

Power-Stud™ Wedge Expansion Anchor

PRODUCT DESCRIPTION

The Power-Stud anchor, formerly known as the *Rawl-Stud*, is a fully threaded, torque-controlled, wedge expansion anchor which is designed for consistent performance. It is available in threaded, rod hanger and tie-wire versions suitable for applications in solid concrete and grout-filled concrete masonry. The threaded version is produced in carbon steel and stainless steel to offer various levels of corrosion resistance depending on use. The drill bit diameter necessary for proper installation is the same as the anchor diameter.

GENERAL APPLICATIONS AND USES

- Water Treatment Plants and Marine Applications
- Lighting Standards
- Sill Plates and Support Ledgers
- Structural Anchorage
- Retrofit Projects and Machinery Anchorage
- Seismic Attachments
- Food and Beverage Facilities

FEATURES AND BENEFITS

- Heavy and medium duty all-purpose anchor
- Tested in accordance with ASTM E488 and AC01 criteria
- Qualified for seismic and wind load applications
- Drill bit diameter is the same as the anchor diameter
- Length ID stamped on each threaded anchor
- Anchors can be installed through the fixture, no need for hole spotting
- Chamfered impact section prevents damage to threads
- Length of holes can be over-drilled or bottomless
- Convenient, fully threaded body – no shims required
- Clip design prevents spinning during installation

APPROVALS AND LISTINGS

International Code Council, Evaluation Service (ICC-ES) ESR-1532
 (formerly listed in ICBO ES ER-5225)
 Southern Building Code Conference International (SBCCI) #9943A
 City of Los Angeles (COLA) Research Report LARR-24960
 Florida Building Code Approval – FL2209.6
 Miami-Dade County Notice of Acceptance (NOA) 03-0311.08
 Factory Mutual Research Corporation (FM Approvals) – File No. J.I. OK3A9.AH
 Underwriters Laboratory (UL Listed) – File No. EX1289
 Federal GSA Specification – Meets the proof load requirements of FF-S-325C, Group II, Type 4, Class 1 (superseded) and CID A-A-1923A, Type 4
 Various North American Departments of Transportation (DOT) – See www.powers.com, including CalTrans listing for “Stud Mechanical Expansion Anchors”

GUIDE SPECIFICATIONS

CSI Divisions: 03151-Concrete Anchoring, 04081-Masonry Anchorage and 05090-Metal Fastenings. Expansion Anchors shall be Power-Stud anchors as supplied by Powers Fasteners, Inc., Brewster, NY.

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Threaded Power-Stud



Rod Hanger Power-Stud



Tie-Wire Power-Stud

HEAD STYLES

- Threaded
- Rod Hanger
- Tie-Wire

ANCHOR MATERIALS

- Zinc Plated Carbon Steel
- Mechanically Galvanized Carbon Steel
- Type 304 Stainless Steel
- Type 316 Stainless Steel

ANCHOR SIZE RANGE (TYP.)

- 1/4" diameter x 1-3/4" length to
- 1 1/4" diameter x 12" length

SUITABLE BASE MATERIALS

- Normal-Weight Concrete
- Structural Lightweight Concrete
- Grouted Concrete Masonry

INSTALLATION SPECIFICATIONS

Carbon Steel Power-Stud

Dimension	Anchor Diameter, <i>d</i>							
	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"
ANSI Drill Bit Size, d_{bit} (in.)	1/4	3/8	1/2	5/8	3/4	7/8	1	1-1/4
Fixture Clearance Hole, d_h (in.)	5/16	7/16	9/16	11/16	13/16	15/16	1-1/8	1-3/8
Thread Size (UNC)	1/4-20	3/8-16	1/2-13	5/8-11	3/4-10	7/8-9	1-8	1 1/4-7
Nut Height (in.)	7/32	21/64	7/16	35/64	41/64	3/4	55/64	1 1/16
Washer O.D., d_w (in.)	5/8	13/16	1 1/16	1 3/4	2	2 1/4	2 1/2	3
Wrench Size (in.)	7/16	9/16	3/4	15/16	1 1/8	1 5/16	1 1/2	1 7/8
Max. Tightening Torque, T_{max} (ft-lbs)	8	28	60	90	175	250	300	450

Maximum tightening torque is listed for anchors installed in normal-weight concrete. Consult performance data tables for other base materials.

Stainless Steel Power-Stud

Dimension	Anchor Diameter, <i>d</i>							
	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1 1/4"
ANSI Drill Bit Size, d_{bit} (in.)	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/4
Fixture Clearance Hole, d_h (in.)	5/16	7/16	9/16	11/16	13/16	15/16	1-1/8	1-3/8
Thread Size (UNC)	1/4-20	3/8-16	1/2-13	5/8-11	3/4-10	7/8-9	1-8	1 1/4-7
Nut Height (in.)	7/32	21/64	7/16	35/64	41/64	3/4	55/64	1 1/16
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	3
Washer O.D (316 SS), d_w (in.)	5/8	7/8	1 1/4	1 1/2	1 3/4	2	2 1/2	3
Wrench Size (in.)	7/16	9/16	3/4	15/16	1 1/8	1 5/16	1 1/2	1 7/8
Max. Tightening Torque, T_{max} (ft-lbs)	8	28	60	90	175	250	300	450

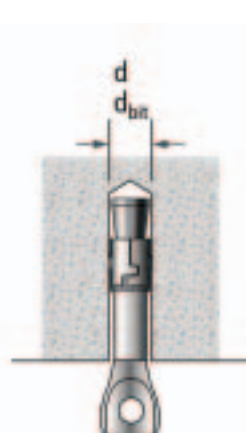
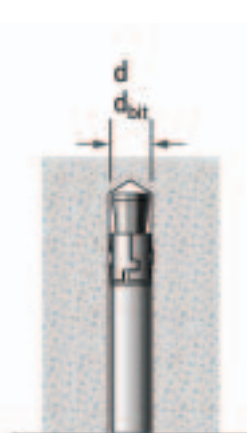
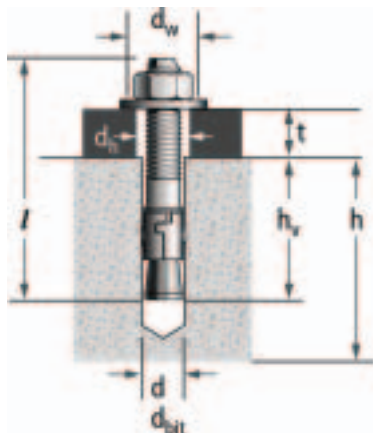
Maximum tightening torque is listed for anchors installed in normal-weight concrete. Consult performance data tables for other base materials.

