



Sleeve Anchors

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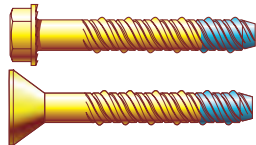
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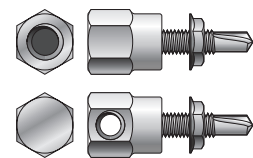
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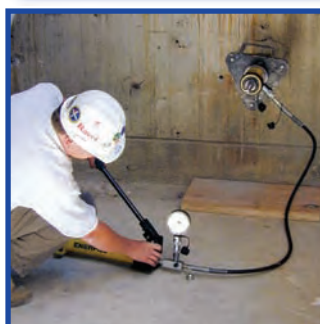
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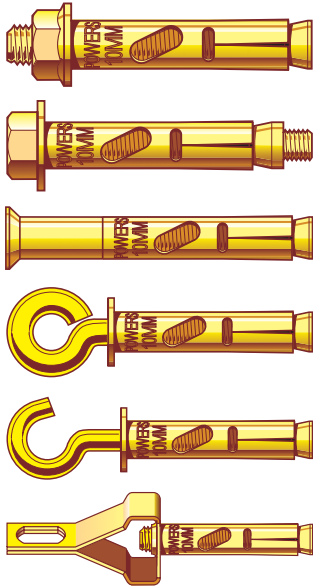
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Sleeve Anchor



Introduction

The Sleeve Anchor is a pre-assembled single unit sleeve anchor available in carbon steel, stainless steel and hot dipped galvanized which can be used in concrete, block, brick, and stone.

Description

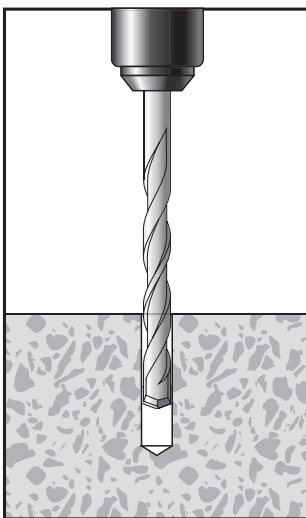
The Sleeve Anchor diameter is the same as that for the hole which eliminates layout or hole spotting. The Hex nut head and Countersunk head style anchors consist of a threaded plow bolt which has a cone shape at the bottom end. Eyebolt, Hookbolt and Flush head style anchors have a cone which is threaded to the bolt at the bottom end. Precision stamped tubular expansion sleeves are assembled over the bolt and butted against the tapered cone or the plow section at the bottom of the bolt.

As the anchor is tightened, the specially tapered plow bolt or the tapered cone is drawn into the expansion sleeve to develop a locking action against the walls of the hole.

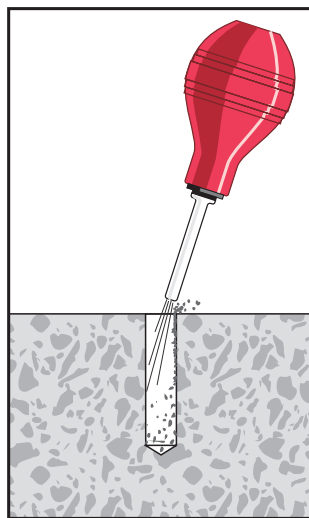
Material specifications

Anchor component	Carbon Steel		Stainless Steel
	Zinc coated	Hot Dipped Galvanised	
Anchor bolt		AISI 1018	316SS
Expansion sleeve		AISI 1010	316SS
Washer		AISI 1018	316SS
Nut		AISI 1018	
Expander cone (Eyebolt, Hookbolt and Flushead style anchors)		AISI 1018	316SS
Plating	Electroplated zinc in accordance with AS1789-2003. Coating thickness 5 microns (min.)	Hot Dip Galvanised in accordance with AS/NZ 4680 - 2006 Coating thickness 42 microns (min.)	

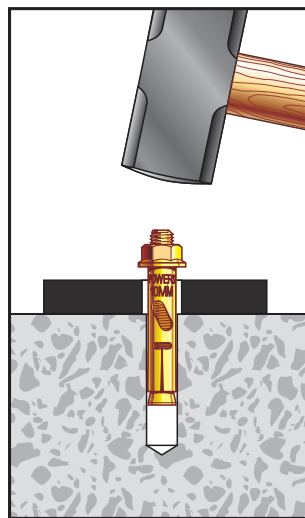
Installation procedure



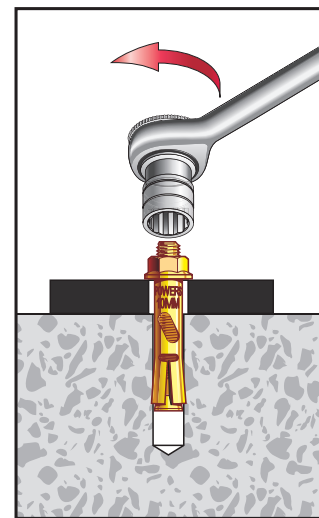
Using the proper diameter bit, drill a hole into the base material to a depth of at least 13mm or one anchor diameter deeper than the embedment required.



