PRODUCT SUBMITTAL / SUBSTITUTION REQUEST

TO:

PROJECT:

SPECIFIED ITEM:

Section *Page* *Paragraph* *Description*

PRODUCT SUBMITTAL / SUBSTITUTION REQUESTED:

AC100+ Gold Adhesive Anchoring System for Uncracked Concrete.

Code listed as given in ICC-ES ESR-2582 (www.Powers.com)

The attached submittal package includes the product description, specifications, drawings, and performance data for use in the evaluation of the request.

SUBMITTED BY:

Name: *Signature:*

Company:

Address:

Date: *Telephone:* *Fax:*

FOR USE BY THE ARCHITECT AND/OR ENGINEER

☐ ***Approved*** ☐ ***Approved as Noted*** ☐ ***Not Approved***

(If not approved, please briefly explain why the product was not accepted.)

By: *Date:*

Remarks:

AC100+ Gold® *Vinylester Injection Adhesive Anchoring System*

PRODUCT DESCRIPTION

The AC100+ Gold is a two-component vinylester adhesive anchoring system. The system includes injection adhesive in plastic cartridges, mixing nozzles, dispensing tools and hole cleaning equipment. The AC100+ Gold is designed for bonding threaded rod and reinforcing bar elements into drilled holes in concrete and masonry base materials.

GENERAL APPLICATIONS AND USES

Bonding threaded rod and reinforcing bar into hardened concrete and masonry
Evaluated for use in dry and water-saturated concrete including water filled holes
Suitable to resist structural loads in uncracked concrete base materials for cases where anchor design theory and criteria applies
Can be installed in a wide range of base material temperatures

FEATURES AND BENEFITS

- Designed for use with threaded rod and reinforcing bar hardware elements
- Consistent performance in low and high strength concrete (2,500 to 8,500 psi)
- Evaluated and recognized for a range of embedments and for interior and exterior applications
- Versatile low odor formula with quick cure time
- Mixing nozzles proportion adhesive and provide simple delivery method into drilled holes
- Cartridge design allows for multiple uses using extra mixing nozzles

TESTING AND EVALUATION

+ Tested and evaluated by an accredited independent laboratory in accordance with ICC-ES AC308 criteria and ASTM E 1512 for anchoring in uncracked concrete, including but not limited to the following:
+ Reliability testing for freeze/thaw conditions
+ Reliability testing for sensitivity to hole cleaning, mixing effort and installation direction
+ Reliability testing for sustained loads, i.e. creep resistance (see applicable long-term and short term temperature ranges)
+ Service condition testing at decreased and elevated temperatures
+ Service condition testing in low and high strength concrete
+ Service condition testing for resistance to alkalinity and sulfur exposure

APPROVALS AND LISTINGS

International Code Council, Evaluation Service (ICC-ES) ESR-2582
Code compliant with the 2006 IBC, 2006 IRC, 2003 IBC, 2003 IRC, 2000 IBC, 2000 IRC, 1997 UBC
Tested in accordance with ICC-ES AC308 for use in structural concrete and design with ACI 318 Appendix D (Strength Design) and as amended by provisions of ICC-ES AC308 Annex A, Section 3.3 (www.icc-es.org)
Compliant with NSF/ANSI Standard 61 for drinking water system components – health effects; minimum requirements for materials in contact with potable water and water treatment
Conforms to requirements of ASTM C 881, Types I, II, IV and V, Grade 3, Classes A & B (meets Type III with exception of elongation)
Department of Transportation listings – see www.powers.com or contact transportation agency

GUIDE SPECIFICATIONS

CSI Divisions: *03151-Concrete Anchoring, 04081 Masonry Anchorage and 05090-Metal Fastenings.*
Adhesive anchoring system shall be AC100+ Gold as supplied by Powers Fasteners, Inc., Brewster, NY. Anchors shall be installed in accordance with published instructions and requirements of the Authority Having Jurisdiction.

This Product Available In

PDA®

Powers Design Assist
Real Time Anchor Design Software
www.powersdesignassist.com

SECTION CONTENTS Page No.

AC100+ Gold coaxial cartridge with mixing nozzle

AC100+ Gold dual cartridge with mixing nozzle and extension

PACKAGING

Coaxial Cartridge
5 fl. oz. (150 ml or 9.2 in³)
10 fl. oz. (280 ml or 17.1 in³)

Dual (side-by-side) Cartridge
8 fl. oz. (235 ml or 14.3 in³)
12 fl. oz. (345 ml or 21.0 in³)
28 fl. oz. (825 ml or 50.3 in³)

STORAGE LIFE & CONDITIONS

Fifteen months in a dry, dark environment with temperature ranging from 32ºF and 86ºF (-0ºC to 30ºC)

ANCHOR SIZE RANGE (TYP.)

3/8" to 1-1/4" diameter threaded rod
No. 3 to No.10 reinforcing bar (rebar)

SUITABLE BASE MATERIALS

Normal-weight concrete
Grouted concrete masonry (CMU)
Hollow concrete masonry (CMU)
Brick masonry

SEISMIC REGION QUALIFICATION NSF

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INSTALLATION SPECIFICATIONS

Installation Specifications for Threaded Rod and Reinforcing Bar (Solid Concrete Base Materials)

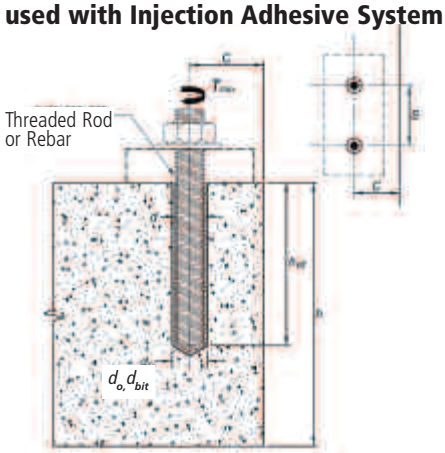
Dimension/Property		Notation	Units	Nominal Anchor Size								
Threaded rod		-	-	**3/8″**	**1/2″**	**5/8″**	**3/4″**	**7/8″**	**1″**	**-**	**1-1/4″**	**-**
Reinforcing bar		-	-	**#3**	**#4**	**#5**	**#6**	**#7**	**#8**	**#9**	**-**	**#10**
Nominal anchor diameter		d	in. (mm)	0.375 (9.5)	0.500 (12.7)	0.625 (15.9)	0.750 (19.1)	0.875 (22.2)	1.000 (25.4)	1.125 (28.6)	1.250 (31.8)	1.250 (31.8)
Nominal diameter of drilled hole		d_o, (d_{bit})	in.	7/16 ANSI	9/16 ANSI	11/16 or 3/4 ANSI	7/8 ANSI	1 ANSI	1-1/8 ANSI	1-3/8 ANSI	1-3/8 ANSI	1-1/2 ANSI
Minimum embedment[1]		$h_{ef,min}$	in. (mm)	2-3/8 (61)	2-3/4 (70)	3-1/8 (79)	3-1/2 (89)	3-1/2 (89)	4 (102)	4-1/2 (114)	5 (127)	5 (127)
Maximum embedment[1]		$h_{ef,max}$	in. (mm)	4-1/2 (114)	6 (153)	7-1/2 (191)	9 (229)	10-1/2 (267)	12 (305)	13-1/2 (343)	15 (381)	15 (381)
Minimum concrete member thickness[1]		h_{min}	in. (mm)	h_{ef} + 1-1/4 (h_{ef} + 30)		$h_{ef} + 2d_o$						
Minimum spacing distance[1,2]		s_{min}	in. (mm)	1-7/8 (48)	2-1/2 (64)	3-1/8 (80)	3-3/4 (95)	4-3/8 (111)	5 (127)	5-5/8 (143)	6-1/4 (159)	6-1/4 (159)
Minimum edge distance[1]		c_{min}	in. (mm)	1-3/4 (44)	1-3/4 (44)	1-3/4 (44)	1-3/4 (44)	1-3/4 (44)	1-3/4 (44)	2-3/4 (70)	2-3/4 (70)	2-3/4 (70))
Maximum torque[2] (only possible after full cure time of adhesive)	A36 or F1554 carbon steel rod	T_{max}	ft.-lb. (N-m)	10 (13)	25 (34)	50 (68)	90 (122)	125 (169)	165 (224)	-	280 (379)	-
	F593 Condition CW stainless steel rod or ASTM A193, Grade B7 carbon steel rod	T_{max}	ft.-lb. (N-m)	16 (22)	33 (45)	60 (81)	105 (142)	125 (169)	165 (224)	-	280 (379)	-

1. For use with the design provisions of ACI 318 Appendix D and ICC-ES AC308 Annex A, Section 3.3 and ESR-2582.
2. For installations between the minimum edge distance and 5 anchor diameters, the tabulated maximum torque must be reduced (multiplied) by a factor of 0.45.

