

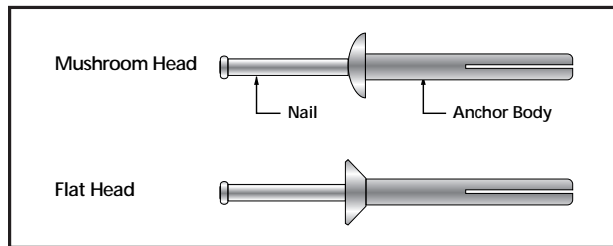
30.0 Zamac Nailin®

30.1 Introduction

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

30.2 Product Description

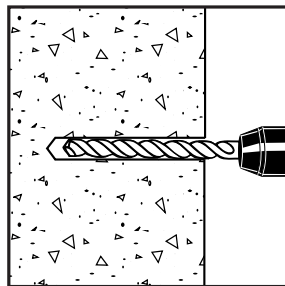
The diameter of the Zamac Nailin anchor is the same as that for the hole which eliminates layout or hole spotting. A corrosion resistant alloy, Zamac 7, is used to form the anchor body with either a mushroom or flat head. On the working end of anchor, two longitudinal slots are formed to allow each half of the body



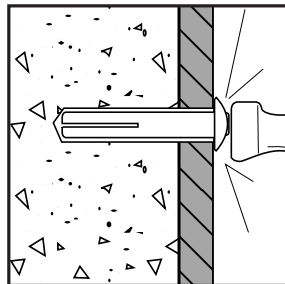
to expand. The anchor is pre-assembled with either a carbon steel or stainless steel nail. As the nail is driven into the anchor body, each half of the expansion mechanism is compressed against the walls of the drilled hole. This anchor is not recommended for applications overhead.

30.3 Installation Procedures

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. This anchor is not recommended for use overhead.



30.4 Anchor Sizes and Styles

The following tables list the sizes and styles of Zamac Nailin anchors including both zinc plated carbon steel and stainless steel nails. For mushroom head Zamac Nailin anchors, the anchor length is measured from below the head while the flat head version is measured end to end. To select the proper length, determine the embedment depth required to obtain the desired load capacity. Then add the thickness of the fixture, including any spacers or shims, to the embedment depth. This will be the minimum anchor length required.

Mushroom Head Zamac Nailin® - Carbon Steel Nail

Cat. No.	Size	Drill Dia.	Std. Box	Std. Ctn.	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

Flat Head Zamac Nailin® - Carbon Steel Nail

Cat. No.	Size	Drill Dia.	Std. Box	Std. Ctn.	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

Master Pack Mushroom Head Zamac Nailin® Carbon Steel Nail

Cat. No.	Size	Drill Dia.	Std. Box	Std. Ctn.	Wt./100
2803	3/16" x 7/8"	3/16"	-	1000	3/4
2807	1/4" x 3/4"	1/4"	-	1000	1-1/2
2809	1/4" x 1"	1/4"	-	1000	1-3/4
2815	1/4" x 1-1/4"	1/4"	-	1000	2-1/4
2821	1/4" x 1-1/2"	1/4"	-	1000	2-1/2
2827	1/4" x 2"	1/4"	-	1000	3

Mushroom Head Zamac Nailin® Type 304 Stainless Steel Nail

Cat. No.	Size	Drill Dia.	Std. Box	Std. Ctn.	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

30.5 Installation Specifications

Anchor Size	3/16" MH	1/4" MH	1/4" FH
ANSI Drill Bit Size	3/16"	1/4"	1/4"
Fixture Clearance Hole	1/4"	5/16"	5/16"
Head Height	7/64"	9/64"	3/16"
Head Width	13/32"	35/64"	35/64"

30.6 Material Specifications

Anchor Component	Component Material		
	Mushroom Head CS Nail	Flat Head CS Nail	Mushroom Head SS Nail
Drive Nail	AISI 1018	AISI 1018	Type 304 SS
Anchor Body	Zamac 7	Zamac 7	Zamac 7
Nail Plating	ASTM B 633, SC1, Type 3 (Fe / Zn)		N/A

30.7 Performance Data

The following ultimate load capacities are based on testing conducted according to ASTM Standard E 488.

Anchor Size	Embed. Depth	2,000 psi Concrete		4,000 psi Concrete		6,000 psi Concrete	
		Tension (lbs.)	Shear (lbs.)	Tension (lbs.)	Shear (lbs.)	Tension (lbs.)	Shear (lbs.)
3/16"	3/4"	460	920	500	1000	580	1,000
1/4"	5/8"	480	1,230	600	1,500	640	1,500
1/4"	3/4"	580	1,230	720	1,500	760	1,500
1/4"	7/8"	770	1,350	820	1,500	890	1,500
1/4"	1-1/8"	890	1,400	960	1,500	1,060	1,500
1/4"	1-3/8"	980	1,400	1,150	1,500	1,230	1,500
1/4"	1-7/8"	1,150	1,400	1,300	1,500	1,365	1,500

NOTE: The values listed above are ultimate load capacities which should be reduced by minimum safety factor of 4 or greater to determine the allowable working load. Refer to the section on Anchor Selection Guidelines for details.