Rod Hanger Power-Stud

Dimension	Rod Diameter, <i>d</i>		
	3/8"	1/2"	5/8"
Anchor Diameter (in.)	1/2	5/8	7/8
ANSI Drill Bit Size, d_{bit} (in.)	1/2	5/8	7/8
Thread Size (UNC)	3/8-16	1/2-13	5/8-11

Tie-Wire Power-Stud

Dimension	Anchor Diameter, <i>d</i>
	1/4"
ANSI Drill Bit Size, d_{bit} (in.)	1/4
Tie-Wire Hole Size (in.)	9/32
Head Height (in.)	3/4



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 $1.5h_v$
- h_v = Minimum embedment depth
- l = Overall length of anchor
- t = Fixture thickness
- T_{max} = Maximum tightening torque

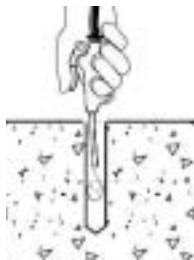
INSTALLATION PROCEDURES

Threaded Stud Version

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 should meet the requirements of ANSI Standard B212.15



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



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.



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.



Rod Hanger Version

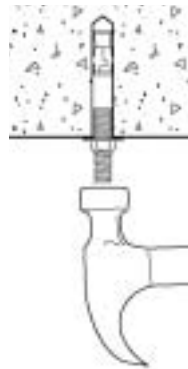
Using the proper diameter bit, drill a hole into the base material to a depth of at least 1/2" or one anchor diameter deeper than the embedment required. The tolerances of the drill bit used should meet the requirements of ANSI Standard B212.15



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



Thread the anchor onto the rod to be used along with a nut and washer. Drive the anchor into the hole until the anchor is at the required embedment depth. The anchor body should be recessed in the hole.



Run the nut and washer up to the concrete surface and 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.

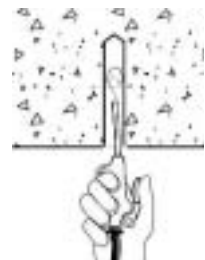


Tie-Wire Version

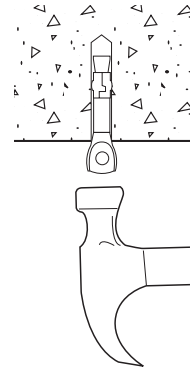
Using the proper diameter bit, drill a hole into the base material to a depth of at least 1/2" or one anchor diameter deeper than the embedment required. The tolerances of the drill bit used should meet the requirements of ANSI Standard B212.15



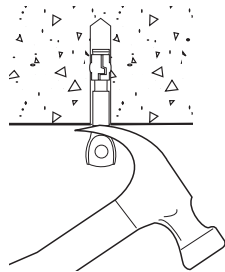
Blow the hole clean of dust and other material. Do not expand the anchor prior to installation



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



Set the anchor with a prying action using a claw hammer.



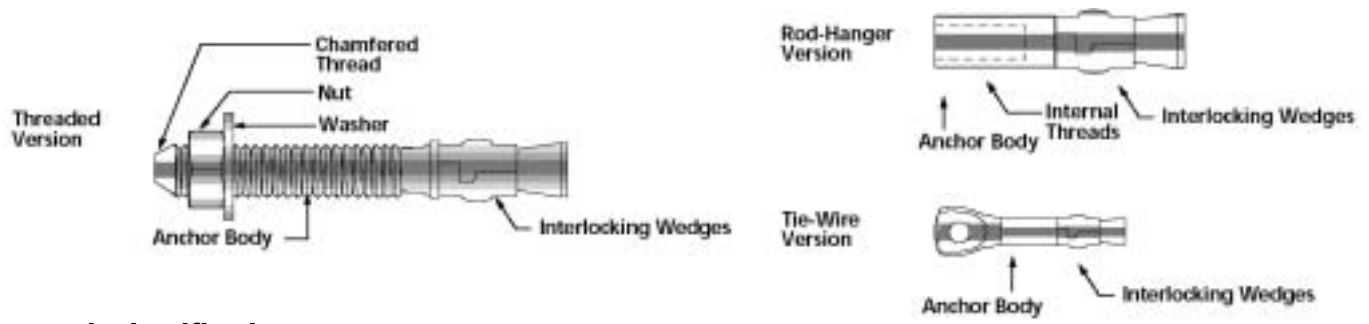
MATERIAL SPECIFICATIONS

Anchor Component	Carbon Steel Power-Stud	Mechanically Galvanized Power-Stud
Anchor Body	AISI 1018 (1/4" – 3/4", lengths up to 7")	AISI 1018 (1/4" – 3/4", lengths up to 7")
	AISI 12L14 (7/8" – 1-1/4" and all lengths over 7")	AISI 12L14 (7/8" – 1-1/4" and all lengths over 7")
Nut	Carbon Steel, ASTM A563, Grade A	Carbon Steel, ASTM A563, Grade A
Washer	AISI 1010 Carbon Steel, Meets Dimensional Requirements of ANSI/ASME 8.22.1, Type A Plain	AISI 1010 Carbon Steel, Meets Dimensional Requirements of ANSI/ASME 8.22.1, Type A Plain
Expansion Wedge	Tempered AISI 1010 Carbon Steel	Type 304 Stainless Steel
Zinc Plating	ASTM B633, SC1, Type III (Fe/Zn 5)	ASTM B695, Class 65, Type I

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

Stainless steel anchor components are passivated.

Anchor Component	Rod Hanger Power-Stud	Tie-Wire Power-Stud
Anchor Body	AISI 12L14 Carbon Steel	AISI 1018 Carbon Steel
Expansion Wedge	Tempered AISI 1010 Carbon Steel	Tempered AISI 1010 Carbon Steel
Zinc Plating	ASTM B633, SC1, Type III (Fe/Zn 5)	ASTM B633, SC1, Type III (Fe/Zn 5)



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"

