

GENERAL INFORMATION

POWER-STUD®

Stainless Steel Wedge Expansion Anchor

PRODUCT DESCRIPTION

The Power-Stud anchor, is a fully threaded, torque-controlled, wedge expansion anchor. It is available in a threaded version suitable for applications in solid concrete and grout-filled concrete masonry. The threaded version is produced in 304 stainless steel and 316 stainless steel.

GENERAL APPLICATIONS AND USES

- Lighting Standards and Base Plates
- Sills and Support Ledgers
- Retrofit Projects and Machinery Anchorage
- Food and Beverage Facilities
- Water Treatment Plants and Marine Applications

FEATURE AND BENEFITS

- + Fully threaded, medium duty all-purpose anchor
- + Length ID stamped on each threaded anchor
- + Anchors can be installed through the fixture for hole spotting not required
- + Chamfered impact section prevents damage to threads
- + Clip design prevents spinning during installation
- + Nominal drill bit diameter same as anchor diameter

APPROVALS AND LISTINGS

- Tested in accordance with ASTM E488
- Underwriters Laboratory (UL Listed) – File No. EX1289 (see listing)
- Federal GSA Specification
Meets the descriptive and proof load requirements of CID A-A-1923A, Type 4

GUIDE SPECIFICATIONS

CSI Divisions: 03 16 00 - Concrete Anchors, 04 05 19.16 - Masonry Anchors and 05 05 19 - Post-Installed Concrete Anchors. Expansion anchors shall be Power-Stud as supplied by DEWALT, Towson, MD. Anchors shall be installed in accordance with published instructions and the Authority Having Jurisdiction.

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THREADED POWER-STUD ASSEMBLY

HEAD STYLES

- Threaded Stud (UNC)

ANCHOR MATERIALS

- 304 Stainless Steel
- 316 Stainless Steel

ANCHOR SIZE RANGE (TYP.)

- 1/4" through 1" diameters

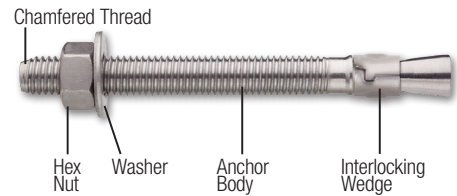
SUITABLE BASE MATERIALS

- Normal-weight Concrete
- Lightweight Concrete
- Grouted Concrete Masonry (CMU)

MATERIAL SPECIFICATIONS

Anchor Component	304 Stainless Steel Power-Stud	316 Stainless Steel Power-Stud
Anchor Body	304Cu (1/4"– 3/4", lengths up to 7")	316 Stainless Steel
	304 (7/8"– 1", lengths up to 7")	
Nut	18-8 (300 Series) Stainless Steel	316 Stainless Steel
Washer	18-8 (300 Series) Stainless Steel	316 Stainless Steel
Expansion Wedge	18-8 (300 Series) Stainless Steel	316 Stainless Steel

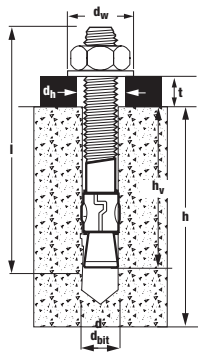
Stainless steel anchor components are passivated.



INSTALLATION SPECIFICATIONS

304 Stainless Steel and 316 Stainless Steel Power-Stud

Dimension	Units	Anchor Diameter, d						
		1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"
ANSI Drill Bit Size, d_{bit}	in.	1/4	3/8	1/2	5/8	3/4	7/8	1
Fixture Clearance Hole, d_h	in.	5/16	7/16	9/16	11/16	13/16	15/16	1-1/8
Thread Size (UNC)	in.	1/4-20	3/8-16	1/2-13	5/8-11	3/4-10	7/8-9	1-8
Nut Height	in.	7/32	21/64	7/16	35/64	41/64	3/4	55/64
Washer O.D. (304 SS), d_w	in.	5/8	13/16	1-1/16	1-3/4	2	2-1/4	2-1/2
Washer O.D. (316 SS), d_w	in.	5/8	7/8	1-1/4	1-1/2	1-3/4	2	2
Wrench / Socket Size	in.	7/16	9/16	3/4	15/16	1-1/8	1-5/16	1-1/2
Tightening Torque, T_{inst} for Normal-Weight Concrete	ft.-lbs.	8	28	60	90	175	250	300
Tightening Torque, T_{inst} for Lightweight Concrete and Grout-filled Concrete Masonry	ft.-lbs.	4	20	30	65	90	-	-



Nomenclature

- d = Diameter of anchor
- d_{bit} = Diameter of drill bit
- d_h = Diameter of fixture clearance hole
- d_w = Diameter of washer
- h = Base material thickness
The minimum value of h should be $1.5h_v$ or 3" whichever is greater
- h_v = Minimum embedment depth
- l = Overall length of anchor
- t = Fixture thickness

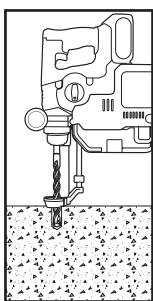
Length Identification

Mark	◆	■	A	B	C	D	E	F	G	H	I
From	1/2"	1"	1-1/2"	2"	2-1/2"	3"	3-1/2"	4"	4-1/2"	5"	5-1/2"
Up to but not including	1"	1-1/2"	2"	2-1/2"	3"	3-1/2"	4"	4-1/2"	5"	5-1/2"	6"

