Zamac Nailin™ *Nail Anchor*

PRODUCT DESCRIPTION

The Zamac Nailin is a nail drive anchor which has a body formed from Zamac alloy. Drive nails are available in carbon or stainless steel. The anchor can be used in concrete, block, brick or stone.

A corrosion resistant Zamac alloy is used to form the anchor body with either a mushroom or flat head. The anchor can be used for light duty, tamperproof applications.

The anchor is not recommened 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

- Roof Flashing
- Brick Ties and Masonry Anchorage
- Electrical Fixtures
- Mechanical Attachments
- Furring Strips
- Maintenance

FEATURES AND BENEFITS

+ General purpose anchoring
+ Installs in a variety of base materials

APPROVALS AND LISTINGS

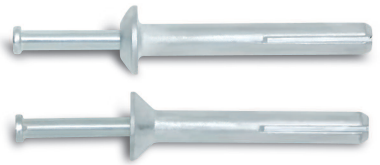
Federal GSA Specification – Meets the proof load requirements of FF-S-325C, Group V, Type 2, Class 3, (superseded) and CID A-A 1925A, Type 1 (mushroom head) & Type 2 (flat head)

GUIDE SPECIFICATIONS

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

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Zamac Nailin

ANCHOR MATERIALS

Zamac Alloy with Carbon or Stainless Steel Drive Nail

ANCHOR SIZE RANGE (TYP.)

3/16" diameter x 7/8" length to 1/4" diameter x 3" length

SUITABLE BASE MATERIALS

Normal-Weight Concrete
Hollow Concrete Masonry (CMU)
Brick Masonry
Stone

INSTALLATION AND MATERIAL SPECIFICATIONS

Installation Specifications

Dimension	Anchor Diameter, *d*		
	3/16" MH	1/4" MH	1/4" FH
ANSI Drill Bit Size, d_{bit} (in.)	3/16	1/4	1/4
Fixture Clearance Hole (in.)	1/4	5/16	5/16
Head Height (in.)	7/64	9/64	3/16
Head Width d_{hd} (in.)	13/32	35/64	35/64

MH = Mushroom Head FH = Flat Head

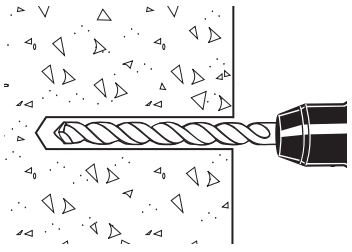
Material Specifications

Anchor Component	Component Material		
	Mushroom Head	Flat Head	Mushroom Head
	CS Nail	CS Nail	SS Nail
Drive Nail	AISI 1018	AISI 1018	Type 304 SS
Anchor Body	Zamac Alloy	Zamac Alloy	Zamac Alloy
Nail Plating	ASTM B 633, SC1, Type III (Fe/Zn 5)		N/A

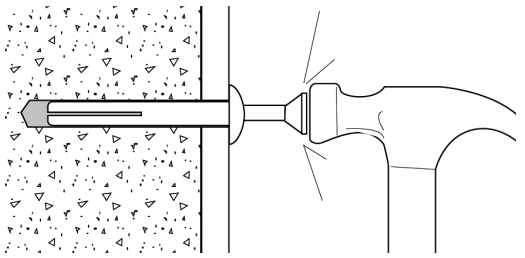
CS = Carbon Steel SS = Stainless Steel

Installation Guidelines

Using the proper diameter bit, 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 nail 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. This anchor is not recommended for use overhead.



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PERFORMANCE DATA

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

Anchor Diameter	Minimum Embedment Depth	Minimum Concrete Compressive Strength (f'_c)					
		2,000 psi (13.8 MPa)		**4,000 psi** (27.6 MPa)		**6,000 psi** (41.4 MPa)	
d in. (mm)	h_v in. (mm)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
3/16 (4.8)	3/4 (19.1)	285 (1.3)	415 (1.8)	400 (1.8)	560 (2.5)	480 (2.1)	560 (2.5)
1/4 (6.4)	5/8 (15.9)	410 (1.8)	440 (2.0)	580 (2.6)	655 (2.9)	580 (2.6)	655 (2.9)
	3/4 (19.1)	540 (2.4)	600 (2.7)	765 (3.4)	850 (3.8)	800 (3.6)	850 (3.8)
	1 (25.4)	620 (2.8)	640 (2.9)	875 (3.9)	890 (4.0)	895 (4.0)	890 (4.0)
	1 1/4 (31.7)	700 (3.1)	720 (3.2)	990 (4.4)	970 (4.3)	990 (4.4)	990 (4.4)

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. Anchors are not recommended for use overhead or for life safety. Consideration of safety factors of 20 or higher may be necessary depending upon the application such as in sustained tensile loading applications.