Installation Specifications for Threaded Rod (Hollow Base Material)

Dimentions/property	Notation	Units	Nominal Size	
			3/8″	1/2″
Nominal threaded rod diameter	d	in (mm)	0.375 (9.5)	0.500 (12.7)
Nominal plastic or stainless steel tube dia.	-	in.	3/8	1/2
Nominal diameter of drilled hole	d_o, (d_{bit})	in	1/2 ANSI	5/8 ANSI
Maximum torque (only possible after full cure time of adhesive)	T_{max}	ft.-lb. (N-m)	10 (8)	10 (8)

Detail of Steel Hardware Elements used with Injection Adhesive System



Threaded Rod and Deformed Reinforcing Bar Material Properties				
Steel Description (General)	**Steel Specification (ASTM)**	**Nominal Anchor Size (inch)**	**Minimum Yield Strength, f_y (ksi)**	**Minimum Ultimate Strength, f_u (ksi)**
Carbon rod	A 36 or F1554 Grade 36	3/8 through 1-1/4	36.0	58.0
Stainless rod (Alloy 304 / 316)	F 593, Condition CW	3/8 through 5/8	65.0	100.0
		3/4 through 1-1/4	45.0	85.0
High strength carbon rod	A 193, Grade B7	3/8 through 1-1/4	105.0	125.0
Grade 60 reinforcing bar	A 615, A 706, A 767, or A 996	3/8 through 1-1/4 (#3 through #10)	60.0	90.0
Grade 40 reinforcing bar	A 615 or A 767	3/8 through 3/4 (#3 through #6)	40.0	60.0

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INSTALLATION INSTRUCTIONS (SOLID BASE MATERIAL)

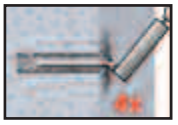
DRILLING

1- Drill a hole into the base material with a rotary hammer drill tool to the size and embedment required by the selected steel anchor element (*see installation specifications for threaded rod and reinforcing bar in solid concrete base material*). The tolerances of the carbide drill bit should meet the requirements of ANSI Standard B212.15.

Precaution: Wear suitable eye and skin protection. Avoid inhalation of dusts during drilling and/or removal.

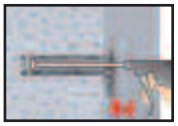
Note! After drilling and prior to hole cleaning, all standing water in the drilled bore hole must be removed if present (e.g. vacuum, compressed air, etc.)

HOLE CLEANING ➔ BLOW 4x, BRUSH 4x, BLOW 4x

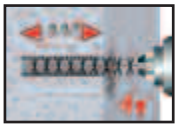


2a - Starting from the bottom or back of the anchor hole, blow the hole clean using a compressed air nozzle (min. 90 psi) or a hand pump (supplied by Powers Fasteners) a minimum of *four* times (4x).

• Use a compressed air nozzle (min. 90 psi) or a hand pump (min. volume 25 fl. oz.) for anchor rod 3/8" to 3/4" diameter or reinforcing bar (rebar) sizes #3 to #6.

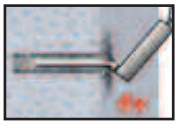


• Use a compressed air nozzle (min. 90 psi) for anchor rod 7/8" to 1-1/4" diameter and rebar sizes #7 to #10. A hand pump shall not be used with these anchor sizes.



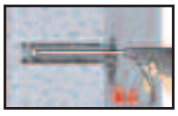
2b - Determine wire brush diameter (*see hole cleaning equipment selection table*) and attach the brush with adaptor to a rotary drill tool or battery screwgun. Brush the hole with the selected wire brush a minimum of *four* times (4x). A brush extension (supplied by Powers Fasteners, Cat. #08282) should be used for holes drilled deeper than the listed brush length.

The wire brush diameter should be checked periodically during use. The brush must be replaced if it becomes worn (less than D_{min}, *see hole cleaning equipment selection table*) or does not come into contact with the sides of the drilled hole.



2c - Finally, blow the hole clean again a minimum of *four* times (4x).

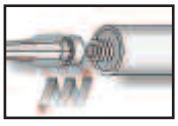
• Use a compressed air nozzle (min. 90 psi) or a hand pump (min. volume 25 fl. oz.) for anchor rod 3/8" to 3/4" diameter or reinforcing bar (rebar) sizes #3 to #6.



• Use a compressed air nozzle (min. 90 psi) for anchor rod 7/8" to 1-1/4" diameter and rebar sizes #7 to #10. A hand pump shall not be used with these anchor sizes.

When finished the hole should be clean and free of dust, debris, ice, grease, oil or other foreign material.

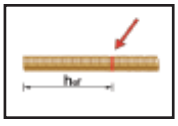
PREPARING



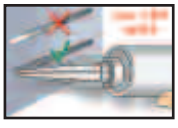
3- Check adhesive expiration date on cartridge label. Do not use expired product. Review Material Safety Data Sheet (MSDS) before use. Cartridge temperature must be between 32°F - 95°F (0°C - 35°C) when in use. Review gel (working) and cure time table. Consideration should be given to the reduced gel time of the adhesive in warm temperatures.

Attach a supplied mixing nozzle to the cartridge. Do not modify the mixer in any way and make sure the mixing element is inside the nozzle. Load the cartridge into the correct dispensing tool.

Note: Always use a new mixing nozzle with new cartridges of adhesive and also for all work interruptions exceeding the published working time of the adhesive.



4- Prior to inserting the anchor rod or rebar into the filled bore hole, the position of the embedment depth has to be marked on the anchor. Verify anchor element is straight and free of surface damage.



5- Adhesive must be properly mixed to achieve published properties. Prior to dispensing adhesive into the drilled hole, separately dispense at least three full strokes of adhesive through the mixing nozzle until the adhesive is a consistent ***gray*** color. Do not attach a used nozzle when changing to a new cartridge.

Review and note the published working and cure times (*see gel time and curing time table*) prior to injection of the mixed adhesive into the cleaned anchor hole.

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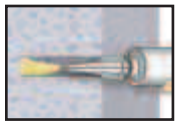
INSTALLATION INSTRUCTIONS (SOLID BASE MATERIAL)

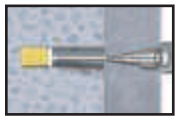
INSTALLATION



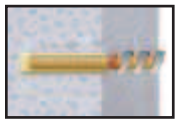
6- Fill the cleaned hole approximately two-thirds full with mixed adhesive starting from the bottom or back of the anchor hole. Slowly withdraw the mixing nozzle as the hole fills to avoid creating air pockets or voids. For embedment depth greater than 7-1/2" an extension nozzle (3/8" dia.) must be used with the mixing nozzle.

Piston plugs (*see adhesive piston plug table*) must be used with and attached to mixing nozzle and extension tube for horizontal and overhead installations with anchor rod from 3/4" to 1-1/4" diameter and rebar sizes #6 to #10. Insert piston plug to the back of the drilled hole and inject as described in the method above. During installation the piston plug will be naturally extruded from the drilled hole by the adhesive pressure.

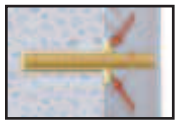
With Piston Plug:



Attention! Do not install anchors overhead without proper training and installation hardware provided by Powers Fasteners. Contact Powers for details prior to use.

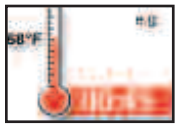


7- The anchor should be free of dirt, grease, oil or other foreign material. Push clean threaded rod or reinforcing bar into the anchor hole while turning slightly to ensure positive distribution of the adhesive until the embedment depth is reached. Observe the gel (working) time.