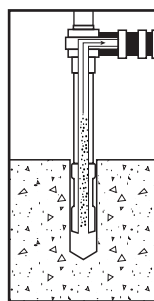
Mark	J	K	L	M	N	O	P	Q	R	S	T
From	6"	6-1/2"	7"	7-1/2"	8"	8-1/2"	9"	9-1/2"	10"	11"	12"
Up to but not including	6-1/2"	7"	7-1/2"	8"	8-1/2"	9"	9-1/2"	10"	11"	12"	13"

INSTALLATION PROCEDURE

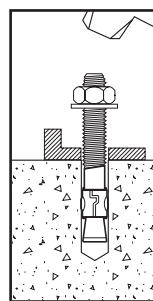
Threaded Stud Version



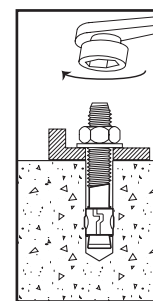
Step 1
Using the proper diameter bit, drill a hole into the base material to a depth of at least 1/2" or one anchor diameter deeper than the embedment required. The tolerances of the drill bit used must meet the requirements of ANSI Standard B212.15



Step 2
Remove dust and debris from the hole during drilling (e.g. dust extractor, hollow bit) or following drilling (e.g. suction, forced air) to extract loose particles created by drilling.



Step 3
Position the washer on the anchor and thread on the nut. Drive the anchor through the fixture into the anchor hole until the nut and washer are firmly seated against the fixture. Be sure the anchor is driven to the required embedment depth.



Step 4
Tighten the anchor by turning the nut 3 to 5 turns past finger tight or by applying the guide installation torque from the finger tight position.

PERFORMANCE DATA (ASD)

Ultimate Load Capacities for Stainless Steel Power-Stud in Normal-Weight Concrete^{1,2}

Anchor Diameter d in. (mm)	Minimum Embedment Depth h in. (mm)	Minimum Concrete Compressive Strength (f _c)					
		2,000 psi (13.8 MPa)		4,000 psi (27.6 MPa)		6,000 psi (41.4 MPa)	
		Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
1/4 (6.4)	1-1/8 (28.6)	1,240 (5.6)	1,580 (7.1)	1,440 (6.5)	1,620 (7.3)	1,740 (7.8)	1,620 (7.3)
	1-1/2 (38.1)	1,635 (7.4)	1,580 (7.1)	2,080 (9.4)	1,620 (7.3)	2,100 (9.5)	1,620 (7.3)
	2 (50.8)	1,900 (8.6)	1,580 (7.1)	2,080 (9.4)	1,620 (7.3)	2,100 (9.5)	1,620 (7.3)
3/8 (9.5)	1-5/8 (41.3)	1,920 (8.6)	3,560 (16.0)	3,040 (13.7)	3,760 (16.9)	3,040 (13.7)	3,760 (16.9)
	2 (50.8)	2,800 (12.6)	3,560 (16.0)	3,850 (17.3)	3,760 (16.9)	4,075 (18.3)	3,760 (16.9)
	3 (76.2)	4,100 (18.5)	3,560 (16.0)	4,200 (18.7)	3,760 (16.9)	4,200 (18.7)	3,760 (16.9)
1/2 (12.7)	2-1/4 (57.2)	3,440 (15.5)	6,540 (29.4)	5,560 (25.0)	6,800 (30.6)	6,540 (29.4)	6,800 (30.6)
	3 (76.2)	5,100 (23.0)	6,540 (29.4)	6,540 (29.4)	6,800 (30.6)	6,540 (29.4)	6,800 (30.6)
	4 (101.6)	5,700 (25.7)	6,540 (29.4)	6,540 (29.4)	6,800 (30.6)	6,540 (29.4)	6,800 (30.6)
5/8 (15.9)	2-3/4 (69.9)	6,240 (27.8)	9,280 (41.8)	8,300 (37.4)	11,900 (53.6)	9,860 (44.4)	11,900 (53.6)
	4 (101.6)	7,125 (31.7)	9,280 (41.8)	9,000 (40.0)	11,900 (53.6)	9,000 (40.0)	11,900 (53.6)
3/4 (19.1)	3-3/8 (85.7)	7,420 (33.0)	12,380 (55.7)	9,500 (42.3)	15,060 (67.8)	10,250 (45.6)	15,060 (67.8)
	5 (127.0)	10,640 (47.3)	12,380 (55.7)	10,640 (47.3)	15,060 (67.8)	10,640 (47.3)	15,060 (67.8)
7/8 (22.2)	3-7/8 (98.4)	7,600 (34.2)	17,960 (80.8)	12,300 (55.4)	24,160 (108.7)	12,500 (55.6)	24,160 (108.7)
	4-1/2 (114.3)	9,600 (43.2)	17,960 (80.8)	12,500 (55.6)	24,160 (108.7)	12,500 (55.6)	24,160 (108.7)
	5-3/4 (146.1)	10,640 (47.3)	17,960 (80.8)	12,500 (55.6)	24,160 (108.7)	12,500 (55.6)	24,160 (108.7)
1 (25.4)	4-1/2 (114.3)	8,740 (39.3)	26,420 (118.9)	13,820 (62.2)	31,100 (140.0)	17,125 (76.2)	31,100 (140.0)
	5-1/2 (139.7)	12,770 (57.5)	26,420 (118.9)	17,125 (76.2)	31,100 (140.0)	17,125 (76.2)	31,100 (140.0)
	6-1/2 (165.1)	16,605 (74.7)	26,420 (118.9)	17,125 (76.2)	31,100 (140.0)	17,125 (76.2)	31,100 (140.0)

1. Tabulated load values are for anchors installed in uncracked 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. Consideration of safety factors of 10 or higher may be necessary depending upon the application such as life safety or overhead.

