# 2022-2023 PRODUCT CATALOG

RED HEAD®

CONCRETE ANCHORING SPECIALISTS

# *Welcome to the RED HEAD® Product and Resource Book*

Our Product and Resource Book is not just a catalog of the quality RED HEAD Anchoring Systems so many of you have come to rely on, but a resource guide to give you the information you need to help you work better, faster and easier.

This highly detailed Application Section allows you to look up your trade or specialty, view a variety of practical applications and receive simple product recommendations. Along with the product recommendations you'll notice page numbers for easy reference to the product selection and specifications pages.

As always, this Product and Resource Book continues to provide a wealth of valuable information including: product approvals/listings, applications, selection charts, performance tables and installation steps.

Remember, if you ever need more information about ITW RED HEAD products, technology and service, contact your local distributor, or look on the back cover for a complete listing of ITW RED HEAD facilities. We welcome your calls and feedback, and look forward to answering any questions you might have.

**www.itwredhead.com**

RED HEAD®
CONCRETE ANCHORING SPECIALISTS

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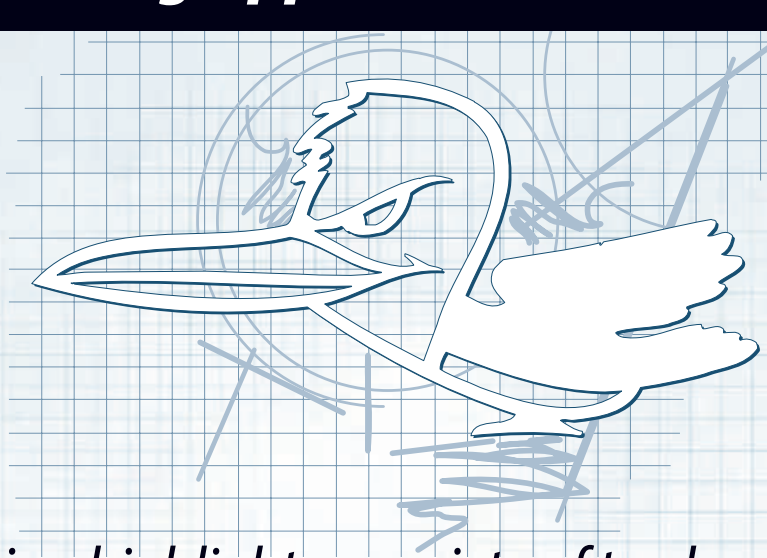
Trubolt LDT Drop-In


Dynabolt Tapcon Original Tapcon Maxi-Set


Tapcon SCOTS Tapcon XL

# RED HEAD®
# Fastening Applications Guide

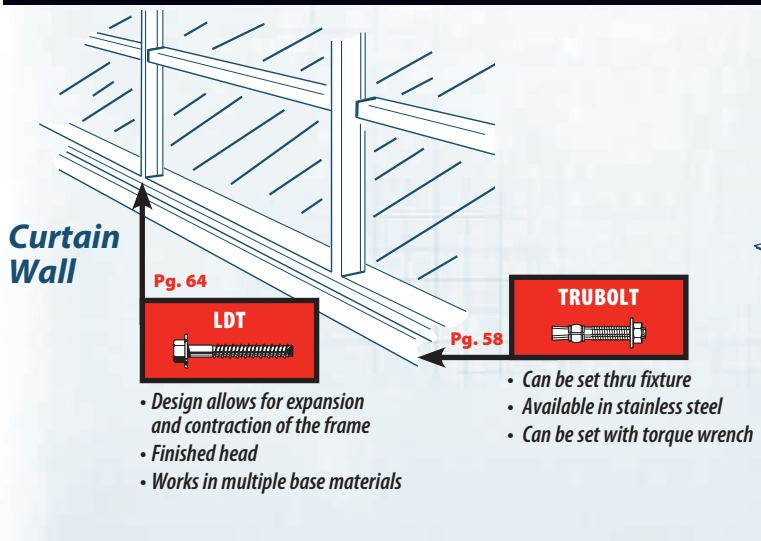


*This section highlights a variety of trade applications and provides information that will assist you in selecting the best fastening system for your application.*

While these are not to be considered complete, they will give you an idea of how contractors use our products.

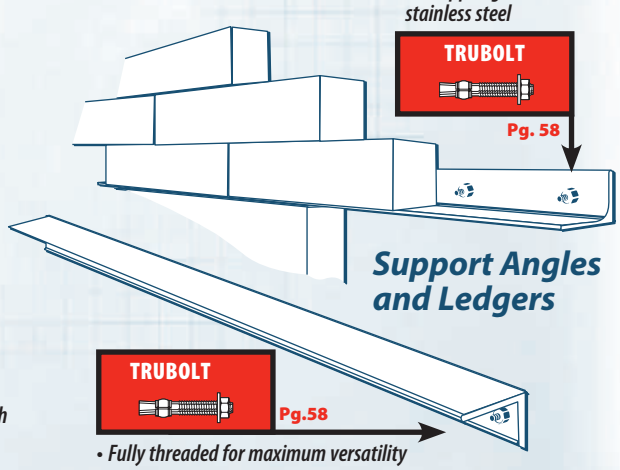
For example, on the Electrical Contractor page, you will find applications, such as junction box/panel boards and suspended lighting. Next to the diagrams are the product name(s) and page number in this catalog where you will find complete information on these products needed for that particular application.

## Curtain Wall Applications




- *Design allows for expansion and contraction of the frame*
- *Finished head*
- *Works in multiple base materials*

- *Can be set thru fixture*
- *Available in stainless steel*
- *Can be set with torque wrench*




- *Fully threaded for maximum versatility*
- *Available in carbon steel, hot dipped galvanized or stainless steel*

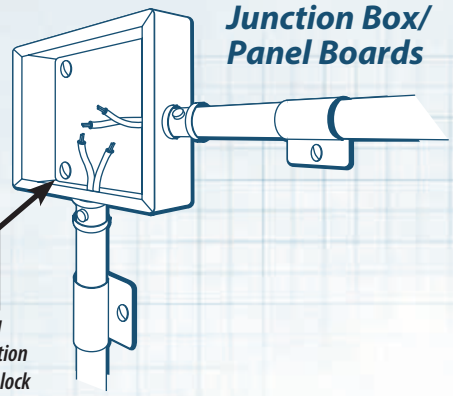
- *Fully threaded for maximum versatility*
- *Carbon steel, hot dipped galvanized or stainless steel available*

***For seismic recognition, see ICC-ES evaluation reports.***

***For installation guidelines for your application, please contact our Technical Services Department at 1-800-848-5611.***

# Electrical Contractor Applications

## Junction Box/ Panel Boards



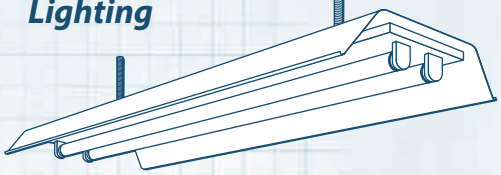
Pg. 78
**TAPCON**

- Counter sunk flathead style for flush installation
- Works in concrete or block
- Available in 3/16" and 1/4" diameters

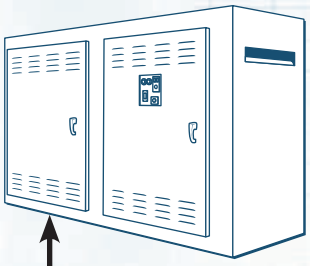
## Suspended Lighting

- Available in special 3/8" & 1/2" short version for precast planks
- Available in sizes 1/4" thru 3/4" internal thread diameters

**MULTI-SET DROP-IN**
Pg.70



## Transformers Switch Gear Electrical Enclosures



Pg.58
**TRUBOLT**

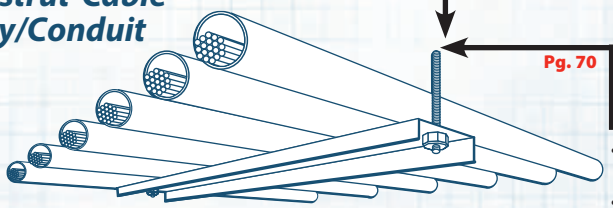
- Fully threaded for maximum versatility
- Carbon steel, hot dipped galvanized or stainless steel available

## Unistrut-Cable Tray/Conduit

- Fully threaded for maximum versatility
- Carbon steel, hot dipped galvanized or stainless steel available

**TRUBOLT**
Pg. 58

Pg. 70
**MULTI-SET DROP-IN**



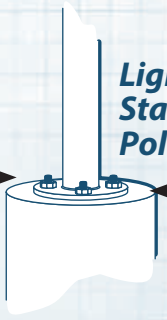
- Available in special 3/8" & 1/2" short version for precast planks
- Available in sizes 1/4" thru 3/4" internal thread diameters

## Light Standards Poles

- Ideal for closely spaced groups of anchors

**A7+ ADHESIVE**
Pg. 23

Pg. 39
**C6+ ADHESIVE**



- "Stress Free" anchor–can be used close to edges or in close spacing pattern

**DYNABOLT**
Pg. 75

- Counter sunk and threshold head styles also available
- Works in concrete, block and brick

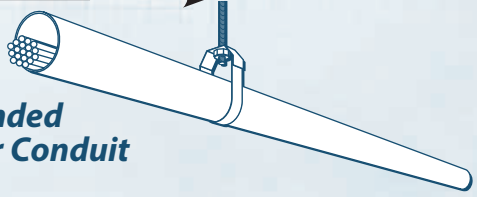
## Wall Mounted Lighting

Pg. 64
**LDT**

- Works in solid concrete, hollow block and brick
- Cuts a thread into the mounted surface
- Finished head appearance

- Available in special 3/8" & 1/2" short version for precast planks
- Available in sizes 1/4" thru 3/4" internal thread diameters

**MULTI-SET DROP-IN**
Pg. 70



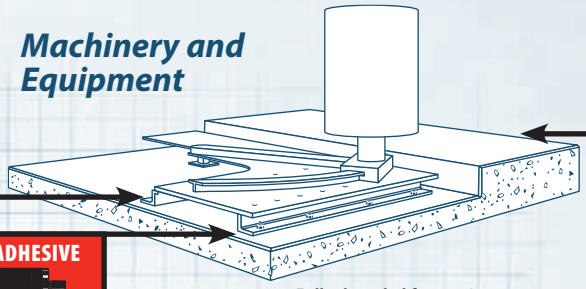
## Suspended Pipe or Conduit

*For seismic recognition, see ICC-ES evaluation reports.*
*For installation guidelines for your application, please contact our Technical Services Department at 1-800-848-5611.*

# Mechanical Contractor Applications

**NOTE:**
*C6+ can be used for **oversized** holes when repairing pumps and machinery anchoring.*

## Machinery and Equipment



Pg. 64
**LDT**
- Removable

Pg. 39
**C6+ ADHESIVE**
- High Load Capacity
- Suitable for use close to edge of slab
- Ideal for moderate to hot climates
- Can be used for oversized holes

Pg. 23
**A7+ ADHESIVE**
- Vibration resistant
- Quick-Cure

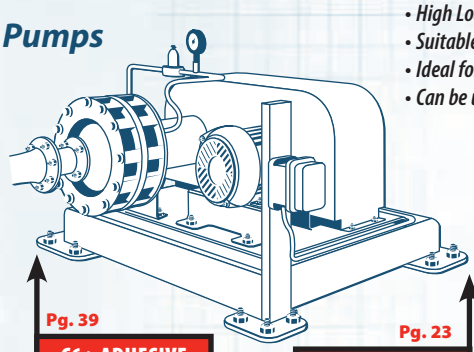
- Fully threaded for maximum versatility
- Carbon steel, hot dipped galvanized or stainless steel available

**TRUBOLT**
Pg. 58

- Simple to install–drill hole and screw in
- Fire resistant

**TAPCON**
Pg. 78

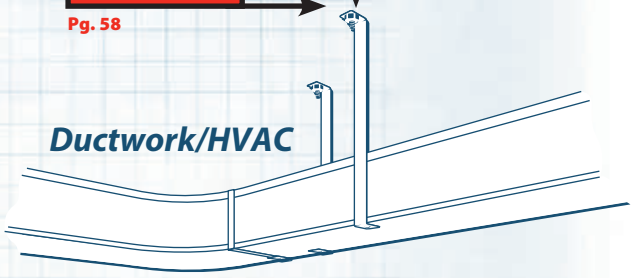
## Pumps



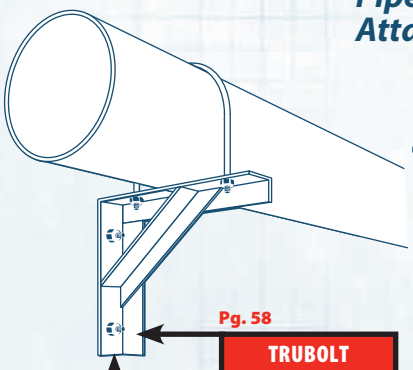
Pg. 39
**C6+ ADHESIVE**
- Corrosion resistant
- Vibration resistant
- NSF Approved

Pg. 23
**A7+ ADHESIVE**
- Quick -Cure
- Vibration Resistant

## Ductwork/HVAC



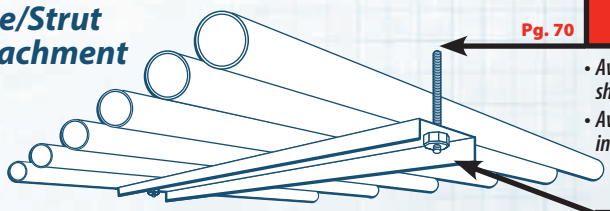
## Heavy-Duty Pipe Support



Pg. 58
**TRUBOLT**
- Fully threaded for maximum versatility
- Carbon steel, hot dipped galvanized or stainless steel available

Pg. 39
**C6+ ADHESIVE**
- High load capacity
- Corrosion resistant
- NSF Approved

## Pipe/Strut Attachment



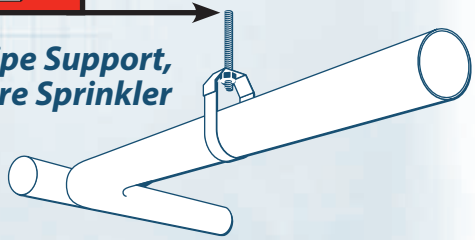
Pg. 70
**MULTI-SET DROP-IN**
- Available in special 3/8" & 1/2" short version for precast planks
- Available in sizes 1/4" thru 3/4" internal thread diameters

Pg. 58
**TRUBOLT**
- Fully threaded for maximum versatility
- Carbon steel, hot dipped galvanized or stainless steel available

- Available in special 3/8" & 1/2" short version for precast planks
- Available in sizes 1/4" thru 3/4" internal thread diameters

Pg. 70
**MULTI-SET DROP-IN**

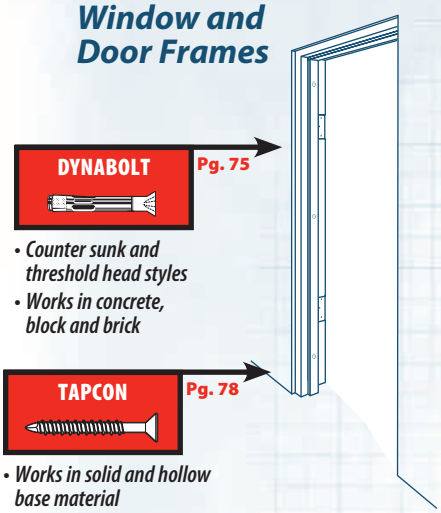
## Pipe Support, Fire Sprinkler



*For seismic recognition, see ICC-ES evaluation reports.*
*For installation guidelines for your application, please contact our Technical Services Department at 1-800-848-5611.*

# Drywall Contractor & Carpenter Applications

## Window and Door Frames



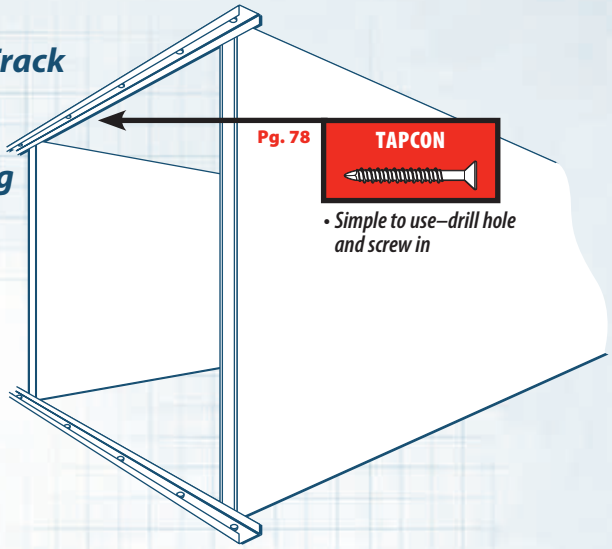
**DYNABOLT** Pg. 75

- Counter sunk and threshold head styles
- Works in concrete, block and brick

**TAPCON** Pg. 78

- Works in solid and hollow base material
- Removable
- Can be set flush with Phillips head if counter sunk

## Drywall Track



### Ceiling Track

Pg. 78

**TAPCON**

- Simple to use–drill hole and screw in

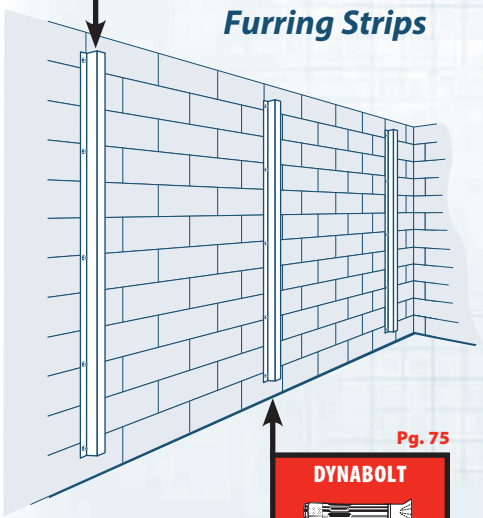
### Floor Track

Pg. 78

**TAPCON**

- Counter sunk flathead style for flush installation
- Works in concrete or block
- Available in 3/16" and 1/4" diameters

## Furring Strips

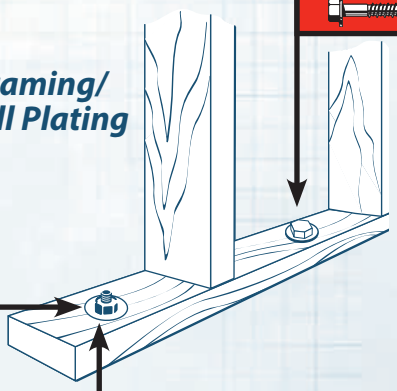


Pg. 75

**DYNABOLT**

- Counter sunk and threshold head styles
- Works in concrete, block and brick

## Framing/ Sill Plating



- Drill hole, install by hand or impact wrench

**LDT** Pg. 64

Pg. 58

**TRUBOLT**

- Fully threaded for maximum versatility
- Carbon steel, hot dipped galvanized or stainless steel available

Pg. 39

**C6+ ADHESIVE**

- High load capacity
- Corrosion resistant
- NSF Approved
- Used for slower cure projects

Pg. 23

**A7+ ADHESIVE**

- Fast cure
- Works in damp wet conditions
- Use A7+ with threaded rod for this appplication

*For seismic recognition, see ICC-ES evaluation reports.*

*For installation guidelines for your application, please contact our Technical Services Department at 1-800-848-5611.*

# Acoustical Ceiling Installer *Applications*

- *Single piece design*
- *Drill hole, hammer wedge into hole, pull down with claw hammer*

**TIE WIRE WEDGE**

Pg. 58

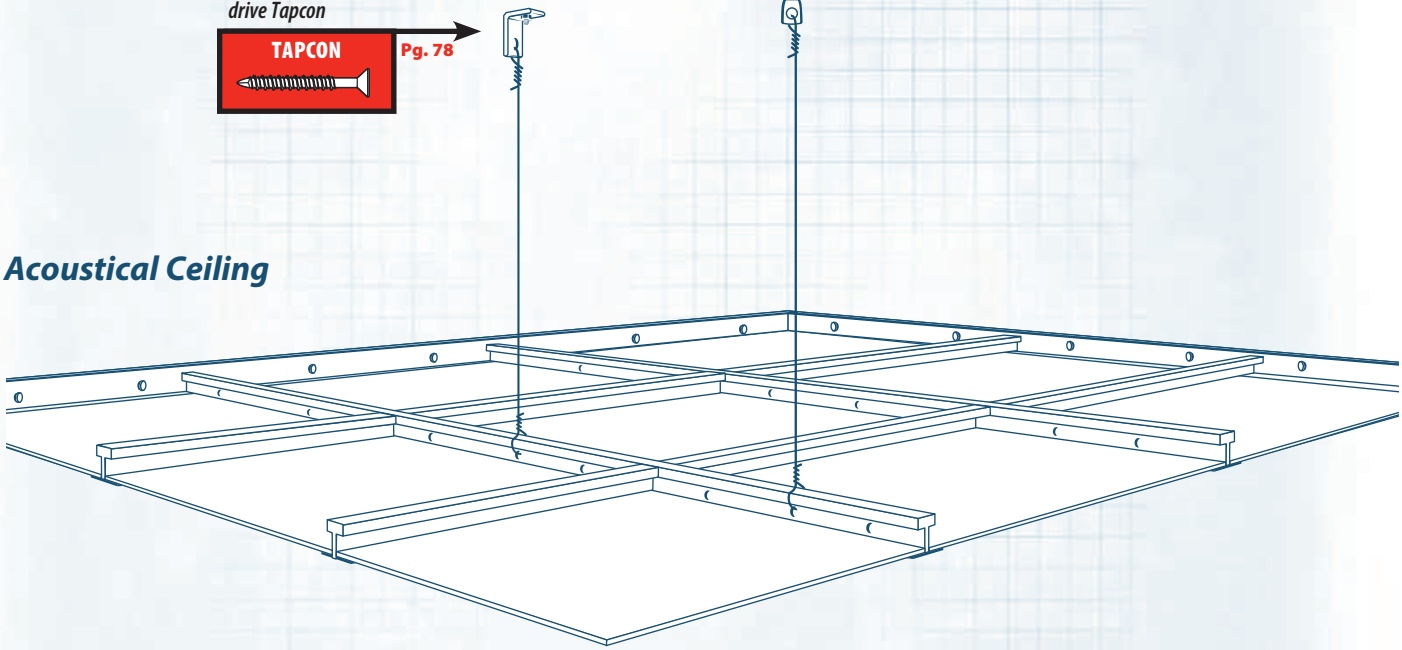
- *Tapcon used with angle clip*
- *Simple to use, drill hole and drive Tapcon*

**TAPCON**



Pg. 78

## *Acoustical Ceiling*

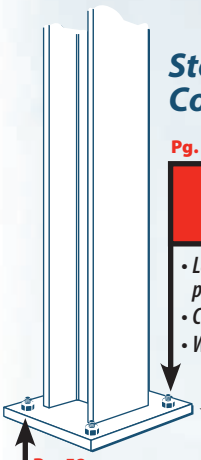


***For seismic recognition, see ICC-ES evaluation reports.***

***For installation guidelines for your application, please contact our Technical Services Department at 1-800-848-5611.***

# Steel Erector Applications

## Steel Beams/ Columns



Pg. 39

**C6+ ADHESIVE**

- Longer working time for positioning of steel
- Can be used in oversized holes
- Works in wet/damp conditions

Pg. 23

**A7+ ADHESIVE**

- Ideal for closely spaced groups of anchors

Pg. 58

**TRUBOLT**

- Fully threaded for maximum versatility
- Carbon steel, hot dipped galvanized or stainless steel available

## Stairs and Ladders

- Fully threaded for maximum versatility
- Carbon steel, hot dipped galvanized or stainless steel available

**TRUBOLT**

Pg. 58

Pg. 23

**A7+ ADHESIVE**

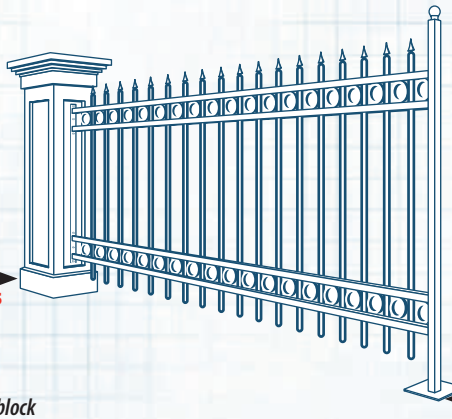
- Fast cure
- Works in damp wet conditions
- Use A7+ with threaded rod for this appplication

Pg. 64

**LDT**

- Finished head
- Removable
- For use in concrete

## Ornamental Iron



**DYNABOLT**

Pg. 75

- Multiple head styles
- Ideal for concrete, brick and block
- Carbon and stainless steel

Pg. 23

**A7+ ADHESIVE**

- Fast cure
- Works in damp wet conditions
- Use A7 with threaded rod for this appplication

## Hand Railings

- Fully threaded for maximum versatility
- Carbon steel, hot dipped galvanized or stainless steel available

**TRUBOLT**

Pg. 58

Pg. 23

**A7+ ADHESIVE**

- Quick cure
- Works in damp wet conditions
- Works in concrete & masonry

**DYNABOLT**

Pg. 75

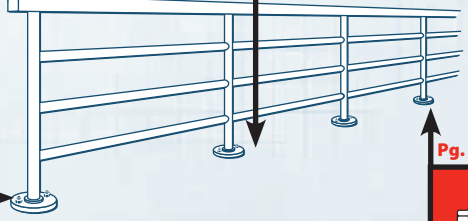
- Multiple head styles
- Ideal for concrete, brick and block
- Carbon and stainless steel

## Protective Railings and Fencing

- Fully threaded for maximum versatility
- Carbon steel, hot dipped galvanized or stainless steel available

**TRUBOLT**

Pg. 58



Pg. 64

**LDT**

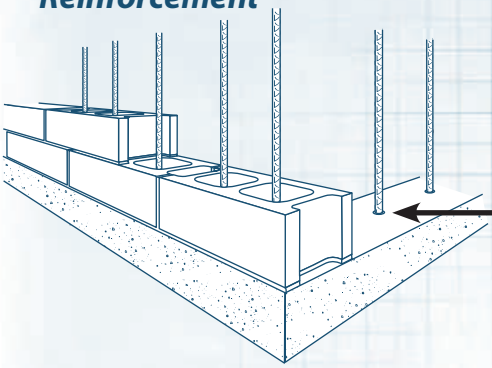
- Finished head
- Removable
- For use in concrete

*For seismic recognition, see ICC-ES evaluation reports.*

*For installation guidelines for your application, please contact our Technical Services Department at 1-800-848-5611.*

# Concrete & Masonry Contractor Applications

## Concrete Block Reinforcement



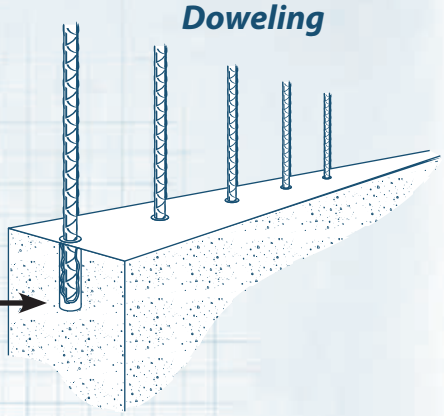
- NSF /ANSI 61
- Vibration resistant
- Corrosion resistant

Pg. 39 **C6+ ADHESIVE**

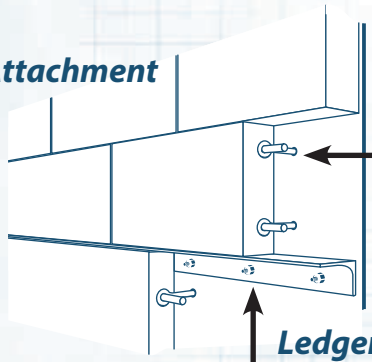
Pg. 23 **A7+ ADHESIVE**

- Fast curing adhesive–ideal for moderate to cold climates

## Rebar Doweling



## Stone Attachment



Pg. 23 **A7+ ADHESIVE**

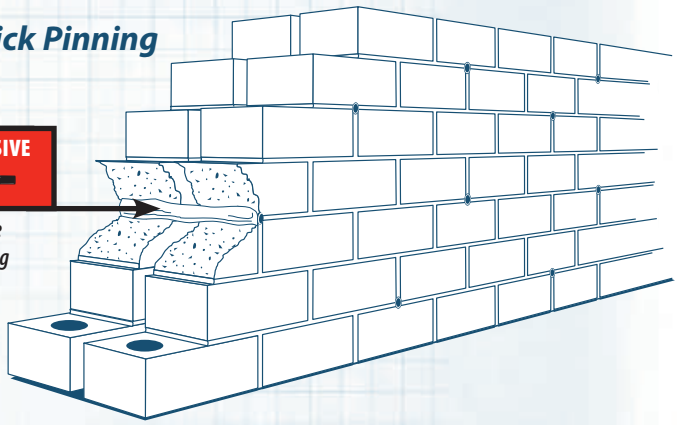
- Compact space
- No-drip–no sag formula
- Easy clean up

Pg. 58 **TRUBOLT**

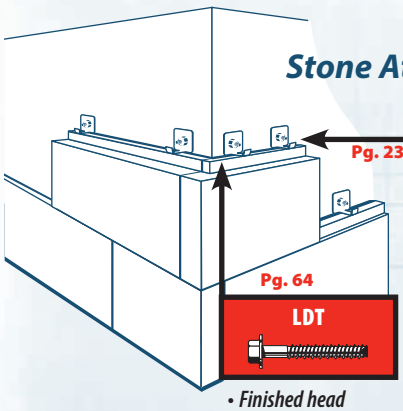
## Ledger Angle Attachment

- Fully threaded for maximum versatility
- Carbon steel, hot dipped galvanized or stainless steel available

## Brick Pinning



## Stone Attachment



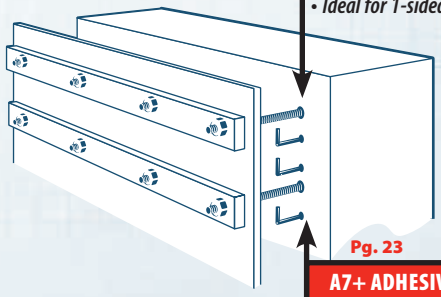
Pg. 23 **A7+ ADHESIVE**

- High load capacity in concrete block
- No drip–no sag formula
- Easy clean up

Pg. 64 **LDT**

- Finished head
- Removable
- For use in concrete

## Concrete Formwork



Pg. 70 **COIL THREAD DROP-IN ANCHOR**

- Designed for 1/2" and 3/4" coil rods
- Ideal for 1-sided forming

Pg. 23 **A7+ ADHESIVE**

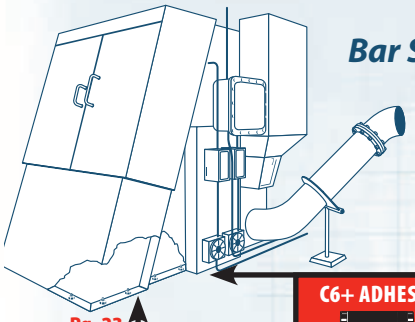
- Fast curing adhesive for rebar doweling

***For seismic recognition, see ICC-ES evaluation reports.***

***For installation guidelines for your application, please contact our Technical Services Department at 1-800-848-5611.***

# Water & Waste Water Treatment *Applications*

## Bar Screens



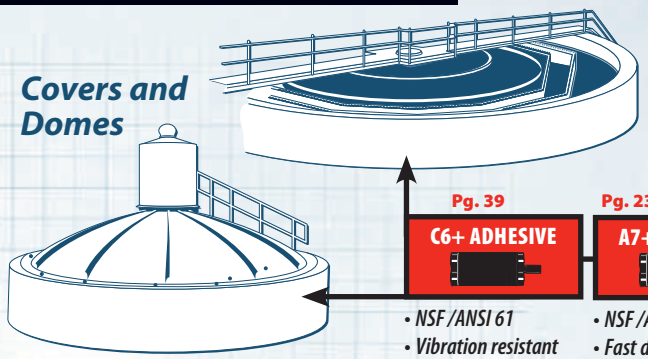
Pg. 23 **A7+ ADHESIVE**

- *Fast dispensing, fast curing adhesive*
- *Works in wet conditions*
- *NSF Approved*

Pg. 39 **C6+ ADHESIVE**

- *NSF /ANSI 61*
- *Vibration resistant*
- *Corrosion resistant*

## Covers and Domes



Pg. 39 **C6+ ADHESIVE**

- *NSF /ANSI 61*
- *Vibration resistant*
- *Corrosion resistant*

Pg. 23 **A7+ ADHESIVE**

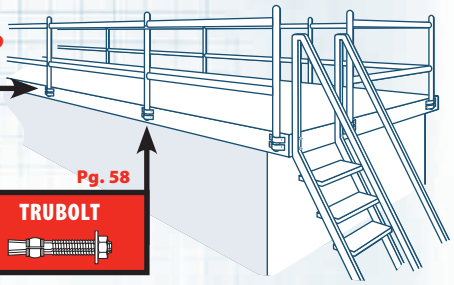
- *NSF /ANSI 61*
- *Fast dispensing, fast curing adhesive*
- *Works with epoxy coated dowels*

## Weirs and Gates

## Railings and Ladders

**A7+/C6+ ADHESIVE** Pg. 23/39

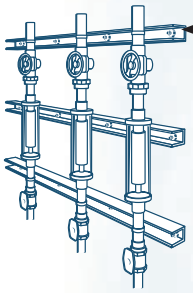
- *NSF /ANSI 61*
- *Vibration resistant*
- *Install close to edge*



Pg. 58 **TRUBOLT**

- *Fully threaded for maximum versatility*
- *Carbon steel, hot dipped galvanized or stainless steel available*

## Instrumentation and Controls



Pg. 58 **TRUBOLT**

- *Fully threaded for maximum versatility*
- *Carbon steel, hot dipped galvanized or stainless steel available*

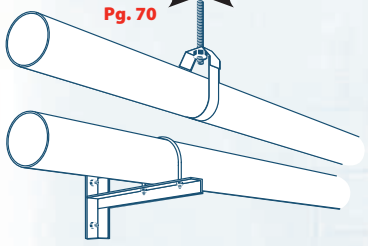
## Pipe Supports

- *Special 3/8" short version for prestressed concrete*
- *Available in 1/4" thru 3/4" internal diameters*
- *Stainless steel available*

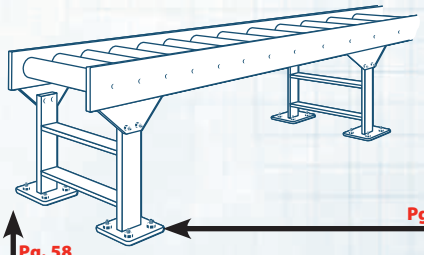
**MULTI-SET DROP-IN** Pg. 70

- *Fully threaded for maximum versatility*
- *Carbon steel, hot dipped galvanized or stainless steel available*

Pg. 58 **TRUBOLT**



## Conveyors



Pg. 64 **LDT**

- *Finished head*
- *Removable*
- *Install by hand or with impact wrench*

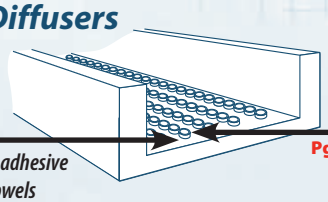
Pg. 58 **TRUBOLT**

- *Fully threaded for maximum versatility*
- *Carbon steel, hot dipped galvanized or stainless steel available*

## Diffusers

Pg. 23 **A7+ ADHESIVE**

- *Fast dispensing, fast curing adhesive*
- *Works with epoxy coated dowels*
- *NSF Approved*



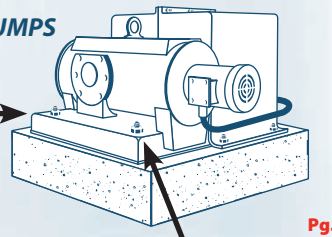
- *NSF /ANSI 61*
- *Vibration resistant*
- *Corrosion resistant*
- *Can be installed underwater*

Pg. 39 **C6+ ADHESIVE**

## Pumps

**C6+ ADHESIVE** Pg. 39

- *NSF /ANSI 61*
- *Vibration resistant*
- *Corrosion resistant*
- *Can be used in oversize holes*



Pg. 58 **TRUBOLT**

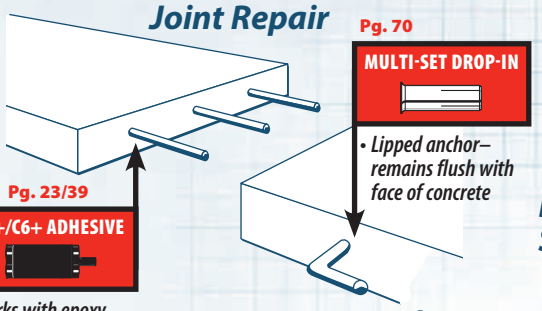
- *Fully threaded for maximum versatility*
- *Carbon steel, hot dipped galvanized or stainless steel available*

***For seismic recognition, see ICC-ES evaluation reports.***

***For installation guidelines for your application, please contact our Technical Services Department at 1-800-848-5611.***

# Highway & Bridge Contractor Applications

## Concrete Pavement Lane Addition and Joint Repair

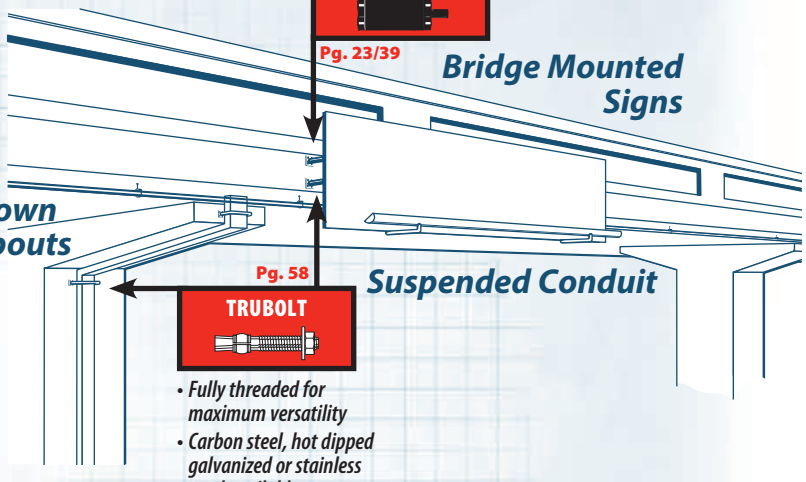


Pg. 70
**MULTI-SET DROP-IN**
- Lipped anchor– remains flush with face of concrete

Pg. 23/39
**A7+/C6+ ADHESIVE**
- Works with epoxy coated dowels

**"J" Bolt**
- With or without lip

## Bridge Mounted Signs



- Can be used overhead

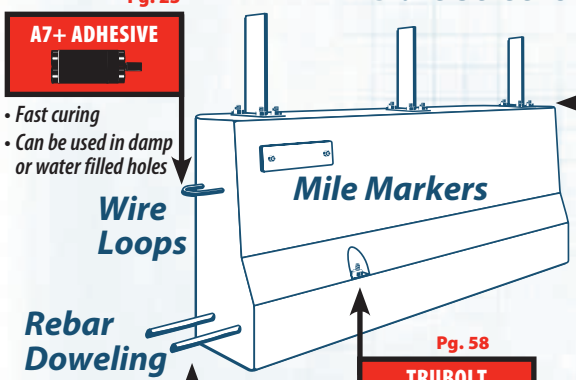
**A7+/C6+ ADHESIVE**
Pg. 23/39

## Down Spouts

## Suspended Conduit

Pg. 58
**TRUBOLT**
- Fully threaded for maximum versatility
- Carbon steel, hot dipped galvanized or stainless steel available

## Glare Screens



Pg. 23
**A7+ ADHESIVE**
- Fast curing
- Can be used in damp or water filled holes

## Wire Loops

## Mile Markers

## Rebar Doweling

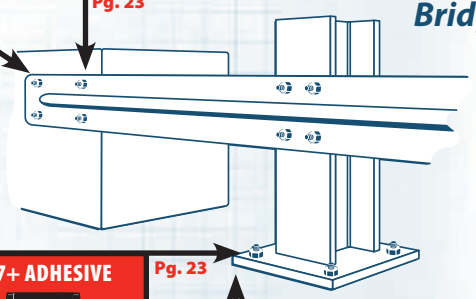
Pg. 23/39
**A7+/C6+ ADHESIVE**
- Can be used in damp or water filled holes

Pg. 58
**TRUBOLT**
- Fully threaded for maximum versatility
- Carbon steel, hot dipped galvanized or stainless steel available

Pg. 58
**TRUBOLT**
Pg. 64
**LDT**
- Finished head
- Removable
- Install by hand or with impact wrench

- Fully threaded for maximum versatility
- Carbon steel, hot dipped galvanized or stainless steel available

