Wedge-Bolt® *Screw Anchor*

PRODUCT DESCRIPTION

The Wedge-Bolt anchor is a one piece, heavy duty screw anchor with a finished hex head. It is easy to identify, fully removable and vibration resistant. The Wedge-Bolt has many unique features and benefits that make it well suited for many applications in a variety of base materials. Optimum performance is obtained using a combination of patented design concepts. The steel threads along the anchor body self tap into the hole during installation and provide positive keyed engagement.

The benefit to the designer is higher load capacities, while the benefit to the user is ease of installation. The Wedge-Bolt can be easily installed with either a powered impact wrench or conventional hand socket.

Wedge-Bolt – Wedge-Bolt screw anchors are designed to be used with a matched tolerance Wedge-Bit™ for optimum performance. The Wedge-Bolt works in fixture clearance holes that are 1/16" over nominal, which is typical of standard fixture holes used in steel fabrication.

Wedge-Bolt OT – The Wedge-Bolt OT is specifically engineered for use in fixture clearance holes sized a minimum of 1/8" over nominal. The Wedge-Bolt OT must be installed with an ANSI rotary drill bit.

GENERAL APPLICATIONS AND USES

- Racking and Shelving
- Support Ledgers
- Fencing
- Maintenance
- Repairs
- Material Handling
- Structural Anchorage
- Masonry Applications
- Food and Beverage Facilities
- Retrofits

FEATURES AND BENEFITS

- One-piece design eliminates possibility of lost anchor parts or improper assembly
- Tested in accordance with ASTM E488 and AC106 criteria
- Qualified for seismic and wind loads
- Wedge-Bolt anchor will fit standard fixture hole dimensions in fabricated steel
- Can be installed with an impact wrench or conventional hand socket
- Fast installation and immediate loading minimizes downtime
- High load capacities and full grip along thread length
- Diameter and length ID stamped on head of each hex head anchor for easy inspection
- Finished hex head provides attractive appearance and eliminates tripping hazard
- No expansion forces transferred to the base material
- Can be installed closer to the edge than traditional expansion anchors
- Versatile installation in concrete, block and brick masonry
- Ratchet teeth on underside of hex washer head lock against the fixture
- Removable and will not leave components in the hole

APPROVALS AND LISTINGS

International Code Council, Evaluation Service (ICC-ES) ESR-1678
(formerly listed in ER-5788)
Southern Building Code Conference International (SBCCI) #2124
City of Los Angeles (COLA) Research Report LARR-25415
Florida Building Code Approval – FL2209.10
Miami-Dade County Notice of Acceptance (NOA) 00-0229.04
Federal GSA Specification – Meets the proof load requirements of FF-S-325C, Group II, Type 4, Class 1 (superseded) and CID A-A1923A, Type 4
Various North American Departments of Transportation (DOT) – See www.powers.com

GUIDE SPECIFICATIONS

CSI Divisions: *03151-Concrete Anchoring, 04081-Masonry Anchorage* and *05090-Metal Fastenings.* Screw Anchors shall be Wedge-Bolt or Wedge-Bolt OT anchors as supplied by Powers Fasteners, Inc., Brewster, NY.

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Carbon Steel Wedge-Bolt



410 Stainless Steel Wedge-Bolt



Carbon Steel Wedge-Bolt OT (ANSI)

HEAD STYLES

Hex Head

ANCHOR MATERIALS

Zinc Plated Carbon Steel
Mechanically Galvanized Carbon Steel
Type 410 Stainless Steel

ANCHOR SIZE RANGE (TYP.)

1/4" diameter x 1 1/4" length to
5/8" x 14" and
3/4" diameter x 8" lengths

SUITABLE BASE MATERIALS

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

INSTALLATION SPECIFICATIONS

Carbon Steel Wedge-Bolt

Dimension	Nominal Anchor Diameter, *d*				
	1/4"	3/8"	1/2"	5/8"	3/4"
Wedge-Bit Size, d_{bit} (in.)	1/4	3/8	1/2	5/8	3/4
Wedge-Bit Size Range (in.)	0.255-0.259	0.385-0.389	0.490-0.495	0.600-0.605	0.720-0.725
Fixture Clearance Hole, d_h (in.)	5/16	7/16	9/16	11/16	13/16
Head Washer Height (in.)	7/32	21/64	7/16	1/2	19/32
Washer O.D., d_w (in.)	9/16	47/64	1	1 3/16	1 13/32
Wrench Size (in.)	7/16	9/16	3/4	15/16	1 1/8

410 Stainless Steel Wedge-Bolt

Dimension	Nominal Anchor Diameter, *d*				
	1/4"	3/8"	1/2"	5/8"	3/4"
Wedge-Bit Size, d_{bit} (in.)	1/4	3/8	1/2	5/8	3/4
Wedge-Bit Size Range (in.)	0.255-0.259	0.385-0.389	0.490-0.495	0.600-0.605	0.720-0.725
Fixture Clearance Hole, d_h (in.)	5/16	7/16	9/16	11/16	13/16
Head Washer Height (in.)	7/32	21/64	7/16	1/2	19/32
Washer O.D., d_w (in.)	9/16	47/64	1	1 3/16	1 13/32
Wrench Size (in.)	7/16	9/16	3/4	15/16	1 1/8

Carbon Steel Wedge-Bolt OT (Orange Tip)

Dimension	Nominal Anchor Diameter, *d*			
	1/4"	3/8"	1/2"	5/8"
ANSI Drill Bit Size, d_{bit} (in.)	1/4	3/8	1/2	5/8
ANSI Drill Bit Size Range (in.)	0.260-0.268	0.390-0.398	0.520-0.530	0.650-0.660
Fixture Clearance Hole, d_h (in.)	3/8	1/2	5/8	3/4
Head Washer Height (in.)	7/32	21/64	7/16	1/2
Washer O.D., d_w (in.)	9/16	47/64	1	1 3/16
Wrench Size (in.)	7/16	9/16	3/4	15/16

Installation Procedure



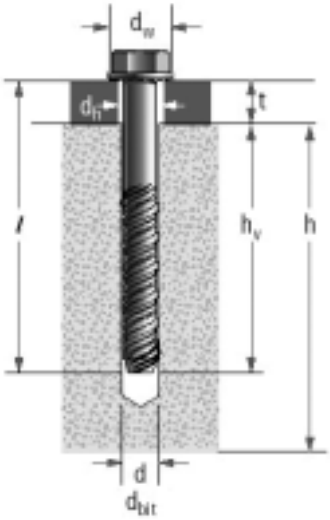
Select the proper diameter Wedge-Bit for Wedge-Bolt and 410 Stainless Steel Wedge-Bolt installations ***or*** proper diameter ANSI drill bit for Wedge-Bolt OT installations. ANSI drill bits should meet the requirements of ANSI Standard B212.15. Using the proper drill bit, drill a hole into the base material to a depth of at least 1/2" or one anchor diameter deeper than the embedment required.



Insert the anchor through the fixture into the anchor hole. Begin tightening the anchor by rotating clockwise and applying pressure in toward the base material. A powered impact wrench may also be used. This will engage the first few threads as the anchor begins to advance.



Continue tightening the anchor until the head is firmly seated against the fixture while achieving the required embedment depth.



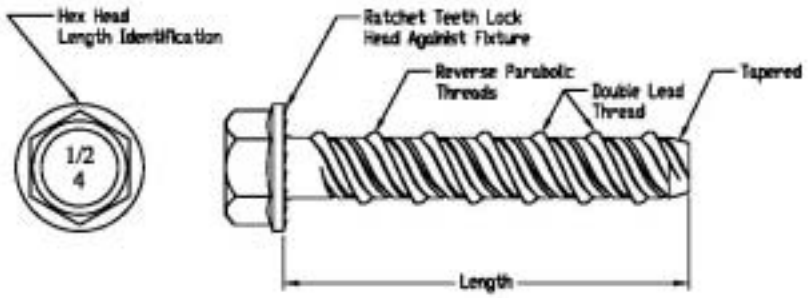
Nomenclature

- 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

INSTALLATION SPECIFICATIONS

Maximum Clamping Torque (ft.-lbs.)