Allowable Load Capacities for Stainless Steel Power-Stud in Normal-Weight Concrete^{1,2,3}

Anchor Diameter d in. (mm)	Minimum Embedment Depth h in. (mm)	Minimum Concrete Compressive Strength (f'c)					
		2,000 psi (13.8 MPa)		4,000 psi (27.6 MPa)		6,000 psi (41.4 MPa)	
		Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
1/4 (6.4)	1-1/8 (28.6)	310 (1.4)	395 (1.8)	360 (1.6)	405 (1.8)	435 (2.0)	405 (1.8)
	1-1/2 (38.1)	410 (1.8)	395 (1.8)	520 (2.3)	405 (1.8)	525 (2.4)	405 (1.8)
	2 (50.8)	475 (2.1)	395 (1.8)	520 (2.3)	405 (1.8)	525 (2.4)	405 (1.8)
3/8 (9.5)	1-5/8 (41.3)	480 (2.2)	890 (4.0)	760 (3.4)	940 (4.2)	760 (3.4)	940 (4.2)
	2 (50.8)	700 (3.2)	890 (4.0)	965 (4.3)	940 (4.2)	1,020 (4.6)	940 (4.2)
	3 (76.2)	1,025 (4.6)	890 (4.0)	1,050 (4.7)	940 (4.2)	1,050 (4.7)	940 (4.2)
1/2 (12.7)	2-1/4 (57.2)	860 (3.9)	1,635 (7.4)	1,390 (6.3)	1,700 (7.7)	1,635 (7.4)	1,700 (7.7)
	3 (76.2)	1,275 (5.7)	1,635 (7.4)	1,635 (7.3)	1,700 (7.7)	1,635 (7.3)	1,700 (7.7)
	4 (101.6)	1,425 (6.4)	1,635 (7.4)	1,635 (7.3)	1,700 (7.7)	1,635 (7.3)	1,700 (7.7)
5/8 (15.9)	2-3/4 (69.9)	1,560 (6.9)	2,320 (10.4)	2,075 (9.3)	2,975 (13.4)	2,215 (9.9)	2,975 (13.4)
	4 (101.6)	1,780 (7.9)	2,320 (10.4)	2,250 (10.0)	2,975 (13.4)	2,250 (10.0)	2,975 (13.4)
3/4 (19.1)	3-3/8 (85.7)	1,855 (8.3)	3,095 (13.9)	2,375 (10.6)	3,765 (16.9)	2,560 (11.4)	3,765 (16.9)
	5 (127.0)	2,660 (11.8)	3,095 (13.9)	2,660 (11.8)	3,765 (16.9)	2,660 (11.8)	3,765 (16.9)
7/8 (22.2)	3-7/8 (98.4)	1,900 (8.6)	4,490 (20.2)	3,075 (13.8)	6,040 (27.2)	3,125 (13.9)	6,040 (27.2)
	4-1/2 (114.3)	2,400 (10.8)	4,490 (20.2)	3,125 (13.9)	6,040 (27.2)	3,125 (13.9)	6,040 (27.2)
	5-3/4 (146.1)	2,660 (11.8)	4,490 (20.2)	3,125 (13.9)	6,040 (27.2)	3,125 (13.9)	6,040 (27.2)
1 (25.4)	4-1/2 (114.3)	2,185 (9.8)	6,605 (29.7)	3,455 (15.5)	7,775 (35.0)	4,280 (19.0)	7,775 (35.0)
	5-1/2 (139.7)	3,195 (14.4)	6,605 (29.7)	4,280 (19.0)	7,775 (35.0)	4,280 (19.0)	7,775 (35.0)
	6-1/2 (165.1)	4,150 (18.7)	6,605 (29.7)	4,280 (19.0)	7,775 (35.0)	4,280 (19.0)	7,775 (35.0)

1. Allowable load capacities listed are calculated using and applied safety factor of 4.0. Consideration of safety factors of 10 or higher may be necessary depending upon the application such as life safety or overhead.
 2. 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.
 3. Linear interpolation may be used to determine allowable loads for intermediate embedments and concrete compressive strength.

MECHANICAL ANCHORS

POWER-STUD®
Stainless Steel Wedge Expansion Anchor

Ultimate and Allowable Load Capacities for Stainless Steel Power-Stud in Lightweight Concrete^{1,2,3}

