

**GENERAL INFORMATION**

**POWER-BOLT®**

Heavy-Duty Sleeve Anchor

**PRODUCT DESCRIPTION**

The Power-Bolt anchor, is a heavy duty sleeve style, self-locking anchor which is vibration resistant and removable. It is available with a finished hex head or flat head with a hex key insert and can be used in concrete, block, brick, or stone.

Expansion occurs at two locations within the drilled hole. First, the cone is pulled into the large triple-tined expansion sleeve, developing a mid-level, compression force. Further turning causes the threaded bolt to advance into the threads of the expander cone, forcing its four sections outward. This action engages the base material deep in the anchor hole. The bolt and cone remain locked together which resists loosening under vibratory conditions.

The Power-Bolt is also designed to draw the fixture into full bearing against the base material through the action of its flexible compression ring. As the anchor is being tightened, the compression ring will crush if necessary to tightly secure the fixture against the face of the base material.

The internal bolt of the Power-Bolt is removable and reusable in the same anchor sleeve making it suitable for applications such as mounting machinery which may need to be removed for service and for temporary applications such as heavy duty form work.

**GENERAL APPLICATIONS AND USES**

- Column Base Plates and Mechanical Equipment
- Dock Bumpers and Support Ledgers
- Racking and Railing Attachments

**FEATURE AND BENEFITS**

- + High load capacity
- + Two-level expansion mechanism
- + Internal high strength bolt is removable and reusable
- + Compression zone in sleeve clamps fixture to the base material
- + Low profile finished head design

**APPROVALS AND LISTINGS**

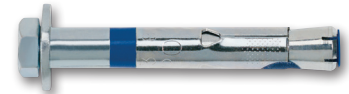
- Tested in accordance with ASTM E488

**GUIDE SPECIFICATIONS**

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

**SECTION CONTENTS**

General Information..... 1  
 Material Specifications .....2  
 Installation Specifications .....2  
 Performance Data.....3  
 Design Criteria (Allowable Stress Design)..... 6  
 Ordering Information..... 9



HEX HEAD POWER-BOLT ASSEMBLY



FLAT HEAD POWER-BOLT ASSEMBLY

**HEAD STYLES**

- Finished Hex Head
- Flat Head

**ANCHOR MATERIALS**

- Type 304 Stainless Steel (Hex Head)
- Zinc Plated Carbon Steel (Flat Head)

**ANCHOR SIZE RANGE (TYP.)**

- 1/4" diameter through 5/8" diameter

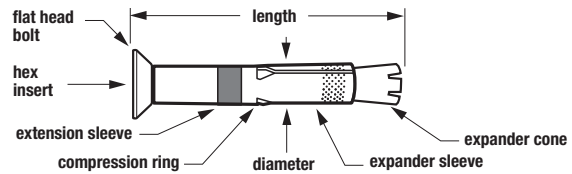
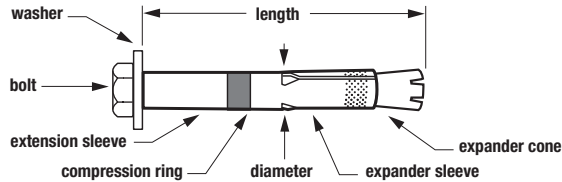
**SUITABLE BASE MATERIALS**

- Normal-weight concrete
- Lightweight concrete
- Grouted Concrete Masonry (CMU)
- Hollow CMU
- Brick Masonry
- Stone

**MATERIAL SPECIFICATIONS**

| Anchor Component | Carbon Steel Flat Head                                       | Stainless Steel Hex Head |
|------------------|--|--------------------------|
| Internal Bolt    | SAE Grade 5  | **Type 304 SS            |
| Washer           | Carbon Steel   | Type 18-8 SS             |
| Expander Sleeve  | AISI 1010  | Type 304 SS              |
| Extension Sleeve | AISI 1010  | Type 304 SS              |
| Expander Cone    | AISI 12L14   | Type 303 SS              |
| Compression Ring | Nylon  | Nylon                    |
| Dust Cap         | Nylon  | Nylon                    |
| Zinc Plating     | ASTM B 633, SC1, Type III (Fe/Zn 5) – Mild Service Condition | N/A                      |

\*\* Manufactured with a minimum yield strength of 65,000 psi. Stainless steel anchor components are passivated. The stainless steel expander cone is zinc plated.



**INSTALLATION SPECIFICATIONS**

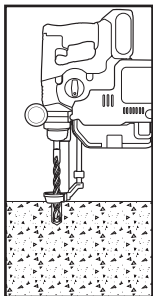
**Carbon Steel Flat Head Power-Bolt (80°– 82° head)**

| Dimension                            | Anchor Diameter, d |        |        |
|--------------------------------------|--------------------|--------|--------|
|                                      | 3/8"               | 1/2"   | 5/8"   |
| ANSI Drill Bit Size, $d_{bit}$ (in.) | 3/8                | 1/2    | 5/8    |
| Fixture Clearance Hole, $d_h$ (in.)  | 7/16               | 9/16   | 11/16  |
| Internal Bolt Size (UNC)             | 5/16-18            | 3/8-16 | 1/2-13 |
| Head Height (in.)                    | 15/64              | 1/4    | 21/64  |
| Head Diameter, $d_{hd}$ (in.)        | 3/4                | 7/8    | 1-1/8  |
| Allen Wrench Size (in.)              | 7/32               | 5/16   | 3/8    |
| Max Bolt Torque, $T_{max}$ (ft-lbs)  | 25                 | 45     | 100    |

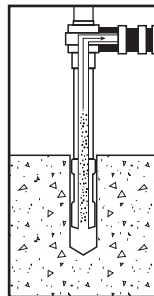
**Stainless Steel Hex Head Power-Bolt**

| Dimension                            | Anchor Diameter, d |         |        |
|--------------------------------------|--------------------|---------|--------|
|                                      | 1/4"               | 3/8"    | 1/2"   |
| ANSI Drill Bit Size, $d_{bit}$ (in.) | 1/4                | 3/8     | 1/2    |
| Fixture Clearance Hole, $d_h$ (in.)  | 5/16               | 7/16    | 9/16   |
| Internal Bolt Size (UNC)             | 10-24              | 5/16-18 | 3/8-16 |
| Head Height (in.)                    | 7/64               | 13/64   | 15/64  |
| Washer O.D., $d_w$ (in.)             | 1/2                | 13/16   | 1      |
| Wrench Size (in.)                    | 5/16               | 1/2     | 9/16   |
| Max Bolt Torque, $T_{max}$ (ft-lbs)  | 3                  | 12      | 25     |

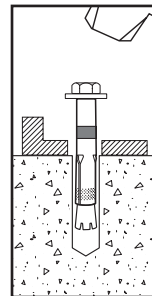
**Installation Procedure**



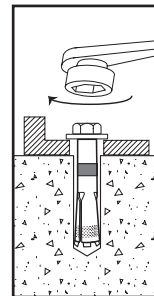
Using the proper diameter bit, drill a hole into the base material to a depth of at least 1/2" or one anchor diameter deeper than the embedment required. The tolerances of the drill bit used must meet the requirements of ANSI Standard B212.15.



