

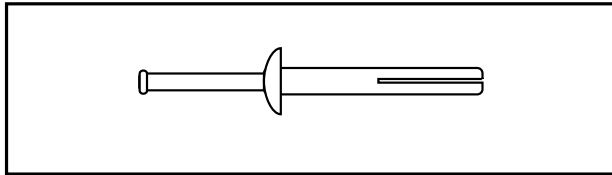
15.0 Metal Pin Anchor

15.1 Introduction

The Metal Pin Anchor is a nail drive anchor which has a body formed from Zamac alloy and a carbon or stainless steel nail. The anchor can be used in concrete, block, brick, or stone.

15.2 Product Description

The diameter of the Metal Pin Anchor 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 a carbon 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. Once set, the anchor is not removable and therefore vandalproof. This anchor is not recommended for applications overhead.

Material Specifications:

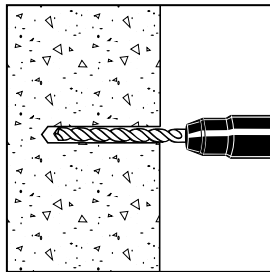
Drive Nail: AISI 1018

Anchor Body: Zamac 7 Alloy

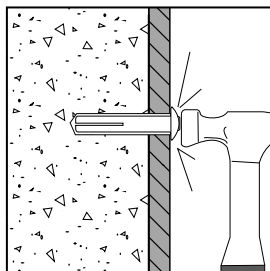
Nail Plating : ASTM B 633, SC1 Type III (Zn / Fe)

15.3 Installation Procedures

Using the proper diameter bit, drill a hole into the base material to a depth of at least 6.5mm deeper than the required embedment. 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.



15.4 Anchor Sizes and Styles

Mushroom Head Zamac Nailin® - Carbon Steel Nail

Cat. No.	Part No.	Anchor Size	Drill Dia.	Std. Box	Std. Ctn.	Wt./ 100
1008	MPa0522	5mm x 22mm	5.0mm	100	500	0.2
1039	MPa6520	6.5mm x 20mm	6.5mm	100	500	0.5
1011	MPa6525	6.5mm x 25mm	6.5mm	100	500	0.8
1010	MPa6532	6.5mm x 32mm	6.5mm	100	500	1.0
1119	MPa6538	6.5mm x 38mm	6.5mm	400	500	1.1
1120	MPa6550	6.5mm x 50mm	6.5mm	400	500	1.4

15.5 Performance Data

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

Anchor Size	Embed. Depth	15 MPa Concrete		30 MPa Concrete		40 MPa Concrete	
		Tension (kN)	Shear (kN)	Tension (kN)	Shear (kN)	Tension (kN)	Shear (kN)
5mm	19mm	2.05	4.09	2.22	4.45	2.58	4.45
6.5mm	16mm	2.14	5.47	2.67	6.67	2.85	6.67
6.5mm	22mm	3.43	6.01	3.65	6.67	3.96	6.67
6.5mm	29mm	3.96	6.23	4.27	6.67	4.72	6.67
6.5mm	35mm	4.36	6.23	5.12	6.67	5.47	6.67
6.5mm	48mm	5.12	6.23	5.78	6.67	6.07	6.67

NOTE: The values listed above are ultimate load capacities which should be reduced by minimum safety factor of four or greater to determine the allowable working load. Refer to the section on Product 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 (kN)	Shear (kN)	Tension (kN)	Shear (kN)
5mm	19mm	1.20	3.83	2.05	4.09
6.5mm	20mm	2.14	5.16	3.51	6.23
6.5mm	25mm	2.62	5.87	3.65	6.23
6.5mm	35mm	3.56	5.87	4.23	6.23
6.5mm	38mm	4.29	5.87	4.52	6.23

NOTE: The values listed above are ultimate load capacities which should be reduced by minimum safety factor of four or greater to determine the allowable working load. Refer to the section on Product 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.

15.6 Design Criteria

Base Material Thickness

The minimum recommended thickness of base material, BMT, when using the Safety Bolt is 125% of the embedment to be used. For example, when installing an anchor to a depth of 20mm, the base material thickness should be 25mm. This does not apply to the thickness of the face shell in 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 (mm) Tension and Shear					
d (mm)	10d	9d	8d	7d	6d	5d
5	50	45	40	35	30	25
6.5	65	59	52	46	39	33
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 (mm) Tension Only							
d (mm)	12d	11d	10d	9d	8d	7d	6d	5d
5	60	55	50	45	40	35	30	25
6.5	78	72	65	59	52	46	39	33
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 (mm)	12d	11d	10d	9d	8d	7d	6d	5d
6.5	78	72	65	59	52	46	39	33
Re	1.00	0.93	0.86	0.79	0.71	0.64	0.57	0.50

15.7 Suggested Specification

Zamac Nailin® with Carbon Steel Nail

Expansion anchors shall be pre-assembled nail drive anchor with a mushroom style head and a body formed from Zamac 7 alloy. The carbon steel nail shall be plated zinc. Anchors shall be as dimensioned and supplied by Powers Fasteners Australasia.