Anchor Diameter d in. (mm)	Min. Embed. Depth h, in. (mm)	Minimum Concrete Compressive Strength (f'c)						Shear, lbs (kN)	
		Tension, lbs (kN)						f'c ≥ 3,000 psi (20.7 MPa)	
		3,000 psi (20.7 MPa)		4,000 psi (27.6 MPa)		5,000 psi (34.5 MPa)			
		Ultimate Load	Allowable Load	Ultimate Load	Allowable Load	Ultimate Load	Allowable Load	Ultimate Load	Allowable Load
1/4 (6.4)	1-1/8 (28.6)	720 (3.2)	180 (0.8)	960 (4.3)	240 (1.1)	1,200 (5.4)	300 (1.4)	720 (3.2)	180 (0.8)
3/8 (9.5)	1-5/8 (41.3)	1,600 (7.2)	400 (1.8)	1,940 (8.7)	485 (2.2)	2,300 (10.4)	575 (2.6)	1,840 (8.3)	460 (2.1)
	3 (76.2)	2,475 (10.1)	620 (2.5)	2,860 (12.9)	715 (3.2)	2,860 (12.9)	715 (3.2)	1,840 (8.3)	460 (2.1)
1/2 (12.7)	2-1/4 (57.2)	2,820 (12.7)	705 (3.2)	3,180 (14.3)	795 (3.6)	3,560 (16.0)	890 (4.0)	5,040 (22.7)	1,260 (5.7)
	4 (101.6)	3,635 (14.9)	910 (3.7)	4,200 (18.9)	1,050 (4.7)	4,200 (18.9)	1,050 (4.7)	5,040 (22.7)	1,260 (5.7)
5/8 (15.9)	2-3/4 (69.9)	4,380 (19.7)	1,095 (4.9)	4,980 (22.4)	1,245 (5.6)	5,580 (25.1)	1,395 (6.3)	6,940 (31.2)	1,735 (7.8)
	5 (127.0)	5,995 (24.5)	1,500 (6.1)	6,920 (31.1)	1,730 (7.8)	6,920 (31.1)	1,730 (7.8)	6,940 (31.2)	1,735 (7.8)
3/4 (19.1)	3-3/8 (85.7)	5,060 (22.8)	1,265 (5.7)	5,600 (25.2)	1,400 (6.3)	6,140 (27.6)	1,535 (6.9)	9,880 (44.5)	2,470 (11.1)
	5 (127.0)	8,055 (32.9)	2,015 (8.2)	9,300 (41.9)	2,325 (10.5)	9,300 (41.9)	2,325 (10.5)	9,880 (44.5)	2,470 (11.1)

1. Tabulated load values are for anchors installed in uncracked sand-lightweight concrete. Concrete compressive strength must be at the specified minimum at the time of installation.
2. Allowable load capacities listed are calculated using an applied safety factor of 4.0. Consideration of safety factors of 10 or higher may be necessary depending upon the application such as life safety or overhead.
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.

MECHANICAL ANCHORS

POWER-STUD®
Stainless Steel Wedge Expansion Anchor

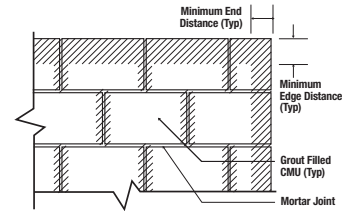
Ultimate and Allowable Load Capacities for Stainless Steel Power-Stud in Grout-Filled Concrete Masonry^{1,2,3}

Anchor Dia. d in. (mm)	Min. Embed. Depth h in. (mm)	Min. Edge Distance in. (mm)	Min. End Distance in. (mm)	Grout-Filled Concrete Masonry f'm ≥ 1,500 psi (10.4 MPa)			
				Ultimate Load		Allowable Load	
				Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
1/4 (6.4)	1-1/8 (28.6)	3-3/4 (95.3)	3-3/4 (95.3)	1,230 (5.5)	1,230 (5.5)	245 (1.1)	245 (1.1)
	2 (50.8)	5-1/4 (133.4)	3-3/4 (95.3)	1,670 (7.5)	1,230 (5.5)	335 (1.5)	245 (1.1)
3/8 (9.5)	1-5/8 (41.3)	5-5/8 (142.9)	5-5/8 (142.9)	1,990 (9.0)	3,240 (14.6)	400 (1.8)	650 (2.9)
	3 (76.2)	7-7/8 (200.0)	5-5/8 (142.9)	2,200 (9.9)	3,240 (14.6)	440 (2.0)	650 (2.9)
1/2 (12.7)	2-1/4 (57.2)	7-1/2 (190.5)	7-1/2 (190.5)	2,260 (10.2)	6,230 (28.0)	450 (2.0)	1,245 (5.6)
	4 (101.6)	10-1/2 (266.7)	7-1/2 (190.5)	2,620 (11.8)	6,230 (28.0)	525 (2.4)	1,245 (5.6)
5/8 (15.9)	2-3/4 (69.9)	9-3/8 (238.1)	9-3/8 (238.1)	3,170 (14.3)	7,830 (35.2)	635 (2.9)	1,565 (7.0)
	5 (127.0)	13-1/8 (333.4)	9-3/8 (238.1)	3,780 (17.0)	7,830 (35.2)	755 (3.4)	1,565 (7.0)
3/4 (19.1)	3-3/8 (85.7)	11-1/4 (285.8)	11-1/4 (285.8)	4,085 (18.4)	9,760 (43.9)	815 (3.7)	1,950 (8.8)
	5 (127.0)	15-3/4 (400.1)	11-1/4 (285.8)	4,420 (19.9)	9,760 (43.9)	885 (4.0)	1,950 (8.8)

1. Tabulated load values are for anchors installed in minimum 8-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 cells may be grouted. Masonry compressive strength must be at the specified minimum at the time of installation (f'm ≥ 1,500 psi).

2. Allowable load capacities listed are calculated using and applied safety factor of 5.0. Consideration of safety factors of 10 or higher may be necessary depending upon the application such as life safety or overhead.