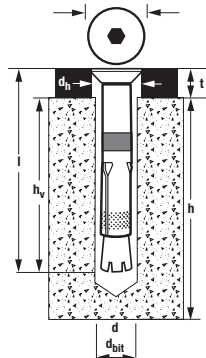
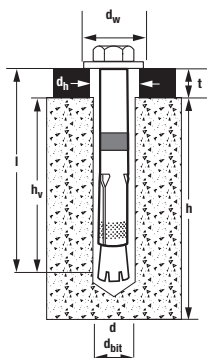
**Step 2**  
Remove dust and debris from the hole during drilling (e.g. dust extractor, hollow bit) or following drilling (e.g. suction, forced air) to extract loose particles created by drilling. Do not modify the anchor or advance the bolt in the anchor assembly prior to installation.



**Step 3**  
Drive the anchor through the fixture into the anchor hole until the bolt head is firmly seated against the fixture. Be sure the anchor is driven to the required embedment depth.



**Step 4**  
Tighten the anchor by turning the head 3 to 4 turns past finger tight.



**Nomenclature**

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

**Length Identification**

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

**PERFORMANCE DATA**

**Ultimate Load Capacities for Carbon and Stainless Steel Power-Bolt in Normal-Weight Concrete<sup>1,2</sup>**

| Anchor Diameter<br>d<br>in. | Minimum Embedment Depth<br>h<br>in.<br>(mm) | Minimum Concrete Compressive Strength (f'c) |                       |                         |                       |                         |                       |                         |                       |
|-----------------------------|---|---|-----------------------|-------------------------|-----------------------|-------------------------|-----------------------|-------------------------|-----------------------|
|                             |   | 2,000 psi (13.8 MPa)                        |                       | 3,000 psi (20.7 MPa)    |                       | 4,000 psi (27.6 MPa)    |                       | 6,000 psi (41.4 MPa)    |                       |
|                             |   | Tension<br>lbs.<br>(kN)                     | Shear<br>lbs.<br>(kN) | Tension<br>lbs.<br>(kN) | Shear<br>lbs.<br>(kN) | Tension<br>lbs.<br>(kN) | Shear<br>lbs.<br>(kN) | Tension<br>lbs.<br>(kN) | Shear<br>lbs.<br>(kN) |
| 1/4                         | 1-1/4<br>(31.8)                             | 945<br>(4.2)                                | 1655<br>(7.4)         | 1105<br>(4.9)           | 1680<br>(7.5)         | 1265<br>(5.6)           | 1705<br>(7.6)         | 1330<br>(5.9)           | 1705<br>(7.6)         |
|                             | 1-3/4<br>(44.5)                             | 1120<br>(5.0)                               | 1655<br>(7.4)         | 1240<br>(5.5)           | 1845<br>(8.2)         | 1360<br>(6.0)           | 2030<br>(9.0)         | 1490<br>(6.6)           | 2030<br>(9.0)         |
|                             | 2-1/2<br>(63.5)                             | 1505<br>(6.7)                               | 1655<br>(7.4)         | 1550<br>(6.9)           | 2185<br>(9.7)         | 1600<br>(7.1)           | 2710<br>(12.1)        | 1680<br>(7.5)           | 2710<br>(12.1)        |
| 3/8                         | 2<br>(50.8)                                 | 3,500<br>(15.8)                             | 3,985<br>(17.9)       | 4,045<br>(18.2)         | 5,205<br>(23.4)       | 4,585<br>(20.6)         | 6,425<br>(28.9)       | 5,915<br>(26.6)         | 7,440<br>(33.5)       |
|                             | 2-1/2<br>(63.5)                             | 3,800<br>(17.1)                             | 4,380<br>(19.7)       | 4,330<br>(19.5)         | 5,770<br>(26.0)       | 4,855<br>(21.8)         | 7,160<br>(32.2)       | 6,665<br>(30.0)         | 7,960<br>(35.8)       |
|                             | 3-1/2<br>(88.9)                             | 4,395<br>(19.8)                             | 4,980<br>(22.4)       | 5,195<br>(23.4)         | 6,815<br>(30.7)       | 5,995<br>(27.0)         | 8,650<br>(38.9)       | 7,150<br>(32.2)         | 8,650<br>(38.9)       |
| 1/2                         | 2-1/2<br>(63.5)                             | 4,900<br>(22.1)                             | 6,840<br>(30.8)       | 5,710<br>(25.7)         | 7,535<br>(33.9)       | 6,520<br>(29.3)         | 8,225<br>(37.0)       | 7,320<br>(32.9)         | 8,225<br>(37.0)       |
|                             | 3-1/2<br>(88.9)                             | 6,140<br>(27.6)                             | 8,540<br>(38.4)       | 7,590<br>(34.2)         | 9,200<br>(41.4)       | 9,040<br>(40.7)         | 9,860<br>(44.4)       | 9,890<br>(44.5)         | 10,780<br>(48.5)      |
|                             | 5<br>(127.0)                                | 7,260<br>(32.7)                             | 10,140<br>(45.6)      | 8,480<br>(38.2)         | 11,230<br>(50.5)      | 9,700<br>(43.7)         | 12,320<br>(55.4)      | 10,935<br>(49.2)        | 12,315<br>(55.4)      |
| 5/8                         | 2-3/4<br>(69.9)                             | 5,360<br>(24.1)                             | 7,970<br>(35.9)       | 6,535<br>(29.4)         | 9,970<br>(44.9)       | 7,705<br>(34.7)         | 11,970<br>(53.9)      | 8,490<br>(38.2)         | 11,970<br>(53.9)      |
|                             | 4<br>(101.6)                                | 6,460<br>(29.1)                             | 10,860<br>(48.9)      | 8,210<br>(36.9)         | 12,710<br>(57.2)      | 9,960<br>(44.8)         | 14,560<br>(65.5)      | 13,110<br>(59.0)        | 15,900<br>(71.6)      |

1. Tabulated load values are for anchors installed in concrete. Concrete compressive strength must be at the specified minimum at the time of installation.
2. Ultimate load capacities must be reduced by a minimum safety factor of 4.0 or greater to determine allowable working load. Consideration of safety factors of 10 or higher may be necessary depending upon the application such as life safety or overhead.