Base Material	Anchor Diameter				
	1/4"	3/8"	1/2"	5/8"	3/4"
2,000 psi Concrete	5	30	45	75	150
4,000 psi Concrete	10	40	60	95	200
6,000 psi Concrete	10	40	60	95	200
3,000 psi Lightweight Concrete	10	15	40	60	70
Grout Filled Block	10	15	40	60	70
Solid Red Brick	10	30	45	75	100



WEDGE-BOLT AND WEDGE-BOLT OT

MATERIAL SPECIFICATIONS

Carbon Steel Wedge-Bolt and Wedge-Bolt OT

Anchor Component	Component Material
Anchor Body	Case Hardened AISI 1020 / 1040 or 10B21 Carbon Steel
Zinc Plating	ASTM B633, SC1, Type III (Fe/Zn 5) ASTM B695, Class 65, Type I (Mechanically galvanized Wedge-Bolts are available on request)

410 Stainless Steel Wedge-Bolt

Anchor Component	Component Material
Anchor Body	Type 410 Stainless Steel
Coating	Class 4 Sealcoat (Passivated)

PERFORMANCE DATA

Ultimate Load Capacities for Wedge-Bolt and Wedge-Bolt OT installed in Normal-Weight Concrete at Critical Spacing and Edge Distances[1,2,3,4]

Anchor Diameter d in. (mm)	Minimum Embedment Depth h_v 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 (25.4)	720 (3.2)	1,040 (4.7)	1,340 (6.0)	2,080 (9.4)	1,660 (7.5)	2,400 (10.8)
	1 1/2 (38.1)	1,440 (6.5)	2,200 (9.9)	2,140 (9.6)	2,200 (9.9)	2,480 (11.2)	2,500 (11.3)
	2 (50.8)	2,400 (10.8)	2,200 (9.9)	3,940 (17.7)	2,200 (9.9)	4,980 (22.4)	2,920 (13.1)
	2 1/2 (63.5)	3,520 (15.8)	2,200 (9.9)	4,660 (21.0)	2,200 (9.9)	5,260 (23.7)	2,920 (13.1)
3/8 (9.5)	1 1/2 (38.1)	1,900 (8.6)	3,380 (15.2)	2,520 (11.3)	4,680 (21.1)	3,040 (13.7)	6,840 (30.8)
	2 (50.8)	3,000 (13.5)	4,440 (20.0)	3,920 (17.6)	5,080 (22.9)	5,200 (23.4)	6,840 (30.8)
	2 1/2 (63.5)	4,100 (18.5)	5,480 (24.7)	5,320 (23.9)	5,480 (24.7)	7,340 (33.0)	6,840 (30.8)
	3 (76.2)	5,800 (26.1)	5,700 (25.7)	7,740 (34.8)	5,920 (26.6)	9,900 (44.6)	6,840 (30.8)
	3 1/2 (88.9)	7,500 (33.8)	5,900 (26.6)	10,140 (45.6)	6,360 (28.6)	12,440 (56.0)	6,840 (30.8)
1/2 (12.7)	2 (50.8)	2,860 (12.9)	5,720 (25.7)	3,940 (17.7)	6,820 (30.7)	4,780 (21.5)	8,740 (39.3)
	2 1/2 (63.5)	4,100 (18.5)	6,680 (30.1)	5,200 (23.4)	7,500 (33.8)	6,480 (29.2)	9,080 (40.9)
	3 (76.2)	5,920 (26.6)	7,160 (32.2)	7,800 (35.1)	8,380 (37.7)	9,380 (42.2)	9,080 (40.9)
	3 1/2 (88.9)	6,060 (27.3)	8,660 (39.0)	8,480 (38.2)	9,080 (40.9)	11,900 (53.6)	9,600 (43.2)
	4 (101.6)	7,560 (34.0)	8,660 (39.0)	12,620 (56.8)	9,080 (40.9)	12,620 (56.8)	9,600 (43.2)
5/8 (15.9)	2 1/2 (63.5)	3,420 (15.4)	7,200 (32.4)	4,720 (21.2)	10,820 (48.7)	6,900 (31.1)	13,400 (60.3)
	3 (76.2)	4,560 (20.5)	9,300 (41.9)	7,380 (33.2)	12,220 (55.0)	8,960 (40.3)	14,200 (63.9)
	3 1/2 (88.9)	5,720 (25.7)	11,380 (51.2)	10,040 (45.2)	13,600 (61.2)	11,040 (49.7)	15,000 (67.5)
	4 (101.6)	8,240 (37.1)	12,580 (56.6)	12,760 (57.4)	14,760 (66.4)	14,320 (64.4)	15,920 (71.6)
	4 1/2 (114.3)	10,780 (48.5)	13,800 (62.1)	15,500 (69.8)	15,920 (71.6)	17,600 (79.2)	16,840 (75.8)
	5 (127.0)	13,300 (59.9)	15,000 (67.5)	18,220 (82.0)	17,080 (76.9)	20,860 (93.9)	17,760 (79.9)
3/4 (19.1)	3 (76.2)	4,320 (19.4)	12,020 (54.1)	6,480 (29.2)	15,340 (69.0)	8,700 (39.2)	18,780 (84.5)
	3 1/2 (88.9)	5,720 (25.7)	13,280 (59.8)	9,320 (41.9)	18,780 (84.5)	11,360 (51.1)	20,800 (93.6)
	4 (101.6)	7,120 (32.0)	14,520 (65.3)	12,140 (54.6)	22,200 (99.9)	14,020 (63.1)	22,820 (102.7)
	4 1/2 (114.3)	9,240 (41.6)	16,640 (74.9)	13,580 (61.1)	23,320 (104.9)	16,720 (75.2)	23,800 (107.1)
	5 (127.0)	11,340 (51.0)	18,760 (84.4)	15,020 (67.6)	24,440 (110.0)	19,400 (87.3)	24,760 (111.4)
	5 1/2 (139.7)	13,440 (60.5)	20,880 (94.0)	16,460 (74.1)	25,560 (115.0)	22,080 (99.4)	25,720 (115.7)
	6 (152.4)	15,540 (69.9)	22,980 (103.4)	17,900 (80.6)	26,680 (120.1)	24,760 (111.4)	26,680 (120.1)

1. Tabulated load values are applicable for carbon steel and stainless steel anchors.
2. 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.
3. Critical and minimum spacing and edge distances as well as reduction factors for intermediate spacing and edge distances are listed in the Design Criteria section.
4. Linear interpolation may be used to determine ultimate loads for intermediate embedments and compressive strengths.

PERFORMANCE DATA

Allowable Load Capacities for Wedge-Bolt and Wedge-Bolt OT installed in Normal-Weight Concrete at Critical Spacing and Edge Distances[1,2,3,4,5]

Anchor Diameter d in. (mm)	Minimum Embedment Depth h_v 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 (25.4)	180 (0.8)	260 (1.2)	335 (1.5)	520 (2.3)	415 (1.9)	600 (2.7)
	1 1/2 (38.1)	360 (1.6)	550 (2.5)	535 (2.4)	550 (2.5)	620 (2.8)	625 (2.8)
	2 (50.8)	600 (2.7)	550 (2.5)	985 (4.4)	550 (2.5)	1,245 (5.6)	730 (3.3)
	2 1/2 (63.5)	880 (4.0)	550 (2.5)	1,165 (5.2)	550 (2.5)	1,315 (5.9)	730 (3.3)
3/8 (9.5)	1 1/2 (38.1)	475 (2.1)	845 (3.8)	630 (2.8)	1,170 (5.3)	760 (3.4)	1,710 (7.7)
	2 (50.8)	750 (3.4)	1,110 (5.0)	980 (4.4)	1,270 (5.7)	1,300 (5.9)	1,710 (7.7)
	2 1/2 (63.5)	1,025 (4.6)	1,370 (6.2)	1,330 (6.0)	1,370 (6.2)	1,835 (8.3)	1,710 (7.7)
	3 (76.2)	1,450 (6.5)	1,425 (6.4)	1,935 (8.7)	1,480 (6.7)	2,475 (11.1)	1,710 (7.7)
	3 1/2 (88.9)	1,875 (8.4)	1,475 (6.6)	2,535 (11.4)	1,590 (7.2)	3,110 (14.0)	1,710 (7.7)
1/2 (12.7)	2 (50.8)	715 (3.2)	1,430 (6.4)	985 (4.4)	1,705 (7.7)	1,195 (5.4)	2,185 (9.8)
	2 1/2 (63.5)	1,025 (4.6)	1,670 (7.5)	1,300 (5.9)	1,875 (8.4)	1,620 (7.3)	2,270 (10.2)
	3 (76.2)	1,480 (6.7)	1,790 (8.1)	1,950 (8.8)	2,095 (9.4)	2,345 (10.6)	2,270 (10.2)
	3 1/2 (88.9)	1,515 (6.8)	2,165 (9.7)	2,120 (9.5)	2,270 (10.2)	2,975 (13.4)	2,400 (10.8)
	4 (101.6)	1,890 (8.5)	2,165 (9.7)	3,155 (14.2)	2,270 (10.2)	3,155 (14.2)	2,400 (10.8)
5/8 (15.9)	2 1/2 (63.5)	855 (3.8)	1,800 (8.1)	1,180 (5.3)	2,705 (12.2)	1,725 (7.8)	3,350 (15.1)
	3 (76.2)	1,140 (5.1)	2,325 (10.5)	1,845 (8.3)	3,055 (13.7)	2,240 (10.1)	3,550 (16.0)
	3 1/2 (88.9)	1,430 (6.4)	2,845 (12.8)	2,510 (11.3)	3,400 (15.3)	2,760 (12.4)	3,750 (16.9)
	4 (101.6)	2,060 (9.3)	3,145 (14.2)	3,190 (14.4)	3,690 (16.6)	3,580 (16.1)	3,980 (17.9)
	4 1/2 (114.3)	2,695 (12.1)	3,450 (15.5)	3,875 (17.4)	3,980 (17.9)	4,400 (19.8)	4,210 (18.9)
	5 (127.0)	3,325 (15.0)	3,750 (16.9)	4,555 (20.5)	4,270 (19.2)	5,215 (23.5)	4,440 (20.0)
3/4 (19.1)	3 (76.2)	1,080 (4.9)	3,005 (13.5)	1,620 (7.3)	3,835 (17.3)	2,175 (9.8)	4,695 (21.1)
	3 1/2 (88.9)	1,430 (6.4)	3,320 (14.9)	2,330 (10.5)	4,695 (21.1)	2,840 (12.8)	5,200 (23.4)
	4 (101.6)	1,780 (8.0)	3,630 (16.3)	3,035 (13.7)	5,550 (25.0)	3,505 (15.8)	5,705 (25.7)
	4 1/2 (114.3)	2,310 (10.4)	4,160 (18.7)	3,395 (15.3)	5,830 (26.2)	4,180 (18.8)	5,950 (26.8)
	5 (127.0)	2,835 (12.8)	4,690 (21.1)	3,755 (16.9)	6,110 (27.5)	4,850 (21.8)	6,190 (27.9)
	5 1/2 (139.7)	3,360 (15.1)	5,220 (23.5)	4,115 (18.5)	6,390 (28.8)	5,520 (24.8)	6,430 (28.9)
	6 (152.4)	3,885 (17.5)	5,745 (25.9)	4,475 (20.1)	6,670 (30.0)	6,190 (27.9)	6,670 (30.0)

