

# ULTRABOND® ACRYL-8CC

## Fast Cure Anchoring Adhesive

### Product Description

ULTRABOND® ACRYL-8CC is a two-component, 10:1 mix ratio by volume, high strength, styrene-free, vinyl ester adhesive anchoring system tested for use with threaded rod and reinforcing bar for cracked and uncracked concrete conditions in accordance with ACI 355.4 and ICC-ES AC308. It has an installation temperature range between 14 °F to 104 °F (-10 °C to 40 °C) and an extended in-service temperature range between 14 °F to 248 °F (-10 °C to 120 °C).

### General Uses & Applications

- Anchoring threaded rod and reinforcing bar (rebar) into cracked or uncracked concrete using a hammer drill
- Suitable for dry, water saturated and water-filled conditions using threaded rod or rebar
- Vertical down, horizontal, upwardly inclined and overhead installations

### Advantages & Features

- ICC-ES ESR-4249 evaluation report for cracked and uncracked normal weight and lightweight concrete
- Building code compliant, IBC/IRC: 2024, 2021, 2018 & 2015
- Florida Building Code (FBC) compliant: 2023
- City of Los Angeles Code (LABC/LARC) compliant: 2026
- Abu Dhabi International Building and Residential Code (ADIBC/RC) compliant: 2013
- Certified - Drinking Water System Components (NSF/ANSI 61) Joining and Sealing
- LEED® EQc4.1 Credit: Low-Emitting materials; LEED (Leadership in Energy and Environmental Design) is the most widely used green building rating system in the world
- Resists static, wind and earthquake loading in tension and shear - (IBC Seismic Design Categories A through F)
- Full cure in 45 minutes at 70 °F (21 °C)

## STANDARDS & APPROVALS

### CODE COMPLIANT:

ICC-ES ESR-4249

IBC/IRC 2024, 2021, 2018 & 2015

Florida Building Code 2023

City of Los Angeles 2026

Abu Dhabi International Building Code 2013

NSF/ANSI 61

ASTM C881-20 & AASHTO M235

Type I, II, IV & V Grade 3 Class A, B & C

(See ATC website for current Department of Transportation approvals throughout the United States)



DESIGN SOFTWARE  
COMPATIBLE

- Resists sustained loads in temperatures up to 161 °F (72 °C)
- Withstands freeze-thaw conditions
- Acceptable for use in USDA inspected facilities
- Compatible with ATC's free Pro Anchor Design software

**Availability:** ATC products are available online and through select distributors providing all your construction needs. Please contact ATC for a distributor near you or visit [www.atcepoxy.com](http://www.atcepoxy.com) for online purchasing options or to search for a distributor by zip code.

**Color & Ratio:** Part A (Resin) Light Beige: Part B (Hardener) Black, Mixed Ratio: 10:1 by volume, Mixed Color - Gray

**Storage & Shelf Life:** 18 months when stored in unopened containers in dry conditions. Store between 41 °F (5 °C) and 77 °F (25 °C).

**Installation & Estimation:** Manufacturer's Printed Installation Instructions (MPII) are available within this Technical Data Sheet (TDS). Due to occasional updates and revisions, always verify the most current MPII usage. In order to achieve maximum results, proper installation is imperative. An estimating guide for product usage may be found at [www.atcepoxy.com](http://www.atcepoxy.com).

**Clean-Up:** Always wear appropriate personal protective equipment such as safety glasses and gloves. Clean uncured materials from tools and equipment using a mild solvent, such as a citrus based product. Cured material can only be removed mechanically using a sander or grinder.

### Limitations & Warnings:

- Do not thin with solvents, as this will prevent cure
- For anchoring applications, concrete should be a minimum of 21 days old prior to anchor installation per ACI 355.4

**Safety:** Please refer to the Safety Data Sheet (SDS) for ULTRABOND ACRYL-8CC. Call ATC for more information at 1-800-892-1880.

**Specification:** Anchoring adhesive shall be a two component, 10:1 ratio by volume, vinyl ester anchoring system supplied in pre-measured cartridges. Adhesive must meet the requirements of ICC-ES AC308, ACI 355.4 and ASTM C881-20 specification for Type I, II, IV, and V, Grade 3 Class A, B & C. Adhesive must have a heat deflection temperature of 192 °F (89 °C) per ASTM D648 and have a compressive yield strength of 11,430 psi (78.8 MPa) at 75 °F (24 °C) after a 7 day cure per ASTM D695. Adhesive shall be ULTRABOND ACRYL-8CC from Adhesives Technology Corp., Pompano Beach, Florida. Anchors shall be installed per the Manufacturer's Printed Installation Instructions (MPII) for ULTRABOND ACRYL-8CC anchoring system.

## Fast Cure Anchoring Adhesive

**TABLE 1: ULTRABOND ACRYL-8CC Adhesive Packaging, Dispensing Tools and Accessories<sup>1</sup>**

Package Size	10 fl. oz. (296 ml) Cartridge	28 fl. oz. (825 ml) Cartridge
Part #	A10-ACRYL8CC	A28-ACRYL8CC
Mixing Nozzle	T10-8CC	T28-8CC
Manual Dispensing Tool <sup>2</sup>	TM10	TM28HD
Pneumatic Dispensing Tool	N/A	TA28
Case Qty.	12	8
Pallet Qty.	900	240
Pallet Weight (lbs.)	1,364	921
SDS Brush Adaptor	BA-SDS	
Brush Extension	BA-EXT	
Nozzle Extension Tubing	T-8CCEXTPK	
Retention Wedge	WEDGE	

1. Each cartridge is packaged with one mixing nozzle.

2. For applications NOT requiring code approval, a TM9 manual dispensing tool may be substituted or a TM28HD may be used.



TM9HD



TM28HD



TB28HD-A



TA28HD-A



Manual Brush Handle



BR-SDS



Brush Extension  
BR-EXT



A10-ACRYL8CC



A28-ACRYL8CC



T12



Small Wire Brush  
(see Table 2)



T34HF



Large Wire Brush  
(see Table 2)



Piston Plugs\*  
(Hole Diameters 7/16 in. to 1 1/2 in.) (See Table 3)

\*Color may vary



Nozzle Extension Tubing  
TUBE916-EXT



Retention Wedge  
WEDGE

**TABLE 2: ULTRABOND ACRYL-8CC Installation Parameters, Brushes and Piston Plugs**

Characteristic	Symbol	Units	Threaded Rod Diameter (inch)								
			3/8	1/2	5/8	3/4	7/8	1	1 1/4	N/A	
			Rebar Size								
			#3	#4	#5	#6	#7	#8	#9	#10	
Threaded Rod	Nominal Anchor Diameter	$d$	in.	0.375	0.500	0.625	0.750	0.875	1.000	1.250	N/A
	Drill Size	$d_o$	in.	7/16	9/16	3/4	7/8	1	1 1/8	1 3/8	N/A
	Brush Part #	----	----	BA716	BA916	BA34	BA78	BA100	BA118	BA138	N/A
	Piston Plug Part #	----	----	----	----	PA34	PA78	PA100	PA118	PA138	N/A
	Piston Plug Color	----	----	----	----	Clear					N/A
Maximum Tightening Torque	A36/A307 Carbon Steel	$T_{inst,max}$	Ft-lb (N-m)	10 (14)	25 (34)	50 (68)	90 (122)	125 (170)	165 (224)	280 (380)	N/A
	A193 B7 Carbon Steel or F593 SS			16 (22)	33 (45)	60 (81)	105 (142)	125 (170)	165 (224)	280 (380)	N/A
Rebar	Nominal Bar Diameter	$d$	in.	0.375	0.500	0.625	0.750	0.875	1.000	1.125	1.250
	Drill Size	$d_o$	in.	7/16	5/8	3/4	7/8	1	1 1/8	1 3/8	1 1/2
	Brush Part #	----	----	BA716	BA58	BA34	BA78	BA100	BA118	BA138	BA112
	Piston Plug Part #	----	----	----	----	PA34	PA78	PA100	PA118	PA138	PA112
	Piston Plug Color	----	----	----	----	Clear					