8- Be sure that the anchor is fully seated at the bottom of the hole and that some adhesive has flowed from the hole and all around the top of the anchor. If there is not enough adhesive in the hole, the installation must be repeated. The anchor shall not be moved after placement and during cure.

CURING AND LOADING



9- Allow the adhesive anchor to cure to the specified full curing time prior to applying any load *(see gel time and curing time table).*

Do not disturb, torque or load the anchor until it is fully cured.

10- After full curing of the adhesive anchor, a fixture can be installed to the anchor and tightened up to the maximum torque *(see installation specifications for threaded rod and reinforcing bar in solid concrete base material)* by using a calibrated torque wrench.

Take care not to exceed the maximum torque for the selected anchor.

INSTALLATION INSTRUCTIONS (HOLLOW BASE MATERIAL)

DRILLING

1- Drill a hole into the base material with a rotary drill tool to the size and embedment for the required screen size *(see installation specifications for threaded rod in hollow concrete base material)*. The tolerances of the drill bit used should meet the requirements of ANSI B212.15.

Precaution: Wear suitable eye and skin protection. Avoid inhalation of dusts during grilling and/or removal.

HOLE CLEANING ➔ BLOW 2x, BRUSH 2x, BLOW 2x

2- Starting from the bottom or back of the anchor hole, blow the hole clean with a hand pump (min. volume 25 fl.oz. supplied by Powers Fasteners) or compressed air nozzle a minimum of *two* times (2x).

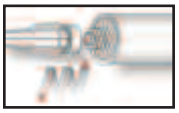
• Determine the wire brush diameter (*see hole cleaning equipment selection table*) and attach the brush with adaptor to a rotary drill tool or battery screw gun. Brush the hole with the selected wire brush a minimum of *two* times (2x). A brush extension (supplied by Powers Fasteners, Cat #08282) should be used for holes drilled deeper than the listed brush length.

The wire brush should be checked periodically during use. The brush must be replaced if it becomes worn (less than D_{min}, *see hole cleaning equipment selection table*) or does not come in contact with sides of the drill hole.

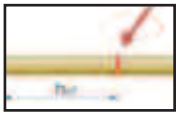
• Finally, blow the hole clean again a minimum of *two* times (2x)

When finished the hole should be clean and free of dust, debris, ice, grease, oil or other foreign material.

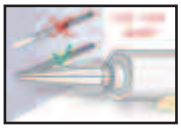
PREPARING



3- Check adhesive expiration date on cartridge label. Do not use expired product. Review Material Safety Data Sheet (MSDS) before use. Cartridge temperature must be between 32°F - 95°F (0°C - 35°C) when in use. Review gel (working) time and curing time table. Consideration should be given to the reduced gel (working) time of the adhesive in warm temperatures.



Attach a supplied mixing nozzle to the cartridge. Do not modify the mixer in any way and make sure the mixing element is inside the nozzle. Load the cartridge into the correct dispensing tool.
Note: Always use a new mixing nozzle with new cartridges of adhesive and also for all work interruptions exceeding the published working time of the adhesive.

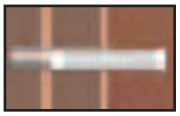


4- Prior to inserting the anchor rod into the filled screen tube, the position of the embedment depth has to be marked on the anchor. Verify anchor element is straight and free of surface damage.

5- Adhesive must be properly mixed to achieve published properties. Prior to dispensing adhesive into the drilled hole, separately dispense at least three full strokes of adhesive through the mixing nozzle until the adhesive is a consistent ***gray*** color. Do not attach a used nozzle when changing to a new cartridge.

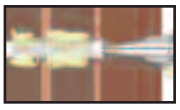
Review and note the published working and cure times (*see gel time and curing time table*) prior to injection of the mixed adhesive into the screen tube.

INSTALLATION



6- Insert a screen tube of suitable length into the cleaned anchor hole.

7- Fill the screen tube full with adhesive starting from the bottom or back of the tube. Slowly withdraw the mixing nozzle as the screen fills to avoid creating air pockets or voids. A plastic extension tube supplied by Powers Fasteners must be used with the mixing nozzle if the back of the screen tube cannot be reached.



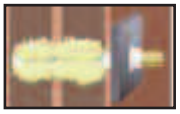
8- Prior to inserting the anchor rod into the screen tube inspect it to ensure that it is free of dirt, grease, oil or other foreign material.

Push the threaded rod into the screen tube while turning slightly to ensure positive distribution of the adhesive until back of the tube is reached.

CURING AND FIXTURE

9- Allow the adhesive anchor to cure to the specified full curing time prior to applying any load.

Do not disturb, torque or load the anchor until it is fully cured (*see gel time and curing time table*).



10- After full curing of the adhesive anchor, a fixture can be installed to the anchor and tightened up to the maximum torque *(see installation specifications for threaded rod and reinforcing bar in hollow base material)* by using a calibrated torque wrench.

Take care not to exceed the maximum torque for the selected anchor.

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REFERENCE TABLES FOR INSTALLATION

Gel (working) Time and Curing Time Table for AC100+ Gold			
Temperature of base material		Gel (working) time	Full curing time
°F	°C		
14	-10	90 minutes	24 hours
23	-5	90 minutes	14 hours
32	0	45 minutes	7 hours
41	5	25 minutes	2 hours
50	10	15 minutes	90 minutes
68	20	6 minutes	45 minutes
86	30	4 minutes	25 minutes
95	35	2 minutes	20 minutes
104	40	1.5 minutes	15 minutes

The gel (working) times listed for 32°F to 95°F are also applicable for the temperature of the adhesive and use of mixing nozzes during installation.
For installations in base material tempertures between 14°F and 23°F the cartridge temperature must be conditioned to between 68°F and 95°F (20°C - 35 °C).

Hole Cleaning Equipment Selection Table for AC100+ Gold							
Threaded rod diameter (inch)	Rebar size (no.)	ANSI drill bit diameter (inch)	Min. brush diameter, D_{min} (inches)	Brush length, L (inches)	Steel wire brush (Cat. #)	Blowout tool	Number of cleaning actions
Solid Base Material							
3/8	#3	7/16	0.475	6-3/4	08284	Hand-pump (Cat#08280) or compressed air nozzle	4x blowing 4x brushing 4x blowing
1/2	#4	9/16	0.600	6-3/4	08285		
5/8	#5	11/16	0.735	7-7/8	08286		
5/8	#5	3/4	0.780	7-7/8	08278		
3/4	#6	7/8	0.920	7-7/8	08287		
7/8	#7	1	1.045	11-7/8	08288	Compressed air nozzle only	
1	#8	1-1/8	1.175	11-7/8	08289		
1-1/4	#9	1-3/8	1.425	11-7/8	08290		
-	#10	1-1/2	1.550	11-7/8	08291		
Hollow Base Material							
3/8	-	1/2	0.600	7-7/8	08285	Hand pump (Cat# 08280) or compressed air nozzle	2x blowing 2x brushing 2x blowing
1/2	-	5/8	0.735	7-7/8	08286		

An SDS-plus adaptor (Cat. #08283) or Jacobs chuck style adaptor (Cat. #08296) is required to attach a steel wire brush to the drill tool.
A brush extension (Cat#08282) should be used for holes drilled deeper than the listed brush length.

Adhesive Piston Plugs					
Threaded rod diameter (inch)	Rebar size (no.)	ANSI drill bit diameter (inch)	Plug Size (inch)	Plastic Plug (Cat. #)	Horizontal and overhead installations
3/4	#6	7/8	7/8	08300	
7/8	#7	1	1	08301	
1	#8	1-1/8	1-1/8	08303	
1-1/4	#9	1-3/8	1-3/8	08305	
-	#10	1-1/2	1-1/2	08309	

A plastic extension tube (3/8" dia., Cat# 08281) must be used with piston plugs.

