

► DESCRIPTION

The UCAN TZ ISS torque controlled mechanical expansion wedge anchors have a Category 1 classification. They are used to resist static, wind and seismic tension and shear loads in cracked and uncracked normal weight or/and lightweight concrete that has a specified compressive strength of between 2,500 psi (17.2 MPa) and 8,500 psi (58.6 MPa). These anchors are fully threaded and are assembled with a unique 3 segment clip. They include a nut and washer and are currently available in diameters 3/8" and 1/2".

► FEATURES

- Fast torque up
- Anchor size = hole size
- Non bottom bearing
- Through fastening type +1/8" clearance hole diameter required
- Fully threaded

► TYPICAL APPLICATIONS

- Exterior anchoring
- Safety equipment
- Fence installation
- Curtain wall
- Balcony railings
- Mechanical equipment
- Brick shelf angles

► LIMITATIONS

Not recommended for uncured concrete (less than 21 days old)

► APPROVALS & LISTINGS

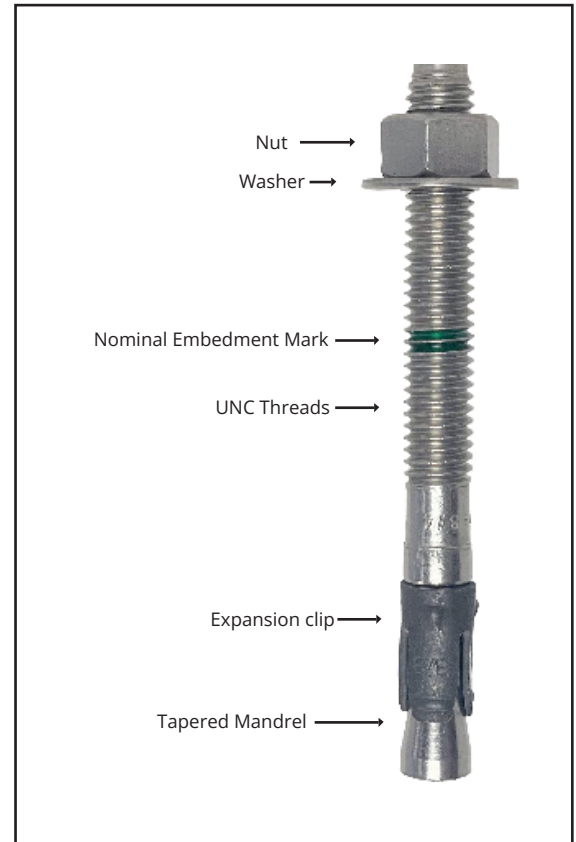
- ICC-ESR 5895
- Tested in accordance with ACI 318 for use in cracked and uncracked structural concrete.
- Meets CSA A23.3-14, Annex D requirements



ICC-ES®
ESR 5895

► MATERIAL SPECIFICATION

Anchor Component	Material	Standard
Anchor body	304 Stainless Steel	ASTM F593 (AISI 304)
Expander Clip		ASTM F593 (AISI 304 HC)
Hex Nut		ASTM F594
Washer		ASME B18.21.1
Additional protective coatings		
Anchor body and nut	Proprietary coating	Gleitmo 605
Expander clip	Sherardized (15 µm)	EN 13811 Class 15



