

Sleeve Anchors

Description

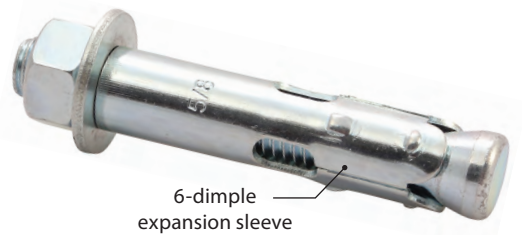
The sleeve anchor is a high-strength pre-assembled expansion anchor designed for anchoring into concrete, masonry, and brick. The Sleeve anchor has a **6-dimple expansion sleeve** over a threaded stud bolt which provides superior performance in all conditions. These anchors are available in a number of head styles for a wide array of applications.

Key Features & Benefits

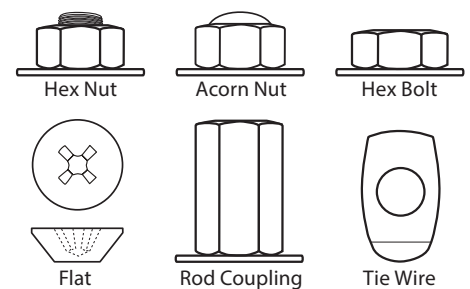
- ▶ Pre-assembled with nut and washer for immediate installation
 - Eliminates the problem of missing components
- ▶ Anchor size = Drill bit size
- ▶ Can be used for solid and hollow concrete and masonry applications
- ▶ New **6-dimple expansion sleeve** allows the anchor to grip imperfections in the base material
- ▶ One-piece sleeve design allows stress to be distributed over the entire contact area
- ▶ Available in a variety of lengths and diameters
- ▶ Available in a variety of head styles:
 - Acorn Nut
 - Hex Bolt
 - Hex Nut
 - Phillips Flat Head
 - Rod Coupling
 - Tie Wire
- ▶ Available in zinc-plated carbon steel and Type 304 stainless steel

Applications

- ▶ Shelving
- ▶ Cable Trays
- ▶ Sill Plates
- ▶ Door Frames
- ▶ Window Frames
- ▶ Railing



Available Nut and Head Styles



Specifications, Listings and Approvals

Diameters: 1/4" – 3/4"

Carbon Steel Anchor Materials:

Body:

1/4 through 5/16: C1035
3/8 through 3/4: C1010/ C1018

Expansion Sleeve:

All sizes: C1010/C1018

Washer:

All sizes: C1010/C1018

Finish: Zinc plating

Meets ASTM B633, SC1 Type III with clear chromate, SC1 class mild

Stainless Steel Anchor Material:

All components:

ASTM F593 Group 1 Type 304

Federal Specifications:

- QQZ-325C, Type II, Class 3 (clear chromate added)
- GSA FFS-325, Group II, Type 3, Class 3

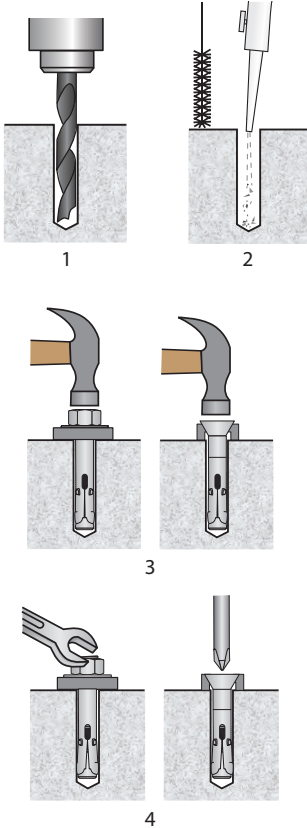
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Installation Information

Instructions

1. Drill the hole perpendicular to the work surface. To assure full holding power, do not ream the hole or allow the drill to wobble.