Revision 2.2

## Fast Cure Anchoring Adhesive

### Material Specifications

**TABLE 3: ULTRABOND ACRYL-8CC performance to ASTM C881-15<sup>1,2,3</sup>**

Property	Cure Time	ASTM Standard	Units	Sample Conditioning Temperature			
				Class A	Class B	Optional	Class C
				14 °F (-10 °C)	50 °F (10 °C)	75 °F (24 °C)	104 °F (40 °C)
Gel Time - 60 Gram Mass <sup>4</sup>	----	C881	min	16	8	5	5
Consistency or Viscosity	----	C881	----	Non-sag			
Compressive Yield Strength	7 day	D695	psi (MPa)	12,820 (88.4)	13,490 (93.0)	11,430 (78.8)	11,830 (81.6)
Compressive Modulus			psi (MPa)	497,300 (3,429)	491,600 (3,389)	374,400 (2,581)	299,100 (2,062)
Tensile Strength <sup>5</sup>		D638	psi (MPa)	2,510 (17.3)			
Tensile Elongation <sup>5</sup>			%	0.9			
Bond Strength Hardened to Hardened Concrete		2 day	C882	psi (MPa)	2,530 (17.4)	2,440 (16.8)	2,320 (16.0)
	14 day	psi (MPa)		1,870 (12.9)	3,020 (20.8)	2,940 (20.3)	3,130 (21.6)
Bond Strength Fresh to Hardened Concrete				psi (MPa)	2,510 (17.3)		
Heat Deflection Temperature	7 day	D648		°F (°C)	192 (89)		
Water Absorption	14 day	D570	%	0.74			
Linear Coefficient of Shrinkage	48 hr	D2566	%	0.005			

1. Product testing results based on representative lot(s). Average results will vary according to the tolerances of the given property.
2. Full cure time is listed above to obtain the given properties for each product characteristic.
3. Results may vary due to environmental factors such as temperature, moisture and type of substrate.
4. Gel time may be lower than the minimum required for ASTM C881 Type I and IV.
5. Optional testing for Grade 3 systems.

**TABLE 4: ULTRABOND ACRYL-8CC NSF/ANSI CERTIFICATION<sup>1</sup>**

ANSI Certification	Description	Application	Water Contact Temperature	Anchor Sizes Installed in Concrete
NSF 61	Drinking Water System Components - Health Effects	Joining and Sealing Materials	Domestic Hot 60 +/- 2 °C (140 +/- 4 °F)	Threaded Rod and Rebar ≤ 1 1/4 in. Diameter

1. ULTRABOND ACRYL-8CC is certified as a joining and sealing material. Mix Ratio: Part A (Resin): Part B (Hardener) = 10:1 by volume. Application method: Dispensing mixing nozzle system. Final Cure Time: 45 minutes at 70 °F (21 °C).

**TABLE 5: ULTRABOND ACRYL-8CC CURE SCHEDULE<sup>1,2,3</sup>**

Concrete Temperature °F (°C)	Working Time	Full Cure Time
14 (-10)	90 min	24 hr
23 (-5)	90 min	14 hr
32 (0)	45 min	7 hr
41 (5)	25 min	2 hr
50 (10)	15 min	90 min
70 (21)	6 min	45 min
86 (30)	4 min	25 min
95 (35)	2 min	20 min
104 (40)	1.5 min	15 min

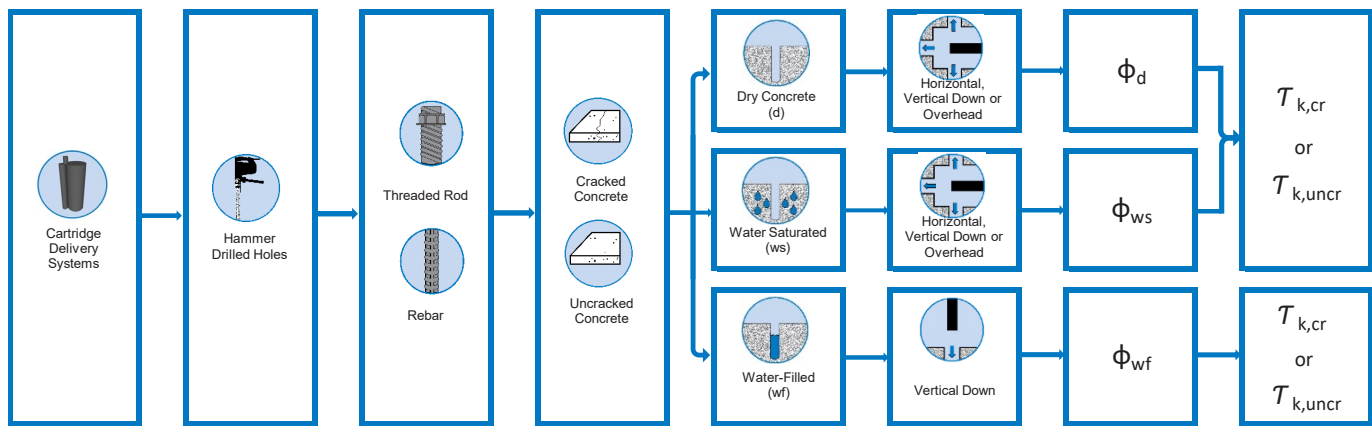
<sup>1</sup>For installations between 14 °F and 23 °F (-10 °C and -5 °C), the cartridge temperature must be conditioned between 70 °F and 75 °F (21 °C and 24 °C).

<sup>2</sup>Store adhesive in dry cool location free from sun and rain.

<sup>3</sup>Storage temperature is 41 °F to 77 °F (5 °C to 25 °C).

ULTRABOND ACRYL-8CC has been tested and assessed by an accredited independent testing laboratory in accordance with ICC-ES AC308, ACI 355.4 and ASTM E488 for use in cracked and uncracked normal weight and lightweight concrete, for loading conditions including seismic and wind, for structural design to ACI 318-14 Chapter 17 (ACI 318-11/08 Appendix D) and is approved per ICC-ES ESR-4249. The design process and parameters for ULTRABOND ACRYL-8CC are shown in Figure 1 and Tables 7 - 12 for Strength Design (SD) and Tables 13 - 16 for Allowable Stress Design (ASD).