► INSTALLATION

TABLE 1 - INSTALLATION PARAMETERS^{1,2}

Characteristic	Symbol	Unit	Nominal Anchor Diameter							
			1/4"	3/8"	1/2"		5/8"		3/4"	
Outside Diameter	d_o^2	in (mm)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)	1/2 (12.7)	5/8 (15.9)	5/8 (15.9)	3/4 (19.1)	3/4 (19.1)
Nominal Embedment Depth	h_{nom}	in (mm)	1.68 (43)	2.33 (59)	2.33 (59)	3.59 (91)	3.23 (82)	4.49 (114)	3.74 (95)	5.26 (134)
Effective Embedment Depth	h_{ef}	in (mm)	1 1/2 (38)	2 (51)	2 (51)	3 1/4 (83)	2 3/4 (70)	4 (102)	3 1/4 (83)	4 3/4 (121)
Minimum Hole Depth	h_{hole}	in (mm)	2 (51)	2 5/8 (67)	2 5/8 (67)	4 (102)	3 1/2 (89)	4 3/4 (121)	4 (102)	5 3/4 (146)
Clearance Hole Diameter	d_f	in (mm)	5/16 (7.9)	7/16 (11.1)	9/16 (14.3)		11/16 (17.5)		7/8 (22.2)	
Recommended Installation Torque	T_{inst}	ft.lb (Nm)	5 (7)	20 (27)	45 (61)		80 (108)		150 (203)	
Minimum Concrete Thickness	h_{min}	in (mm)	4 (102)	4 (102)	4 (102)	6 (152)	5 1/2 (140)	6 1/2 (165)	6 (152)	8 (203)
Critical Edge Distance	C_{ac}	in (mm)	3 (76)	6 1/2 (165)	6 1/2 (165)	7 1/2 (191)	7 (178)	8 1/2 (216)	9 (229)	12 (305)
Minimum Edge Distance (c_{min}) for Spacing ($s \geq$)	c_{min}	in (mm)	1 3/4 (44)	2 1/2 (64)	3 (76)	2 1/2 (64)	3 1/2 (89)	3 1/2 (89)	5 (127)	4 1/2 (114)
	$s \geq$	in (mm)	2 1/4 (57)	6 1/2 (165)	6 (152)	6 (152)	8 (203)	6 (152)	10 1/2 (267)	9 1/2 (241)
Minimum Spacing (s_{min}) for Edge Distance ($c \geq$)	s_{min}	in (mm)	2 1/4 (57)	2 1/2 (64)	2 3/4 (70)	2 1/2 (64)	4 1/2 (114)	4 (102)	5 (127)	4 (102)
	$c \geq$	in (mm)	1 3/4 (44)	4 (102)	6 (152)	4 (102)	6 (152)	5 (127)	10 1/2 (267)	8 1/2 (216)
Minimum Overall Anchor Length	l_{anch}	in (mm)	2 1/4 (57)	3 (76)	3 1/2 (89)	4 1/2 (114)	4 1/4 (108)	5 1/2 (140)	5 (127)	6 1/2 (165)
Torque Wrench Socket Size	-	in	7/16	9/16	3/4		15/16		1 1/8	

¹ The tabulated data is to be used in conjunction with the design criteria given in ACI 318 (-19 and -14) Chapter 17 or ACI 318-11 Appendix D.

² For the 2006 IBC: d_o replaces d_a and $A_{se,N}$ replaces A_{se} .

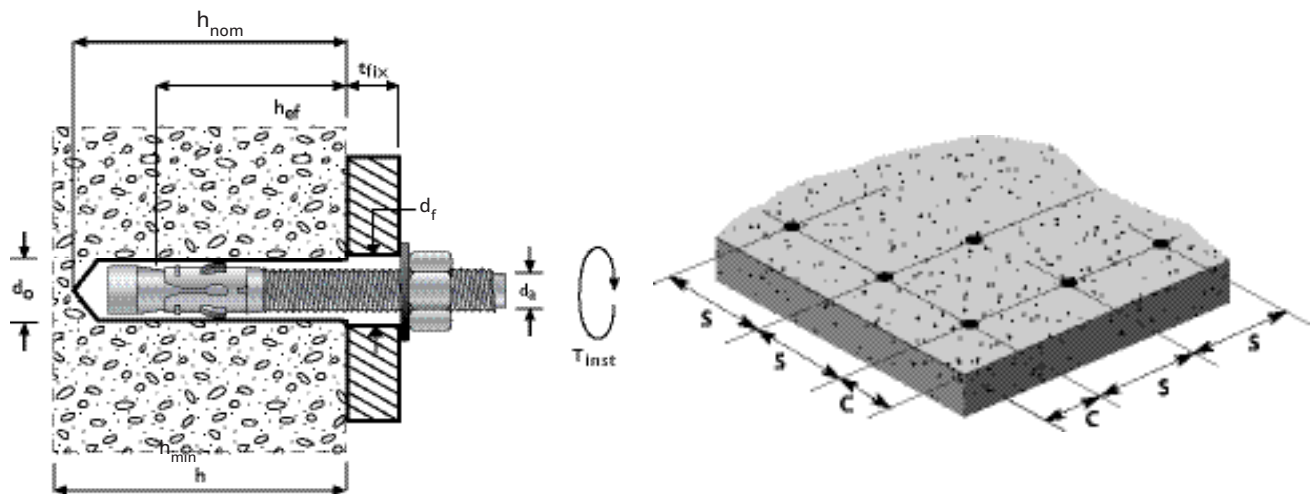
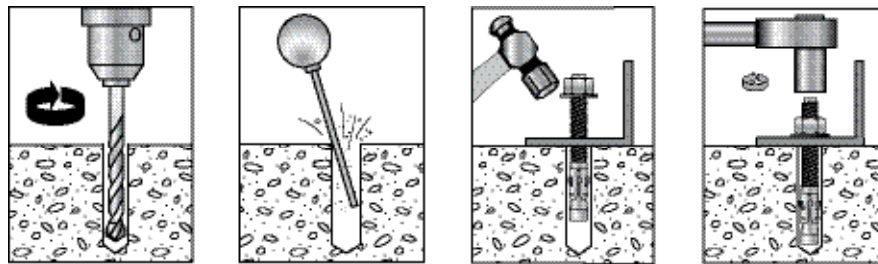