## Guard Rail Attachments to Bridges



- Can be used in wet/damp conditions
- Fast cure
- Easy to pump

**A7+ ADHESIVE**
Pg. 23

**A7+ ADHESIVE**
Pg. 23
- Can be used in wet/ damp conditions
- Fast cure
- Easy to pump
- Suitable for use close to edge of slab

## Steel Guard Rail Post Attachment to Concrete

Pg. 39
**C6+ ADHESIVE**
- High Load Capacity
- Suitable for use close to edge of slab
- Ideal for moderate to hot climates
- Can be used for oversized holes

## Temporary Fastening of Jersey Barriers to Concrete

*For seismic recognition, see ICC-ES evaluation reports.*
*For installation guidelines for your application, please contact our Technical Services Department at 1-800-848-5611.*

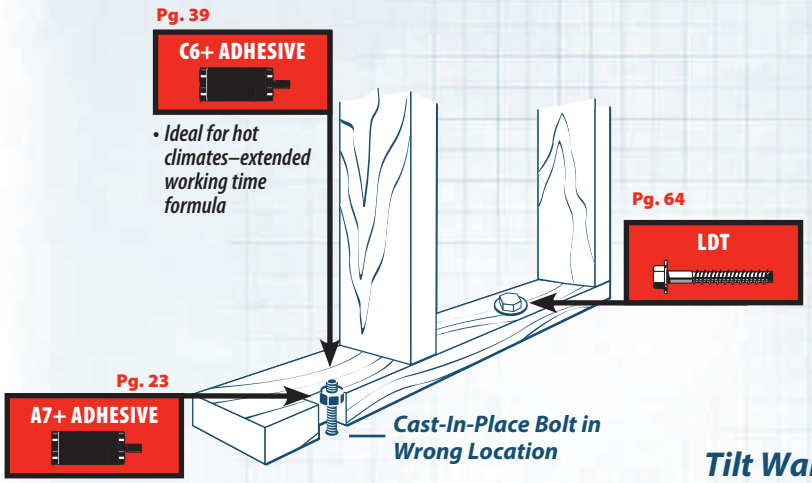
---

# Department of Transportation Approvals & Listings

*For approvals contact local engineering on a per project basis.*
*Call your local RED HEAD sales person for more information.*

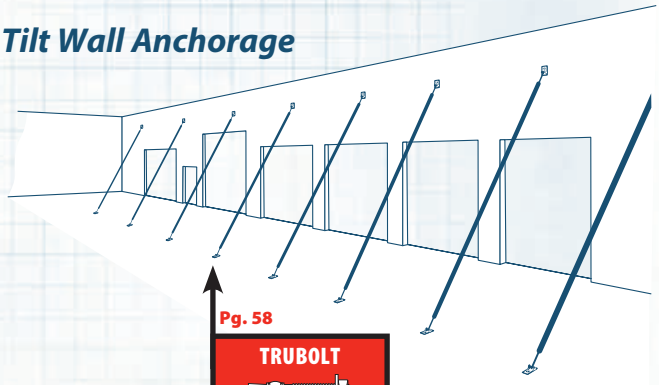
# General Contractor Applications

## Replacement of Misplaced Anchors



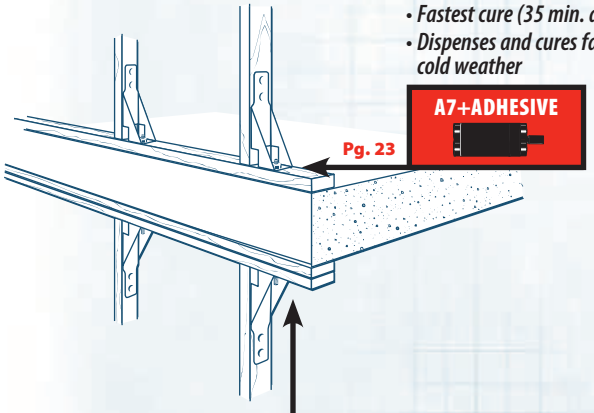

- Damp holes or underwater
- Dispenses and cures faster in cold weather

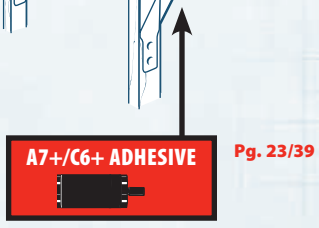
## Tilt Wall Anchorage




- Fully threaded for maximum versatility
- Carbon steel, hot dipped galvanized or stainless steel available

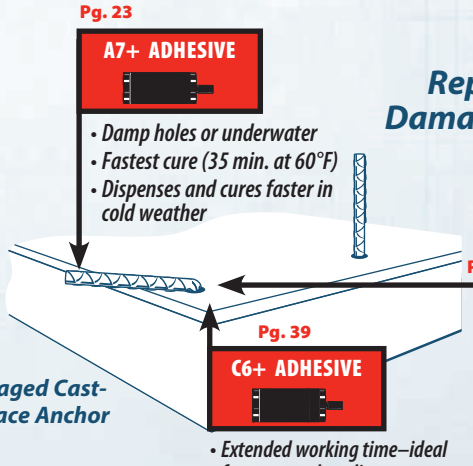
## Seismic Hold Downs




- High Load Capacity
- Suitable for use close to edge of slab
- Ideal for moderate to hot climates
- C6+ can be used for oversized holes

## Replacement of Damaged Anchors

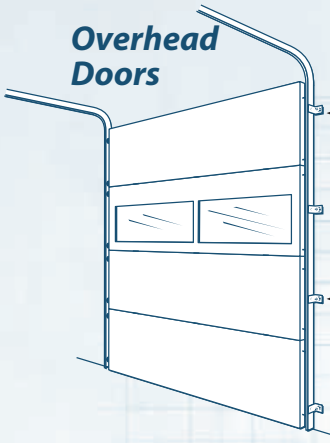



- NSF Approved
- Vibration resistant
- Corrosion resistant
- Can be used in oversize holes
- Extended working time–ideal for warm to hot climates
- Can be used in oversize holes

*For seismic recognition, see ICC-ES evaluation reports.*
*For installation guidelines for your application, please contact our Technical Services Department at 1-800-848-5611.*

# Material Handling *Applications*

## Overhead Doors



Pg. 64 → **LDT**
- Hand installation block or concrete

Pg. 23/50 → **A7+ ADHESIVE WITH UMBRELLA**
- High load in hollow block or concrete

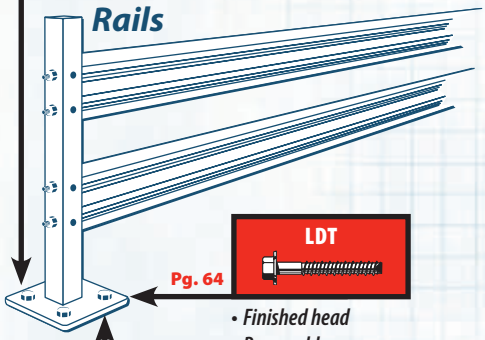
## Shelving

- Removable
- Easy to install
- Single piece design

Pg. 64 → **LDT**

Pg. 58 → **TRUBOLT**
- Fully threaded for maximum versatility
- Available in carbon steel, hot dipped galvanized or stainless steel

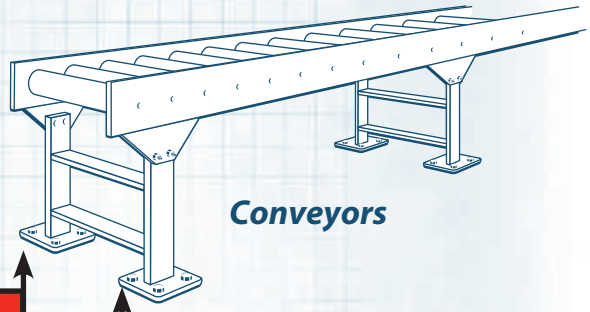
## Rails



Pg. 64 → **LDT**
- Finished head
- Removable
- Installs with impact wrench

Pg. 23 → **A7+ ADHESIVE**
- Fast curing
- Impact resistant
- Non-sag formula

## Conveyors



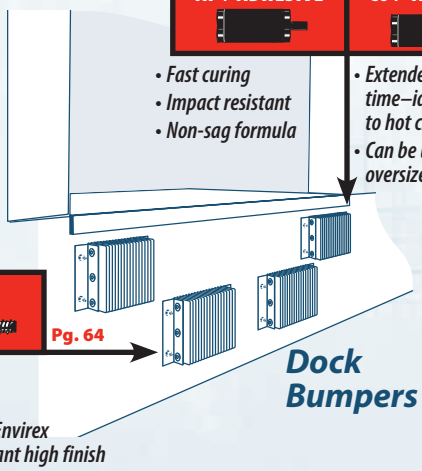
Pg. 64 → **LDT**
- Finished head
- Removable
- Installs with impact wrench
- Single piece design

Pg. 58 → **TRUBOLT**
- Fully threaded for maximum versatility
- Available in carbon steel, hot dipped galvanized or stainless steel

Pg. 23 → **A7+ ADHESIVE**
- Fast curing
- Impact resistant
- Non-sag formula

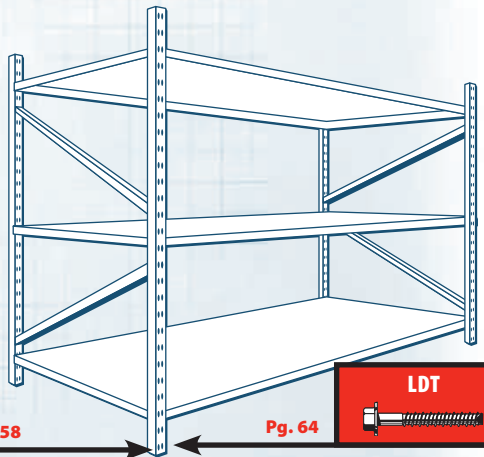
Pg. 39 → **C6+ ADHESIVE**
- Extended working time–ideal for warm to hot climates
- Can be used in oversize holes

## Dock Bumpers



Pg. 64 → **LDT**
- Finished head
- Removable
- Available with Envirex corrosion resistant high finish

## Racks



Pg. 58 → **TRUBOLT**
- Fully threaded for maximum versatility
- Available in carbon steel, hot dipped galvanized or stainless steel

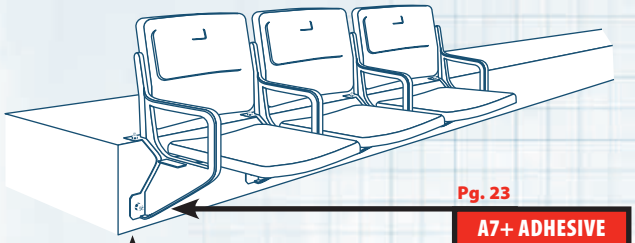
Pg. 64 → **LDT**
- Finished head
- Removable
- Installs with impact wrench
- Single piece design

***For seismic recognition, see ICC-ES evaluation reports.***

***For installation guidelines for your application, please contact our Technical Services Department at 1-800-848-5611.***

# Specialty Applications

## Stadium Seating



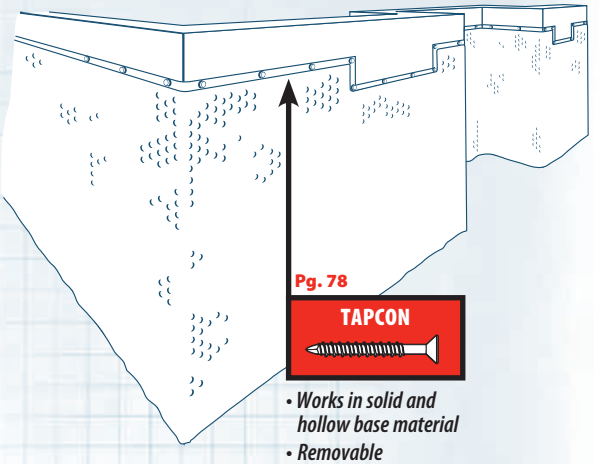
Pg. 23
**A7+ ADHESIVE**

- Corrosion resistant
- Normal weight or lightweight concrete
- Used in major stadiums across the country

Pg. 58
**TRUBOLT**

- Fully threaded for maximum versatility
- Available in carbon steel, hot dipped galvanized or stainless steel

## Foundation Wrap



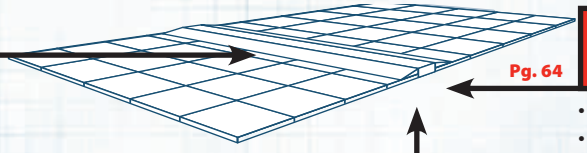
Pg. 78
**TAPCON**

- Works in solid and hollow base material
- Removable

## Expansion Joints

**TRUBOLT**
Pg. 58

- Fully threaded for maximum versatility
- Available in carbon steel, hot dipped galvanized or stainless steel



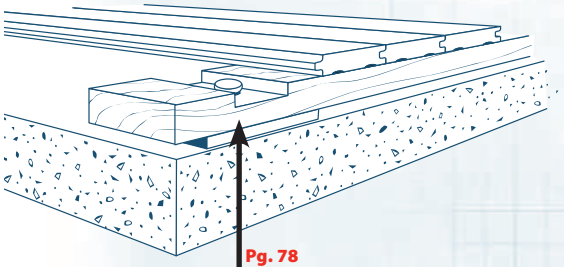
**LDT**
Pg. 64

- Finished head
- Removable
- Installs by hand or with impact wrench

Pg. 39
**C6+ ADHESIVE**

- High load capacity
- Suitable for use close to edge of slab

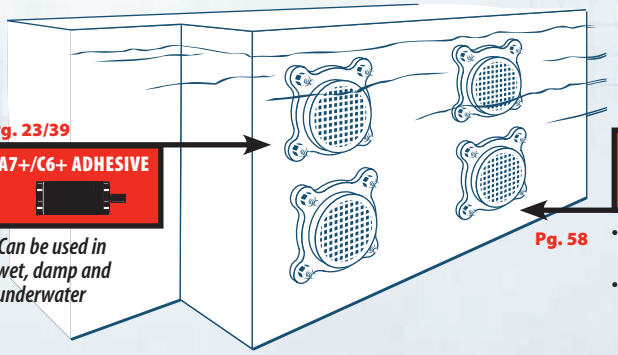
## Flooring Systems



Pg. 78
**TAPCON**

- Works in solid and hollow base material
- Removable
- Can be set flush with Phillips head if countersunk

## Underwater Installation



Pg. 23/39
**A7+/C6+ ADHESIVE**

- Can be used in wet, damp and underwater

**TRUBOLT**
Pg. 58

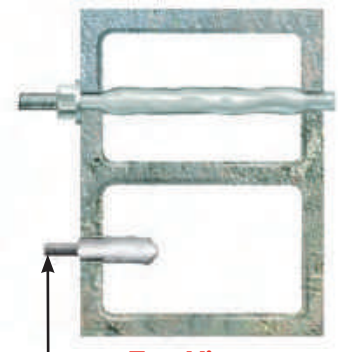
- Fully threaded for maximum versatility
- Available in carbon steel, hot dipped galvanized or stainless steel

*For seismic recognition, see ICC-ES evaluation reports.*
*For installation guidelines for your application, please contact our Technical Services Department at 1-800-848-5611.*

RED HEAD®
CONCRETE ANCHORING SPECIALISTS

# The Inside Story About Mechanical and Adhesive Anchors

## Types, Base Materials, Installation Procedures and More



Top View

For attachments to single face of block, see page 60 for information on "umbrella anchors" and "short screens"

### HOLLOW CONCRETE BLOCK

Maximum holding strength in concrete block can be obtained by fastening to both the front and back of the block using an adhesive screen tube and threaded rod.

## TYPES OF ANCHORS

### Expansion Type—

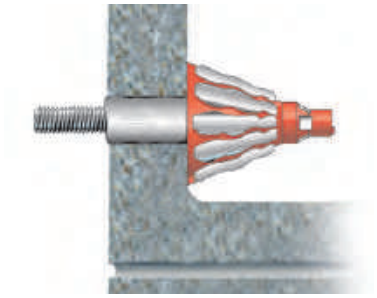
Tension loads are transferred to the base material through a portion of the anchor that is expanded inside the drill hole.

**Examples:** Red Head Trubolt, Dynabolt Sleeve Anchor and Multi-Set II Drop-In Anchor

### Adhesive Type—

Resistance to tension loads is provided by the presence of an adhesive between the threaded rod (or rebar) and the inside walls of the drill hole.

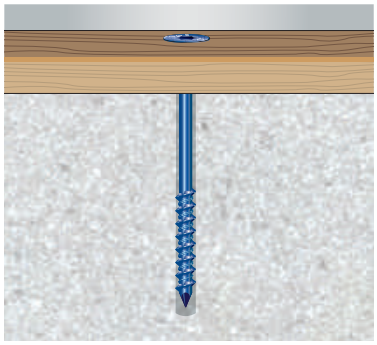
**Examples:** A7+and C6+ Adhesives



### Keying Type—

Holding strength comes from a portion of an anchor that is expanded into a hollow space in a base material that contains voids such as concrete block or brick.

**Examples:** Adhesive Umbrella Anchors

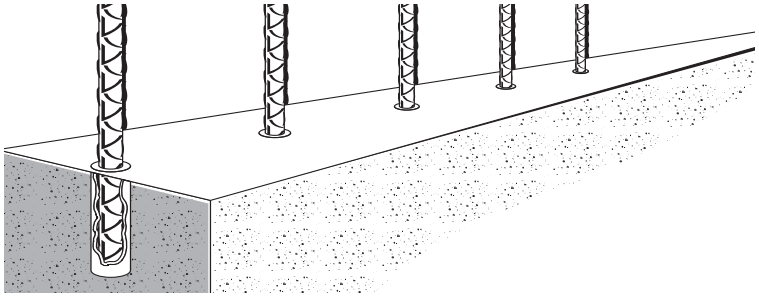


### Screw Type—

Tension loads are resisted by threads on the fastener engaging with grooves cut into the base material.

**Examples:** LDT, Tapcon and E-Z Ancors

## BASE MATERIALS



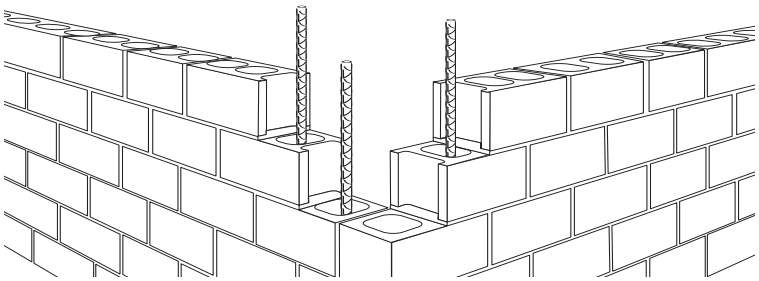
# Concrete

**Normal Weight Concrete** is made from Portland cement, coarse and fine aggregates, water and various admixtures. The proportioning of these components controls the strength of the concrete. In the United States, concrete strength is specified by the compressive strength* of concrete test cylinders. These test cylinders measure six inches in diameter by 12 inches in length and are tested on the 28th day after they are produced.

**Lightweight Concrete** consists of the same components (cement, coarse and fine aggregates, water and admixtures) as normal weight concrete, except it is made with lightweight aggregate. One of the most common uses of lightweight concrete has been as a structural fill of steel decking in the construction of strong, yet light floor systems.

Typical fasteners for both normal weight and lightweight concrete include Trubolt Wedge Anchors, LDT Self-Threading Anchors, Dynabolt Sleeve Anchors, Multi-Set II Drop-In Anchors and Adhesive Anchoring Systems.

* Compressive strengths shown in this catalog were the actual strengths at the time of testing. The load values listed were determined by testing in un-reinforced concrete.



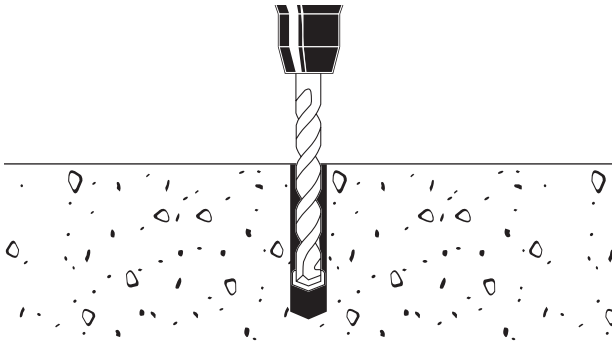
# Masonry

**Grout-Filled Concrete Block** consists of three components: concrete, mortar and grout. The mortar is designed to join the units into an integral structure with predictable performance properties. Typical fasteners for grout-filled block include Dynabolt Sleeve Anchors, A7+ and C6+ Adhesive Anchoring Systems.

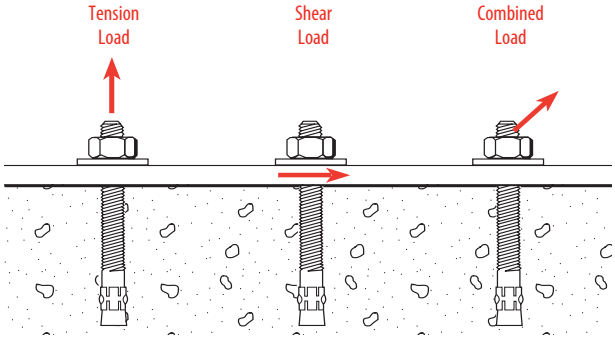
**Hollow Concrete Block, Brick and Clay Tile** are grouped together because they require special anchoring products that can be installed into a substrate that contains voids and still provide reliable holding values. Typical fasteners used in hollow block, brick and clay tile include Dynabolt Sleeve Anchors, Tapcon Self-Tapping Concrete Anchors, Adhesives with Screen Tubes and Adhesives used with the Umbrella Anchor.

## INSTALLATION PROCEDURES

Anchor drill holes are typically produced using carbide tipped drill bits and rotary hammer drills. Look at the product sections of this catalog for the correct drill hole diameter and depth of each type of anchoring system.



Careful cleaning of the anchor drill hole is important in order to obtain the best possible functioning of the anchor system. For each product in this catalog, detailed installation instructions are provided. Suggested clamping force and curing times (for adhesive anchors) are also provided.



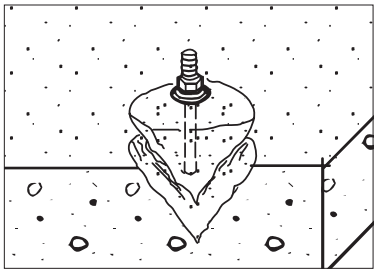

# Loading

Holding values for the following types of loading are provided in this catalog:

- ***Tension loads—***
  when load is applied along the axis of the anchor
- ***Shear loads—***
  when the loads are applied perpendicular to the axis of the anchor
- ***Combined loads—***
  when both tension and shear loads are applied to an anchor, a combined loading equation is provided to determine the maximum loads that can be applied to the anchor at the same time

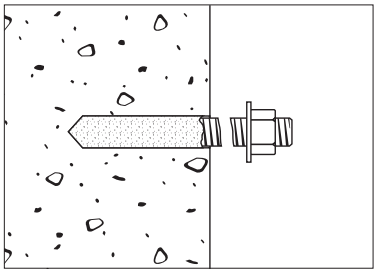
## MODES OF FAILURE

When anchors are loaded to their maximum capacity, several different types (modes) of failure are possible depending on the type of anchor, strength of the base material, embedment depth, location of the anchor, etc. Common modes of failure include:



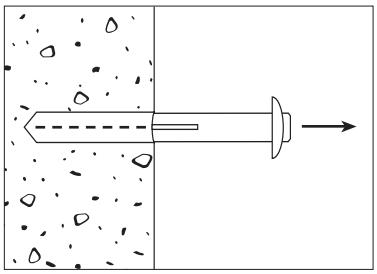
### Concrete Spall Cone—

Occurs at shallow embedments where the resistance of the base material is less than the resistance of the anchor and the base material fails.



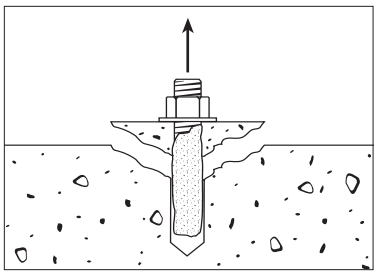
### Steel Breakage—

The capacity of the anchorage exceeds the tensile or shear strength of the steel anchor or rod material.



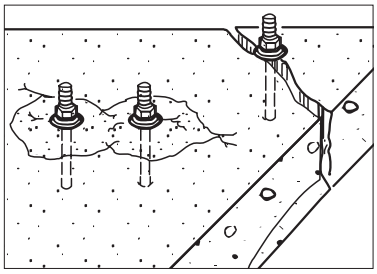
### Anchor Pullout—

Base material adjacent to the extension portion of an anchor crushes, resulting in the anchor pulling out of the hole until the capacity of the spall cone is reached, at which point the concrete will spall. This type of failure happens more commonly when anchors are set with deep embedment depths.



### Bond Failure—

Shear failure of the adhesive at rod-adhesive interface or adhesive-base material interface. Occurs more commonly in deep embedments using high strength steel rods.



### Edge Distance and Spacing Reduction—

Reduces the holding values, when anchors are placed too close to the edge. This also occurs when two or more anchors are spaced closely together. See suggested edge distance, anchor spacing distances and reduction values in the product sections.

# Anchoring
## Selection Chart

| Anchor Selection Chart | | Adhesive Anchors | | Screw Anchors | | Expansion Anchors | |
|---|---|---|---|---|---|---|---|
| | | | | | | Torque-Set | |
| | | A7+ | C6+ | LDT | Tapcon | Trubolt | Dynabolt |
| Base Material | Uncracked Concrete | A7+ | C6+ | LDT | TAP | TRU | DYNA |
| | Cracked Concrete | A7+ | C6+ | | | | |
| | Lightweight Concrete | A7+ | C6+ | | TAP | TRU | DYNA |
| | Lightweight Concrete on Metal Deck | | | LDT | | TRU | |
| | Hollow Core Concrete | | | | | | |
| | Grout Filled Concrete Block | A7+ | C6+ | LDT | | | DYNA |
| | Hollow Concrete Block | A7+ | C6+ | LDT | TAP | | DYNA |
| | Solid Brick | A7+ | C6+ | | | | |
| | Drywall | | | | | | |
| Hole Conditions | Oversized Holes | | C6+ | | | | |
| | Water Saturated Concrete | A7+ | C6+ | LDT | | TRU | DYNA |
| | Water-filled Holes | A7+ | C6+ | LDT | | TRU | DYNA |
| | Submerged | A7+ | C6+ | | | | |
| | No Hole Cleaning Procedures | | | | | | |
| Application Requirements | Through Fixture Fastening | A7+ | C6+ | LDT | TAP | TRU | DYNA |
| | Immediate Loading | | | LDT | TAP | TRU | DYNA |
| | Finished Head or Flush Surface | | | LDT | TAP | | DYNA |
| | Easy to Remove | | | LDT | TAP | | |
| | Seismic | A7+ | C6+ | | | | |
| | Cyclic Loading | A7+ | C6+ | | | TRU | |
| | High Temperature Resistance | A7+ | C6+ | LDT | TAP | TRU | DYNA |
| | Sustained Load | A7+ | C6+ | LDT | TAP | TRU | DYNA |
| Corrosion Resistance | Zinc Plated | A7+ | C6+ | | | TRU | DYNA |
| | Hot-Dipped Galvanized | A7+ | C6+ | | | TRU | |
| | 304 Stainless Steel | A7+ | C6+ | | | TRU | DYNA |
| | 316 Stainless Steel | A7+ | C6+ | | | TRU | |
| | 410 Stainless Steel | A7+ | C6+ | LDT | TAP | | |
| | Trade Secret Coating | | | LDT | TAP | | |
| Anchor Diameters | 3/16" | | | | TAP | | |
| | 1/4" | A7+ | | | TAP | TRU | DYNA |
| | 5/16" | | | | TAP | | DYNA |
| | 3/8" | A7+ | C6+ | LDT | | TRU | DYNA |
| | 1/2" | A7+ | C6+ | LDT | | TRU | DYNA |
| | 5/8" | A7+ | C6+ | LDT | | TRU | DYNA |
| | 3/4" | A7+ | C6+ | LDT | | TRU | DYNA |
| | 7/8" | A7+ | C6+ | | | | |
| | 1" | A7+ | C6+ | | | | |
| | 1-1/4" | A7+ | C6+ | | | | |
| | Rebar Sizes | #3-11 | #3-11 | | | | |
| At 70°F | Working Time (minutes) | 5 | 16 | | | | |
| | Cure Time (minutes) | 45 | 390 | | | | |

# ➤ FREE SOFTWARE!

# truspec➤
## ANCHOR CALCULATION SOFTWARE 3.0

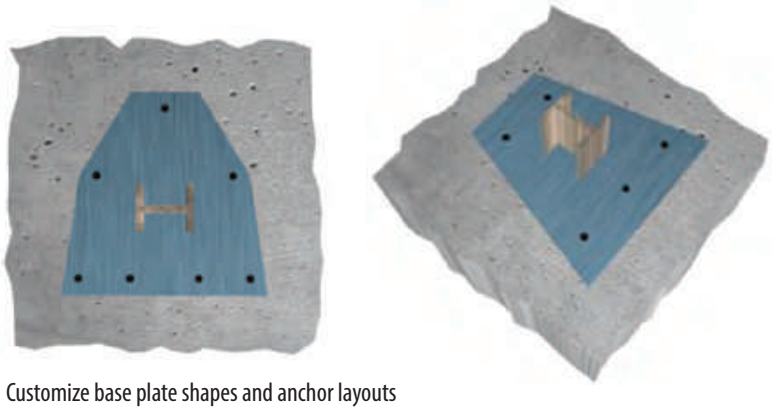
**The most user-friendly anchor design software is now even better, allowing you to do more types of anchor designs from anywhere, be that in the office or out on the jobsite.**

### NEW! Access cloud-based Truspec 3.0 via web browser from your computer or mobile device

- Cloud-based version means users always have access to the latest features, without the hassle of installing updates.
- Can access from 4G mobile devices even without wifi internet connection

### Versatile – do everything in one package

- **NEW** Supports cast-in as well as post-installed anchor design
- **NEW** Supports anchoring to masonry as well as concrete substrates
- **NEW** Allows you to customize base plate shapes and anchor layouts



Customize base plate shapes and anchor layouts

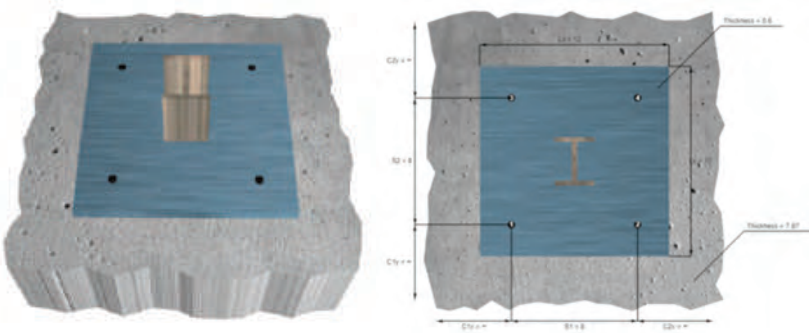
### Accurate, reliable, code-compliant anchor designs

- **NEW** Supports ACI318 Strength Design method for concrete, including cracked and seismic conditions.
- Also supports anchor design in accordance with Canada CSA standards.
- **NEW** Truspec 3.0 lets you enter multiple load combinations and calculates the worst-case controlling combination for you
- **NEW** Truspec 3.0 checks your base plate design using finite element analysis to ensure adequate rigidity

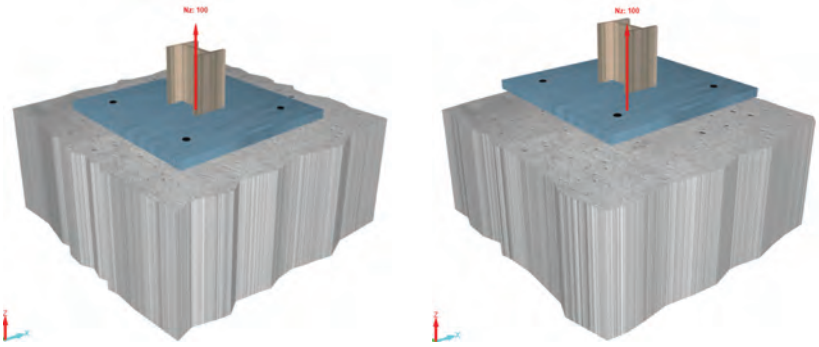

Quickly enter multiple load combinations and determine the controlling combo

## Intuitive, easy to use

- Consistently ranked by designers as one of the simplest anchor design programs to learn and use, Truspec 3.0 walks you through the anchor design and selection process in six easy steps – saving time and preventing errors
- Customizable templates are provided for common anchoring applications like base plates, end plates and safety railings
- Graphical user interface provides 2D and 3D design views making it easy to visualize all design elements at a glance
- Tooltip messages provide helpful information whenever the cursor is positioned over an element on the user interface
- Animated indicators simplify and speed the input of tensile, shear and moment load values
- Truspec allows you to filter anchor recommendations by type, diameter, steel grade, etc. Truspec also ranks the viable options to show which are the most efficient from a capacity utilization perspective



View anchor designs in 2D or 3D perspective



Animated display graphically shows load direction

**The NEW, enhanced design report shows all inputs, formulas, and calculations with relevant standards citations, plus complete anchor product info and installation instructions**

***➤ Truspec 3.0 is a FREE web-based program that provides sophisticated anchor design support to structural and nonstructural engineers.***

***visit:***
***www.itwredhead.com/truspec***

## USE TRUSPEC 3.0 SOFTWARE WITH THE FOLLOWING POPULAR ANCHORING PRODUCTS:

### CHEMICAL ANCHORING ADHESIVES

➤ **Red Head A7+ Adhesive**
- The most versatile quick cure
- Fast-curing, all-weather hybrid adhesive

➤ **Red Head C6+ Adhesive**
- For the most demanding applications
- Maximum strength epoxy adhesive

### POST-INSTALLED MECHANICAL ANCHORS

➤ **Trubolt Wedge Anchors**
- Dependable, heavy-duty expansion anchor

➤ **Tapcon and Tapcon+ Screw Anchors**
- Fast installation with reliable holding power

➤ **Sammys Threaded Rod Hangers**
- Accomodates vertical, horizontal and angled attachments

### CAST-IN ANCHORS

➤ **Hex and heavy hex head bolts**

➤ **Square and heavy square head bolts**

RED HEAD®
ADHESIVE ANCHORING SPECIALISTS

# Adhesive Anchoring Selection Guide


Doweling into Concrete with Rebar


Fastening to Concrete with Threaded Rod

## Solid Concrete Applications

### A7+ *The Most Versatile Quick Cure*

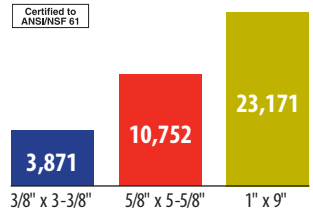
**Works in more applications than the competition**

**5 fluid oz. (150 ml) kit, 9.5 fluid oz. (280 ml) and 28 fluid oz. (825 ml) cartridges**


- The only quick-cure ICC-ES listed for use in all wet conditions
- For use in concrete, block, brick, and clay tile. Solid or hollow base materials
- Cures in only 45 minutes (at substrate temperature of 70°F/21°C)
- ICC-ES listing for cracked concrete and seismic applications (ICC-ES ESR 3903)
- ICC-ES listing for masonry applications (ICC-ES ESR 3951)
- No drip formula that allows direct-injection overhead installation
- 18 month shelf life
- NSF/ANSI 61

| BASE MATERIAL (F°/C°) | GEL/WORKING TIME | FULL CURE TIME |
|---|---|---|
| 110°/ 43° | 1.5 minutes | 45 minutes |
| 90°/ 32° | 3 minutes | 45 minutes |
| 70°/ 21° | 5 minutes | 45 minutes |
| 50°/ 10° | 15 minutes | 90 minutes |
| 30°/ -1° | 35 minutes | 4 hours |
| 14°/ -10° | 35 minutes | 24 hours |

NSF Certified to ANSI/NSF 61




### C6+ *For the Most Demanding Jobs*

**Red Head's highest strength adhesive**

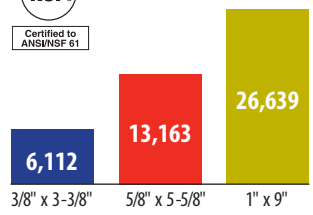
MADE IN USA WITH U.S. AND GLOBAL MATERIALS

**15.2 fluid oz. (450 ml) cartridges and 30.4 fluid oz. (900 ml) cartridges**


- At least 25% stronger than the old C6+ formulation for threaded rod in cracked concrete and with seismic conditions
- Fastest cure time in its class, curing in just 2.75 hours at 90°F and in only 2 hours at 110°F!
- ICC-ES listing for concrete (uncracked and cracked concrete, and seismic conditions) and masonry
- ICC-ES listing for use in core-drill holes, even in cracked concrete
- Can be used in oversized holes
- Can be used in core drilled holes
- Can be used in all wet conditions (saturated, water-filled, and submerged)
- European fire approval
- 24 month shelf life
- NSF/ANSI 61

| BASE MATERIAL (F°/C°) | GEL/WORKING TIME | FULL CURE TIME |
|---|---|---|
| 110°/ 43° | 10 minutes | 2 hours |
| 90°/ 32° | 14 minutes | 2.75 hours |
| 70°/ 21° | 16 minutes | 6.5 hours |
| 50°/ 13° | 30 minutes | 24 hours |
| 40°/ 7° | 46 minutes | 48 hours |

NSF Certified to ANSI/NSF 61

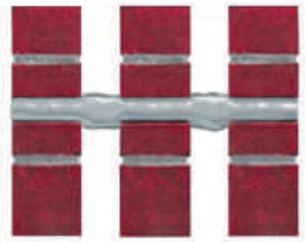



[1] Diameter x Embedment in 4000 psi concrete. All loads given in pounds. Calculated using the ICC-ES threaded rod data in uncracked, dry concrete with periodic inspection. Temperature range A.

*Red head A7+ replaced Epcon A7 and S7. Red Head C6+ replaced Epcon C6+, and Red Head G5+ replaced Epcon G5. For more information on the retired adhesives (Epcon A7, S7, C6+ and G5), please visit www.itwredhead.com

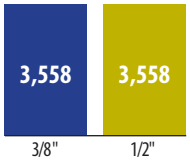
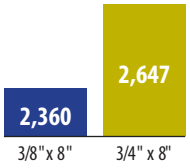
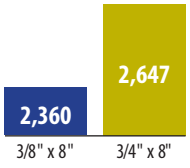
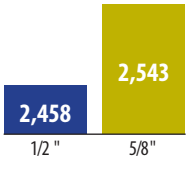
# Hollow Base Material Applications

***Use the following accessories with the A7+ adhesive anchoring system for all of your hollow base material applications.***



Brick Pinning

Fastening to hollow concrete block

| SYSTEM ACCESSORIES | KEY FEATURES | ULTIMATE TENSILE [1, 2] PERFORMANCE (LBS.) |
|---|---|---|
| **Umbrella Anchor**<br>  <br>Umbrella Anchor<br>**Makes it possible to use adhesive for fastening to the face of hollow block or tile** (see page 60-61) | ■ Highest hold in hollow block<br>■ 1/4", 3/8", or 1/2" rods<br>■ Fasten to front face of blocks<br>■ Creates large bearing surface inside block to achieve high loads | A7+<br>  <br> |
| **Nylon Screen Tubes**<br>  <br>**Makes it possible to use adhesive for fastening to hollow block or brick walls** (see page 63) | ■ 3/8" to 3/4" diameter sizes<br>■ 30%-50% lower cost than stainless screens<br>■ Special design makes screens easier to insert through block or brick<br>■ Does not get bent or crushed<br>■ Corrosion resistant | A7+<br>  <br> |
| **Stainless Steel Screen Tubes**<br>  <br>**Makes it possible to use adhesive for fastening to hollow block or brick walls** (see page 63) | ■ 1/4" & 3/4" diameter sizes<br>■ Corrosion resistant | A7+<br>  <br> |
| **Stainless Steel Short Screen Tubes**<br>  <br>**Makes it possible to use adhesive for fastening to the face of hollow block or tile** (see page 61) | ■ 1/4", 3/8", 1/2", 5/8" diameter sizes<br>■ Fasten to front face of block<br>■ Anchor remains perpendicular in wall | A7+<br>  <br> |

[1] Testing performed in hollow concrete block. [2] Diameter x Embedment.

RED HEAD®
ADHESIVE ANCHORING SPECIALISTS

# A7+

# The Most Versatile Quick Cure Adhesive


A7P-10


A7P-28

## APPLICATIONS / USES

- Concrete dowelling (slabs, walls, columns)
- Steel framing (columns, beams, ledgers)
- Brick pinning and CMU reinforcement
- Architectural metal fastening (railings, signage)
- Mechanical, electrical, and plumbing attachment
- Vibratory equipment anchoring
- Overhead and horizontal anchors

## DESCRIPTION

## Quick Curing Hybrid Epoxy Adhesive

RED HEAD A7+ is a high-strength, fast-cure adhesive that is designed to securely anchor threaded rod and rebar to cured concrete and masonry. A7+ is one of the most versatile achoring solutions on the market, suitable for use in an extremely wide range of applications and environmental conditions.