PERFORMANCE DATA

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

Anchor Diameter <i>d</i> in. (mm)	Minimum Embedment Depth <i>h_v</i> in. (mm)	Minimum Concrete Compressive Strength (<i>f'_c</i>)					
		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)
	2 3/4 (69.9)	2,340 (10.5)	1,655 (7.4)	2,360 (10.6)	2,070 (9.3)	2,535 (11.4)	2,080 (9.4)
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)	6,020 (27.1)	3,760 (16.9)	6,025 (27.1)	3,760 (16.9)
	4 1/4 (108.0)	5,045 (22.7)	3,840 (17.3)	6,020 (27.1)	5,185 (23.3)	6,025 (27.1)	5,185 (23.3)
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)	8,160 (36.7)	6,800 (30.6)	9,200 (41.4)	6,800 (30.6)
	4 (101.6)	5,700 (25.7)	6,540 (29.4)	8,160 (36.7)	6,800 (30.6)	9,200 (41.4)	6,800 (30.6)
	6 (152.4)	7,910 (35.6)	7,025 (31.6)	9,550 (43.0)	7,190 (32.4)	10,730 (48.3)	7,190 (32.4)
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)	9,600 (43.2)	9,280 (41.8)	10,825 (48.7)	11,900 (53.6)	13,495 (60.7)	11,900 (53.6)
	5 (127.0)	10,640 (47.3)	9,280 (41.8)	12,510 (56.3)	11,900 (53.6)	16,410 (73.8)	11,900 (53.6)
	7 (177.8)	12,500 (55.6)	9,760 (43.9)	15,880 (71.5)	12,170 (54.8)	16,410 (73.8)	12,170 (54.8)
3/4 (19.1)	3 3/8 (85.7)	7,420 (33.0)	12,380 (55.7)	10,000 (45.0)	15,060 (67.8)	12,540 (56.4)	15,060 (67.8)
	5 (127.0)	10,640 (47.3)	12,380 (55.7)	14,630 (65.8)	15,060 (67.8)	17,265 (77.7)	15,060 (67.8)
	6 (152.4)	10,640 (47.3)	12,380 (55.7)	17,080 (76.9)	15,060 (67.8)	20,180 (90.8)	15,060 (67.8)
	8 (203.2)	14,000 (62.3)	13,600 (61.2)	22,000 (99.0)	17,110 (77.0)	24,905 (112.1)	17,110 (77.0)
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)	17,300 (77.9)	24,160 (108.7)
	4 1/2 (114.3)	9,600 (43.2)	17,960 (80.8)	15,620 (70.3)	24,160 (108.7)	20,075 (90.3)	24,160 (108.7)
	5 3/4 (146.1)	10,640 (47.3)	17,960 (80.8)	19,880 (89.5)	24,160 (108.7)	25,625 (115.3)	24,160 (108.7)
	7 (177.8)	12,680 (56.4)	17,960 (80.8)	20,440 (92.0)	24,160 (108.7)	31,180 (140.3)	24,160 (108.7)
1 (25.4)	8 (203.2)	15,160 (67.4)	18,630 (83.8)	22,840 (101.6)	25,710 (115.7)	31,180 (140.3)	25,710 (115.7)
	4 1/2 (114.3)	8,740 (39.3)	26,420 (118.9)	13,820 (62.2)	31,100 (140.0)	21,220 (94.4)	31,100 (140.0)
	5 1/2 (139.7)	12,770 (57.5)	26,420 (118.9)	20,280 (91.3)	31,100 (140.0)	27,800 (123.7)	31,100 (140.0)
	6 1/2 (165.1)	16,605 (74.7)	26,420 (118.9)	25,485 (114.7)	31,100 (140.0)	34,360 (152.8)	31,100 (140.0)
1 1/4 (31.8)	8 (203.2)	22,360 (100.6)	26,420 (118.9)	27,040 (121.7)	31,100 (140.0)	44,220 (199.0)	31,100 (140.0)
	9 (228.6)	26,195 (117.9)	27,020 (121.6)	34,205 (153.9)	32,370 (145.7)	44,220 (199.0)	32,370 (145.7)
	5 1/2 (139.7)	16,800 (75.6)	40,820 (183.7)	26,980 (121.4)	40,820 (183.7)	36,925 (166.2)	40,820 (183.7)
1 1/4 (31.8)	7 (177.8)	25,360 (114.1)	40,820 (183.7)	35,410 (159.3)	40,820 (183.7)	44,845 (201.8)	40,820 (183.7)
	10 (254.0)	28,800 (129.6)	40,820 (183.7)	52,280 (235.3)	40,820 (183.7)	60,690 (273.1)	40,820 (183.7)

1. The values listed above are ultimate load capacities which should be reduced by a minimum safety factor of 4.0 or greater to determine the allowable working load.
 2. Linear interpolation may be used to determine ultimate loads for intermediate embedments and compressive strengths.

PERFORMANCE DATA

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

Anchor Diameter <i>d</i> in. (mm)	Minimum Embedment Depth <i>h_v</i> in. (mm)	Minimum Concrete Compressive Strength (<i>f'_c</i>)					
		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)
	2 3/4 (69.9)	585 (2.6)	415 (1.9)	590 (2.7)	520 (2.3)	635 (2.9)	520 (2.3)
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)	1,505 (6.8)	940 (4.2)	1,505 (6.8)	940 (4.2)
	4 1/4 (108.0)	1,260 (5.7)	960 (4.3)	1,505 (6.8)	1,295 (5.8)	1,505 (6.8)	1,295 (5.8)
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)	2,040 (9.2)	1,700 (7.7)	2,300 (10.4)	1,700 (7.7)
	4 (101.6)	1,425 (6.4)	1,635 (7.4)	2,040 (9.2)	1,700 (7.7)	2,300 (10.4)	1,700 (7.7)
	6 (152.4)	1,980 (8.9)	1,755 (7.9)	2,390 (10.8)	1,800 (8.1)	2,685 (12.1)	1,800 (8.1)
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)	2,465 (11.1)	2,975 (13.4)
	4 (101.6)	2,400 (10.8)	2,320 (10.4)	2,705 (12.2)	2,975 (13.4)	3,375 (15.2)	2,975 (13.4)
	5 (127.0)	2,660 (11.8)	2,320 (10.4)	3,130 (14.1)	2,975 (13.4)	4,105 (18.5)	2,975 (13.4)
	7 (177.8)	3,125 (13.9)	2,440 (11.0)	3,970 (17.9)	3,045 (13.7)	4,105 (18.5)	3,045 (13.7)
3/4 (19.1)	3 3/8 (85.7)	1,855 (8.3)	3,095 (13.9)	2,500 (11.3)	3,765 (16.9)	3,135 (14.1)	3,765 (16.9)
	5 (127.0)	2,660 (11.8)	3,095 (13.9)	3,660 (16.5)	3,765 (16.9)	4,315 (19.4)	3,765 (16.9)
	6 (152.4)	2,660 (11.8)	3,095 (13.9)	4,270 (19.2)	3,765 (16.9)	5,045 (22.7)	3,765 (16.9)
	8 (203.2)	3,500 (15.6)	3,400 (15.3)	5,710 (25.4)	4,280 (19.3)	6,225 (28.0)	4,280 (19.3)
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)	4,325 (19.5)	6,040 (27.2)
	4 1/2 (114.3)	2,400 (10.8)	4,490 (20.2)	3,905 (17.6)	6,040 (27.2)	5,305 (23.6)	6,040 (27.2)
	5 3/4 (146.1)	2,660 (11.8)	4,490 (20.2)	4,970 (22.4)	6,040 (27.2)	6,950 (30.9)	6,040 (27.2)
	7 (177.8)	3,170 (14.1)	4,490 (20.2)	5,110 (23.0)	6,040 (27.2)	8,590 (38.2)	6,040 (27.2)
	8 (203.2)	3,790 (16.9)	4,660 (21.0)	5,710 (25.4)	6,430 (28.9)	7,795 (35.1)	6,430 (28.9)
1 (25.4)	4 1/2 (114.3)	2,185 (9.8)	6,605 (29.7)	3,455 (15.5)	7,775 (35.0)	5,305 (23.6)	7,775 (35.0)
	5 1/2 (139.7)	3,195 (14.4)	6,605 (29.7)	5,070 (22.8)	7,775 (35.0)	6,950 (30.9)	7,775 (35.0)
	6 1/2 (165.1)	4,150 (18.7)	6,605 (29.7)	6,370 (28.7)	7,775 (35.0)	8,590 (38.2)	7,775 (35.0)
	8 (203.2)	5,590 (25.2)	6,605 (29.7)	6,760 (30.4)	7,775 (35.0)	11,055 (49.7)	7,775 (35.0)
	9 (228.6)	6,550 (29.5)	6,755 (30.4)	8,550 (38.5)	8,095 (36.4)	11,055 (49.7)	8,095 (36.4)
1 1/4 (31.8)	5 1/2 (139.7)	4,200 (18.9)	10,205 (45.9)	6,745 (30.4)	10,205 (45.9)	9,230 (41.5)	10,205 (45.9)
	7 (177.8)	6,340 (28.5)	10,205 (45.9)	8,855 (39.8)	10,205 (45.9)	11,210 (50.4)	10,205 (45.9)
	10 (254.0)	7,200 (32.4)	10,205 (45.9)	13,070 (58.8)	10,205 (45.9)	15,175 (68.3)	10,205 (45.9)