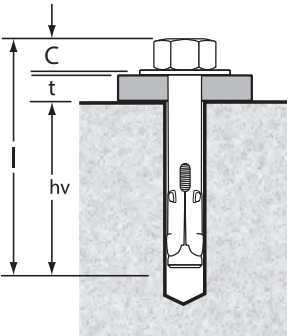
Drill the hole at least 1 anchor diameter deeper than the calculated embedment depth, but not closer than two anchor diameters to the bottom surface of the concrete. Through drilling is allowed when using sleeve anchors in hollow concrete block.
2. Clean the hole using compressed air and a nylon brush. A clean hole is necessary for proper performance.
3. Drive anchor through the fixture into the hole making sure the nut, or head, rests solidly against the fixture. Be sure the anchor is set to the required embedment depth.
4. Tighten the nut, or head, 3 to 5 turns past the hand-tight position.



Installation Data

Anchor Dia. (in.)	Drill Dia. (in.)	Bolt Dia. (in.)	Effective Embed. Depth (in.)	Min. Edge Dist. (in.)	Critical Edge Dist. (in.)	Min. Spacing Dist. (in.)	Critical Spacing Dist. (in.)
1/4	1/4	3/16	1-1/8	1-1/4	3	1-11/16	3-3/8
5/16	5/16	1/4	1-7/16	1-1/2	3-3/4	2-3/16	4-5/16
3/8	3/8	5/16	1-1/2	1-3/4	4-1/2	2-1/4	4-1/2
1/2	1/2	3/8	2-1/4	2-1/4	6	3-3/8	6-3/4
5/8	5/8	1/2	2-3/4	3-1/8	7-1/2	4-1/8	8-1/4
3/4	3/4	5/8	3-3/8	3-3/4	9	5-1/16	10-1/8

Length Selection



- hv: Minimum Embedment
t: Attached Material Thickness
C: Nut Height = anchor diameter
L: Total Anchor Length

Sleeve Anchors

Performance Data

Ultimate and Allowable Loads (lbs.) – Normal-Weight Concrete/Aggregate/Stone

Anchor Dia. (in.)	Head Style	Drill Dia. (in.)	Bolt Size (in.)	Install. Torque (ft-lb)	Embed. (in.)	Allowable						Ultimate					
						2,000 psi		3,000 psi		4,000 psi		2,000 psi		3,000 psi		4,000 psi	
						Tens.	Shear	Tens.	Shear	Tens.	Shear	Tens.	Shear	Tens.	Shear	Tens.	Shear
1/4	Acorn Nut	1/4	10-24	4	1-1/8	275	370	305	370	320	375	1100	1480	1220	1480	1280	1500
					1-11/16	323	440	343	440	373	445	1290	1760	1370	1760	1490	1780
5/16	Hex Nut	5/16	1/4-20	8	1-3/16	345	520	460	558	495	600	1380	2080	1840	2230	1980	2400
					1-7/16	388	530	485	575	515	620	1550	2120	1940	2300	2060	2480
					2-1/16	423	608	525	620	548	630	1690	2430	2100	2480	2190	2520
3/8	Hex Nut	3/8	5/16-18	15	1-1/4	433	700	538	715	628	775	1730	2800	2150	2860	2510	3100
					1-1/2	458	720	585	730	778	805	1830	2880	2340	2920	3110	3220
					2-1/2	518	793	648	868	830	923	2070	3170	2590	3470	3320	3690
1/2	Hex Nut	1/2	3/8-16	25	1-1/2	610	1055	765	1113	1060	1225	2440	4220	3060	4450	4240	4900
					2-1/4	795	1253	1025	1253	1175	1268	3180	5010	4100	5010	4700	5070
					3-3/8	853	1273	1063	1275	1285	1295	3410	5090	4250	5100	5140	5180
5/8	Hex Nut	5/8	1/2-13	55	2-1/4	1115	1768	1385	2033	1535	2040	4460	7070	5540	8130	6140	8160
					2-3/4	1230	1950	1403	2128	1648	2148	4920	7800	5610	8510	6590	8590
					3-15/16	1263	1998	1418	2133	1785	2165	5050	7990	5670	8530	7140	8660
3/4	Hex Nut	3/4	5/8-11	90	1-7/8	1090	2410	1563	2745	2123	2855	4360	9640	6250	10980	8490	11420
					2-1/4	1128	2558	1678	2910	2230	3270	4510	10230	6710	11640	8920	13080
					3-3/8	1738	2910	2058	2943	2383	3278	6950	11640	8230	11770	9530	13110