- The only quick-cure ICC-ES listed for use in all wet conditions
- For use in concrete, block, brick, and clay tile. Solid or hollow base materials
- Cures in only 45 minutes (at substrate temperature of 70°F/21°C)
- ICC-ES listed for cracked concrete and seismic applications (ICC-ES ESR 3903)
- ICC-ES listed for masonry applications (ICC-ES ESR 3951)
- No drip formula that allows direct-injection overhead installation
- Low odor - suitable for use indoors and in occupied buildings
- 18-month storage life minimizes waste and risk of using expired product
- Rugged cartridge resists breakage due to rough handling or cold temperatures
- Store between 32ºF and 95ºF in a cool, dry place.

## ADVANTAGES

- All weather formula
- Works in damp holes and underwater applications
- Fast curing time, 45 minutes at 70°F
- ICC-ES Evaluation Report ESR-3903 (Concrete) and ESR-3951 (Masonry)
- NSF 61 Listed, certified for use in conjunction with drinking water systems
- Fast & easy dispensing, even 28 ounce cartridge can be hand dispensed
- Formula for use in solid and hollow base materials

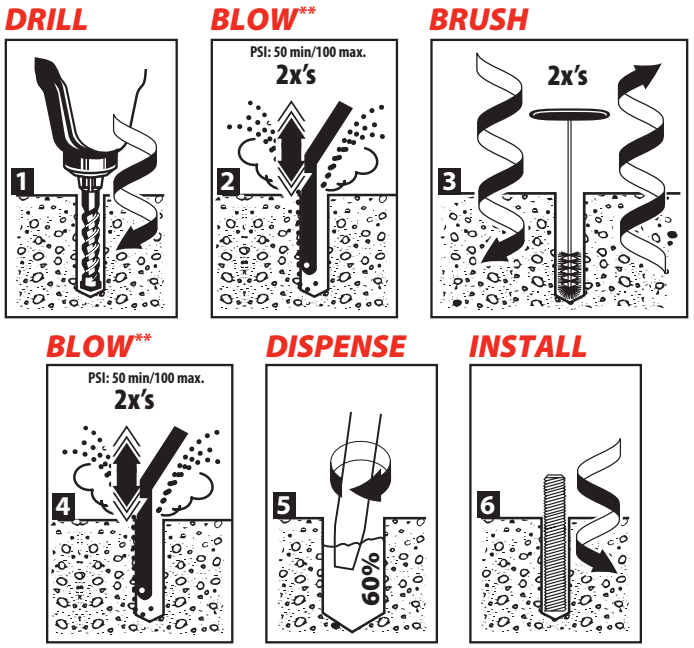
## Curing Times

| CONCRETE (F°) | CONCRETE (C°) | ADHESIVE (F°) | ADHESIVE (C°) | GEL TIME | FULL CURE TIME |
|---|---|---|---|---|---|
| 110 | 43 | 110 | 43 | 1.5 minutes | 45 minutes |
| 90 | 32 | 90 | 32 | 3 minutes | 45 minutes |
| 70 | 21 | 70 | 21 | 5 minutes | 45 minutes |
| 50 | 10 | 50 | 10 | 15 minutes | 90 minutes |
| 32 | 0 | 32 | 0 | 35 minutes | 4 hours |
| 14 | -10 | 32 | 0 | 35 minutes | 24 hours |

## Most Competitive Spacing and Edge Distance

| NOMINAL ANCHOR DIAMETER (IN.) | MINIMUM SPACING (IN.) | MINIMUM EDGE DISTANCE (IN.) |
|---|---|---|
| 3/8 | 15/16 | 15/16 |
| 1/2 | 1-1/2 | 1-1/2 |
| 5/8 | 2-1/2 | 2-1/2 |
| 3/4 | 3 | 3 |
| 7/8 | 3-1/2 | 3-1/2 |
| 1 | 4 | 4 |
| 1-1/4 | 5 | 5 |

## INSTALLATION STEPS



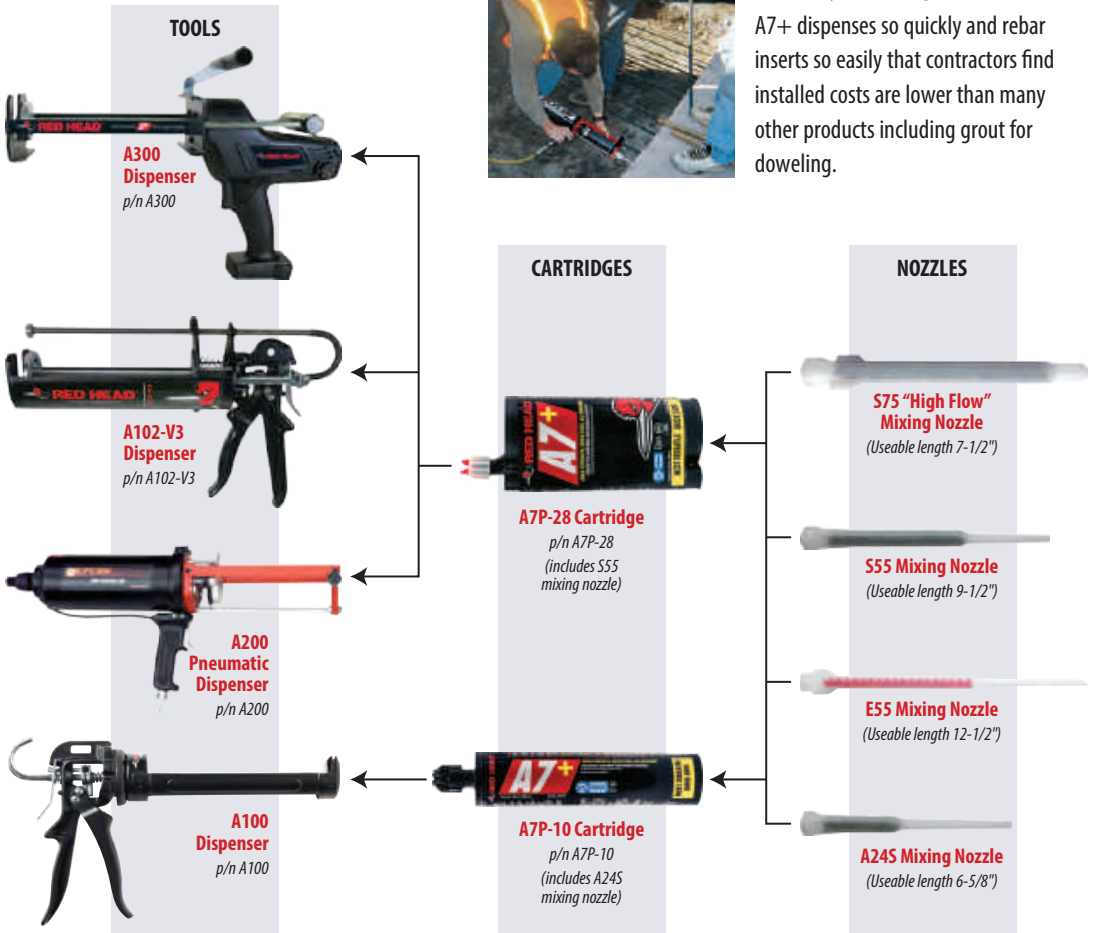

* Damp, submerged and underwater applications require 4x's air, 4x's brushing and 4x's air

** Dust is shown for diagram purposes only. To help mitigate airborne dust and comply with OSHA requirements, we recommend that you either wet the concrete before blowing out the hole, or use a drill dust extractor with your pneumatic air nozzle. We recommend vacuum assisted dust extractors like Milwaukee part numbers 5261-DE or 5317-DE. Call our technical services at (800) 848-5611 for more information.

## PACKAGING

1. Disposable, self-contained cartridge system capable of dispensing both components in the proper mixing ratio
2. Acrylic components dispensed through a static mixing nozzle that thoroughly mixes the material and places the material at the base of the pre-drilled hole
3. Cartridge markings: Include manufacturer's name, batch number and best-used-by date, mix ratio by volume, ANSI hazard classification, and appropriate ANSI handling precautions

*All Red Head nozzles can be used with all A7+ cartridges. Choose the nozzle that is right for you depending on hole depth and dispensing needs.*




## APPROVALS/LISTINGS

ICC-ES ESR 3903 (Concrete Report)

ICC-ES ESR 3951 (Masonry Report)

2018, 2015, 2012, 2009, 2006 International Building Code (IBC) Compliant

Florida Building Code (FBC)

City of Los Angeles (COLA)

Extensive Department of Transportation (DOT) Listings

NSF/ANSI 61 Approval for use in Drinking Water System Components

ASTM C881, Types I, II, IV, and V, Grade 3, Classes A, B, & C (meets Type III except elongation)

**For most current approvals and listings please visit: www.itwredhead.com**

## APPLICATIONS

**Water Treatment Facilities**

The best-in-class in edge and spacing distance of Red Head A7+ and its ability to work in water have make it a great fit for waste water treatment plants.

**Roadway Doweling**

A7+ dispenses so quickly and rebar inserts so easily that contractors find installed costs are lower than many other products including grout for doweling.

# A7P–10 fl. oz. Ordering Information

| PART NUMBER | DESCRIPTION | BOX QTY |
|---|---|---|
|  A7P-10 | 9.5 Fluid Ounce Cartridge with A24S Nozzle | 6 |
|  A24S | Mixing Nozzle for A7P-10 Cartridge<br>Nozzle diameter fits 3/8" to 5/8" holes<br>(Useable length of nozzle 6-5/8") | 24 |
|  A100 | Hand Dispenser Designed for A7P-10 Cartridge<br>Contractor Quality 35:1 Thrust Ratio | 1 |

## ESTIMATING TABLES

### A7+ 9.5 Fluid Ounce Cartridge

### Number of Anchoring Installations per Cartridge* using Threaded Rod with A7+ in Solid Concrete

| ROD (In.) | DRILL HOLE DIA. INCHES | EMBEDMENT DEPTH IN INCHES 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/4 | 5/16 | 371.3 | 185.6 | 123.8 | 92.8 | 74.3 | 61.9 | 53.0 | 46.4 | 41.3 | 37.1 |
| 3/8 | 7/16 | 189.4 | 94.7 | 63.1 | 47.4 | 37.9 | 31.6 | 27.1 | 23.7 | 21.0 | 18.9 |
| 1/2 | 9/16 | 114.6 | 57.3 | 38.2 | 28.6 | 22.9 | 19.1 | 16.4 | 14.3 | 12.7 | 11.5 |
| 5/8 | 3/4 | 64.5 | 32.2 | 21.5 | 16.1 | 12.9 | 10.7 | 9.2 | 8.1 | 7.2 | 6.4 |
| 3/4 | 7/8 | 47.4 | 23.7 | 15.8 | 11.8 | 9.5 | 7.9 | 6.8 | 5.9 | 5.3 | 4.7 |
| 7/8 | 1 | 36.3 | 18.1 | 12.1 | 9.1 | 7.3 | 6.0 | 5.2 | 4.5 | 4.0 | 3.6 |
| 1 | 1-1/8 | 28.6 | 14.3 | 9.5 | 7.2 | 5.7 | 4.8 | 4.1 | 3.6 | 3.2 | 2.9 |
| 1-1/4 | 1-3/8 | 19.2 | 9.6 | 6.4 | 4.8 | 3.8 | 3.2 | 2.7 | 2.4 | 2.1 | 1.9 |
| 1-1/2 | 1-5/8 | 13.7 | 6.9 | 4.6 | 3.4 | 2.7 | 2.3 | 2.0 | 1.7 | 1.5 | 1.4 |

*The estimated number of anchoring installations per cartridge is based upon calculations of filling the hole 60% full of adhesive per the recommendation in our installation instructions. Hole volumes are calculated using ANSI tolerance carbide tipped drill bits. These estimates do not account for any waste.

## ESTIMATING TABLE

### A7+ 9.5 Fluid Ounce Cartridge

### Number of Anchoring Installations per Cartridge* using Rebar with A7+ in Solid Concrete

| REBAR | DRILL HOLE DIA. INCHES | EMBEDMENT DEPTH IN INCHES 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| #3 | 7/16 | 189.4 | 94.7 | 63.1 | 47.4 | 37.9 | 31.6 | 27.1 | 23.7 | 21.0 | 18.9 |
| #4 | 5/8 | 92.8 | 46.4 | 30.9 | 23.2 | 18.6 | 15.5 | 13.3 | 11.6 | 10.3 | 9.3 |
| #5 | 3/4 | 64.5 | 32.2 | 21.5 | 16.1 | 12.9 | 10.7 | 9.2 | 8.1 | 7.2 | 6.4 |
| #6 | 7/8 | 47.4 | 23.7 | 15.8 | 11.8 | 9.5 | 7.9 | 6.8 | 5.9 | 5.3 | 4.7 |
| #7 | 1 | 36.3 | 18.1 | 12.1 | 9.1 | 7.3 | 6.0 | 5.2 | 4.5 | 4.0 | 3.6 |
| #8 | 1-1/8 | 28.6 | 14.3 | 9.5 | 7.2 | 5.7 | 4.8 | 4.1 | 3.6 | 3.2 | 2.9 |
| #9 | 1-1/4 | 23.2 | 11.6 | 7.7 | 5.8 | 4.6 | 3.9 | 3.3 | 2.9 | 2.6 | 2.3 |
| #10 | 1-1/2 | 16.1 | 8.1 | 5.4 | 4.0 | 3.2 | 2.7 | 2.3 | 2.0 | 1.8 | 1.6 |
| #11 | 1-3/4 | 11.8 | 5.9 | 3.9 | 3.0 | 2.4 | 2.0 | 1.7 | 1.5 | 1.3 | 1.2 |

*The estimated number of anchoring installations per cartridge is based upon calculations of filling the hole 60% full of adhesive per the recommendation in our installation instructions. Hole volumes are calculated using ANSI tolerance carbide tipped drill bits. These estimates do not account for any waste.

# A7P–28 fl. oz. Ordering Information

| PART NUMBER | DESCRIPTION | BOX QTY |
|---|---|---|
|  A7P-28 | 28 Fluid Ounce Cartridge A7+<br>Each cartirdge comes with a S55 Nozzle | 4 |
|  E55 | Mixing Nozzle for A7P-28<br>and C6P-30 Cartridge.<br>Nozzle diameter fits 3/8" to 5/8" holes.<br>(Useable length of nozzle 12-1/2") | 24 |
|  A102-V3 | Heavy-Duty 34:1 thrust ratio hand dispenser<br>for A7P-28 cartridge | 1 |

| PART NUMBER | DESCRIPTION | BOX QTY |
|---|---|---|
|  S55 | Mixing Nozzle for A7P-28 Cartridge<br>Nozzle diameter fits holes for 3/8" diameter &<br>larger anchors (Useable length of nozzle 9-1/2") | 6 |
|  A200 | Pneumatic Dispenser<br>for A7P-28 Cartridge | 1 |
|  E25-6 | 6-Foot Straight Tubing<br>(Used when holes are deeper) (can cut to proper size)<br>(.39 in I.D. x .43 in. O.D.) | 24 |
|  A300 | Cordless Battery Dispenser for A7P-28<br>and C6P-30 Cartridge.<br>Includes one battery and charger.<br>Works with all Milwaukee® M18™ batteries | 1 |

*See page 65 for nozzle extension tubes and other accessories

## ESTIMATING TABLE

### A7+ 28 Fluid Ounce Cartridge

### Number of Anchoring Installations per Cartridge* using Threaded Rod with A7+ in Solid Concrete

| Rod (in.) | DRILL HOLE DIA. INCHES | EMBEDMENT DEPTH IN INCHES | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 1/4 | 5/16 | 1094.0 | 547.0 | 364.7 | 273.5 | 218.8 | 182.3 | 156.3 | 136.7 | 121.6 | 109.4 | 99.5 | 91.2 | 84.2 | 78.1 | 72.9 |
| 3/8 | 7/16 | 558.2 | 279.1 | 186.1 | 139.5 | 111.6 | 93.0 | 79.7 | 69.8 | 62.0 | 55.8 | 50.7 | 46.5 | 42.9 | 39.9 | 37.2 |
| 1/2 | 9/16 | 337.7 | 168.8 | 112.6 | 84.4 | 67.5 | 56.3 | 48.2 | 42.2 | 37.5 | 33.8 | 30.7 | 28.1 | 26.0 | 24.1 | 22.5 |
| 5/8 | 3/4 | 189.9 | 95.0 | 63.3 | 47.5 | 38.0 | 31.7 | 27.1 | 23.7 | 21.1 | 19.0 | 17.3 | 15.8 | 14.6 | 13.6 | 12.7 |
| 3/4 | 7/8 | 139.5 | 69.8 | 46.5 | 34.9 | 27.9 | 23.3 | 19.9 | 17.4 | 15.5 | 14.0 | 12.7 | 11.6 | 10.7 | 10.0 | 9.3 |
| 7/8 | 1 | 106.8 | 53.4 | 35.6 | 26.7 | 21.4 | 17.8 | 15.3 | 13.4 | 11.9 | 10.7 | 9.7 | 8.9 | 8.2 | 7.6 | 7.1 |
| 1 | 1-1/8 | 84.4 | 42.2 | 28.1 | 21.1 | 16.9 | 14.1 | 12.1 | 10.6 | 9.4 | 8.4 | 7.7 | 7.0 | 6.5 | 6.0 | 5.6 |
| 1-1/4 | 1-3/8 | 56.5 | 28.3 | 18.8 | 14.1 | 11.3 | 9.4 | 8.1 | 7.1 | 6.3 | 5.7 | 5.1 | 4.7 | 4.3 | 4.0 | 3.8 |
| 1-1/2 | 1-5/8 | 40.5 | 20.2 | 13.5 | 10.1 | 8.1 | 6.7 | 5.8 | 5.1 | 4.5 | 4.0 | 3.7 | 3.4 | 3.1 | 2.9 | 2.7 |

*The estimated number of anchoring installations per cartridge is based upon calculations of filling the hole 60% full of adhesive per the recommendation in our installation instructions. Hole volumes are calculated using ANSI tolerance carbide tipped drill bits. These estimates do not account for any waste.

## ESTIMATING TABLE

### A7+ 28 Fluid Ounce Cartridge

### Number of Anchoring Installations per Cartridge* using Rebar with A7+ in Solid Concrete

| REBAR | DRILL HOLE DIA. INCHES | EMBEDMENT DEPTH IN INCHES | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| #3 | 7/16 | 558.2 | 279.1 | 186.1 | 139.5 | 111.6 | 93.0 | 79.7 | 69.8 | 62.0 | 55.8 | 50.7 | 46.5 | 42.9 | 39.9 | 37.2 |
| #4 | 5/8 | 273.5 | 136.7 | 91.2 | 68.4 | 54.7 | 45.6 | 39.1 | 34.2 | 30.4 | 27.3 | 24.9 | 22.8 | 21.0 | 19.5 | 18.2 |
| #5 | 3/4 | 189.9 | 95.0 | 63.3 | 47.5 | 38.0 | 31.7 | 27.1 | 23.7 | 21.1 | 19.0 | 17.3 | 15.8 | 14.6 | 13.6 | 12.7 |
| #6 | 7/8 | 139.5 | 69.8 | 46.5 | 34.9 | 27.9 | 23.3 | 19.9 | 17.4 | 15.5 | 14.0 | 12.7 | 11.6 | 10.7 | 10.0 | 9.3 |
| #7 | 1 | 106.8 | 53.4 | 35.6 | 26.7 | 21.4 | 17.8 | 15.3 | 13.4 | 11.9 | 10.7 | 9.7 | 8.9 | 8.2 | 7.6 | 7.1 |
| #8 | 1-1/8 | 84.4 | 42.2 | 28.1 | 21.1 | 16.9 | 14.1 | 12.1 | 10.6 | 9.4 | 8.4 | 7.7 | 7.0 | 6.5 | 6.0 | 5.6 |
| #9 | 1-1/4 | 68.4 | 34.2 | 22.8 | 17.1 | 13.7 | 11.4 | 9.8 | 8.5 | 7.6 | 6.8 | 6.2 | 5.7 | 5.3 | 4.9 | 4.6 |
| #10 | 1-1/2 | 47.5 | 23.7 | 15.8 | 11.9 | 9.5 | 7.9 | 6.8 | 5.9 | 5.3 | 4.7 | 4.3 | 4.0 | 3.7 | 3.4 | 3.2 |
| #11 | 1-3/4 | 34.9 | 17.4 | 11.6 | 8.7 | 7.0 | 5.8 | 5.0 | 4.4 | 3.9 | 3.5 | 3.2 | 2.9 | 2.7 | 2.5 | 2.3 |

*The estimated number of anchoring installations per cartridge is based upon calculations of filling the hole 60% full of adhesive per the recommendation in our installation instructions. Hole volumes are calculated using ANSI tolerance carbide tipped drill bits. These estimates do not account for any waste.

# A7P–5 fl. oz. Ordering Information

| PART NUMBER | DESCRIPTION | BOX QTY |
|---|---|---|
|  A7P-500KIT | Kit with Dispenser Included<br>(1) Cartridge<br>(1) Dispenser (plastic)<br>(1) Nozzle<br>Nozzle diameter fits 3/8" to 5/8" holes | 8 |

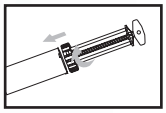
| PART NUMBER | DESCRIPTION | BOX QTY |
|---|---|---|
|  A7P-501KIT | Kit for Standard Caulk Gun<br>(1) Cartridge<br>(1) Sleeve for Caulk Gun<br>(1) Nozzle<br>Nozzle diameter fits 3/8" to 5/8" holes | 8 |

## AVAILABLE WITH YOUR CHOICE OF TWO, EASY DISPENSING SYSTEMS

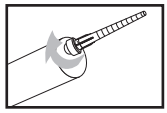
### A500 PLASTIC DISPENSER

Attaches directly to cartridge allowing for easy hand dispensing. **No extra tools are required.**

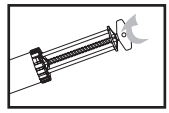
**Simple Assembly and Dispensing**



1. Twist-lock dispenser onto cartridge.



2. Thread nozzle onto cartridge.



3. Turn lever in order to dispense adhesive.

### EASY PACKAGING!

A500 and A501 kits are perfect for both counter or pegboard hanging display.

A7P-500KIT (not shown)

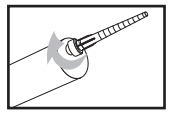
### A501 CAULKING GUN ADAPTOR

Allows cartridge to work with most standard caulking guns (caulking gun supplied by contractor)

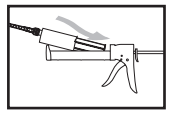
**Simple Assembly and Dispensing**



1. Push adaptor tightly against back of cartridge.



2. Thread nozzle onto cartridge.



3. Place assembly in caulking gun and dispense adhesive.

A7P-501KIT

## ESTIMATING TABLES

### A7+
### 5 Fluid Ounce Cartridge

### Number of Anchoring Installations per Cartridge* using Threaded Rod with A7+ in Solid Concrete

| ROD (in.) | DRILL HOLE DIA. INCHES | EMBEDMENT DEPTH IN INCHES 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1/4 | 5/16 | 198.9 | 99.5 | 66.3 | 49.7 | 39.8 | 33.2 | 28.4 | 24.9 |
| 3/8 | 7/16 | 101.5 | 50.7 | 33.8 | 25.4 | 20.3 | 16.9 | 14.5 | 12.7 |
| 1/2 | 9/16 | 61.4 | 30.7 | 20.5 | 15.3 | 12.3 | 10.2 | 8.8 | 7.7 |
| 5/8 | 3/4 | 34.5 | 17.3 | 11.5 | 8.6 | 6.9 | 5.8 | 4.9 | 4.3 |
| 3/4 | 7/8 | 25.4 | 12.7 | 8.5 | 6.3 | 5.1 | 4.2 | 3.6 | 3.2 |
| 7/8 | 1 | 19.4 | 9.7 | 6.5 | 4.9 | 3.9 | 3.2 | 2.8 | 2.4 |
| 1 | 1-1/8 | 15.3 | 7.7 | 5.1 | 3.8 | 3.1 | 2.6 | 2.2 | 1.9 |

*The estimated number of anchoring installations per cartridge is based upon calculations of filling the hole 60% full of adhesive per the recommendation in our installation instructions. Hole volumes are calculated using ANSI tolerance carbide tipped drill bits. These estimates do not account for any waste.

## ESTIMATING TABLES

### A7+
### 5 Fluid Ounce Cartridge

### Number of Anchoring Installations per Cartridge* using Rebar with A7+ in Solid Concrete

| REBAR | DRILL HOLE DIA. INCHES | EMBEDMENT DEPTH IN INCHES | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| #3 | 7/16 | 101.5 | 50.7 | 33.8 | 25.4 | 20.3 | 16.9 | 14.5 | 12.7 |
| #4 | 5/8 | 49.7 | 24.9 | 16.6 | 12.4 | 9.9 | 8.3 | 7.1 | 6.2 |
| #5 | 3/4 | 34.5 | 17.3 | 11.5 | 8.6 | 6.9 | 5.8 | 4.9 | 4.3 |
| #6 | 7/8 | 25.4 | 12.7 | 8.5 | 6.3 | 5.1 | 4.2 | 3.6 | 3.2 |
| #7 | 1 | 19.4 | 9.7 | 6.5 | 4.9 | 3.9 | 3.2 | 2.8 | 2.4 |
| #8 | 1-1/8 | 15.3 | 7.7 | 5.1 | 3.8 | 3.1 | 2.6 | 2.2 | 1.9 |
| #9 | 1-1/4 | 12.4 | 6.2 | 4.1 | 3.1 | 2.5 | 2.1 | 1.8 | 1.6 |

*The estimated number of anchoring installations per cartridge is based upon calculations of filling the hole 60% full of adhesive per the recommendation in our installation instructions. Hole volumes are calculated using ANSI tolerance carbide tipped drill bits. These estimates do not account for any waste.

## PERFORMANCE TABLE

### A7+
### The Most Versatile Quick-Cure

### Threaded Rod Ultimate Tension and Shear Loads[1,2,3] Installed in Solid Concrete

| THREADED ROD DIAMETER | | DRILL HOLE DIAMETER | | MAX. CLAMPING FORCE AFTER PROPER CURE | | EMBEDMENT IN CONCRETE | | 2000 PSI (13.8 MPa) CONCRETE | | | | 4000 PSI (27.6 MPa) CONCRETE | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | ULTIMATE TENSION | | ULTIMATE SHEAR | | ULTIMATE TENSION | | ULTIMATE SHEAR | |
| in. | (mm) | in | (mm) | ft.-lbs | (Nm) | in. | (mm) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) |
| 3/8 | (9.5) | 7/16 | (11.1) | 9 | (12) | 1-1/2 | (38.1) | N/A | N/A | N/A | N/A | 3,734 | (16.6) | 4,126 | (18.3) |
| | | | | | | 3-3/8 | (85.7) | 5,852 | (26.0) | 5,220 | (23.2) | 10,977 | (48.8) | 5,220 | (23.2) |
| | | | | | | 4-1/2 | (114.3) | 7,729 | (34.4) | 5,220 | (23.2) | 11,661 | (51.9) | 5,220 | (23.2) |
| 1/2 | (12.7) | 9/16 | (14.3) | 16 | (21) | 2 | (50.8) | N/A | N/A | N/A | N/A | 6,022 | (26.8) | 8,029 | (35.7) |
| | | | | | | 4-1/2 | (114.3) | 10,798 | (48.0) | 8,029 | (35.7) | 17,162 | (76.3) | 8,029 | (35.7) |
| | | | | | | 6 | (152.4) | 14,210 | (63.2) | 8,029 | (35.7) | 17,372 | (77.3) | 8,029 | (35.7) |
| 5/8 | (15.9) | 3/4 | (19.1) | 47 | (63) | 2-1/2 | (63.5) | N/A | N/A | N/A | N/A | 7,330 | (32.6) | 11,256 | (50.1) |
| | | | | | | 5-5/8 | (142.9) | 16,417 | (73.0) | 15,967 | (71.0) | 26,504 | (117.9) | 15,967 | (71.0) |
| | | | | | | 7-1/2 | (190.5) | 18,747 | (83.4) | 15,967 | (71.0) | 29,381 | (130.7) | 15,967 | (71.0) |
| 3/4 | (19.1) | 7/8 | (22.2) | 70 | (95) | 3 | (76.2) | N/A | N/A | N/A | N/A | 8,634 | (38.4) | 20,126 | (89.5) |
| | | | | | | 6-3/4 | (171.5) | 18,618 | (82.8) | 20,126 | (89.5) | 29,727 | (132.2) | 20,126 | (89.5) |
| | | | | | | 9 | (228.6) | 23,934 | (106.5) | 20,126 | (89.5) | 37,728 | (167.8) | 20,126 | (89.5) |
| 7/8 | (22.2) | 1 | (25.4) | 90 | (122) | 3-1/2 | (88.9) | N/A | N/A | N/A | N/A | 13,650 | (60.7) | 20,920 | (92.9) |
| | | | | | | 7-7/8 | (200.0) | N/A | N/A | 29,866 | (132.9) | 44,915 | (199.8) | 29,866 | (132.9) |
| | | | | | | 10-1/2 | (266.7) | 36,881 | (164.1) | 29,866 | (132.9) | 48,321 | (215.0) | 29,866 | (132.9) |
| 1 | (25.4) | 1-1/8 | (28.6) | 110 | (149) | 4 | (101.6) | N/A | N/A | N/A | N/A | 16,266 | (72.2) | 33,152 | (147.5) |
| | | | | | | 9 | (228.6) | 32,215 | (143.3) | 37,538 | (167.0) | 48,209 | (214.5) | 37,538 | (167.0) |
| | | | | | | 12 | (304.8) | 46,064 | (204.9) | 37,538 | (167.0) | 63,950 | (284.5) | 37,538 | (167.0) |
| 1-1/4 | (31.8) | 1-3/8 | (34.9) | 370 | (501) | 5 | (127.0) | N/A | N/A | N/A | N/A | 21,838 | (97.1) | 33,152 | (147.5) |
| | | | | | | 11-1/4 | (285.8) | 45,962 | (204.5) | 58,412 | (259.8) | 56,715 | (252.3) | 58,412 | (259.8) |
| | | | | | | 15 | (381.0) | 62,208 | (276.7) | 58,412 | (259.8) | 84,385 | (375.4) | 58,412 | (259.8) |

1 Allowable working loads for the single installation under static loading should not exceed 25% capacity of the ultimate load. To calculate the allowable load of the anchor, divide the ultimate load by 4.

2 Ultimate load values in 2000 and 4000 psi stone aggregate concrete. Ultimate loads are indicated for the embedment shown in the Embedment in Concrete column. Performance values are based on the use of high strength threaded rod (ASTM A193 Gr. B7). The use of lower strength rods will result in lower ultimate tension and shear loads.

3 Linear interpolation may be used for intermediate spacing and edge distances.

## PERFORMANCE TABLE

### A7+
**The most Versatile Quick Cure**

### Threaded Rod Allowable Tension Loads[1,2] Installed in Solid Concrete

| THREADED ROD DIAMETER | | DRILL HOLE DIAMETER | | MIN. EMBEDMENT DEPTH | | ALLOWABLE TENSION LOAD BASED ON ADHESIVE BOND STRENGTH | | | | ALLOWABLE TENSION LOAD BASED ON STEEL STRENGTH | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 2000 PSI (13.8 MPA) CONCRETE | | 4000 PSI (27.6 MPa) CONCRETE | | ASTM A307 (SAE 1018) | | ASTM A193 GR. B7 (SAE4140) | | ASTM F593 AISI 304 SS | |
| in. | (mm) | in. | (mm) | in. | (mm) | lbs. | (kN) | lbs | (kN) | lbs | (kN) | lbs | (kN) | lbs | (kN) |
| 3/8 | (9.5) | 7/16 | (11.1) | 1-1/2 | (38.1) | N/A | N/A | 934 | (4.2) | 2,080 | (9.3) | 4,340 | (19.3) | 3,995 | (17.8) |
| | | | | 3-3/8 | (85.7) | 1,460 | (6.5) | 2,740 | (12.2) | 2,080 | (9.3) | 4,340 | (19.3) | 3,995 | (17.8) |
| | | | | 4-1/2 | (114.3) | 1,930 | (8.6) | 2,915 | (13.0) | 2,080 | (9.3) | 4,340 | (19.3) | 3,995 | (17.8) |
| 1/2 | (12.7) | 9/16 | (14.3) | 2 | (50.8) | N/A | N/A | 1,505 | (6.7) | 3,730 | (16.6) | 7,780 | (34.6) | 7,155 | (31.8) |
| | | | | 4-1/2 | (114.3) | 2,700 | (12.0) | 4,290 | (19.1) | 3,730 | (16.6) | 7,780 | (34.6) | 7,155 | (31.8) |
| | | | | 6 | (152.4) | 3,550 | (15.8) | 4,340 | (19.3) | 3,730 | (16.6) | 7,780 | (34.6) | 7,155 | (31.8) |
| 5/8 | (15.9) | 3/4 | (19.1) | 2-1/2 | (63.5) | N/A | N/A | 1,832 | (8.2) | 5,870 | (26.1) | 12,230 | (54.4) | 11,250 | (50.0) |
| | | | | 5-5/8 | (142.9) | 4,100 | (18.3) | 6,625 | (29.5) | 5,870 | (26.1) | 12,230 | (54.4) | 11,250 | (50.0) |
| | | | | 7-1/2 | (190.5) | 4,685 | (20.8) | 7,345 | (32.7) | 5,870 | (26.1) | 12,230 | (54.4) | 11,250 | (50.0) |
| 3/4 | (19.1) | 7/8 | (22.2) | 3 | (76.2) | N/A | N/A | 2,158 | (9.6) | 8,490 | (37.8) | 17,690 | (78.7) | 14,860 | (66.1) |
| | | | | 6-3/4 | (171.5) | 4,655 | (20.7) | 7,430 | (33.1) | 8,490 | (37.8) | 17,690 | (78.7) | 14,860 | (66.1) |
| | | | | 9 | (228.6) | 5,980 | (26.6) | 9,430 | (42.0) | 8,490 | (37.8) | 17,690 | (78.7) | 14,860 | (66.1) |
| 7/8 | (22.2) | 1 | (25.4) | 3-1/2 | (88.9) | N/A | N/A | 3,413 | (15.2) | 11,600 | (51.6) | 25,510 | (113.5) | 20,835 | (92.7) |
| | | | | 7-7/8 | (200.0) | N/A | N/A | 11,230 | (49.9) | 11,600 | (51.6) | 25,510 | (113.5) | 20,835 | (92.7) |
| | | | | 10-1/2 | (266.7) | 9,220 | (41.0) | 12,080 | (53.7) | 11,600 | (51.6) | 25,510 | (113.5) | 20,834 | (92.7) |
| 1 | (25.4) | 1-1/8 | (28.6) | 4 | (101.6) | N/A | N/A | 4,067 | (18.1) | 15,180 | (67.5) | 31,620 | (140.7) | 26,560 | (118.1) |
| | | | | 9 | (228.6) | 8,050 | (35.8) | 12,050 | (53.6) | 15,180 | (67.5) | 31,620 | (140.7) | 26,560 | (118.1) |
| | | | | 12 | (304.8) | 11,515 | (51.2) | 15,985 | (71.1) | 15,180 | (67.5) | 31,620 | (140.7) | 26,560 | (118.1) |
| 1-1/4 | (31.8) | 1-3/8 | (34.9) | 5 | (127.0) | N/A | N/A | 5,460 | (24.3) | 23,800 | (105.9) | 49,580 | (220.6) | 34,670 | (154.2) |
| | | | | 11-1/4 | (285.8) | 11,490 | (51.1) | 14,175 | (63.1) | 23,800 | (105.9) | 49,580 | (220.6) | 34,670 | (154.2) |
| | | | | 15 | (381.0) | 15,550 | (69.2) | 21,095 | (93.8) | 23,800 | (105.9) | 49,580 | (220.6) | 34,670 | (154.2) |

1 Use lower value of either bond or steel strength for allowable tensile load.

2 Larger rods and/or deeper holes may be used. However, it may not be covered by current codes.

## PERFORMANCE TABLE

### A7+
**The most Versatile Quick Cure**

### Threaded Rod Allowable Shear Loads[1,2] Installed in Solid Concrete

| THREADED ROD DIAMETER | | DRILL HOLE DIAMETER | | MIN. EMBEDMENT DEPTH | | ALLOWABLE SHEAR LOAD BASED ON CONCRETE STRENGTH | | | | ALLOWABLE SHEAR LOAD BASED ON STEEL STRENGTH | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 2000 PSI (13.8 MPA) CONCRETE | | 4000 PSI (27.6 MPa) CONCRETE | | ASTM A307 (SAE 1018) | | ASTM A193 GR. B7 (SAE4140) | | ASTM F593 AISI 304 SS | |
| in. | (mm) | in. | (mm) | in. | (mm) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) |
| 3/8 | (9.5) | 7/16 | (11.1) | 1-1/2 | (38.1) | N/A | N/A | 1,031 | (4.6) | 1,040 | (4.6) | 2,170 | (9.7) | 1,995 | (8.9) |
| | | | | 3-3/8 | (85.7) | 1,305 | (5.8) | 1,305 | (5.8) | 1,040 | (4.6) | 2,170 | (9.7) | 1,995 | (8.9) |
| 1/2 | (12.7) | 9/16 | (14.3) | 2 | (50.8) | N/A | N/A | 2,005 | (8.9) | 1,870 | (8.3) | 3,895 | (17.3) | 3,585 | (15.9) |
| | | | | 4-1/2 | (114.3) | 2,005 | (8.9) | 2,005 | (8.9) | 1,870 | (8.3) | 3,895 | (17.3) | 3,585 | (15.9) |
| 5/8 | (15.9) | 3/4 | (19.1) | 2-1/2 | (63.5) | N/A | N/A | 2,814 | (12.5) | 2,940 | (13.1) | 6,125 | (27.2) | 5,635 | (25.1) |
| | | | | 5-5/8 | (142.9) | 3,990 | (17.8) | 3,990 | (17.8) | 2,940 | (13.1) | 6,125 | (27.2) | 5,635 | (25.1) |
| 3/4 | (19.1) | 7/8 | (22.2) | 3 | (76.2) | N/A | N/A | 5,030 | (22.4) | 4,250 | (18.9) | 8,855 | (39.4) | 7,440 | (33.1) |
| | | | | 6-3/4 | (171.5) | 5,030 | (22.4) | 5,030 | (22.4) | 4,250 | (18.9) | 8,855 | (39.4) | 7,440 | (33.1) |
| 7/8 | (22.2) | 1 | (25.4) | 3-1/2 | (88.9) | N/A | N/A | 5,230 | (23.3) | 5,800 | (25.8) | 12,760 | (56.8) | 10,730 | (47.7) |
| | | | | 7-7/8 | (200.0) | 7,465 | (33.2) | 7,465 | (33.2) | 5,800 | (25.8) | 12,760 | (56.8) | 10,730 | (47.7) |
| 1 | (25.4) | 1-1/8 | (28.6) | 4 | (101.6) | N/A | N/A | 8,288 | (36.9) | 7,590 | (33.8) | 15,810 | (70.3) | 13,285 | (59.1) |
| | | | | 9 | (228.6) | 9,385 | (41.7) | 9,385 | (41.7) | 7,590 | (33.8) | 15,810 | (70.3) | 13,285 | (59.1) |
| 1-1/4 | (31.8) | 1-3/8 | (34.9) | 5 | (127.0) | N/A | N/A | 8,288 | (36.9) | 11,900 | (52.9) | 24,790 | (100.3) | 18,840 | (83.8) |
| | | | | 11-1/4 | (285.8) | 14,600 | (64.9) | 14,600 | (64.9) | 11,900 | (52.9) | 24,790 | (100.3) | 18,840 | (83.8 |

1 Use lower value of either concrete or steel strength for allowable shear load.

2 Larger rods and/or deeper holes may be used. However, it may not be covered by current codes.

## PERFORMANCE TABLE

**A7+**
***The Most Versatile Quick-Cure***

### *Rebar Ultimate Tension Loads[1,2,3] Installed in Solid Concrete*

| REINFORCING BAR DIAMETER | | EMBEDMENT IN CONCRETE | | 2000 PSI (13.8 MPa) CONCRETE ULTIMATE TENSION | | 4000 PSI (27.6 MPa) CONCRETE ULTIMATE TENSION | | ULTIMATE TENSILE AND YIELD STRENGTH: GRADE 60 REBAR | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | MINIMUM YIELD STRENGTH | | MINIMUM ULTIMATE TENSILE STRENGTH | |
| in. | (mm) | in. | (mm) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) |
| # 3 | (9.5) | 3-3/8 | (85.7) | 6,180 | (27.5) | 8,324 | (37.0) | 6,600 | (29.4) | 9,900 | (44.0) |
| | | 4-1/2 | (114.3) | 7,560 | (33.6) | 11,418 | (50.8) | 6,600 | (29.4) | 9,900 | (44.0) |
| # 4 | (12.7) | 4-1/2 | (114.3) | 9,949 | (44.3) | 16,657 | (74.1) | 12,000 | (53.4) | 18,000 | (80.1) |
| | | 6 | (152.4) | 15,038 | (66.9) | 17,828 | (79.3) | 12,000 | (53.4) | 18,000 | (80.1) |
| # 5 | (15.9) | 5-5/8 | (142.9) | 14,012 | (62.3) | 20,896 | (93.0) | 18,600 | (82.7) | 27,900 | (124.1) |
| | | 7-1/2 | (190.5) | 16,718 | (74.4) | 26,072 | (116.0) | 18,600 | (82.7) | 27,900 | (124.1) |
| # 6 | (19.1) | 6-3/4 | (171.5) | 21,247 | (94.5) | 26,691 | (118.7) | 26,400 | (117.4) | 39,600 | (176.2) |
| | | 9 | (228.6) | 33,325 | (148.2) | 37,425 | (166.5) | 26,400 | (117.4) | 39,600 | (176.2) |
| # 7 | (22.2) | 7-7/8 | (200.0) | N/A | N/A | 40,374 | (179.6) | 36,000 | (160.1) | 54,000 | (240.2) |
| | | 10-1/2 | (266.7) | 38,975 | (173.4) | 46,050 | (204.8) | 36,000 | (160.1) | 54,000 | (240.2) |
| # 8 | (25.4) | 9 | (228.6) | 35,600 | (158.4) | 47,311 | (210.5) | 47,400 | (210.9) | 71,100 | (316.3) |
| | | 12 | (304.8) | 41,010 | (182.4) | 66,140 | (294.2) | 47,400 | (210.9) | 71,100 | (316.3) |
| # 9 | (28.6) | 10-1/8 | (257.2) | N/A | N/A | 57,221 | (254.5) | 60,000 | (266.9) | 90,000 | (400.4) |
| | | 13-1/2 | (342.9) | N/A | N/A | 79,966 | (355.7) | 60,000 | (266.9) | 90,000 | (400.4) |
| # 10 | (31.8) | 11-1/4 | (285.8) | 49,045 | (218.2) | 73,091 | (325.1) | 76,200 | (339.0) | 114,300 | (508.5) |
| | | 15 | (381.0) | 69,079 | (307.3) | 83,295 | (370.5) | 76,200 | (339.0) | 114,300 | (508.5) |
| # 11 | (34.9) | 12-3/8 | (314.3) | 63,397 | (282.0) | 75,047 | (333.8) | 93,600 | (416.4) | 140,400 | (624.6) |
| | | 16-1/2 | (419.1) | 81,707 | (363.5) | 91,989 | (409.2) | 93,600 | (416.4) | 140,400 | (624.6) |

1 Allowable working loads for the single installation under static loading should not exceed 25% capacity or the allowable load of the anchor rod.