**Allowable Load Capacities for Carbon and Stainless Steel Power-Bolt in Normal-Weight Concrete<sup>1,2,3</sup>**



| Anchor Diameter<br>d<br>in. | Minimum Embedment Depth<br>h<br>in.<br>(mm) | Minimum Concrete Compressive Strength (f'c) |                       |                         |                       |                         |                       |                         |                       |
|-----------------------------|---|---|-----------------------|-------------------------|-----------------------|-------------------------|-----------------------|-------------------------|-----------------------|
|                             |   | 2,000 psi (13.8 MPa)                        |                       | 3,000 psi (20.7 MPa)    |                       | 4,000 psi (27.6 MPa)    |                       | 6,000 psi (41.4 MPa)    |                       |
|                             |   | Tension<br>lbs.<br>(kN)                     | Shear<br>lbs.<br>(kN) | Tension<br>lbs.<br>(kN) | Shear<br>lbs.<br>(kN) | Tension<br>lbs.<br>(kN) | Shear<br>lbs.<br>(kN) | Tension<br>lbs.<br>(kN) | Shear<br>lbs.<br>(kN) |
| 1/4                         | 1-1/4<br>(31.8)                             | 235<br>(1.0)                                | 415<br>(1.8)          | 275<br>(1.2)            | 420<br>(1.9)          | 315<br>(1.4)            | 425<br>(1.9)          | 335<br>(1.5)            | 425<br>(1.9)          |
|                             | 1-3/4<br>(44.5)                             | 280<br>(1.2)                                | 415<br>(1.8)          | 310<br>(1.4)            | 460<br>(2.0)          | 340<br>(1.5)            | 510<br>(2.3)          | 375<br>(1.7)            | 510<br>(2.3)          |
|                             | 2-1/2<br>(63.5)                             | 375<br>(1.7)                                | 415<br>(1.8)          | 390<br>(1.7)            | 545<br>(2.4)          | 400<br>(1.8)            | 680<br>(3.0)          | 420<br>(1.9)            | 680<br>(3.0)          |
| 3/8                         | 2<br>(50.8)                                 | 875<br>(3.9)                                | 995<br>(4.5)          | 1,010<br>(4.5)          | 1,300<br>(5.9)        | 1,145<br>(5.2)          | 1,605<br>(7.2)        | 1,480<br>(6.7)          | 1,860<br>(8.4)        |
|                             | 2-1/2<br>(63.5)                             | 950<br>(4.3)                                | 1,095<br>(4.9)        | 1,080<br>(4.9)          | 1,445<br>(6.5)        | 1,215<br>(5.5)          | 1,790<br>(8.1)        | 1,665<br>(7.5)          | 1,990<br>(9.0)        |
|                             | 3-1/2<br>(88.9)                             | 1,100<br>(5.0)                              | 1,245<br>(5.6)        | 1,300<br>(5.9)          | 1,705<br>(7.7)        | 1,500<br>(6.8)          | 2,165<br>(9.7)        | 1,790<br>(8.1)          | 2,165<br>(9.7)        |
| 1/2                         | 2-1/2<br>(63.5)                             | 1,225<br>(5.5)                              | 1,710<br>(7.7)        | 1,430<br>(6.4)          | 1,885<br>(8.5)        | 1,630<br>(7.3)          | 2,055<br>(9.2)        | 1,830<br>(8.2)          | 2,055<br>(9.2)        |
|                             | 3-1/2<br>(88.9)                             | 1,535<br>(6.9)                              | 2,135<br>(9.6)        | 1,900<br>(8.6)          | 2,300<br>(10.4)       | 2,260<br>(10.2)         | 2,465<br>(11.1)       | 2,470<br>(11.1)         | 2,695<br>(12.1)       |
|                             | 5<br>(127.0)                                | 1,815<br>(8.2)                              | 2,535<br>(11.4)       | 2,120<br>(9.5)          | 2,810<br>(12.6)       | 2,425<br>(10.9)         | 3,080<br>(13.9)       | 2,735<br>(12.3)         | 3,080<br>(13.9)       |
| 5/8                         | 2-3/4<br>(69.9)                             | 1,340<br>(6.0)                              | 1,995<br>(9.0)        | 1,635<br>(7.4)          | 2,495<br>(11.2)       | 1,925<br>(8.7)          | 2,995<br>(13.5)       | 2,125<br>(9.6)          | 2,995<br>(13.5)       |
|                             | 4<br>(101.6)                                | 1,615<br>(7.3)                              | 2,715<br>(12.2)       | 2,055<br>(9.2)          | 3,180<br>(14.3)       | 2,490<br>(11.2)         | 3,640<br>(16.4)       | 3,275<br>(14.7)         | 3,975<br>(17.9)       |

1. Allowable load capacities listed are calculated using and applied safety factor of 4.0. Consideration of safety factors of 10 or higher may be necessary depending upon the application such as life safety or overhead.
2. Allowable load capacities are multiplied by reduction when anchor spacing or edge distances are less than critical distances.
3. Linear interpolation may be used to determine allowable loads for intermediate embedments and compressive strengths.

**MECHANICAL ANCHORS**

**POWER-BOLT®**  
Heavy-Duty Sleeve Anchor

TECHNICAL GUIDE – MECHANICAL ANCHORS ©2021 DEWALT – REV. B

**Ultimate and Allowable Load Capacities for Carbon and Stainless Steel Power-Bolt in Lightweight Concrete<sup>1,2,3</sup>**

| Anchor Diameter<br>d<br>in. | Minimum Embedment Depth<br>h,<br>in.<br>(mm) | Minimum Concrete Compressive Strength (f <sub>c</sub> ) |                       |                         |                       |                         |                       |                         |                       |
|-----------------------------|--|---|-----------------------|-------------------------|-----------------------|-------------------------|-----------------------|-------------------------|-----------------------|
|                             |  | 3,000 psi (20.7 MPa)                                    |                       |                         |                       | 5,000 psi (34.5 MPa)    |                       |                         |                       |
|                             |  | Ultimate Load   |                       | Allowable Load          |                       | Ultimate Load           |                       | Allowable Load          |                       |
|                             |  | Tension<br>lbs.<br>(kN)                                 | Shear<br>lbs.<br>(kN) | Tension<br>lbs.<br>(kN) | Shear<br>lbs.<br>(kN) | Tension<br>lbs.<br>(kN) | Shear<br>lbs.<br>(kN) | Tension<br>lbs.<br>(kN) | Shear<br>lbs.<br>(kN) |
| 1/4                         | 1-1/4<br>(31.8)                              | 1,000<br>(4.5)  | 1,520<br>(6.8)        | 250<br>(1.1)            | 380<br>(1.7)          | 1,320<br>(5.9)          | 1,520<br>(6.8)        | 330<br>(1.5)            | 380<br>(1.7)          |
|                             | 2<br>(50.8)                                  | 1,510<br>(6.8)  | 1,540<br>(6.9)        | 380<br>(1.7)            | 385<br>(1.7)          | -                       | -                     | -                       | -                     |
| 3/8                         | 2<br>(50.8)                                  | 2,160<br>(9.7)  | 2,780<br>(12.5)       | 540<br>(2.4)            | 695<br>(3.1)          | 3,240<br>(14.6)         | 2,780<br>(12.5)       | 810<br>(3.6)            | 695<br>(3.1)          |
|                             | 3-1/2<br>(88.9)                              | 4,200<br>(18.9)   | 4,980<br>(22.4)       | 1,050<br>(4.7)          | 1,245<br>(5.6)        | -                       | -                     | -                       | -                     |
| 1/2                         | 2-1/2<br>(63.5)                              | 3,680<br>(16.6)   | 4,615<br>(20.8)       | 920<br>(4.1)            | 1,155<br>(5.2)        | 4,920<br>(22.1)         | 4,615<br>(20.8)       | 1,230<br>(5.5)          | 1,155<br>(5.2)        |
|                             | 5<br>(127.0)                                 | 5,540<br>(24.9)   | 8,730<br>(39.3)       | 1,385<br>(6.2)          | 2,185<br>(9.8)        | -                       | -                     | -                       | -                     |
| 5/8                         | 2-3/4<br>(69.9)                              | 3,120<br>(14.0)   | 6,840<br>(30.8)       | 780<br>(3.5)            | 1,710<br>(7.7)        | 5,240<br>(23.6)         | 6,840<br>(30.8)       | 1,310<br>(5.9)          | 1,710<br>(7.7)        |