*Allowable load capacities are calculated using an applied safety factor of 4:1

Ultimate and Allowable Loads (lbs.) – Hollow Concrete Block

Anchor Dia. (in.)	Head Style	Drill Dia. (in.)	Bolt Size (in.)	Installation Torque (ft-lb)	Embed. depth (in.)	2,000 psi							
						Allowable				Ultimate			
						Hollow Core		Grout -Filled		Hollow Core		Grout -Filled	
						Tension	Shear	Tension	Shear	Tension	Shear	Tension	Shear
1/4	Acorn Nut	1/4	10-24	3.5	1-1/8	268	338	300	338	1070	1350	1200	1350
					1-5/8	275	338	323	338	1100	1350	1290	1350
5/16	Hex Nut	5/16	1/4-20	5	2-1/16	283	568	370	568	1130	2270	1480	2270
3/8	Hex Nut	3/8	5/16-18	14	1-1/2	343	765	578	765	1370	3060	2310	3060
					2-1/2	350	765	603	765	1400	3060	2410	3060
1/2	Hex Nut	1/2	3/8-16	20	1-7/8	345	1020	525	1020	1380	4080	2100	4080
					2-3/8	-	-	673	1020	-	-	2690	4080
					3-3/8	-	-	705	1300	-	-	2820	5200
5/8	Hex Nut	5/8	1/2-13	45	2	-	-	778	1645	-	-	3110	6580
					3-15/16	-	-	1025	1645	-	-	4100	6580
3/4	Hex Nut	3/4	5/8-11	80	2-1/2	-	-	1060	2570	-	-	4240	10280
					3-9/16	-	-	1248	2570	-	-	4990	10280

*Allowable load capacities are calculated using an applied safety factor of 4:1

NOTE: Allowable loads are calculated at one-fourth of the maximum tensile and shear capacities to reach the recommended 4:1 safety factor. Information provided only for the use of a qualified design engineer. Use of technical data by persons not qualified could cause serious damage, injury or even death.

Load Adjustment Factors

Load Adjustment Factors – Spacing*

Anchor Diameter		1/4	5/16	3/8	1/2	5/8	3/4
Embedment h_{nom}		1-1/8	1-7/16	1-1/2	2-1/4	2-3/4	3-3/8
Critical Spacing S_{cr}		3-3/8	4-5/16	4-1/2	6-3/4	8-1/4	10-1/8
Minimum Spacing S_{min}		1-11/16	2-3/16	2-1/4	3-3/8	4-1/8	5-1/16
Actual Spacing S_{act}	1-11/16	0.50	–	–	–	–	–
	2-3/16	0.65	0.50	–	–	–	–
	2-1/4	0.67	0.52	0.50	–	–	–
	3-3/8	1.00	0.78	0.75	0.50	–	–
	4-1/8	–	0.96	0.92	0.61	0.50	–
	4-5/16	–	1.00	0.96	0.64	0.52	–
	4-1/2	–	–	1.00	0.67	0.55	–
	5-1/16	–	–	–	0.75	0.61	0.50
	6-3/4	–	–	–	1.00	0.82	0.67
	8-1/4	–	–	–	–	1.00	0.81
	10-1/8	–	–	–	–	–	1.00

* For tension and shear anchor loads, the critical spacing (S_{cr}) is equal to 3 embedment depths at which the anchor achieves 100% of load. Minimum spacing (S_{min}) is equal to 1.5 embedment depths at which the anchor achieves 50% of load.