2 Ultimate load values in 2000 and 4000 psi stone aggregate concrete. Ultimate loads are indicated for the embedment shown in the Embedment in Concrete column. Performance values are based on the use of minimum Grade 60 reinforcing bar. The use of lower strength rods will result in lower ultimate tension loads.

3 SHEAR DATA: Provided the distance from the rebar to the edge of the concrete member exceeds 1.25 times the embedment depth of the rebar, calculate the ultimate shear load for the rebar anchorage as 60% of the ultimate tensile strength of the rebar.

4 Larger rods and/or deeper holes may be used. However, it may not be covered by current codes.

## PERFORMANCE TABLE

**A7+**
***The Most Versatile Quick-Cure***

### *Threaded Rod Recommended Edge Distance Requirements for Tension Loads Installed in Solid Concrete*

| ANCHOR DIAMETER | | EMBEDMENT DEPTH | | CRITICAL EDGE DISTANCE (100% LOAD CAPACITY) | | INTERPOLATED EDGE DISTANCE (90% LOAD CAPACITY) | | INTERPOLATED EDGE DISTANCE (80% LOAD CAPACITY) | | MINIMUM EDGE DISTANCE (70% LOAD CAPACITY) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| in. | (mm) | in. | (mm) | in. | (mm) | in. | (mm) | in. | (mm) | in. | (mm) |
| 3/8 | (9.5) | 3-3/8 | (85.7) | 2-1/2 | (63.5) | 1-15/16 | (49.2) | 1-3/8 | (34.9) | 13/16 | (26.2) |
| | | 4-1/2 | (114.3) | 3-3/8 | (85.7) | 2-5/8 | (66.7) | 1-7/8 | (47.6) | 1-1/8 | (28.6) |
| 1/2 | (12.7) | 4-1/2 | (114.3) | 3-3/8 | (85.7) | 2-5/8 | (66.7) | 1-7/8 | (47.6) | 1-1/8 | (28.6) |
| | | 6 | (152.4) | 4-1/2 | (114.3) | 3-1/2 | (88.9) | 2-1/2 | (63.5) | 1-1/2 | (38.1) |
| 5/8 | (15.9) | 5-5/8 | (142.9) | 4-3/16 | (106.4) | 3-1/4 | (82.6) | 2-5/16 | (58.7) | 1-3/8 | (34.9) |
| | | 7-1/2 | (190.5) | 5-5/8 | (142.9) | 4-3/8 | (111.1) | 3-1/8 | (79.4) | 1-7/8 | (47.6) |
| 3/4 | (19.1) | 6-3/4 | (171.5) | 5-1/16 | (128.6) | 3-15/16 | (100.0) | 2-13/16 | (71.4) | 1-5/8 | (15.9) |
| | | 9 | (228.6) | 6-3/4 | (171.5) | 5-1/4 | (133.4) | 3-3/4 | (95.3) | 2-1/4 | (57.2) |
| 1 | (25.4) | 9 | (228.6) | 6-3/4 | (171.5) | 5-1/4 | (133.4) | 3-3/4 | (95.3) | 2-1/4 | (57.2) |
| | | 12 | (304.8) | 9 | (228.6) | 7 | (177.8) | 5 | (127.0) | 3 | (76.2) |
| 1-1/4 | (31.8) | 11-1/4 | (285.8) | 8-7/16 | (214.3) | 6-9/16 | (166.7) | 4-3/4 | (120.7) | 2-7/8 | (73.0) |
| | | 15 | (381.0) | 11-1/4 | (285.8) | 8-3/4 | (222.2) | 6-1/4 | 158.8) | 3-3/4 | (95.3) |

## PERFORMANCE TABLE

**A7+**
***The Most Versatile Quick-Cure***

### *Threaded Rod Recommended Edge Distance Requirements for Shear Loads Installed in Solid Concrete*

| ANCHOR DIAMETER | | EMBEDMENT DEPTH (100% LOAD CAPACITY) | | CRITICAL EDGE DISTANCE (100% LOAD CAPACITY) | | INTERPOLATED EDGE DISTANCE (80% LOAD CAPACITY) | | INTERPOLATED EDGE DISTANCE (50% LOAD CAPACITY) | | MINIMUM EDGE DISTANCE (10% LOAD CAPACITY) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| in. | (mm) | in. | (mm) | in. | (mm) | in. | (mm) | in. | (mm) | in. | (mm) |
| 3/8 | (9.5) | 3-3/8 | (85.7) | 4-3/16 | (106.4) | 3-7/16 | (87.3) | 2-5/16 | (58.7) | 13/16 | (20.6) |
| 1/2 | (12.7) | 4-1/2 | (114.3) | 5-5/8 | (142.9) | 4-5/8 | (117.5) | 3-1/8 | (79.4) | 1-1/8 | (28.6) |
| 5/8 | (15.9) | 5-5/8 | (142.9) | 7 | (177.8) | 5-3/4 | (146.1) | 3-1/8 | (79.4) | 1-3/8 | (34.9) |
| 3/4 | (19.1) | 6-3/4 | (171.5) | 8-7/16 | (214.2) | 6-15/16 | (176.2) | 4-5/8 | (117.5) | 1-5/8 | (41.3) |
| 1 | (25.4) | 9 | (228.6) | 11-1/4 | (285.8) | 9-1/4 | (235.0) | 6-1/4 | (158.8) | 2-1/4 | (57.2) |
| 1-1/4 | (31.8) | 11-1/4 | (285.8) | 14-1/16 | (357.2) | 11-5/8 | (295.3) | 7-7/8 | (200.0) | 2-7/8 | (73.0) |

## PERFORMANCE REFERENCE TABLE

**A7+**
***The Most Versatile Quick-Cure***

### *Allowable Stress Design Reference Tables*

### Threaded Rod and Rebar Installation in Solid Concrete Edge / Spacing Distance Load Factor Summary[1,2]

| LOAD FACTOR | DISTANCE FROM EDGE OF CONCRETE |
|---|---|
| ***Critical Edge Distance—Tension*** | |
| 100% Tension Load → | 0.75 x Anchor Embedment |
| ***Minimum Edge Distance—Tension*** | |
| 70% Tension Load → | 0.25 x Anchor Embedment |
| ***Critical Edge Distance—Shear*** | |
| 100% Shear Load → | 1.25 x Anchor Embedment |
| ***Minimum Edge Distance—Shear*** | |
| 10% Shear Load → | 0.25 x Anchor Embedment |

| LOAD FACTOR | DISTANCE FROM ANOTHER ANCHOR |
|---|---|
| ***Critical Spacing—Tension*** | |
| 100% Tension Load → | 1.25 x Anchor Embedment |
| ***Minimum Spacing—Tension*** | |
| 80% Tension Load → | 0.25 x Anchor Embedment |
| ***Critical Spacing—Shear*** | |
| 100% Shear Load → | 1.25 x Anchor Embedment |
| ***Minimum Spacing—Shear*** | |
| 25% Shear Load → | 0.25 x Anchor Embedment |

1 Use linear interpolation for load factors at edge distances or spacing distances between critical and minimum.

2 Anchors are affected by multiple combination of spacing and/or edge distance loading and direction of the loading. Use the product of tension and shear loading factors in design.

### Combined Tension and Shear Loading—for A7+/C6+/G5+ Adhesive Anchors

**Allowable loads for anchors under tension and shear loading at the same time (combined loading) will be lower than the allowable loads for anchors subjected to 100% tension or 100% shear. Use the following equation to evaluate anchors in combined loading conditions:**

$$\left(\frac{Na}{Ns}\right)^{5/3} + \left(\frac{Va}{Vs}\right)^{5/3} \leq 1$$

***Na*** = Applied Service Tension Load
***Ns*** = Allowable Tension Load
***Va*** = Applied Service Shear Load
***Vs*** = Allowable Shear Load

## STRENGTH DESIGN TABLE

### A7+
### The Most Versatile Quick-Cure

### Threaded Rod Tension (lbf) and Shear (lbf) Loads in Uncracked Concrete[1,2,3,4] ASTM A193 B7

| Anchor Diameter (in.) | Embedment Depth (in.) | Tension (lbf) | | | | | Shear (lbf) |
|---|---|---|---|---|---|---|---|
| | | 2500 psi | 3000 psi | 4000 psi | 5000 psi | 6000 psi - 8000 psi | 2500 psi - 8000 psi |
| 3/8 | 3-3/8 | 3,870 | 3,870 | 3,870 | 3,870 | 3,870 | 3,775 |
| | 4-1/2 | 5,160 | 5,160 | 5,160 | 5,160 | 5,160 | 3,775 |
| | 7-1/2 | 7,265 | 7,265 | 7,265 | 7,265 | 7,265 | 3,775 |
| 1/2 | 4-1/2 | 6,880 | 6,880 | 6,880 | 6,880 | 6,880 | 6,915 |
| | 6 | 9,175 | 9,175 | 9,175 | 9,175 | 9,175 | 6,915 |
| | 10 | 13,305 | 13,305 | 13,305 | 13,305 | 13,305 | 6,915 |
| 5/8 | 5-5/8 | 10,405 | 10,750 | 10,750 | 10,750 | 10,750 | 11,015 |
| | 7-1/2 | 14,335 | 14,335 | 14,335 | 14,335 | 14,335 | 11,015 |
| | 12-1/2 | 21,185 | 21,185 | 21,185 | 21,185 | 21,185 | 11,015 |
| 3/4 | 6-3/4 | 13,675 | 14,980 | 15,480 | 15,480 | 15,480 | 16,305 |
| | 9 | 20,640 | 20,640 | 20,640 | 20,640 | 20,640 | 16,305 |
| | 15 | 31,355 | 31,355 | 31,355 | 31,355 | 31,355 | 16,305 |
| 7/8 | 7-7/8 | 17,235 | 17,740 | 17,740 | 17,740 | 17,740 | 22,505 |
| | 10-1/2 | 23,650 | 23,650 | 23,650 | 23,650 | 23,650 | 22,505 |
| | 17-1/2 | 39,420 | 39,420 | 39,420 | 39,420 | 39,420 | 22,505 |
| 1 | 9 | 21,060 | 23,070 | 23,170 | 23,170 | 23,170 | 29,525 |
| | 12 | 30,890 | 30,890 | 30,890 | 30,890 | 30,890 | 29,525 |
| | 20 | 51,490 | 51,490 | 51,490 | 51,490 | 51,490 | 29,525 |
| 1-1/4 | 11-1/4 | 29,430 | 32,240 | 37,225 | 41,620 | 42,785 | 47,240 |
| | 15 | 45,310 | 49,635 | 57,045 | 57,045 | 57,045 | 47,240 |
| | 25 | 90,855 | 90,855 | 90,855 | 90,855 | 90,855 | 47,240 |

1 Tabulated values are for estimation purposes only and should not be used for design (please use our free TruSpec anchorage design software at www.itwredhead.com)

2 Tabulated values represent strength design per ACI 318 for a single anchor in adequate concrete thickness, not near an edge nor adjacent anchorage, and not for sustained loading.

3 Bond strengths used in calculations are for dry, uncracked concrete with periodic inspection

4 Bond strengths used in calculations are for Temperature Range A (maximum long term temperature of 110F, maximum short term temperature of 142F).

## STRENGTH DESIGN TABLE

### A7+
### The Most Versatile Quick-Cure

### Threaded Rod Tension (lbf) and Shear (lbf) Loads in 4,000 psi Uncracked Concrete[1,2,3,4]

| Anchor Diameter (in.) | Embedment Depth (in.) | ASTM A193 B7 Threaded Rod | | Stainless Steel F593 | | Carbon Steel A36 | |
|---|---|---|---|---|---|---|---|
| | | Tension (lbf) | Shear (lbf) | Tension (lbf) | Shear (lbf) | Tension (lbf) | Shear (lbf) |
| 3/8 | 3-3/8 | 3,870 | 3,775 | 3,375 | 1,755 | 3,870 | 2,280 |
| | 4-1/2 | 5,160 | 3,775 | 3,375 | 1,755 | 4,785 | 2,280 |
| | 7-1/2 | 7,265 | 3,775 | 3,375 | 1,755 | 4,785 | 2,280 |
| 1/2 | 4-1/2 | 6,880 | 6,915 | 6,170 | 3,210 | 6,880 | 4,040 |
| | 6 | 9,175 | 6,915 | 6,170 | 3,210 | 8,760 | 4,040 |
| | 10 | 13,305 | 6,915 | 6,170 | 3,210 | 8,760 | 4,040 |
| 5/8 | 5-5/8 | 10,750 | 11,015 | 9,830 | 5,115 | 10,750 | 6,440 |
| | 7-1/2 | 14,335 | 11,015 | 9,830 | 5,115 | 13,955 | 6,440 |
| | 12-1/2 | 21,185 | 11,015 | 9,830 | 5,115 | 13,955 | 6,440 |
| 3/4 | 6-3/4 | 15,480 | 16,305 | 14,550 | 7,565 | 15,480 | 7,610 |
| | 9 | 20,640 | 16,305 | 14,550 | 7,565 | 16,500 | 7,610 |
| | 15 | 31,355 | 16,305 | 14,550 | 7,565 | 16,500 | 7,610 |
| 7/8 | 7-7/8 | 17,740 | 22,505 | 17,740 | 10,445 | 17,740 | 10,530 |
| | 10-1/2 | 23,650 | 22,505 | 20,085 | 10,445 | 22,820 | 10,530 |
| | 17-1/2 | 39,420 | 22,505 | 20,085 | 10,445 | 22,820 | 10,530 |
| 1 | 9 | 23,170 | 29,525 | 23,170 | 13,700 | 23,170 | 13,815 |
| | 12 | 30,890 | 29,525 | 26,345 | 13,700 | 29,935 | 13,815 |
| | 20 | 51,490 | 29,525 | 26,345 | 13,700 | 29,935 | 13,815 |
| 1-1/4 | 11-1/4 | 37,225 | 47,240 | 37,225 | 21,920 | 37,225 | 22,090 |
| | 15 | 57,045 | 47,240 | 42,155 | 21,920 | 47,865 | 22,090 |
| | 25 | 90,855 | 47,240 | 42,155 | 21,920 | 47,865 | 22,090 |

1 Tabulated values are for estimation purposes only and should not be used for design (please use our free TruSpec anchorage design software at www.itwredhead.com)

2 Tabulated values represent strength design per ACI 318 for a single anchor in adequate concrete thickness, not near an edge nor adjacent anchorage, and not for sustained loading.

3 Bond strengths used in calculations are for dry, uncracked concrete with periodic inspection

4 Bond strengths used in calculations are for Temperature Range A (maximum long term temperature of 110F, maximum short term temperature of 142F).

## STRENGTH DESIGN TABLE

### A7+
**The Most Versatile Quick-Cure**

### Threaded Rod Tension (lbf) and Shear (lbf) Loads in Cracked Concrete[1,2,3,4] ASTM A193 B7

| Anchor Diameter (in.) | Embedment Depth (in.) | Tension (lbf) 2,500-8,000 psi | Shear (lbf) 2,500-8,000 psi |
|---|---|---|---|
| 3/8 | 3-3/8 | 2,315 | 3,775 |
| | 4-1/2 | 3,090 | 3,775 |
| | 7-1/2 | 5,150 | 3,775 |
| 1/2 | 4-1/2 | 3,070 | 6,915 |
| | 6 | 4,095 | 6,915 |
| | 10 | 6,825 | 6,915 |
| 5/8 | 5-5/8 | 5,220 | 11,015 |
| | 7-1/2 | 6,965 | 11,015 |
| | 12-1/2 | 11,605 | 11,015 |
| 3/4 | 6-3/4 | 7,785 | 15,365 |
| | 9 | 10,380 | 16,305 |
| | 15 | 17,300 | 16,305 |
| 7/8 | 7-7/8 | 8,270 | 20,915 |
| | 10-1/2 | 11,030 | 22,505 |
| | 17-1/2 | 18,385 | 22,505 |
| 1 | 9 | 10,185 | 27,320 |
| | 12 | 13,580 | 29,525 |
| | 20 | 22,635 | 29,525 |
| 1-1/4 | 11-1/4 | 16,795 | 46,600 |
| | 15 | 22,395 | 47,240 |
| | 25 | 37,330 | 47,240 |

1 Tabulated values are for estimation purposes only and should not be used for design (please use our free TruSpec anchorage design software at www.itwredhead.com)
2 Tabulated values represent strength design per ACI 318 for a single anchor in adequate concrete thickness, not near an edge nor adjacent anchorage, and not for sustained loading.
3 Bond strengths used in calculations are for dry, cracked concrete with periodic inspection
4 Bond strengths used in calculations are for Temperature Range A (maximum long term temperature of 110F, maximum short term temperature of 142F).

## STRENGTH DESIGN TABLE

### A7+
**The Most Versatile Quick-Cure**

### Threaded Rod Tension (lbf) and Shear (lbf) Loads in 4,000 psi Cracked Concrete[1,2,3,4]

| Anchor Diameter (in.) | Embedment Depth (in.) | ASTM A193 B7 Threaded Rod | | Stainless Steel F593 | | Carbon Steel A36 | |
|---|---|---|---|---|---|---|---|
| | | Tension (lbf) | Shear (lbf) | Tension (lbf) | Shear (lbf) | Tension (lbf) | Shear (lbf) |
| 3/8 | 3-3/8 | 2,315 | 3,245 | 3,375 | 1,755 | 3,870 | 2,280 |
| | 4-1/2 | 3,090 | 3,775 | 3,375 | 1,755 | 4,785 | 2,280 |
| | 7-1/2 | 5,150 | 3,775 | 3,375 | 1,755 | 4,785 | 2,280 |
| 1/2 | 4-1/2 | 3,070 | 4,295 | 6,170 | 3,210 | 6,670 | 4,040 |
| | 6 | 4,095 | 5,730 | 6,170 | 3,210 | 8,760 | 4,040 |
| | 10 | 6,825 | 6,915 | 6,170 | 3,210 | 8,760 | 4,040 |
| 5/8 | 5-5/8 | 5,220 | 7,310 | 9,320 | 5,115 | 9,320 | 6,440 |
| | 7-1/2 | 6,965 | 9,750 | 9,830 | 5,115 | 13,955 | 6,440 |
| | 12-1/2 | 11,605 | 11,015 | 9,830 | 5,115 | 13,955 | 6,440 |
| 3/4 | 6-3/4 | 7,785 | 10,895 | 12,255 | 7,565 | 12,255 | 7,610 |
| | 9 | 10,380 | 14,530 | 14,550 | 7,565 | 16,500 | 7,610 |
| | 15 | 17,300 | 16,305 | 14,550 | 7,565 | 16,500 | 7,610 |
| 7/8 | 7-7/8 | 8,270 | 11,580 | 15,440 | 10,445 | 15,440 | 10,530 |
| | 10-1/2 | 11,030 | 15,445 | 20,085 | 10,445 | 22,820 | 10,530 |
| | 17-1/2 | 18,385 | 22,505 | 20,085 | 10,445 | 22,820 | 10,530 |
| 1 | 9 | 10,185 | 14,260 | 18,865 | 13,700 | 18,865 | 13,815 |
| | 12 | 13,580 | 19,010 | 26,345 | 13,700 | 29,050 | 13,815 |
| | 20 | 22,635 | 29,525 | 26,345 | 13,700 | 29,935 | 13,815 |
| 1-1/4 | 11-1/4 | 16,795 | 23,515 | 26,370 | 21,920 | 26,370 | 22,090 |
| | 15 | 22,395 | 31,355 | 40,600 | 21,920 | 40,600 | 22,090 |
| | 25 | 37,330 | 47,240 | 42,155 | 21,920 | 47,865 | 22,090 |

1 Tabulated values are for estimation purposes only and should not be used for design (please use our free TruSpec anchorage design software at www.itwredhead.com)
2 Tabulated values represent strength design per ACI 318 for a single anchor in adequate concrete thickness, not near an edge nor adjacent anchorage, and not for sustained loading.
3 Bond strengths used in calculations are for dry, cracked concrete with periodic inspection
4 Bond strengths used in calculations are for Temperature Range A (maximum long term temperature of 110F, maximum short term temperature of 142F).

## STRENGTH DESIGN TABLE

### A7+
### The Most Versatile Quick-Cure

### Rebar Tension (lbf) and Shear (lbf) Loads in Uncracked Concrete[1,2,3,4] ASTM A615 Grade 60

| Rebar | Anchor Diameter (in.) | Embedment Depth (in.) | Tension (lbf) | | | | | Shear (lbf) |
|---|---|---|---|---|---|---|---|---|
| | | | 2500 psi | 3000 psi | 4000 psi | 5000 psi | 6000 - 8000 psi | 2500 - 8000 psi |
| #3 | 3/8 | 3-3/8 | 3,660 | 3,660 | 3,660 | 3,660 | 3,660 | 3,560 |
| | | 4-1/2 | 4,880 | 4,880 | 4,880 | 4,880 | 4,880 | 3,560 |
| | | 7-1/2 | 4,835 | 6,435 | 6,435 | 6,435 | 6,435 | 3,560 |
| #4 | 1/2 | 4-1/2 | 7,445 | 7,520 | 7,520 | 7,520 | 7,520 | 6,480 |
| | | 6 | 10,030 | 10,030 | 10,030 | 10,030 | 10,030 | 6,480 |
| | | 10 | 11,700 | 11,700 | 11,700 | 11,700 | 11,700 | 6,480 |
| #5 | 5/8 | 5-5/8 | 10,405 | 11,395 | 11,540 | 11,540 | 11,540 | 10,040 |
| | | 7-1/2 | 15,385 | 15,385 | 15,385 | 15,385 | 15,385 | 10,040 |
| | | 12-1/2 | 18,135 | 18,135 | 18,135 | 18,135 | 18,135 | 10,040 |
| #6 | 3/4 | 6-3/4 | 13,675 | 14,870 | 14,870 | 14,870 | 14,870 | 14,255 |
| | | 9 | 19,825 | 19,825 | 19,825 | 19,825 | 19,825 | 14,255 |
| | | 15 | 25,740 | 25,740 | 25,740 | 25,740 | 25,740 | 14,255 |
| #7 | 7/8 | 7-7/8 | 17,235 | 18,880 | 19,465 | 19,465 | 19,465 | 19,440 |
| | | 10-1/2 | 25,955 | 25,955 | 25,955 | 25,955 | 25,955 | 19,440 |
| | | 17-1/2 | 35,100 | 35,100 | 35,100 | 35,100 | 35,100 | 19,440 |
| #8 | 1 | 9 | 21,060 | 23,070 | 25,110 | 25,110 | 25,110 | 25,595 |
| | | 12 | 32,420 | 33,485 | 33,485 | 33,485 | 33,485 | 25,595 |
| | | 20 | 46,215 | 46,215 | 46,215 | 46,215 | 46,215 | 25,595 |
| #9 | 1-1/8 | 10-1/8 | 25,130 | 27,525 | 31,195 | 31,195 | 31,195 | 32,400 |
| | | 13-1/2 | 38,690 | 41,590 | 41,590 | 41,590 | 41,590 | 32,400 |
| | | 22-1/2 | 58,500 | 58,500 | 58,500 | 58,500 | 58,500 | 32,400 |
| #10 | 1-1/4 | 11-1/4 | 29,430 | 32,240 | 37,225 | 41,620 | 44,505 | 41,145 |
| | | 15 | 45,310 | 49,635 | 57,315 | 59,345 | 59,345 | 41,145 |
| | | 25 | 74,295 | 74,295 | 74,295 | 74,295 | 74,295 | 41,145 |

1 Tabulated values are for estimation purposes only and should not be used for design (please use our free TruSpec anchorage design software at www.itwredhead.com)

2 Tabulated values represent strength design per ACI 318 for a single anchor in adequate concrete thickness, not near an edge nor adjacent anchorage, and not for sustained loading.

3 Bond strengths used in calculations are for dry, uncracked concrete with periodic inspection

4 Bond strengths used in calculations are for Temperature Range A (maximum long term temperature of 110F, maximum short term temperature of 142F).

## STRENGTH DESIGN TABLE

### A7+
### The Most Versatile Quick-Cure

### Rebar Tension (lbf) and Shear (lbf) Loads in Cracked Concrete[1,2,3,4] ASTM A615 Grade 60

| Rebar | Anchor Diameter (in.) | Embedment Depth (in.) | Tension (lbf) 2500 - 8000 psi concrete | Shear (lbf) 2500 - 8000 psi concrete |
|---|---|---|---|---|
| #3 | 3/8 | 3-3/8 | 1,650 | 2,310 |
| | | 4-1/2 | 2,200 | 3,080 |
| | | 7-1/2 | 3,665 | 3,560 |
| #4 | 1/2 | 4-1/2 | 2,935 | 4,105 |
| | | 6 | 3,910 | 5,475 |
| | | 10 | 6,520 | 6,480 |
| #5 | 5/8 | 5-5/8 | 4,585 | 6,420 |
| | | 7-1/2 | 6,115 | 8,560 |
| | | 12-1/2 | 10,190 | 10,040 |
| #6 | 3/4 | 6-3/4 | 5,115 | 7,160 |
| | | 9 | 6,820 | 9,550 |
| | | 15 | 11,370 | 14,255 |
| #7 | 7/8 | 7-7/8 | 6,965 | 9,750 |
| | | 10-1/2 | 9,285 | 13,000 |
| | | 17-1/2 | 15,475 | 19,440 |
| #8 | 1 | 9 | 9,095 | 12,735 |
| | | 12 | 12,125 | 16,980 |
| | | 20 | 20,215 | 25,595 |
| #9 | 1-1/8 | 10-1/8 | 11,510 | 16,115 |
| | | 13-1/2 | 15,350 | 21,490 |
| | | 22-1/2 | 25,585 | 32,400 |
| #10 | 1-1/4 | 11-1/4 | 16,795 | 23,515 |
| | | 15 | 22,395 | 31,355 |
| | | 25 | 37,330 | 41,145 |

1 Tabulated values are for estimation purposes only and should not be used for design (please use our free TruSpec anchorage design software at www.itwredhead.com)

2 Tabulated values represent strength design per ACI 318 for a single anchor in adequate concrete thickness, not near an edge nor adjacent anchorage, and not for sustained loading.

3 Bond strengths used in calculations are for dry, cracked concrete with periodic inspection

4 Bond strengths used in calculations are for Temperature Range A (maximum long term temperature of 110F, maximum short term temperature of 142F).

## MASONRY DESIGN TABLE

**A7+**
**The Most Versatile Quick-Cure**

### Grout-filled Concrete Block: Threaded Rod Allowable Tension and Shear Load Based on Steel Design Information for U.S. Customary Unit [1,2,3]

| Anchor Diameter (in.) | Tension (lb) | | | Shear (lb) | | |
|---|---|---|---|---|---|---|
| | ASTM A307 $F_u$ = 60 ksi | ASTM A193 Grade B7 $F_u$ = 125 ksi | ASTM F593 SS 304 $F_u$ = 100 ksi | ASTM A307 $F_u$ = 60 ksi | ASTM A193 Grade B7 $F_u$ = 125 ksi | ASTM F593 SS 304 $F_u$ = 100 ksi |
| 3/8 | 2,185 | 4,555 | 3,645 | 1,125 | 2,345 | 1,875 |
| 1/2 | 3,885 | 8,100 | 6,480 | 2,000 | 4,170 | 3,335 |
| 5/8 | 6,075 | 12,655 | 10,125 | 3,130 | 6,520 | 5,215 |
| 3/4 | 8,750 | 18,225 | 12,390 | 4,505 | 9,390 | 6,385 |

For SI: 1 inch = 25.4mm, 1 lbf = 4.45N, 1ft-lbf = 1.356 N-M, 1 psi = 0.006895 MPa

1 Allowable load used in the design must be the lesser of bond values and tabulated steel element values.

2 Allowable tension and shear loads for threaded rods to resist short term loads, such as wind or seismic, must be calculated in accordance with Section 4.1 of ICC ESR 3951as applicable.

3 Allowable steel loads are based on allowable tension and shear stresses equal to 0.33X Fu and 0.17xFu, respectively.

## MASONRY DESIGN TABLE

**A7+**
**The Most Versatile Quick-Cure**

### Grout-filled Concrete Block: Threaded Rod Allowable Tension Loads with Reduction Factors [1,2,3,4,7,9,10,12]

| Anchor Diameter (in.) | Minimum Embedment (inches) | Load at $s_{cr}$ and $c_{cr}$ (lb) | Spacing[5] | | | Edge Distance[6] | | |
|---|---|---|---|---|---|---|---|---|
| | | | Critical $s_{cr}$ (inches) | Minimum $s_{min}$ (inches) | Load reduction factor for $s_{min}$ [8] | Critical $c_{cr}$ (inches) | Minimum $c_{min}$ (inches) | Load reduction factor for $c_{min}$ [8] |
| 3/8 | 3-3/8 | 1,125 | 13.5 | 4 | 1.00 | 12 | 4 | 1.00 |
| 1/2 | 4-1/2 | 1,695 | 18 | 4 | 0.60 | 20 | 4 | 0.90 |
| 5/8 | 5-5/8 | 2,015 | 22.5 | 4 | 0.60 | 20 | 4 | 0.90 |
| 3/4 | 6-3/4 | 3,145 | 27 | 4 | 0.60 | 20 | 4 | 0.63 |

## MASONRY DESIGN TABLE

**A7+**
**The Most Versatile Quick-Cure**

### Grout-filled Concrete Block: Threaded Rod Allowable Shear Loads with Reduction Factors [1,2,3,4,7,9,10,12]

| Anchor Diameter (in.) | Minimum Embedment (in.) | Load at $s_{cr}$ and $c_{cr}$ (lb.) | Spacing[5] | | | Edge Distance[6] | | |
|---|---|---|---|---|---|---|---|---|
| | | | Critical $s_{cr}$ (in.) | Minimum $s_{min}$ (in.) | Load reduction factor for $s_{min}$ [8] | Critical $c_{cr}$ (in.) | Minimum $c_{min}$ (in.) | Load reduction factor for $c_{min}$ [8] |
| 3/8 | 3-3/8 | 750 | 13.5 | 4 | 0.50 | 12 | 4 | 0.95 |
| 1/2 | 4-1/2 | 1,520 | 18 | 4 | 0.50 | 20 | 4 | 0.44 |
| 5/8 | 5-5/8 | 2,285 | 22.5 | 4 | 0.50 | 12 | 4 | 0.26 |
| 3/4 | 6-3/4 | 2,345 | 27 | 4 | 0.50 | 20 | 4 | 0.26 |

For SI: 1 inch = 25.4mm, 1 lbf = 0.0044 kN, 1 ksi = 6.894 MPa. (Refer to Table 4 for footnotes)

1. All values are for anchors installed in fully grouted concrete masonry with minimum masonry strength of 1500 psi (10.3 MPa). Concrete masonry units must be light-, medium, or normal-weight conforming to ASTM C 90. Allowable loads have been calculated using a safety factor of 5.0.
3. Anchors may be installed in any location in the face of the masonry wall (cell, web, bed joint).
4. A maximum of two anchors may be installed in a single masonry cell in accordance with the spacing and edge or end distance requirements. Embedment is measured from the outside surface of the concrete masonry unit to the embedded end of the anchor. See Figure 2 of ICC ESR 3951.
5. The critical spacing distance, scr, is the anchor spacing where full load values in the table may be used. The minimum spacing distance, smin, is the minimum anchor spacing for which values are available and installation is permitted. Spacing distance is measured from the centerline to centerline between two anchors.
6. The critical edge or end distance, ccr, is the distance where full load values in the table may be used. The minimum edge or end distance, cmin, is the minimum distance for which values are available and installation is permitted. Edge or end distance is measured from anchor centerline to the closest unrestrained edge.
7. The tabulated values are applicable for anchors in the ends of grout-filled concrete masonry units where minimum edge distances are maintained.
8. Load values for anchors installed less than scr and ccr must be multiplied by the appropriate load reduction factor based on actual spacing (s) or edge distance (c). Load factors are multiplicative; both spacing and edge reduction factors must be considered.
9. Linear interpolation of load values between minimum spacing (smin) and critical spacing (scr) and between minimum edge or end distance (cmin) and critical edge or end distance (ccr) is permitted.
10. Concrete masonry width (wall thickness) must be equal to or greater than 1.5 times the anchor embedment depth (e.g. 3/8-inch- and 1/2-inch-diameter anchors are permitted in minimum nominally 6-inch-thick concrete masonry). The 5/8- and 3/4-inch-diameter anchors must be installed in minimum nominally 8-inch-thick concrete masonry.
11. Allowable loads must be the lesser of the adjusted masonry or bond values tabulated above and the steel strength values given in Table 2 of ECC ESR 3951.
12. Tabulated allowable bond loads must be adjusted for increased in-service base material temperatures in accordance with Figure 1 of ECC ESR 3951.

## MASONRY DESIGN TABLE

**A7+**
***The Most Versatile Quick-Cure***

### *Grout-filled Concrete Block: Rebar Allowable Tension and Shear Loads[1, 2, 3]*

| Rebar Size | Tension (lb) ASTM A615, Grade 60 | Shear (lb) ASTM A615, Grade 60 |
|---|---|---|
| No. 3 | 3,270 | 1,685 |
| No. 4 | 5,940 | 3,060 |
| No. 5 | 9,205 | 4,745 |
| No. 6 | 13,070 | 6,730 |

For SI: 1 inch = 25.4mm, 1 lbf = 4.45N, 1ft-lbf = 1.356 N-M, 1 psi = 0.006895 MPa

1 Allowable load used in the design must be the lesser of bond values and tabulated steel element values.

2 Allowable tension and shear loads for threaded rods to resist short term loads, such as wind or seismic, must be calculated in accordance with Section 4.1 of ICC ESR 3951 as applicable.

3 Allowable steel loads are based on allowable tension and shear stresses equal to 0.33X Fu and 0.17xFu, respectively.

## MASONRY DESIGN TABLE

**A7+**
***The Most Versatile Quick-Cure***

### *Grout-filled Concrete Block: Rebar Allowable Tension Loads with Reduction Factors[1, 2, 3, 4, 7, 9, 10, 12]*

| Anchor Diameter (in.) | Minimum Embedment (inches) | Load at $s_{cr}$ and $c_{cr}$ (lb.) | Spacing[5] | | | Edge Distance[6] | | |
|---|---|---|---|---|---|---|---|---|
| | | | Critical $s_{cr}$ (in.) | Minimum $s_{min}$ (in.) | Load reduction factor for $s_{min}$ [8] | Critical $c_{cr}$ (in.) | Minimum $c_{min}$ (in.) | Load reduction factor for $c_{min}$ [8] |
| 3/8 | 3-3/8 | 1,530 | 13.5 | 4 | 1.00 | 12 | 4 | 1.00 |
| 1/2 | 4-1/2 | 1,845 | 18 | 4 | 0.60 | 20 | 4 | 0.90 |
| 5/8 | 5-5/8 | 2,465 | 22.5 | 4 | 0.60 | 20 | 4 | 0.90 |
| 3/4 | 6-3/4 | 2,380 | 27 | 4 | 0.60 | 20 | 4 | 0.63 |

## MASONRY DESIGN TABLE

**A7+**
***The Most Versatile Quick-Cure***

### *Grout-filled Concrete Block: Rebar Allowable Shear Loads with Reduction Factors [1, 2, 3, 4, 7, 9, 10, 12]*

| Anchor Diameter (in.) | Minimum Embedment (in.) | Load at $s_{cr}$ and $c_{cr}$ ⊥ to edge (lb.) | Spacing[5] | | | Edge Distance[6] | | |
|---|---|---|---|---|---|---|---|---|
| | | | Critical $s_{cr}$ (in.) | Minimum $s_{min}$ (in.) | Load reduction factor for $s_{min}$ [8] | Critical $c_{cr}$ (in.) | Minimum $c_{min}$ (in.) | Load reduction factor for $c_{min}$ [8] |
| 3/8 | 3-3/8 | 1,410 | 13.5 | 4 | 0.50 | 12 | 4 | 0.95 |
| 1/2 | 4-1/2 | 1,680 | 18 | 4 | 0.50 | 20 | 4 | 0.44 |
| 5/8 | 5-5/8 | 3,245 | 22.5 | 4 | 0.50 | 12 | 4 | 0.26 |
| 3/4 | 6-3/4 | 4,000 | 27 | 4 | 0.50 | 20 | 4 | 0.26 |

For SI: 1 inch = 25.4 mm; 1 lbf = 0.0044 kN, 1 ksi = 6.894 MPa.

(The following footnotes apply to both Tables 6 and 7)

1 All values are for anchors installed in fully grouted concrete masonry with minimum masonry strength of 1500 psi (10.3 MPa). Concrete masonry units must be light-, medium, or normal-weight conforming to ASTM C 90. Allowable loads have been calculated using a safety factor of 5.0.

3 Anchors may be installed in any location in the face of the masonry wall (cell, web, bed joint).

4 A maximum of two anchors may be installed in a single masonry cell in accordance with the spacing and edge or end distance requirements. Embedment is measured from the outside surface of the concrete masonry unit to the embedded end of the anchor. See Figure 2 of ICC ESR 3951.

5 The critical spacing distance, scr, is the anchor spacing where full load values in the table may be used. The minimum spacing distance, smin, is the minimum anchor spacing for which values are available and installation is permitted. Spacing distance is measured from the centerline to centerline between two anchors.

6 The critical edge or end distance, ccr, is the distance where full load values in the table may be used. The minimum edge or end distance, cmin, is the minimum distance for which values are available and installation is permitted. Edge or end distance is measured from anchor centerline to the closest unrestrained edge.

7 The tabulated values are applicable for anchors in the ends of grout-filled concrete masonry units where minimum edge distances are maintained.

8 Load values for anchors installed less than scr and ccr must be multiplied by the appropriate load reduction factor based on actual spacing (s) or edge distance (c). Load factors are multiplicative; both spacing and edge reduction factors must be considered.

9 Linear interpolation of load values between minimum spacing (smin) and critical spacing (scr) and between minimum edge or end distance (cmin) and critical edge or end distance (ccr) is permitted.

10 Concrete masonry width (wall thickness) must be equal to or greater than 1.5 times the anchor embedment depth (e.g. No. 3 and No. 4 reinforcing bars are permitted in minimum nominally 6-inch-thick concrete masonry). No. 5 and No. 6 reinforcing bars must be installed in minimum nominally 8-inch-thick concrete masonry.