**FIGURE 1 - Flow Chart for the Establishment of DESIGN STRENGTH**



**TABLE 6: ULTRABOND ACRYL-8CC DESIGN STRENGTH INDEX**

DESIGN STRENGTH		Threaded Rod	Rebar
Steel Strength	Nsa, Vsa	7	9
Concrete Breakout	Ncb, Vcb, Vcp	8	10
Strength Design Bond Strength (SD)	Cracked Concrete	9	11
	Uncracked Concrete		11
Allowable Stress Design (ASD)	Allowable Tension Load	12	14
	Allowable Shear Load	13	15

**TABLE 7: ULTRABOND ACRYL-8CC STEEL design information for THREADED ROD<sup>1</sup>**

Design Information		Symbol	Units	Threaded Rod						
				3/8"	1/2"	5/8"	3/4"	7/8"	1"	1 1/4"
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)	1.250 (31.8)
Threaded Rod Cross-Sectional Area		$A_{se}$	in. <sup>2</sup> (mm <sup>2</sup> )	0.078 (50)	0.142 (92)	0.226 (146)	0.335 (216)	0.462 (298)	0.606 (391)	0.969 (625)
ASTM A36 Grade 36 F1554 Grade 36	Nominal Strength as Governed by Steel Strength	$N_{sa}$	lb. (kN)	4,495 (20.0)	8,230 (36.6)	13,110 (58.3)	19,400 (86.3)	26,780 (119.1)	35,130 (156.3)	56,210 (250.0)
		$V_{sa}$	lb. (kN)	2,695 (12.0)	4,940 (22.0)	7,860 (35.0)	11,640 (51.8)	16,070 (71.5)	21,080 (93.8)	33,725 (150.0)
	Reduction Factor for Seismic Shear	$\alpha_{v,seis}$	----	Not Applicable	0.85				0.80	
	Strength Reduction Factor for Tension <sup>3</sup>	$\phi$	----	0.75						
	Strength Reduction Factor for Shear <sup>3</sup>	$\phi$	----	0.65						
ASTM A193 B7 ASTM F1554 Grade 105	Nominal Strength as Governed by Steel Strength	$N_{sa}$	lb. (kN)	9,685 (43.1)	17,735 (78.9)	28,250 (125.7)	41,810 (186.0)	57,710 (256.7)	75,710 (336.8)	121,135 (538.8)
		$V_{sa}$	lb. (kN)	4,845 (21.6)	10,640 (47.3)	16,950 (75.4)	25,085 (111.6)	34,625 (154.0)	45,425 (202.1)	72,680 (323.3)
	Reduction Factor for Seismic Shear	$\alpha_{v,seis}$	----	Not Applicable	0.85				0.80	
	Strength Reduction Factor for Tension <sup>3</sup>	$\phi$	----	0.75						
	Strength Reduction Factor for Shear <sup>3</sup>	$\phi$	----	0.65						
ASTM F593 CW Stainless	Nominal Strength as Governed by Steel Strength	$N_{sa}$	lb (kN)	7,750 (34.5)	14,190 (63.1)	22,600 (100.5)	28,430 (126.5)	39,245 (174.6)	51,485 (229.0)	82,370 (366.4)
		$V_{sa}$	lb (kN)	4,650 (20.7)	8,515 (37.9)	13,560 (60.3)	17,060 (75.9)	23,545 (104.7)	30,890 (137.4)	49,425 (219.9)
	Reduction Factor for Seismic Shear	$\alpha_{v,seis}$	----	Not Applicable	0.85				0.80	
	Strength Reduction Factor for Tension <sup>2</sup>	$\phi$	----	0.65						
	Strength Reduction Factor for Shear <sup>2</sup>	$\phi$	----	0.60						

For SI: 1 inch = 25.4 mm, 1lbf = 4.448 N, 1 psi = 0.006897 MPa

For pound-inch units: 1 mm = 0.03937 inch, 1 N = 0.2248 lbf, 1MPa = 145.0 psi

1. Values provided for common rod material types are based on specified strength and calculated in accordance with ACI 318-14 Eq. 17.4.1.2 and Eq. 17.5.1.2b or ACI 318-11 Eq. (D-2) and Eq. (D-29), as applicable. Nuts and washers must be appropriate for the rod strength and type.

2. For use with load combinations of IBC Section 1605.2, ACI 318-14 5.3 or ACI 318-11 9.2, as applicable, as set forth in ACI 318-14 17.3.3 or ACI 318-11 D.4.3. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of  $\phi$  must be determined in accordance with ACI 318-11 D4.4. Values correspond to a brittle steel element.

3. For use with load combinations of IBC Section 1605.2, ACI 318-14 5.3 or ACI 318-11 9.2, as applicable, as set forth in ACI 318-14 17.3.3 or ACI 318-11 D.4.3. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of  $\phi$  must be determined in accordance with ACI 318-11 D4.4. Values correspond to a ductile steel element.

**TABLE 8: ULTRABOND ACRYL-8CC CONCRETE BREAKOUT design information for THREADED ROD**

Design Information	Symbol	Units	Threaded Rod						
			3/8"	1/2"	5/8"	3/4"	7/8"	1"	1 1/4"
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)	5 (127)
Maximum Embedment Depth	$h_{ef,max}$	in. (mm)	4 1/2 (114)	6 (152)	7 1/2 (191)	9 (229)	10 1/2 (267)	12 (305)	15 (381)
Effectiveness Factor for Cracked Concrete	$k_{c,cr}$	---- SI	Not Applicable	17 (7.1)					
Effectiveness Factor for Uncracked Concrete	$k_{c,uncr}$	---- SI	24 (10)						
Minimum Spacing Distance	$s_{min}$	in. (mm)	$S_{min} = C_{min}$						
Minimum Edge Distance	$c_{min}$	in. (mm)	1 7/8 (48)	2 1/2 (64)	3 1/8 (79)	3 3/4 (95)	4 3/8 (111)	5 (127)	6 1/4 (159)
Minimum Concrete Thickness	$h_{min}$	in. (mm)	$h_{ef} + 1.25, [ \geq 3.937 ]$ $(h_{ef} + 30, [ \geq 100 ])$		$h_{ef} + 2d_0$ where $d_0$ is the hole diameter				
Critical Edge Distance (Uncracked Concrete Only)	$c_{ac}$	in.	$C_{ac} = h_{ef} \cdot \left( \frac{\min(\tau_{k,uncr}; \tau_{k,max})}{1160} \right)^{0.4} \cdot \max \left[ \left( 3.1 - 0.7 \frac{h}{h_{ef}} \right); 1.4 \right]$						
		mm	$C_{ac} = h_{ef} \cdot \left( \frac{\min(\tau_{k,uncr}; \tau_{k,max})}{8} \right)^{0.4} \cdot \max \left[ \left( 3.1 - 0.7 \frac{h}{h_{ef}} \right); 1.4 \right]$						
Strength Reduction Factor for Tension, Concrete Failure Mode, Condition B <sup>1</sup>	$\phi$	----	0.65						
Strength Reduction Factor for Shear, Concrete Failure Mode, Condition B <sup>1</sup>	$\phi$	----	0.70						

For SI: 1 inch = 25.4 mm, 1lbf = 4.448 N, 1 psi = 0.006897 MPa

For pound-inch units: 1 mm = 0.03937 inch, 1 N = 0.2248 lbf, 1MPa = 145.0 psi

1. Values provided for post-installed anchors with category as determined from ACI 355.4 given for Condition B. Condition B applies without supplementary reinforcement or where pullout (bond) or pryout govern, as set forth in ACI 318-14 17.3.3 or ACI 318-11 D.4.3, as applicable, while condition A requires supplemental reinforcement. Values are for use with the load combinations Section 1605.2 of the IBC, ACI 318-14 5.3 or ACI 318-11 Section 9.2, as applicable, as set forth in ACI 318-11 D.4.3. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of  $\phi$  must be determined in accordance with ACI 318-11 D.4.4.