Blow the hole clean of dust and other material. Do not expand the anchor prior to installation



Drive the anchor through the fixture into the anchor hole until the head is firmly seated against the fixture. Be sure the anchor is driven to the required embedment depth.



Tighten the anchor by turning the head 3 to 4 turns or by applying the guide installation torque from the finger tight position.

Anchor sizes and styles

The following tables list the sizes and styles of Sleeve Anchors. To select the proper length for the hex nut and countersunk, 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 along with the nut mechanism. This will be the minimum anchor length required. The eyebolt and hook bolt anchor styles are installed directly into the base material to the minimum required embedment.

Sleeve anchor, hex head, zinc plated carbon steel

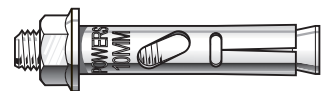
Information listed below is based on anchor "minimum" embedment depth and "maximum" fixture thickness. Increased embedment depth and reduced fixture thickness is permitted. Consult Powers Fasteners for further assistance.

Part No	Description	Drill Ø mm	Fixture clearance Ø mm	Embed. Depth mm	Fixture thickness mm	Box qty	Carton qty
HS6520	6.5 x 20mm			18	2		
HS6525	6.5 x 25mm			20	5		
HS6535	6.5 x 35mm	6.5	8	30	5	100	1000
HS6555	6.5 x 55mm			30	25		
HS6575	6.5 x 75mm			30	45		
HS0840	8 x 40mm			35	5	100	1000
HS0865	8 x 65mm	8	10	35	30	50	500
HS0885	8 x 85mm			35	50	50	500
HS1040	10 x 40mm			34	6		500
HS1050	10 x 50mm			40	10		500
HS1060	10 x 60mm	10	12	40	20	50	500
HS1075	10 x 75mm			40	35		500
HS1095	10 x 95mm			40	55		400
HS10120	10 x 120mm			40	80		300
HS1260	12 x 60mm				10	50	400
HS1275	12 x 75mm	12	14	50	25	25	250
HS12100	12 x 100mm				50	25	250
HS12130	12 x 130mm				80	25	200
HS1665	16 x 65mm				10	25	200
HS16110	16 x 110mm	16	18	55	55	10	100
HS16145	16 x 145mm				90	10	100
HS2075	20 x 75mm				15	10	100
HS20105	20 x 105mm	20	22	60	45	10	60
HS20150	20 x 150mm				90	10	60

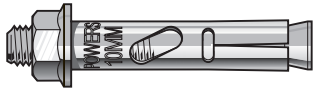


Sleeve anchor, stainless steel (316 grade)

Part No	Description	Drill Ø mm	Fixture clearance Ø mm	Embed. Depth mm	Fixture thickness mm	Box qty	Carton qty
HS6535SS	6.5 x 35mm				5		
HS6555SS	6.5 x 55mm	6.5	8	30	25	100	1000
HS6575SS	6.5 x 75mm				45		
HS0840SS	8 x 40mm				5	100	1000
HS0865SS	8 x 65mm	8	10	35	30	50	500
HS0885SS	8 x 85mm				50	50	500
HS1040SS	10 x 40mm			34	6		500
HS1050SS	10 x 50mm				10		500
HS1060SS	10 x 60mm	10	12	40	20	50	500
HS1075SS	10 x 75mm				35		500
HS1095SS	10 x 95mm				55		400
HS1260SS	12 x 60mm				10	50	400
HS1275SS	12 x 75mm	12	14	50	25	25	250
HS12100SS	12 x 100mm				50	25	250

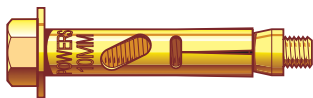


Sleeve anchor, carbon steel, galvanised



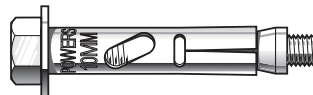
Part No	Description	Drill Ø mm	Fixture clearance Ø mm	Embed. Depth mm	Fixture thickness mm	Box qty	Carton qty
HS0840G	8 x 40mm			35	5	100	1000
HS0865G	8 x 65mm	8	10	35	30	50	500
HS0885G	8 x 85mm			35	50	50	500
HS1040G	10 x 40mm			36	4		500
HS1050G	10 x 50mm			40	10		500
HS1060G	10 x 60mm	10	12	40	20	50	500
HS1075G	10 x 75mm			40	35		500
HS1095G	10 x 95mm			40	55		400
HS1260G	12 x 60mm				10	50	400
HS1275G	12 x 75mm				25	25	250
HS12100G	12 x 100mm	12	14	50	50	25	250
HS12130G	12 x 130mm				80	25	200
HS1665G	16 x 65mm	16	18	55	10	25	200

