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 zinc plated carbon steel or Perma-Seal™ coated drive screw, this anchor has been developed as an improvement over standard nailin anchors.

The Zamac Hammer-Screw has been designed to provide a removable anchor with higher tension load capacities compared with traditional nailin when installed in concrete.

The anchor is not recommended for overhead, life-sfety or sustained tensile loading applications unless special considerations are given to the allowable loads. (see performance data section).

GENERAL APPLICATIONS AND USES

- Brick Ties and Masonry Anchorage
- Electrical Fixtures
- Signage
- Drywall track
- Maintenance
- Surveillance equiptment

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

Federal GSA Specification Meets the proof load requirements of FF-S-325C, Group V, Type 2, Class 3, (superseded) and CID A-A 1925A, Type 1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.* Nail Anchors shall be Zamac Hammer-Screw anchors as supplied by Powers Fasteners, Inc., Brewster, NY.

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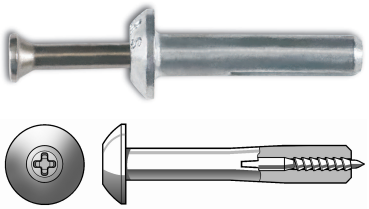


Zamac Hammer-Screw

ANCHOR MATERIALS

Zamac Alloy with Carbon Steel Drive Screw or Perma-Seal™ Coated Carbon 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 (CMU)
Brick Masonry
Stone

INSTALLATION AND MATERIAL SPECIFICATIONS

Installation Specifications

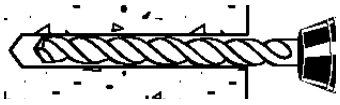
Dimension	Anchor Diameter, *d* 1/4"
ANSI Drill Bit Size, d_{bit} (in.)	1/4
Fixture Clearance Hole (in.)	5/16
Head Height (in.)	9/64
Head Width d_{hd} (in.)	35/64

Material Specifications

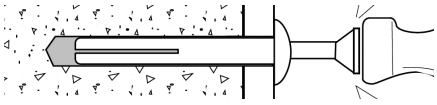
Anchor Component	Component Material: Mushroom Head: Carbon Steel Screw
Drive Screw	AISI 1018
Anchor Body	Zamac Alloy
Screw Plating	ASTM B 633, SC1, Type III (Fe/Zn 5)
Screw Coating	Perma-Seal Fluoropolymer

Installation Guidelines

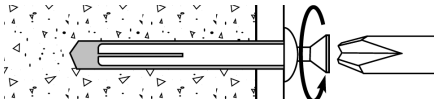
Drill a hole into the base material to a depth of at least 1/4" deeper than the required embedment. The tolerances of the drill bit used should meet the requirements of ANSI Standard B212.15. Blow the hole clean of dust and other material.



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



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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. 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. Consideration of safety factors of 20 or higher may be necessary depending upon the application such as life safety, overhead and in sustained tensile loading applications.

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 and applied safety factor of 4.0. Consideration of safety factors of 20 or higher may be necessary depending upon the application such as life safety, overhead and in sustained tensile loading applications.
2. Linear interpolation may be used to determine allowable loads for intermediate embedments and compressive strengths.
3. Allowable load capacities are multiplied by reduction factors found in the Design Criteria section when anchor spacing or edge distances are less than critical distances.

PERFORMANCE DATA

Ultimate and Allowable Load Capacities for Zamac Hammer Screw in Hollow Concrete Masonry[1,2,3]

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 Type N, S or M. Masonry compressive strength must be 1,500 psi minimum at the time of installation. Masonry cells may be grouted.
2. The tabulated values are for anchors installed at a minimum of 16 anchor diameters on center for 100 percent capacity. Spacing distances may be reduced to 8 anchor diameters on center provied the capacities are reduced by 50 percent. Linear interpolation may be used for intermediate spacing.
3. Allowable load capacities listed are calculated using and applied safety factor of 5.0. Consideration of safety factors of 20 or higher may be necessary depending upon the application such as life safety, and in sustained tensile loading applications.

Ultimate and Allowable Load Capacities for Zamac-Hammer Screw in Solid Clay Brick Masonry[1,2,3]

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 multiple wythe, minimum Grade SW, solid clay brick masonry walls conforming to ASTM C 62. Mortar must be minimum Type N. Masonry compressive strength must be at the specified minimum at the time of installation ($f'm \geq$ 1,500 psi).
2. The tabulated values are for anchors installed at a minimum of 16 anchor diameters on center for 100 percent capacity. Spacing distances may be reduced to 8 anchor diameters on center provied the capacities are reduced by 50 percent. Linear interpolation may be used for intermediate spacing.
3. Allowable load capacities listed are calculated using and applied safety factor of 5.0. Consideration of safety factors of 20 or higher may be necessary depending upon the application such as life safety, and in sustained tensile loading applications.

DESIGN CRITERIA (ALLOWABLE STRESS DESIGN)

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 in Concrete[1]

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	$s_{cr} = 10d$	$F_{N_s} = F_{V_s} = 1.0$	$s_{min} = 5d$	$F_{N_s} = F_{V_s} = 0.50$
Edge Distance (c)	Tension	$c_{cr} = 12d$	$F_{N_c} = 1.0$	$c_{min} = 6d$	$F_{N_c} = 0.80$
	Shear	$c_{cr} = 12d$	$F_{V_c} = 1.0$	$c_{min} = 6d$	$F_{V_c} = 0.50$

1. Allowable load values found in the performance data tables are multiplied by reduction factors when anchor spacing or edge distances are less than critical distances. Linear interpolation is allowed for intermediate anchor spacing and edge distances between critical and minimum distances. When an anchor is affected by both reduced spacing and edge distance, the spacing and edge reduction factors must be combined (multiplied). Multiple reduction factors for anchor spacing and edge distance may be required depending on the anchor group configuration.

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ORDERING INFORMATION

Mushroom Head with No. 2 Phillips Head Screw

Catalog Number	Anchor Size	Drill Diameter	Standard Box	Standard Carton	Wt./ 100
2839	1/4" x 3/4"	1/4"	100	500	1 1/2
2840	1/4" x 1"	1/4"	100	500	1 3/4
2842	1/4' x 1 1/4"	1/4"	100	500	2 1/4
2844	1/4" x 1 1/2"	1/4"	100	500	2 1/2
2846	1/4" x 2"	1/4"	100	500	3
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

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