Load Adjustment Factors – Edge*

Anchor Dia.		Tension						Shear					
		1/4	5/16	3/8	1/2	5/8	3/4	1/4	5/16	3/8	1/2	5/8	3/4
Embedment h_{nom}		1-1/8	1-7/16	1-1/2	2-1/4	2-3/4	3-3/8	1-1/8	1-7/16	1-1/2	2-1/4	2-3/4	3-3/8
Critical Edge C_{cr}		3	3-3/4	4-1/2	6	7-1/2	9	3	3-3/4	4-1/2	6	7-1/2	9
Minimum Edge C_{min}		1-1/4	1-9/16	1-7/8	2-1/2	3-1/8	3-3/4	1-1/4	1-9/16	1-7/8	2-1/2	3-1/8	3-3/4
Actual Edge C_{act}	1-1/4	0.70	–	–	–	–	–	0.45	–	–	–	–	–
	1-9/16	0.75	0.70	–	–	–	–	0.56	0.45	–	–	–	–
	1-7/8	0.81	0.74	0.70	–	–	–	0.65	0.53	0.45	–	–	–
	2-1/2	0.91	0.83	0.77	0.70	–	–	0.84	0.69	0.58	0.45	–	–
	3	1.00	0.90	0.83	0.74	–	–	1.00	0.81	0.69	0.53	–	–
	3-1/8	–	0.91	0.84	0.75	0.70	–	–	0.84	0.71	0.55	0.45	–
	3-3/4	–	1.00	0.91	0.81	0.74	0.70	–	1.00	0.84	0.65	0.53	0.45
	4-1/2	–	–	1.00	0.87	0.79	0.74	–	–	1.00	0.76	0.62	0.53
	6	–	–	–	1.00	0.90	0.81	–	–	–	1.00	0.81	0.69
	7-1/2	–	–	–	–	1.00	0.84	–	–	–	–	1.00	0.84
	9	–	–	–	–	–	1.00	–	–	–	–	–	1.00

* For tension anchor loads, the critical edge distance (C_{cr}) is equal to 12 diameters at which the anchor achieves 100% of load. Minimum edge distance (C_{min}) is equal to 5 anchor diameters at which the anchor achieves 70% of load.

* For shear anchor loads, the critical edge distance (C_{cr}) is equal to 12 diameters at which the anchor achieves 100% of load. Minimum edge distance (C_{min}) is equal to 5 anchor diameters at which the anchor achieves 45% of load.

Sleeve Anchors

Order Information



Acorn Nut: Zinc-Plated Carbon Steel					
Catalog No.	Anchor Size (in.)	Drill Bit Dia. (in.)	Min. Embed. (in.)	Box Quantity	Carton Quantity
ASA1413	1/4 x 1-3/8	1/4	1-1/8	100	1000
ASA1421	1/4 x 2-1/4	1/4	1-1/8	100	800



Hex Nut: Zinc-Plated Carbon Steel					
Catalog No.	Anchor Size (in.)	Drill Bit Dia. (in.)	Min. Embed. (in.)	Box Quantity	Carton Quantity
HSA5612	5/16 x 1-1/2	5/16	1-3/16	100	800
HSA5622	5/16 x 2-1/2	5/16	1-3/16	100	800
HSA3813	3/8 x 1-7/8	3/8	1-1/4	50	400
HSA3830	3/8 x 3	3/8	1-1/4	50	400
HSA3840	3/8 x 4	3/8	1-1/4	50	400
HSA1221	1/2 x 2-1/4	1/2	1-1/2	25	200
HSA1230	1/2 x 3	1/2	1-1/2	25	200
HSA1240	1/2 x 4	1/2	1-1/2	25	200
HSA1260	1/2 x 6	1/2	1-1/2	25	200
HSA5821	5/8 x 2-1/4	5/8	2	25	200
HSA5830	5/8 x 3	5/8	2	25	200
HSA5841	5/8 x 4-1/4	5/8	2	10	80
HSA5860	5/8 x 6	5/8	2	10	80
HSA3422	3/4 x 2-1/2	3/4	2-1/4	10	80
HSA3440	3/4 x 4	3/4	2-1/4	10	80
HSA3461	3/4 x 6-1/4	3/4	2-1/4	10	80