1. Tabulated load values are applicable for carbon steel and stainless steel anchors.
2. Allowable load capacities listed are calculated using an applied safety factor of 4.0.
3. Critical and minimum spacing and edge distances as well as reduction factors for intermediate spacing and edge distances are listed in the Design Criteria section.
4. Linear interpolation may be used to determine allowable loads for intermediate embedments and compressive strengths.
5. 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.

PERFORMANCE DATA

Ultimate Load Capacities for Wedge-Bolt and Wedge-Bolt OT installed in Normal-Weight Concrete at 16 Diameters Spacing and Edge Distances[1,2,3,4]

Anchor Diameter *d* in. (mm)	Minimum Embed. Depth h_v in. (mm)	Spacing and Edge Distance at 16*d* 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 (25.4)	4 (101.6)	920 (4.1)	1,030 (4.6)	1,520 (6.8)	2,090 (9.4)	1,650 (7.4)	2,440 (11.0)
	1 1/2 (38.1)		1,760 (7.9)	2,580 (11.6)	2,360 (10.6)	2,780 (12.5)	2,480 (11.2)	2,690 (12.1)
	2 (50.8)		2,800 (12.6)	2,780 (12.5)	4,230 (19.0)	2,780 (12.5)	4,980 (22.4)	3,360 (15.1)
	2 1/2 (63.5)		4,220 (19.0)	3,080 (13.9)	4,900 (22.1)	3,080 (13.9)	5,260 (23.7)	3,660 (16.5)
3/8 (9.5)	1 1/2 (38.1)	6 (152.4)	2,140 (9.6)	3,600 (16.2)	2,660 (12.0)	4,870 (21.9)	3,030 (13.6)	7,340 (33.0)
	2 (50.8)		3,300 (14.9)	4,540 (20.4)	4,120 (18.5)	5,180 (23.3)	5,185 (23.3)	7,340 (33.0)
	2 1/2 (63.5)		4,460 (20.1)	5,480 (24.7)	5,550 (25.0)	5,480 (24.7)	7,340 (33.0)	7,340 (33.0)
	3 (76.2)		6,180 (27.8)	6,400 (28.8)	7,970 (35.9)	6,460 (29.1)	9,890 (44.5)	7,475 (33.6)
	3 1/2 (88.9)		7,900 (35.6)	7,290 (32.8)	10,390 (46.8)	7,440 (33.5)	12,440 (56.0)	7,610 (34.2)
1/2 (12.7)	2 (50.8)	8 (203.2)	2,960 (13.3)	6,570 (29.6)	3,930 (17.7)	7,420 (33.4)	4,780 (21.5)	9,000 (40.5)
	2 1/2 (63.5)		4,100 (18.5)	7,420 (33.4)	5,200 (23.4)	7,980 (35.9)	6,480 (29.2)	9,260 (41.7)
	3 (76.2)		5,910 (26.6)	7,700 (34.7)	7,800 (35.1)	8,730 (39.3)	9,380 (42.2)	9,260 (41.7)
	3 1/2 (88.9)		6,060 (27.3)	8,650 (38.9)	8,480 (38.2)	9,080 (40.9)	11,890 (53.5)	9,430 (42.4)
	4 (101.6)		7,620 (34.3)	8,650 (38.9)	13,260 (59.7)	9,080 (40.9)	13,260 (59.7)	9,600 (43.2)
5/8 (15.9)	2 1/2 (63.5)	10 (254.0)	3,420 (15.4)	7,790 (35.1)	4,720 (21.2)	11,320 (50.9)	6,900 (31.1)	13,400 (60.3)
	3 (76.2)		4,560 (20.5)	10,075 (45.3)	7,380 (33.2)	12,740 (57.3)	8,960 (40.3)	13,620 (61.3)
	3 1/2 (88.9)		5,720 (25.7)	12,360 (55.6)	10,040 (45.2)	14,160 (63.7)	11,040 (49.7)	15,100 (68.0)
	4 (101.6)		8,280 (37.3)	13,700 (61.7)	12,760 (57.4)	15,400 (69.3)	14,320 (64.4)	15,920 (71.6)
	4 1/2 (114.3)		10,860 (48.9)	15,100 (68.0)	15,500 (69.8)	16,580 (74.6)	17,600 (79.2)	16,840 (75.8)
	5 (127.0)		13,440 (60.5)	16,480 (74.2)	18,220 (82.0)	17,750 (79.9)	20,860 (93.9)	17,750 (79.9)
3/4 (19.1)	3 (76.2)	12 (304.8)	4,320 (19.4)	12,270 (55.2)	6,480 (29.2)	15,500 (69.8)	10,260 (46.2)	18,770 (84.5)
	3 1/2 (88.9)		5,760 (25.9)	13,945 (62.8)	9,320 (41.9)	19,160 (86.2)	12,140 (54.6)	20,795 (93.6)
	4 (101.6)		7,200 (32.4)	15,620 (70.3)	12,140 (54.6)	22,820 (102.7)	14,020 (63.1)	22,820 (102.7)
	4 1/2 (114.3)		9,800 (44.1)	18,740 (84.3)	13,640 (61.4)	24,760 (111.4)	16,720 (75.2)	25,160 (113.2)
	5 (127.0)		12,400 (55.8)	21,840 (98.3)	15,120 (68.0)	26,700 (120.2)	19,400 (87.3)	27,500 (123.8)
	5 1/2 (139.7)		15,000 (67.5)	24,940 (112.2)	16,600 (74.7)	28,640 (128.9)	22,080 (99.4)	29,840 (134.3)
	6 (152.4)		17,570 (79.1)	28,030 (126.1)	18,080 (81.4)	30,550 (137.5)	24,760 (111.4)	32,180 (144.8)

1. Tabulated load values are applicable for carbon and stainless steel anchors.
2. 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.
3. Linear interpolation may be used to determine ultimate loads for intermediate embedments and compressive strengths.
4. Tabular loads are for anchors installed at a minimum spacing distance between anchors and an edge distance of 16 times the anchor diameter.