11 Allowable loads must be the lesser of the adjusted masonry or bond values tabulated above and the steel strength values given in Table 2 of ICC ESR 3951.

12 Tabulated allowable bond loads must be adjusted for increased in-service base material temperatures in accordance with Figure 1 of ICC ESR 3951 as applicable.

RED HEAD®
ADHESIVE ANCHORING SPECIALISTS

# C6+

## For the Most Demanding Jobs


C6P-15 C6P-30

MADE IN USA WITH U.S. AND GLOBAL MATERIALS

## DESCRIPTION

### Maximum strength epoxy for your most heavy-duty and specialty applications

Red Head C6+ is the highest strength adhesive in our history. Designed for use in the most demanding anchoring applications, the maximum strength of Red Head C6+ is backed by ICC-ES (AC308, AC58) approvals for both concrete and masonry. It is also the only adhesive approved for core-drilled holes in cracked concrete without the use of a roughening tool.

- At least 25% stronger than the old Epcon C6+ formulation for threaded rod in cracked concrete with seismic conditions
- Fastest Cure time in its class, curing in just 2.75 hours at 90°F and in only 2 hours at 110°F!
- ICC-ES listing for cracked concrete and seismic applications (ICC-ES ESR 4046)
- ICC-ES listing for masonry applications (ICC-ES ESR 4109)
- ICC-ES listing for use in core-drill holes, even in cracked concrete
- ICC-ES listing for all wet conditions (including underwater)
- Rebar fire performance report in accordance with EAD (European Assessment Document)
- At least 10 minutes of nozzle life (Even at 110F!)
- Can be used down to 40°F and up to 110°F
- Can be used in oversized and core drilled holes
- Buy American Compliant. Made in USA with U.S. and Global Materials
- Rugged cartridges resist breakage due to rough handling or cold temperatures
- 24-month shelf life
- Store between 50°F and 95°F in a cool, dry place.

## ADVANTAGES

- The industry's first adhesive to be approved for use in core-drilled holes in cracked concrete without the need for a roughening tool
- Install Red Head C6+ and apply the load in the same work shift! (in 70F and above)
- Can be used in wet/damp/underwater applications
- More safe and durable on job sites than sausage packs
- Can use in both concrete and masonry substrates, including hollow and solid base materials

## Cure and Gel Times

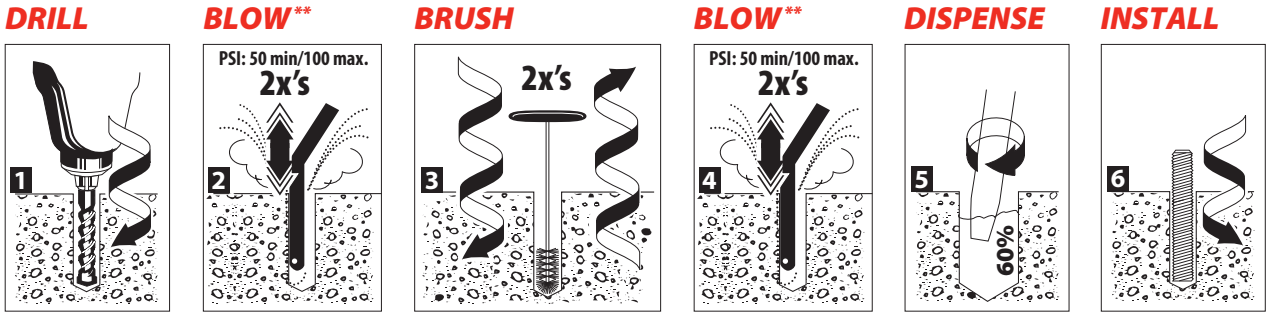
| BASE MATERIAL (F°/C°) | GEL TIME[2] | FULL CURE TIME |
|---|---|---|
| 110°/ 43° | 10 minutes | 2 hours |
| 90°/ 32° | 14 minutes | 2.75 hours |
| 70°/ 21° | 16 minutes | 6.5 hours |
| 50°/ 10° | 30 minutes | 24 hours |
| 40°/ 4.4° | 46 minutes | 48 hours |

1 For concrete temperatures between 40-50°F adhesive must be maintained at a minimum of 50°F during installation.

2 Gel time is max time from the end of mixing to when the insertion of the threaded rod or rebar into the adhesive shall be completed.

# C6+

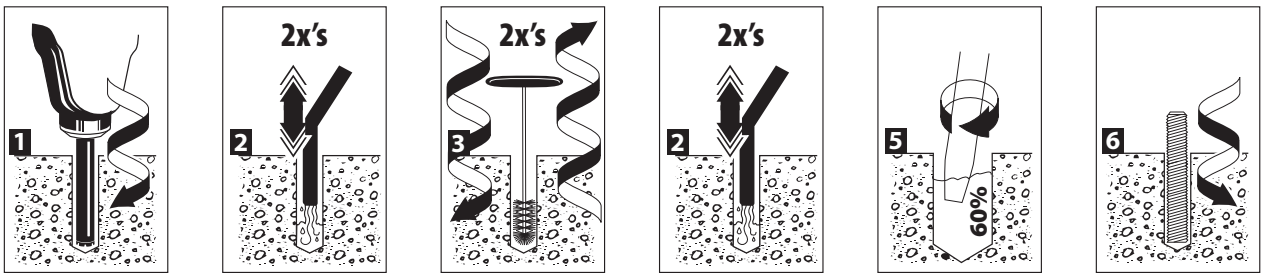
## INSTALLATION STEPS *for Carbide-Tipped Bits*




* Damp, submerged and underwater applications require 4x's air, 4x's brushing and 4x's air

** Dust is shown for diagram purposes only. To help mitigate airborne dust and comply with OSHA requirements, we recommend that you either wet the concrete before blowing out the hole, or use a drill dust extractor with your pneumatic air nozzle. We recommend vacuum assisted dust extractors like Milwaukee part numbers 5261-DE or 5317-DE. Call our technical services at (800) 848-5611 for more information.

## INSTALLATION STEPS *for Core-Drilled Holes*




Flush with water

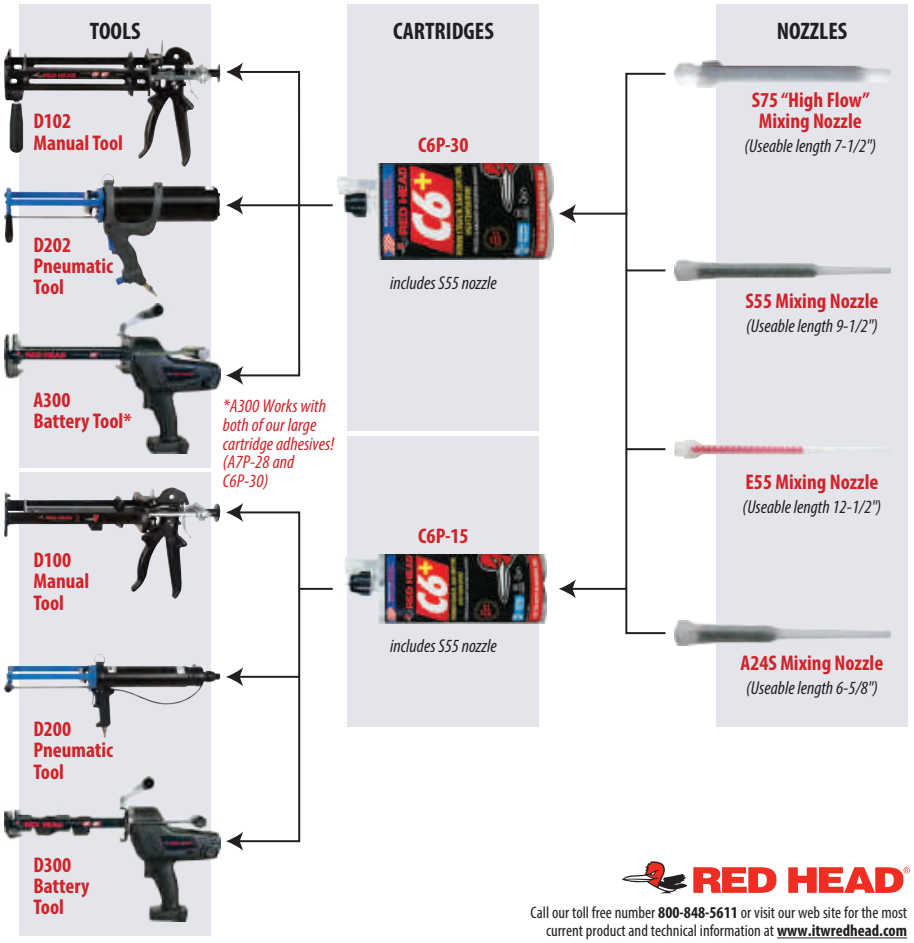
Flush with water & remove any standing water

## APPROVALS/LISTINGS

- ICC-ES ESR 4046 (Concrete Report)
- ICC-ES ESR 4109 (Masonry Report)
- 2018, 2015, 2012, 2009, 2006 International Building Code (IBC) Compliant
- Florida Building Code (FBC)
- City of Los Angeles (COLA)
- Department of Transportation (DOT) Listings
- NSF/ANSI 61 Approval for use in Drinking Water System Components
- ASTM C881, Types I, II, IV, and V, Grade 3, Classes B & C
- Rebar fire performance report in accordance with EAD (European Assessment Document)

**For the most current approvals/listings visit: www.itwredhead.com**

## *Selection Guide*



# C6P–15 fl. oz. Ordering Information

| PART NUMBER | DESCRIPTION | BOX QTY |
|---|---|---|
|  C6P-15 | 15.2 Fluid Ounce Red Head C6+ Cartridge with S55 Nozzle | 4 |
|  D100 | Heavy-Duty 34:1 thrust ratio hand dispenser for C6P-15 cartridge. | 1 |
|  S55 | Standard Mixing Nozzle, fits holes for 3/8" diameter anchors and larger. 3-1/2" inch useable length for 3/8" and 1/2" anchors, 9-1/2" useable length for 5/8" anchors and above | 24 |
|  E55 | Long Mixing Nozzle, fits holes for 3/8" diameter anchors and larger. 5-3/4" inch useable length for 3/8" and ½" anchors, 12-1/2" useable length for 5/8" anchors and above | 24 |

| PART NUMBER | DESCRIPTION | BOX QTY |
|---|---|---|
|  D200 | Ergonomic Pneumatic Dispenser for C6P-15 cartridge. | 1 |
|  D300 | Cordless Battery Dispenser for C6P-15 cartridge. Includes one battery and charger. Works with all Milwaukee® M18™ batteries | 1 |
|  S75 | High Flow Mixing Nozzle, fits holes for ¾" diameter anchors and larger. 7-1/2" useable length | 24 |

*See page 55 for nozzle extension tubes and other accessories

## ESTIMATING TABLES

### C6P-15
### 15.2 Fluid Ounce Cartridge

### Number of Anchoring Installations Per Cartridge* using Threaded Rod or Rebar with C6+ in Solid Concrete

| ANCHOR DIA. in. | ANCHOR DIA. # rebar | DRILL HOLE DIA. (in.) | EMBEDMENT DEPTH IN INCHES 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3/8 | #3 | 7/16 | 304.5 | 152.2 | 101.5 | 76.1 | 60.9 | 50.7 | 43.5 | 38.1 | 33.8 | 30.4 | 27.7 | 25.4 | 23.4 | 21.7 | 20.3 |
| 1/2 | | 9/16 | 184.2 | 92.1 | 61.4 | 46.0 | 36.8 | 30.7 | 26.3 | 23.0 | 20.5 | 18.4 | 16.7 | 15.3 | 14.2 | 13.2 | 12.3 |
| | #4 | 5/8 | 149.2 | 74.6 | 49.7 | 37.3 | 29.8 | 24.9 | 21.3 | 18.6 | 16.6 | 14.9 | 13.6 | 12.4 | 11.5 | 10.7 | 9.9 |
| 5/8 | #5 | 3/4 | 103.6 | 51.8 | 34.5 | 25.9 | 20.7 | 17.3 | 14.8 | 12.9 | 11.5 | 10.4 | 9.4 | 8.6 | 8.0 | 7.4 | 6.9 |
| 3/4 | #6 | 7/8 | 76.1 | 38.1 | 25.4 | 19.0 | 15.2 | 12.7 | 10.9 | 9.5 | 8.5 | 7.6 | 6.9 | 6.3 | 5.9 | 5.4 | 5.1 |
| 7/8 | #7 | 1 | 58.3 | 29.1 | 19.4 | 14.6 | 11.7 | 9.7 | 8.3 | 7.3 | 6.5 | 5.8 | 5.3 | 4.9 | 4.5 | 4.2 | 3.9 |
| 1 | #8 | 1-1/8 | 46.0 | 23.0 | 15.3 | 11.5 | 9.2 | 7.7 | 6.6 | 5.8 | 5.1 | 4.6 | 4.2 | 3.8 | 3.5 | 3.3 | 3.1 |
| | #9 | 1-1/4 | 37.3 | 18.6 | 12.4 | 9.3 | 7.5 | 6.2 | 5.3 | 4.7 | 4.1 | 3.7 | 3.4 | 3.1 | 2.9 | 2.7 | 2.5 |
| 1-1/4 | | 1-3/8 | 30.8 | 15.4 | 10.3 | 7.7 | 6.2 | 5.1 | 4.4 | 3.9 | 3.4 | 3.1 | 2.8 | 2.6 | 2.4 | 2.2 | 2.1 |
| | #10 | 1-1/2 | 25.9 | 12.9 | 8.6 | 6.5 | 5.2 | 4.3 | 3.7 | 3.2 | 2.9 | 2.6 | 2.4 | 2.2 | 2.0 | 1.8 | 1.7 |
| 1-1/2" | | 1-5/8" | 22.1 | 11.0 | 7.4 | 5.5 | 4.4 | 3.7 | 3.2 | 2.8 | 2.5 | 2.2 | 2.0 | 1.8 | 1.7 | 1.6 | 1.5 |
| | #11 | 1-3/4 | 19.0 | 9.5 | 6.3 | 4.8 | 3.8 | 3.2 | 2.7 | 2.4 | 2.1 | 1.9 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 |

*The estimated number of anchoring installations per cartridge is based upon calculations of filling the hole 60% full of adhesive per the recommendation in our installation instructions. Hole volumes are calculated using ANSI tolerance carbide tipped drill bits. These estimates do not account for any waste.

# C6P–30.4 fl. oz. Ordering Information

| PART NUMBER | DESCRIPTION | BOX QTY |
|---|---|---|
|  C6P-30 | 30.4 Fluid Ounce Red Head C6+ Cartridge with S55 Nozzle | 4 |
|  D102 | Heavy-Duty 34:1 thrust ratio hand dispenser for C6P-30 cartridge | 1 |
|  S55 | Standard Mixing Nozzle, fits holes for 3/8" diameter anchors and larger. 3-1/2" inch useable length for 3/8" and 1/2" anchors, 9-1/2" useable length for 5/8" anchors and above | 24 |
|  E55 | Long Mixing Nozzle, fits holes for 3/8" diameter anchors and larger. 5-3/4" inch useable length for 3/8" and ½" anchors, 12-1/2" useable length for 5/8" anchors and above | 24 |

| PART NUMBER | DESCRIPTION | BOX QTY |
|---|---|---|
|  D202 | Pneumatic Dispenser for C6P-30 cartridge | 1 |
|  A300 | Cordless Battery Dispenser for A7P-28 and C6P-30 Cartridges. Includes one battery and charger. Works with all Milwaukee® M18™ batteries (Contact Milwaukee® for more information on batteries) | 1 |
|  S75 | High Flow Mixing Nozzle, fits holes for ¾" diameter anchors and larger. 7-1/2" useable length | 24 |

*See page 55 for nozzle extension tubes and other accessories

## ESTIMATING TABLES

### C6P-30
### 30.4 Fluid Ounce Cartridge

### Number of Anchoring Installations Per Cartridge* using Threaded Rod or Rebar with C6+ in Solid Concrete

| ANCHOR DIA. | | DRILL HOLE DIA. | EMBEDMENT DEPTH IN INCHES | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| in. | # rebar | (in.) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 3/8 | #3 | 7/16 | 608.9 | 304.5 | 203.0 | 152.2 | 121.8 | 101.5 | 87.0 | 76.1 | 67.7 | 60.9 | 55.4 | 50.7 | 46.8 | 43.5 | 40.6 |
| 1/2 | | 9/16 | 368.3 | 184.2 | 122.8 | 92.1 | 73.7 | 61.4 | 52.6 | 46.0 | 40.9 | 36.8 | 33.5 | 30.7 | 28.3 | 26.3 | 24.6 |
| | #4 | 5/8 | 298.4 | 149.2 | 99.5 | 74.6 | 59.7 | 49.7 | 42.6 | 37.3 | 33.2 | 29.8 | 27.1 | 24.9 | 23.0 | 21.3 | 19.9 |
| 5/8 | #5 | 3/4 | 207.2 | 103.6 | 69.1 | 51.8 | 41.4 | 34.5 | 29.6 | 25.9 | 23.0 | 20.7 | 18.8 | 17.3 | 15.9 | 14.8 | 13.8 |
| 3/4 | #6 | 7/8 | 152.2 | 76.1 | 50.7 | 38.1 | 30.4 | 25.4 | 21.7 | 19.0 | 16.9 | 15.2 | 13.8 | 12.7 | 11.7 | 10.9 | 10.1 |
| 7/8 | #7 | 1 | 116.5 | 58.3 | 38.8 | 29.1 | 23.3 | 19.4 | 16.6 | 14.6 | 12.9 | 11.7 | 10.6 | 9.7 | 9.0 | 8.3 | 7.8 |
| 1 | #8 | 1-1/8 | 92.1 | 46.0 | 30.7 | 23.0 | 18.4 | 15.3 | 13.2 | 11.5 | 10.2 | 9.2 | 8.4 | 7.7 | 7.1 | 6.6 | 6.1 |
| | #9 | 1-1/4 | 74.6 | 37.3 | 24.9 | 18.6 | 14.9 | 12.4 | 10.7 | 9.3 | 8.3 | 7.5 | 6.8 | 6.2 | 5.7 | 5.3 | 5.0 |
| 1-1/4 | | 1-3/8 | 61.6 | 30.8 | 20.5 | 15.4 | 12.3 | 10.3 | 8.8 | 7.7 | 6.8 | 6.2 | 5.6 | 5.1 | 4.7 | 4.4 | 4.1 |
| | #10 | 1-1/2 | 51.8 | 25.9 | 17.3 | 12.9 | 10.4 | 8.6 | 7.4 | 6.5 | 5.8 | 5.2 | 4.7 | 4.3 | 4.0 | 3.7 | 3.5 |
| 1-1/2 | | 1-5/8 | 44.1 | 22.1 | 14.7 | 11.0 | 8.8 | 7.4 | 6.3 | 5.5 | 4.9 | 4.4 | 4.0 | 3.7 | 3.4 | 3.2 | 2.9 |
| | #11 | 1-3/4 | 38.1 | 19.0 | 12.7 | 9.5 | 7.6 | 6.3 | 5.4 | 4.8 | 4.2 | 3.8 | 3.5 | 3.2 | 2.9 | 2.7 | 2.5 |

*The estimated number of anchoring installations per cartridge is based upon calculations of filling the hole 60% full of adhesive per the recommendation in our installation instructions. Hole volumes are calculated using ANSI tolerance carbide tipped drill bits. These estimates do not account for any waste.

## PERFORMANCE TABLE

**C6+**
***For the Most Demanding Jobs***

### *Threaded Rod Ultimate Tension and Shear Loads[1,2,3] Installed in Solid Concrete*

| THREADED ROD DIA. (in.) | EMBEDMENT IN CONCRETE (in.) | MAX. CLAMPING FORCE AFTER PROPER CURE (ft./lbs.) | ULTIMATE TENSION (lbs.) | | | ULTIMATE SHEAR (lbs.) |
|---|---|---|---|---|---|---|
| | | | 3,000 PSI CONCRETE | 5,000 PSI CONCRETE | 7,000 PSI CONCRETE | 3,000 PSI CONCRETE & HIGHER |
| 3/8 | 1-1/2 | 9 | 3,160 | 3,785 | 4,405 | N/A |
| | 3-3/8 | | 11,640 | 12,315 | 12,985 | 5,200 |
| 1/2 | 2 | 16 | 6,075 | 7,015 | 7,950 | N/A |
| | 4-1/2 | | 20,005 | 23,305 | 26,605 | 11,420 |
| 5/8 | 2-1/2 | 47 | 8,570 | 9,995 | 11,420 | N/A |
| | 5-5/8 | | 24,905 | 29,015 | 33,125 | 18,300 |
| 3/4 | 3 | 70 | 12,030 | 13,570 | 15,105 | N/A |
| | 6-3/4 | | 36,645 | 42,695 | 48,740 | 25,720 |
| 7/8 | 3-1/2 | 90 | 15,005 | 17,335 | 19,660 | N/A |
| | 7-7/8 | | 55,575 | 70,338 | 85,100 | 32,120 |
| 1 | 4 | 110 | 17,735 | 20,390 | 23,045 | N/A |
| | 9 | | 62,250 | 73,850 | 85,450 | 38,520 |
| 1-1/4 | 5 | 370 | 34,695 | 36,935 | 39,170 | N/A |
| | 11-1/4 | | 77,815 | 90,655 | 103,495 | 65,080 |
| 1-1/2 | 13 | 450 | 101,085 | 117,765 | 134,445 | N/A |

1 Allowable working loads for the single installations under static loading should not exceed 25% capacity of the Ultimate Load. To calculate the Allowable Load of the anchor rod, divide the Ultimate Load by 4.
2 Performance values are based on the use of high strength threaded rod (ASTM A193 Gr. B7). The use of lower strength rods will result in lower ultimate tension and shear loads.
3 Linear interpolation may be used for intermediate spacing and edge distances.

## PERFORMANCE TABLE

**C6+**
***For the Most Demanding Jobs***

### *Threaded Rod Allowable Tension Loads[1] Installed in Solid Concrete*

| THREADED ROD DIA in. | EMBEDMENT IN CONCRETE in. | ALLOWABLE TENSION LOAD BASED ON CONCRETE STRENGTH (lbs.) | | | ALLOWABLE TENSION LOAD BASED ON STEEL STRENGTH (lbs.) | | |
|---|---|---|---|---|---|---|---|
| | | 3,000 psi concrete | 5,000 psi concrete | 7,000 psi concrete | ASTM A307 | ASTM A193 GRADE B7 | ASTM F593 AISI 304 SS |
| 3/8 | 1-1/2 | 790 | 945 | 1,100 | 2,080 | 4,340 | 3,995 |
| | 3-3/8 | 2,910 | 3,080 | 3,245 | 2,080 | 4,340 | 3,995 |
| 1/2 | 2 | 1,520 | 1,755 | 1,990 | 3,730 | 7,780 | 7,155 |
| | 4-1/2 | 5,000 | 5,825 | 6,650 | 3,730 | 7,780 | 7,155 |
| 5/8 | 2-1/2 | 2,145 | 2,500 | 2,855 | 5,870 | 12,230 | 11,250 |
| | 5-5/8 | 6,225 | 7,255 | 8,280 | 5,870 | 12,230 | 11,250 |
| 3/4 | 3 | 3,010 | 3,395 | 3,775 | 8,490 | 17,690 | 14,860 |
| | 6-3/4 | 9,160 | 10,675 | 12,185 | 8,490 | 17,690 | 14,860 |
| 7/8 | 3-1/2 | 3,750 | 4,335 | 4,915 | 11,600 | 25,510 | 20,835 |
| | 7-7/8 | 13,895 | 17,585 | 21,275 | 11,600 | 25,510 | 20,835 |
| 1 | 4 | 4,435 | 5,100 | 5,760 | 15,180 | 31,620 | 26,560 |
| | 9 | 15,565 | 18,465 | 21,365 | 15,180 | 31,620 | 26,560 |
| 1-1/4 | 5 | 8,675 | 9,235 | 9,795 | 23,800 | 49,580 | 34,670 |
| | 11-1/4 | 19,455 | 22,665 | 25,875 | 23,800 | 49,580 | 34,670 |
| 1-1/2 | 13 | 25,270 | 29,440 | 33,610 | 33,720 | 70,250 | 47,770 |

1 Use lower value of either bond or steel strength for allowable tension load.

## PERFORMANCE TABLE

**C6+**
***For the Most Demanding Jobs***

### *Threaded Rod Allowable Shear Loads[1] Installed in Solid Concrete*

| THREADED ROD DIA. (in.) | EMBEDMENT IN CONCRETE (in.) | ALLOWABLE SHEAR LOAD BASED ON CONCRETE STRENGTH (lbs.) | ALLOWABLE SHEAR LOAD BASED ON STEEL STRENGTH (lbs.) | | |
|---|---|---|---|---|---|
| | | 3,000 psi concrete & higher | ASTM A307 | ASTM A193 GRADE B7 | ASTM F593 AISI 304 SS |
| 3/8 | 1-1/2 | N/A | 1,040 | 2,170 | 1,995 |
| | 3-3/8 | 1,300 | 1,040 | 2,170 | 1,995 |
| 1/2 | 2 | N/A | 1,870 | 3,895 | 3,585 |
| | 4-1/2 | 2,855 | 1,870 | 3,895 | 3,585 |
| 5/8 | 2-1/2 | N/A | 2,940 | 6,125 | 5,635 |
| | 5-5/8 | 4,575 | 2,940 | 6,125 | 5,635 |
| 3/4 | 3 | N/A | 4,250 | 8,855 | 7,440 |
| | 6-3/4 | 6,430 | 4,250 | 8,855 | 7,440 |
| 7/8 | 3-1/2 | N/A | 5,800 | 12,760 | 10,730 |
| | 7-7/8 | 8,030 | 5,800 | 12,760 | 10,730 |
| 1 | 4 | N/A | 7,590 | 15,810 | 13,285 |
| | 9 | 9,630 | 7,590 | 15,810 | 13,285 |
| 1-1/4 | 5 | N/A | 11,900 | 24,790 | 18,840 |
| | 11-1/4 | 16,270 | 11,900 | 24,790 | 18,840 |

1 Use lower value of either concrete or steel strength for allowable shear load.

## PERFORMANCE TABLE

**C6+**
***For the Most Demanding Jobs***

### *Rebar Ultimate Tension Loads[1,2,3] Installed in Solid Concrete*

| REINFORCING BAR | EMBEDMENT IN CONCRETE (in.) | ULTIMATE TENSION (lbs.) | | | ULTIMATE YIELD STRENGTH GRADE 60 REBAR (lbs.) | ULTIMATE TENSILE STRENGTH GRADE 60 REBAR (lbs.) |
|---|---|---|---|---|---|---|
| | | 3,000 psi concrete | 5,000 psi concrete | 7,000 psi concrete | | |
| #3 | 1-1/2 | 3,160 | 3,785 | 4,405 | 6,600 | 9,900 |
| | 3-3/8 | 11,640 | 12,315 | 12,985 | | |
| #4 | 2 | 6,075 | 7,015 | 7,950 | 12,000 | 18,000 |
| | 4-1/2 | 20,005 | 23,305 | 26,605 | | |
| #5 | 2-1/2 | 8,570 | 9,995 | 11,420 | 18,600 | 27,900 |
| | 5-5/8 | 24,905 | 29,015 | 33,125 | | |
| #6 | 3 | 12,030 | 13,570 | 15,105 | 26,400 | 39,600 |
| | 6-3/4 | 36,645 | 42,695 | 48,740 | | |
| #7 | 3-1/2 | 15,005 | 17,335 | 19,660 | 36,000 | 54,000 |
| | 7-7/8 | 55,575 | 70,338 | 85,100 | | |
| #8 | 4 | 17,735 | 20,390 | 23,045 | 47,400 | 71,100 |
| | 9 | 62,250 | 73,850 | 85,450 | | |
| #10 | 5 | 34,695 | 36,935 | 39,170 | 79,200 | 114,300 |
| | 11-1/4 | 77,815 | 90,655 | 103,495 | | |
| #11 | 13 | 101,085 | 117,764 | 134,443 | 93,600 | 140,400 |

1 Allowable working loads for the single installation under static loading should not exceed 25% capacity of the Ultimate Load. To calculate the Allowable Load of the anchor, divide the ultimate load by 4.
2 Performance values are based on the use of ASTM A615 Grade 60 reinforcing bar. The use of lower strength rebar will result in lower ultimate tension loads
3 SHEAR DATA: Provided the distance from the rebar to the edge of the concrete member exceeds 1.25 times the embedment depth of the rebar, calculate the ultimate shear load for the rebar anchorage as 60% of the ultimate tensile strength of the rebar.

## PERFORMANCE REFERENCE TABLE

**C6+**
***For the Most Demanding Jobs***

### *Threaded Rod and Rebar Installation in Solid Concrete Edge/Spacing Distance Load Factor Summary[1,2]*

| LOAD FACTOR | DISTANCE FROM EDGE OF CONCRETE |
|---|---|
| ***Critical Edge Distance—Tension*** | |
| 100% Tension Load | → 1.25 x Anchor Embedment (or greater) |
| ***Minimum Edge Distance—Tension*** | |
| 70% Tension Load | → 0.50 x Anchor Embedment |
| ***Critical Edge Distance—Shear*** | |
| 100% Shear Load | → 1.25 x Anchor Embedment (or greater) |
| ***Minimum Edge Distance—Shear*** | |
| 30% Shear Load | → 0.30 x Anchor Embedment |

| LOAD FACTOR | DISTANCE FROM ANOTHER ANCHOR |
|---|---|
| ***Critical Spacing—Tension*** | |
| 100% Tension Load | → 1.50 x Anchor Embedment (or greater) |
| ***Minimum Spacing—Tension*** | |
| 75% Tension Load | → 0.75 x Anchor Embedment |
| ***Critical Spacing—Shear*** | |
| 100% Shear Load | → 1.50 x Anchor Embedment (or greater) |
| ***Minimum Spacing—Shear*** | |
| 30% Shear Load | → 0.50 x Anchor Embedment |

1 Use linear interpolation for load factors at edge distances or spacing distances between critical and minimum.
2 Anchors are affected by multiple combination of spacing and/or edge distance loading and direction of the loading. Use the product of tension and shear loading factors in design.

## STRENGTH DESIGN TABLE

**C6+**
***For the Most Demanding Jobs***

### *Threaded Rod Tension (lbf) and Shear (lbf) Loads in Uncracked Concrete[1,2,3,4] ASTM A193 B7*

| ANCHOR DIAMETER (in.) | EMBEDMENT DEPTH (in.) | TENSION (lbf) | | | | | | SHEAR (lbf) |
|---|---|---|---|---|---|---|---|---|
| | | 2500 psi | 3000 psi | 4000 psi | 5000 psi | 6000 psi | 7000-8000 psi | 2500-8000 psi |
| 3/8 | 3-3/8 | 4,835 | 5,295 | 6,115 | 6,380 | 6,380 | 6,380 | 3,775 |
| | 4-1/2 | 7,265 | 7,265 | 7,265 | 7,265 | 7,265 | 7,265 | 3,775 |
| | 7-1/2 | 7,265 | 7,265 | 7,265 | 7,265 | 7,265 | 7,265 | 3,775 |
| 1/2 | 4-1/2 | 7,445 | 8,155 | 9,415 | 10,530 | 10,980 | 10,980 | 6,915 |
| | 6 | 11,460 | 12,555 | 13,305 | 13,305 | 13,305 | 13,305 | 6,915 |
| | 10 | 13,305 | 13,305 | 13,305 | 13,305 | 13,305 | 13,305 | 6,915 |
| 5/8 | 5-5/8 | 10,405 | 11,395 | 13,160 | 14,715 | 16,120 | 16,615 | 11,015 |
| | 7-1/2 | 16,020 | 17,550 | 20,265 | 21,185 | 21,185 | 21,185 | 11,015 |
| | 12-1/2 | 21,185 | 21,185 | 21,185 | 21,185 | 21,185 | 21,185 | 11,015 |
| 3/4 | 6-3/4 | 13,675 | 14,980 | 17,300 | 19,345 | 19,590 | 19,590 | 16,305 |
| | 9 | 21,060 | 23,070 | 26,125 | 26,125 | 26,125 | 26,125 | 16,305 |
| | 15 | 31,355 | 31,355 | 31,355 | 31,355 | 31,355 | 31,355 | 16,305 |
| 7/8 | 7-7/8 | 17,235 | 18,880 | 21,800 | 24,375 | 25,715 | 25,715 | 22,505 |
| | 10-1/2 | 26,535 | 29,070 | 33,565 | 34,285 | 34,285 | 34,285 | 22,505 |
| | 17-1/2 | 43,280 | 43,280 | 43,280 | 43,280 | 43,280 | 43,280 | 22,505 |
| 1 | 9 | 21,060 | 23,070 | 26,635 | 29,780 | 32,420 | 32,420 | 29,525 |
| | 12 | 32,420 | 35,515 | 41,010 | 43,230 | 43,230 | 43,230 | 29,525 |
| | 20 | 56,780 | 56,780 | 56,780 | 56,780 | 56,780 | 56,780 | 29,525 |
| 1-1/4 | 11-1/4 | 29,430 | 32,240 | 37,225 | 41,620 | 45,595 | 46,895 | 47,240 |
| | 15 | 45,310 | 49,635 | 57,315 | 62,525 | 62,525 | 62,525 | 47,240 |
| | 25 | 90,855 | 90,855 | 90,855 | 90,855 | 90,855 | 90,855 | 47,240 |

1 Tabulated values are for estimation purposes only and should not be used for design (please use our free TruSpec anchorage design software at www.itwredhead.com)
2 Tabulated values represent strength design per ACI 318 for a single anchor in adequate concrete thickness, not near an edge nor adjacent anchorage, and not for sustained loading.
3 Bond strengths are for dry, uncracked concrete with periodic inspection
4 Bond strengths are for Temperature Range A (maximum long term temperature of 110F, maximum short term temperature of 142F).

## STRENGTH DESIGN TABLE

**C6+**
***For the Most Demanding Jobs***

### *Threaded Rod Tension (lbf) and Shear (lbf) Loads in 4,000 psi Uncracked Concrete[1,2,3,4]*

| ANCHOR DIAMETER (in.) | EMBEDMENT DEPTH (in.) | ASTM A193 B7 THREAD ROD | | CARBON STEEL A36 | | STAINLESS STEEL F593 | |
|---|---|---|---|---|---|---|---|
| | | TENSION (lbf) | SHEAR (lbf) | TENSION (lbf) | SHEAR (lbf) | TENSION (lbf) | SHEAR (lbf) |
| 3/8 | 3-3/8 | 6,115 | 3,775 | 3,375 | 1,755 | 4,785 | 2,280 |
| | 4-1/2 | 7,265 | 3,775 | 3,375 | 1,755 | 4,785 | 2,280 |
| | 7-1/2 | 7,265 | 3,775 | 3,375 | 1,755 | 4,785 | 2,280 |
| 1/2 | 4-1/2 | 9,415 | 6,915 | 6,170 | 3,210 | 8,760 | 4,040 |
| | 6 | 13,305 | 6,915 | 6,170 | 3,210 | 8,760 | 4,040 |
| | 10 | 13,305 | 6,915 | 6,170 | 3,210 | 8,760 | 4,040 |
| 5/8 | 5-5/8 | 13,160 | 11,015 | 9,830 | 5,115 | 13,160 | 6,440 |
| | 7-1/2 | 20,265 | 11,015 | 9,830 | 5,115 | 13,955 | 6,440 |
| | 12-1/2 | 21,185 | 11,015 | 9,830 | 5,115 | 13,955 | 6,440 |
| 3/4 | 6-3/4 | 17,300 | 16,305 | 14,550 | 7,565 | 16,500 | 7,610 |
| | 9 | 26,125 | 16,305 | 14,550 | 7,565 | 16,500 | 7,610 |
| | 15 | 31,355 | 16,305 | 14,550 | 7,565 | 16,500 | 7,610 |
| 7/8 | 7-7/8 | 21,800 | 22,505 | 20,085 | 10,445 | 21,800 | 10,530 |
| | 10-1/2 | 33,565 | 22,505 | 20,085 | 10,445 | 22,820 | 10,530 |
| | 17-1/2 | 43,280 | 22,505 | 20,085 | 10,445 | 22,820 | 10,530 |
| 1 | 9 | 26,635 | 29,525 | 26,345 | 13,700 | 26,635 | 13,815 |
| | 12 | 41,010 | 29,525 | 26,345 | 13,700 | 29,935 | 13,815 |
| | 20 | 56,780 | 29,525 | 26,345 | 13,700 | 29,935 | 13,815 |
| 1-1/4 | 11-1/4 | 37,225 | 47,240 | 37,225 | 21,920 | 37,225 | 22,090 |
| | 15 | 57,315 | 47,240 | 42,155 | 21,920 | 47,865 | 22,090 |
| | 25 | 90,855 | 47,240 | 42,155 | 21,920 | 47,865 | 22,090 |

1 Tabulated values are for estimation purposes only and should not be used for design (please use our free TruSpec anchorage design software at www.itwredhead.com)
2 Tabulated values represent strength design per ACI 318 for a single anchor in adequate concrete thickness, not near an edge nor adjacent anchorage, and not for sustained loading.
3 Bond strengths are for dry, uncracked concrete with periodic inspection
4 Bond strengths are for Temperature Range A (maximum long term temperature of 110F, maximum short term temperature of 142F).

## STRENGTH DESIGN TABLE

### C6+
### For the Most Demanding Jobs

### Threaded Rod Tension (lbf) and Shear (lbf) Loads in Cracked Concrete[1,2,3,4] ASTM A193 B7

| ANCHOR DIAMETER (in.) | EMBEDMENT DEPTH (in.) | TENSION (lbf) | | | | | | SHEAR (lbf) |
|---|---|---|---|---|---|---|---|---|
| | | 2500 psi | 3000 psi | 4000 psi | 5000 psi | 6000 psi | 7000-8000 psi | 2500-8000 psi |
| 3/8 | 3-3/8 | 2,905 | 2,905 | 2,905 | 2,905 | 2,905 | 2,905 | 3,775 |
| | 4-1/2 | 3,875 | 3,875 | 3,875 | 3,875 | 3,875 | 3,875 | 3,775 |
| | 7-1/2 | 6,460 | 6,460 | 6,460 | 6,460 | 6,460 | 6,460 | 3,775 |
| 1/2 | 4-1/2 | 5,165 | 5,165 | 5,165 | 5,165 | 5,165 | 5,165 | 6,915 |
| | 6 | 6,890 | 6,890 | 6,890 | 6,890 | 6,890 | 6,890 | 6,915 |
| | 10 | 11,485 | 11,485 | 11,485 | 11,485 | 11,485 | 11,485 | 6,915 |
| 5/8 | 5-5/8 | 7,370 | 8,070 | 8,075 | 8,075 | 8,075 | 8,075 | 11,015 |
| | 7-1/2 | 10,765 | 10,765 | 10,765 | 10,765 | 10,765 | 10,765 | 11,015 |
| | 12-1/2 | 17,945 | 17,945 | 17,945 | 17,945 | 17,945 | 17,945 | 11,015 |
| 3/4 | 6-3/4 | 9,685 | 10,610 | 10,975 | 10,975 | 10,975 | 10,975 | 15,365 |
| | 9 | 14,635 | 14,635 | 14,635 | 14,635 | 14,635 | 14,635 | 16,305 |
| | 15 | 24,395 | 24,395 | 24,395 | 24,395 | 24,395 | 24,395 | 16,305 |
| 7/8 | 7-7/8 | 12,210 | 13,375 | 14,940 | 14,940 | 14,940 | 14,940 | 20,915 |
| | 10-1/2 | 18,795 | 19,920 | 19,920 | 19,920 | 19,920 | 19,920 | 22,505 |
| | 17-1/2 | 33,200 | 33,200 | 33,200 | 33,200 | 33,200 | 33,200 | 22,505 |
| 1 | 9 | 14,915 | 16,340 | 18,865 | 19,515 | 19,515 | 19,515 | 27,320 |
| | 12 | 22,965 | 25,155 | 26,020 | 26,020 | 26,020 | 26,020 | 29,525 |
| | 20 | 43,365 | 43,365 | 43,365 | 43,365 | 43,365 | 43,365 | 29,525 |
| 1-1/4 | 11-1/4 | 20,845 | 22,835 | 26,370 | 29,480 | 32,295 | 33,285 | 46,600 |
| | 15 | 32,095 | 35,160 | 40,600 | 44,380 | 44,380 | 44,380 | 47,240 |
| | 25 | 69,060 | 73,970 | 73,970 | 73,970 | 73,970 | 73,970 | 47,240 |

1 Tabulated values are for estimation purposes only and should not be used for design (please use our free TruSpec anchorage design software at www.itwredhead.com)
2 Tabulated values represent strength design per ACI 318 for a single anchor in adequate concrete thickness, not near an edge nor adjacent anchorage, and not for sustained loading.
3 Bond strengths are for dry, cracked concrete with periodic inspection
4 Bond strengths are for Temperature Range A (maximum long term temperature of 110F, maximum short term temperature of 142F).