SD PERFORMANCE DATA

Tension Design Information for Threaded Rod and Reinforcing Bar in Normal-Weight Concrete (For use with load combinations taken from ACI 318 Section 9.2)[1,2,3]

Design Characteristic		Notation	Units	Nominal Anchor Size							
				3/8"	1/2"	5/8"	3/4"	7/8"	1"	-	1-1/4"
				#3	#4	#5	#6	#7	#8	#9	#10
Minimum embedment depth		$h_{ef,min}$	in. (mm)	2-3/8 (60)	2-3/4 (70)	3-1/8 (79)	3-1/2 (89)	3-1/2 (89)	4 (102)	4-1/2 (114)	5 (127)
STEEL STRENGTH IN TENSION											
Effective cross sectional area of threaded rod		A_{se}	in.^{2} (mm^2)	0.078 (50)	0.142 (92)	0.226 (146)	0.335 (216)	0.462 (298)	0.606 (391)	-	0.969 (625)
Steel strength in tension	Carbon rod (ASTM A 36 or F1554, Grade C)	N_{sa}	lb (kN)	4,525 (20.1)	8,235 (36.6)	13,110 (58.3)	19,430 (86.4)	26,795 (119.2)	35,150 (156.3)	-	56,200 (250.0)
	Stainless steel rod - alloy 304/316 (ASTM F 593, Condition CW)	N_{sa}	lb (kN)	7,800 (34.7)	14,200 (63.2)	22,600 (100.5)	28,475 (126.7)	39,270 (174.7)	51,510 (645)	-	82,365 (366.4)
	High strength carbon rod (ASTM A 193, Grade B7)	N_{sa}	lb (kN)	9,360 (41.6)	17,040 (75.8)	27,120 (120.6)	40,200 (178.8)	55,440 (246.6)	72,720 (323.5)	-	116,280 (517.2)
Effective cross sectional area of reinforcing bar		A_{se}	in.^{2} (mm^2)	0.110 (71)	0.200 (129)	0.310 (200)	0.440 (284)	0.600 (387)	0.790 (510)	1,000 (645)	1.270 (819)
Steel strength in tension, Grade 60 reinforcing bars		N_{sa}	lb (kN)	9,900 (44.0)	18,000 (80.1)	27,900 (124.1)	39,600 (176.1)	54,000 (240.2)	71,100 (316.3)	90,000 (400.3)	114,300 (508.4)
Steel strength in tension, Grade 40 reinforcing bars		N_{sa}	lb (kN)	6,600 (29.4)	12,000 (53.4)	18,600 (82.7)	26,400 (117.4)	-	-	-	-
Reduction factor for steel strength		ϕ	-	0.75 (0.65 for stainless steel rod)							
CONCRETE BREAKOUT STRENGTH IN TENSION											
Effectiveness factor for uncracked concrete		k_{uncr}	-	24	24	24	24	24	24	24	24
Modification factor for uncracked concrete		$\Psi_{c,N}$	-	For all design cases use $\Psi_{c,N} = 1.0$							
Critical edge distance[6]		c_{ac}	in. (mm)	$c_{ac} = 1.5h_{ef}$ for $h/h_{ef} \geq 2$; $c_{ac} = 1.5h_{ef}\ [3\text{-}h/h_{ef}]$ for $1.3h_{ef} < h < 2h_{ef}$; $c_{ac} = 2.55h_{ef}$ for $h/h_{ef} \geq 1.3$							
Critical spacing distance		s_{ac}	in. (mm)	$2c_{ac}$							
Reduction factor for concrete breakout strength		ϕ	-	0.65 (Condition B)							
BOND STRENGTH IN TENSION FOR TEMPERATURE RANGE[4] Maximum long term temperature = 75°F (24°C), Maximum short term temperature = 104°F (40°C)											
Dry hole	Characteristic bond strength, uncracked concrete (2,500 psi)	$\tau_{k,uncr}$	psi (N/mm^2)	1,450 (10.0)	1,450 (10.0)	1,450 (10.0)	1,450 (10.0)	1,450 (10.0)	1,305 (9.0)	1,160 (9.0)	1,030 (7.1)
	Reduction factor for bond strength	ϕ_d	-	0.65							
Water Saturated Concrete	Reduction factor for bond strength	ϕ_{ws}	-	0.55							
	Additional factor for water saturated concrete condition	K_{ws}	-	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Water-filled hole	Reduction factor for bond strength	ϕ_{wf}	-	0.45							
	Additional factor for water-filled hole condition	K_{ws}	-	0.77	0.77	0.77	0.77	0.70	0.69	0.68	0.67
BOND STRENGTH IN TENSION FOR TEMPERATURE RANGE B[4,5] Maximum long term temperature = 122°F (50°C), Maximum short term temperature = 176°F (80°C)											
Dry hole	Characteristic bond strength, uncracked concrete (2,500 psi)	$\tau_{k,uncr}$	psi (N/mm^2)	870 (6.0)	870 (6.0)	870 (6.0)	870 (6.0)	870 (6.0)	798 (5.5)	696 (4.8)	6.38 (4.4)
	Reduction factor for bond strength	ϕ_d	-	0.65							
Water Saturated Concrete	Reduction factor for bond strength	ϕ_{ws}	-	0.55							
	Additional factor for water saturated concrete condition	K_{ws}	-	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Water-filled hole	Reduction factor for bond strength	ϕ_{wf}	-	0.45							
	Additional factor for water-filled hole condition	K_{ws}	-	0.77	0.77	0.77	0.77	0.70	0.69	0.68	0.67

(Continued on next page)

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SD PERFORMANCE DATA

(Continued)

1. The data in this table is intended to be used together with the design provisions of ACI 318 Appendix D and ICC-ES AC308 Annex A, Section 3.3 and ESR-2582.
2. Installation must comply with published instructions and details. Special inspection must be performed where required by code or the Authority Having Jurisdiction (AHJ). See ICC-ES AC308 Annex A, Section 14.4 and ESR-2582.
3. For ductility classification of steel anchor elements see ESR-2582.
4. Long term concrete temperatures are roughly constant over significant periods of time. Short-term elevated temperatures are those that occur over brief intervals, e.g. as a result of diurnal cycling.
5. For load combinations consisting of short term loads only such as wind, bond strength may be increased by 40% for Temperature Range B.
6. Linear interpolation is permitted to determine the ratio c_{ac} for values or h/h_{ef} between 2 and 1.3 by calculation.

Shear Design Information for Threaded Rod and Reinforcing Bar in Normal-Weight Concrete (For use with load combinations taken from ACI 318 Section 9.2)[1,2,3]

Design Characteristic		Notation	Units	Nominal Anchor Size							
				3/8"	1/2"	5/8"	3/4"	7/8"	1"	-	1-1/4"
				#3	#4	#5	#6	#7	#8	#9	#10
Minimum embedment depth		$h_{ef,min}$	in. (mm)	2-3/8 (60)	2-3/4 (70)	3-1/8 (79)	3-1/2 (89)	3-1/2 (89)	4 (107)	4-1/2 (114)	5 (127)
STEEL STRENGTH IN SHEAR											
Steel strength in shear	Standard carbon rod (ASTM A 307, Grade C or F1554)	V_{sa}	lb (kN)	2,715 (12.1)	4,940 (22.0)	7,865 (35.0)	11,660 (51.9)	16,075 (71.5)	21,090 (93.8)	-	33,720 (150.0)
	Stainless steel rod - alloy 304/316 (ASTM F 593, Condition CW)	V_{sa}	lb (kN)	4,680 (20.8)	8,520 (37.9)	13,560 (60.3)	17,085 (76.0)	23,560 (104.8)	30,905 (137.5)	-	49,420 (219.8)
	High strength carbon rod (ASTM A 193, Grade B7)	V_{sa}	lb (kN)	5,615 (25.0)	10,225 (45.5)	16,270 (72.4)	24,120 (107.3)	33,265 (148.0)	43,630 (194.1)	-	69,770 (310.3)
Steel strength in shear, Grade 60 reinforcing bar		V_{sa}	lb (kN)	5,940 (26.4)	10,800 (48.0)	16,740 (74.5)	23,760 (105.7)	32,400 (144.1)	42,660 (189.8)	54,000 (240.2)	68,580 (305.0)
Steel strength in shear, Grade 40 reinforcing bar		V_{sa}	lb (kN)	3,960 (17.6)	7,200 (32.0)	11,160 (49.6)	15,840 (70.5)	-	-	-	-
Reduction factor for steel strength		ϕ	-	0.65 (0.60 for stainless steel rod)							
BREAKOUT STRENGTH IN SHEAR											
Load bearing length of anchor		ℓ_e	in. (mm)	h_{ef} or 8d whichever is less							
Reduction factor for concrete breakout strength		ϕ	-	Condition B = 0.70							
CONCRETE PRYOUT STRENGTH IN SHEAR											
Coefficient for pryout strength		k_{cp}	-	1.0 for $h_{ef} < 2.5$ in., 2.0 for $h_{ef} \geq 2.5$ in.							
Reduction factor for pryout strength		ϕ	-	Condition B = 0.70							

1. The data in this table is intended to be used together with the design provisions of ACI 318 Appendix D and ICC-ES AC308 Annex A, Section 3.3 and ESR-2582.
2. Installation must comply with published instructions and details. Periodic special inspection must be performed where required by code or the Authority Having Jurisdiction (AHJ). See ICC-ES AC308 Annex A, Section 14.4 and ESR-2582.
3. For ductility classification of steel anchor elements see ESR-2582.