Flush head sleeve anchor, hex head, zinc plated carbon steel



Part No	Description	Drill Ø mm	Fixture clearance Ø mm	Embed. Depth mm	Fixture thickness mm	Box qty	Carton qty
FHS0845	8 x 45mm				10	100	1000
FHS0870	8 x 70mm	8	10	35	35	50	500
FHS0890	8 x 90mm				55	50	500
FHS1045	10 x 45mm				5		500
FHS1055	10 x 55mm				15		500
FHS1065	10 x 65mm	10	12	40	25	50	500
FHS1080	10 x 80mm				40		500
FHS10100	10 x 100mm				60		400
FHS1265	12 x 65mm				15	50	300
FHS1280	12 x 80mm	12	14	50	30	25	250
FHS12105	12 x 105mm				55	25	250
FHS1675	16 x 75mm	16	18	60	15	25	200
FHS16110	16 x 110mm				50	10	100

Flush head sleeve anchor, hex head, stainless steel (316 grade)



Part No	Description	Drill Ø mm	Fixture clearance Ø mm	Embed. Depth mm	Fixture thickness mm	Box qty	Carton qty
FHS0845SS	8 x 45mm			35	10	100	1000
FHS0870SS	8 x 70mm	8	10	35	35	50	500
FHS0890SS	8 x 90mm			35	55	50	500
FHS1040SS	10 x 40mm			34	6		500
FHS1060SS	10 x 60mm			40	20		500
FHS1075SS	10 x 75mm	10	12	40	35	50	500
FHS1095SS	10 x 95mm			40	55		400
FHS1275SS	12 x 75mm	12	14	50	25	25	250

Sleeve anchor, CSK head, zinc plated carbon steel

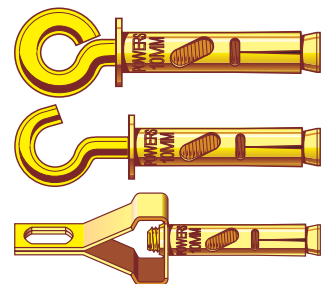
Part No	Description	Drill Ø mm	Fixture clearance Ø mm	Embed. Depth mm	Fixture thickness mm	Box qty	Carton qty
FS6536	6.5 x 36mm				6		
FS6555	6.5 x 55mm	6.5	8	30	25	100	1000
FS6575	6.5 x 75mm				45		
FS65100	6.5 x 100mm				70		
FS0860	8 x 60mm	8	10	35	25	50	500
FS0885	8 x 85mm				50		
FS1075	10 x 75mm	10	12	40	35	50	500
FS10100	10 x 100mm				60		500
FS10120	10 x 120mm				80		400



Suspension anchor, zinc plated carbon steel

Part No	Description	Drill Ø mm	Embed. Depth mm	Fixture thickness mm	Box qty	Carton qty
SUS6525	Suspension 6.5 x 25mm	6.5	25	N/A	100	1000
SUS6535	Suspension 6.5 x 35mm		35			
EB8045	Eye bolt 8 x 45mm	8	45			100
HB8045	Hook bolt 8 x 45mm					

NOTE: Working load capacity for:
 SUS6525 is 0.60kN
 SUS6535 is 0.70kN
 EB8045 is 0.50kN
 HB8045 is 0.50kN



Performance data

Working stress design



Allowable working load capacities for Sleeve Anchor									
BOLT SIZE mm	ANCHOR SIZE mm	DRILL SIZE mm	EMBED. DEPTH mm	20 MPa concrete		32 MPa concrete		40 MPa concrete	
				Tension kN	Shear kN	Tension kN	Shear kN	Tension kN	Shear kN
M5	6.5	6.5	20	1.1	1.1	1.4	1.4	1.6	1.6
			30	1.5	1.5	1.8	1.8	1.6	1.6
			40	1.5	1.5	1.8	1.8	2.0	2.0
M6	8	8	30	2.1	2.1	2.1	2.1	2.3	2.3
			40	2.1	2.1	2.4	2.4	2.4	2.4
			50	2.3	2.3	2.4	2.4	2.4	2.4
M8	10	10	40	2.5	2.5	3.2	3.2	3.5	3.5
			50	3.4	3.4	3.5	3.5	3.9	3.9
			60	4.4	4.4	4.4	4.4	4.6	4.6
M10	12	12	40	3.4	3.4	4.3	4.3	4.8	4.8
			50	3.8	3.8	5.5	5.5	5.8	5.8
			60	4.6	4.6	5.9	5.9	6.1	6.1
M12	16	16	50	4.5	4.5	5.6	5.6	6.3	6.3
			70	7.4	7.4	9.3	9.3	9.5	9.5
			80	9.0	9.0	9.5	9.5	9.5	9.5
M16	20	20	70	7.5	7.5	9.5	9.5	10.6	10.6
			90	9.9	16.2	13.8	16.2	14.4	16.2
			100	11.3	16.2	14.4	16.2	14.4	16.2

