stored between 45°F (7°C) and 90°F (32°C)
- Low-odor formulation
- When properly mixed, SET-3G will be a uniform gray color
- Volatile organic compound (VOC) — 1.9 g/L
- Manufactured in the USA using global materials
- Tested per ACI355.4
- SET-3G code listed for installation with the Speed Clean™ DXS drill bits without any further cleaning (ICC-ES ESR-4057)



SET-3G Adhesive

Applications

- Threaded rod anchor and rebar dowel installations in cracked and uncracked concrete under a wide variety of environmental installation and use conditions
- Installation in downward, horizontal and upwardly inclined (including overhead) orientations
- Qualified for use in structures assigned to Seismic Design Categories A through F

Codes

ICC-ES ESR-4057 (concrete); City of Los Angeles (see ICC-ES ESR-4057); AASHTO M235 and ASTM C881, Types I and IV, Grade 3, Class C; NSF/ANSI Standard 61 (300 in.^{2} / 1,000 gal.)

Chemical Resistance

Contact Simpson Strong-Tie for information.

Installation and Application Instructions

(See also pp. 100–102)

- Surfaces to receive epoxy must be clean per approved hole cleaning method.
- Base-material temperatures must be 40°F (4°C) or above at the time of installation. For best results, adhesive should be conditioned to a temperature between 70°F (21°C) and 80°F (37°C) at the time of installation.
- To warm cold adhesive, store cartridges in a warm, uniformly heated area or storage container. Do not immerse cartridges in water or use microwave to facilitate warming.
- Mixed material can harden in the dispensing nozzle within 30 minutes at 70°F (21°C).

Note: For full installation instructions, see product packaging or visit **strongtie.com/set3g**.

SET-3G™ High-Strength Epoxy Adhesive

SET-3G Adhesive Cartridge System

Model No.	Capacity (ounces)	Cartridge Type	Carton Quantity	Dispensing Tool(s)	Mixing Nozzle
SET3G10[2]	8.5	Coaxial	12	CDT10S	EMN22I
SET3G22-N[1]	22	Side-by-side	10	EDT22S, EDTA22P, EDTA22CKT	EMN22I

1. One EMN21I mixing nozzle and one extension are supplied with each cartridge.
2. Two EMN22I mixing nozzles and two nozzle extensions are supplied with each cartridge.
3. Cartridge estimation guidelines are available at **strongtie.com/apps**.
4. Use only Simpson Strong-Tie® mixing nozzles in accordance with Simpson Strong-Tie instructions. Modification or improper use of mixing nozzle may impair SET-3G adhesive performance.

SET-3G Cure Schedule[1, 2]

Concrete Temperature		Gel Time	Cure Time
(°F)	(°C)	(min.)	(hr.)
40	4	120	192
50	10	75	72
60	16	50	48
70	21	35	24
90	32	25	24
100	38	15	24

For SI: 1°F = (°C x 9⁄5) + 32.

1. For water-saturated concrete and water-filled holes, the cure times should be doubled.
2. For installation of anchors in concrete where the temperature is below 70°F (21°C), the adhesive must be conditioned to a minimum temperature of 70°F (21°C).

Test Criteria

Anchors installed with SET-3G adhesive have been tested in accordance with ICC-ES *Acceptance Criteria for Adhesive Anchors in Concrete Elements* (AC308).

Property	Test Method	Result*
Consistency	ASTM C881	Passed, non-sag
Heat deflection	ASTM D648	147°F
Bond strength (moist cure)	ASTM C882	3,306 psi at 2 days
Water absorption	ASTM D570	0.13%
Compressive yield strength	ASTM D695	15,390 psi
Compressive modulus	ASTM D695	991,830 psi
Shore D durometer	ASTM D2240	84
Gel time	ASTM C881	52 minutes
Volatile Organic Compound (VOC)	—	1.9 g/L

*Material and curing conditions: 73 ± 2°F, unless otherwise noted.