1. Allowable load capacities listed are calculated using an applied safety factor of 4.0.
 2. Linear interpolation may be used to determine allowable loads for intermediate embedments and compressive strengths.
 3. Allowable loads for anchors to resist short-term loads such as earthquake or wind may be increased by 33-1/3 percent for the duration of the load, where permitted by code.

MECHANICAL ANCHORS

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

Anchor Diameter <i>d</i> in. (mm)	Max. Guide Torque <i>T</i> _{max} ft.-lbs.	Min. Embed. Depth <i>h_v</i> in. (mm)	Minimum Concrete Compressive Strength (<i>f</i> ' _c)						Shear, lbs (kN)	
			Tension, lbs (kN)						<i>f</i> ' _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)	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)	20	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)	–	–	2,860 (12.9)	715 (3.2)	–	–	1,840 (8.3)	460 (2.1)
1/2 (12.7)	30	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)
		3 (76.2)	–	–	4,020 (18.1)	1,005 (4.5)	–	–	5,040 (22.7)	1,260 (5.7)
		5 (127.0)	–	–	4,200 (18.9)	1,050 (4.7)	–	–	5,040 (22.7)	1,260 (5.7)
5/8 (15.9)	65	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)
		3 1/2 (88.9)	–	–	4,840 (21.8)	1,210 (5.4)	–	–	6,940 (31.2)	1,735 (7.8)
		5 (127.0)	–	–	6,920 (31.1)	1,730 (7.8)	–	–	6,940 (31.2)	1,735 (7.8)
3/4 (19.1)	90	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)
		4 (101.6)	–	–	8,240 (37.1)	2,060 (9.3)	–	–	9,880 (44.5)	2,470 (11.1)
		5 (127.0)	–	–	9,300 (41.9)	2,325 (10.5)	–	–	9,880 (44.5)	2,470 (11.1)

1. The values listed above are ultimate and allowable load capacities for anchors installed in sand-lightweight concrete.

2. Allowable load capacities are calculated using an applied safety factor of 4.0.

3. Linear interpolation may be used to determine loads for intermediate embedments and compressive strengths.

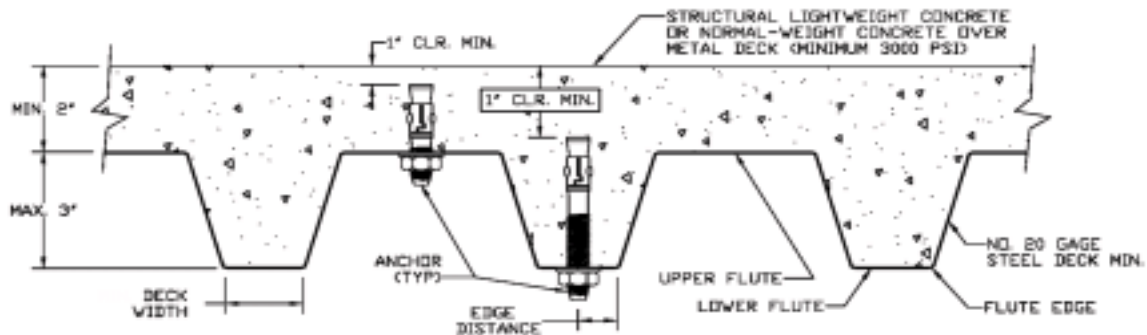
PERFORMANCE DATA

Ultimate and Allowable Load Capacities for Carbon and Stainless Steel Power-Stud Installed Through Metal Deck into Structural Lightweight Concrete^{1,2,3,4}