BOND STRENGTH DETERMINATION				
Concrete State	**Hole Drilling Method**	**Installation Condition**	**Bond Strength**	**Strength Reduction Factor**
Uncracked concrete	Hammer drill	Dry concrete	$\tau_{k,uncr}$	ϕ_d
		Water-saturated concrete	$\tau_{k,uncr} \cdot k_{ws}$	ϕ_{ws}
		Water-filled hole	$\tau_{k,uncr} \cdot k_{wf}$	ϕ_{wf}

For concrete compressive strength between 2,500 psi and 8,000 psi, the tabulated characteristic bond strength for cracked concrete $\tau_{k,cr}$ or uncracked concrete $\tau_{k,uncr}$ may be increased by a factor of $(f'_c / 2{,}500)^{0.13}$.

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Factored Design Strength (ϕN_n and ϕV_n) in Accordance with ACI 318 Appendix D and ICC-ES AC308 Annex A:

1. Tabular values are provided for illustration and are applicable for single anchors installed in uncracked normal-weight concrete with minimum slab thickness, $h_a = h_{min}$, and with the following conditions:
   - c_{a1} is greater than or equal to the critical edge distance, c_{ac} where $c_{ac} = 2.7\ h_{ef}$.
   - c_{a2} is greater than or equal to 1.5 times c_{a1}.
2. Calculations were performed according to ACI 318-05 Appendix D and ICC-ES AC308 Annex A, Section 3.3. The load level corresponding to the failure mode is listed (e.g. For *tension:* steel, concrete breakout or bond strength; For *shear:* steel, concrete breakout or pryout strength). The lowest load level controls.
3. Strength reduction factors (ϕ) for steel strength and concrete breakout strength are based on ACI 318 Section 9.2 for load combinations. Condition B was assumed.
4. Strength reduction factors (ϕ) for bond strength are determined from reliability testing and qualification in accordance with ICC-ES AC308 and are tabulated in this product information and in ESR-2582.
5. Tabular values are permitted for static loads only, seismic loading is not considered with these tables. Periodic special inspection must be performed where required by code or the Authority Having Jurisdiction (AHJ). See ICC-ES AC308 Annex A, Section 14.4 and ESR-2582.
6. Tabular values are not permitted for anchors subjected to tension resulting from sustained loading. Please see ICC-ES AC308 Annex A, Section 3.3 and ESR-2582 for the supplement design requirement for this loading condition.
7. For designs that include combined tension and shear, the interaction of tension and shear loads must be calculated in accordance with ACI 318-05 Appendix D.
8. Interpolation is not permitted to be used with the tabular values. For intermediate base material compressive strengths, please see ACI 318-05 Appendix D, ICC-ES AC308 Annex A, Section 3.3 and information included in this product supplement. For other design conditions including seismic considerations please see ACI 318-05 Appendix D and ICC-ES AC308 Annex A, Section 3.3 and ESR-2582.
9. Long term concrete temperatures are roughly constant over significant periods of time. Short-term elevated temperatures are those that occur over brief intervals, e.g. as a result of diurnal cycling.

Tension and Shear Design Strength for AC100+ Gold Installed into Uncracked Concrete in Dry Hole Condition *Temperature Range A* (Bond or Concrete Strength)

Maximum long term temperature = 75°F (24°C), Maximum short term temperature = 104°F (40°C)

Nominal Rod/Rebar Size (in. or No.)	Embed. Depth h_{ef} (in.)	Minimum Concrete Compressive Strength, f'_c (psi)									
		2,500		3,000		4,000		6,000		8,000	
		$ØN_{cb}$ or $ØN_a$ Tension (lbs.)	$ØV_{cb}$ or $ØV_{cp}$ Shear (lbs.)	$ØN_{cb}$ or $ØN_a$ Tension (lbs.)	$ØV_{cb}$ or $ØV_{cp}$ Shear (lbs.)	$ØN_{cb}$ or $ØN_a$ Tension (lbs.)	$ØV_{cb}$ or $ØV_{cp}$ Shear (lbs.)	$ØN_{cb}$ or $ØN_a$ Tension (lbs.)	$ØV_{cb}$ or $ØV_{cp}$ Shear (lbs.)	$ØN_{cb}$ or $ØN_a$ Tension (lbs.)	$ØV_{cb}$ or $ØV_{cp}$ Shear (lbs.)
3/8 or #3	2 3/8	2,635	1,860	2,700	2,035	2,805	2,350	2,995	2,880	3,070	3,305
	3	3,330	2,565	3,410	2,810	3,540	3,245	3,735	3,975	3,873	4,590
	4 1/2	4,995	4,255	5,115	4,660	5,310	5,380	5,600	6,590	5,810	7,610
1/2 or #4	2 3/4	3,555	2,480	3,895	2,715	4,330	3,135	4,560	3,840	4,735	4,435
	4	5,920	4,230	6,065	4,630	6,295	5,350	6,635	6,550	6,890	7,565
	6	8,885	7,150	9,095	7,835	9,445	9,045	9,955	11,080	10,335	12,795
5/8 or #5	3 1/8	4,310	3,260	4,720	3,570	5,450	4,125	6,480	5,050	6,725	5,830
	5	8,720	6,420	9,475	7,030	9,835	8,120	10,370	9,945	10,765	11,480
	7 1/2	13,880	10,945	14,210	11,990	14,755	13,840	15,550	16,955	16,145	19,575
3/4 or #6	3 1/2	5,105	4,350	5,595	4,765	6,460	5,500	7,910	6,740	9,040	7,780
	6	11,465	9,365	12,560	10,255	14,165	11,845	14,930	14,505	15,500	16,750
	9	19,985	15,905	20,465	17,425	21,245	20,120	22,395	24,640	23,250	28,455
7/8 or #7	3 1/2	5,105	4,770	5,595	5,225	6,460	6,035	7,910	7,395	9,135	8,535
	7	14,445	12,685	15,825	13,895	18,275	16,045	20,320	19,650	21,095	22,690
	10 1/2	26,540	21,580	27,855	23,640	28,920	27,295	30,485	33,430	31,645	38,600
1 or #8	4	6,240	6,195	6,835	6,790	7,895	7,840	9,665	9,600	11,160	11,085
	8	17,650	16,510	15,825	18,085	22,325	20,885	26,545	25,580	27,555	29,535
	12	32,425	28,115	35,520	30,795	37,770	35,560	39,815	43,555	41,330	50,290
#9	4 1/2	7,445	8,090	8,155	8,860	9,420	10,230	11,535	12,530	13,320	14,465
	9	21,060	21,295	23,070	23,325	26,640	26,935	30,235	32,985	31,385	38,090
	13 1/2	38,690	36,065	41,445	39,510	43,020	45,620	45,350	55,875	47,080	64,515
1-1/4	5	8,720	9,605	9,555	10,525	11,030	12,150	13,510	14,880	15,600	17,185
	10	24,665	25,670	27,020	28,125	31,200	32,475	33,180	39,770	34,445	45,925
	15	44,415	43,775	45,480	47,950	47,215	55,370	49,770	67,810	51,665	78,305
#10	5	8,720	9,915	9,555	10,860	11,030	12,545	13,510	15,360	15,290	17,740
	10	24,665	26,175	26,920	28,675	28,950	33,110	29,460	40,550	30,535	46,825
	15	39,435	44,390	40,385	48,625	41,920	56,150	44,190	68,765	45,875	79,405

