

# Ankr-TITE® CCAT Wedge Anchors



## Specifications, Listings and Approvals

**Diameters:** 3/8" – 1"

**Material:**

- Anchor Body: C1035 carbon steel
- Anchor Clip: AISI Type 316 stainless steel
- Washer: ASTM F844
- Nut: ASTM A563 Grade A

**Finish:** Zinc plated to ASTM B633 with clear chromate added

**Federal Specifications:** QQZ-325, Type II, Class 3

**Code Compliance:**

- **ICC-ES Report Number ESR-2777 Category 1: Cracked and Uncracked Concrete**
- 2009, 2006, 2003 and 2000 International Building Codes (IBC)
- 2009, 2006, 2003 and 2000 International Residential Code (IRC)
- 1999 Standard Building Code (SBC)
- 1997 Uniform Building Code (UBC)
- 2007 Florida Building Code (BC & RC)
- Miami-Dade NOA: #09-0319.05
- COLA RR 24939

NOTE: Order Information on following page.

## Engineered for Superior Performance in Cracked Concrete

### Key Features and Benefits

- Engineered to provide superior performance in cracked concrete in both seismic and wind load conditions
- **Category 1** design criteria ICC-ES Report Number ESR-2777
- **Bolt Size is Hole Size**®
- Safe and reliable expansion mechanism works in both normal and extreme load conditions
- 360° segment contact equalizes load distribution, increasing load-carrying capacity
- Unique **safety shoulder** supports the clip when the anchor is under strain
- Corrosion-resistant **316 stainless steel clip** increases service life and strength
- Dog point prevents damage during installation
- 4-line marking around the length ID stamp eases post-installation inspection
- Proprietary design (US Patent #5,413,441) meets strict acceptance criteria in the 2009, 2006 and 2003 International Building Code for post-installed anchoring applications

**Code Compliance:**  
Category 1  
**ICC ESR-2777**  
Miami-Dade  
NOA  
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Expansion Anchors



### Installation Data<sup>†</sup>

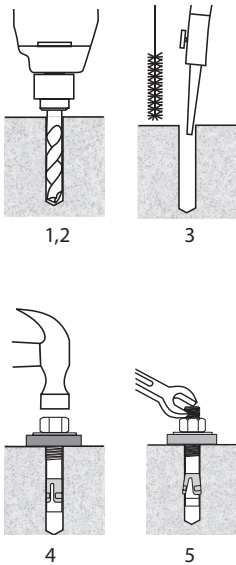
Characteristic	Sym.	Units	Nom. Anchor Dia. (in.)						
			1/2		5/8		3/4		
Outside Diameter	d <sub>o</sub>	in.	1/2		5/8		3/4		
Drill Bit Diameter	d	in.	1/2		5/8		3/4		
Installation Torque	T <sub>inst</sub>	ft-lbf	75		125		225		
Min. Nom. Embedment Depth	h <sub>nom</sub>	in.	3-1/4	5-1/2	4	6-3/8	4-1/2	7-3/4	
Effective Embedment Depth	h <sub>ef</sub>	in.	2-3/4	5	3-3/8	5-3/4	3-3/4	7	
Critical Edge Distance	c <sub>ac</sub>	in.	4-1/8	7-1/2	5	8-5/8	7-1/2	10-1/2	
Min. Edge Distance	c <sub>min</sub>	in.	5-1/2		5		5-5/8		
Min. Spacing	s <sub>min</sub>	in.	8-1/4		9-1/4		5-5/8		
Min. Concrete Thickness	h <sub>min</sub>	in.	6	10	6-3/4	11-1/2	7-1/2	14	
Specified Yield Strength of Anchor Steel	f <sub>ya</sub>	psi	88,000		83,000		73,000		
Specified Tensile Strength of Anchor Steel	f <sub>uta</sub>	psi	110,000		104,000		91,000		
Effective Tensile and Shear Stress Area	A <sub>se</sub>	in <sup>2</sup>	0.116		0.144		0.219		

For SI: 1 inch = 25.4 mm, 1 ft-lbf = 1.356 N-m, 1 psi = 6.89 Pa, 1 in<sup>2</sup> = 645 mm<sup>2</sup>, 1 lb./in. = 0.175 N/mm. †The information presented in this table is to be used in conjunction with the design criteria of ACI 318 Appendix D.