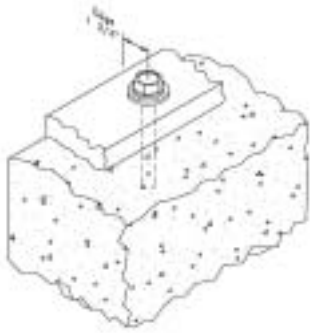
PERFORMANCE DATA

Allowable Load Capacities for Wedge-Bolt and Wedge-Bolt OT installed in Normal-Weight Concrete at 16 Diameters Spacing and Edge Distances[1,2,3,4,5]

Anchor Diameter d in. (mm)	Minimum Embed. Depth h_v in. (mm)	Spacing and Edge Distance at 16d 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 (25.4)	4 (101.6)	230 (1.0)	260 (1.2)	380 (1.7)	525 (2.4)	415 (1.9)	610 (2.7)
	1 1/2 (38.1)		440 (2.0)	645 (2.9)	590 (2.7)	695 (3.1)	620 (2.8)	675 (3.0)
	2 (50.8)		700 (3.2)	695 (3.1)	1,060 (4.8)	695 (3.1)	1,245 (5.6)	840 (3.8)
	2 1/2 (63.5)		1,055 (4.7)	770 (3.5)	1,225 (5.5)	770 (3.5)	1,315 (5.9)	915 (4.1)
3/8 (9.5)	1 1/2 (38.1)	6 (152.4)	535 (2.4)	900 (4.1)	665 (3.0)	1,220 (5.5)	760 (3.4)	1,835 (8.3)
	2 (50.8)		825 (3.7)	1,135 (5.1)	1,030 (4.6)	1,295 (5.8)	1,300 (5.9)	1,835 (8.3)
	2 1/2 (63.5)		1,115 (5.0)	1,370 (6.2)	1,390 (6.3)	1,370 (6.2)	1,835 (8.3)	1,835 (8.3)
	3 (76.2)		1,545 (7.0)	1,600 (7.2)	1,995 (9.0)	1,615 (7.3)	2,475 (11.1)	1,870 (8.4)
	3 1/2 (88.9)		1,975 (8.9)	1,825 (8.2)	2,600 (11.7)	1,860 (8.4)	3,110 (14.0)	1,905 (8.6)
1/2 (12.7)	2 (50.8)	8 (203.2)	740 (3.3)	1,645 (7.4)	985 (4.4)	1,855 (8.3)	1,195 (5.4)	2,250 (10.1)
	2 1/2 (63.5)		1,025 (4.6)	1,855 (8.3)	1,300 (5.9)	1,995 (9.0)	1,620 (7.3)	2,315 (10.4)
	3 (76.2)		1,480 (6.7)	1,925 (8.7)	1,950 (8.8)	2,185 (9.8)	2,345 (10.6)	2,315 (10.4)
	3 1/2 (88.9)		1,515 (6.8)	2,165 (9.7)	2,120 (9.5)	2,270 (10.2)	2,975 (13.4)	2,360 (10.6)
	4 (101.6)		1,905 (8.6)	2,165 (9.7)	3,315 (14.9)	2,270 (10.2)	3,315 (14.9)	2,400 (10.8)
5/8 (15.9)	2 1/2 (63.5)	10 (254.0)	855 (3.8)	1,950 (8.8)	1,180 (5.3)	2,830 (12.7)	1,725 (7.8)	3,350 (15.1)
	3 (76.2)		1,140 (5.1)	2,520 (11.3)	1,845 (8.3)	3,185 (14.3)	2,240 (10.1)	3,405 (15.3)
	3 1/2 (88.9)		1,430 (6.4)	3,090 (13.9)	2,510 (11.3)	3,540 (15.9)	2,760 (12.4)	3,775 (17.0)
	4 (101.6)		2,070 (9.3)	3,425 (15.4)	3,190 (14.4)	3,850 (17.3)	3,580 (16.1)	3,980 (17.9)
	4 1/2 (114.3)		2,715 (12.2)	3,775 (17.0)	3,875 (17.4)	4,145 (18.7)	4,400 (19.8)	4,210 (18.9)
	5 (127.0)		3,360 (15.1)	4,120 (18.5)	4,555 (20.5)	4,440 (20.0)	5,215 (23.5)	4,440 (20.0)
3/4 (19.1)	3 (76.2)	12 (304.8)	1,080 (4.9)	3,070 (13.8)	1,620 (7.3)	3,875 (17.4)	2,565 (11.5)	4,695 (21.1)
	3 1/2 (88.9)		1,440 (6.5)	3,490 (15.7)	2,330 (10.5)	4,790 (21.6)	3,035 (13.7)	5,200 (23.4)
	4 (101.6)		1,800 (8.1)	3,905 (17.6)	3,035 (13.7)	5,705 (25.7)	3,505 (15.8)	5,705 (25.7)
	4 1/2 (114.3)		2,450 (11.0)	4,685 (21.1)	3,410 (15.3)	6,190 (27.9)	4,180 (18.8)	6,290 (28.3)
	5 (127.0)		3,100 (14.0)	5,460 (24.5)	3,780 (17.0)	6,675 (30.0)	4,850 (21.8)	6,875 (30.9)
	5 1/2 (139.7)		3,750 (16.9)	6,235 (28.1)	4,150 (18.7)	7,160 (32.2)	5,520 (24.8)	7,460 (33.6)
	6 (152.4)		4,395 (19.8)	7,010 (31.5)	4,520 (20.3)	7,640 (34.4)	6,190 (27.9)	8,045 (36.2)

1. Tabulated load values are applicable for carbon and stainless steel anchors.
2. Allowable load capacities listed are calculated using an applied safety factor of 4.0.
3. Linear interpolation may be used to determine allowable loads for intermediate embedments and compressive strengths.
4. 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.
5. Tabular loads are for anchors installed at a minimum spacing distance between anchors and an edge distance of 16 times the anchor diameter.

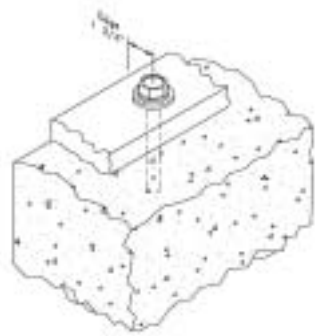
PERFORMANCE DATA



Ultimate and Allowable Shear Load Capacities for Wedge-Bolt and Wedge-Bolt OT at the Edge of Normal-Weight Concrete[1,2,3]

Anchor Diameter d in. (mm)	Minimum Embedment Depth h_v in. (mm)	Minimum Edge Distance in. (mm)	$f'_c \geq$ 2,000 psi (13.8 MPa) Parallel to the Free Edge	
			Ultimate Shear lbs. (kN)	Allowable Shear lbs. (kN)
1/2 (12.7)	3 3/8 (85.7)	1 3/4 (44.5)	5,020 (22.6)	1,255 (5.6)
5/8 (15.9)	3 3/8 (85.7)	1 3/4 (44.5)	5,420 (24.4)	1,355 (6.1)
3/4 (19.1)	3 3/8 (85.7)	1 3/4 (44.5)	5,660 (25.5)	1,415 (6.4)

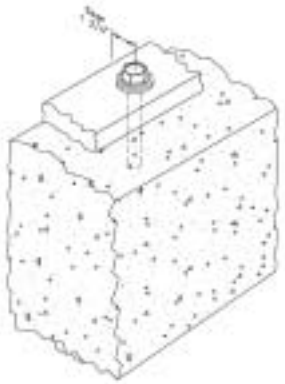
1. Tabulated load values are applicable to carbon steel and stainless steel anchors.
2. Allowable load capacities are calculated using an applied safety factor of 4.0.
3. Allowable loads for anchors to resist short-term loads such as earthquake or wind may be increased by 33-1/3 percent for the duration of the load where permitted by code.



Ultimate and Allowable Tension Load Capacities for Wedge-Bolt and Wedge-Bolt OT Installed at the Edge of Normal-Weight Concrete[1,2]

Anchor Dia. d in. (mm)	Min. Embed. Depth h_v in. (mm)	Min. Edge Distance in. (mm)	Minimum Concrete Compressive Strength (f'_c)					
			2,500 psi (17.2 MPa)		3,000 psi (20.7 MPa)		4,000 psi (27.6 MPa)	
			Ultimate lbs. (kN)	Allow. lbs. (kN)	Ultimate lbs. (kN)	Allow. lbs. (kN)	Ultimate lbs. (kN)	Allow. lbs. (kN)
5/8 (15.9)	8 (203.2)	1 3/4 (44.5)	15,630 (70.3)	3,910 (17.6)	16,630 (74.8)	4,160 (18.7)	18,150 (81.7)	4,540 (20.4)
	9 (228.6)		16,995 (76.5)	4,250 (19.1)	18,185 (81.8)	4,545 (20.5)	19,820 (89.2)	4,955 (22.3)
	10 (254.0)		18,360 (82.6)	4,590 (20.7)	19,740 (88.8)	4,935 (22.2)	21,490 (96.7)	5,375 (24.2)
	11 (279.4)		19,065 (85.8)	4,765 (21.4)	20,425 (91.9)	5,105 (23.0)	22,605 (101.7)	5,650 (25.4)
	12 (304.8)		19,775 (89.0)	4,945 (22.3)	21,105 (95.0)	5,275 (23.7)	23,715 (106.7)	5,930 (26.7)
	13 (330.2)		20,480 (92.2)	5,120 (23.0)	21,790 (98.1)	5,450 (24.5)	24,830 (111.7)	6,210 (27.9)

1. Allowable load capacities 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 strength.



Allowable Load Capacities for Wedge-Bolt and Wedge-Bolt OT installed in Normal-Weight Concrete Stem Walls[1,2,3,4]

Anchor Diameter d in. (mm)	Minimum Embedment Depth h_v in. (mm)	Minimum Edge Distance in. (mm)	$f'_c \geq$ 2,500 psi (17.2 MPa)		
			Tension lbs. (kN)	Parallel to the Free Edge Shear lbs. (kN)	Towards the Free Edge Shear lbs. (kN)
1/2 (12.7)	4 (101.6)	1 3/4 (44.5)	1,270 (5.7)	1,425 (6.4)	470 (2.1)
5/8 (15.9)	2 1/2 (63.5)	1 3/4 (44.5)	610 (2.7)	1,155 (5.2)	380 (1.7)
	3 3/4 (95.3)		1,310 (5.9)	1,330 (6.0)	490 (2.2)
	5 (127.0)		2,015 (9.1)	1,505 (6.8)	600 (2.7)

1. Tabulated load values are applicable to carbon steel and stainless steel anchors.
2. Allowable load capacities are calculated using an applied safety factor of 4.0.
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.
4. Allowable load capacities may also be applied to conditions at the edge of normal-weight concrete slabs.