1. Tabulated load values are for anchors installed in sand-lightweight concrete. Concrete compressive strength must be at the specified minimum at the time of installation.
2. Allowable load capacities listed are calculated using and applied safety factor of 4.0. Consideration of safety factors of 10 or higher may be necessary depending upon the application such as life safety or overhead.
3. Linear interpolation may be used to determine ultimate and allowable loads for intermediate embedments and compressive strengths.

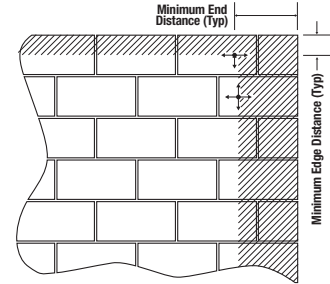
**Ultimate and Allowable Load Capacities for Carbon and Stainless Steel Power-Bolt Installed Through Steel Deck into Lightweight Concrete<sup>1,2,3,4</sup>**

| Anchor Diameter<br>d<br>in. | Minimum Embedment Depth<br>h,<br>in.<br>(mm) | Lightweight Concrete over minimum 20 Gage Metal Deck, f <sub>c</sub> ≥ 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<br>lbs.<br>(kN)   | Shear<br>lbs.<br>(kN) | Tension<br>lbs.<br>(kN) | Shear<br>lbs.<br>(kN) | Tension<br>lbs.<br>(kN)  | Shear<br>lbs.<br>(kN) | Tension<br>lbs.<br>(kN) | Shear<br>lbs.<br>(kN) |
| 1/4                         | 1-1/4<br>(31.8)                              | 720<br>(3.2)  | 2,360<br>(10.6)       | 180<br>(0.8)            | 590<br>(2.7)          | 920<br>(4.1)             | 2,360<br>(10.6)       | 230<br>(1.0)            | 590<br>(2.7)          |
| 3/8                         | 2<br>(50.8)                                  | 720<br>(3.2)  | 2,740<br>(12.3)       | 180<br>(0.8)            | 685<br>(3.1)          | 1,840<br>(8.3)           | 2,740<br>(12.3)       | 460<br>(2.1)            | 685<br>(3.1)          |
| 1/2                         | 2-1/2<br>(63.5)                              | 1,640<br>(7.4)  | 2,740<br>(12.3)       | 410<br>(1.8)            | 685<br>(3.1)          | 2,000<br>(9.0)           | 4,400<br>(19.8)       | 500<br>(2.3)            | 1,100<br>(5.0)        |
| 5/8                         | 2-3/4<br>(88.9)                              | -   | -                     | -                       | -                     | 2,000<br>(9.0)           | 4,440<br>(20.0)       | 500<br>(2.3)            | 1,110<br>(5.0)        |

1. Tabulated load values are for anchors installed in sand-lightweight concrete over steel deck. Concrete compressive strength must be at the specified minimum at the time of installation.
2. Allowable load capacities listed are calculated using and applied safety factor of 4.0. Consideration of safety factors of 10 or higher may be necessary depending upon the application such as life safety or overhead.
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.
4. Anchors are permitted to be installed in the lower or upper flute of the steel deck provided the proper installation procedures are maintained.

**Ultimate and Allowable Load Capacities for Power-Bolt in Grout-Filled Concrete Masonry<sup>1,2,3,4</sup>**

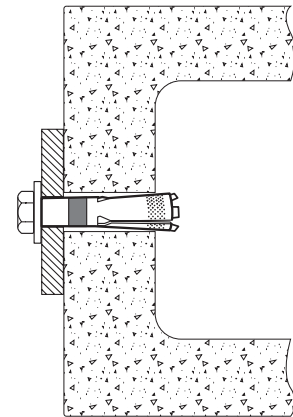
| Anchor Diameter d in. | Minimum Embed. Depth h in. (mm) | Minimum Edge Distance in. (mm) | Minimum End Distance in. (mm) | f'm ≥ 1,500 psi (10.4 MPa) |                 |                   |                 |
|-----------------------|---------------------------------|--------------------------------|-------------------------------|----------------------------|-----------------|-------------------|-----------------|
|                       |                                 |                                |                               | Ultimate Load              |                 | Allowable Load    |                 |
|                       |                                 |                                |                               | Tension lbs. (kN)          | Shear lbs. (kN) | Tension lbs. (kN) | Shear lbs. (kN) |
| 1/4                   | 1-1/8 (28.6)                    | 3-3/4 (95.3)                   | 3-3/4 (95.3)                  | 1,215 (5.5)                | 1,185 (5.3)     | 245 (1.1)         | 235 (1.1)       |
|                       | 2-1/2 (63.5)                    | 5-1/4 (133.4)                  | 3-3/4 (95.3)                  | 1,760 (7.9)                | 1,185 (5.3)     | 350 (1.6)         | 235 (1.1)       |
| 3/8                   | 2 (50.8)                        | 5-5/8 (142.9)                  | 5-5/8 (142.9)                 | 1,985 (8.9)                | 3,065 (13.8)    | 395 (1.8)         | 615 (2.8)       |
|                       | 3-1/2 (88.9)                    | 7-7/8 (200.0)                  | 5-5/8 (142.9)                 | 2,120 (9.5)                | 3,065 (13.8)    | 425 (1.9)         | 615 (2.8)       |
| 1/2                   | 2-1/2 (63.5)                    | 7-1/2 (190.5)                  | 7-1/2 (190.5)                 | 2,435 (11.0)               | 5,650 (25.4)    | 485 (2.2)         | 1,130 (5.1)     |
|                       | 4 (101.6)                       | 10-1/2 (266.7)                 | 7-1/2 (190.5)                 | 2,690 (12.1)               | 5,650 (25.4)    | 540 (2.4)         | 1,130 (5.1)     |
| 5/8                   | 2-3/4 (69.9)                    | 9-3/8 (238.1)                  | 9-3/8 (238.1)                 | 2,560 (11.5)               | 9,000 (40.5)    | 510 (2.3)         | 1,800 (8.1)     |
|                       | 5 (127.0)                       | 13-1/8 (333.4)                 | 9-3/8 (238.1)                 | 2,975 (13.4)               | 9,000 (40.5)    | 595 (2.7)         | 1,800 (8.1)     |



1. Tabulated load values are for carbon steel and stainless steel anchors installed in minimum 6-inch wide, minimum Grade N, Type II, lightweight, medium-weight or normal-weight concrete masonry units conforming to ASTM C 90. Mortar must be minimum Type N. Masonry cells may be grouted. Masonry compressive strength must be at the specified minimum at the time of installation (f'm ≥ 1,500 psi).
2. Allowable load capacities listed are calculated using and applied safety factor of 5.0. Consideration of safety factors of 10 or higher may be necessary depending upon the application such as life safety or overhead.
3. Linear interpolation may be used to determine ultimate and allowable loads for intermediate embedment depths.
4. 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.