## Order Information

Catalog No.	Anchor Size (in.)	Max. Thickness Fastened Material (in.)	Thread Length (in.)	Quantity Box/ Carton
CCAT3830	3/8 x 3	0.525	1-3/4	50/400
CCAT3833	3/8 X 3-3/4	1.275	2-1/2	50/400
CCAT3850	3/8 X 5	2.525	3-1/4	50/400
CCAT1223	1/2 X 2-3/4	0.125	1-1/8	25/200
CCAT1233	1/2 X 3-3/4	0.375	2-5/8	25/200
CCAT1241	1/2 X 4-1/4	0.875	2-5/8	25/200
CCAT1252	1/2 X 5-1/2	2.125	3-3/4	25/150
CCAT1270	1/2 X 7	3.625	4-1/2	25/150
CCAT1282	1/2 X 8-1/2	5.125	5	25/150
CCAT1210	1/2 X 10	6.625	5	25/150
CCAT5832	5/8 X 3-1/2	0.245	1-1/2	10/80
CCAT5841	5/8 X 4-1/4	0.245	2-3/8	10/80
CCAT5850	5/8 X 5	0.87	3-1/8	10/80
CCAT5860	5/8 X 6	1.87	4	10/80
CCAT5870	5/8 X 7	2.87	4-1/2	10/80
CCAT5882	5/8 X 8-1/2	4.37	5	10/40
CCAT5810	5/8 X 10	5.87	5	10/40
CCAT3443	3/4 X 4-3/4	0.55	2-1/4	10/80
CCAT3452	3/4 X 5-1/2	1	3-1/4	10/60
CCAT3461	3/4 X 6-1/4	2.05	3-3/4	10/60
CCAT3470	3/4 X 7	2.8	4-3/4	10/60
CCAT3482	3/4 X 8-1/2	4.3	5	10/40
CCAT3410	3/4 X 10	5.8	5	10/40
CCAT3412	3/4 X 12	7.8	5	5/20
CCAT1060	1 X 6	0.75	3	5/30
CCAT1090	1 X 9	3.75	5	5/20
CCAT1012	1 X 12	6.75	5	5/20

## Installation Instructions



1. Drill the hole, at a diameter equal to the anchor diameter, perpendicular to the work surface. To assure full holding power, do not ream the hole or allow the drill to wobble.
2. Drill the hole deeper than the intended embedment, but not closer than two diameters to the bottom (opposite) surface of the concrete.
3. A clean hole is necessary for proper performance. Clean the hole using a nylon brush and compressed air.
4. Assemble the nut and washer so that the top of the anchor extends above the nut slightly. Install the anchor through the material to be fastened.
5. Installing the Ankr-TITE CCAT anchors with a torque wrench is recommended for optimum performance. Refer to torque recommendations on this page.

**NOTE: Always wear safety glasses.** Follow drill manufacturer's instructions. Use only solid carbide-tipped drill bits meeting ANSI B212.15 diameter standards.

## Allowable Stress Design Values

Anchor Dia. (in.)	$h_{nom}$ Nom. Embedment (in.)	$h_{ef}$ Effective Embedment (in.)	Allowable Tension Load (lb.)
3/8	2-3/8	2	1,050
1/2	3-1/4	2-3/4	2,080
	5-1/2	5	2,246
5/8	4	3-3/8	3,110
	6-3/8	5-3/4	5,593
3/4	4-1/2	3-3/4	3,827
	7-3/4	7	7,294

### NOTES:

- For SI: 1 inch = 25.4 mm; 1 lbf = 4.45 N
- Single anchor with static tension only
- Concrete determined to remain uncracked for life of the anchorage
- Load combinations from ACI 318 9.2 (no seismic loading)
- 30% dead load and 70% live load, controlling load combination 1.2D + 1.6L
- Calculation of weighed average:  
 $\alpha = 1.2(0.3) + 1.6(0.7) = 1.48$
- $f'_c = 2,500$  psi normal weight concrete  
 $C_{a1} = C_{a2} \geq C_{ac} \quad h \geq h_{min}$
- Values are for Condition B (supplementary reinforcement in accordance with ACI 318 D.4.4 is not provided).