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

Anchor Diameter	Minimum Embedment Depth	Minimum Concrete Compressive Strength (f'_c)					
		2,000 psi (13.8 MPa)		**4,000 psi** (27.6 MPa)		**6,000 psi** (41.4 MPa)	
d in. (mm)	h_v in. (mm)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
3/16 (4.8)	3/4 (19.1)	70 (0.3)	100 (0.5)	100 (0.5)	140 (0.6)	120 (0.5)	140 (0.6)
1/4 (6.4)	5/8 (15.9)	100 (0.5)	110 (0.5)	145 (0.6)	160 (0.7)	145 (0.6)	160 (0.7)
	3/4 (19.1)	135 (0.6)	150 (0.7)	190 (0.8)	210 (0.9)	200 (0.9)	210 (0.9)
	1 (25.4)	155 (0.7)	150 (0.7)	220 (1.0)	220 (1.0)	220 (1.0)	220 (1.0)
	1 1/4 (31.7)	175 (0.8)	180 (0.8)	245 (1.1)	240 (1.1)	245 (1.3)	240 (1.1)

1. Allowable load capacities listed are calculated using and applied safety factor of 4.0. Anchors are not recommended for use overhead or for life safety. Consideration of safety factors of 20 or higher may be necessary depending upon the application such as 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 Nailin 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)
3/16 (4.8)	3/4 (19.1)	270 (1.2)	560 (2.5)	55 (0.2)	110 (0.5)
1/4 (6.4)	5/8 (15.9)	360 (1.6)	655 (2.9)	70 (0.3)	130 (0.6)
	3/4 (19.1)	735 (3.3)	850 (3.8)	145 (0.7)	170 (0.8)
	1 (25.4)	835 (3.8)	890 (4.0)	165 (0.7)	180 (0.8)
	1 1/4 (31.7)	990 (4.4)	970 (4.3)	200 (0.9)	195 (0.9)

1. Tabulated load values are for anchors installed in minimum 6-inch wide, minimum Grade N, Type II, lightweight, medium-weight or normal-weight concrete masonry units conforming to ASTM C 90. 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. Allowable load capacities listed are calculated using and applied safety factor of 5.0. Anchors are not recommended for use overhead or for life safety. Consideration of safety factors of 20 or higher may be necessary depending upon the application such as in sustained tensile loading applications.
3. Anchors installed flush with face shell surface.

Ultimate and Allowable Load Capacities for Zamac Nailin 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)
3/16 (4.8)	3/4 (19.1)	460 (2.1)	920 (4.1)	90 (0.4)	185 (0.8)
1/4 (6.4)	5/8 (15.9)	570 (2.6)	1,250 (5.6)	115 (0.5)	250 (1.1)
	3/4 (19.1)	790 (3.6)	1,400 (6.3)	160 (0.7)	280 (1.3)
	1 (25.4)	820 (3.7)	1,400 (6.3)	165 (0.7)	280 (1.3)
	1 1/4 (31.7)	865 (3.9)	1,400 (6.3)	175 (0.8)	280 (1.3)

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. Allowable load capacities listed are calculated using and applied safety factor of 5.0. Anchors are not recommended for use overhead or for life safety. Consideration of safety factors of 20 or higher may be necessary depending upon the application such as in sustained tensile loading applications.

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[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	$s_{cr} = 10d$	$F_{Ns} = F_{vs} = 1.0$	$s_{min} = 5d$	$F_{Ns} = F_{vs} = 0.50$
Edge Distance (c)	Tension	$c_{cr} = 12d$	$F_{Nc} = 1.0$	$c_{min} = 5d$	$F_{Nc} = 0.80$
	Shear	$c_{cr} = 12d$	$F_{Vc} = 1.0$	$c_{min} = 5d$	$F_{Vc} = 0.50$

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 Zamac Nailin with Carbon Steel Nail

Cat. No.	Anchor Size	Drill Diameter	Std. Box	Std. Carton	Wt./100
2802	3/16" x 7/8"	3/16"	100	500	3/4
2806	1/4" x 3/4"	1/4"	100	500	1 1/2
2808	1/4" x 1"	1/4"	100	500	1 3/4
2814	1/4" x 1 1/4"	1/4"	100	500	2 1/4
2820	1/4" x 1 1/2"	1/4"	100	500	2 1/2
2826	1/4" x 2"	1/4"	100	500	3
2804	1/4" x 3"	1/4"	100	500	4



Master Pack Mushroom Head Zamac Nailin with Carbon Steel Nail

Cat. No.	Anchor Size	Drill Diameter	Std. Box	Std. Carton	Wt./100
2803	3/16" x 7/8"	3/16"	–	1,000	3/4
2807	1/4" x 3/4"	1/4"	–	1,000	1 1/2
2809	1/4" x 1"	1/4"	–	1,000	1 3/4
2815	1/4" x 1 1/4"	1/4"	–	1,000	2 1/4
2821	1/4" x 1 1/2"	1/4"	–	1,000	2 1/2
2827	1/4" x 2"	1/4"	–	1,000	3
2805	1/4" x 3"	1/4"	–	1,000	4



Flat Head Zamac Nailin with Carbon Steel Nail

Cat. No.	Anchor Size	Drill Diameter	Std. Box	Std. Carton	Wt./100
2836	1/4" x 1 1/2"	1/4"	100	500	2 1/2
2838	1/4" x 2"	1/4"	100	500	3



Mushroom Head Zamac Nailin with Stainless Steel Nail

Cat. No.	Anchor Size	Drill Diameter	Std. Box	Std. Carton	Wt./100
2858	1/4" x 1"	1/4"	100	500	1 3/4
2864	1/4" x 1 1/4"	1/4"	100	500	2 1/4
2870	1/4' x 1 1/2"	1/4"	100	500	2 1/2
2876	1/4" x 2"	1/4"	100	500	3



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