SIMPSON Strong-Tie®

SET-3G Installation Information and Additional Data for Threaded Rod and Rebar in Normal-Weight Concrete[1]

IBC *

Characteristic	Symbol	Units	Nominal Anchor Diameter d_a (in.) / Rebar Size						
			⅜ / #3	½ / #4	⅝ / #5	¾ / #6	⅞ / #7	1 / #8	1¼ / #10
Installation Information									
Drill Bit Diameter for Threaded Rod	d_{hole}	in.	7⁄16	9⁄16	11⁄16	⅞	1	1⅛	1⅜
Drill Bit Diameter for Rebar	d_{hole}	in.	½	⅝	¾	⅞	1	1⅛	1⅜
Maximum Tightening Torque	T_{inst}	ft.-lb.	15	30	60	100	125	150	200
Minimum Embedment Depth	$h_{ef, min}$	in.	2⅜	2¾	3⅛	3½	3¾	4	5
Maximum Embedment Depth	$h_{ef, max}$	in.	7½	10	12½	15	17½	20	25
Minimum Concrete Thickness	h_{min}	in.	h_{ef} + 1¼		h_{ef} + 2d_{hole}				
Critical Edge Distance	c_{ac}	in.	See footnote 2						
Minimum Edge Distance	c_{min}	in.	1¾						2¾
Minimum Anchor Spacing	s_{min}	in.	3						6

1. The information presented in this table is to be used in conjunction with the design criteria of ACI 318-14 and ACI 318-11.
2. $c_{ac} = h_{ef}(\tau_{k,uncr}/1{,}160)^{0.4}$ x $[3.1 - 0.7(h/h_{ef})]$, where:
   $[h/h_{ef}] \leq 2.4$
   $\tau_{k,uncr}$ = the characteristic bond strength in uncracked concrete, given in the tables that follow $\leq k_{uncr}((h_{ef} \times f'_c)^{0.5}/(\pi \times d_a))$
   h = the member thickness (inches)
   h_{ef} = the embedment depth (inches)

Adhesive Anchors

* See p. 13 for an explanation of the load table icons.

SET-3G™ Design Information — Concrete

SET-3G Tension Strength Design Data for Threaded Rod in Normal-Weight Concrete[1, 8]