**Ultimate and Allowable Load Capacities for Power-Bolt in Hollow Concrete Masonry<sup>1,2,3,4,5</sup>**

| Anchor Diameter d in. | Minimum Embed. Depth h in. (mm) | Minimum Edge Distance in. (mm) | Minimum End Distance in. (mm) | f'm ≥ 1,500 psi (10.4 MPa) |                 |                   |                 |
|-----------------------|---------------------------------|--------------------------------|-------------------------------|----------------------------|-----------------|-------------------|-----------------|
|                       |                                 |                                |                               | Ultimate Load              |                 | Allowable Load    |                 |
|                       |                                 |                                |                               | Tension lbs. (kN)          | Shear lbs. (kN) | Tension lbs. (kN) | Shear lbs. (kN) |
| 1/4                   | 7/8 (22.2)                      | 3-3/4 (95.3)                   | 3-3/4 (95.3)                  | 600 (2.7)                  | 765 (3.4)       | 120 (0.5)         | 155 (0.7)       |
|                       | 1-1/4 (31.8)                    | 3-3/4 (95.3)                   | 8 (203.2)                     | 825 (3.7)                  | 1,055 (4.8)     | 165 (0.7)         | 210 (0.9)       |
|                       | 1-1/2 (38.1)                    | 3-3/4 (95.3)                   | 12 (304.8)                    | 1,130 (5.1)                | 1,230 (5.5)     | 225 (1.0)         | 245 (1.1)       |
| 3/8                   | 1-1/4 (31.8)                    | 12 (304.8)                     | 8 (203.2)                     | 1,360 (6.1)                | 2,150 (9.7)     | 270 (1.2)         | 430 (1.9)       |
|                       | 1-1/2 (38.1)                    | 12 (304.8)                     | 12 (304.8)                    | 1,470 (6.6)                | 2,600 (11.7)    | 295 (1.3)         | 520 (2.3)       |
| 1/2                   | 1-1/4 (31.8)                    | 12 (304.8)                     | 8 (203.2)                     | 2,560 (11.5)               | 2,150 (9.7)     | 590 (2.4)         | 430 (1.9)       |
|                       | 1-1/2 (38.1)                    | 12 (304.8)                     | 12 (304.8)                    | 2,560 (11.5)               | 3,385 (15.2)    | 510 (2.3)         | 675 (3.0)       |



1. Tabulated load values are for carbon steel and stainless steel anchors installed in minimum 6-inch wide, minimum Grade N, Type II, lightweight, medium-weight or normal-weight concrete masonry units conforming to ASTM C 90. Mortar must be minimum Type N. Masonry cells may be grouted. Masonry compressive strength must be at the specified minimum at the time of installation (f'm ≥ 1,500 psi).
2. Allowable load capacities listed are calculated using and applied safety factor of 5.0. Consideration of safety factors of 10 or higher may be necessary depending upon the application such as life safety or overhead.
3. Linear interpolation may be used to determine ultimate and allowable loads for intermediate embedment depths.
4. The tabulated values are for anchors installed at a minimum of 16 anchor diameters on center for 100 percent capacity. Spacing distances may be reduced to 8 anchor diameters on center provided the capacities are reduced by 50 percent. Linear interpolation may be used for intermediate spacing.
5. A suitable anchor length must be selected which included consideration of fixture to engage the base material at the minimum embedment depth when anchoring into hollow concrete masonry. (e.g. attachment thickness + embedment + one half inch = suitable anchor length)

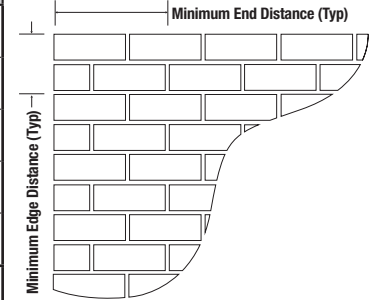
**Ultimate and Allowable Load Capacities for Power-Bolt in Clay Brick Masonry<sup>1,2,3</sup>**

| Anchor Dia. d in. | Min. Embed. Depth h in. (mm) | Min. Edge Distance | Min. End Distance | Min. Spacing Distance | Structural Brick Masonry<br>f'm ≥ 1,500 psi (10.4 MPa) |                 |                   |                 |
|-------------------|------------------------------|--------------------|-------------------|-----------------------|--|-----------------|-------------------|-----------------|
|                   |                              |                    |                   |                       | Ultimate Load  |                 | Allowable Load    |                 |
|                   |                              |                    |                   |                       | Tension lbs. (kN)                                      | Shear lbs. (kN) | Tension lbs. (kN) | Shear lbs. (kN) |
| 1/4               | 7/8 (22.2)                   | 8 (203.2)          | 4 (101.6)         | 6 (152.4)             | 1,090 (4.9)  | 1,160 (5.2)     | 220 (1.0)         | 230 (1.0)       |
|                   | 1-1/2 (38.1)                 |                    |                   |                       | 1,455 (6.6)  | 1,265 (5.7)     | 290 (1.3)         | 255 (1.1)       |
| 3/8               | 2 (50.8)                     | 12 (304.8)         | 6 (152.4)         | 8 (203.2)             | 2,015 (9.1)  | 3,655 (16.5)    | 405 (1.8)         | 730 (3.3)       |
| 1/2               | 2-1/2 (63.5)                 |                    | 8 (203.2)         | 10 (254.0)            | 3,110 (14.0)   | 4,585 (20.6)    | 620 (2.8)         | 915 (4.1)       |
| 5/8               | 2-3/4 (69.9)                 | 16 (406.4)         | 10 (254.0)        | 12 (304.8)            | 4,535 (20.4)   | 5,470 (24.6)    | 905 (4.1)         | 1,095 (4.9)     |

1. Tabulated load values are for anchors installed in multiple wythe, minimum Grade SW, solid clay brick masonry walls conforming to ASTM C 62. Mortar must be minimum Type N. Masonry compressive strength must be at the specified minimum at the time of installation (f'm ≥ 1,500 psi).