PERFORMANCE DATA

Ultimate and Allowable Load Capacities for Wedge-Bolt and Wedge-Bolt OT installed in Structural Lightweight Concrete[1,2,3,4,5]

Anchor Diameter d in. (mm)	Minimum Embedment Depth h_v in. (mm)	Minimum Concrete Compressive Strength $f'_c \geq$ 3,000 psi (20.7 MPa)			
		Ultimate Load		Allowable Load	
		Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
1/4 (6.4)	2 (50.8)	3,320 (14.9)	3,000 (13.5)	830 (3.7)	750 (3.4)
3/8 (9.5)	1 1/2 (38.1)	2,220 (10.0)	2,200 (9.9)	555 (2.5)	550 (2.5)
	2 1/4 (57.2)	3,760 (16.9)	3,960 (17.8)	940 (4.2)	990 (4.5)
	3 (76.2)	5,280 (23.8)	5,700 (25.7)	1,320 (5.9)	1,425 (6.4)
1/2 (12.7)	2 (50.8)	2,920 (13.1)	6,180 (27.8)	730 (3.3)	1,545 (7.0)
	3 (76.2)	5,320 (23.9)	8,420 (37.9)	1,330 (6.0)	2,105 (9.5)
	4 (101.6)	7,720 (34.7)	10,660 (48.0)	1,930 (8.7)	2,665 (12.0)
5/8 (15.9)	2 1/2 (63.5)	3,720 (16.7)	9,240 (41.6)	930 (4.2)	2,310 (10.4)
	3 3/4 (95.3)	7,940 (35.7)	14,440 (65.0)	1,985 (8.9)	3,610 (16.2)
	5 (127.0)	12,160 (54.7)	19,640 (88.4)	3,040 (13.7)	4,910 (22.1)
3/4 (19.1)	5 1/4 (133.4)	13,320 (59.9)	22,520 (101.3)	3,330 (15.0)	5,630 (25.3)

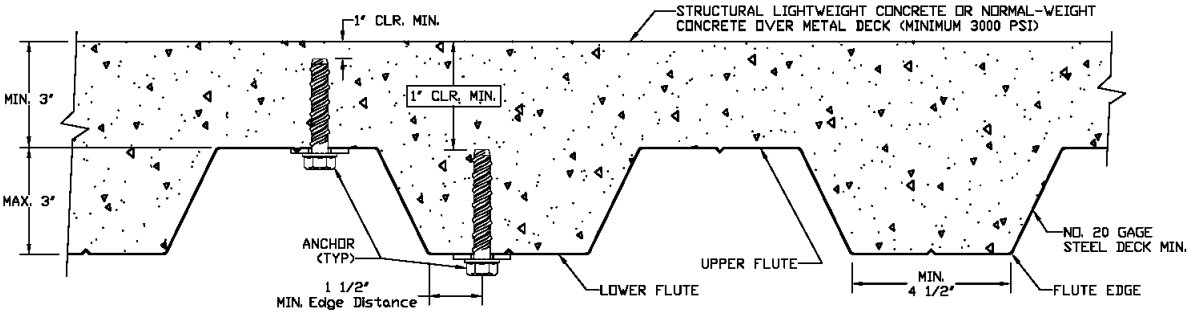
1. The values listed above are ultimate and allowable load capacities for anchors installed in sand-lightweight concrete.
2. Allowable load capacities are calculated using an applied safety factor of 4.0.
3. Critical and minimum spacing and edge distances as well as reduction factors for intermediate spacing and edge distances are listed in the Design Criteria section.
4. Linear interpolation for allowable loads for anchors at intermediate embedment depths may also be used.
5. 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.

PERFORMANCE DATA

Ultimate and Allowable Load Capacities for Wedge-Bolt and Wedge-Bolt OT Installed Through Metal Deck into Structural Lightweight Concrete[1,2,3,4,5]

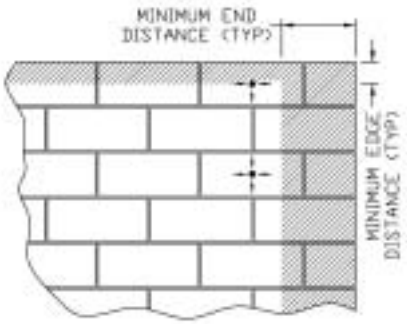
Anchor Diameter d in. (mm)	Minimum Embedment Depth h_v in. (mm)	Lightweight Concrete Over Minimum 20 Gage Metal Deck $f'_c \geq$ 3,000 psi (20.7 MPa)			
		Minimum 4 1/2" Wide Deck			
		Ultimate Load		Allowable Load	
		Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
1/4 (6.4)	2 (50.8)	2,660 (12.0)	3,600 (16.2)	665 (3.0)	900 (4.1)
3/8 (9.5)	1 1/2 (38.1)	1,780 (8.0)	3,380 (15.2)	445 (2.0)	845 (3.8)
	2 1/4 (57.2)	3,160 (14.2)	4,320 (19.4)	790 (3.6)	1,080 (4.9)
	3 (76.2)	4,520 (20.3)	5,240 (23.6)	1,130 (5.1)	1,310 (5.9)
1/2 (12.7)	2 (50.8)	2,940 (13.2)	4,380 (19.7)	735 (3.3)	1,095 (4.9)
	3 (76.2)	4,380 (19.7)	6,300 (28.4)	1,095 (4.9)	1,575 (7.1)
	4 (101.6)	5,820 (26.2)	8,220 (37.0)	1,455 (6.5)	2,055 (9.2)
5/8 (15.9)	2 1/2 (63.5)	3,100 (14.0)	5,020 (22.6)	775 (3.5)	1,255 (5.6)
	3 3/4 (95.3)	5,420 (24.4)	7,640 (34.4)	1,355 (6.1)	1,910 (8.6)
	5 (127.0)	7,740 (34.8)	10,260 (46.2)	1,935 (8.7)	2,565 (11.5)
3/4 (19.1)	5 1/4 (133.4)	9,700 (43.7)	11,540 (51.9)	2,425 (10.9)	2,885 (13.0)

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. Spacing distances shall be in accordance with the spacing table for lightweight concrete listed in the Design Criteria.
4. Anchors are permitted to be installed in the lower or upper flute of the metal deck provided the proper installed procedures are maintained.
5. 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.



PERFORMANCE DATA

Allowable Load Capacities for Wedge-Bolt and Wedge-Bolt OT Anchors Installed in Grout-Filled Concrete Masonry[1,2,3,4,5,6]

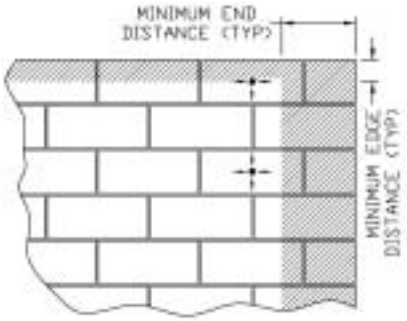


Face Shell
(Grouted Cell)
Permissible Anchor Locations
(Unshaded Area)

Anchor Installed Through Face Shell Into Grouted Cell					
Rod Diameter *d* in. (mm)	Minimum Embed. Depth h_v in. (mm)	Minimum Edge Distance in. (mm)	Minimum End Distance in. (mm)	Tension lbs. (kN)	Shear lbs. (kN)
1/4 (6.4)	1 (25.4)	3 3/4 (95.3)	3 3/4 (95.3)	80 (0.4)	150 (0.7)
	2 (50.8)			340 (1.5)	340 (1.5)
3/8 (9.5)	1 1/2 (38.1)	2 (50.8)	–	210 (0.9)	340 (1.5)
	1 1/2 (38.1)	3 3/4 (95.3)	12 (304.8)	210 (0.9)	400 (1.8)
	2 1/2 (63.5)	2 (50.8)	–	670 (3.0)	340 (1.5)
	2 1/2 (63.5)	7 7/8 (200.0)	12 (304.8)	750 (3.4)	755 (3.4)
	3 1/2 (88.9)	12 (304.8)		1,290 (5.8)	1,110 (5.0)
1/2 (12.7)	2 (50.8)	3 3/4 (95.3)	12 (304.8)	335 (1.5)	720 (3.2)
	3 (76.2)	7 7/8 (200.0)		930 (4.2)	985 (4.4)
	4 (101.6)	12 (304.8)		1,525 (6.9)	1,245 (5.6)
5/8 (15.9)	2 1/2 (63.5)	3 3/4 (95.3)	12 (304.8)	455 (2.0)	1,320 (5.9)
	3 1/4 (82.6)	7 7/8 (200.0)		885 (4.0)	1,500 (6.8)
	4 (101.6)	12 (304.8)		1,310 (5.9)	1,500 (6.8)
	5 (127.0)			1,940 (8.7)	1,680 (7.6)
3/4 (19.1)	3 (76.2)	3 3/4 (95.3)	12 (304.8)	615 (2.8)	750 (3.4)
		12 (304.8)		615 (2.8)	1,320 (5.9)
	3 1/2 (88.9)	7 7/8 (200.0)		1,035 (4.7)	1,265 (5.7)
	4 (101.6)	12 (304.8)		1,455 (6.5)	1,780 (8.0)
	5 (127.0)			1,680 (7.6)	2,240 (10.1)