Legend Concrete Breakout Strength · Bond Strength/Pryout Strength

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Factored Design Strength (ϕN_n and ϕV_n) in Accordance with ACI 318 Appendix D and ICC-ES AC308 Annex A:

Tension and Shear Design Strength for AC100+ Gold Installed into Uncracked Concrete in Dry Hole Cond.
Temperature Range B **(Bond or Concrete Strength) - see notes on previous page**
Maximum long term temperature = 122°F (50°C), Maximum short term temperature = 176°F (80°C)

Nominal Rod/Rebar Size (in. or No.)	Embed. Depth h_{ef} (in.)	Minimum Concrete Compressive Strength, f'_c (psi)									
		2,500		3,000		4,000		6,000		8,000	
		$ØN_{cb}$ or $ØN_a$ Tension (lbs.)	$ØV_{cb}$ or $ØV_{cp}$ Shear (lbs.)	$ØN_{cb}$ or $ØN_a$ Tension (lbs.)	$ØV_{cb}$ or $ØV_{cp}$ Shear (lbs.)	$ØN_{cb}$ or $ØN_a$ Tension (lbs.)	$ØV_{cb}$ or $ØV_{cp}$ Shear (lbs.)	$ØN_{cb}$ or $ØN_a$ Tension (lbs.)	$ØV_{cb}$ or $ØV_{cp}$ Shear (lbs.)	$ØN_{cb}$ or $ØN_a$ Tension (lbs.)	$ØV_{cb}$ or $ØV_{cp}$ Shear (lbs.)
3/8 or #3	2 3/8	1,580	1,705	1,620	1,745	1,680	1,810	1,775	1,910	1,840	1,980
	3	2,000	2,565	2,045	2,810	2,125	3,245	2,240	3,975	2,325	4,590
	4 1/2	3,000	4,255	3,070	4,660	3,185	5,380	3,360	6,590	3,485	7,190
1/2 or #4	2 3/4	2,445	2,480	2,500	2,715	2,595	3,135	2,735	3,840	2,840	4,435
	4	3,555	4,230	3,640	4,630	3,775	5,350	3,980	6,550	4,135	7,565
	6	5,330	7,150	5,460	7,835	5,665	9,045	5,970	11,080	6,200	12,785
5/8 or #5	3 1/8	3,470	3,260	3,555	3,570	3,690	4,125	3,890	5,050	4,035	5,830
	5	5,550	6,420	5,685	7,030	5,900	8,120	6,220	9,945	6,460	11,480
	7 1/2	8,330	10,945	8,525	11,990	8,850	13,840	9,330	16,955	9,685	19,575
3/4 or #6	3 1/2	4,665	4,350	4,775	4,765	4,955	5,500	5,225	6,740	5,425	7,780
	6	7,995	9,365	8,185	10,255	8,500	11,845	8,960	14,505	9,300	16,750
	9	11,990	15,905	12,280	17,425	12,745	20,120	13,435	24,640	13,950	28,455
7/8 or #7	3 1/2	5,105	4,770	5,570	5,225	5,785	6,035	6,095	7,395	6,330	8,535
	7	10,880	12,685	11,140	13,895	11,565	16,045	12,195	19,650	12,660	22,690
	10 1/2	16,320	21,580	16,715	23,640	17,350	27,295	18,290	33,430	18,985	38,600
1 or #8	4	6,240	6,195	6,835	6,790	7,555	7,840	7,965	9,600	8,265	11,085
	8	14,215	16,510	14,555	18,085	15,110	20,885	15,925	25,580	16,535	29,535
	12	21,320	28,115	21,830	30,795	22,660	35,560	23,890	43,555	24,800	53,415
#9	4 1/2	7,445	8,090	8,155	8,860	8,770	10,230	9,245	12,530	9,595	14,465
	9	16,500	21,295	16,895	23,325	17,540	26,935	18,490	32,985	19,190	41,340
	13 1/2	24,750	36,065	25,340	39,510	26,310	45,620	27,730	51,450	28,790	62,005
1-1/4	5	8,720	9,605	9,095	10,525	9,445	12,150	9,955	14,880	10,335	17,185
	10	17,765	25,670	18,190	28,125	18,885	32,475	19,905	39,770	20,665	44,510
	15	26,650	43,775	27,290	47,950	28,330	55,370	29,860	59,730	31,000	66,765
#10	5	8,145	9,915	8,340	10,860	8,655	12,545	9,125	15,360	9,470	17,740
	10	16,285	26,175	16,675	28,675	17,310	33,110	18,250	40,550	18,945	44,510
	15	24,430	44,390	25,015	48,625	25,965	56,150	27,370	64,315	28,415	66,765

Legend Concrete Breakout Strength — Bond Strength/Pryout Strength

Factored bond or concrete strength must be checked against factored steel strength to determine the controlling ultimate load.
Factored tension design strength = min$|ØN_{cb}$ or $ØN_a$, $ØN_{sa}|$ and factored shear design strength = min$|ØV_{cb}$ or $ØV_{cr}$, $ØV_{cp}|$

Tension and Shear Design Strength of Steel Elements (Steel Strength)

Nominal Rod/Rebar Size (in. or No.)	Steel Elements - Threaded Rod and Reinforcing Bar						
	A 36 or F1554		F 593 (SS), CW		A 193, Grade B7		Grade 60 Rebar
	$ØN_{sa}$ *Tension (lbs.)*	$ØV_{sa}$ *Shear (lbs.)*	$ØN_{sa}$ *Tension (lbs.)*	$ØV_{sa}$ *Shear (lbs.)*	$ØN_{sa}$ *Tension (lbs.)*	$ØV_{sa}$ *Shear (lbs.)*	$ØN_{sa}$ *Tension (lbs.)*
3/8 or #3	3,395	1,765	5,850	3,040	7,315	3,805	7,425
1/2 or #4	6,175	3,210	10,650	5,540	13,315	6,925	13,500
5/8 or #5	9,830	5,110	16,950	8,815	21,190	11,020	20,925
3/4 or #6	14,575	7,580	21,355	11,105	31,405	16,330	29,700
7/8 or #7	20,095	10,450	29,455	15,315	43,315	22,525	40,500
1 or #8	26,360	13,710	38,635	20,090	56,815	29,545	53,325
#9	-	-	-	-	-	-	67,500
1-1/4	42,150	21,920	61,775	32,190	90,845	47,240	-
#10	-	-	-	-	-	-	85,725

Legend Steel Strength

c4

ASD PERFORMANCE DATA

Allowable Load Capacities for AC100+ Gold Installed into Normal-Weight Concrete with Threaded Rod and Reinforcing Bar (Based on Bond Strength/Concrete Capacity)[1,2,3,4,5,6]

Nominal Red/Rebar Size (in. or #)	Minimum Embedment Depth (in.)	Minimum Concrete Compressive Strength, (f'c)			
		3,000 psi	4,000 psi	5,000 psi	6,000 psi
		Tension (lbs)			
3/8 or #3	2 3/8	1,045	1,085	1,115	1,145
	3 1/2	1,540	1,600	1,645	1,685
	4 1/2	1,980	2,055	2,115	2,170
1/2 or #4	2 3/4	1,720	1,785	1,840	1,885
	4 3/8	2,740	2,845	2,925	2,995
	6	3,755	3,900	4,015	4,110
5/8 or #5	3 1/8	2,420	2,515	2,585	2,650
	5 1/4	4,140	4,300	4,425	4,530
	7 1/2	5,960	6,190	6,370	6,525
3/4 or #6	3 1/2	2,870	2,980	3,065	3,140
	6 1/4	5,795	6,015	6,190	6,340
	9	8,715	9,050	9,315	9,540
7/8 or #7	3 1/2	2,870	2,980	3,065	3,140
	7	7,905	8,205	8,450	8,650
	10 1/2	12,940	13,435	13,830	14,160
1 or #8	4	3,505	3,640	3,745	3,835
	8	10,030	10,410	10,720	10,975
	12	16,555	17,185	17,690	18,115
1-1/4 or #10	5	4,900	5,085	5,235	5,360
	10	14,200	14,740	15,175	15,540
	15	23,500	24,395	25,115	25,715

1. Allowable load capacities listed are calculated using an applied safety factor of 4.0 which includes assessment of freezing/thawing conditions and sensitivity to sustained loads (e.g. creep resistance). Consideration of safety factors of 10 or higher may be necessary depending on the application, such as life safety or overhead.
2. Linear interpolation may be used to determine allowable loads for intermediate embedments and compressive strengths.
3. The tabulated load values are applicable to single anchors installed at critical edge and spacing distances and where the minimum member thickess is 2.5 times the embedment depth.
4. The tabulated load values are applicable for dry concrete. Holes must be drilled with a hammer drill and an ANSI carbide drill bit. Installations in wet concrete or in water-filled holes may require a reduction in capacity. Contact Powers Fasteners for more information concerning these installation conditions.
5. Adhesives experience reductions in capacity at elevated temperatures. See the In-Service Temperature chart for allowable loads.
6. Allowable bond strength/concrete capacity must be checked against allowable steel strength to determine the controlling allowable load. Allowable shear capacity is controlled by allowable steel strength for the given conditions.