TABLE 2 - STRENGTH DESIGN DATA IN CRACKED AND UNCRACKED NORMAL WEIGHT CONCRETE^{1,2,3,4,5}

Characteristic	Symbol	Unit	Nominal Anchor Diameter							
			1/4"	3/8"	1/2"		5/8"		3/4"	
Outside Diameter	d_o^2	in (mm)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)	1/2 (12.7)	5/8 (15.9)	5/8 (15.9)	3/4 (19.1)	3/4 (19.1)
Nominal Embedment Depth	h_{nom}	in (mm)	1.68 (43)	2.33 (59)	2.33 (59)	3.59 (91)	3.23 (82)	4.49 (114)	3.74 (95)	5.26 (134)
Effective Embedment Depth	h_{ef}	in (mm)	1 1/2 (38)	2 (51)	2 (51)	3 1/4 (83)	2 3/4 (70)	4 (102)	3 1/4 (83)	4 3/4 (121)
Effective Steel Stress Area (Threads)	A_{se}^2	in ² (mm ²)	0.0318 (20.5)	0.077 (49.7)	0.141 (91.0)	0.141 (91.0)	0.226 (145.8)	0.226 (145.8)	0.334 (215.5)	0.334 (215.5)
Effective Steel Stress Area (Neck)	A_{se}^2	in ² (mm ²)	0.0258 (14.8)	0.061 (39.6)	0.112 (72.4)	0.112 (72.4)	0.164 (105.7)	0.164 (105.7)	0.239 (153.9)	0.239 (153.9)
Steel Strength in Tension and Shear										
Minimum Specified Yield Strength (Threads)	f_y	psi (N/mm ²)	76,100 (525)	70,600 (487)			76,100 (525)			
Minimum Specified Yield Strength (Neck)	f_y	psi (N/mm ²)	87,300 (602)							
Minimum Specified Ultimate Strength (Threads)	f_{ut}	psi (N/mm ²)	101,500 (700)	94,300 (650)			101,500 (700)			
Minimum Specified Ultimate Strength (Neck)	f_{ut}	psi (N/mm ²)	101,500 (700)							
Steel Strength in Tension	N_{sa}	lb (kN)	2,615 (11.6)	6,229 (27.7)	11,388 (50.7)	11,388 (50.7)	16,627 (74.0)	16,627 (74.0)	24,218 (107.7)	24,218 (107.7)
Strength Reduction Factor for Steel Failure in Tension	ϕ_{sa}	-	0.75							
Steel Strength in Shear	V_{sa}	lb (kN)	1,861 (8.3)	4,008 (17.8)	4,745 (21.1)	7,301 (32.5)	10,163 (45.2)	10,163 (45.2)	14,805 (65.9)	14,805 (65.9)
Steel Strength in Shear, Seismic	$V_{sa,eq}$	lb (kN)	NA	4,008 (17.8)	4,745 (21.1)	6,596 (29.3)	7,740 (34.4)	7,740 (34.4)	10,556 (47.0)	10,556 (47.0)
Strength Reduction Factor for Steel Failure in Shear	ϕ_{sa}	-	0.65							
Pullout Strength in Tension										
Pullout Strength in Uncracked Concrete	$N_{p,uncr}$	lb (kN)	1,247 (5.6)	3,299 (14.7)	3,723 (16.6)	6,257 (27.8)	-	9,977 (44.4)	-	-
Pullout Strength in Cracked Concrete	$N_{p,cr}$	lb (kN)	NA	2,361 (10.5)	2,117 (9.4)	-	-	-	-	-
Pullout Strength in Cracked Concrete, Seismic	N_{eq}	lb (kN)	NA	2,361 (10.5)	2,117 (9.4)	-	-	-	-	-
Anchor Category	1, 2 or 3	-	1	1	1	1	1	1	1	1
Strength Reduction Factor for Pullout Strength in Tension	ϕ_p	-	0.65							
Concrete Breakout Strength in Tension										
Effectiveness Factor for Uncracked Concrete	k_{uncr}	-	24	24	24	24	24	24	24	24
Effectiveness Factor for Cracked Concrete	k_{cr}	-	-	17	17	17	17	17	21	17
Strength Reduction Factor for Concrete Breakout Strength in Tension	ϕ_{cb}	-	0.65							
Axial stiffness in service load range in uncracked concrete	β_{uncr}	lb/inch (N/mm)	130,772 (22,902)	99,669 (17,455)	177,031 (31,003)	45,481 (7,965)	179,362 (31,411)	74,892 (13,116)	282,916 (49,546)	209,464 (36,683)
Axial stiffness in service load range in cracked concrete	β_{cr}	lb/inch (N/mm)	NA	38,385 (6,722)	70,569 (12,359)	41,385 (7,248)	71,270 (12,481)	43,709 (7,655)	154,605 (27,075)	120,824 (21,159)
Normalization Exponent, Uncracked Concrete	n	-	0.13	0.30	0.32	0.48	0.27	0.44	0.43	0.33
Normalization Exponent, Cracked Concrete	n	-	NA	0.45	0.50	0.49	0.50	0.50	0.27	0.43
Concrete Breakout Strength in Shear										
Nominal Diameter	d_o^2	in (mm)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)	1/2 (12.7)	5/8 (15.9)	5/8 (15.9)	3/4 (19.1)	3/4 (19.1)
Load Bearing Length of Anchor	l_e	in (mm)	1 1/2 (38)	2 (51)	2 (51)	3 1/4 (83)	2 3/4 (70)	4 (102)	3 1/4 (83)	4 3/4 (121)
Reduction Factor for Concrete Breakout Strength in Shear	ϕ_{cb}	-	0.70							
Concrete Pryout Strength in Shear										
Coefficient for Pryout Strength	k_{cp}	-	1.0	1.0	1.0	2.0	2.0	2.0	2.0	2.0
Reduction Factor for Pryout Strength in Shear	ϕ_{cp}	-	0.70							