MECHANICAL ANCHORS

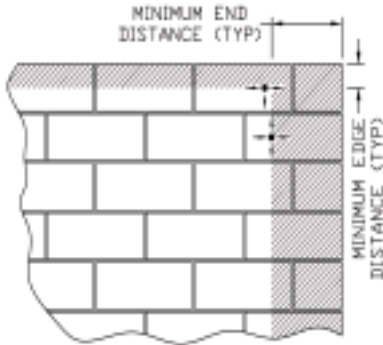
Anchor Diameter <i>d</i> in. (mm)	Max. Guide Torque <i>T_{max}</i> ft.-lbs.	Min. Embed. Depth <i>h_v</i> in. (mm)	Lightweight Concrete over minimum 20 Gage Metal Deck, <i>f'_c</i> ≥ 3,000 (20.7 MPa)							
			Minimum 1-1/2" Wide Deck				Minimum 4-1/2" Wide Deck			
			Ultimate Load		Allowable Load		Ultimate Load		Allowable Load	
			Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
1/4 (6.4)	4	1 1/8 (28.6)	880 (4.0)	1,840 (8.3)	220 (1.0)	460 (2.1)	880 (4.0)	1,840 (8.3)	220 (1.0)	460 (2.1)
3/8 (9.5)	20	1 5/8 (41.3)	880 (4.0)	2,800 (12.6)	220 (1.0)	700 (3.2)	1,520 (6.8)	2,800 (12.6)	380 (1.7)	700 (3.2)
		3 (76.2)	880 (4.0)	2,800 (12.6)	220 (1.0)	700 (3.2)	4,480 (20.2)	3,840 (17.3)	1,120 (5.0)	960 (4.3)
1/2 (12.7)	30	2 1/4 (57.2)	1,400 (6.3)	2,800 (12.6)	350 (1.6)	700 (3.2)	3,200 (14.4)	4,780 (21.5)	800 (3.6)	1,195 (5.4)
		3 (76.2)	1,400 (6.3)	2,800 (12.6)	350 (1.6)	700 (3.2)	4,560 (20.5)	5,960 (26.8)	1,140 (5.1)	1,490 (6.7)
		4 (101.6)	1,400 (6.3)	2,800 (12.6)	350 (1.6)	700 (3.2)	6,360 (28.6)	7,540 (33.9)	1,590 (7.2)	1,885 (8.5)
5/8 (15.9)	65	2 3/4 (69.9)	-	-	-	-	3,200 (14.4)	4,780 (21.5)	800 (3.6)	1,195 (5.4)
		3 1/2 (88.9)	-	-	-	-	5,540 (24.9)	7,160 (32.2)	1,385 (6.2)	1,790 (8.1)
		5 (127.0)	-	-	-	-	9,200 (41.4)	10,940 (49.2)	2,300 (10.4)	2,735 (12.3)
3/4 (19.1)	90	3 3/8 (85.7)	-	-	-	-	2,740 (12.3)	7,000 (31.5)	685 (3.1)	1,750 (7.9)
		5 (127.0)	-	-	-	-	10,840 (48.8)	12,570 (56.6)	2,710 (12.2)	3,140 (14.1)

1. The values listed above are ultimate and allowable load capacities for anchors installed in sand-lightweight concrete.
2. Allowable loads capacities are calculated using an applied safety factor of 4.0.
3. Tabulated load values are for anchors installed in the center of the flute. Spacing distances shall be in accordance with the spacing table for lightweight concrete listed in the Design Criteria section. Linear interpolation may be used for flute edge distances between those listed. Flute edge distance equals one-half the minimum deck width.
4. Anchors are permitted to be installed in the lower or upper flute of the metal deck provided the proper installation procedures are maintained.



PERFORMANCE DATA

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



Anchor Dia. <i>d</i> in. (mm)	Max. Guide Torque <i>T</i> _{max} ft.-lbs.	Min. Embed. Depth <i>h_v</i> in. (mm)	Min. Edge Distance in. (mm)	Min. End Distance in. (mm)	Grout-Filled Concrete Masonry <i>f</i> ' _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)	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)	20	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)	30	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)	65	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)	90	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 6-inch wide, Grade N, Type II, medium and normal-weight concrete masonry units conforming to ASTM C 90 that have reached the minimum designated ultimate compressive strength at the time of installation (*f*'_m ≥ 1,500 psi).
2. Allowable load capacities listed are calculated using an applied safety factor of 5.0.
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.

DESIGN CRITERIA

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 Distances

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 (<i>s</i>)	Tension and Shear	<i>s</i> _{cr} = 2.0 <i>h_v</i>	<i>F_N</i> = <i>F_V</i> = 1.0	<i>s</i> _{min} = <i>h_v</i>	<i>F_N</i> = <i>F_V</i> = 0.50
Edge Distance (<i>c</i>)	Tension	<i>c</i> _{cr} = 12 <i>d</i>	<i>F_N</i> = 1.0	<i>c</i> _{cr} = 5 <i>d</i>	<i>F_N</i> = 0.75
	Shear	<i>c</i> _{cr} = 12 <i>d</i>	<i>F_V</i> = 1.0	<i>c</i> _{cr} = 5 <i>d</i>	<i>F_V</i> = 0.35

Anchor Installed in Lightweight Concrete					
Anchor Dimension	Load Type	Critical Distance (Full Anchor Capacity)	Critical Load Factor	Minimum Distance (Reduced Capacity)	Minimum Load Factor
Spacing (<i>s</i>)	Tension and Shear	<i>s</i> _{cr} = 2.0 <i>h_v</i>	<i>F_N</i> = <i>F_V</i> = 1.0	<i>s</i> _{min} = <i>h_v</i>	<i>F_N</i> = <i>F_V</i> = 0.50
Edge Distance (<i>c</i>)	Tension	<i>c</i> _{cr} = 12 <i>d</i>	<i>F_N</i> = 1.0	<i>c</i> _{cr} = 5 <i>d</i>	<i>F_N</i> = 0.95
	Shear	<i>c</i> _{cr} = 12 <i>d</i>	<i>F_V</i> = 1.0	<i>c</i> _{cr} = 5 <i>d</i>	<i>F_V</i> = 0.30

DESIGN CRITERIA

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

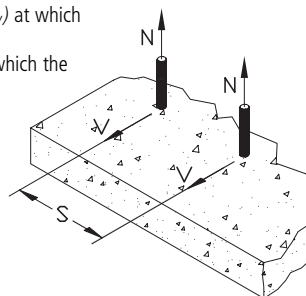
Spacing, Tension (F_N) & Shear (F_V)																			
Dia. (in.)	1/4				3/8				1/2					5/8					
h_v (in.)	1 1/8	1 1/2	2	2 3/4	1 5/8	2	3	4 1/4	2 1/4	3	4	5	6	2 3/4	3 1/2	4	5	7	
s_{cr} (in.)	2 1/4	3	4	5 1/2	3 1/4	4	6	8 1/2	4 1/2	6	8	10	12	5 1/2	7	8	10	14	
s_{min} (in.)	1 1/8	1 1/2	2	2 3/4	1 5/8	2	3	4 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		0.92	0.69	0.50	0.85	0.69			0.61				0.50					
	3		1.00	0.75	0.55	0.92	0.75	0.50		0.67	0.50				0.55				
	3 1/4			0.81	0.59	1.00	0.81	0.54		0.72	0.54				0.59				
	3 1/2			0.88	0.64		0.88	0.58		0.78	0.58				0.64	0.50			
	4			1.00	0.73		1.00	0.67		0.89	0.67	0.50			0.73	0.57	0.50		
	4 1/4				0.77			0.71	0.50	0.94	0.71	0.53			0.77	0.61	0.53		
	4 1/2				0.82			0.75	0.53	1.00	0.75	0.56			0.82	0.64	0.56		
	5				0.91			0.83	0.59		0.83	0.63	0.50		0.91	0.71	0.63	0.50	
	5 1/2				1.00			0.92	0.65		0.92	0.69	0.55		1.00	0.79	0.69	0.55	
	6							1.00	0.71		1.00	0.75	0.60	0.50		0.86	0.75	0.60	
	7								0.82			0.88	0.70	0.58		1.00	0.88	0.70	0.50
	8								0.94			1.00	0.80	0.67			1.00	0.80	0.57
8 1/2								1.00				0.85	0.71				0.85	0.61	
10												1.00	0.83				1.00	0.71	
11													0.92					0.79	
12													1.00					0.86	
13																		0.93	
14																		1.00	