**TABLE 9: ULTRABOND ACRYL-8CC BOND STRENGTH** design information for **THREADED ROD**<sup>1,3,4</sup>

Design Information			Symbol	Units	Threaded Rod								
					3/8"	1/2"	5/8"	3/4"	7/8"	1"	1 1/4"		
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)	5 (127)		
Maximum Embedment Depth			$h_{ef,max}$	in. (mm)	4 1/2 (114)	6 (152)	7 1/2 (191)	9 (229)	10 1/2 (267)	12 (305)	15 (381)		
Dry and Water Saturated Concrete	Maximum Long Term Temperature 122 °F (50 °C)	Cracked Concrete	Characteristic Bond Strength with Sustained Load	$T_{k,cr}$	psi (MPa)	---	498 (3.4)	519 (3.6)	519 (3.6)	519 (3.6)	519 (3.6)	525 (3.6)	
			Characteristic Bond Strength without Sustained Load	$T_{k,cr}$	psi (MPa)	---	712 (4.9)	742 (5.1)	742 (5.1)	742 (5.1)	742 (5.1)	751 (5.2)	
	Maximum Short Term Temperature 176 °F (80 °C)	Uncracked Concrete <sup>2</sup>	Characteristic Bond Strength with Sustained Load	$T_{k,uncr}$	psi (MPa)	823 (5.7)	823 (5.7)	823 (5.7)	823 (5.7)	823 (5.7)	743 (5.1)	588 (4.1)	
			Characteristic Bond Strength without Sustained Load	$T_{k,uncr}$	psi (MPa)	1,177 (8.1)	1,177 (8.1)	1,177 (8.1)	1,177 (8.1)	1,177 (8.1)	1,062 (7.3)	841 (5.8)	
	Maximum Long Term Temperature 161 °F (72 °C)	Cracked Concrete	Characteristic Bond Strength with Sustained Load	$T_{k,cr}$	psi (MPa)	---	245 (1.7)	255 (1.8)	255 (1.8)	255 (1.8)	255 (1.8)	255 (1.8)	
			Characteristic Bond Strength without Sustained Load	$T_{k,cr}$	psi (MPa)	---	544 (3.8)	566 (3.9)	566 (3.9)	566 (3.9)	566 (3.9)	566 (3.9)	
	Maximum Short Term Temperature 248 °F (120 °C)	Uncracked Concrete <sup>2</sup>	Characteristic Bond Strength with Sustained Load	$T_{k,uncr}$	psi (MPa)	405 (2.8)	405 (2.8)	405 (2.8)	405 (2.8)	405 (2.8)	366 (2.5)	---	
			Characteristic Bond Strength without Sustained Load	$T_{k,uncr}$	psi (MPa)	899 (6.2)	899 (6.2)	899 (6.2)	899 (6.2)	899 (6.2)	813 (5.6)	---	
	Reduction Factors for Dry Holes in Concrete			$\phi_d$	---	0.65							
	Reduction Factors for Water Saturated Holes in Concrete			$\phi_{ws}$	---	0.55							
	Water-Filled Holes in Concrete	Maximum Long Term Temperature 122 °F (50 °C)	Cracked Concrete	Characteristic Bond Strength with Sustained Load	$T_{k,cr}$	psi (MPa)	---	388 (2.7)	405 (2.8)	405 (2.8)	363 (2.5)	358 (2.5)	352 (2.4)
				Characteristic Bond Strength without Sustained Load	$T_{k,cr}$	psi (MPa)	---	555 (3.8)	579 (4.0)	579 (4.0)	520 (3.6)	512 (3.5)	503 (3.5)
Maximum Short Term Temperature 176 °F (80 °C)		Uncracked Concrete <sup>2</sup>	Characteristic Bond Strength with Sustained Load	$T_{k,uncr}$	psi (MPa)	642 (4.4)	642 (4.4)	642 (4.4)	642 (4.4)	576 (4.0)	---	---	
			Characteristic Bond Strength without Sustained Load	$T_{k,uncr}$	psi (MPa)	918 (6.3)	918 (6.3)	918 (6.3)	918 (6.3)	824 (5.7)	---	---	
Maximum Long Term Temperature 161 °F (72 °C)		Cracked Concrete	Characteristic Bond Strength with Sustained Load	$T_{k,cr}$	psi (MPa)	---	191 (1.3)	199 (1.4)	199 (1.4)	179 (1.2)	176 (1.2)	171 (1.2)	
			Characteristic Bond Strength without Sustained Load	$T_{k,cr}$	psi (MPa)	---	424 (2.9)	442 (3.0)	442 (3.0)	396 (2.7)	391 (2.7)	379 (2.6)	
Maximum Short Term Temperature 248 °F (120 °C)		Uncracked Concrete <sup>2</sup>	Characteristic Bond Strength with Sustained Load	$T_{k,uncr}$	psi (MPa)	316 (2.2)	316 (2.2)	316 (2.2)	316 (2.2)	---	---	---	
			Characteristic Bond Strength without Sustained Load	$T_{k,uncr}$	psi (MPa)	701 (4.8)	701 (4.8)	701 (4.8)	701 (4.8)	---	---	---	
Reduction Factors for Water-Filled Holes in Concrete			$\phi_{wf}$	---	0.45								
Reduction Factor for Seismic Tension <sup>5</sup>			$\alpha_{N,seis}$	---	0.95								

For SI: 1 inch = 25.4 mm, 1 lbf = 4.448 N, 1 psi = 0.006897 MPa

For pound-inch units: 1 mm = 0.03937 inch, 1 N = 0.2248 lbf, 1 MPa = 145.0 psi

1. Characteristic bond strength values correspond to concrete compressive strength  $f'_c = 2,500$  psi (17.2 MPa). For uncracked concrete compressive strength  $f'_c$  between 2,500 psi (17.2 MPa) and 8,000 psi (55.2 MPa), the tabulated characteristic bond strength may be increased by a factor of  $(f'_c / 2,500)^{0.13}$  (for SI:  $(f'_c / 17.2)^{0.13}$ ).

2. Lightweight concrete may be used by applying a reduction factor as given in ACI 318-14 17.2.6 or ACI 318-11 Appendix D section D3.6 as applicable.