3. The tabulated values are for anchors installed at a minimum of 12 anchor diameters on center for 100 percent capacity. Spacing distances may be reduced to 6 anchor diameters on center provided the capacities are reduced by 50 percent. Linear interpolation may be used for intermediate spacing.



Wall Face Permissible Anchor Locations (Un-hatched Area)

Combined Loading

For anchors loaded in both shear and tension, the combination of loads should be proportioned as follows:

$$\left(\frac{N_u}{N_n}\right)^{\frac{5}{3}} + \left(\frac{V_u}{V_n}\right)^{\frac{5}{3}} \leq 1 \quad \text{OR} \quad \left(\frac{N_u}{N_n}\right) + \left(\frac{V_u}{V_n}\right) \leq 1$$

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 Distances¹

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	$S_{cr} = 2.0h_v$	$F_{NS} = F_{VS} = 1.0$	$S_{min} = h_v$	$F_{NS} = F_{VS} = 0.50$
Edge Distance (c)	Tension	$C_{cr} = 12d$	$F_{NC} = 1.0$	$C_{min} = 5d$	$F_{NC} = 0.75$
	Shear	$C_{cr} = 12d$	$F_{VC} = 1.0$	$C_{min} = 5d$	$F_{VC} = 0.75$

Anchor Installed in Structural Lightweight 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	$S_{cr} = 2.0h_v$	$F_{NS} = F_{VS} = 1.0$	$S_{min} = h_v$	$F_{NS} = F_{VS} = 0.50$
Edge Distance (c)	Tension	$C_{cr} = 12d$	$F_{NC} = 1.0$	$C_{min} = 5d$	$F_{NC} = 0.95$
	Shear	$C_{cr} = 12d$	$F_{VC} = 1.0$	$C_{min} = 5d$	$F_{VC} = 0.30$

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.

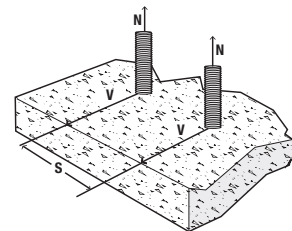
Spacing Load Adjustment Factors for Normal-Weight and Lightweight Concrete (Continued Below)

Dia. (in.)	1/4				3/8				1/2						5/8				
h _v (in.)	1-1/8	1-1/2	2	2-3/4	1-5/8	2	3	4-1/4	2-1/4	3	4	5	6	2-3/4	3-1/2	4	5	7	
s _c (in.)	2-1/4	3	4	5-1/2	3-1/4	4	6	8-1/2	4-1/2	6	8	10	12	5-1/2	7	8	10	14	
s _{min} (in.)	1-1/8	1-1/2	2	2-3/4	1-5/8	2	3	4-1/4	2-1/4	3	4	5	6	2-3/4	3-1/2	4	5	7	
Spacing, s (inches)	1-1/8	0.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	1-1/2	0.67	0.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	1-5/8	0.72	0.54	-	-	0.50	-	-	-	-	-	-	-	-	-	-	-	-	
	2	0.89	0.67	0.50	-	0.62	0.50	-	-	-	-	-	-	-	-	-	-	-	
	2-1/4	1.00	0.75	0.56	-	0.69	0.56	-	0.50	-	-	-	-	-	-	-	-	-	
	2-3/4	1.00	0.92	0.69	0.50	0.85	0.69	-	0.61	-	-	-	-	0.50	-	-	-	-	
	3	1.00	1.00	0.75	0.55	0.92	0.75	0.50	-	0.67	0.50	-	-	-	0.55	-	-	-	
	3-1/4	1.00	1.00	0.81	0.59	1.00	0.81	0.54	-	0.72	0.54	-	-	-	0.59	-	-	-	
	3-1/2	1.00	1.00	0.88	0.64	1.00	0.88	0.58	-	0.78	0.58	-	-	-	0.64	0.50	-	-	
	4	1.00	1.00	1.00	0.73	1.00	1.00	0.67	-	0.89	0.67	0.50	-	-	0.73	0.57	0.50	-	
	4-1/4	1.00	1.00	1.00	0.77	1.00	1.00	0.71	0.50	0.94	0.71	0.53	-	-	0.77	0.61	0.53	-	
	4-1/2	1.00	1.00	1.00	0.82	1.00	1.00	0.75	0.53	1.00	0.75	0.56	-	-	0.82	0.64	0.56	-	
	5	1.00	1.00	1.00	0.91	1.00	1.00	0.83	0.59	1.00	0.83	0.63	0.50	-	0.91	0.71	0.63	0.50	
	5-1/2	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.65	1.00	0.92	0.69	0.55	-	1.00	0.79	0.69	0.55	
6	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.71	1.00	1.00	0.75	0.60	0.50	1.00	0.86	0.75	0.60		
7	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.82	1.00	1.00	0.88	0.70	0.58	1.00	1.00	0.88	0.70		
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.94	1.00	1.00	1.00	0.80	0.67	1.00	1.00	1.00	0.80		
8-1/2	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.85	0.71	1.00	1.00	1.00	0.85		
10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.83	1.00	1.00	1.00	1.00		
11	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	1.00	1.00	1.00	1.00		
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
13	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
14	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		

Spacing Load Adjustment Factors for Normal-Weight and Lightweight Concrete (Continued from Above)