## STRENGTH DESIGN TABLE

### C6+
### For the Most Demanding Jobs

### Threaded Rod Tension (lbf) and Shear (lbf) Loads in 4,000 psi Cracked Concrete[1,2,3,4]

| ANCHOR DIAMETER (in.) | EMBEDMENT DEPTH (in.) | ASTM A193 B7 THREAD ROD | | CARBON STEEL A36 | | STAINLESS STEEL F593 | |
|---|---|---|---|---|---|---|---|
| | | TENSION (lbf) | SHEAR (lbf) | TENSION (lbf) | SHEAR (lbf) | TENSION (lbf) | SHEAR (lbf) |
| 3/8 | 3-3/8 | 2,905 | 3,775 | 3,375 | 1,755 | 4,785 | 2,280 |
| | 4-1/2 | 3,875 | 3,775 | 3,375 | 1,755 | 4,785 | 2,280 |
| | 7-1/2 | 6,460 | 3,775 | 3,375 | 1,755 | 4,785 | 2,280 |
| 1/2 | 4-1/2 | 5,165 | 6,915 | 6,170 | 3,210 | 8,760 | 4,040 |
| | 6 | 6,890 | 6,915 | 6,170 | 3,210 | 8,760 | 4,040 |
| | 10 | 11,485 | 6,915 | 6,170 | 3,210 | 8,760 | 4,040 |
| 5/8 | 5-5/8 | 8,075 | 11,015 | 9,830 | 5,115 | 13,160 | 6,440 |
| | 7-1/2 | 10,765 | 11,015 | 9,830 | 5,115 | 13,955 | 6,440 |
| | 12-1/2 | 17,945 | 11,015 | 9,830 | 5,115 | 13,955 | 6,440 |
| 3/4 | 6-3/4 | 10,975 | 15,365 | 14,550 | 7,565 | 16,500 | 7,610 |
| | 9 | 14,635 | 16,305 | 14,550 | 7,565 | 16,500 | 7,610 |
| | 15 | 24,395 | 16,305 | 14,550 | 7,565 | 16,500 | 7,610 |
| 7/8 | 7-7/8 | 14,940 | 20,915 | 20,085 | 10,445 | 21,800 | 10,530 |
| | 10-1/2 | 19,920 | 22,505 | 20,085 | 10,445 | 22,820 | 10,530 |
| | 17-1/2 | 33,200 | 22,505 | 20,085 | 10,445 | 22,820 | 10,530 |
| 1 | 9 | 19,515 | 27,320 | 26,345 | 13,700 | 26,635 | 13,815 |
| | 12 | 26,020 | 29,525 | 26,345 | 13,700 | 29,935 | 13,815 |
| | 20 | 43,365 | 29,525 | 26,345 | 13,700 | 29,935 | 13,815 |
| 1-1/4 | 11-1/4 | 33,285 | 46,600 | 37,225 | 21,920 | 37,225 | 22,090 |
| | 15 | 44,380 | 47,240 | 42,155 | 21,920 | 47,865 | 22,090 |
| | 25 | 73,970 | 47,240 | 42,155 | 21,920 | 47,865 | 22,090 |

1 Tabulated values are for estimation purposes only and should not be used for design (please use our free TruSpec anchorage design software at www.itwredhead.com)
2 Tabulated values represent strength design per ACI 318 for a single anchor in adequate concrete thickness, not near an edge nor adjacent anchorage, and not for sustained loading.
3 Bond strengths are for dry, cracked concrete with periodic inspection
4 Bond strengths are for Temperature Range A (maximum long term temperature of 110F, maximum short term temperature of 142F).

## STRENGTH DESIGN TABLE

**C6+**
***For the Most Demanding Jobs***

### *Rebar Tension (lbf) and Shear (lbf) Loads in Uncracked Concrete[1,2,3,4] ASTM A615 Grade 60*

| ANCHOR DIAMETER # Rebar | EMBEDMENT DEPTH (in.) | TENSION (lbf) | | | | | | SHEAR (lbf) |
|---|---|---|---|---|---|---|---|---|
| | | 2500 psi | 3000 psi | 4000 psi | 5000 psi | 6000 psi | 7000-8000 psi | 2500-8000 psi |
| #3 | 3-3/8 | 4,835 | 5,295 | 6,110 | 6,110 | 6,110 | 6,110 | 3,560 |
| | 4-1/2 | 6,435 | 6,435 | 6,435 | 6,435 | 6,435 | 6,435 | 3,560 |
| | 7-1/2 | 4,835 | 6,435 | 6,435 | 6,435 | 6,435 | 6,435 | 3,560 |
| #4 | 4-1/2 | 7,445 | 8,155 | 9,415 | 10,450 | 10,450 | 10,450 | 6,480 |
| | 6 | 11,460 | 11,700 | 11,700 | 11,700 | 11,700 | 11,700 | 6,480 |
| | 10 | 11,700 | 11,700 | 11,700 | 11,700 | 11,700 | 11,700 | 6,480 |
| #5 | 5-5/8 | 10,405 | 11,395 | 13,160 | 14,715 | 15,650 | 15,650 | 10,040 |
| | 7-1/2 | 16,020 | 17,550 | 18,135 | 18,135 | 18,135 | 18,135 | 10,040 |
| | 12-1/2 | 18,135 | 18,135 | 18,135 | 18,135 | 18,135 | 18,135 | 10,040 |
| #6 | 6-3/4 | 13,675 | 14,980 | 17,300 | 18,235 | 18,235 | 18,235 | 14,255 |
| | 9 | 21,060 | 23,070 | 24,315 | 24,315 | 24,315 | 24,315 | 14,255 |
| | 15 | 25,740 | 25,740 | 25,740 | 25,740 | 25,740 | 25,740 | 14,255 |
| #7 | 7-7/8 | 17,235 | 18,880 | 21,800 | 23,690 | 23,690 | 23,690 | 19,440 |
| | 10-1/2 | 26,535 | 29,070 | 31,590 | 31,590 | 31,590 | 31,590 | 19,440 |
| | 17-1/2 | 35,100 | 35,100 | 35,100 | 35,100 | 35,100 | 35,100 | 19,440 |
| #8 | 9 | 21,060 | 23,070 | 26,635 | 29,465 | 29,465 | 29,465 | 25,595 |
| | 12 | 32,420 | 35,515 | 39,290 | 39,290 | 39,290 | 39,290 | 25,595 |
| | 20 | 46,215 | 46,215 | 46,215 | 46,215 | 46,215 | 46,215 | 25,595 |
| #9 | 10-1/8 | 25,130 | 27,525 | 31,785 | 35,525 | 35,525 | 35,525 | 32,400 |
| | 13-1/2 | 38,690 | 42,380 | 47,365 | 47,365 | 47,365 | 47,365 | 32,400 |
| | 22-1/2 | 58,500 | 58,500 | 58,500 | 58,500 | 58,500 | 58,500 | 32,400 |
| #10 | 11-1/4 | 29,430 | 32,240 | 37,225 | 41,620 | 42,210 | 42,210 | 41,145 |
| | 15 | 45,310 | 49,635 | 56,285 | 56,285 | 56,285 | 56,285 | 41,145 |
| | 25 | 74,295 | 74,295 | 74,295 | 74,295 | 74,295 | 74,295 | 41,145 |

1 Tabulated values are for estimation purposes only and should not be used for design (please use our free TruSpec anchorage design software at www.itwredhead.com)
2 Tabulated values represent strength design per ACI 318 for a single anchor in adequate concrete thickness, not near an edge nor adjacent anchorage, and not for sustained loading.
3 Bond strengths are for dry, uncracked concrete with periodic inspection
4 Bond strengths are for Temperature Range A (maximum long term temperature of 110F, maximum short term temperature of 142F).

## STRENGTH DESIGN TABLE

**C6+**
***For the Most Demanding Jobs***

### *Rebar Tension (lbf) and Shear (lbf) Loads in Cracked Concrete[1,2,3,4] ASTM A615 Grade 60*

| ANCHOR DIAMETER # Rebar | EMBEDMENT DEPTH (in.) | TENSION (lbf) | | | | | | SHEAR (lbf) |
|---|---|---|---|---|---|---|---|---|
| | | 2500 psi | 3000 psi | 4000 psi | 5000 psi | 6000 psi | 7000-8000 psi | 2500-8000 psi |
| #3 | 3-3/8 | 2,825 | 2,905 | 2,905 | 2,905 | 2,905 | 3,560 | 3,560 |
| | 4-1/2 | 3,875 | 3,875 | 3,875 | 3,875 | 3,875 | 3,560 | 3,560 |
| | 7-1/2 | 6,435 | 6,435 | 6,435 | 6,435 | 6,435 | 3,560 | 3,560 |
| #4 | 4-1/2 | 5,165 | 5,165 | 5,165 | 5,165 | 5,165 | 6,480 | 6,480 |
| | 6 | 6,890 | 6,890 | 6,890 | 6,890 | 6,890 | 6,480 | 6,480 |
| | 10 | 11,485 | 11,485 | 11,485 | 11,485 | 11,485 | 6,480 | 6,480 |
| #5 | 5-5/8 | 7,370 | 7,965 | 7,965 | 7,965 | 7,965 | 10,040 | 10,040 |
| | 7-1/2 | 10,620 | 10,620 | 10,620 | 10,620 | 10,620 | 10,040 | 10,040 |
| | 12-1/2 | 17,705 | 17,705 | 17,705 | 17,705 | 17,705 | 10,040 | 10,040 |
| #6 | 6-3/4 | 9,685 | 10,405 | 10,405 | 10,405 | 10,405 | 14,255 | 14,255 |
| | 9 | 13,875 | 13,875 | 13,875 | 13,875 | 13,875 | 14,255 | 14,255 |
| | 15 | 23,130 | 23,130 | 23,130 | 23,130 | 23,130 | 14,255 | 14,255 |
| #7 | 7-7/8 | 12,210 | 13,375 | 13,570 | 13,570 | 13,570 | 19,000 | 19,440 |
| | 10-1/2 | 18,095 | 18,095 | 18,095 | 18,095 | 18,095 | 19,440 | 19,440 |
| | 17-1/2 | 30,160 | 30,160 | 30,160 | 30,160 | 30,160 | 19,440 | 19,440 |
| #8 | 9 | 14,915 | 16,340 | 16,950 | 16,950 | 16,950 | 23,730 | 25,595 |
| | 12 | 22,600 | 22,600 | 22,600 | 22,600 | 22,600 | 25,595 | 25,595 |
| | 20 | 37,665 | 37,665 | 37,665 | 37,665 | 37,665 | 25,595 | 25,595 |
| #9 | 10-1/8 | 17,800 | 19,495 | 20,465 | 20,465 | 20,465 | 28,655 | 32,400 |
| | 13-1/2 | 27,290 | 27,290 | 27,290 | 27,290 | 27,290 | 32,400 | 32,400 |
| | 22-1/2 | 45,485 | 45,485 | 45,485 | 45,485 | 45,485 | 32,400 | 32,400 |
| #10 | 11-1/4 | 20,845 | 22,835 | 26,370 | 26,660 | 26,660 | 37,325 | 41,145 |
| | 15 | 32,095 | 35,160 | 35,545 | 35,545 | 35,545 | 41,145 | 41,145 |
| | 25 | 59,245 | 59,245 | 59,245 | 59,245 | 59,245 | 41,145 | 41,145 |

1 Tabulated values are for estimation purposes only and should not be used for design (please use our free TruSpec anchorage design software at www.itwredhead.com)
2 Tabulated values represent strength design per ACI 318 for a single anchor in adequate concrete thickness, not near an edge nor adjacent anchorage, and not for sustained loading.
3 Bond strengths are for dry, cracked concrete with periodic inspection
4 Bond strengths are for Temperature Range A (maximum long term temperature of 110F, maximum short term temperature of 142F).

## MASONRY DESIGN TABLE

**C6+**
***For the Most Demanding Jobs***

### *Grout-filled Concrete Block: Threaded Rod Allowable Tension and Shear Loads Based on Steel Design Information for U.S. Customary Unit[1,2,3]*

| Anchor Diameter (in.) | Tension (lb) | | | Shear (lb) | | |
|---|---|---|---|---|---|---|
| | ASTM A307 $F_u$ = 60 ksi | ASTM A193 Grade B7 $F_u$ = 125 ksi | ASTM F593 SS 304 $F_u$ = 100 ksi | ASTM A307 $F_u$ = 60 ksi | ASTM A193 Grade B7 $F_u$ = 125 ksi | ASTM F593 SS 304 $F_u$ = 100 ksi |
| 3/8 | 2,185 | 4,555 | 3,645 | 1,125 | 2,345 | 1,875 |
| 1/2 | 3,885 | 8,100 | 6,480 | 2,000 | 4,170 | 3,335 |
| 5/8 | 6,075 | 12,655 | 10,125 | 3,130 | 6,520 | 5,215 |
| 3/4 | 8,750 | 18,225 | 12,390 | 4,505 | 9,390 | 6,385 |

For SI: 1 inch = 25.4mm, 1 lbf = 4.45N, 1ft-lbf = 1.356 N-M, 1 psi = 0.006895 MPa

1 Allowable load used in the design must be the lesser of bond values and tabulated steel element values.

2 Allowable tension and shear loads for threaded rods to resist short term loads, such as wind or seismic, must be calculated in accordance with Section 4.1 of ICC ESR 4109 as applicable.

3 Allowable steel loads are based on allowable tension and shear stresses equal to 0.33X $F_u$ and 0.17x$F_u$, respectively.

## MASONRY DESIGN TABLE

**C6+**
***For the Most Demanding Jobs***

### *Grout-filled Concrete Block: Threaded Rod Allowable Tension Loads with Reduction Factors[1,2,3,4,7,9,10,12]*

| Threaded Rod Size (in.) | Minimum Embedment (inches) | Load at $s_{cr}$ and $c_{cr}$ (lb) | Spacing[5] | | | Edge Distance[6] | | |
|---|---|---|---|---|---|---|---|---|
| | | | Critical $s_{cr}$ (inches) | Minimum $s_{min}$ (inches) | Load reduction factor for $s_{min}$ [8] | Critical $c_{cr}$ (inches) | Minimum $c_{min}$ (inches) | Load reduction factor for $c_{min}$ [8] |
| 3/8 | 3-3/8 | 945 | 13.5 | 4 | 1.00 | 12 | 4 | 0.87 |
| 1/2 | 4-1/2 | 1,395 | 18 | 4 | 0.50 | 20 | 4 | 0.68 |
| 5/8 | 5-5/8 | 1,825 | 22.5 | 4 | 0.50 | 20 | 4 | 0.68 |
| 3/4 | 6-3/4 | 2,085 | 27 | 4 | 0.50 | 20 | 4 | 0.68 |

For SI: 1 inch = 25.4mm, 1 lbf = 0.0044kN, 1 ksi = 6.894 MPa
See footnotes below

## MASONRY DESIGN TABLE

**C6+**
***For the Most Demanding Jobs***

### *Grout-filled Concrete Block: Threaded Rod Allowable Shear Loads with Reduction Factors[1,2,3,4,7,9,10,12]*

| Threaded Rod Size (in.) | Minimum Embedment (inches) | Load at $s_{cr}$ and $c_{cr}$ ⊥ to edge (lb) | Spacing[5] | | | Edge Distance[6] | | |
|---|---|---|---|---|---|---|---|---|
| | | | Critical $s_{cr}$ (inches) | Minimum $s_{min}$ (inches) | Load reduction factor for $s_{min}$ [8] | Critical $c_{cr}$ (inches) | Minimum $c_{min}$ (inches) | Load reduction factor for $c_{min}$ [8] |
| 3/8 | 3-3/8 | 825 | 13.5 | 4 | 0.50 | 12 | 4 | 0.87 |
| 1/2 | 4-1/2 | 1,560 | 18 | 4 | 0.50 | 20 | 4 | 0.56 |
| 5/8 | 5-5/8 | 2,680 | 22.5 | 4 | 0.50 | 20 | 4 | 0.30 |
| 3/4 | 6-3/4 | 3,180 | 27 | 4 | 0.50 | 20 | 4 | 0.27 |

For SI: 1 inch = 25.4mm, 1 lbf = 0.0044kN, 1 ksi = 6.894 MPa

1 All values are for anchors installed in fully grouted concrete masonry with minimum masonry strength of 1500 psi (10.3 MPa). Concrete masonry units must be light-, medium, or normal-weight conforming to ASTM C 90. Allowable loads have been calculated using a safety factor of 5.0.

3 Anchors may be installed in any location in the face of the masonry wall (cell, web, bed joint) as shown in Figure 2 of ICC ESR 4109.

4 A maximum of two anchors may be installed in a single masonry cell in accordance with the spacing and edge or end distance requirements. Embedment is measured from the outside surface of the concrete masonry unit to the embedded end of the anchor.

5 The critical spacing distance, scr, is the anchor spacing where full load values in the table may be used. The minimum spacing distance, smin, is the minimum anchor spacing for which values are available and installation is permitted. Spacing distance is measured from the centerline to centerline between two anchors.

6 The critical edge or end distance, ccr, is the distance where full load values in the table may be used. The minimum edge or end distance, cmin, is the minimum distance for which values are available and installation is permitted. Edge or end distance is measured from anchor centerline to the closest unrestrained edge.

7 The tabulated values are applicable for anchors in the ends of grout-filled concrete masonry units where minimum edge distances are maintained.

8 Load values for anchors installed less than scr and ccr must be multiplied by the appropriate load reduction factor based on actual spacing (s) or edge distance (c). Load factors are multiplicative; both spacing and edge reduction factors must be considered.

9 Linear interpolation of load values between minimum spacing (smin) and critical spacing (scr) and between minimum edge or end distance (cmin) and critical edge or end distance (ccr) is permitted.

10 Concrete masonry width (wall thickness) must be equal to or greater than 1.5 times the anchor embedment depth (e.g. 3/8-inch- and 1/2-inch-diameter anchors are permitted in minimum nominally 6-inch-thick concrete masonry). The 5/8- and 3/4-inch-diameter anchors must be installed in minimum nominally 8-inch-thick concrete masonry.

11 Allowable loads must be the lesser of the adjusted masonry or bond values tabulated above and the steel strength values given in Table 2 of ICC ESR 4109.

12 Tabulated allowable bond loads must be adjusted for increased in-service base material temperatures in accordance with Figure 1 of ICC ESR 4109 as applicable.

## MASONRY DESIGN TABLE

**C6+**
***For the Most Demanding Jobs***

### *Grout-filled Concrete Block: Rebar Allowable Tension and Shear Loads Based on Steel Design Information for U.S. Customary Unit[1,2,3]*

| Rebar Size | Tension (lb) ASTM A615, Grade 60 | Shear (lb) ASTM A615, Grade 60 |
|---|---|---|
| #3 | 3,270 | 1,685 |
| #4 | 5,940 | 3,060 |
| #5 | 9,205 | 4,745 |
| #6 | 13,070 | 6,730 |

For SI: 1 inch = 25.4mm, 1 lbf = 4.45N, 1ft-lbf = 1.356 N-M, 1 psi = 0.006895 MPa

1 Allowable load used in the design must be the lesser of bond values and tabulated steel element values.

2 Allowable tension and shear loads for threaded rods to resist short term loads, such as wind or seismic, must be calculated in accordance with Section 4.1 of ICC ESR 4109 as applicable.

3 Allowable steel loads are based on allowable tension and shear stresses equal to 0.33X $F_u$ and 0.17x$F_u$, respectively.

## MASONRY DESIGN TABLE

**C6+**
***For the Most Demanding Jobs***

### *Grout-filled Concrete Block: Rebar Allowable Tension Loads with Reduction Factors[1,2,3,4,7,9,10,12]*

| Rebar Size | Minimum Embedment (inches) | Load at $s_{cr}$ and $c_{cr}$ (lb) | Spacing[5] | | | Edge Distance[6] | | |
|---|---|---|---|---|---|---|---|---|
| | | | Critical $s_{cr}$ (inches) | Minimum $s_{min}$ (inches) | Load reduction factor for $s_{min}$ [8] | Critical $c_{cr}$ (inches) | Minimum $c_{min}$ (inches) | Load reduction factor for $c_{min}$ [8] |
| #3 | 3-3/8 | 785 | 13.5 | 4 | 1.00 | 12 | 4 | 0.87 |
| #4 | 4-1/2 | 1,355 | 18 | 4 | 0.50 | 20 | 4 | 0.68 |
| #5 | 5-5/8 | 2,060 | 22.5 | 4 | 0.50 | 20 | 4 | 0.68 |
| #6 | 6-3/4 | 2,415 | 27 | 4 | 0.50 | 20 | 4 | 0.68 |

For SI: 1 inch = 25.4mm, 1 lbf = 0.0044kN, 1 ksi = 6.894 MPa
See footnotes below

## MASONRY DESIGN TABLE

**C6+**
***For the Most Demanding Jobs***

### *Grout-filled Concrete Block: Rebar Allowable Shear Loads with Reduction Factors[1,2,3,4,7,9,10,12]*

| Rebar Size | Minimum Embedment (inches) | Load at $s_{cr}$ and $c_{cr}$ ⊥ to edge (lb) | Spacing[5] | | | Edge Distance[6] | | |
|---|---|---|---|---|---|---|---|---|
| | | | Critical $s_{cr}$ (inches) | Minimum $s_{min}$ (inches) | Load reduction factor for $s_{min}$ [8] | Critical $c_{cr}$ (inches) | Minimum $c_{min}$ (inches) | Load reduction factor for $c_{min}$ [8] |
| #3 | 3-3/8 | 1,230 | 13.5 | 4 | 0.50 | 12 | 4 | |
| #4 | 4-1/2 | 2,340 | 18 | 4 | 0.50 | 12 | 4 | |
| #5 | 5-5/8 | 3,600 | 22.5 | 4 | 0.50 | 20 | 4 | |
| #6 | 6-3/4 | 3,685 | 27 | 4 | 0.50 | 20 | 4 | |

For SI: 1 inch = 25.4 mm; 1 lbf = 0.0044 kN, 1 ksi = 6.894 MPa.

1 All values are for anchors installed in fully grouted concrete masonry with minimum masonry strength of 1500 psi (10.3 MPa). Concrete masonry units must be light-, medium, or normal-weight conforming to ASTM C 90. Allowable loads have been calculated using a safety factor of 5.0.

3 Anchors may be installed in any location in the face of the masonry wall (cell, web, bed joint) as shown in figure 2 of ICC ESR 4901.

4 A maximum of two anchors may be installed in a single masonry cell in accordance with the spacing and edge or end distance requirements. Embedment is measured from the outside surface of the concrete masonry unit to the embedded end of the anchor.

5 The critical spacing distance, $s_{cr}$, is the anchor spacing where full load values in the table may be used. The minimum spacing distance, $s_{min}$, is the minimum anchor spacing for which values are available and installation is permitted. Spacing distance is measured from the centerline to centerline between two anchors.

6 The critical edge or end distance, $c_{cr}$, is the distance where full load values in the table may be used. The minimum edge or end distance, $c_{min}$, is the minimum distance for which values are available and installation is permitted. Edge or end distance is measured from anchor centerline to the closest unrestrained edge.

7 The tabulated values are applicable for anchors in the ends of grout-filled concrete masonry units where minimum edge distances are maintained.

8 Load values for anchors installed less than $s_{cr}$ and $c_{cr}$ must be multiplied by the appropriate load reduction factor based on actual spacing (s) or edge distance (c). Load factors are multiplicative; both spacing and edge reduction factors must be considered.

9 Linear interpolation of load values between minimum spacing ($s_{min}$) and critical spacing ($s_{cr}$) and between minimum edge or end distance ($c_{min}$) and critical edge or end distance ($c_{cr}$) is permitted.

10 Concrete masonry width (wall thickness) must be equal to or greater than 1.5 times the anchor embedment depth (e.g. No. 3 and No. 4 reinforcing bars are permitted in minimum nominally 6-inch-thick concrete masonry). No. 5 and No. 6 reinforcing bars must be installed in minimum nominally 8-inch-thick concrete masonry.

11 Allowable loads must be the lesser of the adjusted masonry or bond values tabulated above and the steel strength values given in Table 4 of ICC ESR 4901.

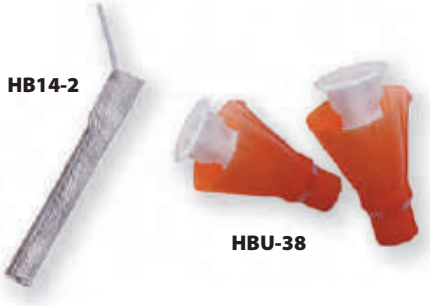
12 Tabulated allowable bond loads must be adjusted for increased in-service base material temperatures in accordance with Figure 1 of ICC ESR 4901.

RED HEAD®
ADHESIVE ANCHORING SPECIALISTS

# Umbrella Inserts and Screen Tubes

## High Performance Adhesive Systems for Fastening to Hollow Base Materials


A7P-10 A7P-28



HB14-2 HBU-38

## DESCRIPTION/ADVANTAGES

## Hollow Block Fastening with A7+ or C6+ Adhesive

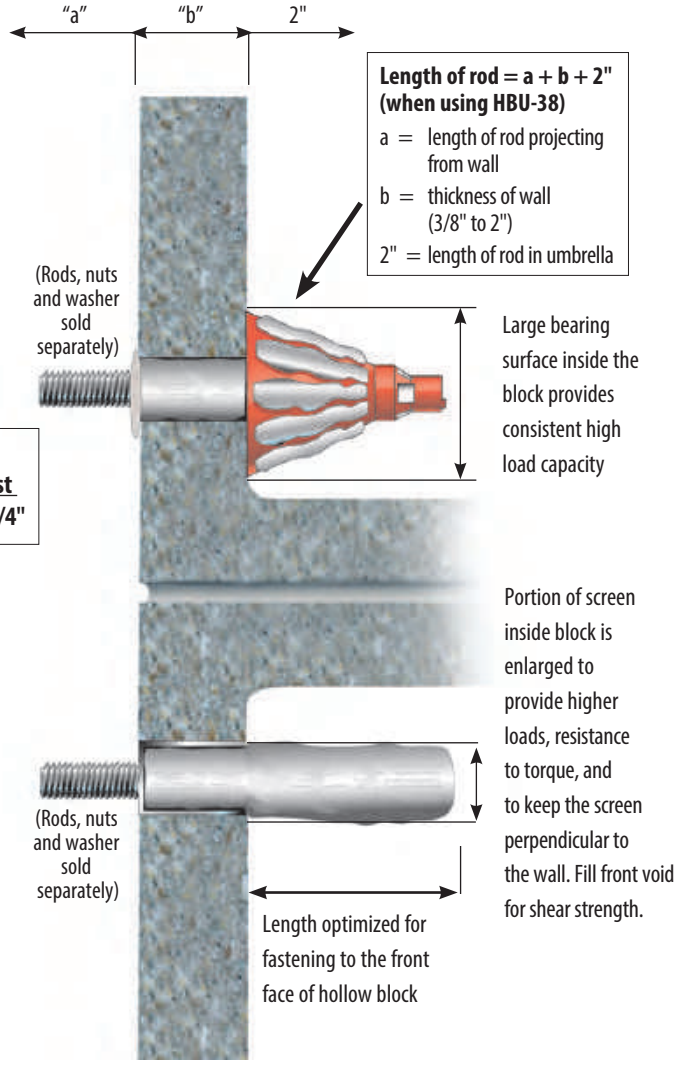
### HBU-38

Umbrella Inserts—specially designed for fastening to the face of hollow concrete block, brick, clay tile or terra cotta. Accepts rods 1/4", 3/8" and 1/2"

**For umbrella to open correctly, air gap must be a minimum of 2-1/4"**

### SHORT SCREENS

Specially designed stainless steel screens provide maximum performance for a screen in the front face of hollow concrete block. Screens available for rods 1/4" to 5/8"



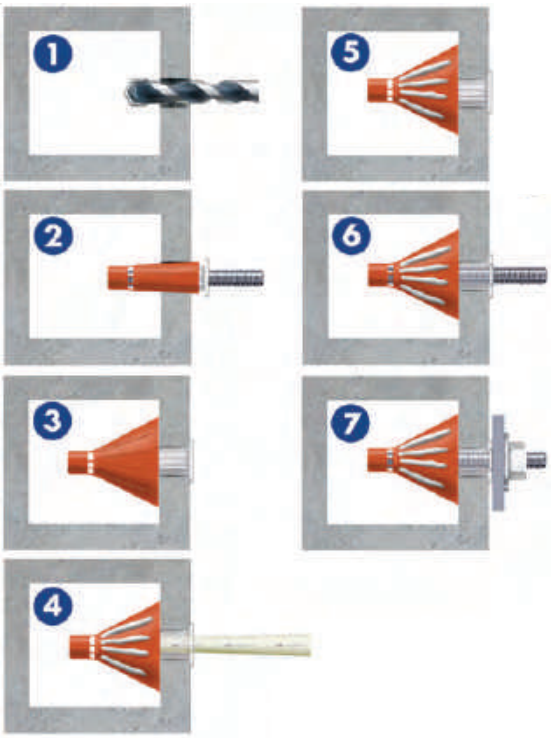

**Section View—Concrete Block**

## COMBINE WITH A7+ OR C6+ TO CREATE AN ADHESIVE FASTENING SYSTEM IDEAL FOR HOLLOW BLOCK, TERRA COTTA, CLAY TILE, MASONRY AND MORE

- Accepts 1/4", 3/8", and 1/2" threaded rods
- Use with A7+ Acrylic adhesive for fast dispensing, fast curing installation
- Use with C6+ Epoxy for fast curing extended working time installation

# Umbrella Inserts and Screens

## INSTALLATION STEPS




1. Drill 3/4" diameter hole, 3-3/4" deep using rotation only drilling mode and carbide tipped drill bit. Clean out hole with forced air. Complete hole preparation with use of a brush and repeat cleaning with compressed air (leave no dust or slurry).
2. Place umbrella on piece of threaded rod, stretch umbrella over the rod by pulling the white collar back approximately 1". Squeeze orange portion of umbrella and push umbrella into hole.
3. With the rod, push umbrella body through the hole and completely into void until umbrella opens behind wall. Remove threaded rod. (Do not use in solid base materials. For anchoring into block web, ends and mortar joints, use screens.)
4. Dispense and discard a sufficient amount of adhesive from new cartridge until a uniform adhesive mix is achieved. Inject approximately 1-1/2 fl. oz. of adhesive into umbrella (7 to 8 pumps using manual dispenser) to completely fill umbrella.
5. 3/8" rod uses a centering ring (supplied with inserts) to keep rod perpendicular to the wall.
6. Insert rod into the filled umbrella using a slow, soft twisting motion until it contacts the back of umbrella.
7. Wait for appropriate temperature/cure time before tightening fixture to the recommended torque of 10 ft./lbs.

**Installation instructions for screens provided on page 53.**

## SELECTION CHART
### Umbrella Inserts

| DESCRIPTION | PART NO. | BOX CONTENTS |
|---|---|---|
| Umbrella Anchor  | HBU-38 | 20 Umbrellas<br>20 Centering Rings |

## SELECTION CHART
### Short Screen Tubes

| PART NO. | DESCRIPTION | | QTY/BOX |
|---|---|---|---|
| HB14-2 | 1/4" x 2" | Stainless Screen | 100 |
| HB38-312 | 3/8" x 3-1/2" | Stainless Screen | 100 |
| HB12-312 | 1/2" x 3-1/2" | Stainless Screen | 50 |
| HB58-412 | 5/8" x 4-1/2" | Stainless Screen | 50 |

## ESTIMATING TABLE
### Umbrella Inserts

***Number of Anchoring Installations Per Cartridge* Using Threaded Rod and Umbrella Inserts with A7+ in Hollow Block***

| ROD in. | ROD (mm) | DRILL HOLE DIA. INCHES | VOLUME OF CARTRIGE | UMBRELLA INSERT WITH EMBEDMENT OF 3-3/4" |
|---|---|---|---|---|
| 3/8 | (9.5) | 3/4 | A7+ 9.5 fluid oz. | 6 |
| | | | A7+ 28 fluid oz. | 17 |

* These estimates do not account for waste.

## ESTIMATING TABLE

# Short Screens

### Number of Anchoring Installations per Cartridge* Threaded Rod using Short Screen Tubes in A7+ in Hollow Block

| ROD | | DRILL HOLE DIA. INCHES | VOLUME OF CARTRIGE | | SCREEN LENGTH PLUS 1 DIAMETER (inches) | | |
|---|---|---|---|---|---|---|---|
| in. | (mm) | | | | 2" | 3-1/2" | 4-1/2" |
| 1/4 | (6.4) | 3/8 | A7+ | 9.5 fluid oz. | 48 | | |
| | | | A7+ | 28 fluid oz. | 135 | | |
| 3/8 | (9.5) | 1/2 | A7+ | 9.5 fluid oz. | | 21 | |
| | | | A7+ | 28 fluid oz. | | 62 | |
| 1/2 | (12.7) | 5/8 | A7+ | 9.5 fluid oz. | | 15 | |
| | | | A7+ | 28 fluid oz. | | 43 | |
| 5/8 | (15.9) | 3/4 | A7+ | 9.5 fluid oz. | | | 11 |
| | | | A7+ | 28 fluid oz. | | | 24 |

*These estimates do not account for waste

## PERFORMANCE TABLE

# Load Values[1,2]

### Hollow Concrete Block: Ultimate Tension and Shear Loads using Umbrellas and Short Screen Tubes[1,2]

| | ROD DIA. | | MAX CLAMPING FORCE AFTER PROPER CURE | | DRILL HOLE DIA. | | EMBEDMENT (SCREEN LENGTH) | | ULTIMATE TENSION | | ULTIMATE SHEAR | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | in. | (mm) | ft. lbs. | (Nm) | in. | (mm) | in. | (mm) | lbs. | (Kn) | lbs. | (Kn) |
| Umbrella | 3/8 | (9.5) | 10 | (13) | 3/4 | (19.1 | 3-3/4 | (95.3) | 3,600 | (16) | 3,200 | (14.2) |
| | 1/2" | (12.7) | 10 | (13) | 3/4 | (19.1 | 3-3/4 | (95.3) | 3,600 | (16) | 3,200 | (14.2) |
| Short Screen Tubes | 1/4 | (6.4) | 4 | (5) | 3/8 | (9.5) | 2 -1/4 | (57.1) | 1,550 | (6.9) | 1,900 | (8.5) |
| | 3/8 | (9.5) | 7 | (9) | 1/2 | (12.7) | 3-7/8 | (98.4) | 1,661 | (7.4) | 2,071 | (9.2) |
| | 1/2 | (12.7) | 10 | (13) | 5/8 | (15.9) | 4 | (101.6) | 2,458 | (10.9) | 4,467 | (19.9) |
| | 5/8 | (15.9 | 13 | (17) | 3/4 | (19.1) | 5-1/8 | (130.2) | 2,543 | (10.9) | 5,047 | (22.4) |

1 Allowable working loads should not exceed 20% ultimate capacity. Based upon testing using ASTM A193, Grade B7 rod. Divide by 5.
2 The tabulated values are for anchors installed at a minimum 12 inch edge distance and minimum 8 inch spacing.

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ADHESIVE ANCHORING SPECIALISTS

# Screen Tubes

## Quality Adhesive Systems for Fastening Through Block and for Brick Pinning Applications


A7P-10 A7P-28

Screen Tubes

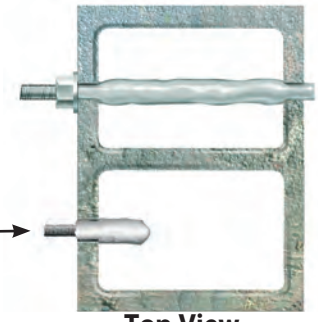
## DESCRIPTION/SUGGESTED SPECIFICATIONS

### Screens Tubes Used with A7+ or C6+

**HOLLOW CONCRETE BLOCK**

Maximum holding strength in concrete block can be obtained by fastening to both the front and back of the block using an adhesive screen tube and threaded rod.

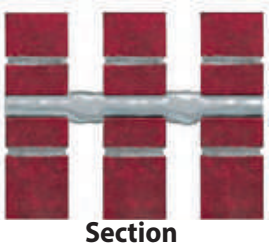
**For attachment of screens to front face of a block, see Installation Steps below**



Top View

**BRICK WALL**

Systems designed for Seismic Retrofit, Brick Pinning or fastening to brick—various lengths and diameters available to accommodate site conditions.



Section

The no-drip feature of A7+ adhesive makes it particularly well suited for brick pinning applications.

## ADVANTAGES

### HBP SERIES—NYLON SCREENS

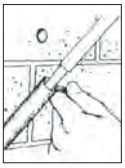
- 30%-50% savings from stainless steel screens
- Comparable performance values
- Easier to insert and span across voids
- Flexible material is less susceptible to damage from crushing

### HB SERIES—STAINLESS SCREENS

- Corrosion resistant
- Available in 1/4" to 3/4" diameters
- Special version, "dosage control" available for overhead and underwater installations

## INSTALLATION STEPS


1. Drill hole to the length of the screen plus 1 diameter, using rotation-only drilling mode. Clean out hole with forced air. Complete hole preparation with use of a brush and repeat cleaning with forced air (leave no dust or slurry).



2. When starting new cartridge or new nozzle, dispense and discard enough adhesive until uniform adhesive mix is achieved. Insert the nozzle into the bottom of the screen and fill screen completely full (use extension tube if needed to reach bottom of screen).

3. Insert the filled screen completely into the hole (subflush).

4. While holding the tab of the screen against the wall, hand insert the selected rod slowly into the screen tube with a slow twisting motion. Pull screen flush to face and coat with adhesive. Wait for appropriate cure time before torquing fixture in place.

## SELECTION CHART

# Screen Tubes

HB Stainless Screen

HBP Nylon Screen

| ROD DIA. | | SCREEN LENGTH | | STAINLESS STEEL SCREENS | | NYLON SCREENS | |
|---|---|---|---|---|---|---|---|
| in. | (mm) | in. | (mm) | PART NO. | QTY/BOX | PART NO. | QTY/BOX |
| 1/4 | (6.4) | 6 | (152.4) | HB14-6 | 100 | | |
| 1/4 | (6.4) | 8 | (203.2) | HB14-8 | 100 | | |
| 1/4 | (6.4) | 10 | (254.0) | HB14-10 | 100 | | |
| 3/8 | (9.5) | 6 | (152.4) | | | HBP38-6 | 50 |
| 3/8 | (9.5) | 8 | (203.2) | | | HBP38-8 | 25 |
| 3/8 | (9.5) | 10 | (254.0) | | | HBP38-10 | 25 |
| 1/2 | (12.7) | 6 | (152.4) | | | HBP12-6 | 50 |
| 1/2 | (12.7) | 8 | (203.2) | | | HBP12-8 | 25 |
| 1/2 | (12.7) | 10 | (254.0) | | | HBP12-10 | 25 |
| 5/8 | (15.9) | 6 | (152.4) | | | HBP58-6 | 40 |
| 5/8 | (15.9) | 8 | (203.2) | | | HBP58-8 | 40 |
| 5/8 | (15.9) | 10 | (254.0) | | | HBP58-10 | 40 |
| 3/4 | (19.1) | 8 | (203.2) | HB34-8 | 20 | | |
| 3/4 | (19.1) | 10 | (254.0) | | | HBP34-10 | 20 |
| 3/4 | (19.1) | 13 | (330.2) | | | HBP34-13 | 20 |

*Not available in standard strength nylon screens.

## ESTIMATING TABLE

# Screen Tubes

### *Number of Holes per Cartridge* using Threaded Rod and Screen Tubes with A7+ in Hollow Base Materials*

| ROD | | DRILL HOLE DIA. INCHES | VOLUME OF CARTRIDGE | | SCREEN LENGTH | | | |
|---|---|---|---|---|---|---|---|---|
| in. | (mm) | | | | 6" | 8" | 10" | 13" |
| 1/4 | (6.4) | 3/8 | A7+ | 9.5 fluid oz. | 16 | 12 | 10 | |
| | | | A7+ | 28 fluid oz. | 45 | 35 | 28 | |
| 3/8 | (9.5) | 1/2 | A7+ | 9.5 fluid oz. | 12 | 10 | 7.5 | |
| | | | A7+ | 28 fluid oz. | 37 | 29 | 23 | |
| 1/2 | (12.7) | 5/8 | A7+ | 9.5 fluid oz. | 9 | 6 | 5 | |
| | | | A7+ | 28 fluid oz. | 26 | 18 | 14 | |
| 5/8 | (15.9) | 3/4 | A7+ | 9.5 fluid oz. | 6 | 5 | 4 | |
| | | | A7+ | 28 fluid oz. | 18 | 14 | 10 | |
| 3/4 | (19.1) | 7/8 | A7+ | 9.5 fluid oz. | | 3 | 2.5 | 1.75 |
| | | | A7+ | 28 fluid oz. | | 9 | 6 | 5 |

* These estimates do not account for waste.