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

3. Spacing between anchors may be reduced to half the listed distances provided the capacities are reduced by 50 percent. Linear interpolation may be used for intermediate spacing.



**DESIGN CRITERIA (ALLOWABLE STRESS DESIGN)**

**Combined Loading**

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

$$\left(\frac{N_u}{N_n}\right) + \left(\frac{V_u}{V_n}\right) \leq 1$$

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<sup>1</sup>**

**Anchor Installed in Normal-Weight Concrete**

| Anchor Dimension  | Load Type         | Critical Distance (Full Anchor Capacity) | Critical Load Factor | Minimum Distance (Reduced Capacity) | Minimum Load Factor  |
|-------------------|-------------------|--|----------------------|-------------------------------------|----------------------|
| Spacing (s)       | Tension and Shear | $S_{cr} = 2.0h_v$                        | $FN_s = FV_s = 1.0$  | $S_{min} = h_v$                     | $FN_s = FV_s = 0.50$ |
| Edge Distance (c) | Tension           | $C_{cr} = 12d$                           | $FN_c = 1.0$         | $C_{min} = 5d$                      | $FN_c = 0.70$        |
|                   | Shear             | $C_{cr} = 12d$                           | $FV_c = 1.0$         | $C_{min} = 5d$                      | $FV_c = 0.35$        |

**Anchor Installed in Structural Lightweight Concrete**

| Anchor Dimension  | Load Type         | Critical Distance (Full Anchor Capacity) | Critical Load Factor | Minimum Distance (Reduced Capacity) | Minimum Load Factor  |
|-------------------|-------------------|--|----------------------|-------------------------------------|----------------------|
| Spacing (s)       | Tension and Shear | $S_{cr} = 2.0h_v$                        | $FN_s = FV_s = 1.0$  | $S_{min} = h_v$                     | $FN_s = FV_s = 0.50$ |
| Edge Distance (c) | Tension           | $C_{cr} = 12d$                           | $FN_c = 1.0$         | $C_{min} = 5d$                      | $FN_c = 0.80$        |
|                   | Shear             | $C_{cr} = 12d$                           | $FV_c = 1.0$         | $C_{min} = 5d$                      | $FV_c = 0.40$        |

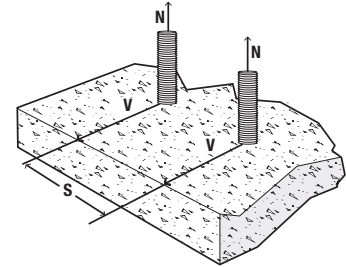
1. Allowable load values found in the performance data tables are multiplied by reduction factors when anchor spacing or edge distances are less than critical distances. Linear interpolation is allowed for intermediate anchor spacing and edge distances between critical and minimum distances. When an anchor is affected by both reduced spacing and edge distance, the spacing and edge reduction factors must be combined (multiplied). Multiple reduction factors for anchor spacing and edge distance may be required depending on the anchor group configuration.

**Load Adjustment Factors for Normal-Weight Concrete**

| Spacing, Tension ( $F_{tS}$ ) & Shear ( $F_{vS}$ ) |       |       |       |      |       |       |       |       |      |       |      |      |
|--|-------|-------|-------|------|-------|-------|-------|-------|------|-------|------|------|
| Dia. (in.)   | 1/4   |       |       | 3/8  |       |       | 1/2   |       |      | 5/8   |      |      |
| h <sub>v</sub> (in.)                               | 1-1/4 | 1-3/4 | 2-1/2 | 2    | 2-1/2 | 3-1/2 | 2-1/2 | 3-1/2 | 5    | 2-3/4 | 4    | 6    |
| s <sub>cr</sub> (in.)                              | 2-1/2 | 3-1/2 | 5     | 4    | 5     | 7     | 5     | 7     | 10   | 5-1/2 | 8    | 12   |
| s <sub>min</sub> (in.)                             | 1-1/4 | 1-3/4 | 2-1/2 | 2    | 2-1/2 | 3-1/2 | 2-1/2 | 3-1/2 | 5    | 2-3/4 | 4    | 6    |
| Spacing, s (inches)                                | 1-1/4 | 0.50  | -     | -    | -     | -     | -     | -     | -    | -     | -    | -    |
|  | 1-3/4 | 0.70  | 0.50  | -    | -     | -     | -     | -     | -    | -     | -    | -    |
|  | 2     | 0.80  | 0.57  | -    | 0.50  | -     | -     | -     | -    | -     | -    | -    |
|  | 2-1/2 | 1.00  | 0.71  | 0.50 | 0.63  | 0.50  | -     | 0.50  | -    | -     | -    | -    |
|  | 2-3/4 | 1.00  | 0.79  | 0.55 | 0.69  | 0.55  | -     | 0.55  | -    | 0.50  | -    | -    |
|  | 3     | 1.00  | 0.86  | 0.60 | 0.75  | 0.60  | -     | 0.60  | -    | 0.55  | -    | -    |
|  | 3-1/2 | 1.00  | 1.00  | 0.70 | 0.88  | 0.70  | 0.50  | 0.70  | 0.50 | 0.64  | -    | -    |
|  | 4     | 1.00  | 1.00  | 0.80 | 1.00  | 0.80  | 0.57  | 0.80  | 0.57 | 0.73  | 0.50 | -    |
|  | 4-1/2 | 1.00  | 1.00  | 0.90 | 1.00  | 0.90  | 0.64  | 0.90  | 0.64 | 0.82  | 0.56 | -    |
|  | 5     | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 0.71  | 1.00  | 0.71 | 0.50  | 0.91 | 0.63 |
|  | 5-1/2 | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 0.79  | 1.00  | 0.79 | 0.55  | 1.00 | 0.69 |
|  | 6     | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 0.86  | 1.00  | 0.86 | 0.60  | 1.00 | 0.75 |
|  | 7     | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 0.70  | 1.00 | 0.88 |
|  | 8     | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 0.80  | 1.00 | 1.00 |
| 9  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 0.90 | 1.00  | 1.00 |      |
| 10   | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00 |      |
| 12   | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00 |      |
| 14   | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00 |      |

Notes: For anchors loaded in tension and shear, the critical spacing ( $s_{cr}$ ) is equal to 2 embedment depths ( $2h_v$ ) at which the anchor achieves 100% of load.