Characteristic			Symbol	Units	Nominal Rod Diameter (in.) ⅜	½	⅝	¾	⅞	1	1¼
Steel Strength in Tension											
Minimum Tensile Stress Area			A_{se}	in.^{2}	0.078	0.142	0.226	0.334	0.462	0.606	0.969
Tension Resistance of Steel — ASTM F1554, Grade 36			N_{sa}	lb.	4,525	8,235	13,110	19,370	26,795	35,150	56,200
Tension Resistance of Steel — ASTM F1554, Grade 55			N_{sa}	lb.	5,850	10,650	16,950	25,050	34,650	45,450	72,675
Tension Resistance of Steel — ASTM A193, Grade B7			N_{sa}	lb.	9,750	17,750	28,250	41,750	57,750	75,750	121,125
Tension Resistance of Steel — Stainless Steel ASTM A193, Grade B8 and B8M (Types 304 and 316)			N_{sa}	lb.	4,445	8,095	12,880	19,040	26,335	34,540	55,235
Tension Resistance of Steel — Stainless Steel ASTM F593 CW (Types 304 and 316)			N_{sa}	lb.	7,800	14,200	22,600	28,390	39,270	51,510	82,365
Tension Resistance of Steel — Stainless Steel ASTM A193, Grade B6 (Type 410)			N_{sa}	lb.	8,580	15,620	24,860	36,740	50,820	66,660	106,590
Strength Reduction Factor for Tension — Steel Failure			ϕ	—	0.75[5]						
Concrete Breakout Strength in Tension (2,500 psi ≤ f'_c ≤ 8,000 psi)											
Effectiveness Factor for Cracked Concrete			$k_{c,cr}$	—	17						
Effectiveness Factor for Uncracked Concrete			$k_{c,uncr}$	—	24						
Strength Reduction Factor — Concrete Breakout Failure in Tension			ϕ	—	0.65[6]						
Bond Strength in Tension (2,500 psi ≤ f'_c ≤ 8,000 psi)[7]											
Minimum Embedment			$h_{ef,min}$	in.	2⅜	2¾	3⅛	3½	3¾	4	5
Maximum Embedment			$h_{ef,max}$	in.	7½	10	12½	15	17½	20	25
Continuous Inspection	Temperature Range A[2,4]	Characteristic Bond Strength in Cracked Concrete[9]	$\tau_{k,cr}$	psi	1,448	1,402	1,356	1,310	1,265	1,219	1,128
Continuous Inspection	Temperature Range A[2,4]	Characteristic Bond Strength in Uncracked Concrete[9]	$\tau_{k,uncr}$	psi	2,357	2,260	2,162	2,064	1,967	1,868	1,672
Continuous Inspection	Temperature Range B[3,4]	Characteristic Bond Strength in Cracked Concrete[9]	$\tau_{k,cr}$	psi	1,201	1,163	1,125	1,087	1,050	1,012	936
Continuous Inspection	Temperature Range B[3,4]	Characteristic Bond Strength in Uncracked Concrete[9]	$\tau_{k,uncr}$	psi	1,957	1,876	1,795	1,713	1,632	1,551	1,388
Continuous Inspection	Anchor Category	Dry Concrete	—	—	1						
Continuous Inspection	Strength Reduction Factor	Dry Concrete	$\phi_{dry,ci}$	—	0.65[10]						
Continuous Inspection	Anchor Category	Water-Saturated Concrete, or Water-Filled Hole	—	—	3		2				
Continuous Inspection	Strength Reduction Factor	Water-Saturated Concrete, or Water-Filled Hole	$\phi_{wet,ci}$	—	0.45[10]		0.55[10]				
Periodic Inspection	Temperature Range A[2,4]	Characteristic Bond Strength in Cracked Concrete[9]	$\tau_{k,cr}$	psi	1,346	1,304	1,356	1,310	1,265	1,219	1,128
Periodic Inspection	Temperature Range A[2,4]	Characteristic Bond Strength in Uncracked Concrete[9]	$\tau_{k,uncr}$	psi	2,192	2,102	2,162	2,064	1,967	1,868	1,672
Periodic Inspection	Temperature Range B[3,4]	Characteristic Bond Strength in Cracked Concrete[9]	$\tau_{k,cr}$	psi	1,117	1,082	1,125	1087	1,050	1,012	936
Periodic Inspection	Temperature Range B[3,4]	Characteristic Bond Strength in Uncracked Concrete[9]	$\tau_{k,uncr}$	psi	1,820	1,744	1,795	1,713	1,632	1,551	1,388
Periodic Inspection	Anchor Category	Dry Concrete		—	2		1				
Periodic Inspection	Strength Reduction Factor	Dry Concrete	$\phi_{dry,pi}$	—	0.55[10]		0.65[10]				
Periodic Inspection	Anchor Category	Water-Saturated Concrete, or Water-Filled Hole	—	—	3						
Periodic Inspection	Strength Reduction Factor	Water-Saturated Concrete, or Water-Filled Hole	$\phi_{wet,pi}$	—	0.45[10]						
Reduction Factor for Seismic Tension			$\alpha_{N,seis}$[11]	—	1.0	0.9	1.0	1.0	1.0	1.0	1.0