Load Capacities in C-90 Block and Solid Brick

Anchor Size	Embed. Depth	C-90 Hollow Block		Solid Red Brick	
		Tension (lbs.)	Shear (lbs.)	Tension (lbs.)	Shear (lbs.)
3/16"	3/4"	270	860	460	920
1/4"	5/8"	360	1,040	570	1,250
1/4"	3/4"	480	1,160	790	1,400
1/4"	1"	590	1,320	820	1,400
1/4"	1-3/8"	800	1,320	950	1,400
1/4"	1-1/2"	965	1,320	1,015	1,400

NOTE: The values listed above are ultimate load capacities in pounds which should be reduced by a minimum safety factor of four or greater to determine the allowable working load. Refer to the section on Anchor Selection Guidelines for details. The consistency of hollow block and brick varies greatly. The load capacities listed should be used as guidelines only. Job site tests should be conducted to determine actual load capacities.

30.8 Design Criteria

Base Material Thickness

The minimum recommended thickness of base material, BMT, when using the Zamac Nailin is 125% of the embedment to be used. For example, when installing an anchor to a depth of 1-1/2", the base material thickness should be 1-7/8". This does not apply to the face shell of a hollow block wall.

Spacing Between Anchors

To obtain the maximum load in tension or shear, a spacing, S, of 10 anchor diameters (10d) should be used. The minimum recommended anchor spacing, S, is 5 anchor diameters (5d) at which point the load should be reduced by 50%. The following table lists the load reduction factor, Rs, for each anchor diameter, d, based on the center to center anchor spacing.

Anchor Size	Anchor Spacing, S (Inches)					
	Tension And Shear					
d	10d	9d	8d	7d	6d	5d
3/16	1-7/8	1-3/4	1-1/2	1-3/8	1-1/8	1
1/4	2-1/2	2-1/4	2	1-3/4	1-1/2	1-1/4
Rs	1.00	0.90	0.80	0.70	0.60	0.50

Edge Distance - Tension

An edge distance, E, of 12 anchor diameters (12d) should be used to obtain the maximum tension load. The minimum recommended edge distance, E, is 5 anchor diameters (5d) at which point the tension load should be reduced by 20%. The following table lists the load reduction factor, Re, for each anchor diameter, d, based on the anchor center to edge distance.

Anchor Size	Edge Distance, E (Inches)							
	Tension Only							
d	12d	11d	10d	9d	8d	7d	6d	5d
3/16	2-1/4	2-1/8	1-7/8	1-3/4	1-1/2	1-3/8	1-1/8	1
1/4	3	2-3/4	2-1/2	2-1/4	2	1-3/4	1-1/2	1-1/4
Re	1.00	0.97	0.94	0.91	0.89	0.86	0.83	0.80

Edge Distance - Shear

For shear loads, an edge distance, E, of 12 anchor diameters (12d) should be used to obtain the maximum load. The minimum recommended edge distance, E, is 5 anchor diameters (5d) at which point the shear load should be reduced by 50%. The following table lists the load reduction factor, Re, for each anchor diameter, d, based on the anchor center to edge distance.

Anchor Size	Edge Distance, E (Inches)							
	Shear Only							
d	12d	11d	10d	9d	8d	7d	6d	5d
3/16	2-1/4	2-1/8	1-7/8	1-3/4	1-1/2	1-3/8	1-1/8	1
1/4	3	2-3/4	2-1/2	2-1/4	2	1-3/4	1-1/2	1-1/4
Re	1.00	0.93	0.86	0.79	0.71	0.64	0.57	0.50

30.9 Approvals and Listings

The following approvals and listings are for reference purposes. They should be reviewed by the design professional responsible for the product installation to verify approved base materials, sizes, and compliance with local codes.

Federal Specification

Meets the descriptive requirements of FF-S-325C, Group V, Type 2, Class 3

Metro Dade Acceptance No. 90-1109.8

30.10 Suggested Specification

Zamac Nailin® with Carbon Steel Nail

Expansion anchors shall be a pre-assembled nail drive anchor with a _____ style head and a body formed from Zamac 7 alloy. The carbon steel nail shall be plated according to ASTM specification B633, SC1, Type III. Zamac Nailin anchors shall be as dimensioned and supplied by Powers Fastening, Inc.

Zamac Nailin® with Stainless Steel Nail

Expansion anchors shall be a pre-assembled nail drive anchor with a mushroom style head and a body formed from Zamac 7 alloy. The nail shall be manufactured from Type 304 stainless steel. Zamac Nailin anchors shall be as dimensioned and supplied by Powers Fastening, Inc.