*Footnotes can be found on the next page.

TABLE 2 FOOTNOTES - STRENGTH DESIGN DATA IN CRACKED AND UNCRACKED NORMAL WEIGHT CONCRETE^{1,2,3,4,5}

For SI: 1 inch = 25.4mm, 1lbf = 4.45N, 1 lb/in = 0.175 N/mm, 1 psi = 0.00689 MPa = 0.00689 N/mm², 1 in² = 645 mm², 1 lb/in = 0.175 N/mm.

¹ The tabulated data is to be used in conjunction with the design criteria given in ACI 318 (-19 and -14) Chapter 17 or ACI 318-11 Appendix D.

² For the 2006 IBC: d_o replaces d_a and $A_{se,N}$ replaces A_{se} .

³ The strength reduction factors apply when the load combinations of Section 1605.1 of the 2018, 2015, 2012, 2009 and 2006 IBC, ACI 318 (-19 and -14) Section 5.3 or ACI 318-11 Section 9.2 are used, and the requirements of ACI 318-19 17.5.3, ACI 318-14 17.3.3(c) or ACI 318-11 D.4.3(c), as applicable, for Condition B (supplementary reinforcement not present) are met. For installations where complying reinforcement can be verified, the applicable strength reduction, factors described in ACI 318-19 17.5.3, ACI 318-14 17.3.3(c) or ACI 318-11 D.4.3(c), as applicable, may be used for Condition A (supplementary reinforcement present). If the load combinations of ACI 318-11 Appendix C are used, the appropriate strength reduction factor must be determined in accordance with ACI 318-11 D.4.4(a) or D.4.4(c) for Condition B (supplementary reinforcement not present), as applicable.

⁴ Where no value is reported for pullout strength, this resistance does not need to be considered.

⁵ NA = Not Applicable.

ISS TZ WEDGE ANCHOR LENGTH CODE IDENTIFICATION SYSTEM

Length ID marking on threaded stud head (dog point)		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Overall anchor length (in.)	From	1½	2	2½	3	3½	4	4½	5	5½	6	6½	7	7½	8	8½	9	9½
	Up to, but not including	2	2½	3	3½	4	4½	5	5½	6	6½	7	7½	8	8½	9	9½	10