1. Tabulated load values are for carbon and stainless steel anchors installed in minimum 6" wide, Grade N, Type II, lightweight, medium-weight 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 ($f'_m \geq 1{,}500$ psi).
2. Allowable load capacities listed are calculated using an applied safety factor of 5.0.
3. Tabulated load values are applicable for screw anchors installed at a critical spacing between screw anchors of 16 times the screw anchor diameter. Reduce the tabulated load capacities by 50 percent when anchors are installed at minimum spacing between anchors of 8 times the screw anchor diameter. Linear interpolation may be used for intermediate spacing distances.
4. Linear interpolation for allowable loads for anchors at intermediate embedment depths may be used.
5. Allowable shear loads for 1/4" and 3/8" diameter anchor installations into the face shell of a masonry wall may be applied in any direction. Allowable shear loads for anchor diameters 1/2" and greater installed into the face shell may be applied in any direction provided the location is a minimum of 12" from the edge and end of the wall. For anchors diameters 1/2" and greater installed with an edge distance less than 12" the allowable shear loads may be applied in any direction except upward vertically.
6. 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.

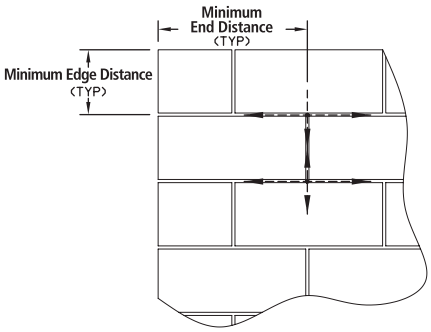
PERFORMANCE DATA



Face Shell
(Cell Web)
Permissible Anchor Locations
(Unshaded Area)

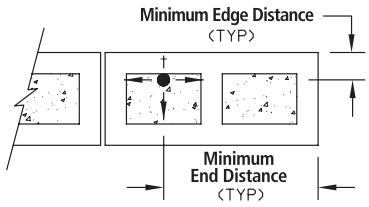
Allowable Load Capacities for Wedge-Bolt and Wedge-Bolt OT Anchors Installed in Grout-Filled Concrete Masonry[1,2,3,4,5,6,7,8]

Anchor Installed Through Face Shell Into Cell Web				
Rod Diameter *d* in. (mm)	Minimum Embed. Depth h_v in. (mm)	Minimum Edge Distance in. (mm)	Minimum End Distance in. (mm)	Tension lbs. (kN)
3/8 (9.5)	3 1/2 (25.4)	16 (406.4)	16 (406.4)	870 (3.9)
1/2 (12.7)	4 (101.6)			1,110 (5.0)
5/8 (15.9)	4 (101.6)			1,205 (5.4)
3/4 (19.1)	4 (101.6)			1,310 (5.9)



T-Joints
Permissible Anchor Locations

Anchor Installed In Joint					
Rod Diameter *d* in. (mm)	Minimum Embed. Depth h_v in. (mm)	Minimum Edge Distance in. (mm)	Minimum End Distance in. (mm)	Tension lbs. (kN)	Shear lbs. (kN)
3/8 (9.5)	1 1/2 (38.1)	16 (406.4)	16 (406.4)	–	510 (2.3)
	3 1/2 (88.9)			830 (3.7)	
1/2 (12.7)	4 (101.6)			1,090 (4.9)	
5/8 (15.9)	4 (101.6)			840 (3.8)	1,225 (5.5)
3/4 (19.1)	2 1/2 (63.5)			–	
	4 (101.6)			890 (4.0)	

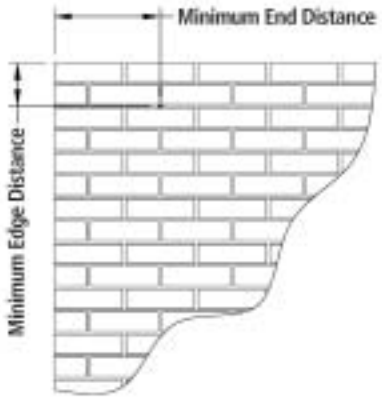


Top of Wall

Anchor Installed in Cell Opening (Top of Wall)				
Rod Diameter *d* in. (mm)	Minimum Embed. Depth h_v in. (mm)	Minimum Edge Distance in. (mm)	Tension lbs. (kN)	Shear lbs. (kN)
3/8 (9.5)	1 1/2 (38.1)	2 (50.8)	–	350 (1.6)
	2 1/2 (63.5)		570 (2.5)	380 (1.7)

1. Tabulated load values are for carbon and stainless steel anchors installed in minimum 6" wide, Grade N, Type II, lightweight, medium-weight 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 ($f'm \geq 1{,}500$ psi).
2. Allowable load capacities listed are calculated using an applied safety factor of 5.0.
3. Tabulated load values are applicable for screw anchors installed at a critical spacing between screw anchors of 16 times the screw anchor diameter. Reduce the tabulated load capacities by 50 percent when anchors are installed at minimum spacing between anchors of 8 times the screw anchor diameter. Linear interpolation may be used for intermediate spacing distances.
4. Linear interpolation for allowable loads for anchors at intermediate embedment depths may be used.
5. Allowable shear loads for anchor installations into the cell web may be applied in any direction.
6. Allowable shear loads for anchor installation into the horizontal and vertical mortar joints may be applied in any direction provided the anchor location is a minimum of 16" from the edge and end of the wall. For anchor installations with an edge distance less than 16" the allowable shear loads may be applied in any direction except upward vertically.
7. Allowable tension load values for anchors installed into horizontal mortar (bed) joint locations may be increased by 35 percent.
8. 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.

PERFORMANCE DATA



Ultimate and Allowable Load Capacities for Wedge-Bolt and Wedge-Bolt OT Anchors Installed in Multiple Wythe Brick Masonry[1,2,3]

Anchor Diameter d in. (mm)	Minimum Embed. Depth h_v in. (mm)	Minimum Edge and End Distance in. (mm)	Minimum Spacing Distance	Structural Brick Masonry $f'_m \geq$ 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)	2 1/2 (63.5)	4 (101.6)	4" Any Direction	2,280 (10.3)	1,480 (6.7)	455 (2.0)	295 (1.3)
3/8 (9.5)	3 1/2 (88.9)	6 (152.4)	6" Any Direction	3,390 (15.3)	3,830 (17.2)	680 (3.1)	765 (3.4)
1/2 (12.7)	4 (101.6)	8 (101.6)	8" Any Direction	4,800 (21.6)	7,060 (31.8)	960 (4.3)	1,410 (6.3)
5/8 (15.9)	4 (101.6)	10 (254.0)	12" Any Direction	6,120 (27.5)	11,250 (50.6)	1,225 (5.5)	2,250 (10.1)
3/4 (19.1)	4 (101.6)	12 (304.8)	2 Bricks or 16" Any Direction (whichever is less)	6,580 (29.6)	12,340 (55.5)	1,315 (5.9)	2,470 (11.1)

1. Tabulated load values are applicable to carbon steel and stainless steel anchors.
2. Tabulated load values are for anchors installed in minimum Grade SW multiple wythe, solid brick masonry conforming to ASTM C62.
3. Allowable loads are calculated using an applied safety factor of 5.0.