Dia. (in.)	3/4				7/8				1						1-1/4			
h _v (in.)	3-3/8	4	5	6	8	3-7/8	4-1/2	5-3/4	7	8	4-1/2	5-1/2	6-1/2	8	9	5-1/2	7	10
s _c (in.)	6-3/4	8	10	12	16	7-3/4	9	11-1/2	14	16	9	11	13	16	18	11	14	20
s _{min} (in.)	3-3/8	4	5	6	8	3-7/8	4-1/2	5-3/4	7	8	4-1/2	5-1/2	6-1/2	8	9	5-1/2	7	10
Spacing, s (inches)	3-3/8	0.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3-7/8	0.57	-	-	-	0.50	-	-	-	-	-	-	-	-	-	-	-	-
	4	0.59	0.50	-	-	0.52	-	-	-	-	-	-	-	-	-	-	-	-
	4-1/2	0.67	0.56	-	-	0.58	0.50	-	-	-	0.50	-	-	-	-	-	-	-
	5	0.74	0.63	0.50	-	0.65	0.56	-	-	-	0.56	-	-	-	-	-	-	-
	5-1/2	0.81	0.69	0.55	-	0.71	0.61	-	-	-	0.61	0.50	-	-	-	-	0.50	-
	5-3/4	0.85	0.72	0.58	-	0.74	0.64	0.50	-	-	0.64	0.52	-	-	-	-	0.52	-
	6	0.89	0.75	0.60	0.50	-	0.77	0.67	0.52	-	-	0.67	0.55	-	-	-	0.55	-
	6-1/2	0.96	0.81	0.65	0.54	-	0.84	0.72	0.57	-	-	0.72	0.59	0.50	-	-	0.59	-
	6-3/4	1.00	0.84	0.68	0.56	-	0.87	0.75	0.59	-	-	0.75	0.61	0.52	-	-	0.61	-
	7	1.00	0.88	0.70	0.58	-	0.90	0.78	0.61	0.50	-	0.78	0.64	0.54	-	-	0.64	0.50
	7-3/4	1.00	0.97	0.78	0.65	-	1.00	0.86	0.67	0.55	-	0.86	0.70	0.60	-	-	0.70	0.55
	8	1.00	1.00	0.80	0.67	0.50	1.00	0.89	0.70	0.57	0.50	0.89	0.73	0.62	0.50	-	0.73	0.57
	9	1.00	1.00	0.90	0.75	0.56	1.00	1.00	0.78	0.64	0.56	1.00	0.82	0.69	0.56	0.50	0.82	0.64
	10	1.00	1.00	1.00	0.83	0.63	1.00	1.00	0.87	0.71	0.63	1.00	0.91	0.77	0.63	0.56	0.91	0.71
	11	1.00	1.00	1.00	0.92	0.69	1.00	1.00	0.96	0.79	0.69	1.00	1.00	0.85	0.69	0.61	1.00	0.79
	11-1/2	1.00	1.00	1.00	0.96	0.72	1.00	1.00	1.00	0.82	0.72	1.00	1.00	0.88	0.72	0.64	1.00	0.82
12	1.00	1.00	1.00	1.00	0.75	1.00	1.00	1.00	0.86	0.75	1.00	1.00	0.92	0.75	0.67	1.00	0.86	
13	1.00	1.00	1.00	1.00	0.81	1.00	1.00	1.00	0.93	0.81	1.00	1.00	1.00	0.81	0.72	1.00	0.93	
14	1.00	1.00	1.00	1.00	0.88	1.00	1.00	1.00	1.00	0.88	1.00	1.00	1.00	0.88	0.78	1.00	1.00	
16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89	1.00	1.00	
18	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

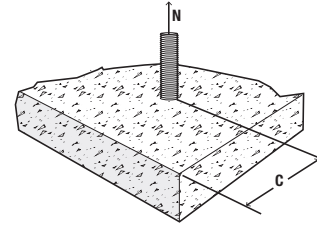
Notes: Critical spacing (s_c) is equal to 2 embedment depths (2h_v) at which the anchor achieves 100% of load.
Minimum spacing (s_{min}) is equal to 1 embedment depth (h_v) at which the anchor achieves 50% of load.



Edge Distance Load Adjustment Factors for Normal-Weight Concrete

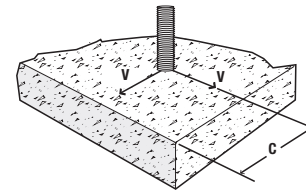
Edge Distance, Tension (F_{Tc})								
Diameter (in.)	1/4	3/8	1/2	5/8	3/4	7/8	1	
c_{cr} (in.)	3	4-1/2	6	7-1/2	9	10-1/2	12	
c_{min} (in.)	1-1/4	1-7/8	2-1/2	3-1/8	3-3/4	4-3/8	5	
Edge Distance, c (inches)	1-1/4	0.75	-	-	-	-	-	
	1-5/8	0.80	-	-	-	-	-	
	1-7/8	0.84	0.75	-	-	-	-	
	2	0.86	0.76	-	-	-	-	
	2-1/2	0.93	0.81	0.75	-	-	-	
	3	1.00	0.86	0.79	-	-	-	
	3-1/8	1.00	0.87	0.79	0.75	-	-	
	3-3/4	1.00	0.93	0.84	0.79	0.75	-	
	4	1.00	0.95	0.86	0.80	0.76	-	
	4-3/8	1.00	0.99	0.88	0.82	0.78	0.75	
	4-1/2	1.00	1.00	0.89	0.83	0.79	0.76	
	5	1.00	1.00	0.93	0.86	0.81	0.78	0.75
	6	1.00	1.00	1.00	0.91	0.86	0.82	0.79
	6-1/4	1.00	1.00	1.00	0.93	0.87	0.83	0.79
	7	1.00	1.00	1.00	0.97	0.90	0.86	0.82
	7-1/2	1.00	1.00	1.00	1.00	0.93	0.88	0.84
8	1.00	1.00	1.00	1.00	0.95	0.90	0.86	
9	1.00	1.00	1.00	1.00	1.00	0.94	0.89	
10-1/2	1.00	1.00	1.00	1.00	1.00	1.00	0.95	
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
15	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Notes: For anchors loaded in tension, the critical edge distance (c_{cr}) is equal to 12 anchor diameters (12d) at which the anchor achieves 100% of load.
Minimum edge distance (c_{min}) is equal to 5 anchor diameters (5d) at which the anchor achieves 75% of load.