3. Short term elevated concrete temperatures are those that occur over brief intervals, e.g., as a result of diurnal cycling. Long term concrete temperatures are roughly constant over significant periods of time.

4. Characteristic bond strength values are for sustained loads (when noted), including dead and live loads.

5. For structures in regions assigned to Seismic Design Category C, D, E, or F the bond strength values must be multiplied by  $\alpha_{n,seis}$ .

**TABLE 10: ULTRABOND ACRYL-8CC STEEL design information for REBAR<sup>1</sup>**

Design Information		Symbol	Units	Rebar Size							
				#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)
Rebar Cross-Sectional Area		$A_{se}$	in <sup>2</sup> (mm <sup>2</sup> )	0.110 (71)	0.200 (129)	0.310 (200)	0.440 (284)	0.600 (387)	0.790 (510)	1.000 (645)	1.270 (819)
ASTM A615 Grade 40	Nominal Strength as Governed by Steel Strength	$N_{sa}$	lb. (kN)	6,600 (29.4)	12,000 (53.4)	18,600 (82.7)	26,400 (117.4)	Grade 40 reinforcing bars are only available in sizes #3 through #6 per ASTM A615			
		$V_{sa}$	lb. (kN)	3,960 (17.6)	7,200 (32.0)	11,160 (49.6)	15,840 (70.5)				
	Reduction Factor for Seismic Shear	$\alpha_{v,seis}$	----	Not Applicable	0.70						
	Strength Reduction Factor for Tension <sup>2</sup>	$\phi$	----	0.65							
	Strength Reduction Factor for Shear <sup>2</sup>	$\phi$	----	0.60							
ASTM A615 Grade 60	Nominal Strength as Governed by Steel Strength	$N_{sa}$	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)
		$V_{sa}$	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 (305.1)
	Reduction Factor for Seismic Shear	$\alpha_{v,seis}$	----	Not Applicable	0.70						
	Strength Reduction Factor for Tension <sup>2</sup>	$\phi$	----	0.65							
	Strength Reduction Factor for Shear <sup>2</sup>	$\phi$	----	0.60							

For SI: 1 inch = 25.4 mm, 1 lbf = 4.448 N, 1 psi = 0.006897 MPa

For pound-inch units: 1 mm = 0.03937 inch, 1 N = 0.2248 lbf, 1 MPa = 145.0 psi

1. Values provided for common rod material types are based on specified strength and calculated in accordance with ACI 318-14 Eq. 17.4.1.2 and Eq. 17.5.1.2b or ACI 318-11 Eq. (D-2) and Eq. (D-29), as applicable. Nuts and washers must be appropriate for the rod strength and type.

2. For use with load combinations of IBC Section 1605.2, ACI 318-14 5.3 or ACI 318-11 9.2, as applicable, as set forth in ACI 318-14 17.3.3 or ACI 318-11 D.4.3. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of  $\phi$  must be determined in accordance with ACI 318-11 D4.4. Values correspond to a brittle steel element.

**TABLE 11: ULTRABOND ACRYL-8CC CONCRETE BREAKOUT design information for REBAR**

Design Information	Symbol	Units	Rebar Size							
			#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)
Maximum Embedment Depth	$h_{ef,max}$	in. (mm)	4 1/2 (114)	6 (152)	7 1/2 (191)	9 (229)	10 1/2 (267)	12 (305)	13 1/2 (343)	15 (381)
Effectiveness Factor for Cracked Concrete	$k_{c,cr}$	---- SI	NOT Applicable	17 (7.1)						
Effectiveness Factor for Uncracked Concrete	$k_{c,uncr}$	---- SI	24 (10)							
Minimum Spacing Distance	$s_{min}$	in. (mm)	$S_{min} = C_{min}$							
Minimum Edge Distance	$c_{min}$	in. (mm)	1 7/8 (48)	2 1/2 (64)	3 1/8 (79)	3 3/4 (95)	4 3/8 (111)	5 (127)	5 5/8 (143)	6 1/4 (159)
Minimum Concrete Thickness	$h_{min}$	in. (mm)	$h_{ef} + 1.25, [\geq 3.937]$ $(h_{ef} + 30, [\geq 100])$		$h_{ef} + 2d_o$ where $d_o$ is the hole diameter					
Critical Edge Distance (Uncracked Concrete Only)	$C_{ac}$	in.	$C_{ac} = h_{ef} \cdot \left( \frac{\min(\tau_{k,uncr}; \tau_{k,max})}{1160} \right)^{0.4} \cdot \max \left[ \left( 3.1 - 0.7 \frac{h}{h_{ef}} \right); 1.4 \right]$							
		mm	$C_{ac} = h_{ef} \cdot \left( \frac{\min(\tau_{k,uncr}; \tau_{k,max})}{8} \right)^{0.4} \cdot \max \left[ \left( 3.1 - 0.7 \frac{h}{h_{ef}} \right); 1.4 \right]$							
Strength Reduction Factor for Tension, Concrete Failure Mode, Condition B <sup>1</sup>	$\phi$	----	0.65							
Strength Reduction Factor for Shear, Concrete Failure Mode, Condition B <sup>1</sup>	$\phi$	----	0.70							

For SI: 1 inch = 25.4 mm, 1lbf = 4.448 N, 1 psi = 0.006897 MPa

For pound-inch units: 1 mm = 0.03937 inch, 1 N = 0.2248 lbf, 1MPa = 145.0 psi

1. Values provided for post-installed anchors with category as determined from ACI 355.4 given for Condition B. Condition B applies without supplementary reinforcement or where pullout (bond) or pryout govern, as set forth in ACI 318-14 17.3.3 or ACI 318-11 D.4.3, as applicable, while condition A requires supplemental reinforcement. Values are for use with the load combinations Section 1605.2 of the IBC, ACI 318-14 5.3 or ACI 318-11 Section 9.2, as applicable, as set forth in ACI 318-11 D.4.3. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of  $\phi$  must be determined in accordance with ACI 318-11 D.4.4.

