

Metallics

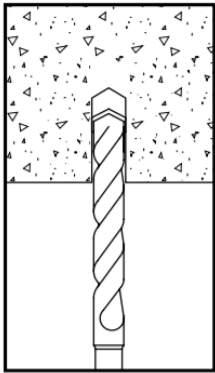
An **AMERICAN** Source For Premier
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SNAKE INTERNAL THREAD SELF-TAPPING ANCHOR

The following Specification Sheet applies to all **Snake Internal Thread Self-Tapping Anchor** in our **M640 series**.

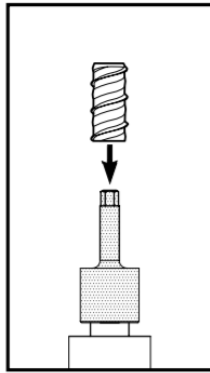


INSTALLATION INSTRUCTIONS



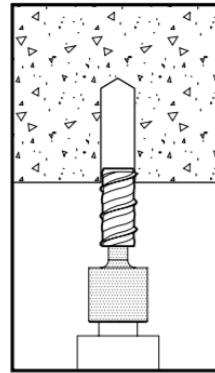
Step 1

Using the proper drill bit size, drill a hole into the base material to the required depth. The tolerances of the carbide drill bit used should meet the requirements of ANSI Standard B212.15.



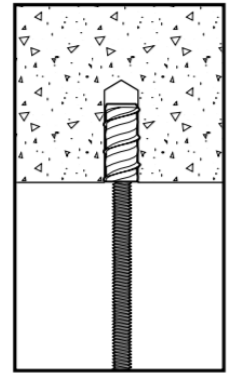
Step 2

Select a powered impact wrench that does not exceed the maximum torque, T_{screw} , for the selected anchor diameter. Attach the Snake+ setting tool supplied by Powers Fasteners to the impact wrench. Mount the anchor onto the setting tool.



Step 3

Drive the anchor into the hole until the shoulder of the Snake+ setting tool comes into contact with the surface of the base material. Do not spin the setting tool off the anchor to disengage.



Step 4

Insert threaded rod or a bolt into the Snake+, taking care not to exceed the maximum specified tightening torque of the steel insert element, T_{max} . Minimum thread engagement should be at least one anchor diameter.

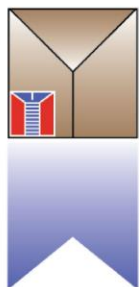
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229 Cross Street
Bristol, CT 06010

www.metallics.us

Phone: 860 589-4186 Toll Free: 800 243-8272

Fax: 860 584-1008 Toll Free Fax: 800 831-9358



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Installation Information for Snake+ Screw Anchor for Single Point Applications¹

Anchor Property/ Setting Information	Notation	Units	Nominal Anchor Size		
			1/4"	3/8"	1/2"
Nominal outside anchor diameter	$d_a(d_o)^3$	in. (mm)	0.375 (9.5)	0.500 (12.7)	0.750 (19.1)
Internal thread diameter (UNC)	d	in. (mm)	0.250 (6.4)	0.375 (9.5)	0.500 (12.7)
Minimum diameter of hole clearance in fixture for steel insert element (following anchor installation)	d_h	in.	5/16	7/16	9/16
Nominal drill bit diameter	d_{bit}	in.	3/8 ANSI	1/2 ANSI	3/4 ANSI
Minimum hole depth	h_o	in. (mm)	2 (51)	2 (51)	2-1/2 (64)
Overall anchor length	ℓ_{anch}	in. (mm)	1-1/4 (32)	1-1/4 (32)	1-11/16 (43)
Minimum nominal embedment depth ²	h_{nom}	in. (mm)	1-5/8 (41)	1-5/8 (41)	2-3/16 (55)
Effective embedment	h_{ef}	in. (mm)	Not Applicable ⁴	1.10 (28)	1.54 (39)
Maximum impact wrench power (torque)	T_{screw}	ft.-lb. (N-m)	120 (163)	345 (468)	345 (468)
Maximum tightening torque of steel insert element (threaded rod or bolt)	T_{max}	ft.-lb. (N-m)	4 (6)	8 (11)	36 (49)
Anchors Installed in Concrete Construction²					
Minimum member thickness ²	h_{min}	in. (mm)	Not Applicable ⁴	4 (102)	4 (102)
Critical edge distance ²	c_{ac}	in. (mm)	Not Applicable ⁴	3 (76)	4 (102)
Minimum edge distance ²	c_{min}	in. (mm)	Not Applicable ⁴	3 (76)	4 (102)
Minimum spacing distance ²	s_{min}	in. (mm)	Not Applicable ⁴	3 (76)	4 (102)

1. The information presented in this table is to be used in conjunction with the design criteria of ACI 318 Appendix D.
2. For installations through the soffit of steel deck into concrete, see installation detail. Anchors in the lower flute may be installed with a maximum 1-inch offset in either direction from center of the flute. In addition, anchors shall have an axial spacing along the flute equal to the greater of $3h_{ef}$ or 1.5 times the flute width.
3. The notation in parenthesis is for the 2009 IBC.
4. The 1/4-inch diameter anchor is limited to redundant fastening design only.
5. For 3/8-inch diameters installed in the topside of concrete-filled steel deck assemblies, steel installation detail.