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ASD PERFORMANCE DATA

Allowable Load Capacities for AC100+ Gold Installed into Normal-Weight Concrete with Threaded Rod and Reinforcing Bar (Based on Steel Strength)[1,2,3]

Nominal Rod Diameter or Rebar Size (in. or #)	Steel Elements - Threaded Rod and Reinforcing Bar							
	A36 or F1554		A 193, Grade B7		F 593, CW (SS)		Grade 60 Rebar	
	Tension (lbs)	Shear (lbs)	**Tension** (lbs)	Shear (lbs)	**Tension** (lbs)	Shear (lbs)	**Tension** (lbs)	Shear (lbs)
3/8 or #3	1,485	760	3,085	1,585	2,565	1,315	2,655	1,320
1/2 or #4	2,725	1,395	5,655	2,900	4,685	2,410	4,710	2,345
5/8 or #5	4,325	2,225	8,990	4,625	7,480	3,845	7,370	3,670
3/4 or #6	6,420	3,295	13,320	6,845	9,465	4,865	10,592	5,285
7/8 or #7	8,855	4,550	18,390	9,445	13,070	6,715	14,425	7,195
1 or #8	11,630	5,970	24,115	12,395	17,150	8,810	18,840	9,400
#9	-	-	-	-	-	-	23,845	11,890
1-1/4	18,595	9,555	38,585	19,830	27,430	14,095	-	-
#10	-	-	-	-	-	-	29,435	14,680

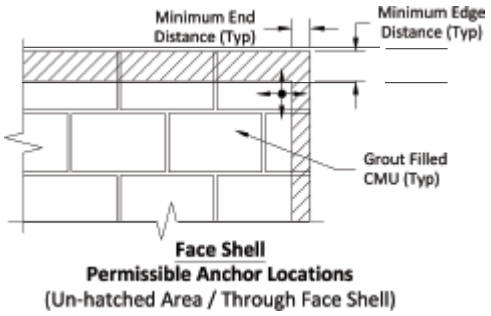
1. Allowable load capacities listed are calculated for the steel element type. Consideration of applying additional safety factors may be necessary depending on the application, such as life safety or overhead.
2. Allowable bond strength/concrete capacity must be checked against allowable steel strength to determine the controlling allowable load.
3. Allowable shear capacity is controlled by steel strength for the given conditions described on the previous page.

In-Service Temperature Chart for Allowable Load Capacities[1]

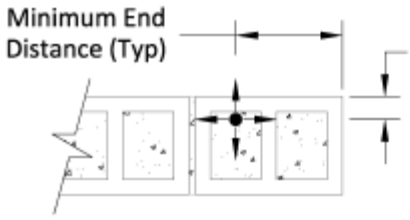
BASE MATERIAL TEMPERATURE		REDUCTION FACTOR FOR TEMPERATURE
°F	°C	
32	0	1.00
41	5	1.00
50	10	1.00
68	20	1.00
86	30	0.93
104	40	0.86
122	50	0.80
140	60	0.73
158	70	0.66
176	80	0.59

1. Linear interpolation may be used to derive reduction factors for base material temperatures between those listed.

MASONRY PERFORMANCE DATA



Face Shell
Permissible Anchor Locations
(Un-hatched Area / Through Face Shell)



Top of Wall

Allowable Load Capacities for Threaded Rod Installed with AC100+ Gold into Grout Filled Concrete Masonry[1,2,3,4,5,6]

ANCHOR DIAMETER *d* (inch)	MINIMUM EMBEDMENT h_{nom} (inches)	MINIMUM EDGE DISTANCE (inches)	MINIMUM END DISTANCE (inches)	TENSION LOAD (pounds) Based on bond or masonry strength	Direction of Shear Loading	SHEAR LOAD (pounds) Based on bond or masonry strength
ANCHOR INSTALLED INTO GROUTED MASONRY WALL FACES[8]						
3/8	3	3	4	735[9]	Any	490[9]
		12	12	960[9]	Any	855[9]
1/2	4	3	3	740	Any	455
		4	4	985[9]	Any	655[9]
		12	12	960	Any	1,425
		7-3/4 (Bed Joint)	3	935	Load to Edge	460
5/8	5	3	3	745	Any	410
		12	12	1,095	Any	1,530
		7-3/4 (Bed Joint)	3	1,030	Load to Edge	590
3/4	6	4	4	790	Any	630
		12	12	1,155	Any	1,565
		7-3/4 (Bed Joint)	4	945	Load to Edge	565
ANCHOR INSTALLED INTO TOPS OF GROUTED MASONRY WALLS[7]						
1/2	2 3/4	1 3/4	4	595[9]	Any	300[9]
	4	1 3/4	4	520	Load to Edge	190
					Load to End	295
5/8	5	1 3/4	4	740	Any	235
3/4	6	2 3/4	4	1,260	Load to Edge	410
					Load to End	490

For SI: 1 inch = 25.4 mm, 1 psi = 6.89 kPa, 1 lbf = 4.45 N.

1. Tabulated load values are for anchors installed in nominal 8-inch-wide (203 mm) Grade N, Type II, lightweight, medium-weight or normal-weight grout-filled concrete masonry units conforming to ASTM C 90. If the specified compressive strength of the masonry, *f 'm*, is 2,000 psi (13.8 MPa) minimum the tabulated values may be increased by 4 percent.
2. The tabulated allowable loads are permitted to be increased for wind and seismic by 33-1/3 percent.
3. Allowable bond or masonry strength in tension and shear are calculated using a safety factor of 5.0 and must be checked against the allowable tension and shear load capacities for threaded rod based on steel strength to determine the controlling factor.
4. The AC100+ Gold adhesive experiences a reduction in tensile and shear capacity with increased concrete temperature. Reduction factors must be applied to the allowable values based on bond or masonry strength noted in the table when the anchors are installed in locations where the in-service concrete temperature may be greater than 75°F (24°C).
5. Anchors may be installed in the grouted cells, cell webs and bed joints not closer than 1-inch from head joints.
6. The tabulated values are applicable for anchors installed into grouted masonry wall faces and masonry wall tops at a critical spacing distance, scr, between anchors of 3 times the embedment depth.
7. Anchor installations into tops of grouted masonry walls are limited to one per masonry cell.
8. The critical spacing for use with the anchor values shown in this table is 16 anchor diameters. For 1/2 -, 5/8 - and 3/4 - inch diameter anchors ,the spacing may be reduced to a minimum of 8 anchor diameters when using a tension reduction factor of 0.85 and a shear reduction factor of 0.45. Linear interpolation may be used for spacing distances between the minimum and critical distances.
9. Tabultated load values also apply to anchors installed in nominal 6-inch-wide (152 mm) Grade N, Type II, lightweight, medium-weight or normal-weight grout-filled concrete masonry units conforming to ASTM C 90. These tabulated load values may not be increased for wind and seismic.