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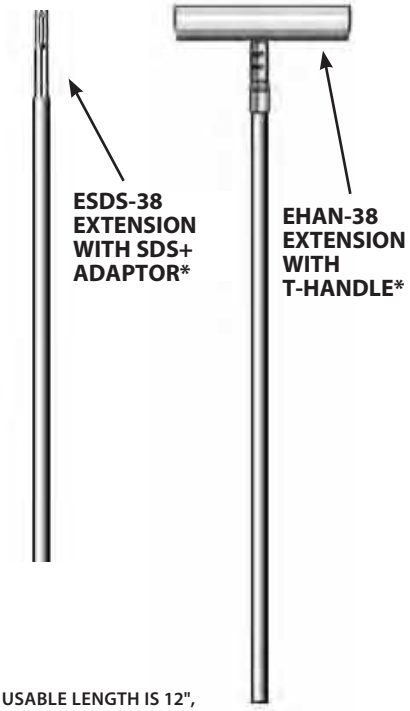
# Accessories


## Wire Brush Extensions




* USABLE LENGTH IS 12", GOOD FOR ALL HOLES EXCEPT 7/16" DIAMETER

# DESCRIPTION/ADVANTAGES

## Wire Brushes

***Proper hole cleaning using a brush is essential to achieve optimum performance***

**1/8" NPT**
(National Pipe Thread Taper)

| PART No. | ANCHOR DIA. | REBAR DIA. | HOLE DIA. | OVERALL LENGTH | BRUSH DIA. | QTY/ BAG |
|---|---|---|---|---|---|---|
| WB-038 | 3/8" | No. 3 | 7/16" | 4-7/8" | 5/8" | 10 |
| WB-012 | 1/2" | No. 4 | 5/8" | 4-7/8" | 3/4" | 10 |
| WB-058 | 5/8" | No. 5 | 3/4" | 4-7/8" | 1" | 10 |
| WB-034 | 3/4" | No. 6 | 7/8" | 4-7/8" | 1-1/4" | 10 |
| WB-078 | 7/8" | No. 7 | 1" | 5-1/8" | 1-1/2" | 10 |
| WB-100 | 1" | No. 8 | 1-1/8" | 5-1/4" | 1-5/8" | 10 |
| WB-125 | 1-1/4" | No. 10 | 1-3/8" | 5-1/4" | 1-3/4" | 10 |
| ESDS-38 | Wire brush 12" usable extension with SDS+ adaptor | | | | | 1 |
| EHAN-38 | Wire brush 12" usable extension with T-Handle | | | | | 1 |

* Proper hole cleaning using a wire brush is essential to achieve optimum performance. Brush may be used up to 50 holes depending on concrete strength. Brushes required for installation of No. 4, No. 8 rebar and larger are available with lead time.

## Plastic Extension Tubing

***Attaches to Adhesive System nozzles for deep hole installations***



| DESCRIPTION | PART NO. | QTY |
|---|---|---|
| 6-Foot Straight Tubing (.39 in. I.D. x .43 in. O.D.) (works with A245, S55, and E55 nozzle) | E25-6 | 6 |
| 6-Foot Long Extension Tube for use with Piston Plugs (works with all nozzles except S75) | E916-6 | 5 |

## Blow Pump


| DESCRIPTION | PART NO. | QTY/BAG |
|---|---|---|
| Blow Pump | BP-10 | 1 |

Minimum hole 7/16".

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# Selection Guide – Anchors for Concrete Applications

| ANCHOR TYPE | KEY FEATURES | SIZE RANGE (inches) |
|---|---|---|

## Trubolt® Wedge Anchors

ID STAMP 

- 2018 IBC Compliant
- Seismic zone (A-B) approved
- Fully-threaded
- Length ID head stamped
- Stainless steel clip
- Through-fixture fastening

**Diameter:** 1/4 – 1
**Length:** 1-3/4 – 10

## Large Diameter Tapcon (LDT)

Self-Threading Anchor

- Anti-rotation serrated washer
- Extra large hex washer head
- Length ID head stamped
- Through-fixture fastening

**LDT with Zinc Plating**
**Diameter:** 3/8 – 3/4
**Length:** 1-3/4 – 6-1/4

## Multi-Set II® Drop-In Anchors

RM RL RX CL

- RM: Flanged body to keep anchor flush with surface of concrete — **Diameter:** 3/8 – 3/4, **Length:** 1-5/8 – 3-3/16
- RL: Non-flanged body for recessed setting — **Diameter:** 1/4 – 3/4, **Length:** 1 – 3-3/16
- RX: Designed for hollow core and post tension concrete — **Diameter:** 3/8 & 1/2, **Length:** 3/4 - 1
- CL: Designed for one-sided forming, accepts coil rod — **Diameter:** 1/2, **Length:** 2

## Dynabolt® Sleeve Anchors

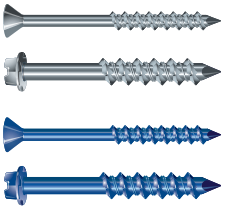
- Concrete, block and brick
- Through-fixture fastening
- Available in 304 stainless steel

**Diameter:** 3/8 –5/8
**Length:** 1-7/8 – 5

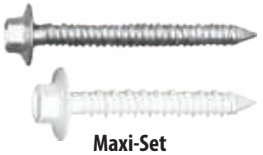
**For both Hollow (1/4" & 3/8" diameter) and Solid Concrete (1/4" through 3/4" diameter) Applications**

## Tapcon®

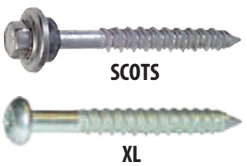
Concrete Anchors with Advanced Threadform Technology™



Original



Maxi-Set



SCOTS XL

# Selection Guide

| | CORROSION RESISTANCE | PERFORMANCE | HEAD STYLES | APPROVALS/LISTINGS |
|---|---|---|---|---|
| **Trubolt® Wedge** cont'd | ■ Zinc-plated carbon steel to ASTM B633, SC1, Type III<br>■ Hot dipped galvanized to ASTM A-153<br>■ Type 304 and 316 stainless steel | Ultimate Pullout Performance in 4,000 psi Concrete up to 26,540 lbs. (1" diameter) | Hex Nut and Tie-Wire version | ICC Evaluation Service, Inc. # ESR-2251<br>Underwriters Laboratories<br>Factory Mutual<br>Caltrans<br>Meets or exceeds U.S. Government G.S.A. Specification A-A-1923A Type 4 (formerly GSA: FF-S-325 Group II, Type 4, Class 1) |
| **LDT** cont'd | ■ Zinc-plated carbon steel to ASTM B695 & B633<br>■ Type 410 stainless steel | Ultimate Pullout Performance in 4,000 psi Concrete up to 23,268 lbs. (3/4" diameter) | Finished bolt style | |
| **Multi-Set II Drop-In** cont'd | ■ Zinc-plated carbon steel to ASTM B633, SC1, Type III<br>■ Type 18-8 stainless steel | Ultimate Pullout Performance in 4,000 psi Concrete up to 9,480 lbs. (3/4" diameter) | RM: Flanged body<br>RL: Non-flanged body<br>Use any bolt or threaded rod | GSA: A-A-55614 Type 1 (Formerly GSA: FF-S-325 Group VIII)<br>Underwriters Laboratories<br>Factory Mutual<br>Caltrans |
| **Dynabolt® Sleeve** cont'd | ■ Zinc-plated carbon steel to ASTM B633, SC1, Type III<br>■ Type 304 stainless steel | Ultimate Pullout Performance in 4,000 psi Concrete up to 8,900 lbs. (3/4" diameter) | Flat head<br>Hex nut<br>Acorn nut<br>Tie-Wire<br>Round head<br>Threshold flat head | GSA: A-A-1922A (Formerly GSA: FF-S-325 Group II, Type 3, Class 3)<br>Factory Mutual |
| **Tapcon** cont'd | ■ Patented Trade Secret Climaseal® coating<br>■ Type 410 stainless steel | Ultimate Pullout Performance in 4,000 psi Concrete up to 2,380 lbs. | Hex head<br>Star Drive flat head | **Blue Climaseal™**<br>ICC Evaluation Service, Inc.– ESR-1671<br>ICC Evaluation Service, Inc.– ESR-2202<br>Miami-Dade County<br>Florida Building Code<br>**410 Stainless Steel**<br>Miami-Dade County<br>Florida Building Code |

The above is for the Original and 410 SS Tapcon only.
For data on other Tapcon products see their product pages as follows:
Tapcon Maxi-Set on page 82, Tapcon SCOTS on page 84, Tapcon XL on page 86

RED HEAD®
CONCRETE ANCHORING SPECIALISTS

# Trubolt® Wedge Anchors

## Dependable, Heavy-Duty, Inspectable, Wedge Type Expansion Anchor

2018 IBC Compliant

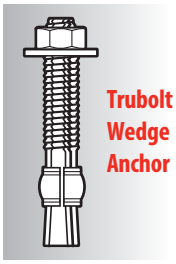
Trubolt®
Wedge Anchors

## DESCRIPTION/SUGGESTED SPECIFICATIONS

### Wedge Type Anchors—

**SPECIFIED FOR ANCHORAGE INTO CONCRETE**

Trubolt Wedge anchors feature a stainless steel expansion clip, threaded stud body, nut and washer. Anchor bodies are made of plated carbon steel, hot-dipped galvanized carbon steel, type 304 stainless steel or type 316 stainless steel as identified in the drawings or other notations.




The exposed end of the anchor is stamped to identify anchor length. Stampings should be preserved during installation for any subsequent embedment verification.

Use carbide tipped hammer drill bits made in accordance with ANSI B212.15-1994 to install anchors.

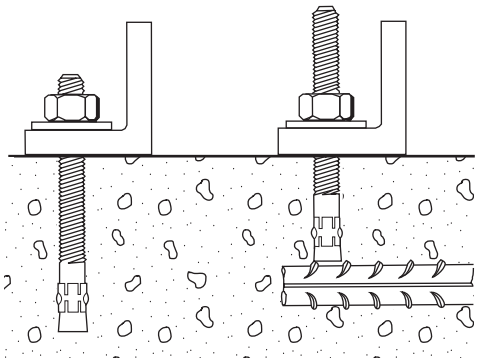
Anchors are tested to ACI 355.2 and ICC-ES AC193. Anchors are listed by the following agencies as required by the local building code: ICC-ES, UL, FM, and Caltrans.

## ADVANTAGES

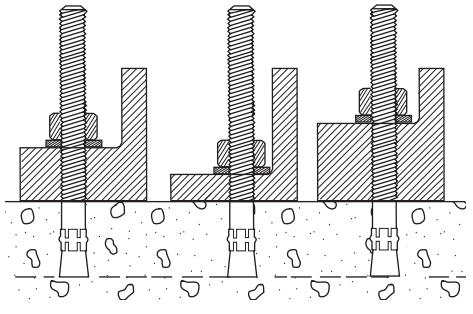
- 2018 International Building Code (IBC) Compliant for 1/4" through 1/2" diameters-carbon steel
- Versatile fully threaded design is standard on sizes up to 1" diameter and 10" length
- Anchor diameter equals hole diameter
- Standard carbon and stainless steel anchors
- Non bottom-bearing, may be used in hole depth exceeding anchor length
- Can be installed through the work fixture, eliminating hole spotting
- Inspectable torque values, indicating proper installation

### Fully Threaded Advantage

Trubolt's fully threaded feature eliminates subsurface obstruction problems.



Fully threaded design accommodates various material thicknesses at the same embedment. One anchor length saves time and money.



## APPLICATIONS

Anchoring machinery and conveyors is a common wedge anchor application. The Trubolt is fully threaded to allow a large range of embedment and fixture thickness.

## LENGTH INDICATION CODE*

| CODE | LENGTH OF ANCHOR in. | LENGTH OF ANCHOR mm | CODE | LENGTH OF ANCHOR in. | LENGTH OF ANCHOR mm |
|---|---|---|---|---|---|
| A | 1-1/2 < 2 | (38.1 < 50.8) | K | 6-1/2 < 7 | (165.1 < 177.8) |
| B | 2 < 2-1/2 | (50.8 < 63.5) | L | 7 < 7-1/2 | (177.8 < 190.5) |
| C | 2-1/2 < 3 | (63.5 < 76.2) | M | 7-1/2 < 8 | (190.5 < 203.2) |
| D | 3 < 3-1/2 | (76.2 < 88.9) | N | 8 < 8-1/2 | (203.2 < 215.9) |
| E | 3-1/2 < 4 | (88.9 < 101.6) | O | 8-1/2 < 9 | (215.9 < 228.6) |
| F | 4 < 4-1/2 | (101.6 < 114.3) | P | 9 < 9-1/2 | (228.6 < 241.3) |
| G | 4-1/2 < 5 | (114.3 < 127.0) | Q | 9-1/2 < 10 | (241.3 < 254.0) |
| H | 5 < 5-1/2 | (127.0 < 139.7) | R | 10 < 11 | (254.0 < 279.4) |
| I | 5-1/2 < 6 | (139.7 < 152.4) | S | 11 < 12 | (279.4 < 304.8) |
| J | 6 < 6-1/2 | (152.4 < 165.1) | T | 12 < 13 | (304.8 < 330.2) |

*Located on top of anchor for easy inspection.

## FEATURES

**Length ID Head Stamp**—provides for embedment inspection after installation

**Fully Threaded Design**

**Cold-Formed**—manufacturing process adds strength

**Stainless steel split expansion ring**

**Anchor Body**—available in zinc-plated steel, hot-dipped galvanized steel, 304 stainless steel and 316 stainless steel

**TRUBOLT® WEDGE ANCHOR**

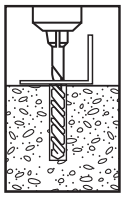
## APPROVALS/LISTINGS

**Trubolt®**
Wedge Anchors

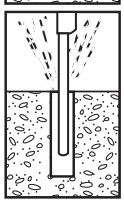
ICC Evaluation Service, Inc. ESR-2251
- – Category 1 performance rating
- – 2018 IBC compliant
- – Meets ACI 318 ductility requirements
- – Tested in accordance with ACI 355.2 and ICC-ES AC193
- – For use in seismic zones A & B
- – 1/4", 3/8" & 1/2" diameter anchors listed in ESR-2251

Underwriters Laboratories
Factory Mutual
Caltrans
Meets or exceeds U.S. Government G.S.A. Specification A-A-1923A Type 4 (formerly GSA: FF-S-325 Group II, Type 4, Class 1)

## INSTALLATION STEPS

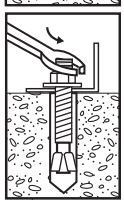


1. Select a carbide drill bit with a diameter equal to the anchor diameter. Drill hole to any depth exceeding the desired embedment. See chart for minimum recommended embedment.



2. Clean hole or continue drilling additional depth to accommodate drill fines.

3. Assemble washer and nut, leaving top of stud exposed through nut. Drive anchor through material to be fastened until washer is flush to surface of material.



4. Expand anchor by tightening nut 3 to 5 full turns past the hand tight position, or to the specified torque requirement.

**** ONLY FOR USE IN CONCRETE****

## SELECTION CHART

# Trubolt Wedge

### Carbon Steel w/Zinc Plating

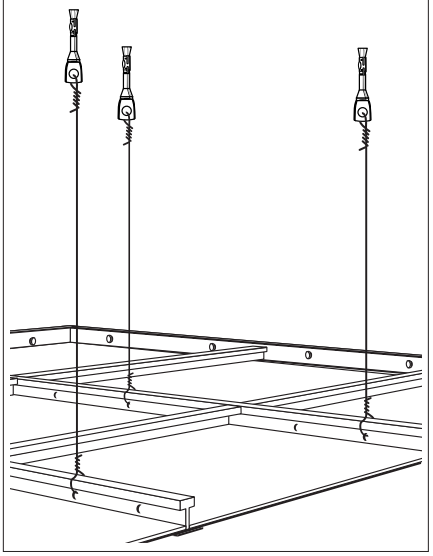
**Meets ASTM B633 SC1, Type III specifications for electroplating of 5um = .0002" thickness. This material is well suited for non-corrosive environments.**

**Typical Applications**—Structural Columns, Machinery, Equipment, etc.

**Environment**—Interior (non-corrosive)

**Level of Corrosion**—Low

**TW-1400 Tie Wire Wedge**



| PART NUMBER | THREAD LENGTH | | ANCHOR DIA. & DRILL BIT SIZE (THREADS) PER INCH | OVERALL LENGTH | | MAX. THICKNESS OF MATERIALS TO BE FASTENED | | QTY/WT PER BOX | | QTY/WT PER MASTER CARTON | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | in. | (mm) | | in. | (mm) | in. | (mm) | qty. | lbs. | qty. | lbs. |
| WS-1416 | 3/4 | (19.1) | 1/4" - 20 | 1-3/4 | (44.5) | 3/8 | (9.5) | 100 | 3.1 | 1000 | 32 |
| WS-1422 | 1-1/4 | (31.8) | | 2-1/4 | (57.2) | 7/8 | (22.2) | 100 | 3.6 | 1000 | 37 |
| WS-1432 | 2-1/4 | (57.2) | | 3-1/4 | (82.6) | 1-7/8 | (47.6) | 100 | 4.7 | 800 | 39 |
| WS-3822 | 1-1/8 | (28.6) | 3/8" - 16 | 2-1/4 | (57.2) | 3/8 | (9.5) | 50 | 4.1 | 500 | 41 |
| WS-3826 | 1-5/8 | (41.3) | | 2-3/4 | (69.9) | 7/8 | (22.2) | 50 | 4.7 | 400 | 39 |
| WS-3830 | 1-3/4 | (44.5) | | 3 | (76.2) | 1-1/8 | (28.6) | 50 | 5.0 | 400 | 41 |
| WS-3836 | 2-1/2 | (63.5) | | 3-3/4 | (95.3) | 1-7/8 | (47.6) | 50 | 5.9 | 300 | 36 |
| WS-3850 | 3-3/4 | (95.2) | | 5 | (127.0) | 3-1/8 | (79.4) | 50 | 7.4 | 250 | 38 |
| WS-3870 | 3-7/8 | (98.4) | | 7 | (177.8) | 5-1/8 | (130.2) | 50 | 10.4 | 250 | 53 |
| WS-1226 | 1-1/4 | (31.8) | 1/2" - 13 | 2-3/4 | (69.9) | 1/8 | (3.2) | 25 | 4.6 | 200 | 38 |
| WS-1236 | 2-1/4 | (57.2) | | 3-3/4 | (95.3) | 1 | (25.4) | 25 | 5.7 | 150 | 35 |
| WS-1242 | 2-3/4 | (69.9) | | 4-1/4 | (108.0) | 1-1/2 | (38.1) | 25 | 6.2 | 150 | 38 |
| WS-1244 | 3 | (76.2) | | 4-1/2 | (114.3) | 1-3/4 | (44.5) | 25 | 6.5 | 150 | 39 |
| WS-1254 | 4 | (101.6) | | 5-1/2 | (139.7) | 2-3/4 | (69.9) | 25 | 7.7 | 150 | 47 |
| WS-1270 | 5-1/2 | (139.7) | | 7 | (177.8) | 4-1/4 | (108.0) | 25 | 9.3 | 150 | 57 |
| WS-5834 | 1-3/4 | (44.5) | 5/8" - 11 | 3-1/2 | (88.9) | 1/8 | (3.2) | 10 | 3.6 | 100 | 37 |
| WS-5850 | 3-1/4 | (82.6) | | 5 | (127.0) | 1-5/8 | (41.3) | 10 | 4.7 | 100 | 48 |
| WS-5860 | 4-1/4 | (107.9) | | 6 | (152.4) | 2-5/8 | (66.7) | 10 | 5.4 | 50 | 28 |
| WS-5870 | 5-1/4 | (133.4) | | 7 | (177.8) | 3-5/8 | (92.1) | 10 | 6.2 | 30 | 19 |
| WS-5884 | 5-3/4 | (146.0) | | 8-1/2 | (215.9) | 5-1/8 | (130.2) | 10 | 8.0 | 30 | 25 |
| WS-3446 | 2-7/8 | (73.0) | 3/4" - 10 | 4-3/4 | (120.7) | 3/4 | (19.1) | 10 | 7.4 | 60 | 45 |
| WS-3454 | 3-5/8 | (92.1) | | 5-1/2 | (139.7) | 1-1/2 | (38.1) | 10 | 8.1 | 50 | 41 |
| WS-3462 | 4-3/8 | (111.1) | | 6-1/4 | (158.8) | 2-1/4 | (57.2) | 10 | 9.1 | 30 | 28 |
| WS-3470 | 5-1/8 | (130.2) | | 7 | (177.8) | 3 | (76.2) | 10 | 9.7 | 30 | 30 |
| WS-3484 | 5-3/4 | (146.0) | | 8-1/2 | (215.9) | 4-1/2 | (114.3) | 10 | 12.3 | 30 | 38 |
| WS-34100 | 5-3/4 | (146.0) | | 10 | (254.0) | 6 | (152.4) | 10 | 14.0 | 30 | 43 |
| **TIE WIRE** | | | | | | | | | | | |
| TW-1400 | N/A | | 1/4" | 2-1/8 | (54.0) | 9/32-hole | (7.1) | 100 | 3.6 | 1000 | 36 |

## SELECTION CHART

# Trubolt Wedge

### Carbon Steel w/ Hot Dipped Galvanizing

**Meets ASTM A153 Class specifications for hot-dipped galvanizing > 45um = .002". It is highly recommended for damp, humid environments near coastal regions. Hot-dipped galvanized Trubolts have a coating thickness of zinc that is almost 10 times as thick as electroplating. This creates greater corrosion resistance at a minimal cost.**

**Typical Applications**—Railings, Signage, Awnings, etc.

**Environment**—Rural/Suburban (exterior environment—essentially unpolluted areas)

**Level of Corrosion**—Low to Medium

| PART NUMBER | THREAD LENGTH | | ANCHOR DIA. & DRILL BIT SIZE (THREADS) PER INCH | OVERALL LENGTH | | MAX. THICKNESS OF MATERIALS TO BE FASTENED | | QTY/WT PER BOX | | QTY/WT PER MASTER CARTON | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | in. | (mm) | | in. | (mm) | in. | (mm) | qty. | lbs. | qty. | lbs. |
| WS-1242G | 2-3/4 | (69.9) | 1/2" - 13 | 4-1/4 | (108.0) | 1-1/2 | (38.1) | 25 | 6.7 | 150 | 41 |
| WS-1254G | 4 | (101.6) | | 5-1/2 | (139.7) | 2-3/4 | (69.9) | 25 | 8.0 | 150 | 49 |
| WS-1270G | 5-1/2 | (139.7) | | 7 | (177.8) | 4-1/4 | (108.0) | 25 | 9.7 | 150 | 59 |
| WS-5860G | 4-1/4 | (107.9) | 5/8" - 11 | 6 | (152.4) | 2-5/8 | (66.7) | 10 | 5.6 | 50 | 29 |
| WS-3454G | 3-5/8 | (92.1) | 3/4" - 10 | 5-1/2 | (139.7) | 1-1/2 | (38.1) | 10 | 8.4 | 50 | 42 |

# Trubolt Wedge
## 304 Stainless Steel

**Serves many applications well. It withstands rusting in architectural and food processing environments and resists organic chemicals, dye stuffs and many inorganic chemicals.**

**Typical Applications**—Cladding, Stadium Seating, etc.

**Environment**—Urban (slight to moderate degree of pollution)

**Level of Corrosion**—Medium

| PART NUMBER | THREAD LENGTH | | ANCHOR DIA. & DRILL BIT SIZE (THREADS) PER INCH | OVERALL LENGTH | | MAX. THICKNESS OF MATERIALS TO BE FASTENED | | QTY/WT PER BOX | | QTY/WT PER MASTER CARTON | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | in. | (mm) | | in. | (mm) | in. | (mm) | qty. | lbs. | qty. | lbs. |
| WW-1416 | 3/4 | (19.1) | 1/4" - 20 | 1-3/4 | (44.5) | 3/8 | (9.5) | 100 | 3.2 | 1000 | 32 |
| WW-1422 | 1-1/4 | (31.8) | | 2-1/4 | (57.2) | 7/8 | (22.2) | 100 | 3.7 | 1000 | 37 |
| WW-1432 | 2-1/4 | (57.2) | | 3-1/4 | (82.6) | 1-7/8 | (47.6) | 100 | 4.8 | 800 | 39 |
| WW-3822 | 1-1/8 | (28.6) | 3/8" - 16 | 2-1/4 | (57.2) | 3/8 | (9.5) | 50 | 4.1 | 500 | 41 |
| WW-3826 | 1-5/8 | (41.3) | | 2-3/4 | (69.9) | 7/8 | (22.2) | 50 | 4.8 | 400 | 39 |
| WW-3830 | 1-3/4 | (44.5) | | 3 | (76.2) | 1-1/8 | (28.6) | 50 | 5.1 | 400 | 42 |
| WW-3836 | 2-1/2 | (63.5) | | 3-3/4 | (95.3) | 1-7/8 | (47.6) | 50 | 6.0 | 300 | 37 |
| WW-3850 | 3-3/4 | (95.3) | | 5 | (127.0) | 3-1/8 | (79.4) | 50 | 7.5 | 250 | 39 |
| WW-1226 | 1-1/4 | (31.8) | 1/2" - 13 | 2-3/4 | (69.9) | 1/8 | (3.2) | 25 | 4.7 | 200 | 38 |
| WW-1236 | 2-1/4 | (57.2) | | 3-3/4 | (95.3) | 1 | (25.4) | 25 | 5.8 | 150 | 36 |
| WW-1242 | 2-3/4 | (69.9) | | 4-1/4 | (108.0) | 1-1/2 | (38.1) | 25 | 6.3 | 150 | 39 |
| WW-1254 | 3 | (76.2) | | 5-1/2 | (139.7) | 2-3/4 | (69.9) | 25 | 7.7 | 150 | 47 |
| WW-1270 | 3-1/2 | (88.9) | | 7 | (177.8) | 4-1/4 | (108.0) | 25 | 9.4 | 150 | 57 |
| WW-5834 | 1-3/4 | (44.5) | 5/8" - 11 | 3-1/2 | (88.9) | 1/8 | (3.2) | 10 | 3.6 | 100 | 37 |
| WW-5842 | 2-1/2 | (63.5) | | 4-1/4 | (108.0) | 7/8 | (22.2) | 10 | 4.2 | 100 | 43 |
| WW-5850 | 3-1/4 | (82.6) | | 5 | (127.0) | 1-5/8 | (41.3) | 10 | 4.8 | 100 | 49 |
| WW-5860 | 4-1/4 | (107.9) | | 6 | (152.4) | 2-5/8 | (66.7) | 10 | 5.5 | 50 | 28 |
| WW-5870 | 3-1/2 | (88.9) | | 7 | (177.8) | 3-5/8 | (92.1) | 10 | 6.2 | 30 | 20 |
| WW-5884 | 3-1/2 | (88.9) | | 8-1/2 | (215.9) | 5-1/8 | (130.2) | 10 | 8.0 | 30 | 25 |
| WW-3446 | 2-7/8 | (73.0) | 3/4" - 10 | 4-3/4 | (120.7) | 3/4 | (19.1) | 10 | 6.7 | 60 | 41 |
| WW-3454 | 3-5/8 | (92.1) | | 5-1/2 | (139.7) | 1-1/2 | (38.1) | 10 | 7.5 | 50 | 38 |
| WW-3462 | 4-3/8 | (111.1) | | 6-1/4 | (158.8) | 2-1/4 | (57.2) | 10 | 9.1 | 30 | 28 |
| WW-3470 | 3-1/2 | (88.9) | | 7 | (177.8) | 3 | (76.2) | 10 | 9.2 | 30 | 28 |
| WW-3484 | 3-1/2 | (88.9) | | 8-1/2 | (215.9) | 4-1/2 | (114.3) | 10 | 12.3 | 30 | 38 |
| WW-34100 | 1-3/4 | (44.5) | | 10 | (254.0) | 6 | (152.4) | 10 | 13.5 | 30 | 42 |
| WW-10060 | 2-1/2 | (63.5) | 1" - 8 | 6 | (152.4) | 1/2 | (12.7) | 5 | 8.3 | 25 | 43 |
| WW-10090 | 2-1/2 | (63.5) | | 9 | (228.6) | 3-1/2 | (88.9) | 5 | 11.4 | 15 | 35 |

* For continuous extreme low temperature applications, use stainless steel.

SELECTION CHARTS

# Trubolt Wedge
## 316 Stainless Steel

**Contains more nickel and chromium than Type 304, and 2%-3% molybdenum, which gives it better corrosion resistance. It is especially more effective in chloride environments that tend to cause pitting.**

**Typical Applications**—Pumps, Diffusers, Gates, Weir Plates, etc.

**Environment**—Industrial (moderate to heavy atmospheric pollution)

**Level of Corrosion**—Medium to High

**Typical Applications**—Tunnels, Dams, Tiles, Lighting Fixtures, etc.

**Environment**—Marine (heavy atmospheric pollution)

**Level of Corrosion**—High

| PART NUMBER | THREAD LENGTH | | ANCHOR DIA. & DRILL BIT SIZE (THREADS) PER INCH | OVERALL LENGTH | | MAX. THICKNESS OF MATERIALS TO BE FASTENED | | QTY/WT PER BOX | | QTY/WT PER MASTER CARTON | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | in. | (mm) | | in. | (mm) | in. | (mm) | qty. | lbs. | qty. | lbs. |
| SWW-1422 | 1-1/4 | (31.8) | 1/4" - 20 | 2-1/4 | (57.2) | 7/8 | (22.2) | 100 | 3.7 | 1000 | 37 |
| SWW-1432 | 2-1/4 | (57.2) | | 3-1/4 | (82.6) | 1-1/8 | (28.6) | 100 | 4.8 | 1000 | 39 |
| SSW-3830 | 1-3/4 | (44.5) | 3/8" - 16 | 3 | (76.2) | 1-1/8 | (28.6) | 50 | 5.2 | 400 | 42 |
| SWW-3836 | 2-1/2 | (63.5) | | 3-3/4 | (95.5) | 1-7/8 | (47.6) | 50 | 6.0 | 300 | 37 |
| SWW-3850 | 3-3/4 | (95.3) | | 5 | (127.0) | 3-1/8 | (79.4) | 50 | 7.5 | 250 | 39 |
| SWW-1236 | 2-1/4 | (57.2) | 1/2" - 13 | 3-3/4 | (95.3) | 1 | (25.4) | 25 | 5.8 | 150 | 36 |
| SWW-1242 | 2-3/4 | (69.9) | | 4-1/4 | (108.0) | 1-1/2 | (38.1) | 25 | 6.5 | 150 | 40 |
| SWW-1254 | 3 | (76.2) | | 5-1/2 | (139.7) | 2-3/4 | (69.9) | 25 | 7.8 | 150 | 48 |
| SWW-5850 | 3-1/4 | (82.6) | 5/8" - 11 | 5 | (127.0) | 1-5/8 | (41.3) | 10 | 4.8 | 100 | 49 |

* For continuous extreme low temperature applications, use stainless steel.

## PERFORMANCE TABLE

# Trubolt Wedge Anchors

## Ultimate Tension and Shear Values (lbs/kN) in Solid Concrete*

| ANCHOR DIA. | | INSTALLATION TORQUE | | EMBEDMENT DEPTH | | ANCHOR TYPE | f'c + 2,000 PSI (13.8 MPa) | | | | f'c + 4,000 PSI (27.6 MPa) | | | | f'c + 6,000 PSI (41.4 MPa) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | TENSION | | SHEAR | | TENSION | | SHEAR | | TENSION | | SHEAR | |
| in. | (mm) | ft. lbs. | (Nm) | in. | (mm) | | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) |
| 1/4 | (6.4) | 4 | (5.4) | 1-1/8 | (28.6) | WS-Carbon or WS-G Hot-Dipped Galvanized or WW-304 S.S. or SWW-316 S.S. | 1,180 | (5.2) | 1,400 | (6.2) | 1,780 | (7.9) | 1,400 | (6.2) | 1,900 | (8.5) | 1,400 | (6.2) |
| | | | | 1-15/16 | (49.2) | | 2,100 | (9.3) | 1,680 | (7.5) | 3,300 | (14.7) | 1,680 | (7.5) | 3,300 | (14.7) | 1,680 | (7.5) |
| | | | | 2-1/8 | (54.0) | | 2,260 | (10.1) | 1,680 | (7.5) | 3,300 | (14.7) | 1,680 | (7.5) | 3,300 | (14.7) | 1,680 | (7.5) |
| 3/8 | (9.5) | 25 | (33.9) | 1-1/2 | (38.1) | | 1,620 | (7.5) | 2,320 | (10.3) | 2,240 | (10.0) | 2,620 | (11.7) | 2,840 | (12.6) | 3,160 | (14.1) |
| | | | | 3 | (76.2) | | 3,480 | (15.5) | 4,000 | (17.8) | 5,940 | (26.4) | 4,140 | (18.4) | 6,120 | (27.2) | 4,500 | (20.0) |
| | | | | 4 | (101.6) | | 4,800 | (21.4) | 4,000 | (17.8) | 5,940 | (26.4) | 4,140 | (18.4) | 6,120 | (27.2) | 4,500 | (20.0) |
| 1/2 | (12.7) | 55 | (74.6) | 2-1/4 | (57.2) | | 3,455 | (20.7) | 4,760 | (21.2) | 4,920 | (22.7) | 4,760 | (21.2) | 6,025 | (31.3) | 7,040 | (31.3) |
| | | | | 4-1/8 | (104.8) | | 4,660 | (20.7) | 7,240 | (32.2) | 9,640 | (42.9) | 7,240 | (32.2) | 10,820 | (48.1) | 8,160 | (36.3) |
| | | | | 6 | (152.4) | | 5,340 | (23.8) | 7,240 | (32.2) | 9,640 | (42.9) | 7,240 | (32.2) | 10,820 | (48.1) | 8,160 | (36.3) |
| 5/8 | (15.9) | 90 | (122.0) | 2-3/4 | (69.9) | | 5,185 | (29.3) | 7,120 | (31.7) | 7,180 | (31.9) | 7,120 | (31.7) | 9,225 | (43.2) | 9,616 | (42.8 |
| | | | | 5-1/8 | (130.2) | | 6,580 | (29.3) | 9,600 | (42.7) | 14,920 | (66.4) | 11,900 | (52.9) | 16,380 | (72.9) | 12,520 | (55.7) |
| | | | | 7-1/2 | (190.5) | | 7,060 | (31.4) | 9,600 | (42.7) | 15,020 | (66.8) | 11,900 | (52.9) | 16,380 | (72.9) | 12,520 | (55.7) |
| 3/4 | (19.1) | 110 | (149.2) | 3-1/4 | (82.6) | | 6,765 | (31.7) | 10,120 | (45.0) | 10,840 | (48.2) | 13,720 | (61.0) | 13,300 | (59.2) | 15,980 | (71.1) |
| | | | | 6-5/8 | (168.3) | | 10,980 | (48.8) | 20,320 | (90.4) | 17,700 | (78.7) | 23,740 | (105.6) | 20,260 | (90.1) | 23,740 | (105.6) |
| | | | | 10 | (254.0) | | 10,980 | (48.8) | 20,320 | (90.4) | 17,880 | (79.5) | 23,740 | (105.6) | 23,580 | (104.9) | 23,740 | (105.6) |
| 7/8 | (22.2) | 250 | (339.0) | 3-3/4 | (95.3) | | 9,290 | (42.3) | 13,160 | (58.5) | 14,740 | (65.6) | 16,580 | (73.8) | 17,420 | (77.5) | 19,160 | (85.2) |
| | | | | 6-1/4 | (158.8) | | 14,660 | (65.2) | 20,880 | (92.9) | 20,940 | (93.1) | 28,800 | (128.1) | 24,360 | (108.4) | 28,800 | (128.1) |
| | | | | 8 | (203.2) | | 14,660 | (65.2) | 20,880 | (92.9) | 20,940 | (93.1) | 28,800 | (128.1) | 24,360 | (108.4) | 28,800 | (128.1) |
| 1 | (25.4) | 300 | (406.7) | 4-1/2 | (114.3) | | 11,770 | (62.0) | 16,080 | (71.5) | 19,245 | (89.8) | 22,820 | (101.5) | 21,180 | (94.2) | 24,480 | (108.9) |
| | | | | 7-3/8 | (187.3) | | 14,600 | (64.9) | 28,680 | (127.6) | 23,980 | (106.7) | 37,940 | (168.8) | 33,260 | (148.0) | 38,080 | (169.4) |
| | | | | 9-1/2 | (241.3) | | 18,700 | (83.2) | 28,680 | (127.6) | 26,540 | (118.1) | 37,940 | (168.8) | 33,260 | (148.0) | 38,080 | (169.4) |
| 1/4 | (6.4) | N/A | | 1-1/8 | (28.6) | Tie-Wire Wedge Anchor | 1072 | (4.8) | 1523 | (6.8) | 1516 | (6.7) | 2154 | (9.6) | 1625 | (7.2) | 2492 | (11.1) |

* To calculate the Allowable Load of the anchor, divide the Ultimate Load by 4.
* For continuous extreme low temperature applications, use stainless steel.

## PERFORMANCE TABLE

# Trubolt Wedge Anchors

## Ultimate Tension and Shear Values (lbs/kN) in Lightweight Concrete*

| ANCHOR DIA. | | INSTLLATION TORQUE | | EMBEDMENT DEPTH | | ANCHOR TYPE | LIGHTWEIGHT CONCRETE f'c + 3,000 PSI (20.7 MPa) | | | | LOWER FLUTE OF STEEL DECK WITH LIGHTWEIGHT CONCRETE FILL f'c + 3,000 PSI (20.7 MPa) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | TENSION | | SHEAR | | TENSION | | SHEAR | |
| in. | (mm) | ft. lbs. | (Nm) | in. | (mm) | | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) |
| 3/8 | (9.5) | 25 | (33.9) | 1-1/2 | (38.1) | WS-Carbon or WS-G Hot-Dipped Galvanized or WW-304 S.S. or SWW-316 S.S. | 1,175 | (5.2) | 1,480 | (6.6) | 1,900 | (8.5) | 3,160 | (14.1) |
| | | | | 3 | (76.2) | | 2,825 | (12.6) | 2,440 | (10.9) | 2,840 | (12.6) | 4,000 | (17.8) |
| 1/2 | (12.7) | 55 | (74.6) | 2-1/4 | (57.2) | | 2,925 | (13.0) | 2,855 | (12.7) | 3,400 | (15.1) | 5,380 | (23.9) |
| | | | | 3 | (76.2) | | 3,470 | (15.4) | 3,450 | (15.3) | 4,480 | (19.9) | 6,620 | (29.4) |
| | | | | 4 | (101.6) | | 4,290 | (19.1) | 3,450 | (15.3) | 4,800 | (21.4) | 6,440 | (28.6) |
| 5/8 | (15.9) | 90 | (122.0) | 3 | (76.2) | | 4,375 | (19.5) | 4,360 | (19.4) | 4,720 | (21.0) | 5,500 | (24.5) |
| | | | | 5 | (127.0) | | 6,350 | (28.2) | 6,335 | (28.2) | 6,580 | (29.3) | 9,140 | (40.7) |
| 3/4 | (19.1) | 110 | (149.2) | 3-1/4 | (82.6) | | 5,390 | (24.0) | 7,150 | (31.8) | 5,840 | (26.0) | 8,880 | (39.5) |
| | | | | 5-1/4 | (133.4) | | 7,295 | (32.5) | 10,750 | (47.8) | 7,040 | (31.3) | N/A | N/A |

* To calculate the Allowable Load of the anchor, divide the Ultimate Load by 4.