1. The information presented in this table is to be used in conjunction with the design criteria of ACI 318-14 and ACI 318-11.
2. Temperature Range A: Maximum short-term temperature = 160°F, maximum long-term temperature = 110°F.
3. Temperature Range B: Maximum short-term temperature = 176°F, maximum long-term temperature = 110°F.
4. Short-term concrete temperatures are those that occur over short intervals (diurnal cycling). Long-term temperatures are roughly constant over significant periods of time.
5. The tabulated value of ϕ applies when the load combinations of ACI 318-14 5.3 or ACI 318-11 9.2 are used. If the load combinations of ACI 318-11 Appendix C are used, refer to ACI 318-11 D.4.4 to determine the appropriate value of ϕ.
6. The tabulated value of ϕ applies when both the load combinations of ACI 318-14 5.3, or ACI 318-11 9.2 are used and the requirements of ACI 318-14 17.3.3 (c) or ACI 318-11 D.4.3 (c), as applicable, for Condition B are met. If the load combinations of ACI 318-11 Appendix C are used, refer to ACI 318 D.4.4 (c) for Condition B to determine the appropriate value of ϕ.
7. Bond strength values shown are for normal-weight concrete having a compressive strength of f'_c = 2,500 psi. For higher compressive strengths up to 8,000 psi, the tabulated characteristic bond strength may be increased by a factor of $(f'_c/2{,}500)^{0.35}$ for uncracked concrete and a factor of $(f'_c/2{,}500)^{0.24}$ for cracked concrete.
8. For lightweight concrete, the modification factor for bond strength shall be as given in ACI 318-14 17.2.6 or ACI 318-11 D.3.6, as applicable, where applicable.
9. Characteristic bond strength values are for sustained loads, including dead and live loads.
10. The tabulated value of ϕ applies when both the load combinations of ACI 318-14 5.3, or ACI 318-11 9.2 are used and the requirements of ACI 318-14 17.3.3 (c) or ACI 318-11 D.4.3 (c), as applicable, for Condition B are met. If the load combinations of ACI 318-11 Appendix C are used, refer to ACI 318 D.4.4(c) for Condition B to determine the appropriate value of ϕ.
11. For anchors installed in regions assigned to Seismic Design Category C, D, E or F, the bond strength values must be multiplied by $\alpha_{N,seis}$.

* See p. 13 for an explanation of the load table icons.

SET-3G™ Design Information — Concrete

SET-3G Tension Strength Design Data for Rebar in Normal-Weight Concrete[1,8]