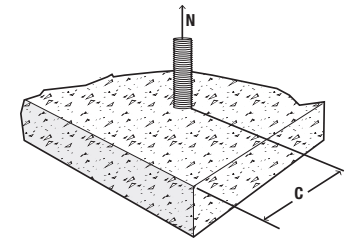
Minimum spacing ( $s_{min}$ ) is equal to 1 embedment depth ( $h_v$ ) at which the anchor achieves 50% of load.



| Edge Distance, Tension ( $F_{tC}$ ) |       |       |       |       |
|-------------------------------------|-------|-------|-------|-------|
| Dia. (in.)                          | 1/4   | 3/8   | 1/2   | 5/8   |
| c <sub>cr</sub> (in.)               | 3     | 4-1/2 | 6     | 7-1/2 |
| c <sub>min</sub> (in.)              | 1-1/4 | 1-7/8 | 2-1/2 | 3-1/8 |
| Edge Distance, c (inches)           | 1-1/4 | 0.70  | -     | -     |
|                                     | 1-5/8 | 0.76  | -     | -     |
|                                     | 1-7/8 | 0.81  | 0.70  | -     |
|                                     | 2     | 0.83  | 0.71  | -     |
|                                     | 2-1/2 | 0.91  | 0.77  | 0.70  |
|                                     | 3     | 1.00  | 0.83  | 0.74  |
|                                     | 3-1/8 | 1.00  | 0.84  | 0.75  |
|                                     | 3-3/4 | 1.00  | 0.91  | 0.81  |
|                                     | 4     | 1.00  | 0.94  | 0.83  |
|                                     | 4-1/2 | 1.00  | 1.00  | 0.87  |
|                                     | 5     | 1.00  | 1.00  | 0.91  |
|                                     | 6     | 1.00  | 1.00  | 1.00  |
|                                     | 6-1/4 | 1.00  | 1.00  | 1.00  |
|                                     | 7     | 1.00  | 1.00  | 1.00  |
| 7-1/2                               | 1.00  | 1.00  | 1.00  |       |
| 8                                   | 1.00  | 1.00  | 1.00  |       |
| 9                                   | 1.00  | 1.00  | 1.00  |       |

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

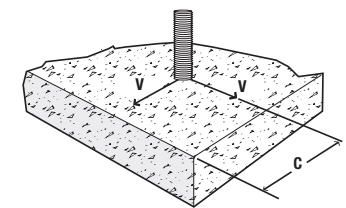
Minimum edge distance ( $c_{min}$ ) is equal to 5 anchor diameters (5d) at which the anchor achieves 70% of load.



| Edge Distance, Shear ( $F_{vC}$ ) |       |       |       |       |
|-----------------------------------|-------|-------|-------|-------|
| Dia. (in.)                        | 1/4   | 3/8   | 1/2   | 5/8   |
| c <sub>cr</sub> (in.)             | 3     | 4-1/2 | 6     | 7-1/2 |
| c <sub>min</sub> (in.)            | 1-1/4 | 1-7/8 | 2-1/2 | 3-1/8 |
| Edge Distance, c (inches)         | 1-1/4 | 0.35  | -     | -     |
|                                   | 1-5/8 | 0.49  | -     | -     |
|                                   | 1-7/8 | 0.58  | 0.35  | -     |
|                                   | 2     | 0.63  | 0.38  | -     |
|                                   | 2-1/2 | 0.81  | 0.50  | 0.35  |
|                                   | 3     | 1.00  | 0.63  | 0.44  |
|                                   | 3-1/8 | 1.00  | 0.66  | 0.47  |
|                                   | 3-3/4 | 1.00  | 0.81  | 0.58  |
|                                   | 4     | 1.00  | 0.88  | 0.63  |
|                                   | 4-1/2 | 1.00  | 1.00  | 0.72  |
|                                   | 5     | 1.00  | 1.00  | 0.81  |
|                                   | 6     | 1.00  | 1.00  | 1.00  |
|                                   | 6-1/4 | 1.00  | 1.00  | 1.00  |
|                                   | 7     | 1.00  | 1.00  | 1.00  |
| 7-1/2                             | 1.00  | 1.00  | 1.00  |       |
| 8                                 | 1.00  | 1.00  | 1.00  |       |
| 9                                 | 1.00  | 1.00  | 1.00  |       |

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

Minimum edge distance ( $c_{min}$ ) is equal to 5 anchor diameters (5d) at which the anchor achieves 35% of load.

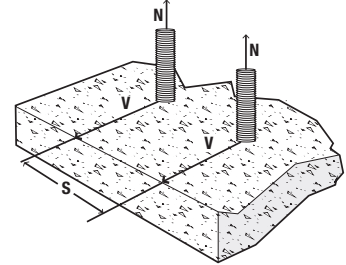


**Load Adjustment Factors for Lightweight Concrete**

| Spacing, Tension ( $F_{ts}$ ) & Shear ( $F_{vs}$ ) |       |       |       |      |       |       |       |       |      |       |      |      |
|--|-------|-------|-------|------|-------|-------|-------|-------|------|-------|------|------|
| Dia. (in.)   | 1/4   |       |       | 3/8  |       |       | 1/2   |       |      | 5/8   |      |      |
| $h_v$ (in.)  | 1-1/4 | 1-3/4 | 2-1/2 | 2    | 2-1/2 | 3-1/2 | 2-1/2 | 3-1/2 | 5    | 2-3/4 | 4    | 6    |
| $s_{cr}$ (in.)                                     | 2-1/2 | 3-1/2 | 5     | 4    | 5     | 7     | 5     | 7     | 10   | 5-1/2 | 8    | 12   |
| $s_{min}$ (in.)                                    | 1-1/4 | 1-3/4 | 2-1/2 | 2    | 2-1/2 | 3-1/2 | 2-1/2 | 3-1/2 | 5    | 2-3/4 | 4    | 6    |
| Spacing, s (inches)                                | 1-1/4 | 0.50  | -     | -    | -     | -     | -     | -     | -    | -     | -    | -    |
|  | 1-3/4 | 0.70  | 0.50  | -    | -     | -     | -     | -     | -    | -     | -    | -    |
|  | 2     | 0.80  | 0.57  | -    | 0.50  | -     | -     | -     | -    | -     | -    | -    |
|  | 2-1/2 | 1.00  | 0.71  | 0.50 | 0.63  | 0.50  | -     | 0.50  | -    | -     | -    | -    |
|  | 2-3/4 | 1.00  | 0.79  | 0.55 | 0.69  | 0.55  | -     | 0.55  | -    | -     | 0.50 | -    |
|  | 3     | 1.00  | 0.86  | 0.60 | 0.75  | 0.60  | -     | 0.60  | -    | -     | 0.55 | -    |
|  | 3-1/2 | 1.00  | 1.00  | 0.70 | 0.88  | 0.70  | 0.50  | 0.70  | 0.50 | -     | 0.64 | -    |
|  | 4     | 1.00  | 1.00  | 0.80 | 1.00  | 0.80  | 0.57  | 0.80  | 0.57 | -     | 0.73 | 0.50 |
|  | 4-1/2 | 1.00  | 1.00  | 0.90 | 1.00  | 0.90  | 0.64  | 0.90  | 0.64 | -     | 0.82 | 0.56 |
|  | 5     | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 0.71  | 1.00  | 0.71 | 0.50  | 0.91 | 0.63 |
|  | 5-1/2 | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 0.79  | 1.00  | 0.79 | 0.55  | 1.00 | 0.69 |
|  | 6     | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 0.86  | 1.00  | 0.86 | 0.60  | 1.00 | 0.75 |
|  | 7     | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 0.70  | 1.00 | 0.88 |
|  | 8     | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 0.80  | 1.00 | 1.00 |
| 9  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 0.90 | 1.00  | 1.00 |      |
| 10   | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00 |      |
| 12   | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00 |      |
| 14   | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00 |      |

Notes: For anchors loaded in tension and shear, the critical spacing ( $s_{cr}$ ) is equal to 2 embedment depths ( $2h_v$ ) at which the anchor achieves 100% of load.