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

Spacing, Tension (F_N) & Shear (F_V)																			
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_{cr} (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		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		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	0.80	0.67	0.50		0.89	0.70	0.57	0.50	0.89	0.73	0.62	0.50		0.73	0.57	
	9			0.90	0.75	0.56		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	0.83	0.63			0.87	0.71	0.63		0.91	0.77	0.63	0.56	0.91	0.71	0.50
	11				0.92	0.69			0.96	0.79	0.69		1.00	0.85	0.69	0.61	1.00	0.79	0.55
	11 1/2				0.96	0.72			1.00	0.82	0.72			0.88	0.72	0.64		0.82	0.58
12				1.00	0.75				0.86	0.75			0.92	0.75	0.67		0.86	0.60	
13					0.81				0.93	0.81			1.00	0.81	0.72		0.93	0.65	
14					0.88				1.00	0.88				0.88	0.78		1.00	0.70	
16					1.00					1.00				1.00	0.89			0.80	
18															1.00			0.90	
20																		1.00	

Notes: Critical spacing (s_{cr}) 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.

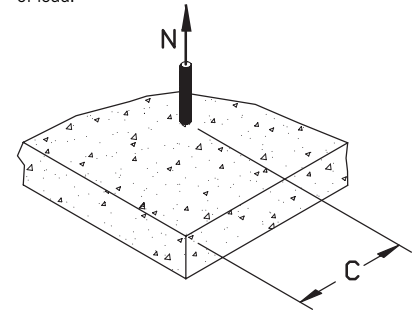


DESIGN CRITERIA

Edge Distance Load Adjustment Factors for Normal-Weight Concrete

Edge Distance, Tension (F_N)									
Diameter (in.)	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/4	
C_{cr} (in.)	3	4 1/2	6	7 1/2	9	10 1/2	12	15	
C_{min} (in.)	1 1/4	1 7/8	2 1/2	3 1/8	3 3/4	4 3/8	5	6 1/4	
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		0.87	0.79	0.75				
	3 3/4		0.93	0.84	0.79	0.75			
	4		0.95	0.86	0.80	0.76			
	4 3/8		0.99	0.88	0.82	0.78	0.75		
	4 1/2		1.00	0.89	0.83	0.79	0.76		
	5			0.93	0.86	0.81	0.78	0.75	
	6			1.00	0.91	0.86	0.82	0.79	
	6 1/4				0.93	0.87	0.83	0.79	0.75
	7				0.97	0.90	0.86	0.82	0.77
7 1/2				1.00	0.93	0.88	0.84	0.79	
8					0.95	0.90	0.86	0.80	
9					1.00	0.94	0.89	0.83	
10 1/2						1.00	0.95	0.87	
12							1.00	0.91	
15								1.00	

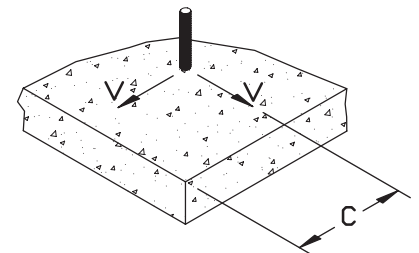
Notes: For anchors loaded in tension, the critical edge distance (c_{cr}) is equal to 12 anchor diameters ($12d$) at which the anchor achieves 100% of load. Minimum edge distance (c_{min}) is equal to 5 anchor diameters ($5d$) at which the anchor achieves 75% of load.



Edge Distance, Shear (F_V)									
Diameter (in.)	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/4	
C_{cr} (in.)	3	4 1/2	6	7 1/2	9	10 1/2	12	15	
C_{min} (in.)	1 1/4	1 7/8	2 1/2	3 1/8	3 3/4	4 3/8	5	6 1/4	
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		0.66	0.47	0.35				
	3 3/4		0.81	0.58	0.44	0.35			
	4		0.88	0.63	0.48	0.38			
	4 3/8		0.97	0.70	0.54	0.43	0.35		
	4 1/2		1.00	0.72	0.55	0.44	0.36		
	5			0.81	0.63	0.50	0.42	0.35	
	6			1.00	0.78	0.63	0.52	0.44	
	6 1/4				0.81	0.66	0.55	0.47	0.35
	7				0.93	0.75	0.63	0.54	0.41
7 1/2				1.00	0.81	0.68	0.58	0.44	
8					0.88	0.73	0.63	0.48	
9					1.00	0.84	0.72	0.55	
10 1/2						1.00	0.86	0.67	
12							1.00	0.78	
15								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.

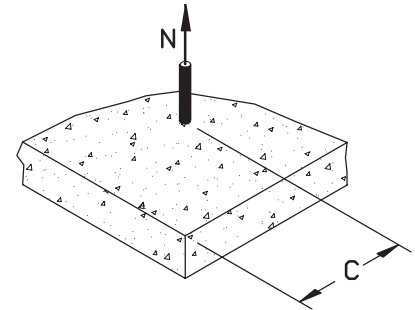


DESIGN CRITERIA

Edge Distance Load Adjustment Factors for Lightweight Concrete

Edge Distance, Tension (F_N)									
Diameter (in.)	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/4	
C_{cr} (in.)	3	4 1/2	6	7 1/2	9	10 1/2	12	15	
C_{min} (in.)	1 1/4	1 7/8	2 1/2	3 1/8	3 3/4	4 3/8	5	6 1/4	
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		0.97	0.96	0.95				
	3 3/4		0.99	0.97	0.96	0.95			
	4		0.99	0.97	0.96	0.95			
	4 3/8		1.00	0.98	0.96	0.96	0.95		
	4 1/2		1.00	0.98	0.97	0.96	0.95		
	5			0.99	0.97	0.96	0.96	0.95	
	6			1.00	0.98	0.97	0.96	0.96	
	6 1/4				0.99	0.97	0.97	0.96	0.95
	7				0.99	0.98	0.97	0.96	0.95
7 1/2				1.00	0.99	0.98	0.97	0.96	
8					0.99	0.98	0.97	0.96	
9					1.00	0.99	0.98	0.97	
10 1/2						1.00	0.99	0.97	
12							1.00	0.98	
15								1.00	

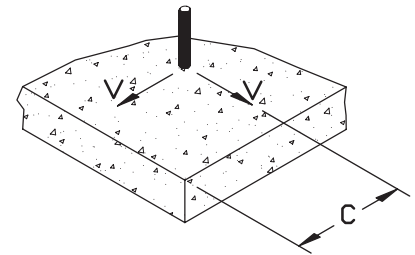
Notes: For anchors loaded in tension, the critical edge distance (c_{cr}) is equal to 12 anchor diameters ($12d$) at which the anchor achieves 100% of load. Minimum edge distance (c_{min}) is equal to 5 anchor diameters ($5d$) at which the anchor achieves 95% of load.