IBC *

Characteristic			Symbol	Units	Rebar Size						
					#3	#4	#5	#6	#7	#8	#10
Steel Strength in Tension											
Minimum Tensile Stress Area			A_{se}	in.^{2}	0.11	0.20	0.31	0.44	0.60	0.79	1.27
Tension Resistance of Steel — Rebar (ASTM A615 Grade 60)			N_{sa}	lb.	9,900	18,000	27,900	39,600	54,000	71,100	114,300
Tension Resistance of Steel — Rebar (ASTM A706 Grade 60)			N_{sa}	lb.	8,800	16,000	24,800	35,200	48,000	63,200	101,600
Strength Reduction Factor for Tension — Steel Failure			ϕ	—	0.75[5]						
Concrete Breakout Strength in Tension (2,500 psi ≤ f'_c ≤ 8,000 psi)											
Effectiveness Factor for Cracked Concrete			$k_{c,cr}$	—	17						
Effectiveness Factor for Uncracked Concrete			$k_{c,uncr}$	—	24						
Strength Reduction Factor — Concrete Breakout Failure in Tension			ϕ	—	0.65[6]						
Bond Strength in Tension (2,500 psi ≤ f'_c ≤ 8,000 psi)[7]											
Minimum Embedment			$h_{ef,min}$	in.	2⅜	2¾	3⅛	3½	3¾	4	5
Maximum Embedment			$h_{ef,max}$	in.	7½	10	12½	15	17½	20	25
Continuous Inspection	Temperature Range A[2,4]	Characteristic Bond Strength in Cracked Concrete[9]	$\tau_{k,cr}$	psi	1,448	1,402	1,356	1,310	1,265	1,219	1,128
Continuous Inspection	Temperature Range A[2,4]	Characteristic Bond Strength in Uncracked Concrete[9]	$\tau_{k,uncr}$	psi	2,269	2,145	2,022	1,898	1,774	1,651	1,403
Continuous Inspection	Temperature Range B[3,4]	Characteristic Bond Strength in Cracked Concrete[9]	$\tau_{k,cr}$	psi	1,201	1,163	1,125	1,087	1,050	1,012	936
Continuous Inspection	Temperature Range B[3,4]	Characteristic Bond Strength in Uncracked Concrete[9]	$\tau_{k,uncr}$	psi	1,883	1,781	1,678	1,575	1,473	1,370	1,165
Continuous Inspection	Anchor Category	Dry Concrete	—	—	1						
Continuous Inspection	Strength Reduction Factor	Dry Concrete	$\phi_{dry,ci}$	—	0.65[10]						
Continuous Inspection	Anchor Category	Water-Saturated Concrete, or Water-Filled Hole	—	—	3		2				
Continuous Inspection	Strength Reduction Factor	Water-Saturated Concrete, or Water-Filled Hole	$\phi_{wet,ci}$	—	0.45[10]		0.55[10]				
Periodic Inspection	Temperature Range A[2,4]	Characteristic Bond Strength in Cracked Concrete[9]	$\tau_{k,cr}$	psi	1,346	1,304	1,356	1,310	1,265	1,219	1,128
Periodic Inspection	Temperature Range A[2,4]	Characteristic Bond Strength in Uncracked Concrete[9]	$\tau_{k,uncr}$	psi	2,110	1,995	2,022	1,898	1,774	1,651	1,403
Periodic Inspection	Temperature Range B[3,4]	Characteristic Bond Strength in Cracked Concrete[9]	$\tau_{k,cr}$	psi	1,117	1,082	1,125	1,087	1,050	1,012	936
Periodic Inspection	Temperature Range B[3,4]	Characteristic Bond Strength in Uncracked Concrete[9]	$\tau_{k,uncr}$	psi	1,751	1,656	1,678	1,575	1,473	1,370	1,165
Periodic Inspection	Anchor Category	Dry Concrete	—	—	2		1				
Periodic Inspection	Strength Reduction Factor	Dry Concrete	$\phi_{dry,pi}$	—	0.55[10]		0.65[10]				
Periodic Inspection	Anchor Category	Water-Saturated Concrete, or Water-Filled Hole	—	—	3						
Periodic Inspection	Strength Reduction Factor	Water-Saturated Concrete, or Water-Filled Hole	$\phi_{wet,pi}$	—	0.45[10]						
Reduction Factor for Seismic Tension			$\alpha_{N,seis}$[11]	—	1.0	1.0	1.0	1.0	1.0	1.0	1.0

