Zamac Hammer-Screw™ *Nail Anchor*

PRODUCT DESCRIPTION

The Zamac Hammer-Screw is a unique, one-step nail drive anchor featuring a Phillips type head and a screw thread for use in concrete, block, brick or stone. It is available in 1/4" diameter and lengths ranging from 3/4" to 3". With a body formed from corrosion resistant Zamac alloy and a carbon or stainless steel drive screw, this anchor has been developed as an improvement over standard nailin anchors.

Traditionally, Zamac Nailin anchors have been used for light duty, non-engineered applications and have not been recommended for use overhead. In order to overcome these problems, the Zamac Hammer-Screw has been designed to provide a removable anchor with up to 40% higher tension load capacities when installed in concrete.

While the standard Zamac Nailin has not been recommended for use overhead, the Zamac Hammer-Screw can be used overhead provided it is designed by an engineer who will take the proper design considerations and safety factors into account.

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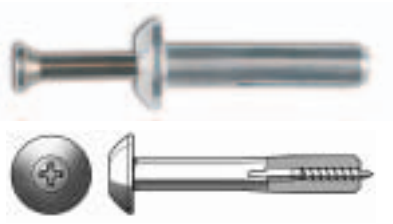


Zamac Hammer-Screw

GENERAL APPLICATIONS AND USES

- Roof Flashings
- Brick Ties and Masonry Anchorage
- Electrical Fixtures
- HVAC and Mechanical Attachments
- Drywall track
- Maintenance

FEATURES AND BENEFITS

- General purpose anchoring
- Installs in a variety of base materials
- Removable anchor when screw is backed out with a Phillips head driver

APPROVALS AND LISTINGS

Southern Building Code Conference International (SBCCI) #9944A
Federal GSA Specification Meets the proof load requirements of FF-S-325C, Group V, Type 2, Class 3, (superseded) and CID A-A 1925A, Type 1

GUIDE SPECIFICATIONS

CSI Divisions: *03151-Concrete Anchoring, 04081-Masonry Anchorage* and *05090-Metal Fastenings.* Pin Anchors shall be Zamac Hammer-Screw anchors as supplied by Powers Fasteners, Inc., Brewster, NY.

ANCHOR MATERIALS

Zamac Alloy with Carbon or Stainless Steel Drive Screw

ANCHOR SIZE RANGE (TYP.)

1/4" x 3/4" to 1/4" x 3" diameter

SUITABLE BASE MATERIALS

Normal-Weight Concrete
Hollow Concrete Masonry
Brick Masonry

INSTALLATION AND MATERIAL SPECIFICATIONS

Installation Specifications

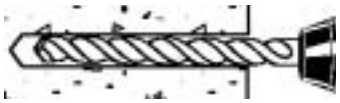
Dimension	Anchor Diameter, *d* 1/4"
ANSI Drill Bit Size, d_{bit} (in.)	1/4
Fixture Clearance Hole (in.)	5/16
Head Height (in.)	9/64
Head Width d_{hd} (in.)	35/64

Material Specifications

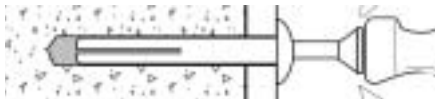
Anchor Component	Component Material	
	Mushroom Head Carbon Steel Screw	Mushroom Head Stainless Screw
Drive Screw	AISI 1018	Type 304 SS
Anchor Body	Zamac Alloy	Zamac Alloy
Screw Plating	ASTM B 633, SC1, Type III (Fe/Zn 5)	N/A
Screw Coating	Perma-Seal Fluoropolymer	N/A

Installation Guidelines

Drill a hole into the base material to a depth of at least 1/4" deeper than the required embedment. The tolerances of the drill bit used should meet the requirements of ANSI Standard B212.15. Blow the hole clean of dust and other material.



Insert the anchor through the fixture. Drive the screw into the anchor body to expand it. Be sure the head is seated firmly against the fixture and that the anchor is at the proper embedment.



To remove – Press a Phillips screw driver firmly into the screw head and turn counterclockwise. Remove the screw from the anchor body, then pry out the fixture and anchor body simultaneously by working the claw of a hammer under the fixture

PERFORMANCE DATA

Ultimate Load Capacities for Zamac Hammer-Screw in Normal-Weight Concrete[1,2]