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MASONRY PERFORMANCE DATA

Ultimate Load Capacities for Threaded Rod Installed with AC100+ Gold Into Hollow Concrete Masonry Walls with Stainless Steel and Plastic Screen Tubes[1,2,3]

Rod Diameter d in. (mm)	Drill Diameter d_{bit} (in.)	Screen Tube Length in. (mm)	Minimum End Distance in. (mm)	Minimum Edge Distance in. (mm)	Ultimate Load		Allowable Load	
					Tension lbs. (kN)	Shear lbs. (kN	Tension lbs. (kN)	Shear lbs. (kN
3/8 (9.5)	1/2	3-1/2 (88.9)	3-3/4 (95.2)	3-3/4 (95.2)	1,600 (7.2)	1,700 (7.6)	320 (1.4)	340 (1.5)
1/2 (12.7)	5/8	3-1/2 (88.9)	3-3/4 (95.2)	3-3/4 (95.2)	2,165 (9.6)	1,700 (7.6)	430 (1.9)	340 (1.5)

1. Tabulated load values are for anchors installed in minimum 8" wide, Grade N, Type II, lightweight, medium-weight or normal-weight concrete masonry units conforming to ASTM C 90 that have reached a designated ultimate compressive strength at the time of installation ($f'm \geq 1,500$ psi). Mortar must be type N, S or M.
2. Allowable loads are calculated using an applied safety factor of 5.0. Consideration of safety factors of 10 or higher may be necessary depending on the application, such as life safety.
3. Anchor spacing is limited to one anchor per masonry cell.

Ultimate Load Capacities for Threaded Rod Installed with AC100+ Gold into the Face of Brick Masonry Walls[1,2]

Rod Diameter d in. (mm)	Drill Diameter d_{bit} (in.)	Minimum Embedment Depth in. (mm)	Minimum End Distance in. (mm)	Minimum Edge Distance in. (mm)	Minimum Spacing in. (mm)	Ultimate Load		Allowable Load	
						Tension lbs. (kN)	Shear lbs. (kN	Tension lbs. (kN)	Shear lbs. (kN
3/8 (9.5)	1/2	3-1/2 (88.9)	6 (152.4)	6 (152.4)	6 (152.4)	5,845 (25.9)	4,580 (20.4)	1,170 (5.2)	915 (4.1)
1/2 (12.7)	5/8	6 (152.4)	8 (203.2)	8 (203.2)	8 (203.2)	11,500 (51.2)	9,300 (41.4)	2,300 (10.3)	1,860 (8.3)

1. Tabulated load values are for anchors installed in minimum 2 wythe, Grade SW, solid clay brick masonry conforming to ASTM C 62. Motar must be N, S or M.
2. Allowable loads are calculated using all applied safety factor or 5.0. Consideration of safety factors of 10 or higher may be necessary depending on the application, such as life safety.

ORDERING INFORMATION

AC100+ Gold Cartridges

Cat No.	Description	Std. Box	Std. Carton	Pallet
8462SD	AC100+ Gold 5 fl. oz. Push-Pak (DIY series)	12	36	-
8478SD	AC100+ Gold 10 fl. oz. Quik-Shot (DIY series)	12	36	972
8480SD	AC100+ Gold 8 fl. oz. dual cartridge	12	-	576
8486SD	AC100+ Gold 12 fl. oz. dual cartridge	12	-	864
8490SD	AC100+ Gold 28 fl. oz. dual cartridge	8	-	400

One AC100+ Gold mixing nozzle is packaged with each cartridge.
AC100+ Gold mixing nozzles must be used to ensure complete and proper mixing of the adhesive.

Cartridge System Mixing Nozzles

Cat No.	Description	Std. Pack/Box	Std. Carton
08293	Extra mixing nozzle for AC100+ Gold (5 oz., 8 oz.,10 oz. & 12 oz.)	2	24
08294	Extra mixing nozzle (with 8" extension) for AC100+ Gold 28 oz.	2	24
08281	Mixing nozzle extension, 8" length minimum	2	24

Dispensing Tools for Injection Adhesive

Cat No.	Description	Std. Box	Std. Carton
08437	Manual caulking gun for Push-Pak and Quik-Shot	1	12
08479	High performance caulking gun for Push-Pak and Quik-Shot	1	6
08484	AC100+ Gold 8 oz. standard all metal manual tool	1	6
08485	AC100+ Gold 8 oz., 10 oz. & 12 oz. high performance manual tool	1	20
08494	AC100+ Gold 28 oz. standard all metal manual tool	1	-
08495	AC100+ Gold 28 oz. high performance manual tool	1	-
08496	AC100+ Gold 28 oz. pneumatic tool	1	-
08444	AC100+ Gold 28 oz. cordless power tool	1	-

ADHESIVES

ORDERING INFORMATION (Continued)

Hole Cleaning Tools and Accessories

Cat No.	Description	Std. Package
08284	Wire brush for 7/16"ANSI hole (3/8" rod or #3 rebar), 6-3/4" length	1
08285	Wire brush for 9/16"ANSI hole (1/2" rod or #4 rebar), 6-3/4" length	1
08286	Wire brush for 11/16"ANSI hole (5/8" rod or #5 rebar), 7-7/8" length	1
08278	Wire brush for 3/4"ANSI hole (5/8" rod or #5 rebar), 7-7/8" length	1
08287	Wire brush for 7/8"ANSI hole (3/4" rod or #6 rebar), 7-7/8" length	1
08288	Wire brush for 1"ANSI hole (7/8" rod or #7 rebar), 11-7/8" length	1
08289	Wire brush for 1-1/8"ANSI hole (1" rod or #8 rebar), 11-7/8" length	1
08290	Wire brush for 1-3/8"ANSI hole (1-1/4" rod or #9 rebar), 11-7/8" length	1
08291	Wire brush for 1-1/2"ANSI hole (#10 rebar), 11-7/8" length	1
08283	SDS-plus adapter for steel brushes	1
08296	Standard drill adapter for steel brushes (e.g. Jacobs Chuck)	1
08282	Steel brush extension, 12" length	1
08280	Hand pump/dust blower (25 fl. oz. cylinder volume)	1
08292	Air compressor nozzle with extension, 18" length	1
08465	Adjustable torque wrench with 1/2" square drive (10 to 150 ft.-lbs.)	1
08466	Adjustable torque wrench with 1/2" square drive (25 to 250 ft.-lbs.)	1
52073	Adhesive cleaning kit, includes 4 wire brushes (08284, 08285, 08286, 08287), steel brush extension (08282), SDS-plus adapter (08283), standard drill adapter (08296), hand pump/dust blower (08280), gloves and safety glasses	1

Stainless Steel Screen Tubes

Cat. No.	Description	Drill Diameter	Standard Carton
07961	3/8" x 3 1/2" Screen Tube	1/2"	25
07962	3/8" x 6" Screen Tube*	1/2"	25
07963	3/8" x 8" Screen Tube*	1/2"	25
07964	3/8" x 10" Screen Tube*	1/2"	25
07959	3/8" x 12" Screen Tube*	1/2"	25
07965	1/2" x 3 1/2" Screen Tube	5/8"	25
07966	1/2" x 6" Screen Tube	5/8"	25
07967	1/2" x 8" Screen Tube*	5/8"	25
07968	1/2" x 10" Screen Tube*	5/8"	25

Screen tubes are made from a 300 series stainless steel. The nominal diameter of the screen listed indicates the matching rod diameter.
*Includes extension tubing.

Plastic Screen Tubes

Cat. No.	Description	Drill Diameter	Standard Carton
08310	3/8" x 3-1/2" Plastic Screen	1/2"	25
08311	3/8" x 6" Plastic Screen	1/2"	25
08313	3/8" x 8" Plastic Screen	1/2"	25
08315	1/2" x 3-1/2" Plastic Screen	3/4"	25
08317	1/2" x 6" Plastic Screen	3/4"	25

Adhesive Pistons

Cat. No.	Description	ANSI Drill Dia.	Reinforcing Bar Size	Threaded Rod Size	Std. Bag	Std. Ctd.
08300	7/8" Plug	7/8"	#6	3/4"	10	100
08301	1" Plug	1"	#7	7/8"	10	100
08303	1-1/8" Plug	1-1/8"	#8	1"	10	100
08305	1-3/8" Plug	1-3/8"	#9	1-1/4"	10	100
08309	1-1/2" Plug	1-1/2"	#10	-	10	100