Rod Coupling: Zinc-Plated Carbon Steel					
Catalog No.	Anchor Size (in.)	Drill Bit Dia. (in.)	Min. Embed. (in.)	Box Quantity	Carton Quantity
CSA3813	3/8 x 1-7/8	3/8	1-1/4	50	400
CSA1221	1/2 x 2-1/4	1/2	1-1/2	25	200
CSA5821	5/8 x 2-1/4	5/8	2	25	200



Flat Head: Zinc-Plated Carbon Steel					
Catalog No.	Anchor Size (in.)	Drill Bit Dia. (in.)	Min. Embed. (in.)	Box Quantity	Carton Quantity
FSA1421	1/4 x 2-1/4	1/4	1-1/8	100	800
FSA1431	1/4 x 3-1/4	1/4	1-1/8	100	800
FSA1440	1/4 x 4	1/4	1-1/8	100	800
FSA3823	3/8 x 2-3/4	3/8	1-1/4	50	400
FSA3830	3/8 x 3	3/8	1-1/4	50	400
FSA3840	3/8 x 4	3/8	1-1/4	50	400
FSA3850	3/8 x 5	3/8	1-1/4	50	400
FSA3860	3/8 x 6	3/8	1-1/4	50	400



Hex Bolt Head: Zinc-Plated Carbon Steel					
Catalog No.	Anchor Size (in.)	Drill Bit Dia. (in.)	Min. Embed. (in.)	Box Quantity	Carton Quantity
HBSA3813	3/8 x 1-7/8	3/8	1-1/4	50	400
HBSA3830	3/8 x 3	3/8	1-1/4	50	400
HBSA3840	3/8 x 4	3/8	1-1/4	50	400
HBSA1221	1/2 x 2-1/4	1/2	1-1/2	25	200
HBSA1230	1/2 x 3	1/2	1-1/2	25	200
HBSA1240	1/2 x 4	1/2	1-1/2	25	200



Tie-Wire: Zinc-Plated Carbon Steel					
Catalog No.	Anchor Size (in.)	Drill Bit Dia. (in.)	Min. Embed. (in.)	Box Quantity	Carton Quantity
WTSA5612	5/16 x 1-1/2	5/16	1-3/16	100	1000



Acorn Nut: Type 304 Stainless Steel

Catalog No.	Anchor Size (in.)	Drill Bit Dia. (in.)	Min. Embed. (in.)	Box Quantity	Carton Quantity
ASAX1413	1/4 x 1-3/8	1/4	1-1/8	100	1000
ASAX1421	1/4 x 2-1/4	1/4	1-1/8	100	800

Flat Head: Type 304 Stainless Steel

Catalog No.	Anchor Size (in.)	Drill Bit Dia. (in.)	Min. Embed. (in.)	Box Quantity	Carton Quantity
FSAX1420	1/4 x 2	1/4	1-1/8	100	800
FSAX1430	1/4 x 3	1/4	1-1/8	100	800
FSAX3830	3/8 x 3	3/8	1-1/4	50	400
FSAX3840	3/8 x 4	3/8	1-1/4	50	400
FSAX3850	3/8 x 5	3/8	1-1/4	50	400
FSAX3860	3/8 x 6	3/8	1-1/4	50	400



Hex Nut: Type 304 Stainless Steel

Catalog No.	Anchor Size (in.)	Drill Bit Dia. (in.)	Min. Embed. (in.)	Box Quantity	Carton Quantity
HSAX5612	5/16 x 1-1/2	5/16	1-3/16	100	800
HSAX5622	5/16 x 2-1/2	5/16	1-3/16	100	800
HSAX3813	3/8 x 1-7/8	3/8	1-1/4	50	400
HSAX3830	3/8 x 3	3/8	1-1/4	50	400
HSAX3840	3/8 x 4	3/8	1-1/4	50	400
HSAX1221	1/2 x 2-1/4	1/2	1-1/2	25	200
HSAX1230	1/2 x 3	1/2	1-1/2	25	200
HSAX1240	1/2 x 4	1/2	1-1/2	25	200
HSAX5841	5/8 x 4-1/4	5/8	2	10	80

For more information, please contact:

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