Anchor Diameter d in. (mm)	Minimum Embedment Depth h_v in. (mm)	Minimum Concrete Compressive Strength (f'_c)					
		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)	5/8 (15.9)	675 (3.0)	650 (2.9)	850 (3.8)	880 (4.0)	890 (4.0)	880 (4.0)
	3/4 (19.1)	790 (3.6)	805 (3.6)	1,135 (5.1)	1,115 (5.0)	1,190 (5.4)	1,115 (5.0)
	7/8 (22.2)	930 (4.2)	990 (4.5)	1,205 (5.4)	1,230 (5.5)	1,250 (5.6)	1,230 (5.5)
	1 1/8 (28.6)	1,220 (5.5)	1,365 (6.1)	1,350 (6.1)	1,470 (6.6)	1,450 (6.5)	1,470 (6.6)
	1 3/8 (34.9)	1,325 (6.0)	1,555 (7.0)	1,450 (6.5)	1,645 (7.4)	1,530 (6.9)	1,645 (7.4)
	1 3/4 (44.5)	1,480 (6.7)	1,840 (8.3)	1,600 (7.2)	1,910 (8.6)	1,660 (7.5)	1,910 (8.6)
	1 7/8 (47.6)	1,480 (6.7)	1,840 (8.3)	1,600 (7.2)	1,910 (8.6)	1,660 (7.5)	1,910 (8.6)

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 embedments and compressive strengths.

Allowable Load Capacities for Zamac Hammer-Screw in Normal-Weight Concrete[1,2,3]

Anchor Diameter d in. (mm)	Minimum Embedment Depth h_v in. (mm)	Minimum Concrete Compressive Strength (f'_c)					
		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)	5/8 (15.9)	170 (0.8)	165 (0.7)	215 (1.0)	220 (1.0)	225 (1.0)	220 (1.0)
	3/4 (19.1)	200 (0.9)	200 (0.9)	285 (1.3)	280 (1.3)	300 (1.4)	280 (1.3)
	7/8 (22.2)	235 (1.1)	250 (1.1)	300 (1.4)	310 (1.4)	315 (1.4)	310 (1.4)
	1 1/8 (28.6)	305 (1.4)	340 (1.5)	340 (1.5)	370 (1.7)	365 (1.6)	370 (1.7)
	1 3/8 (34.9)	330 (1.5)	390 (1.8)	365 (1.6)	410 (1.8)	385 (1.7)	410 (1.8)
	1 3/4 (44.5)	370 (1.7)	460 (2.1)	400 (1.8)	480 (2.2)	415 (1.9)	480 (2.2)
	1 7/8 (47.6)	370 (1.7)	460 (2.1)	400 (1.8)	480 (2.2)	415 (1.9)	480 (2.2)

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 embedments and compressive strengths.
3. Critical and minimum spacing and edge distances as well as reduction factors for intermediate spacing and edge distances are listed in the Design Criteria section.

PERFORMANCE DATA

Ultimate and Allowable Load Capacities for Zamac Nailin in Hollow Concrete Masonry[1,2]

Anchor Diameter d in. (mm)	Minimum Embedment Depth h_v in. (mm)	$f'_m \geq$ 1,500 psi (10.4 MPa)			
		Ultimate Load		Allowable Load	
		Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
1/4 (6.4)	5/8 (15.9)	420 (1.9)	1,160 (5.2)	85 (0.4)	230 (1.0)
	3/4 (19.1)	825 (3.7)	1,215 (5.5)	165 (0.7)	245 (1.1)
	1 (25.4)	1,000 (4.5)	1,265 (5.7)	200 (0.9)	255 (1.1)
	1 1/8 (28.6)	1,090 (4.9)	1,290 (5.8)	220 (1.0)	260 (1.2)
	1 3/8 (34.9)	1,145 (5.2)	1,345 (6.1)	230 (1.0)	270 (1.2)
	1 1/2 (38.1)	1,145 (5.2)	1,345 (6.1)	230 (1.0)	270 (1.2)

1. Tabulated load values are for anchors installed in minimum 6-inch wide, Grade N, Type II, medium and normal-weight and lightweight concrete masonry units. Mortar must be minimum Type N. Masonry compressive strength must be 1,500 psi minimum at the time of installation.
2. Tabulated load values are applicable to anchors with carbon and stainless steel drive screws. The values listed above are ultimate load capacities which should be reduced by a minimum safety factor of 5.0 or greater to determine the allowable working load.

Ultimate and Allowable Load Capacities for Zamac-Hammer Screw in Solid or Hollow Clay Brick Masonry[1,2]

Anchor Diameter d in. (mm)	Minimum Embedment Depth h_v in. (mm)	$f'_m \geq$ 1,500 psi (10.4 MPa)			
		Ultimate Load		Allowable Load	
		Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
1/4 (6.4)	5/8 (15.9)	680 (3.1)	1,400 (6.3)	135 (0.6)	280 (1.3)
	3/4 (19.1)	930 (4.2)	1,600 (7.2)	185 (0.8)	320 (1.4)
	1 (25.4)	990 (4.5)	1,600 (7.2)	200 (0.9)	320 (1.4)
	1 1/8 (28.6)	1,040 (4.7)	1,600 (7.2)	210 (0.9)	320 (1.4)
	1 3/8 (34.9)	1,150 (5.2)	1,600 (7.2)	230 (1.0)	320 (1.4)
	1 1/2 (38.1)	1,260 (5.7)	1,600 (7.2)	250 (1.1)	320 (1.4)

1. Tabulated load values are for anchors installed in Grade SW multiple wythe, brick masonry conforming to ASTM C62.
2. Tabulated load values are applicable to anchors with carbon and stainless steel drive screws. Allowable loads are calculated using an applied safety factor of 5.0.

