GENERAL INFORMATION

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-safety 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
- Flashing
- Drywall track
- Maintenance
- Surveillance equipment
- Light gage attachments

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

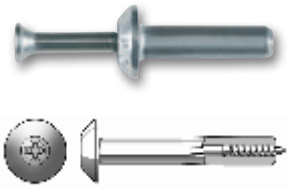
Federal GSA Specification Meets the proof load requirements of FF-S-325C, Group V, Type 2, Class 3, (superseded) and CID A-A 1925A, Type 1

GUIDE SPECIFICATIONS

CSI Divisions: 03 16 00 - Concrete Anchors, 04 05 19.16 - Masonry Anchors and 05 05 19 - Post-Installed Concrete Anchors. Anchors shall be Zamac Hammer-Screw anchors as supplied by Powers Fasteners, Inc., Brewster, NY.

SECTION CONTENTS

General Information.....1
Installation and Material Specifications.....1
Performance Data.....2
Design Criteria.....3
Ordering Information.....4



ZAMAC HAMMER-SCREW

ANCHOR MATERIALS

- Zamac Alloy body 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
- Concrete Masonry (CMU)
- Brick Masonry
- Stone

INSTALLATION AND MATERIAL SPECIFICATIONS

Installation Specifications

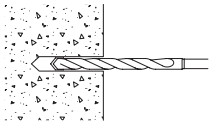
Dimension	Anchor Diameter, d
	1/4
ANSI Drill Bit Size d_{bit} (in.)	1/4
Fixture Clearance Hole (in.)	5/16
Head Height (in.)	9/64
Head Width d_{hd} (in.)	35/64

Material Specifications

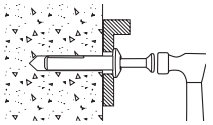
Anchor Component	Mushroom Head Carbon Steel Screw	Mushroom Head Perma-Seal Coated Screw
Anchor Body	Zamac Alloy	Zamac Alloy
Drive Screw	AISI 1018	AISI 1018
Screw Plating/ Coating	ASTM B 633, SC1, Type III (Fe/Zn5)	Perma-Seal™ Fluoropolymer

Installation Guidelines

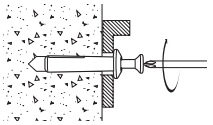
1. Drill a hole into the base material to a depth of at least 1/4" deeper than the required embedment. The tolerances of the drill bit used should meet the requirements of ANSI Standard B212.15. Blow the hole clean of dust and other material.



2. 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. Take care not to overdrive.



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

Rod/ Anchor Diameter d in. (mm)	Min. Embed. Depth h_v in. (mm)	Minimum Concrete Compressive Strength, f 'c											
		2,000 psi				4,000 psi				6,000 psi			
		Tension		Shear		Tension		Shear		Tension		Shear	
		Ultimate lbs. (kN)	Allowable lbs. (kN)	Ultimate lbs. (kN)	Allowable lbs. (kN)	Ultimate lbs. (kN)	Allowable lbs. (kN)	Ultimate lbs. (kN)	Allowable lbs. (kN)	Ultimate lbs. (kN)	Allowable lbs. (kN)	Ultimate lbs. (kN)	Allowable lbs. (kN)
1/4 (6.4)	5/8 (16)	675 (3.0)	170 (0.8)	650 (2.9)	165 (0.7)	850 (3.8)	215 (1.0)	880 (3.9)	220 (1.0)	890 (4.0)	225 (1.0)	880 (3.9)	220 (1.0)
	3/4 (19)	790 (3.5)	200 (0.9)	805 (3.6)	200 (0.9)	1,135 (5.0)	285 (1.3)	1,115 (5.0)	280 (1.2)	1,190 (5.3)	300 (1.3)	1,115 (5.0)	280 (1.2)
	7/8 (22)	930 (4.1)	235 (1.0)	990 (4.4)	250 (1.1)	1,205 (5.4)	300 (1.3)	1,230 (5.5)	310 (1.4)	1,250 (5.6)	315 (1.4)	1,230 (5.5)	310 (1.4)
	1-1/8 (29)	1,220 (5.4)	305 (1.4)	1,365 (6.1)	340 (1.5)	1,350 (6.0)	340 (1.5)	1,470 (6.5)	370 (1.6)	1,450 (6.4)	365 (1.6)	1,470 (6.5)	370 (1.6)
	1-3/8 (35)	1,325 (5.9)	330 (1.5)	1,555 (6.9)	390 (1.7)	1,450 (6.4)	365 (1.6)	1,645 (7.3)	410 (1.8)	1,530 (6.8)	385 (1.7)	1,645 (7.3)	410 (1.8)
	1-3/4 (44)	1,480 (6.6)	370 (1.6)	1,840 (8.2)	460 (2.0)	1,600 (7.1)	400 (1.8)	1,910 (8.5)	480 (2.1)	1,660 (7.4)	415 (1.8)	1,910 (8.5)	480 (2.1)
	1-7/8 (48)	1,480 (6.6)	370 (1.6)	1,840 (8.2)	460 (2.0)	1,600 (7.1)	400 (1.8)	1,910 (8.5)	480 (2.1)	1,660 (7.4)	415 (1.8)	1,910 (8.5)	480 (2.1)