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 (s)	Tension	$s_{cr} = 12d$	$F_N = 1.0$	$s_{min} = 4d$	$F_N = 0.50$
	Shear	$s_{cr} = 12d$	$F_V = 1.0$	$s_{min} = 4d$	$F_V = 0.75$
Edge Distance (c)	Tension	$c_{cr} = 8d$	$F_N = 1.0$	$c_{min} = 3d$	$F_N = 0.70$
	Shear	$c_{cr} = 12d$	$F_V = 1.0$	$c_{min} = 3d$	$F_V = 0.15$

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 (s)	Tension	$s_{cr} = 14.1d$	$F_N = 1.0$	$s_{min} = 4.7d$	$F_N = 0.50$
	Shear	$s_{cr} = 14.1d$	$F_V = 1.0$	$s_{min} = 4.7d$	$F_V = 0.75$
Edge Distance (c)	Tension	$c_{cr} = 9.4d$	$F_N = 1.0$	$c_{min} = 3.5d$	$F_N = 0.70$
	Shear	$c_{cr} = 14.1d$	$F_V = 1.0$	$c_{min} = 3.5d$	$F_V = 0.15$

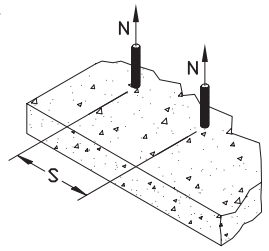
DESIGN CRITERIA

Load Adjustment Factors for Normal-Weight Concrete

Spacing, Tension (F_N)						
Dia. (in.)		1/4	3/8	1/2	5/8	3/4
s_{cr} (in.)		3	4 1/2	6	7 1/2	9
s_{min} (in.)		1	1 1/2	2	2 1/2	3
Spacing, s (inches)	1	0.50				
	1 1/2	0.63	0.50			
	2	0.75	0.58	0.50		
	2 1/2	0.88	0.67	0.56	0.50	
	3	1.00	0.75	0.63	0.55	0.50
	4 1/2		1.00	0.81	0.70	0.63
	6			1.00	0.85	0.75
	7 1/2				1.00	0.88
	9					1.00

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

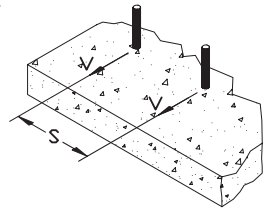
Minimum spacing (s_{min}) is equal to 4 anchor diameters (4d) at which the anchor achieves 50% of load.



Spacing, Shear (F_V)						
Dia. (in.)		1/4	3/8	1/2	5/8	3/4
s_{cr} (in.)		3	4 1/2	6	7 1/2	9
s_{min} (in.)		1	1 1/2	2	2 1/2	3
Spacing, s (inches)	1	0.75				
	1 1/2	0.81	0.75			
	2	0.88	0.79	0.75		
	2 1/2	0.94	0.83	0.78	0.75	
	3	1.00	0.88	0.81	0.78	0.75
	4 1/2		1.00	0.91	0.85	0.81
	6			1.00	0.93	0.88
	7 1/2				1.00	0.94
	9					1.00

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

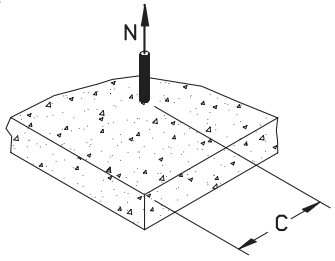
Minimum spacing (s_{min}) is equal to 4 anchor diameters (4d) at which the anchor achieves 75% of load.



Edge Distance, Tension (F_N)						
Dia. (in.)		1/4	3/8	1/2	5/8	3/4
c_{cr} (in.)		2	3	4	5	6
c_{min} (in.)		3/4	1 1/8	1 1/2	1 7/8	2 1/4
Edge Distance, c (in.)	3/4	0.70				
	1 1/8	0.79	0.70			
	1 1/2	0.88	0.76	0.70		
	1 7/8	0.97	0.82	0.75	0.70	
	2	1.00	0.84	0.76	0.71	
	2 1/4		0.88	0.79	0.74	0.70
	3		1.00	0.88	0.81	0.76
	4			1.00	0.90	0.84
	5				1.00	0.92
	6					1.00

Notes: For anchors loaded in tension, the critical edge distance (c_{cr}) is equal to 8 anchor diameters (8d) at which the anchor achieves 100% of load.

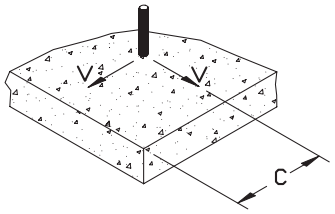
Minimum edge distance (c_{min}) is equal to 3 anchor diameters (3d) at which the anchor achieves 70% of load.



Edge Distance, Shear (F_V)						
Dia. (in.)		1/4	3/8	1/2	5/8	3/4
c_{cr} (in.)		3	4 1/2	6	7 1/2	9
c_{min} (in.)		3/4	1 1/8	1 1/2	1 7/8	2 1/4
Edge Distance, c (in.)	3/4	0.15				
	1 1/8	0.29	0.15			
	1 1/2	0.43	0.24	0.15		
	1 7/8	0.58	0.34	0.22	0.15	
	2 1/4	0.72	0.43	0.29	0.21	0.15
	3	1.00	0.62	0.43	0.32	0.24
	4 1/2		1.00	0.72	0.55	0.43
	6			1.00	0.77	0.62
	7 1/2				1.00	0.81
	9					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 3 anchor diameters (3d) at which the anchor achieves 15% of load



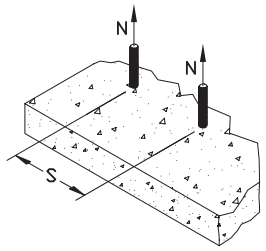
DESIGN CRITERIA

Load Adjustment Factors for Lightweight Concrete

Spacing, Tension (F_N)						
Dia. (in.)		1/4	3/8	1/2	5/8	3/4
s_{cr} (in.)		3 1/2	5 1/4	7	8 7/8	10 1/2
s_{min} (in.)		1 1/4	1 3/4	2 3/8	3	3 1/2
Spacing, s (inches)	1 1/4	0.50				
	1 3/4	0.61	0.50			
	2 3/8	0.75	0.59	0.50		
	3	0.89	0.67	0.57	0.50	
	3 1/2	1.00	0.74	0.62	0.54	0.50
	5 1/4		1.00	0.82	0.70	0.63
	7			1.00	0.84	0.75
	8 7/8				1.00	0.88
	10 1/2					1.00

Notes: For anchors loaded in tension, the critical spacing (s_{cr}) is equal to 14.1 anchor diameters (14.1d) at which the anchor achieves 100% of load.

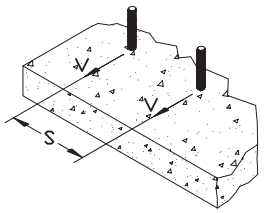
Minimum spacing (s_{min}) is equal to 4.7 anchor diameters (4.7d) at which the anchor achieves 50% of load.



Spacing, Shear (F_V)						
Dia. (in.)		1/4	3/8	1/2	5/8	3/4
s_{cr} (in.)		3 1/2	5 1/4	7	8 7/8	10 1/2
s_{min} (in.)		1 1/4	1 3/4	2 3/8	3	3 1/2
Spacing, s (inches)	1 1/4	0.75				
	1 3/4	0.81	0.75			
	2 3/8	0.88	0.79	0.75		
	3	0.94	0.84	0.78	0.75	
	3 1/2	1.00	0.87	0.81	0.77	0.75
	5 1/4		1.00	0.91	0.85	0.82
	7			1.00	0.92	0.88
	8 7/8				1.00	0.94
	10 1/2					1.00

Notes: For anchors loaded in shear, the critical spacing (s_{cr}) is equal to 14.1 anchor diameters (14.1d) at which the anchor achieves 100% of load.

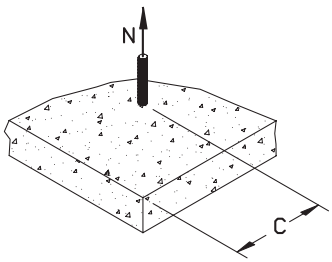
Minimum spacing (s_{min}) is equal to 4.7 anchor diameters (4.7d) at which the anchor achieves 75% of load.



Edge Distance, Tension (F_N)						
Dia. (in.)		1/4	3/8	1/2	5/8	3/4
c_{cr} (in.)		2 3/8	3 1/2	4 3/4	5 7/8	7
c_{min} (in.)		7/8	1 3/8	1 3/4	2 1/4	2 5/8
Edge Distance, c (in.)	7/8	0.70				
	1 3/8	0.80	0.70			
	1 3/4	0.88	0.76	0.70		
	2 1/4	0.98	0.83	0.75	0.70	
	2 3/8	1.00	0.84	0.76	0.72	
	2 5/8		0.88	0.79	0.74	0.70
	3 1/2		1.00	0.88	0.81	0.76
	4 3/4			1.00	0.91	0.84
	5 7/8				1.00	0.92
	7					1.00

Notes: For anchors loaded in tension, the critical edge distance (c_{cr}) is equal to 9.4 anchor diameters (9.4d) at which the anchor achieves 100% of load.

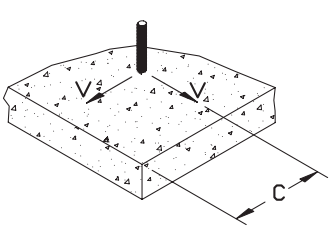
Minimum edge distance (c_{min}) is equal to 3.5 anchor diameters (3.5d) at which the anchor achieves 70% of load.