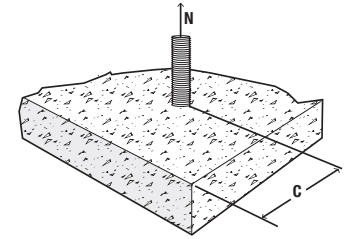
Minimum spacing ( $s_{min}$ ) is equal to 1 embedment depth ( $h_v$ ) at which the anchor achieves 50% of load.



| Edge Distance, Tension ( $F_{tc}$ ) |       |       |       |       |
|-------------------------------------|-------|-------|-------|-------|
| Dia. (in.)                          | 1/4   | 3/8   | 1/2   | 5/8   |
| $c_{cr}$ (in.)                      | 3     | 4-1/2 | 6     | 7-1/2 |
| $c_{min}$ (in.)                     | 1-1/4 | 1-7/8 | 2-1/2 | 3-1/8 |
| Edge Distance, c (inches)           | 1-1/4 | 0.80  | -     | -     |
|                                     | 1-5/8 | 0.84  | -     | -     |
|                                     | 1-7/8 | 0.87  | 0.80  | -     |
|                                     | 2     | 0.89  | 0.81  | -     |
|                                     | 2-1/2 | 0.94  | 0.85  | 0.80  |
|                                     | 3     | 1.00  | 0.89  | 0.83  |
|                                     | 3-1/8 | 1.00  | 0.90  | 0.84  |
|                                     | 3-3/4 | 1.00  | 0.94  | 0.87  |
|                                     | 4     | 1.00  | 0.96  | 0.89  |
|                                     | 4-1/2 | 1.00  | 1.00  | 0.91  |
|                                     | 5     | 1.00  | 1.00  | 0.94  |
|                                     | 6     | 1.00  | 1.00  | 1.00  |
|                                     | 6-1/4 | 1.00  | 1.00  | 1.00  |
|                                     | 7     | 1.00  | 1.00  | 1.00  |
| 7-1/2                               | 1.00  | 1.00  | 1.00  |       |
| 8                                   | 1.00  | 1.00  | 1.00  |       |
| 9                                   | 1.00  | 1.00  | 1.00  |       |

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

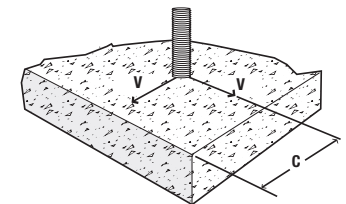
Minimum edge distance ( $c_{min}$ ) is equal to 5 anchor diameters ( $5d$ ) at which the anchor achieves 80% of load.



| Edge Distance, Shear ( $F_{vc}$ ) |       |       |       |       |
|-----------------------------------|-------|-------|-------|-------|
| Dia. (in.)                        | 1/4   | 3/8   | 1/2   | 5/8   |
| $c_{cr}$ (in.)                    | 3     | 4-1/2 | 6     | 7-1/2 |
| $c_{min}$ (in.)                   | 1-1/4 | 1-7/8 | 2-1/2 | 3-1/8 |
| Edge Distance, c (inches)         | 1-1/4 | 0.40  | -     | -     |
|                                   | 1-5/8 | 0.53  | -     | -     |
|                                   | 1-7/8 | 0.61  | 0.40  | -     |
|                                   | 2     | 0.66  | 0.43  | -     |
|                                   | 2-1/2 | 0.83  | 0.54  | 0.40  |
|                                   | 3     | 1.00  | 0.66  | 0.49  |
|                                   | 3-1/8 | 1.00  | 0.69  | 0.51  |
|                                   | 3-3/4 | 1.00  | 0.83  | 0.61  |
|                                   | 4     | 1.00  | 0.89  | 0.66  |
|                                   | 4-1/2 | 1.00  | 1.00  | 0.74  |
|                                   | 5     | 1.00  | 1.00  | 0.83  |
|                                   | 6     | 1.00  | 1.00  | 1.00  |
|                                   | 6-1/4 | 1.00  | 1.00  | 1.00  |
|                                   | 7     | 1.00  | 1.00  | 1.00  |
| 7-1/2                             | 1.00  | 1.00  | 1.00  |       |
| 8                                 | 1.00  | 1.00  | 1.00  |       |
| 9                                 | 1.00  | 1.00  | 1.00  |       |

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

Minimum edge distance ( $c_{min}$ ) is equal to 5 anchor diameters ( $5d$ ) at which the anchor achieves 40% of load.





## ORDERING INFORMATION

## Stainless Steel Hex Head Power-Bolt

| Cat.No. | Anchor Size   | Drill Dia. | Min. Embed. | Std. Box | Std. Carton | Wt./100 |
|---------|---------------|------------|-------------|----------|-------------|---------|
| 5902    | 1/4" x 1-3/4" | 1/4"       | 1-1/4"      | 100      | 600         | 3       |
| 5906    | 1/4" x 3"     | 1/4"       | 1-1/4"      | 100      | 600         | 5       |
| 5910    | 3/8" x 2-1/4" | 3/8"       | 2"          | 50       | 300         | 10      |
| 5914    | 3/8" x 3-1/2" | 3/8"       | 2"          | 50       | 300         | 12      |
| 5916    | 3/8" x 4"     | 3/8"       | 2"          | 50       | 300         | 14      |
| 5930    | 1/2" x 2-3/4" | 1/2"       | 2-1/2"      | 50       | 200         | 16      |
| 5934    | 1/2" x 4-3/4" | 1/2"       | 2-1/2"      | 25       | 150         | 26      |

The published length is measured from below the washer to the end of the anchor.

## Carbon Steel Flat Head Power-Bolt

| Cat.No. | Anchor Size   | Drill Dia. | Min. Embed. | Std. Box | Std. Carton | Wt./100 |
|---------|---------------|------------|-------------|----------|-------------|---------|
| 6981    | 3/8" x 3-3/4" | 3/8"       | 2"          | 50       | 300         | 14      |
| 6982    | 3/8" x 5"     | 3/8"       | 2"          | 50       | 300         | 17      |
| 6983    | 3/8" x 6"     | 3/8"       | 2"          | 50       | 300         | 20      |
| 6984    | 1/2" x 5"     | 1/2"       | 2-1/2"      | 25       | 150         | 26      |
| 6987    | 5/8" x 5-1/2" | 5/8"       | 2-3/4"      | 15       | 90          | 57      |

The published length is the overall length of the anchor.

The flat head Power-Bolt anchor has a hex key insert formed in the head of the bolt.

Each box contains an Allen wrench which matches the insert size.