### Technical Data

**TABLE 12: ULTRABOND ACRYL-8CC BOND STRENGTH design information for REBAR<sup>1,3,4</sup>**

Design Information			Symbol	Units	Rebar Size														
					#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)							
Maximum Embedment Depth			$h_{ef,max}$	in. (mm)	4 1/2 (114)	6 (152)	7 1/2 (191)	9 (229)	10 1/2 (267)	12 (305)	13 1/2 (343)	15 (381)							
Dry and Water Saturated Concrete	Maximum Long Term Temperature <b>122 °F</b> (50 °C)	Cracked Concrete	Characteristic Bond Strength with Sustained Load	$T_{k,cr}$	psi (MPa)	---	331 (2.3)	345 (2.4)	345 (2.4)	345 (2.4)	345 (2.4)	349 (2.4)	349 (2.4)						
			Characteristic Bond Strength without Sustained Load	$T_{k,cr}$	psi (MPa)	---	473 (3.3)	493 (3.4)	493 (3.4)	493 (3.4)	493 (3.4)	499 (3.4)	499 (3.4)						
	Maximum Short Term Temperature <b>176 °F</b> (80 °C)	Uncracked Concrete <sup>2</sup>	Characteristic Bond Strength with Sustained Load	$T_{k,uncr}$	psi (MPa)	823 (5.7)	823 (5.7)	823 (5.7)	823 (5.7)	823 (5.7)	743 (5.1)	668 (4.6)	588 (4.1)						
			Characteristic Bond Strength without Sustained Load	$T_{k,uncr}$	psi (MPa)	1,177 (8.1)	1,177 (8.1)	1,177 (8.1)	1,177 (8.1)	1,177 (8.1)	1,062 (7.3)	955 (6.6)	841 (5.8)						
	Maximum Long Term Temperature <b>161 °F</b> (72 °C)	Cracked Concrete	Characteristic Bond Strength with Sustained Load	$T_{k,cr}$	psi (MPa)	---	163 (1.1)	170 (1.2)	170 (1.2)	170 (1.2)	170 (1.2)	170 (1.2)	172 (1.2)	172 (1.2)					
			Characteristic Bond Strength without Sustained Load	$T_{k,cr}$	psi (MPa)	---	362 (2.5)	377 (2.6)	377 (2.6)	377 (2.6)	377 (2.6)	377 (2.6)	382 (2.6)	382 (2.6)					
	Maximum Short Term Temperature <b>248 °F</b> (120 °C)	Uncracked Concrete <sup>2</sup>	Characteristic Bond Strength with Sustained Load	$T_{k,uncr}$	psi (MPa)	405 (2.8)	405 (2.8)	405 (2.8)	405 (2.8)	405 (2.8)	366 (2.5)	329 (2.3)	---	---					
			Characteristic Bond Strength without Sustained Load	$T_{k,uncr}$	psi (MPa)	899 (6.2)	899 (6.2)	899 (6.2)	899 (6.2)	899 (6.2)	813 (5.6)	730 (5.0)	---	---					
	Reduction Factors for Dry Holes in Concrete			$\phi_d$	---	0.65													
	Reduction Factors for Water Saturated Holes in Concrete			$\phi_{ws}$	---	0.55													
Water-Filled Holes in Concrete	Maximum Long Term Temperature <b>122 °F</b> (50 °C)	Cracked Concrete	Characteristic Bond Strength with Sustained Load	$T_{k,cr}$	psi (MPa)	---	258 (1.779)	269 (1.855)	269 (1.855)	242 (1.669)	238 (1.641)	237 (1.634)	234 (1.613)						
			Characteristic Bond Strength without Sustained Load	$T_{k,cr}$	psi (MPa)	---	369 (2.5)	385 (2.7)	385 (2.7)	346 (2.4)	340 (2.3)	339 (2.3)	335 (2.3)						
	Maximum Short Term Temperature <b>176 °F</b> (80 °C)	Uncracked Concrete <sup>2</sup>	Characteristic Bond Strength with Sustained Load	$T_{k,uncr}$	psi (MPa)	642 (4.4)	642 (4.4)	642 (4.4)	642 (4.4)	576 (4.0)	---	---	---						
			Characteristic Bond Strength without Sustained Load	$T_{k,uncr}$	psi (MPa)	918 (6.3)	918 (6.3)	918 (6.3)	918 (6.3)	824 (5.7)	---	---	---						
	Maximum Long Term Temperature <b>161 °F</b> (72 °C)	Cracked Concrete	Characteristic Bond Strength with Sustained Load	$T_{k,cr}$	psi (MPa)	---	127 (0.9)	133 (0.9)	133 (0.9)	119 (0.8)	117 (0.8)	117 (0.8)	115 (0.8)						
			Characteristic Bond Strength without Sustained Load	$T_{k,cr}$	psi (MPa)	---	282 (1.9)	295 (2.0)	295 (2.0)	264 (1.8)	260 (1.8)	260 (1.8)	255 (1.8)						
	Maximum Short Term Temperature <b>248 °F</b> (120 °C)	Uncracked Concrete <sup>2</sup>	Characteristic Bond Strength with Sustained Load	$T_{k,uncr}$	psi (MPa)	316 (2.2)	316 (2.2)	316 (2.2)	316 (2.2)	---	---	---	---						
			Characteristic Bond Strength without Sustained Load	$T_{k,uncr}$	psi (MPa)	702 (4.8)	702 (4.8)	702 (4.8)	702 (4.8)	---	---	---	---						
	Reduction Factors for Water-Filled Holes in Concrete			$\phi_{wf}$	---	0.45													
	Reduction Factor for Seismic Tension <sup>5</sup>			$\alpha_{N,seis}$	---	1.00													

For SI: 1 inch = 25.4 mm, 1 lbf = 4.448 N, 1 psi = 0.006897 MPa

For pound-inch units: 1 mm = 0.03937 inch, 1 N = 0.2248 lbf, 1MPa = 145.0 psi

1. Characteristic bond strength values correspond to concrete compressive strength  $f'_c = 2,500$  psi (17.2 MPa). For uncracked concrete compressive strength  $f'_c$  between 2,500 psi (17.2 MPa) and 8,000 psi (55.2 MPa), the tabulated characteristic bond strength may be increased by a factor of  $(f'_c / 2,500)^{0.1}$  (for SI:  $(f'_c / 17.2)^{0.13}$ ).
2. Lightweight concrete may be used by applying a reduction factor as given in ACI 318-14 17.2.6 or ACI 318-11 Appendix D section D3.6 as applicable.
3. Short term elevated concrete temperatures are those that occur over brief intervals, e.g., as a results of diurnal cycling. Long term concrete temperatures are roughly constant over significant periods of time.
4. Characteristic bond strength values are for sustained loads (when noted), including dead and live loads.
5. For structures in regions assigned to Seismic Design Category C, D, E, or F the bond strength values must be multiplied by  $\alpha_{N,seis}$ .

Revision 2.2



**TABLE 13: ULTRABOND ACRYL-8CC allowable TENSION loads for THREADED ROD in normal-weight concrete<sup>1</sup>**

Threaded Rod Diameter in.	Nominal Drill Bit Diameter in.	Embedment Depth in. (mm)		Allowable Tension Load Based on Bond Strength / Concrete Capacity <sup>2,3</sup>		Allowable Tension Load Based on Steel Strength <sup>4</sup>						
				$f'_c \geq 2,500$ psi (17.4 MPa)		ASTM F1554 Grade 36 lbs. (kN)		ASTM A193 Grade B7 lbs. (kN)		ASTM F593 304/316 SS lbs. (kN)		
3/8	7/16	2	3/8	(60)	1,011	(4.5)	2,114	(9.4)	4,556	(20.3)	3,645	(16.2)
		3	3/8	(86)	1,437	(6.4)						
		4	1/2	(114)	1,916	(8.5)						
1/2	9/16	2	3/4	(70)	1,540	(6.8)	3,758	(16.7)	8,099	(36.0)	6,480	(28.8)
		4	1/2	(114)	2,555	(11.4)						
		6		(152)	3,407	(15.2)						
5/8	3/4	3	1/8	(79)	2,129	(9.5)	5,872	(26.1)	12,655	(56.3)	10,124	(45.0)
		5	5/8	(143)	3,992	(17.8)						
		7	1/2	(191)	5,323	(23.7)						
3/4	7/8	3	1/2	(86)	2,810	(13.7)	8,456	(37.6)	18,224	(81.1)	12,392	(55.1)
		6	3/4	(171)	5,749	(25.6)						
		9		(229)	7,665	(34.1)						
7/8	1	3	1/2	(89)	2,728	(12.1)	11,509	(51.2)	24,804	(110.3)	16,867	(75.0)
		7	7/8	(200)	7,825	(34.8)						
		10	1/2	(267)	10,433	(46.4)						
1	1 1/8	4		(102)	3,415	(15.2)	15,033	(66.9)	32,398	(144.1)	22,030	(98.0)
		9		(229)	9,226	(41.0)						
		12		(305)	12,302	(54.7)						
1 1/4	1 3/8	5		(127)	4,798	(21.3)	23,488	(104.5)	50,621	(225.2)	34,423	(153.1)
		11	1/4	(286)	11,409	(50.7)						
		15		(381)	15,212	(67.7)						