Edge Distance, Shear (F_V)						
Dia. (in.)		1/4	3/8	1/2	5/8	3/4
c_{cr} (in.)		3 1/2	5 1/4	7	8 7/8	10 1/2
c_{min} (in.)		7/8	1 3/8	1 3/4	2 1/4	2 5/8
Edge Distance, c (in.)	7/8	0.15				
	1 3/8	0.31	0.15			
	1 3/4	0.43	0.24	0.15		
	2 1/4	0.59	0.35	0.23	0.15	
	2 5/8	1.00	0.43	0.29	0.21	
	3 1/2		0.62	0.43	0.32	0.15
	5 1/4		1.00	0.71	0.54	0.43
	7			1.00	0.77	0.62
	8 7/8				1.00	0.82
	10 1/2					1.00

Notes: For anchors loaded in shear, the critical edge distance (c_{cr}) is equal to 14.1 anchor diameters (14.1d) at which the anchor achieves 100% of load.

Minimum edge distance (c_{min}) is equal to 3.5 anchor diameters (3.5d) at which the anchor achieves 15% of load



ORDERING INFORMATION

Carbon Steel Wedge-Bolt

Catalog Number	Size	Wedge Bit Diameter	Clearance Hole Diameter	Minimum Embedment	Thread Length	Standard Box	Standard Carton
7204	1/4" x 1 1/4"	1/4"	5/16"	1"	1 1/8"	100	500
7206	1/4" x 1 3/4"	1/4"	5/16"	1"	1 5/8"	100	500
7208	1/4" x 2 1/4"	1/4"	5/16"	1"	2"	100	500
7210	1/4" x 3"	1/4"	5/16"	1"	2 3/4"	100	500
7220	3/8" x 1 3/4"	3/8"	7/16"	1 1/2"	1 1/2"	50	250
7222	3/8" x 2 1/2"	3/8"	7/16"	1 1/2"	2 1/4"	50	250
7224	3/8" x 3"	3/8"	7/16"	1 1/2"	2 3/4"	50	250
7226	3/8" x 4"	3/8"	7/16"	1 1/2"	3 3/4"	50	250
NEW! 7228	3/8" x 5"	3/8"	7/16"	1 1/2"	3 3/4"	50	250
NEW! 7230	3/8" x 6"	3/8"	7/16"	1 1/2"	3 3/4"	50	150
7240	1/2" x 2"	1/2"	9/16"	1 3/4"	2 1/4"	50	200
7242	1/2" x 2 1/2"	1/2"	9/16"	1 3/4"	2 3/4"	50	200
7244	1/2" x 3"	1/2"	9/16"	1 3/4"	2 3/4"	50	150
7246	1/2" x 4"	1/2"	9/16"	1 3/4"	3 3/4"	50	150
7248	1/2" x 5"	1/2"	9/16"	1 3/4"	3 3/4"	25	100
7250	1/2" x 6"	1/2"	9/16"	1 3/4"	3 3/4"	25	75
7260	5/8" x 3"	5/8"	11/16"	2 1/2"	2 3/4"	25	100
7262	5/8" x 4"	5/8"	11/16"	2 1/2"	3 3/4"	25	100
7264	5/8" x 5"	5/8"	11/16"	2 1/2"	3 3/4"	25	75
7266	5/8" x 6"	5/8"	11/16"	2 1/2"	3 3/4"	25	75
NEW! 7270	5/8" x 10"	5/8"	1 1/16"	2 1/2"	6"	25	75
NEW! 7272	5/8" x 12"	5/8"	1 1/16"	2 1/2"	6"	25	75
NEW! 7274	5/8" x 14"	5/8"	1 1/16"	2 1/2"	6"	25	–
7280	3/4" x 3"	3/4"	13/16"	2 1/2"	2 3/4"	20	60
7282	3/4" x 4"	3/4"	13/16"	3"	3 3/4"	20	60
7284	3/4" x 5"	3/4"	13/16"	3"	3 3/4"	20	60
7286	3/4" x 6"	3/4"	13/16"	3"	3 3/4"	20	60
7288	3/4" x 8"	3/4"	13/16"	3"	3 3/4"	10	40



Installation is recommended with the use of a Wedge-Bit.

410 Stainless Steel Wedge-Bolt

Catalog Number	Size	Wedge Bit Diameter	Clearance Hole Diameter	Minimum Embedment	Thread Length	Standard Box	Standard Carton
7701	1/4" x 1 3/4"	1/4"	5/16"	1"	1 5/8"	100	500
7705	3/8" x 2 1/2"	3/8"	7/16"	1 1/2"	2 1/4"	50	250
7706	3/8" x 3"	3/8"	7/16"	1 1/2"	2 3/4"	50	250
7710	1/2" x 3"	1/2"	9/16"	1 3/4"	2 3/4"	50	150
7711	1/2" x 4"	1/2"	9/16"	1 3/4"	3 3/4"	50	150
7715	5/8" x 4"	5/8"	11/16"	2 1/2"	3 3/4"	25	100
7722	3/4" x 6"	3/4"	13/16"	3"	3 3/4"	20	60



Installation is recommended with the use of a Wedge-Bit.

Carbon Steel Wedge-Bolt OT

Catalog Number	Size	Drill Bit Diameter	Clearance Hole Diameter	Minimum Embedment	Thread Length	Standard Box	Standard Carton
7215	1/4" x 3"	1/4"	3/8"	1"	2 3/4"	100	500
7216	3/8" x 4"	3/8"	1/2"	1 1/2"	3 3/4"	50	250
7217	1/2" x 4"	1/2"	5/8"	1 3/4"	3 3/4"	50	150
7218	1/2" x 5"	1/2"	5/8"	1 3/4"	3 3/4"	25	100
NEW! 7214	1/2" x 6"	1/2"	5/8"	1 3/4"	3 3/4"	25	75
7219	5/8" x 4"	5/8"	3/4"	2 1/2"	3 3/4"	25	100
7221	5/8" x 5"	5/8"	3/4"	2 1/2"	3 3/4"	25	75
NEW! 7227	5/8" x 6"	5/8"	3/4"	2 1/2"	3 3/4"	25	75
NEW! 7229	5/8" x 7"	5/8"	3/4"	2 1/2"	3 3/4"	25	40



Installation is recommended with the use of an ANSI bit.

ORDERING INFORMATION

SDS-Plus Wedge-Bit

Catalog Number	Size	Usable Length Inches	Overall Length Inches	Standard Pouch
1312	1/4" SDS-Plus Wedge-Bit	2	4	1
1314	1/4" SDS-Plus Wedge-Bit	4	6	1
1316	3/8" SDS-Plus Wedge-Bit	4	6	1
1318	3/8" SDS-Plus Wedge-Bit	6	8	1
1332	3/8" SDS-Plus Wedge-Bit	10	12	1
1320	1/2" SDS-Plus Wedge-Bit	4	6	1
1322	1/2" SDS-Plus Wedge-Bit	8	10	1
1334	1/2" SDS-Plus Wedge-Bit	10	12	1
1324	5/8" SDS-Plus Wedge-Bit	6	8	1
1326	5/8" SDS-Plus Wedge-Bit	10	12	1
1336	5/8" SDS-Plus Wedge-Bit	16	18	1
1328	3/4" SDS-Plus Wedge-Bit	6	8	1
1330	3/4" SDS-Plus Wedge-Bit	10	12	1



Heavy Duty Straight Shank Wedge-Bit

Catalog Number	Size	Usable Length Inches	Overall Length Inches	Standard Pouch
1370	1/4" Heavy Duty Straight Shank	2 3/4	4	1
1372	1/4" Heavy Duty Straight Shank	4	6	1
1380	3/8" Heavy Duty Straight Shank	4	6	1
1384	3/8" Heavy Duty Straight Shank	11	13	1
1390	1/2" Heavy Duty Straight Shank	4	6	1
1394	1/2" Heavy Duty Straight Shank	11	13	1
1396	5/8" Heavy Duty Straight Shank	11	13	1
1397	3/4" Heavy Duty Straight Shank	11	13	1



Spline Wedge-Bit

Catalog Number	Size	Usable Length Inches	Overall Length Inches	Standard Pouch
1340	1/2" Spline Wedge-Bit	8	13	1
1342	1/2" Spline Wedge-Bit	11	16	1
1344	5/8" Spline Wedge-Bit	8	13	1
1348	3/4" Spline Wedge-Bit	8	13	1



SDS-Max Wedge-Bit

Catalog Number	Size	Usable Length Inches	Overall Length Inches	Standard Pouch
1354	1/2" SDS-Max Wedge-Bit	8	13	1
1356	5/8" SDS-Max Wedge-Bit	8	13	1
101293	5/8" SDS-Max Wedge-Bit	16	21	1
1358	3/4" SDS-Max Wedge-Bit	8	13	1



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