## Torque Values

Anchor Dia. (in.)	Recommended Setting Torque (ft. lb.)
3/8	20
1/2	75
5/8	125
3/4	225
1	290

## Length Identification Codes

Code	Length of Anchor
A	1-1/2 < 2
B	2 < 2-1/2
C	2-1/2 < 3
D	3 < 3-1/2
E	3-1/2 < 4
F	4 < 4-1/2
G	4-1/2 < 5
H	5 < 5-1/2
I	5 1/2 < 6
J	6 < 6-1/2
K	6-1/2 < 7

Code	Length of Anchor
L	7 < 7-1/2
M	7 1/2 < 8
N	8 < 8-1/2
O	8-1/2 < 9
P	9 < 9-1/2
Q	9-1/2 < 10
R	10 < 11
S	11 < 12
T	12 < 13
U	13 < 14
V	14 < 15

**Characteristic Shear Strength Design Values**

Characteristic	Symbol	Units	Nominal Anchor Diameter (inch)						
			3/8 <sup>†</sup>	1/2	5/8	3/4			
Anchor Category	1, 2, or 3	–	3	1	1	1			
Effective Embedment Depth	<i>h<sub>ef</sub></i>	in.	2	2-3/4	5	3-3/8	5-3/4	3-3/4	7
<b>Steel Strength in Shear (ACI 318 D.6.1)<sup>†††</sup></b>									
Shear Resistance of Steel	<i>V<sub>sa</sub></i>	lbf	3,108	3,599	7,195	7,217	8,986	8,683	11,957
Strength Reduction Factor – Steel Failure	<i>ϕ<sub>sa</sub></i>	–	0.6						
<b>Concrete Breakout In Shear (ACI 318 D.6.2)</b>									
Load-bearing Length for Shear	<i>l<sub>e</sub></i>	in.	2	2-3/4	5	3-3/8	5-3/4	3-3/4	7
Nominal Anchor Diameter	<i>d<sub>a</sub>[d<sub>a</sub>]<sup>††</sup></i>	in.	3/8	1/2	1/2	5/8	5/8	3/4	3/4
Strength Reduction Factor – Concrete Breakout	<i>ϕ<sub>cb</sub></i>	–	0.65	0.7					
<b>Pry-out Strength in Shear</b>									
Coefficient for Pry-out Strength (1.0 for <i>h<sub>ef</sub></i> < 2.5 in., 2.0 for <i>h<sub>ef</sub></i> > 2.5 in.)	<i>k<sub>cp</sub></i>	–	1	2					
Strength Reduction Factor – Pry-out Failure	<i>ϕ<sub>p</sub></i>	–	0.6	0.7					
<b>Shear Strength for Seismic Applications (ACI 318 D.3.3.3)</b>									
Shear Resistance of Single Anchor for Seismic Loads ( <i>f'<sub>c</sub></i> = 2,500 psi)	<i>V<sub>eq</sub></i>	lbf	–	3,239	6,476	5,055	8,154	8,504	11,957
Strength Reduction Factor – Pull-out Failure	<i>ϕ<sub>eq</sub></i>	–	–	0.7					
<b>Shear Strength for Sand-Lightweight and Normal-weight Concrete Over Steel Deck</b>									
Steel Strength in Shear for Concrete Over Steel Deck	<i>V<sub>sa, deck</sub></i>	lbf	–	3,200	–	3,890	–	–	–
Steel Strength in Shear, Concrete Over Steel Deck, Seismic	<i>V<sub>sa, deck, eq</sub></i>	lbf	–	2,880	–	2,725	–	–	–
Reduction Factor for Steel Strength in Shear, Concrete Over Steel Deck	<i>ϕ</i>	–	–	0.65					