For SI: 1 inch = 25.4 mm, 1lbf = 4.448 N, 1 psi = 0.006897 MPa.

For pound-inch units: 1 mm = 0.03937 inch, 1 N = 0.2248 lbf, 1MPa = 145.0 psi

- The lower value of either the allowable bond strength/concrete capacity or steel strength should be used as the allowable tension value for design.
- Allowable tension loads calculated based on strength design provisions of IBC Section 1605.3 with the following assumptions: Temperature range A: Maximum short term temperature of 176 °F (80 °C), Maximum long term temperature of 122 °F (50 °C). Load combination from ACI based on 1.2D + 1.6L assuming dead load of 0.3 and live load of 0.7 giving a weighted average of 1.48.  $f'_c = 2,500$  psi normal-weight uncracked concrete. Single anchor, vertically down with periodic special inspection and no seismic loading.  $\phi_d 0.65$  for dry concrete,  $C_{a1} \geq 1.5 \times h_{ef}$ ,  $h_{min} \geq 1.5 \times C_{a1}$ ,  $C_{a2} \geq 1.5 \times C_{a1}$ . Load values based on characteristic uncracked bond strength with sustained load.
- For long term temperature exposure greater than 122 °F (50 °C) and up to 161 °F (72 °C), with short term temperatures up to 248 °F (120 °C), apply a reduction factor of 0.49 to the allowable tension load.
- Allowable steel strengths calculated in accordance with AISC Manual of Steel Construction: Tensile =  $0.33 \times F_u \times A_{nom}$ .



**TABLE 14: ULTRABOND ACRYL-8CC allowable SHEAR loads for THREADED ROD in normal-weight concrete<sup>1</sup>**

Threaded Rod Diameter in.	Nominal Drill Bit Diameter in.	Embedment Depth in. (mm)	Allowable Shear Load Based on Bond Strength / Concrete Capacity <sup>2,3</sup>		Allowable Shear Load Based on Steel Strength <sup>4</sup>					
			$f'_c \geq 2,500$ psi (17.4 MPa)		ASTM F1554 Grade 36 lbs. (kN)		ASTM A193 Grade B7 lbs. (kN)		ASTM F593 304/316 SS lbs. (kN)	
3/8	7/16	2 3/8 (60)	1,089	(4.8)	1,089	(4.8)	2,347	(10.4)	1,878	(8.4)
		3 3/8 (86)	3,095	(13.8)						
		4 1/2 (114)	4,127	(18.4)						
1/2	9/16	2 3/4 (70)	2,401	(10.7)	1,936	(8.6)	4,172	(18.6)	3,338	(14.8)
		4 1/2 (114)	5,503	(24.5)						
		6 (152)	7,337	(32.6)						
5/8	3/4	3 1/8 (79)	3,163	(14.1)	3,025	(13.5)	6,519	(29.0)	5,216	(23.2)
		5 5/8 (143)	8,598	(38.2)						
		7 1/2 (191)	11,465	(51.0)						
3/4	7/8	3 1/2 (86)	4,024	(17.9)	4,356	(19.4)	9,388	(41.8)	6,384	(28.4)
		6 3/4 (171)	12,382	(55.1)						
		9 (229)	16,509	(73.4)						
7/8	1	3 1/2 (89)	4,117	(18.3)	5,929	(26.4)	12,778	(56.8)	8,689	(38.7)
		7 7/8 (200)	16,205	(72.1)						
		10 1/2 (267)	22,471	(100.0)						
1	1 1/8	4 (102)	5,255	(23.4)	7,744	(34.4)	16,690	(74.2)	11,349	(50.5)
		9 (229)	19,830	(88.2)						
		12 (305)	26,496	(117.9)						
1 1/4	1 3/8	5 (127)	7,374	(32.8)	12,100	(53.8)	26,078	(116.0)	17,733	(78.9)
		11 1/4 (286)	24,573	(109.3)						
		15 (381)	32,764	(145.7)						

For SI: 1 inch = 25.4 mm, 1 lbf = 4.448 N, 1 psi = 0.006897 MPa.

For pound-inch units: 1 mm = 0.03937 inch, 1 N = 0.2248 lbf, 1 MPa = 145.0 psi

- The lower value of either the allowable bond strength/concrete capacity or steel strength should be used as the allowable tension value for design.
- Allowable tension loads calculated based on strength design provisions of IBC Section 1605.3 with the following assumptions: Temperature range A: Maximum short term temperature of 176 °F (80 °C), Maximum long term temperature of 122 °F (50°C). Load combination from ACI based on 1.2D + 1.6L assuming dead load of 0.3 and live load of 0.7 giving a weighted average of 1.48.  $f'_c = 2,500$  psi normal-weight uncracked concrete. Single anchor, vertically down with periodic special inspection and no seismic loading.  $\phi_d 0.65$  for dry concrete,  $C_{a1} \geq 1.5 \times h_{ef}$ ,  $h_{min} \geq 1.5 \times C_{a1}$ ,  $C_{a2} \geq 1.5 \times C_{a1}$ . Load values based on characteristic uncracked bond strength with sustained load.
- For long term temperature exposure greater than 122 °F (50 °C) and up to 161 °F (72°C), with short term temperatures up to 248 °F (120 °C), apply a reduction factor of 0.49 to the allowable shear load.
- Allowable steel strengths calculated in accordance with AISC Manual of Steel Construction: Shear =  $0.17 \times F_u \times A_{nom}$ .