1. The information presented in this table is to be used in conjunction with the design criteria of ACI 318-14 and ACI 318-11.
2. Temperature Range A: Maximum short-term temperature = 160°F, maximum long-term temperature = 110°F.
3. Temperature Range B: Maximum short-term temperature = 176°F, maximum long-term temperature = 110°F.
4. Short-term concrete temperatures are those that occur over short intervals (diurnal cycling). Long-term temperatures are roughly constant over significant periods of time.
5. The tabulated value of ϕ applies when the load combinations of ACI 318-14 5.3 or ACI 318-11 9.2 are used. If the load combinations of ACI 318-11 Appendix C are used, refer to ACI 318-11 D.4.4 to determine the appropriate value of ϕ.
6. The tabulated value of ϕ applies when both the load combinations of ACI 318-14 5.3, or ACI 318-11 9.2 are used and the requirements of ACI 318-14 17.3.3 (c) or ACI 318-11 D.4.3 (c), as applicable, for Condition B are met. If the load combinations of ACI 318-11 Appendix C are used, refer to ACI 318 D.4.4(c) for Condition B to determine the appropriate value of ϕ.
7. Bond strength values shown are for normal-weight concrete having a compressive strength of f'_c = 2,500 psi. For higher compressive strengths up to 8,000 psi, the tabulated characteristic bond strength may be increased by a factor of $(f'_c/2{,}500)^{0.36}$ for uncracked concrete and a factor of $(f'_c/2{,}500)^{0.25}$ for cracked concrete.
8. For lightweight concrete, the modification factor for bond strength shall be as given in ACI 318-14 17.2.6 or ACI 318-11 D.3.6, as applicable, where applicable.
9. Characteristic bond strength values are for sustained loads, including dead and live loads.
10. The tabulated value of ϕ applies when both the load combinations of ACI 318-14 5.3, or ACI 318-11 9.2 are used and the requirements of ACI 318-14 17.3.3 (c) or ACI 318-11 D.4.3 (c), as applicable, for Condition B are met. If the load combinations of ACI 318-11 Appendix C are used, refer to ACI 318 D.4.4(c) for Condition B to determine the appropriate value of ϕ.
11. For anchors installed in regions assigned to Seismic Design Category C, D, E or F, the bond strength values must be multiplied by $\alpha_{N,seis}$.

* See p. 13 for an explanation of the load table icons.

SET-3G Shear Strength Design Data for Threaded Rod in Normal-Weight Concrete[1]

*

Characteristic	Symbol	Units	Nominal Rod Diameter (in.)						
			3/8	1/2	5/8	3/4	7/8	1	1 1/4
Steel Strength in Shear									
Minimum Shear Stress Area	A_{se}	in.^{2}	0.078	0.142	0.226	0.334	0.462	0.606	0.969
Shear Resistance of Steel — ASTM F1554, Grade 36	V_{sa}	lb.	2,715	4,940	7,865	11,625	16,080	21,090	33,720
Shear Resistance of Steel — ASTM F1554, Grade 55			3,510	6,390	10,170	15,030	20,790	27,270	43,605
Shear Resistance of Steel — ASTM A193, Grade B7			5,850	10,650	16,950	25,050	34,650	45,450	72,675
Reduction factor for Seismic Shear — Carbon Streel	$\alpha_{V,seis}$[4]	—	0.75					1.0	
Shear Resistance of Steel — Stainless Steel ASTM A193, Grade B8 and B8M (Types 304 and 316)	V_{sa}	lb.	2,665	4,855	7,730	11,425	15,800	20,725	33,140
Shear Resistance of Steel — Stainless Steel ASTM F593 CW (Types 304 and 316)			4,680	8,520	13,560	17,035	23,560	30,905	49,420
Shear Resistance of Steel — Stainless Steel ASTM A193, Grade B6 (Type 410)			5,150	9,370	14,915	22,040	30,490	40,000	63,955
Reduction factor for Seismic Shear — Stainless Steel	$\alpha_{V,seis}$[4]	—	0.80		0.75			1.0	
Strength Reduction Factor for Shear — Steel Failure	ϕ	—	0.65[2]						
Concrete Breakout Strength in Shear									
Outside Diameter of Anchor	d_a	in.	0.375	0.5	0.625	0.75	0.875	1	1.25
Load-Bearing Length of Anchor in Shear	l_e	in.	h_{ef}						
Strength Reduction Factor for Shear — Breakout Failure	ϕ	—	0.70[3]						
Concrete Pryout Strength in Shear/									
Load-Bearing Length of Anchor in Shear	k_{cp}	in.	1.0 for $h_{ef} < 2.50$"; 2.0 for $h_{ef} \geq 2.50$"						
Strength Reduction Factor for Shear — Breakout Failure	ϕ	—	0.70[3]						

