

NEW! **Snake**[™] Internally Threaded Self-Tapping Anchor

PRODUCT DESCRIPTION

The Snake anchor is an all-steel, self-tapping, machine bolt anchor designed for use in concrete and is suitable for overhead applications. The anchor is installed with a power tool and mechanically interlocks with the base material. A hammer is not required for installation.

GENERAL APPLICATIONS AND USES

- Suspending Conduit
- Cable Trays and Strut
- Pipe Supports
- Fire Sprinklers
- Concrete Formwork
- Suspended Lighting

FEATURES AND BENEFITS

- Anchor design allows for shallow embedment
- Internally threaded anchor for easy removability and service work
- Fast Installation with a powered impact tool
- Factory Mutual Research Corporation (FM Approvals) – File No. 3024502 for 3/8" diameter Snake

GUIDE SPECIFICATIONS

CSI Divisions: 03151-Concrete Anchoring and 05090-Metal Fastening.
Internally threaded anchors shall be Snake anchors as supplied by Powers Fasteners, Inc., Brewster, NY.

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Snake

THREAD VERSION

UNC Thread

ANCHOR MATERIALS

Zinc Plated Carbon Steel

ROD/ANCHOR SIZE RANGE (TYP.)

1/4" to 3/8" diameter

SUITABLE BASE MATERIALS

Normal-Weight Concrete

INSTALLATION AND MATERIAL SPECIFICATIONS

Installation Specifications

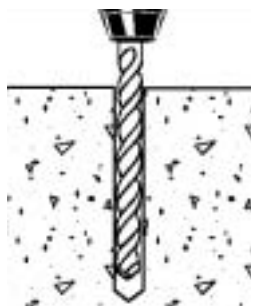
Dimension	Rod/Anchor Diameter, <i>d</i>	
	1/4"	3/8"
ANSI Drill Bit Size, <i>d_{bit}</i> (in.)	5/16	1/2
Max. Tightening Torque, <i>T_{max}</i> (ft.-lbs)	4	8
Internal Thread Size (UNC)	1/4-20	3/8-16
Overall Anchor Length (in.)	1 3/16	1 1/4

Material Specifications

Anchor Component	Component Material
Anchor Body	Case Hardened 10B21 Carbon Steel
Plating	ASTM B 633, SC1, Type III (Fe/Zn 5)

Installation Guidelines

Drill a hole into the base material to the depth of embedment required. The tolerances of the drill bit used should meet the requirements of ANSI Standard B212.15.



Insert the tip of the anchor into the hole. With the appropriate hex driver attached to a powered impact wrench, drive the anchor until the setting tool spins off the anchor. The anchor should be slightly subset following installation.

If using a fixture, position it, insert bolt and tighten. Many overhead applications utilize threaded rod. Minimum thread engagement should be at least one anchor diameter.

PERFORMANCE DATA**Ultimate Load Capacities for Snake in Normal-Weight Concrete^{1,2}**

Rod/Anchor Diameter <i>d</i> in. (mm)	Minimum Embedment Depth <i>h_v</i> in. (mm)	Minimum Concrete Compressive Strength (<i>f'_c</i>)					
		2,000 psi (13.8 MPa)		4,000 psi (27.6 MPa)		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 (6.4)	1 1/4 (31.8)	980 (4.4)	1,250 (5.6)	1,250 (5.6)	1,450 (6.5)	1,410 (6.3)	1,650 (7.4)
3/8 (9.5)	1 1/2 (38.1)	1,565 (7.0)	2,850 (12.8)	2,150 (9.6)	3,290 (14.8)	2,230 (10.0)	4,220 (19.0)

1. The values listed above are ultimate load capacities which should be reduced by a minimum safety factor of 4.0 or greater to determine the allowable working load.

2. Linear interpolation may be used to determine ultimate loads for intermediate compressive strengths.

Allowable Load Capacities for Snake in Normal-Weight Concrete^{1,2}

Rod/Anchor Diameter <i>d</i> in. (mm)	Minimum Embedment Depth <i>h_v</i> in. (mm)	Minimum Concrete Compressive Strength (<i>f'_c</i>)					
		2,000 psi (13.8 MPa)		4,000 psi (27.6 MPa)		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 (6.4)	1 1/4 (31.8)	245 (1.1)	313 (1.4)	313 (1.4)	365 (1.6)	355 (1.6)	413 (1.9)
3/8 (9.5)	1 1/2 (38.1)	391 (1.8)	713 (3.2)	540 (2.4)	825 (3.7)	558 (2.5)	1,055 (4.7)

1. Allowable load capacities listed are calculated using an applied safety factor of 4.0.

2. Linear interpolation may be used to determine allowable loads for intermediate compressive strengths.

DESIGN CRITERIA**Combined Loading**

For anchors loaded in both shear and tension, the combination of loads should be proportioned as follows:

$$\left(\frac{N_u}{N_n}\right) + \left(\frac{V_u}{V_n}\right) \leq 1$$

Where: N_u = Applied Service Tension Load
 N_n = Allowable Tension Load
 V_u = Applied Service Shear Load
 V_n = Allowable Shear Load