Edge Distance, Shear (F_{Vc})								
Diameter (in.)	1/4	3/8	1/2	5/8	3/4	7/8	1	
c_{cr} (in.)	3	4-1/2	6	7-1/2	9	10-1/2	12	
c_{min} (in.)	1-1/4	1-7/8	2-1/2	3-1/8	3-3/4	4-3/8	5	
Edge Distance, c (inches)	1-1/4	0.35	-	-	-	-	-	
	1-5/8	0.49	-	-	-	-	-	
	1-7/8	0.58	0.35	-	-	-	-	
	2	0.63	0.38	-	-	-	-	
	2-1/2	0.81	0.50	0.35	-	-	-	
	3	1.00	0.63	0.44	-	-	-	
	3-1/8	1.00	0.66	0.47	0.35	-	-	
	3-3/4	1.00	0.81	0.58	0.44	0.35	-	
	4	1.00	0.88	0.63	0.48	0.38	-	
	4-3/8	1.00	0.97	0.70	0.54	0.43	0.35	
	4-1/2	1.00	1.00	0.72	0.55	0.44	0.36	
	5	1.00	1.00	0.81	0.63	0.50	0.42	0.35
	6	1.00	1.00	1.00	0.78	0.63	0.52	0.44
	6-1/4	1.00	1.00	1.00	0.81	0.66	0.55	0.47
	7	1.00	1.00	1.00	0.93	0.75	0.63	0.54
	7-1/2	1.00	1.00	1.00	1.00	0.81	0.68	0.58
8	1.00	1.00	1.00	1.00	0.88	0.73	0.63	
9	1.00	1.00	1.00	1.00	1.00	0.84	0.72	
10-1/2	1.00	1.00	1.00	1.00	1.00	1.00	0.86	
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
15	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Notes: For anchors loaded in shear, the critical edge distance (c_{cr}) is equal to 12 anchor diameters (12d) at which the anchor achieves 100% of load.
Minimum edge distance (c_{min}) is equal to 5 anchor diameters (5d) at which the anchor achieves 35% of load.

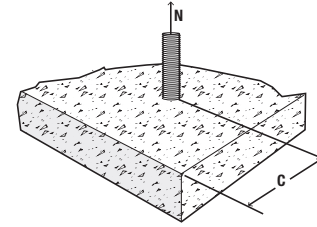


Edge Distance Load Adjustment Factors for Lightweight Concrete

Edge Distance, Tension ($F_{t,c}$)							
Diameter (in.)	1/4	3/8	1/2	5/8	3/4	7/8	1
c_{cr} (in.)	3	4-1/2	6	7-1/2	9	10-1/2	12
c_{min} (in.)	1-1/4	1-7/8	2-1/2	3-1/8	3-3/4	4-3/8	5
Edge Distance, c (inches)	1-1/4	0.95	-	-	-	-	-
	1-5/8	0.96	-	-	-	-	-
	1-7/8	0.97	0.95	-	-	-	-
	2	0.97	0.95	-	-	-	-
	2-1/2	0.99	0.96	0.95	-	-	-
	3	1.00	0.97	0.96	-	-	-
	3-1/8	1.00	0.97	0.96	0.95	-	-
	3-3/4	1.00	0.99	0.97	0.96	0.95	-
	4	1.00	0.99	0.97	0.96	0.95	-
	4-3/8	1.00	1.00	0.98	0.96	0.96	0.95
	4-1/2	1.00	1.00	0.98	0.97	0.96	0.95
	5	1.00	1.00	0.99	0.97	0.96	0.96
	6	1.00	1.00	1.00	0.98	0.97	0.96
	6-1/4	1.00	1.00	1.00	0.99	0.97	0.97
	7	1.00	1.00	1.00	0.99	0.98	0.97
7-1/2	1.00	1.00	1.00	1.00	0.99	0.98	
8	1.00	1.00	1.00	1.00	0.99	0.98	
9	1.00	1.00	1.00	1.00	1.00	0.99	
10-1/2	1.00	1.00	1.00	1.00	1.00	1.00	
12	1.00	1.00	1.00	1.00	1.00	1.00	
15	1.00	1.00	1.00	1.00	1.00	1.00	

Notes: For anchors loaded in tension, the critical edge distance (c_{cr}) is equal to 12 anchor diameters (12d) at which the anchor achieves 100% of load.