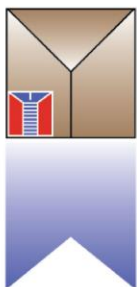
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Anchors Installed in the Topside of Concrete-Filled Steel Deck Assemblies ¹					
Minimum member topping thickness	$h_{min,deck}$	in. (mm)	Not Applicable ⁴	3-1/4 (83)	Not applicable
Critical edge distance	$C_{ac,deck,top}$	in. (mm)	Not Applicable ⁴	3 (76)	Not applicable
Minimum edge distance	$C_{min,deck,top}$	in. (mm)	Not Applicable ⁴	3 (76)	Not applicable
Minimum spacing distance	$S_{min,deck,top}$	in. (mm)	Not Applicable ⁴	3 (76)	Not applicable

- The information presented in this table is to be used in conjunction with the design criteria of ACI 318 Appendix D.
- For installations through the soffit of steel deck into concrete, see installation detail. Anchors in the lower flute may be installed with a maximum 1-inch offset in either direction from center of the flute. In addition, anchors shall have an axial spacing along the flute equal to the greater of $3h_{ef}$ or 1.5 times the flute width.
- The notation in parenthesis is for the 2009 IBC.
- The 1/4-inch diameter anchor is limited to redundant fastening design only.
- For 3/8-inch diameters installed in the topside of concrete-filled steel deck assemblies, steel installation detail.

Tension and Shear Design Strengths Installed in Uncracked Concrete



Nominal Anchor Size (in.)	Nominal Embed. h_{nom} (in.)	Steel Insert Element (Threaded Rod or Bolt)	Minimum Concrete Compressive Strength, f'_c (psi)									
			2,500		3,000		4,000		6,000		8,000	
			ϕN_n Tension (lbs.)	ϕV_n Shear (lbs.)	ϕN_n Tension (lbs.)	ϕV_n Shear (lbs.)	ϕN_n Tension (lbs.)	ϕV_n Shear (lbs.)	ϕN_n Tension (lbs.)	ϕV_n Shear (lbs.)	ϕN_n Tension (lbs.)	ϕV_n Shear (lbs.)
3/8	1-5/8	ASTM A36	900	500	985	500	1,140	500	1,395	500	1,610	500
		ASTM A193 Grade B7	900	970	985	1,060	1,140	1,075	1,395	1,075	1,610	1,075
1/2	2-3/16	ASTM A36	1,865	1,295	2,040	1,295	2,355	1,295	2,885	1,295	3,335	1,295

 - Anchor Pullout/Pryout Strength Controls
 - Concrete Breakout Strength Controls
 - Steel Strength Controls

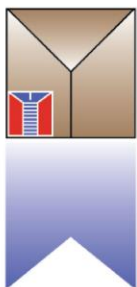
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Tension and Shear Design Strengths Installed in Cracked Concrete



Nominal Anchor Size (in.)	Nominal Embed. h_{nom} (in.)	Steel Insert Element (Threaded Rod or Bolt)	Minimum Concrete Compressive Strength, f'_c (psi)									
			2,500		3,000		4,000		6,000		8,000	
			ϕN_n Tension (lbs.)	ϕV_n Shear (lbs.)	ϕN_n Tension (lbs.)	ϕV_n Shear (lbs.)	ϕN_n Tension (lbs.)	ϕV_n Shear (lbs.)	ϕN_n Tension (lbs.)	ϕV_n Shear (lbs.)	ϕN_n Tension (lbs.)	ϕV_n Shear (lbs.)
3/8	1-5/8	ASTM A36	635	500	700	500	805	500	985	500	1,140	500
		ASTM A193 Grade B7	635	685	700	750	805	870	985	1,065	1,140	1,075
1/2	2-3/16	ASTM A36	1,080	1,295	1,185	1,295	1,370	1,295	1,675	1,295	1,935	1,295

 - Anchor Pullout/Pryout Strength Controls
 - Concrete Breakout Strength Controls
 - Steel Strength Controls

Ultimate Tension Load Capacities for Snake+ in Normal-Weight Uncracked Concrete^{1,2,3,4}

Nominal Anchor Diameter in.	Minimum Embedment Depth in. (mm)	Minimum Concrete Compressive Strength					
		$f'_c = 2,500$ psi (17.2 MPa)		$f'_c = 3,000$ psi (20.7 MPa)		$f'_c = 6,000$ psi (41.4 MPa)	
		Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
1/4	1-5/8 (41)	2,130 (9.5)	1,045 (4.6)	2,335 (10.4)	1,045 (4.6)	-	-
3/8	1-5/8 (41)	2,165 (9.7)	1,045 (4.6)	2,370 (10.6)	1,045 (4.6)	3,190 (14.2)	1,045 (4.6)
1/2	2-3/16 (55)	5,590 (24.9)	2,050 (9.1)	6,125 (27.3)	2,050 (9.1)	7,240 (32.0)	2,050 (9.1)

1. Tabulated load values are for anchors installed in concrete. Concrete compressive strength must be at the specified minimum at the time of installation.
2. Ultimate load capacities must be reduced by a minimum safety factor of 4.0 or greater to determine allowable working load.
3. The tabulated load values are applicable to single anchors in uncracked concrete installed at critical spacing distance between anchors and at critical edge distance.
4. Ultimate shear capacity is controlled by steel strength of ASTM A36 element (or equivalent).

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