NOTE: Incorporated safety factor (Tension and shear) for concrete $F_{sc} = 3$, for steel $F_s = 2.5$

Limit state design



Allowable working load capacities for Sleeve Anchor									
BOLT SIZE mm	ANCHOR SIZE mm	DRILL SIZE mm	EMBED. DEPTH mm	20 MPa concrete		32 MPa concrete		40 MPa concrete	
				Tension kN	Shear kN	Tension kN	Shear kN	Tension kN	Shear kN
M5	6.5	6.5	20	2.0	2.0	2.5	2.5	2.8	2.8
			30	2.7	2.7	3.2	3.2	3.2	3.2
			40	2.7	2.7	3.2	3.2	3.6	3.6
M6	8	8	30	3.7	3.7	3.8	3.8	4.1	4.1
			40	3.8	3.8	4.3	4.3	4.3	4.3
			50	4.1	4.1	4.3	4.3	4.3	4.3
M8	10	10	40	4.5	4.5	5.7	5.7	6.3	6.3
			50	6.1	6.1	6.3	6.3	7.0	7.0
			60	7.9	7.9	7.9	7.9	8.3	8.3
M10	12	12	40	6.1	6.1	7.7	7.7	8.6	8.6
			50	6.8	6.8	9.9	9.9	10.4	10.4
			60	8.3	8.3	10.6	10.6	11.0	11.0
M12	16	16	70	10.4	10.4	11.0	11.0	11.0	11.0
			50	8.0	8.0	10.1	10.1	11.3	11.3
			80	16.2	16.2	17.1	17.1	17.1	17.1
M16	20	20	70	13.5	13.5	17.1	17.1	19.1	19.1
			90	17.8	32.4	24.9	32.4	25.9	32.4
			100	20.3	32.4	25.9	32.4	25.9	32.4

NOTE: Incorporated strength reduction factor (Tension and shear) for concrete $\phi = 0.6$, for steel $\phi = 0.8$

Design criteria

Base material thickness

The minimum recommended thickness of base material, BMT, when using the Sleeve Anchor is 125% of the embedment to be used. For example, when installing an anchor to a depth of 100mm, the base material thickness should be 125mm.

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 HOLE SIZE Ø mm	Spacing distance, S (mm) Tension and Shear					
	10d	9d	8d	7d	6d	5d
6.5	65	58.5	52	45.5	39	32.5
8	80	72	64	56	48	40
10	100	90	80	70	60	50
12	120	108	96	84	72	60
16	160	144	128	112	96	80
20	200	180	160	140	120	100
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 centre to edge distance.

ANCHOR HOLE SIZE Ø mm	Edge distance, E (mm) Tension only							
	12d	11d	10d	9d	8d	7d	6d	5d
6.5	78	71.5	65	58.5	52	45.5	39	32.5
8	96	88	80	72	64	56	48	40
10	120	110	100	90	80	70	60	50
12	144	132	120	108	96	84	72	60
16	192	176	160	144	128	112	96	80
20	240	220	200	180	160	140	120	100
Re(t)	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 centre to edge distance.

ANCHOR HOLE SIZE Ø mm	Edge distance, E (mm) Shear only							
	12d	11d	10d	9d	8d	7d	6d	5d
6.5	78	71.5	65	58.5	52	45.56	39	32.5
8	96	88	80	72	64	56	48	40
10	120	110	100	90	80	70	60	50
12	144	132	120	108	96	84	72	60
16	192	176	160	144	128	112	96	80
20	240	220	200	180	160	140	120	100
Re(s)	1.00	0.93	0.86	0.79	0.71	0.64	0.57	0.50

Suggested specification

	Example
Product name	Sleeve anchor
Head style	Flush head
Material	Carbon steel
Plating	Zinc plated
Part number	FHS12105
Size	12 x 105mm
Embedment depth	75mm
Minimum spacing and edge distance	Spacing: 120mm, Edge distance: 144mm
	Product to be installed in accordance with published installation procedure



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