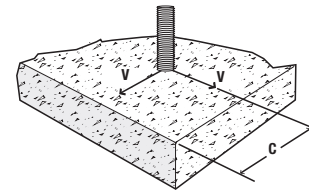
Minimum edge distance (c_{min}) is equal to 5 anchor diameters (5d) at which the anchor achieves 95% of load.



Edge Distance, Shear ($F_{v,c}$)							
Diameter (in.)	1/4	3/8	1/2	5/8	3/4	7/8	1
c_{cr} (in.)	3	4-1/2	6	7-1/2	9	10-1/2	12
c_{min} (in.)	1-1/4	1-7/8	2-1/2	3-1/8	3-3/4	4-3/8	5
Edge Distance, c (inches)	1-1/4	0.30	-	-	-	-	-
	1-5/8	0.45	-	-	-	-	-
	1-7/8	0.55	0.30	-	-	-	-
	2	0.60	0.33	-	-	-	-
	2-1/2	0.80	0.47	0.30	-	-	-
	3	1.00	0.60	0.40	-	-	-
	3-1/8	1.00	0.63	0.43	0.30	-	-
	3-3/4	1.00	0.80	0.55	0.40	0.30	-
	4	1.00	0.87	0.60	0.44	0.33	-
	4-3/8	1.00	0.97	0.68	0.50	0.38	0.30
	4-1/2	1.00	1.00	0.70	0.52	0.40	0.31
	5	1.00	1.00	0.80	0.60	0.47	0.37
	6	1.00	1.00	1.00	0.76	0.60	0.49
	6-1/4	1.00	1.00	1.00	0.80	0.63	0.51
	7	1.00	1.00	1.00	0.92	0.73	0.60
7-1/2	1.00	1.00	1.00	1.00	0.80	0.66	
8	1.00	1.00	1.00	1.00	0.87	0.71	
9	1.00	1.00	1.00	1.00	1.00	0.83	
10-1/2	1.00	1.00	1.00	1.00	1.00	1.00	
12	1.00	1.00	1.00	1.00	1.00	1.00	
15	1.00	1.00	1.00	1.00	1.00	1.00	

Notes: For anchors loaded in shear, the critical edge distance (c_{cr}) is equal to 12 anchor diameters (12d) at which the anchor achieves 100% of load.

Minimum edge distance (c_{min}) is equal to 5 anchor diameters (5d) at which the anchor achieves 30% of load.



ORDERING INFORMATION

Stainless Steel Power-Stud

Cat. No.		Anchor Size	Thread Length	Pack Qty	Carton Qty.
304 SS	316 SS				
07300-PWR	07600-PWR	1/4" x 1-3/4"	3/4"	100	500
07302-PWR	07602-PWR	1/4" x 2-1/4"	1-1/4"	100	500
07304-PWR	07604-PWR	1/4" x 3-1/4"	2-1/4"	100	500
07310-PWR	07610-PWR	3/8" x 2-1/4"	1-1/4"	50	250
07312-PWR	07612-PWR	3/8" x 2-3/4"	1-5/8"	50	250
07313-PWR	07613-PWR	3/8" x 3"	1-7/8"	50	250
07314-PWR	07614-PWR	3/8" x 3-1/2"	2-3/8"	50	250
07315-PWR	07615-PWR	3/8" x 3-3/4"	2-5/8"	50	250
07316-PWR	07616-PWR	3/8" x 5"	3-1/8"	50	250
07320-PWR	07620-PWR	1/2" x 2-3/4"	1-3/8"	50	200
07322-PWR	07622-PWR	1/2" x 3-3/4"	2-3/8"	50	200
07323-PWR	07623-PWR	1/2" x 4-1/2"	3-1/8"	50	200
07324-PWR	07624-PWR	1/2" x 5-1/2"	4-1/8"	50	150
07326-PWR	07626-PWR	1/2" x 7"	5-5/8"	25	100
07330-PWR	07630-PWR	5/8" x 3-1/2"	2"	25	100
07332-PWR	07632-PWR	5/8" x 4-1/2"	3"	25	100
07333-PWR	07633-PWR	5/8" x 5"	3-1/2"	25	100
07334-PWR	07634-PWR	5/8" x 6"	4-1/2"	25	75
07336-PWR	07636-PWR	5/8" x 7"	5-1/2"	25	75
07338-PWR	07638-PWR	5/8" x 8 1/2"	7"	25	75
07340-PWR	07640-PWR	3/4" x 4 1/4"	2-3/8"	20	60
07341-PWR	07641-PWR	3/4" x 4 3/4"	2-7/8"	20	60
07342-PWR	07642-PWR	3/4" x 5 1/2"	3-5/8"	20	60
07344-PWR	07644-PWR	3/4" x 6-1/4"	4-3/8"	20	60
07346-PWR	07646-PWR	3/4" x 7"	5-1/8"	20	60
07348-PWR	07648-PWR	3/4" x 8-1/2"	6-5/8"	10	40
07349-PWR	-	3/4" x 10"	8-1/8"	10	30
07352-PWR	-	7/8" x 8"	4-3/4"	10	40
07361-PWR	-	1" x 6"	2-3/8"	10	30
07363-PWR	-	1" x 9"	5-3/8"	10	30
07365-PWR	-	1" x 12"	8-3/8"	5	15

The published length is the overall length of the anchor.
Allow for fixture thickness plus one anchor diameter for the nut and washer thickness when selecting a length.



MECHANICAL ANCHORS

POWER-STUD®
Stainless Steel Wedge Expansion Anchor