Edge Distance, Shear (F_V)									
Diameter (in.)	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/4	
C_{cr} (in.)	3	4 1/2	6	7 1/2	9	10 1/2	12	15	
C_{min} (in.)	1 1/4	1 7/8	2 1/2	3 1/8	3 3/4	4 3/8	5	6 1/4	
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		0.63	0.43	0.30				
	3 3/4		0.80	0.55	0.40	0.30			
	4		0.87	0.60	0.44	0.33			
	4 3/8		0.97	0.68	0.50	0.38	0.30		
	4 1/2		1.00	0.70	0.52	0.40	0.31		
	5			0.80	0.60	0.47	0.37	0.30	
	6			1.00	0.76	0.60	0.49	0.40	
	6 1/4				0.80	0.63	0.51	0.43	0.30
	7				0.92	0.73	0.60	0.50	0.36
7 1/2				1.00	0.80	0.66	0.55	0.40	
8					0.87	0.71	0.60	0.44	
9					1.00	0.83	0.70	0.52	
10 1/2						1.00	0.85	0.64	
12							1.00	0.76	
15								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

Carbon Steel Power-Stud

Cat. No.	Anchor Size	Min. Embed.	Thread Length	Std. Box	Std. Carton	Wt./100
7400	1/4" x 1 3/4"	1 1/8"	3/4"	100	500	3
7402	1/4" x 2 1/4"	1 1/8"	1 1/4"	100	500	3 1/2
7404	1/4" x 3 1/4"	1 1/8"	2 1/4"	100	500	4 3/4
7410	3/8" x 2 1/4"	1 5/8"	1 1/4"	50	250	8 3/4
7412	3/8" x 2 3/4"	1 5/8"	1 5/8"	50	250	9 1/2
7413	3/8" x 3"	1 5/8"	1 7/8"	50	250	10 3/4
7414	3/8" x 3 1/2"	1 5/8"	2 3/8"	50	250	12
7415	3/8" x 3 3/4"	1 5/8"	2 5/8"	50	250	12 3/4
7416	3/8" x 5"	1 5/8"	3 7/8"	50	250	15 1/2
7417	3/8" x 7"	1 5/8"	5 7/8"	50	200	21
7420	1/2" x 2 3/4"	2 1/4"	1 3/8"	50	200	18
7422	1/2" x 3 3/4"	2 1/4"	2 3/8"	50	200	23
7423	1/2" x 4 1/2"	2 1/4"	3 1/8"	50	200	28
7424	1/2" x 5 1/2"	2 1/4"	4 1/8"	50	150	32
7426	1/2" x 7"	2 1/4"	5 5/8"	25	100	44
7427	1/2" x 8 1/2"	2 1/4"	7 1/8"	25	100	46
7430	5/8" x 3 1/2"	2 3/4"	2"	25	100	40
7432	5/8" x 4 1/2"	2 3/4"	3"	25	100	54
7433	5/8" x 5"	2 3/4"	3 1/2"	25	100	57
7434	5/8" x 6"	2 3/4"	4 1/2"	25	75	64
7436	5/8" x 7"	2 3/4"	5 1/2"	25	75	72
7438	5/8" x 8 1/2"	2 3/4"	7"	25	75	84
7439	5/8" x 10"	2 3/4"	8 1/2"	25	75	100
7440	3/4" x 4 1/4"	3 3/8"	2 3/8"	20	60	70
7441	3/4" x 4 3/4"	3 3/8"	2 7/8"	20	60	76
7442	3/4" x 5 1/2"	3 3/8"	3 5/8"	20	60	85
7444	3/4" x 6 1/4"	3 3/8"	4 3/8"	20	60	95
7446	3/4" x 7"	3 3/8"	5 1/8"	20	60	105
7448	3/4" x 8 1/2"	3 3/8"	6 5/8"	10	40	120
7449	3/4" x 10"	3 3/8"	8 1/8"	10	30	135
7451	3/4" x 12"	3 3/8"	10 1/8"	10	30	155
7450	7/8" x 6"	3 7/8"	2 3/4"	10	40	120
7452	7/8" x 8"	3 7/8"	4 3/4"	10	40	160
7454	7/8" x 10"	3 7/8"	6 3/4"	10	30	200
7461	1" x 6"	4 1/2"	2 3/8"	10	30	170
7463	1" x 9"	4 1/2"	5 3/8"	10	30	240
7465	1" x 12"	4 1/2"	8 3/8"	5	15	300
7473	1 1/4" x 9"	5 1/2"	4 3/4"	5	15	360
7475	1 1/4" x 12"	5 1/2"	7 3/4"	5	15	480



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.

Mechanically Galvanized Power-Stud

Cat. No.	Anchor Size	Min. Embed.	Thread Length	Std. Box	Std. Carton	Wt./100
7720	1/2" x 2 3/4"	2 1/4"	1 3/8"	50	200	18
7723	1/2" x 4 1/2"	2 1/4"	3 1/8"	50	200	30
7724	1/2" x 5 1/2"	2 1/4"	4 1/8"	50	150	34
7726	1/2" x 7"	2 1/4"	5 5/8"	25	100	34
7730	5/8" x 3 1/2"	2 3/4"	2"	25	100	40
7734	5/8" x 6"	2 3/4"	4 1/2"	25	75	64
7741	3/4" x 4 3/4"	3 3/8"	2 7/8"	20	60	76
7742	3/4" x 5 1/2"	3 3/8"	3 5/8"	20	60	85
7748	3/4" x 8 1/2"	3 3/8"	6 5/8"	10	40	120
7750	7/8" x 6"	3 7/8"	2 3/4"	10	40	120
7752	7/8" x 8"	3 7/8"	4 3/4"	10	40	160
7763	1" x 9"	4 1/2"	5 3/8"	10	30	240



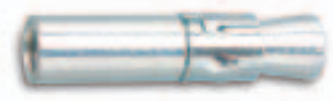
The published length is the overall length of the anchor. Allow for fixture thickness plus one anchor diameter for the nut and washer thickness when selecting a length.