Load Adjustment Factors for Spacing and Edge Distances

Anchor Installed in Normal-Weight Concrete					
Anchor Dimension	Load Type	Critical Distance (Full Anchor Capacity)	Critical Load Factor	Minimum Distance (Reduced Capacity)	Minimum Load Factor
Spacing (<i>s</i>)	Tension	$s_{cr} = 12d$	$F_N = 1.0$	$s_{min} = 4d$	$F_N = 0.50$
	Shear	$s_{cr} = 12d$	$F_V = 1.0$	$s_{min} = 4d$	$F_V = 0.75$
Edge Distance (<i>c</i>)	Tension	$c_{cr} = 8d$	$F_N = 1.0$	$c_{min} = 3d$	$F_N = 0.70$
	Shear	$c_{cr} = 12d$	$F_V = 1.0$	$c_{min} = 3d$	$F_V = 0.15$

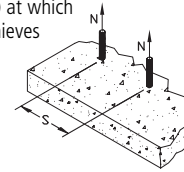
DESIGN CRITERIA

Load Adjustment Factors for Normal-Weight Concrete

Spacing, Tension (F_N)		
Dia. (in.)	1/4	3/8
S_{cr} (in.)	3	4 1/2
S_{min} (in.)	1	1 1/2
Spacing, s (in.)	1	0.50
	1 1/2	0.63
	2	0.75
	2 1/2	0.88
	3	1.00
4 1/2	1.00	1.00

Notes: For anchors loaded in tension, the critical spacing (S_{cr}) is equal to 12 anchor diameters ($12d$) at which the anchor achieves 100% of load.

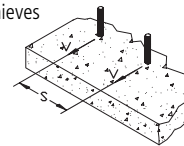
Minimum spacing (S_{min}) is equal to 4 anchor diameters ($4d$) at which the anchor achieves 50% of load.



Spacing, Shear (F_V)		
Dia. (in.)	1/4	3/8
S_{cr} (in.)	3	4 1/2
S_{min} (in.)	1	1 1/2
Spacing, s (in.)	1	0.75
	1 1/2	0.81
	2	0.88
	2 1/2	0.94
	3	1.00
4 1/2	1.00	1.00

Notes: For anchors loaded in tension, the critical spacing (S_{cr}) is equal to 12 anchor diameters ($12d$) at which the anchor achieves 100% of load.

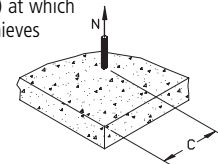
Minimum spacing (S_{min}) is equal to 4 anchor diameters ($4d$) at which the anchor achieves 75% of load.



Edge Distance, Tension (F_N)		
Dia. (in.)	1/4	3/8
C_{cr} (in.)	2	3
C_{min} (in.)	3/4	1 1/8
Edge Dist., c (in.)	3/4	0.70
	1 1/8	0.79
	1 1/2	0.88
	2	1.00
	2 1/2	0.92
	3	1.00

Notes: For anchors loaded in tension, the critical edge distance (C_{cr}) is equal to 8 anchor diameters ($8d$) at which the anchor achieves 100% of load.

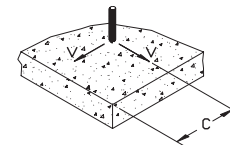
Minimum edge distance (C_{min}) is equal to 3 anchor diameters ($3d$) at which the anchor achieves 70% of load.



Edge Distance, Shear (F_V)		
Dia. (in.)	1/4	3/8
C_{cr} (in.)	3	4 1/2
C_{min} (in.)	3/4	1 1/8
Edge Dist., c (in.)	3/4	0.15
	1 1/8	0.29
	1 1/2	0.43
	2	0.62
	2 1/2	0.81
	3	1.00
	4 1/2	1.00

Notes: For anchors loaded in tension, the critical edge distance (C_{cr}) is equal to 12 anchor diameters ($12d$) at which the anchor achieves 100% of load.

Minimum edge distance (C_{min}) is equal to 3 anchor diameters ($3d$) at which the anchor achieves 15% of load.



ORDERING INFORMATION

Carbon Steel Snake Anchor

Cat. No.	Rod/Anchor Size	Min. Hole Depth	Thread Depth	Standard Box	Standard Carton
6400	1/4"	1 1/8"	9/16"	100	1,000
6401	3/8"	1 1/4"	11/16"	50	500

One setting tool is included in each box.

Setting Tool for Snake Anchor

Cat. No.	Rod/Anchor Size	Standard Box	Standard Carton
6402	1/4"	1	100
6403	3/8"	1	100