1. The information presented in this table is to be used in conjunction with the design criteria of ACI 318-14 and ACI 318-11.
2. The tabulated value of ϕ applies when the load combinations of ACI 318-14 5.3 or ACI 318-11 9.2 are used. If the load combinations of ACI 318-11 Appendix C are used, refer to ACI 318-11 D.4.4 to determine the appropriate value of ϕ.
3. The tabulated value of ϕ applies when both the load combinations of ACI 318-14 5.3, or ACI 318-11 9.2 are used and the requirements of ACI 318-14 17.3.3 (c) or ACI 318-11 D.4.3 (c), as applicable, for Condition B are met. If the load combinations of ACI 318-11 Appendix C are used, refer to ACI 318 D.4.4 (c) for Condition B to determine the appropriate value of ϕ.
4. The values of V_{sa} are applicable for both cracked concrete and uncracked concrete. For anchors installed in regions assigned to Seismic Design Category C, D, E or F, V_{sa} must be multiplied by α_{Vseis} for the corresponding anchor steel type.

* See p. 13 for an explanation of the load table icons.

SET-3G™ Design Information — Concrete

SET-3G Shear Strength Design Data for Rebar in Normal-Weight Concrete[1]

Characteristic	Symbol	Units	Nominal Rod Diameter (in.)						
			#3	#4	#5	#6	#7	#8	#10
Steel Strength in Shear									
Minimum Shear Stress Area	A_{se}	in.^{2}	0.110	0.200	0.310	0.440	0.600	0.790	1.270
Shear Resistance of Steel — Rebar (ASTM A615 Grade 60)	V_{sa}	lb.	5,940	10,800	16,740	23,760	32,400	42,660	68,580
Shear Resistance of Steel — Rebar (ASTM A706 Grade 60)			5,280	9,600	14,880	21,120	28,800	37,920	60,960
Reduction Factor for Seismic Shear — Rebar (ASTM A615 Grade 60)	$\alpha_{V,seis}$[4]	—	0.60					0.8	
Reduction Factor for Seismic Shear — Rebar (ASTM A706 Grade 60)			0.60					0.8	
Strength Reduction Factor for Shear — Steel Failure	ϕ	—	0.65[2]						
Concrete Breakout Strength in Shear									
Outside Diameter of Anchor	d_a	in.	0.375	0.5	0.625	0.75	0.875	1	1.25
Load-Bearing Length of Anchor in Shear	l_e	in.	h_{ef}						
Strength Reduction Factor for Shear — Breakout Failure	ϕ	—	0.70[3]						
Concrete Pryout Strength in Shear									
Load-Bearing Length of Anchor in Shear	k_{cp}	in.	1.0 for $h_{ef} < 2.50$"; 2.0 for $h_{ef} \geq 2.50$"						
Strength Reduction Factor for Shear — Breakout Failure	ϕ	—	0.70[3]						

1. The information presented in this table is to be used in conjunction with the design criteria of ACI 318-14 and ACI 318-11.
2. The tabulated value of ϕ applies when the load combinations of ACI 318-14 5.3 or ACI 318-11 9.2 are used. If the load combinations of ACI 318-11 Appendix C are used, refer to ACI 318-11 D.4.4 to determine the appropriate value of ϕ.
3. The tabulated value of ϕ applies when both the load combinations of ACI 318-14 5.3 or ACI 318-11 9.2 are used and the requirements of ACI 318-14 17.3.3 (c) or ACI 318-11 D.4.3 (c), as applicable, for Condition B are met. If the load combinations of ACI 318-11 Appendix C are used, refer to ACI 318 D.4.4 (c) for Condition B to determine the appropriate value of ϕ.
4. The values of V_{sa} are applicable for both cracked concrete and uncracked concrete. For anchors installed in regions assigned to Seismic Design Category C, D, E or F, V_{sa} must be multiplied by α_{Vseis} for the corresponding anchor steel type.

For additional load tables, visit **strongtie.com/set3g**.

* See p. 13 for an explanation of the load table icons.