ORDERING INFORMATION

Rod Hanger Power-Stud

Cat. No.	Rod Size	Anchor Size	Drill Dia.	Min. Embed.	Thread Depth	Std. Box	Std. Ctn.	Wt./100
7806	3/8"	1/2" x 2 3/8"	1/2"	2 1/4"	9/16"	50	250	18
7808*	1/2"	5/8" x 2 1/2"	5/8"	2 3/4"	3/4"	25	125	40
7810*	5/8"	7/8" x 3 1/4"	7/8"	3 7/8"	15/16"	10	50	120

The published length is the overall length of the anchor.
*Discontinued item once current stock is exhausted.



MECHANICAL ANCHORS

Tie-Wire Power-Stud

Cat. No.	Size	Tie-Wire Hole Size	Min. Embed.	Std. Box	Std. Carton	Wt./100
7409	1/4" x 2"	9/32"	1 1/8"	100	500	3 3/4

The published length is the overall length of the anchor.



Type 304 Stainless Steel Power-Stud

Cat. No.	Anchor Size	Min. Embed.	Thread Length	Std. Box	Std. Carton	Wt./100
7300	1/4" x 1 3/4"	1 1/8"	3/4"	100	500	3
7302	1/4" x 2 1/4"	1 1/8"	1 1/4"	100	500	3 1/2
7304	1/4" x 3 1/4"	1 1/8"	2 1/4"	100	500	4 3/4
7310	3/8" x 2 1/4"	1 5/8"	1 1/4"	50	250	8 3/4
7312	3/8" x 2 3/4"	1 5/8"	1 5/8"	50	250	9 1/2
7313	3/8" x 3"	1 5/8"	1 7/8"	50	250	10 3/4
7314	3/8" x 3 1/2"	1 5/8"	2 3/8"	50	250	12
7315	3/8" x 3 3/4"	1 5/8"	2 5/8"	50	250	12 3/4
7316	3/8" x 5"	1 5/8"	3 1/8"	50	250	15 1/2
7320	1/2" x 2 3/4"	2 1/4"	1 3/8"	50	200	18
7322	1/2" x 3 3/4"	2 1/4"	2 3/8"	50	200	23
7323	1/2" x 4 1/2"	2 1/4"	3 1/8"	50	200	30
7324	1/2" x 5 1/2"	2 1/4"	4 1/8"	50	150	34
7326	1/2" x 7"	2 1/4"	5 5/8"	25	100	44
7330	5/8" x 3 1/2"	2 3/4"	2"	25	100	40
7332	5/8" x 4 1/2"	2 3/4"	3"	25	100	54
7333	5/8" x 5"	2 3/4"	3 1/2"	25	100	57
7334	5/8" x 6"	2 3/4"	4 1/2"	25	75	64
7336	5/8" x 7"	2 3/4"	5 1/2"	25	75	72
7338	5/8" x 8 1/2"	2 3/4"	7"	25	75	84
7340	3/4" x 4 1/4"	3 3/8"	2 3/8"	20	60	70
7341	3/4" x 4 3/4"	3 3/8"	2 7/8"	20	60	76
7342	3/4" x 5 1/2"	3 3/8"	3 5/8"	20	60	85
7344	3/4" x 6 1/4"	3 3/8"	4 3/8"	20	60	95
7346	3/4" x 7"	3 3/8"	5 1/8"	20	60	105
7348	3/4" x 8 1/2"	3 3/8"	6 5/8"	10	40	120
7349	3/4" x 10"	3 3/8"	8 1/8"	10	30	135
7352	7/8" x 8"	3 7/8"	4 3/4"	10	40	160
7361	1" x 6"	4 1/2"	2 3/8"	10	30	170
7363	1" x 9"	4 1/2"	5 3/8"	10	30	240
7365	1" x 12"	4 1/2"	8 3/8"	5	15	300

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.



ORDERING INFORMATION**Type 316 Stainless Steel Power-Stud**

Cat. No.	Anchor Size	Min. Embed.	Thread Length	Std. Box	Std. Carton	Wt./100
7600	1/4" x 1 3/4"	1 1/8"	3/4"	100	500	3 1/4
7602	1/4" x 2 1/4"	1 1/8"	1 1/4"	100	500	3 3/4
7604	1/4" x 3 1/4"	1 1/8"	2 1/4"	100	500	5 1/4
7610	3/8" x 2 1/4"	1 5/8"	1 1/4"	50	250	8 3/4
7612	3/8" x 2 3/4"	1 5/8"	1 5/8"	50	250	10 1/2
7613	3/8" x 3"	1 5/8"	1 7/8"	50	250	11
7614	3/8" x 3 1/2"	1 5/8"	2 3/8"	50	250	12
7615	3/8" x 3 3/4"	1 5/8"	2 5/8"	50	250	13
7616	3/8" x 5"	1 5/8"	3 1/8"	50	250	17 1/4
7620	1/2" x 2 3/4"	2 1/4"	1 3/8"	50	200	18
7622	1/2" x 3 3/4"	2 1/4"	2 3/8"	50	200	24
7623	1/2" x 4 1/2"	2 1/4"	3 1/8"	50	200	30
7624	1/2" x 5 1/2"	2 1/4"	4 1/8"	50	150	34
7626	1/2" x 7"	2 1/4"	5 5/8"	25	100	44
7630	5/8" x 3 1/2"	2 3/4"	2"	25	100	40
7632	5/8" x 4 1/2"	2 3/4"	3"	25	100	54
7633	5/8" x 5"	2 3/4"	3 1/2"	25	100	57
7634	5/8" x 6"	2 3/4"	4 1/2"	25	75	64
7636	5/8" x 7"	2 3/4"	5 1/2"	25	75	72
7638	5/8" x 8 1/2"	2 3/4"	7"	25	75	84
7640	3/4" x 4 1/4"	3 3/8"	2 3/8"	20	60	70
7641	3/4" x 4 3/4"	3 3/8"	2 7/8"	20	60	76
7642	3/4" x 5 1/2"	3 3/8"	3 5/8"	20	60	85
7644	3/4" x 6 1/4"	3 3/8"	4 3/8"	20	60	95
7646	3/4" x 7"	3 3/8"	5 1/8"	20	60	105
7648	3/4" x 8 1/2"	3 3/8"	6 5/8"	10	40	120



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.