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 (s)	Tension and Shear	$s_{cr} = 10d$	$F_N = F_V = 1.0$	$s_{min} = 5d$	$F_N = F_V = 0.50$
Edge Distance (c)	Tension	$c_{cr} = 12d$	$F_N = 1.0$	$c_{min} = 5d$	$F_N = 0.80$
	Shear	$c_{cr} = 12d$	$F_V = 1.0$	$c_{min} = 5d$	$F_V = 0.50$

DESIGN CRITERIA

Load Adjustment Factors for Normal-Weight Concrete

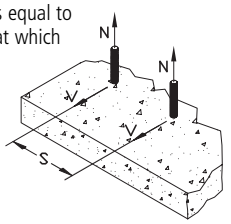
Spacing, Tension (F_N) & Shear (F_V)		
Dia. (in.)		1/4
s_{cr} (in.)		2 1/2
s_{min} (in.)		1 1/4
Spacing, s (in.)	1 1/4	0.50
	1 3/8	0.55
	1 9/16	0.63
	1 5/8	0.65
	1 7/8	0.75
	2 1/8	0.85
	2 1/2	1.00

Edge Distance, Tension (F_N)		
Dia. (in.)		1/4
c_{cr} (in.)		3
c_{min} (in.)		1 1/4
Edge Dist., c (in.)	1 1/4	0.80
	2	0.89
	2 1/4	0.91
	2 1/2	0.94
	3	1.00

Edge Distance, Shear (F_V)		
Dia. (in.)		1/4
c_{cr} (in.)		3
c_{min} (in.)		1 1/4
Edge Dist., c (in.)	1 1/4	0.50
	2	0.71
	2 1/4	0.79
	2 1/2	0.86
	3	1.00

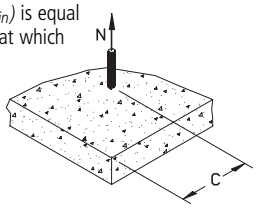
Notes: For anchors loaded in tension and shear, the critical spacing (s_{cr}) is equal to 10 anchor diameters (10d) at which the anchor achieves 100% of load.

Minimum spacing (s_{min}) is equal to 5 anchor diameters (5d) at which the anchor achieves 50% of load.



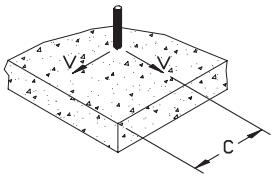
Notes: For anchors loaded in tension, the critical edge distance (c_{cr}) is equal to 12 anchor diameters (12d) at which the anchor achieves 100% of load.

Minimum edge distance (c_{min}) is equal to 5 anchor diameters (5d) at which the anchor achieves 80% of load.



Notes: For anchors loaded in shear, 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 5 anchor diameters (5d) at which the anchor achieves 50% of load.



ORDERING INFORMATION

Mushroom Head with No. 2 Phillips Head Screw

Catalog Number		Anchor Size	Drill Diameter	Standard Box	Standard Carton	Wt./ 100
CS	SS					
2848	–	1/4" x 2 1/4"	1/4"	100	500	3 1/2
2850	–	1/4" x 3"	1/4"	100	500	4 1/4

*Discontinued item once current stock is exhausted.

Master Pack

Catalog Number	Anchor Size	Drill Diameter	Standard Box	Standard Carton	Wt./ 100
2939	1/4" x 3/4"	1/4"	1,000	1,000	1 1/2
2940	1/4" x 1"	1/4"	1,000	1,000	1 3/4
2942	1/4' x 1 1/4"	1/4"	1,000	1,000	2 1/4
2944	1/4" x 1 1/2"	1/4"	1,000	1,000	2 1/2
2946	1/4" x 2"	1/4"	1,000	1,000	3
2948	1/4" x 2 1/4"	1/4"	1,000	1,000	3 1/2
2949	1/4" x 3"	1/4"	1,000	1,000	4 1/4

Mushroom Head with No. 2 Phillips Head Perma-Seal Screw

Catalog Number	Anchor Size	Drill Diameter	Standard Box	Standard Carton	Wt./ 100
2817	1/4" x 1 1/4"	1/4"	100	500	2 1/4
2818 Master Pack	1/4" x 1 1/4"	1/4"	1,000	1,000	2 1/4