**Characteristic Tension Strength Design Values**

Characteristic	Symbol	Units	Nominal Anchor Diameter (in.)						
			3/8 <sup>†</sup>	1/2	5/8	3/4			
Anchor Category	1, 2 or 3	–	3	1	1	1			
Effective Embedment Depth	<i>h<sub>ef</sub></i>	in.	2	2-3/4	5	3-3/8	5-3/4	3-3/4	7
<b>Steel Strength in Tension (ACI 318 D.5.1)<sup>†††</sup></b>									
Tension Resistance of Steel	<i>N<sub>sa</sub></i>	lbf	5,180	12,760	14,980	19,930			
Strength Reduction Factor – Steel Failure	<i>ϕ<sub>sa</sub></i>	–	0.65						
<b>Concrete Breakout Strength In Tension (ACI 318 D.5.2)</b>									
Effectiveness Factor – Uncracked Concrete	<i>K<sub>un-cr</sub></i>	–	24						
Effectiveness Factor – Cracked Concrete	<i>K<sub>cr</sub></i>	–	–	17					
Modification Factor for Cracked and Uncracked Concrete	<i>ψ<sub>c, N</sub>**</i>	–	–	1.00					
Strength Reduction Factor – Concrete Breakout Failure	<i>ϕ<sub>cb</sub></i>	–	0.45	0.65					
<b>Pull-Out Strength in Tension (ACI 318 D.5.3)</b>									
Pull-Out Resistance, Uncracked Concrete ( <i>f'<sub>c</sub></i> =2,500 psi)	<i>N<sub>p, un-cr</sub></i>	lbf	N/A*	4,737	5,115	7,082	12,734	N/A*	16,607
Pull-Out Resistance, Cracked Concrete ( <i>f'<sub>c</sub></i> =2,500 psi)	<i>N<sub>p, cr</sub></i>	lbf	–	2,616	3,584	5,144	6,645	N/A*	11,849
Strength Reduction Factor – Pull-out Failure	<i>ϕ<sub>p</sub></i>	0.45	–	0.65					
<b>Tension Strength for Seismic Applications (ACI D.3.3.3)</b>									
Tension Resistance Factor of Single Anchor for Seismic Loads ( <i>f'<sub>c</sub></i> =2,500 psi)	<i>N<sub>p, eq</sub></i>	lbf	–	2,616	3,584	5,144	6,645	N/A*	11,849
Strength Reduction Factor – Pull-out Failure	<i>ϕ<sub>eq</sub></i>	–	–	0.65					
<b>Pull-Out Strength in Tension for Concrete Over Steel Deck</b>									
Characteristic Pull-Out Strength, Uncracked Concrete Over Steel Deck	<i>N<sub>p, deck un-cr</sub></i>	lbf	–	2,475	4,061	–			
Characteristic Pull-Out Strength, Cracked Concrete Over Steel Deck	<i>N<sub>p, deck cr</sub></i>	lbf	–	1,361	2,965	–			
Reduction Factor for Pull-Out Strength	<i>ϕ</i>	–	–	0.65					

**NOTES:**

- For SI: 1 inch = 25.4 mm; 1 lbf = 4.45 N
- All values of *ϕ* apply to the load combinations of IBC Section 1605.2.1, UBC Section 1612.2.1, or ACI 318 Section 9.2. If the load combinations of UBC Section 1902.2 or ACI 318 Appendix C are used, the appropriate value of *ϕ* must be determined in accordance with ACI 318 D.4.5. For reinforcement that complies with ACI 318 Appendix D requirements for Condition A, the appropriate *ϕ* factor must be determined in accordance with ACI 318 D.4.4.
- Installation must comply with published instructions and details.
- The information presented in these tables must be used in conjunction with the design criteria of ACI 318 Appendix D; for anchors resisting seismic load combinations the additional requirements of ACI 318 D.3.3 must apply.
- Shear loads for anchors installed through steel deck into concrete may be applied in any direction.

- The nominal pull-out strength in tension can be adjusted in accordance with Section 4.1.4 of ICC-ES ESR-2777.
- † The 3/8" anchor must be limited to uncracked concrete and not used in concrete-filled metal deck applications.
- †† The notation in brackets is for the 2006 IBC.
- ††† The Ankr-TITE anchor is considered a brittle steel element as defined by ACI 318 D.1.
- \*Pull-out strength will not control design of indicated anchors.
- \*\* For all cases, *ψ<sub>c, N</sub>*=1.0. The appropriate effectiveness factor for cracked concrete *K<sub>cr</sub>* or uncracked concrete *K<sub>un-cr</sub>* must be used.