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. Allowable load capacities listed are calculated using an applied safety factor of 4.0. Consideration of safety factors of 20 or higher may be necessary depending on the application, such as life safety, overhead and in sustained tensile loading applications.
3. Linear interpolation may be used to determine allowable loads for anchors at intermediate embedment depths and compressive strengths.
4. The tabulated load values are applicable to single anchors installed at critical edge and spacing distances. Allowable load capacities are multiplied by reduction factors when anchor spacing or edge distances are less than critical distances.

Ultimate and Allowable Load Capacities for Zamac Hammer-Screw in Hollow Concrete Masonry[1,2,3,4]

Nominal Anchor Diameter d in. (mm)	Minimum Embedment Depth h_v in. (mm)	f'm ≥ 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. Hollow masonry cells may also be grouted or solid.
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 provided 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.
4. Anchors installed flush with face or end of masonry surface.

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Ultimate and Allowable Load Capacities for Zamac-Hammer Screw in Solid Clay Brick Masonry[1,2,3,4]

Nominal Anchor Diameter d in. (mm)	Minimum Embedment Depth h_v in. (mm)	f'm ≥ 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)	1,025 (4.6)	135 (0.6)	205 (0.9)
	3/4 (19.1)	930 (4.2)	1,200 (5.3)	185 (0.8)	240 (1.1)
	1 (25.4)	990 (4.5)	1,350 (6.0)	200 (0.9)	270 (1.2)
	1-1/8 (28.6)	1,040 (4.7)	1,350 (6.0)	210 (0.9)	270 (1.2)
	1-3/8 (34.9)	1,150 (5.2)	1,350 (6.0)	230 (1.0)	270 (1.2)
	1-1/2 (38.1)	1,260 (5.7)	1,350 (6.0)	250 (1.1)	270 (1.2)

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 ≥ 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 provided 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.
4. Anchors installed flush with face or end of masonry surface.

DESIGN CRITERIA

Combined Loading

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

$$\left(\frac{Nu}{Nn}\right) + \left(\frac{Vu}{Vn}\right) \leq 1$$

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

Load Adjustment Factors for Spacing and Edge Distances in Normal-Weight Concrete[1]

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	$F_{NS} = F_{VS} = 1.0$	s_{min} = 5d	$F_{NS} = F_{VS} = 0.50$
Edge Distance (c)	Tension	c_{cr} = 12d	$F_{NC} = 1.0$	c_{min} = 6d	$F_{NC} = 0.80$
	Shear	c_{cr} = 12d	$F_{VC} = 1.0$	c_{min} = 6d	$F_{VC} = 0.50$

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.

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

The published size includes the diameter and length of the anchor measured from under the shoulder of the anchor body.

Master Pack

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

The published size includes the diameter and length of the anchor measured from under the shoulder of the anchor body.

Mushroom Head with No. 2 Phillips Head Perma-Seal™ Coated 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	2-1/4

The published size includes the diameter and length of the anchor measured from under the shoulder of the anchor body.

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