**TABLE 15: ULTRABOND ACRYL-8CC allowable TENSION loads for REBAR in normal-weight concrete<sup>1</sup>**

Rebar Size	Nominal Drill Bit Diameter in.	Embedment Depth in. (mm)		Allowable Tension Load Based on Bond Strength / Concrete Capacity <sup>2,3</sup>		Allowable Tension Load Based on Steel Strength <sup>4</sup>			
				f <sub>c</sub> ≥ 2,500 psi (17.4 MPa)		ASTM A615 Grade 60 lbs. (kN)		ASTM A615 Grade 40 lbs. (kN)	
#3	1/2	2	3/8 (60)	1,011	(4.5)	2,640	(11.7)	1,760	(7.8)
		3	3/8 (86)	1,437	(6.4)				
		4	1/2 (114)	1,916	(8.5)				
#4	5/8	2	3/4 (70)	1,540	(6.8)	4,800	(21.4)	3,200	(14.2)
		4	1/2 (114)	2,555	(11.4)				
		6	(152)	3,407	(15.2)				
#5	3/4	3	1/8 (79)	2,129	(9.5)	7,440	(33.1)	4,960	(22.1)
		5	5/8 (143)	3,992	(17.8)				
		7	1/2 (191)	5,323	(23.7)				
#6	7/8	3	1/2 (89)	2,810	(13.7)	10,560	(47.0)	7,040	(31.3)
		6	3/4 (171)	5,749	(25.6)				
		9	(229)	7,665	(34.1)				
#7	1 1/8	3	1/2 (89)	2,728	(12.1)	14,400	(64.1)	Grade 40 reinforcing bars are only available in sizes #3 through #6 per ASTM A615	
		7	7/8 (200)	7,825	(34.8)				
		10	1/2 (267)	10,433	(46.4)				
#8	1 1/4	4	(102)	3,415	(15.2)	18,960	(84.3)		
		9	(229)	9,226	(41.0)				
		12	(305)	12,302	(54.7)				
#9	1 3/8	4	1/2 (114)	5,031	(22.4)	24,000	(106.8)		
		10	1/8 (257)	16,980	(75.5)				
		13	1/2 (343)	26,142	(116.3)				
#10	1 1/2	5	(127)	4,798	(21.3)	30,480	(135.6)		
		11	1/4 (286)	11,409	(50.7)				
		15	(381)	15,212	(67.7)				

For SI: 1 inch = 25.4 mm, 1 lbf = 4.448 N, 1 psi = 0.006897 MPa.

For pound-inch units: 1 mm = 0.03937 inch, 1 N = 0.2248 lbf, 1 MPa = 145.0 psi

- The lower value of either the allowable bond strength/concrete capacity or steel strength should be used as the allowable tension value for design.
- Allowable tension loads calculated based on strength design provisions of IBC Section 1605.3 with the following assumptions: Temperature range A: Maximum short term temperature of 176 °F (80 °C), Maximum long term temperature of 122 °F (50°C). Load combination from ACI based on 1.2D + 1.6L assuming dead load of 0.3 and live load of 0.7 giving a weighted average of 1.48. f<sub>c</sub> = 2,500 psi normal-weight uncracked concrete. Single anchor, vertically down with periodic special inspection and no seismic loading. φ<sub>u</sub> 0.65 for dry concrete, C<sub>a1</sub> ≥ 1.5 x h<sub>ef</sub>, h<sub>min</sub> ≥ 1.5 x C<sub>a1</sub>, C<sub>a2</sub> ≥ 1.5 x C<sub>a1</sub>. Load values based on characteristic uncracked bond strength with sustained load.
- For long term temperature exposure greater than 122 °F (50 °C) and up to 161 °F (72°C), with short term temperatures up to 248 °F (120 °C), apply a reduction factor of 0.49 to the allowable tension load.
- Allowable steel strengths calculated in accordance with AISC Manual of Steel Construction: Tensile = 0.33 \* F<sub>u</sub> \* A<sub>nom</sub>.

### Technical Data



**TABLE 16:** ULTRABOND ACRYL-8CC allowable  **SHEAR**  loads for  **REBAR**  in normal-weight concrete<sup>1</sup>

Rebar Size	Nominal Drill Bit Diameter in.	Embedment Depth in. (mm)	Allowable Shear Load Based on Bond Strength / Concrete Capacity <sup>2,3</sup>		Allowable Shear Load Based on Steel Strength <sup>4</sup>			
			$f'_c \geq 2,500$ psi (17.4 MPa)		ASTM A615 Grade 60 lbs. (kN)		ASTM A615 Grade 40 lbs. (kN)	
#3	1/2	2 3/8 (60)	1,089	(4.8)	1,683	(7.5)	1,122	(5.0)
		3 3/8 (86)	3,095	(13.8)				
		4 1/2 (114)	4,127	(18.4)				
#4	5/8	2 3/4 (70)	2,401	(10.7)	3,060	(13.6)	2,040	(9.1)
		4 1/2 (114)	5,503	(24.5)				
		6 (152)	7,337	(32.6)				
#5	3/4	3 1/8 (79)	3,163	(14.1)	4,743	(21.1)	3,162	(14.1)
		5 5/8 (143)	8,598	(38.2)				
		7 1/2 (191)	11,465	(51.0)				
#6	7/8	3 1/2 (86)	4,024	(13.7)	6,732	(29.9)	4,488	(20.0)
		6 3/4 (171)	12,382	(55.1)				
		9 (229)	16,509	(73.4)				
#7	1 1/8	3 1/2 (89)	4,117	(18.3)	9,180	(40.8)	Grade 40 reinforcing bars are only available in sizes #3 through #6 per ASTM A615	
		7 7/8 (200)	16,205	(72.1)				
		10 1/2 (267)	22,471	(100.0)				
#8	1 1/4	4 (102)	5,255	(23.4)	12,087	(53.8)		
		9 (229)	19,830	(88.2)				
		12 (305)	26,496	(117.9)				
#9	1 3/8	4 1/2 (114)	6,175	(27.5)	15,300	(68.1)		
		10 1/8 (257)	23,460	(104.4)				
		13 1/2 (343)	37,123	(165.1)				
#10	1 1/2	5 (127)	7,258	(32.3)	19,431	(86.4)		
		11 1/4 (286)	24,573	(109.3)				
		15 (381)	32,764	(145.7)				

For SI: 1 inch = 25.4 mm, 1 lbf = 4.448 N, 1 psi = 0.006897 MPa.

For pound-inch units: 1 mm = 0.03937 inch, 1 N = 0.2248 lbf, 1 MPa = 145.0 psi

1. The lower value of either the allowable bond strength/concrete capacity or steel strength should be used as the allowable tension value for design.

2. Allowable tension loads calculated based on strength design provisions of IBC Section 1605.3 with the following assumptions: Temperature range A: Maximum short term temperature of 176 °F (80 °C), Maximum long term temperature of 122 °F (50°C). Load combination from ACI based on 1.2D + 1.6L assuming dead load of 0.3 and live load of 0.7 giving a weighted average of 1.48.  $f'_c = 2,500$  psi normal-weight uncracked concrete. Single anchor, vertically down with periodic special inspection and no seismic loading.  $\phi_d 0.65$  for dry concrete,  $C_{a1} \geq 1.5 \times h_{ef}$ ,  $h_{min} \geq 1.5 \times C_{a1}$ ,  $C_{a2} \geq 1.5 \times C_{a1}$ . Load values based on characteristic uncracked bond strength with sustained load.

3. For long term temperature exposure greater than 122 °F (50 °C) and up to 161 °F (72°C), with short term temperatures up to 248 °F (120 °C), apply a reduction factor of 0.49 to the allowable shear load.

4. Allowable steel strengths calculated in accordance with AISC Manual of Steel Construction:  $Shear = 0.17 * F_u * A_{nom}$ .