## PERFORMANCE TABLE

# Trubolt Wedge Anchors

## Recommended Edge and Spacing Distance Requirements for Tension Loads*

| ANCHOR DIA. | | EMBEDMENT DEPTH | | ANCHOR TYPE | EDGE DISTANCE REQUIRED TO OBTAIN MAX. WORKING LOAD | | MIN. ALLOWABLE EDGE DISTANCE AT WHICH THE LOAD FACTOR APPLIED = .65 | | SPACING REQUIRED TO OBTAIN MAX. WORKING LOAD | | MIN. ALLOWABLE SPACING AT WHICH THE LOAD FACTOR APPLIED = .70 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| in. | (mm) | in. | (mm) | | in. | (mm) | in. | (mm) | in. | (mm) | in. | (mm) |
| 1/4 | (6.4) | 1-1/8 | (28.6) | WS-Carbon or WS-G Hot-Dipped Galvanized or WW-304 S.S. or SWW-316 S.S. | 2 | (50.8) | 1 | (25.4) | 3-15/16 | (100.0) | 2 | (50.8) |
| | | 1-15/16 | (49.2) | | 1-15/16 | (49.2) | 1 | (25.4) | 3-7/8 | (98.4) | 1-15/16 | (49.2) |
| | | 2-1/8 | (54.0) | | 1-5/8 | (41.3) | 13/16 | (20.6) | 3-3/16 | (81.0) | 1-5/8 | (41.3) |
| 3/8 | (9.5) | 1-1/2 | (38.1) | | 2-5/8 | (66.7) | 1-5/16 | (33.3) | 5-1/4 | (133.4) | 2-5/8 | (66.7) |
| | | 3 | (76.2) | | 3 | (76.2) | 1-1/2 | (38.1) | 6 | (152.4) | 3 | (76.2) |
| | | 4 | (101.6) | | 3 | (76.2) | 1-1/2 | (38.1) | 6 | (152.4) | 3 | (76.2) |
| 1/2 | (12.7) | 2-1/4 | (57.2) | | 3-15/16 | (100.0) | 2 | (50.8) | 7-7/8 | (200.0) | 3-15/16 | (100.0) |
| | | 4-1/8 | (104.8) | | 3-1/8 | (79.4) | 1-9/16 | (39.7) | 6-3/16 | (157.2) | 3-1/8 | (79.4) |
| | | 6 | (152.4) | | 4-1/2 | (114.3) | 2-1/4 | (57.2) | 9 | (228.6) | 4-1/2 | (114.3) |
| 5/8 | (15.9) | 2-3/4 | (69.9) | | 4-13/16 | (122.2) | 2-7/16 | (61.9) | 9-5/8 | (244.5) | 4-13/16 | (122.2) |
| | | 5-1/8 | (130.2) | | 3-7/8 | (98.4) | 1-15/16 | (49.2) | 7-1/16 | (195.3) | 3-7/8 | (98.4) |
| | | 7-1/2 | (190.5) | | 5-5/8 | (142.9) | 2-13/16 | (71.4) | 11-1/4 | (285.8) | 5-5/8 | (142.9) |
| 3/4 | (19.1) | 3-1/4 | (82.6) | | 5-11/16 | (144.5) | 2-7/8 | (73.0) | 11-3/8 | (288.9) | 5-11/16 | (144.5) |
| | | 6-5/8 | (168.3) | | 5 | (127.0) | 2-1/2 | (63.5) | 9-15/16 | (252.4) | 5 | (127.0) |
| | | 10 | (254.0) | | 7-1/2 | (190.5) | 3-3/4 | (95.3) | 15 | (381.0) | 7-1/2 | (190.5) |
| 7/8 | (22.2) | 3-3/4 | (95.3) | | 6-9/16 | (166.7) | 3-5/16 | (84.1) | 13-1/8 | (333.4) | 6-9/16 | (166.7) |
| | | 6-1/4 | (158.8) | | 6-1/4 | (158.8) | 3-1/8 | (79.4) | 12-1/2 | (317.5) | 6-1/4 | (158.8) |
| | | 8 | (203.2) | | 6 | (152.4) | 3 | (76.2) | 12 | (304.8) | 6 | (152.4) |
| 1 | (25.4) | 4-1/2 | (114.3) | | 7-7/8 | (200.0) | 3-15/16 | (100.0) | 15-3/4 | (400.1) | 7-7/8 | (200.0) |
| | | 7-3/8 | (187.3) | | 7-3/8 | (187.3) | 3-11/16 | (93.7) | 14-3/4 | (374.7) | 7-3/8 | (187.3) |
| | | 9-1/2 | (241.3) | | 7-1/8 | (181.0) | 3-9/16 | (90.5) | 14-1/4 | (362.0) | 7-1/8 | (181.0) |

* Spacing and edge distances shall be divided by 0.75 when anchors are placed in structural lightweight concrete. Linear interpolation may be used for intermediate spacing and edge distances.

## PERFORMANCE TABLE

# Trubolt Wedge Anchors

## Recommended Edge and Spacing Distance Requirements for Shear Loads*

| ANCHOR DIA. | | EMBEDMENT DEPTH | | ANCHOR TYPE | EDGE DISTANCE REQUIRED TO OBTAIN MAX. WORKING LOAD | | MIN. EDGE DISTANCE AT WHICH THE LOAD FACTOR APPLIED = .60 | | MIN. EDGE DISTANCE AT WHICH THE LOAD FACTOR APPLIED = .20 | | SPACING REQUIRED TO OBTAIN MAX. WORKING LOAD | | MIN. ALLOWABLE SPACING BETWEEN ANCHORS in. (mm) LOAD FACTOR APPLIED = .40 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| in. | (mm) | in. | (mm) | | in. | (mm) | in. | (mm) | in. | (mm) | in. | (mm) | in. | (mm) |
| 1/4 | (6.4) | 1-1/8 | (28.6) | WS-Carbon or WS-G Hot-Dipped Galvanized or WW-304 S.S. or SWW-316 S.S. | 2 | (50.8) | 1-5/16 | (33.3) | N/A | N/A | 3-15/16 | (100.0) | 2 | (50.8) |
| | | 1-15/16 | (49.2) | | 1-15/16 | (49.2) | 1 | (25.4) | N/A | N/A | 3-7/8 | (98.4) | 1-15/16 | (49.2) |
| 3/8 | (9.5) | 1-1/2 | (38.1) | | 2-5/8 | (66.7) | 1-3/4 | (44.5) | N/A | N/A | 5-1/4 | (133.4) | 2-5/8 | (66.7) |
| | | 3 | (76.2) | | 3-3/4 | (95.3) | 3 | (76.2) | 1-1/2 | (38.1) | 6 | (152.4) | 3 | (76.2) |
| 1/2 | (12.7) | 2-1/4 | (57.2) | | 3-15/16 | (100.0) | 2-9/16 | (65.1) | N/A | N/A | 7-7/8 | (200.0) | 3-15/16 | (100.0) |
| | | 4-1/8 | (104.8) | | 5-3/16 | (131.8) | 3-1/8 | (79.4) | 1-9/16 | (39.7) | 6-3/16 | (157.2) | 3-1/8 | (79.4) |
| 5/8 | (15.9) | 2-3/4 | (69.9) | | 4-13/16 | (122.2) | 3-1/8 | (79.4) | N/A | N/A | 9-5/8 | (244.5) | 4-13/16 | (122.2) |
| | | 5-1/8 | (130.2) | | 6-7/16 | (163.5) | 3-7/8 | (98.4) | 1-15/16 | (49.2) | 7-11/16 | (195.3) | 3-7/8 | (98.4) |
| 3/4 | (19.1) | 3-1/4 | (82.6) | | 5-11/16 | (144.5) | 3-3/4 | (95.3) | N/A | N/A | 11-3/8 | (288.9) | 5-11/16 | (144.5) |
| | | 6-5/8 | (168.3) | | 6-5/16 | (160.3) | 5 | (127.0) | 2-1/2 | (63.5) | 9-15/16 | (252.4) | 5 | (127.0) |
| 7/8 | (22.2) | 3-3/4 | (95.3) | | 6-9/16 | (166.7) | 4-5/16 | (109.5) | N/A | N/A | 13-1/8 | (333.4) | 6-9/16 | (166.7) |
| | | 6-1/4 | (158.8) | | 8-1/2 | (215.9) | 6-1/4 | (158.8) | 3-1/8 | (79.4) | 12-1/2 | (317.5) | 6-1/4 | (158.8) |
| 1 | (25.4) | 4-1/4 | (108.0) | | 7-7/8 | (200.0) | 5-1/8 | (130.2) | N/A | N/A | 15-3/4 | (400.1) | 7-7/8 | (200.0) |
| | | 7-3/8 | (187.3) | | 10-1/16 | (255.6) | 7-3/8 | (187.3) | 3-11/16 | (93.7) | 14-3/4 | (374.7) | 7-3/8 | (187.3) |

* Spacing and edge distances shall be divided by 0.75 when anchors are placed in structural lightweight concrete. Linear interpolation may be used for intermediate spacing and edge distances.

## Combined Tension and Shear Loading—for Trubolt Anchors

**Allowable loads for anchors subjected to combined shear and tension forces are determined by the following equation:**

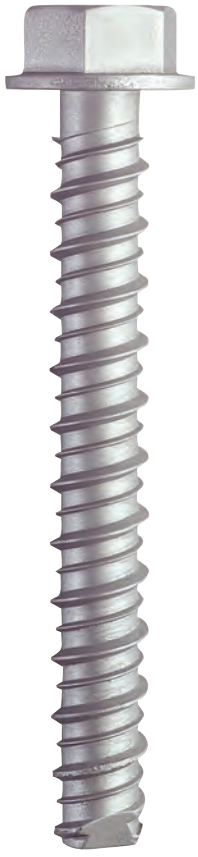
$$(Ps/Pt)^{5/3} + (Vs/Vt)^{5/3} \leq 1$$

**Ps = Applied tension load  Vs = Applied shear load  Pt = Allowable tension load  Vt = Allowable shear load**

RED HEAD®
CONCRETE ANCHORING SPECIALISTS

# Large Diameter Tapcon (LDT) Anchors

## Finished head, Removable Anchor



**LDT**

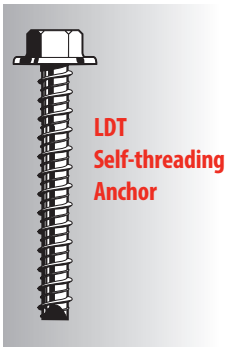
**(3/8" & 1/2")** **(5/8" & 3/4")** **Sawtooth™**

**Uses standard drill bits—no special drill bits to purchase or lose!**

## DESCRIPTION/SUGGESTED SPECIFICATIONS

### Self-threading Anchors—

**SPECIFIED FOR ANCHORAGE INTO CONCRETE**



LDT Self-threading Anchor

The LDT anchor is a high performance anchor that cuts its own threads into concrete.

Anchor bodies are made of hardened carbon steel and zinc plated, **Grade 5.**

The anchors shall have a finished hex washer head with anti-rotation serrations to prevent anchor back-out. The head of the anchor is stamped with a length identification code for easy inspection.

The hole shall be drilled with carbide tipped hammer drill bits made in accordance to ANSI B212.15-1994.

## ADVANTAGES

### SAVE TIME

**EASILY INSTALLED**

- Installs in less than half the time of wedge anchors or adhesive anchors
- Simply drill a pilot hole and drive the LDT anchor by hand or impact

**EASILY REMOVED**

- No torching or grinding required to remove anchors

### SAVE MONEY

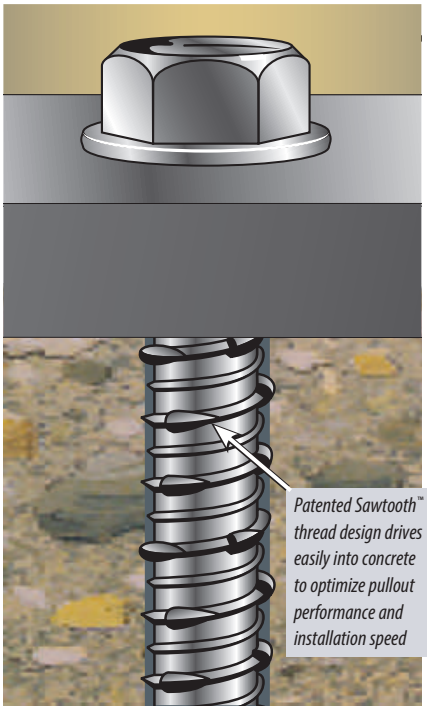
**LOWER DRILL BIT COSTS**

- Use standard ANSI bits instead of proprietary bits
- Single piece design, no nut and washer to assemble

**USE STANDARD ANSI BITS**

- No special proprietary bits to purchase or lose
- Reduce chances for anchor failure due to incorrect bit usage

### Sawtooth Threads™ diameters available on 5/8" and 3/4"




**IMPROVED PERFORMANCE IN LARGE DIAMETER HOLES**

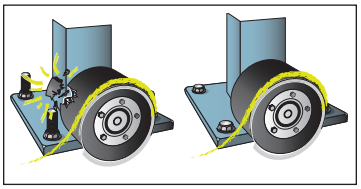
- Superior performance to wedge anchor
- Higher loads in shallow embedments
- Closer edge/spacing distance than mechanical anchors
- More threads for better thread engagement and higher pullout resistance
- Durable induction-hardened tip

**EASY INSTALLATION**

- Easy 2-step installation, simply drill a pilot hole and drive
- Installs in less than half the time of a wedge anchor
- Efficient thread cutting
- Use standard drill bit sizes
- Single piece design—no nut and washer assembly
- Easily removed

# LDT Anchors

## APPLICATIONS

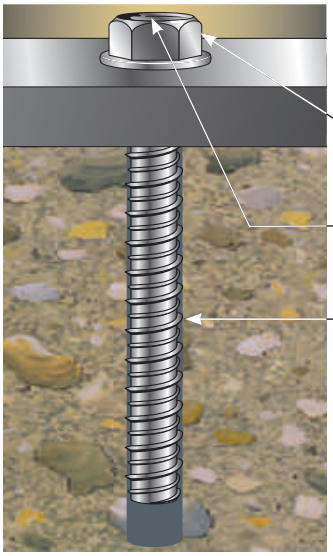


Racking, shelving and conveyors are just a few high volume applications ideal for Large Diameter Tapcon (LDT™). The ease and speed of installation of the LDT can reduce installation time to less than half the time of typical systems used today.

For installation speed, high performance and easy removability, LDT is the anchor of choice.

The LDT's finished head and lack of exposed threads virtually eliminates tire damage on fork lift trucks.

## FEATURES



**Easy Installation**
Installs into concrete by hand or impact wrench

**Anti-rotation Serrated Washer**
— Prevents anchor back-out

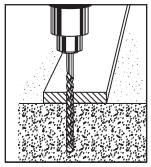
**Extra Large Hex Washer Head**
— With increased bearing surface

**Length Identification Head Stamp**
— For embedment inspection after installation

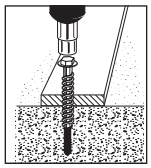
**Hi-Lo Threads**
— Cuts its own threads into concrete for greater pull-out resistance

## INSTALLATION STEPS

**Installation Steps for Concrete, Lightweight Concrete and Metal Deck**

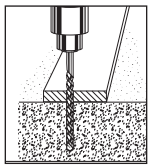


1. Using the proper size carbide bit (see chart) drill a pilot hole at least 1" deeper than anchor embedment.

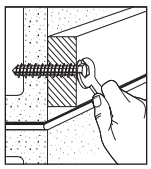


2. Using an **electric impact wrench**, or socket wrench (hand install) insert anchor into hole and tighten anchor until fully seated. (see chart for socket size) (do not over tighten).

**Installation Steps for Hollow or Grout-Filled CMU**
(3/8" and 1/2" diameter)



1. Using a 5/16" (for 3/8" LDT) or 7/16" (for 1/2" LDT) carbide tipped bit, drill a pilot hole at least 1" deeper than anchor embedment.



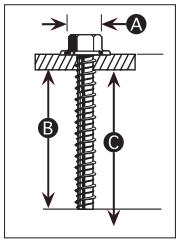
2. Using a socket wrench insert anchor into hole and hand tighten anchor until fully seated. (9/16" socket for 3/8" and 3/4" socket for 1/2") (do not over tighten).

**LDT's can be installed with an impact wrench in solid concrete only**
Installation by hand—is easy, simply using a socket wrench

Installation by impact wrench—is recommended for faster installations or for high volume projects. Installation with impact wrench—is ***not recommended for hollow block.***

### SELECTION CHART

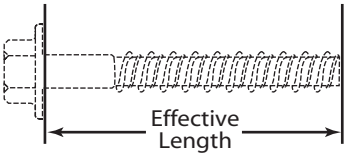
| LDT SIZE | ANSI STANDARD DRILL BIT DIAM. | Ⓐ ANCHOR HEAD (SOCKET SIZE) DIAM. | WASHER DIAM. | Ⓑ MINIMUM EMBEDMENT | Ⓒ HOLE DEPTH | USE IN | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | CONCRETE | CMU | |
| | | | | | | | HOLLOW | GROUT-FILLED |
| **LDT 3/8"** | 5/16" | 9/16" | 13/16" | 1-1/2" | 2-1/2" | YES | YES | YES |
| **LDT 1/2"** | 7/16" | 3/4" | 1" | 2-1/2" | 3-1/2" | YES | NO | YES |
| **LDT 5/8"** | 1/2" | 13/16" | 1-3/16" | 2-3/4" | 3-3/4" | YES | NO | YES |
| **LDT 3/4"** | 5/8" | 15/16" | 1-5/16" | 3-1/4" | 4-1/4" | YES | NO | YES |




See page 75 for effective lengths and length indication code.

## SELECTION CHART

# LDT Carbon and Stainless Steel




**Carbon Steel with Zinc Plating:** Meets ASTM B695 and B633 specifications for zinc plating of 5um = .0002" thickness. This coating is well suited for non-corrosive interior environments.

**Stainless Steel:** Provides additional corrosion protection for outdoor applications.

| PART NO. CARBON STEEL ZINC PLATED | PART NO. FOR 410 STAINLESS STEEL | ANCHOR DIA. | | DRILL BIT DIA. | | ANCHOR LENGTH | | MAX. THICKNESS OF MATERIAL TO BE FASTENED | | QTY/WT PER BOX qty / lbs. | QTY/WT PER MASTER CARTON qty / lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | in. | (mm) | in. | (mm) | in. | (mm) | in. | (mm) | | |
| LDT-3816 | — | 3/8 | (9.5) | 5/16 | (7.9) | 1-3/4 | (44.5) | 1/4 | (6.4) | 50 / 3.0 | 400 / 24.0 |
| LDT-3824 | SLDT-3824 | 3/8 | (9.5) | 5/16 | (7.9) | 2-1/2 | (63.5) | 1 | (25.4) | 50 / 4.5 | 400 / 34.0 |
| LDT-3830 | SLDT-3830 | 3/8 | (9.5) | 5/16 | (7.9) | 3 | (76.2) | 1-1/2 | (38.1) | 50 / 5.0 | 400 / 40.0 |
| LDT-3840 | SLDT-3840 | 3/8 | (9.5) | 5/16 | (7.9) | 4 | (101.6) | 2-1/2 | (63.5) | 50 / 6.5 | 400 / 52.0 |
| LDT-3850 | SLDT-3850 | 3/8 | (9.5) | 5/16 | (7.9) | 5 | (127.0) | 3-1/2 | (89.0) | 40 / 7.5 | 320 / 60.0 |
| LDT-1230 | SLDT-1230 | 1/2 | (12.7) | 7/16 | (11.1) | 3 | (76.2) | 1/2 | (12.7) | 25 / 4.5 | 150 / 27.0 |
| LDT-1240 | SLDT-1240 | 1/2 | (12.7) | 7/16 | (11.1) | 4 | (101.6) | 1-1/2 | (38.1) | 25 / 6.0 | 150 / 36.6 |
| LDT-1250 | SLDT-1250 | 1/2 | (12.7) | 7/16 | (11.1) | 5 | (127.0) | 2-1/2 | (63.5) | 25 / 7.6 | 150 / 45.6 |
| LDT-1260 | — | 1/2 | (12.7) | 7/16 | (11.1) | 6 | (152.4) | 4 | (101.6) | 20 / 9.0 | 120 / 54.0 |
| LDT-5830 | — | 5/8 | (15.9) | 1/2 | (12.7) | 3 | (76.2) | 1/4 | (6.4) | 10 / 3.5 | 100 / 35.0 |
| LDT-5840 | — | 5/8 | (15.9) | 1/2 | (12.7) | 4 | (101.6) | 1-1/4 | (31.8) | 10 / 4.0 | 100 / 40.0 |
| LDT-5850 | — | 5/8 | (15.9) | 1/2 | (12.7) | 5 | (127.0) | 2-1/4 | (57.1) | 10 / 4.7 | 100 / 47.0 |
| LDT-5860 | — | 5/8 | (15.9) | 1/2 | (12.7) | 6 | (152.4) | 3-1/4 | (82.6) | 10 / 5.4 | 50 / 27.0 |
| LDT-3444 | — | 3/4 | (19.1) | 5/8 | (15.9) | 4-1/2 | (114.3) | 1-1/4 | (31.8) | 10 / 7.4 | 50 / 37.0 |
| LDT-3454 | — | 3/4 | (19.1) | 5/8 | (15.9) | 5-1/2 | (139.7) | 2-1/4 | (57.1) | 10 / 8.1 | 50 / 40.5 |
| LDT-3462 | — | 3/4 | (19.1) | 5/8 | (15.9) | 6-1/4 | (158.8) | 3 | (76.2) | 10 / 9.1 | 30 / 27.3 |

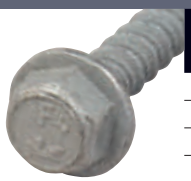
* The stainless steel LDTs will have the number 4 stamped on the head next to the length indication code

## DESIGN GUIDE

**For proper selection of anchor diameters based upon pre-drilled holes in base plates and fixtures.**

| HOLE DIAMETER IN FIXTURE | | SUGGESTED LDT DIAMETER | |
|---|---|---|---|
| in. | (mm) | in. | (mm) |
| 7/16 | (11.1) | 3/8 | (9.5) |
| 1/2 | (12.7) | 3/8 | (9.5) |
| 9/16 | (14.3) | 1/2 | (12.7) |
| 5/8 | (15.9) | 1/2 | (12.7) |
| 3/4 | (19.1) | 5/8 | (15.9) |
| 7/8 | (22.2) | 3/4 | (19.1) |

## LENGTH INDICATION CODE



**Length Code letter located on top of head. Additional number 4 indicates 410 stainless steel**

| CODE | LENGTH OF ANCHOR | |
|---|---|---|
| | in. | (mm) |
| A | 1-1/2 < 2 | (38.1 < 50.8) |
| B | 2 < 2-1/2 | (50.8 < 63.5) |
| C | 2-1/2 < 3 | (63.5 < 76.2) |
| D | 3 < 3-1/2 | (76.2 < 88.9) |
| E | 3-1/2 < 4 | (88.9 < 101.6) |
| F | 4 < 4-1/2 | (101.6 < 114.3) |
| G | 4-1/2 < 5 | (114.3 < 127.0) |
| H | 5 < 5-1/2 | (127.0 < 139.7) |
| I | 5-1/2 < 6 | (139.7 <152.4) |
| J | 6 < 6-1/2 | (152.4 < 165.1) |

## PERFORMANCE TABLE

# LDT Anchors

***Ultimate Tension and Shear Values (lbs/kN) in Solid Concrete Carbon and Stainless Steel***

| ANCHOR DIAMETER | | EMBEDMENT DEPTH | | f'c = 2000 PSI (13.8 MPa) | | | | f'c = 3000 PSI (20.7 MPa) | | | | f'c = 4000 PSI (27.6 MPa) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | TENSION | | SHEAR | | TENSION | | SHEAR | | TENSION | | SHEAR | |
| in. | (mm) | in. | (mm) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) |
| 3/8 | (9.5) | 1-1/2 | (38.1) | 1,336 | (5.9) | 2,108 | (9.4) | 1,652 | (7.3) | 2,764 | (12.3) | 1,968 | (8.8) | 3,416 | (15.2) |
| | | 2 | (50.8) | 1,492 | (6.6) | 3,036 | (13.5) | 2,024 | (9.0) | 3,228 | (14.4) | 2,552 | (11.4) | 3,420 | (15.2) |
| | | 2-1/2 | (63.5) | 3,732 | (16.6) | 3,312 | (14.7) | 3,748 | (16.7) | 3,364 | (15.0) | 3,760 | (16.7) | 3,424 | (15.2) |
| | | 3-1/2 | (88.9) | 5,396 | (24.0) | 3,312 | (14.7) | 6,624 | (29.5) | 3,368 | (15.0) | 7,852 | (34.9) | 3,428 | (15.2) |
| 1/2 | (12.7) | 2 | (50.8) | 3,580 | (15.9) | 5,644 | (25.1) | 3,908 | (17.4) | 6,512 | (29.0) | 4,236 | (18.8) | 7,380 | (32.8) |
| | | 3-1/2 | (88.9) | 7,252 | (32.3) | 6,436 | (28.6) | 8,044 | (35.8) | 7,288 | (32.4) | 8,836 | (39.3) | 8,140 | (36.2) |
| | | 4-1/2 | (114.3) | 10,176 | (45.3) | 7,384 | (32.8) | 10,332 | (46.0) | 7,968 | (35.4) | 10,488 | (46.7) | 8,552 | (38.0) |
| 5/8 | (15.9) | 2-3/4 | (69.9) | 5,276 | (23.5) | 8,656 | (38.5) | 6,560 | (29.2) | 11,064 | (49.2) | 7,844 | (34.8) | 13,476 | (59.9) |
| | | 3-1/2 | (88.9) | 7,972 | (35.5) | 10,224 | (45.5) | 9,848 | (43.8) | 12,144 | (54.0) | 11,724 | (52.2) | 14,060 | (62.5) |
| | | 4-1/2 | (114.3) | 11,568 | (51.5) | 12,316 | (54.8) | 13,432 | (59.8) | 13,580 | (60.4) | 16,892 | (75.1) | 14,840 | (66.0) |
| 3/4 | (19.1) | 3-1/4 | (82.6) | 6,876 | (30.6) | 7,140 | (31.8) | 9,756 | (43.4) | 10,728 | (47.7) | 12,636 | (56.2) | 14,316 | (63.6) |
| | | 4-1/2 | (114.3) | 10,304 | (45.8) | 13,120 | (58.4) | 14,424 | (64.2) | 16,868 | (75.0) | 18,540 | (82.5) | 20,612 | (91.7) |
| | | 5-1/2 | (139.7) | 13,048 | (58.0) | 17,908 | (79.7) | 18,156 | (80.8) | 21,718 | (96.9) | 23,268 | (130.5) | 25,652 | (114.1) |

To calculate the Allowable Load of the anchor, divide the Ultimate Load by 4.

## PERFORMANCE TABLE

# LDT Anchors

### *Ultimate Tension and Shear (lbs/kN) in Concrete Block*
### *(anchors should be installed by hand in hollow block)*

| ANCHOR DIAMETER | | EMBEDMENT DEPTH | | HOLLOW CONCRETE BLOCK | | | | GROUT FILLED CONCRETE BLOCK | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | TENSION | | SHEAR | | TENSION | | SHEAR | |
| in. | (mm) | in. | (mm) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) |
| 3/8 | (9.5) | 1-1/2 | (38.1) | 916 | (4.1) | 3,176 | (14.1) | 1,592 | (7.1) | 3,900 | (17.3) |
| 1/2 | (12.7) | 2-1/2 | (63.5) | N/A | | N/A | | 5,924 | (26.4) | 6,680 | (29.7) |

To calculate the Allowable Load of the anchor, divide the Ultimate Load by 4.

## PERFORMANCE TABLE

# LDT Anchors

### *Allowable Tension and Shear (lbs/kN) in Concrete Block*
### *(anchors should be installed by hand in hollow block)*

| ANCHOR DIAMETER | | EMBEDMENT DEPTH | | HOLLOW CONCRETE BLOCK | | | | GROUT FILLED CONCRETE BLOCK | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | TENSION | | SHEAR | | TENSION | | SHEAR | |
| in. | (mm) | in. | (mm) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) |
| 3/8 | (9.5) | 1-1/2 | (38.1) | 229 | (1.0) | 794 | (3.5) | 398 | (1.8) | 975 | (4.3) |
| 1/2 | (12.7) | 2-1/2 | (63.5) | N/A | | N/A | | 1,481 | (6.6) | 1,670 | (7.4) |

## PERFORMANCE TABLE

# LDT Anchors

### *Recommended Edge & Spacing Requirements for Tension Loads**
### *Carbon and Stainless Steel in Concrete*

| ANCHOR DIAMETER | | EMBEDMENT DEPTH | | EDGE DISTANCE REQUIRED TO OBTAIN MAX. WORKING LOAD | | AT MIN. EDGE DISTANCE 1-3/4" (44mm) | SPACING DISTANCE REQUIRED TO OBTAIN MAX. WORKING LOAD | | LOAD FACTOR APPLIED AT MIN. SPACING DISTANCE 3" (76mm) |
|---|---|---|---|---|---|---|---|---|---|
| in. | (mm) | in. | (mm) | in. | (mm) | | in. | (mm) | |
| 3/8 | (9.5) | 1-1/2 | (38.1) | 2 | (50.8) | 70% | 6 | (152.4) | 44% |
| | | 2 | (50.8) | 2 | (50.8) | 70% | 6 | (152.4) | 44% |
| | | 2-1/2 | (63.5) | 3 | (76.2) | 70% | 6 | (152.4) | 44% |
| | | 3-1/2 | (88.9) | 4 | (101.6) | 70% | 6 | (152.4) | 44% |
| 1/2 | (12.7) | 2 | (50.8) | 2-1/4 | (57.2) | 65% | 8 | (203.2) | 27% |
| | | 3-1/2 | (88.9) | 3 | (76.2) | 65% | 8 | (203.2) | 27% |
| | | 4-1/2 | (114.3) | 4 | (101.6) | 65% | 8 | (203.2) | 27% |

| ANCHOR DIAMETER | | EMBEDMENT DEPTH | | EDGE DISTANCE REQUIRED TO OBTAIN MAX. WORKING LOAD | | AT MIN. EDGE DISTANCE 1-3/4" (44mm) | SPACING DISTANCE REQUIRED TO OBTAIN MAX. WORKING LOAD | | LOAD FACTOR APPLIED AT MIN. SPACING DISTANCE 3.75" (95.2mm) |
|---|---|---|---|---|---|---|---|---|---|
| in. | (mm) | in. | (mm) | in. | (mm) | | in. | (mm) | |
| 5/8 | (15.9) | 2-3/4 | (69.9) | 6-1/4 | (158.8) | 65% | 10 | (254) | 50% |
| | | 3-1/2 | (88.9) | 6-1/4 | (158.8) | 65% | 10 | (254) | 50% |
| | | 4-1/2 | (114.3) | 6-1/4 | (158.8) | 65% | 10 | (254) | 50% |

| ANCHOR DIAMETER | | EMBEDMENT DEPTH | | EDGE DISTANCE REQUIRED TO OBTAIN MAX. WORKING LOAD | | AT MIN. EDGE DISTANCE 1-3/4" (44mm) | SPACING DISTANCE REQUIRED TO OBTAIN MAX. WORKING LOAD | | LOAD FACTOR APPLIED AT MIN. SPACING DISTANCE 4.5" (114.3mm) |
|---|---|---|---|---|---|---|---|---|---|
| in. | (mm) | in. | (mm) | in. | (mm) | | in. | (mm) | |
| 3/4 | (19.1) | 3-1/2 | (82.6) | 7-1/2 | (191) | 65% | 12 | (305) | 50% |
| | | 4-1/2 | (114.3) | 7-1/2 | (191) | 65% | 12 | (305) | 50% |
| | | 5-1/2 | (139.7) | 7-1/2 | (191) | 65% | 12 | (305) | 50% |

* Edge and spacing distance shall be divided by .75 when anchors are placed in structural lightweight concrete. Linear interpolation may be used for intermediate spacing and edge distances.

**For 5/8" and 3/4" LDT Anchors, the critical edge distance for these anchors is 10 times the anchor diameter**. The edge distance of these anchors may be reduced to 1-3/4" provided a 0.65 load factor is used for tension loads, a 0.15 load factor is used for shear loads applied perpendicular to the edge, or a 0.60 load factor is used for shear loads applied parallel to the edge. Linear interpolation may be used for intermediate edge distances.

## PERFORMANCE TABLE

# LDT Anchors

### *Recommended Edge & Spacing Requirements for Shear Loads* Carbon and Stainless Steel in Concrete*

| ANCHOR DIAMETER | | EMBEDMENT DEPTH | | EDGE DISTANCE REQUIRED TO OBTAIN MAX. WORKING LOAD | | AT MIN. EDGE DISTANCE 1-3/4" (44mm) | SPACING DISTANCE REQUIRED TO OBTAIN MAX. WORKING LOAD | | LOAD FACTOR APPLIED AT MIN. SPACING DISTANCE 3" (76mm) |
|---|---|---|---|---|---|---|---|---|---|
| in. | (mm) | in. | (mm) | in. | (mm) | | in. | (mm) | |
| 3/8 | (9.5) | 1-1/2 | (38.1) | 3 | (76.2) | 25% | 6 | (152.4) | 57% |
| | | 2 | (50.8) | 4 | (101.6) | 25% | 6 | (152.4) | 57% |
| | | 2-1/2 | (63.5) | 5 | (127.0) | 25% | 6 | (152.4) | 57% |
| | | 3-1/2 | (88.9) | 5 | (127.0) | 25% | 6 | (152.4) | 57% |
| 1/2 | (12.7) | 2 | (50.8) | 5 | (127.0) | 25% | 8 | (203.2) | 60% |
| | | 3-1/2 | (88.9) | 5 | (127.0) | 25% | 8 | (203.2) | 60% |
| | | 4-1/2 | (114.3) | 5-1/2 | (139.7) | 25% | 8 | (203.2) | 60% |
| 5/8 | (15.9) | 2-3/4 | (69.9) | 6-1/4 | (158.8) | 15%**/60%*** | 10 | (254) | 75% |
| | | 3-1/2 | (88.9) | 6-1/4 | (158.8) | 15%**/60%*** | 10 | (254) | 75% |
| | | 4-1/2 | (114.3) | 6-1/4 | (158.8) | 15%**/60%*** | 10 | (254) | 75% |
| 3/4 | (19.1) | 3-1/2 | (82.6) | 7-1/2 | (191) | 15%**/60%*** | 12 | (305) | 75% |
| | | 4-1/2 | (114.3) | 7-1/2 | (191) | 15%**/60%*** | 12 | (305) | 75% |
| | | 5-1/2 | (139.7) | 7-1/2 | (191) | 15%**/60%*** | 12 | (305) | 75% |

* Edge and spacing distances shall be divided by .75 when anchors are placed in structural lightweight concrete. Linear interpolation may be used for intermediate spacing and edge distances.

** 15% = shear load applied perpendicular to the edge

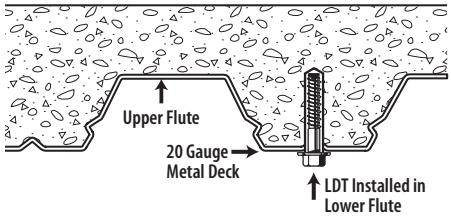
*** 60% = shear load applied parallel to the edge

## PERFORMANCE TABLE

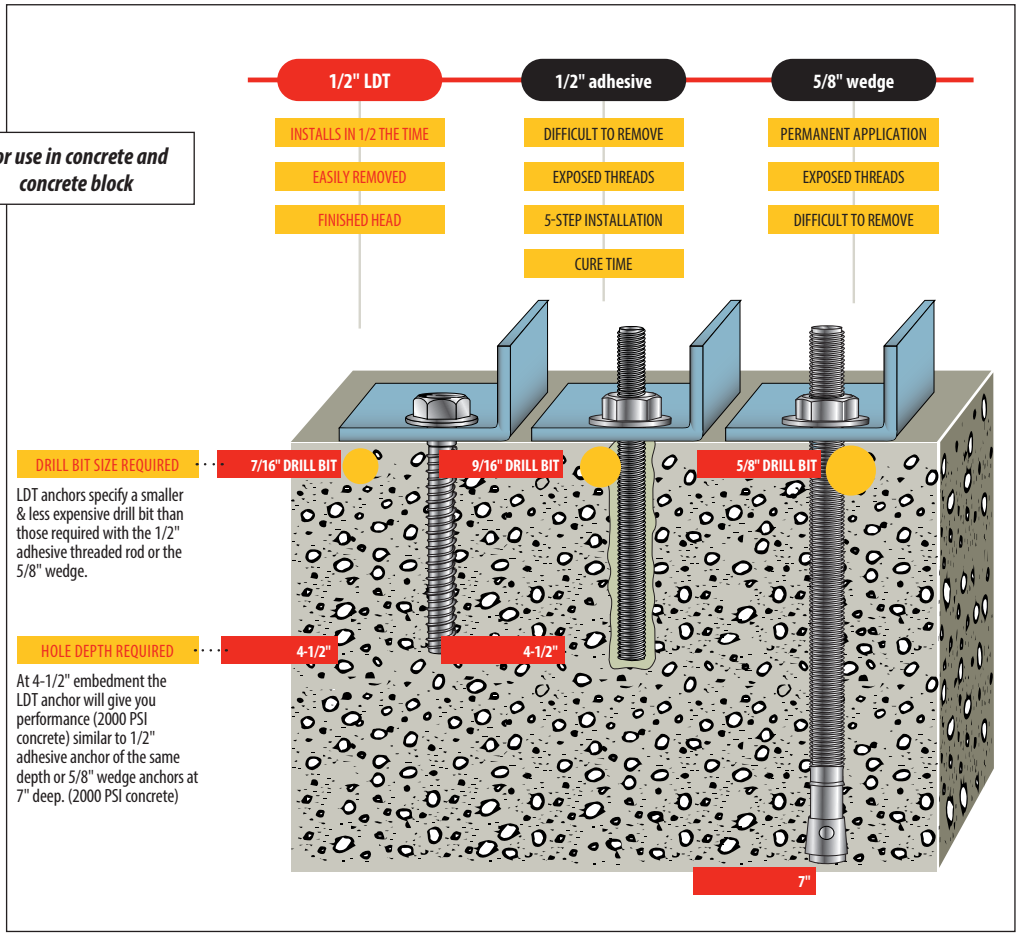
# LDT Anchors

## *Anchoring Overhead in 3,000 PSI Lightweight Concrete on Metal Deck*

| ANCHOR | DRILL HOLE DIAMETER | | EMBEDMENT | | 3000PSI (20.7 MPa) CONCRETE | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | ULTIMATE TENSION LOAD | | | ALLOWABLE WORKING LOAD | |
| | in. | (mm) | lbs. | (kN) | | lbs. | (kN) | lbs. | (kN) |
| 3/8" LDT | 5/16 | (7.9) | 1-1/2 | (38.1) | Upper Flute | 2,889 | (12.9) | 722 | (3.2) |
| | | | | | Lower Flute | 1,862 | (8.3) | 465 | (2.1) |




*For use in concrete and concrete block*



# Multi-Set II® Drop-In Anchors

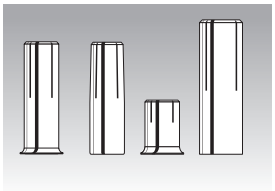
## Internally Threaded Heavy-Duty Anchoring Systems

## DESCRIPTION/SUGGESTED SPECIFICATIONS

### Drop-In, Shell-Type Anchors—

**SPECIFIED FOR ANCHORAGE INTO CONCRETE**

Drop-In, shell-type anchors feature an internally threaded, all-steel shell with expansion cone insert and flush embedment lip. Anchors are manufactured from zinc-plated carbon steel, 18-8 stainless steel and 316 stainless steel.



Multi-Set II Drop-In Anchors

Anchors should be installed with carbide tipped hammer drill bits made in accordance to ANSI B212.15-1994 specifications.

The minimum concrete thickness for an anchor is 1-1/2 times the embedment depth – or the embedment depth plus three times the anchor diameter – whichever is greater.

Anchors should be tested to ASTM E488 criteria.

## ADVANTAGES

### Short Drop-In (RX) Anchors

**Ideal for Hollow-Core, Pre-Cast Plank and Post Tension Slabs**

DepthCharge™ Stop Drill

- Optimized for use in hollow-core, pre-cast plank and post-tension slabs
- Lip keeps anchor flush during installation
- Shallow drilling—fast installation

RX Drop-In Anchor

### RM Drop-In Anchor

- Lipped anchor body keeps anchor flush
- Easy installation
- Keeps all rods same length
- Easy inspection
- Available in carbon steel and 18-8 stainless steel

### RL Drop-In Anchor

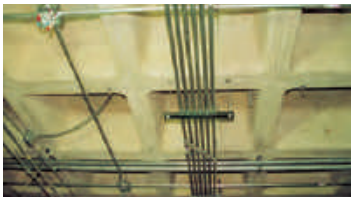
- Below surface setting for easy patch work

### Coil Thread Anchor

- Quick thread attachment—ideal for 1 sided forming
- Use coil rod on job
- Available in 1/2" diameter

## APPLICATIONS

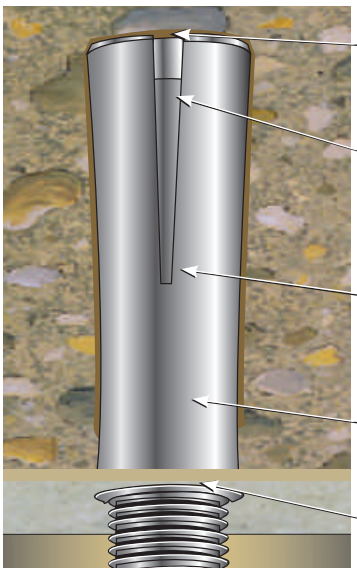
Pumps and heavy piping are common applications for larger diameter Multi-Set Drop-In Anchors.



Cable tray and strut suspended from concrete ceilings are ideal Multi-Set applications. In post-tension or hollow-core slabs use the RX-38.

The Multi-Set Anchor is the standard for pipe-hanging. The RM version has a retainer lip to keep all anchors flush at the surface, keeping all your threaded rod the same length.

## FEATURES



**Expander Slots**—allow for easy setting and superior performance

**Cone Insert**—that expands the anchor when driven with setting tool and hammer

**Body**—available in zinc-plated steel, 18-8 stainless steel, and 316 stainless steel

**Easy Depth Inspection**—keeps threaded rod drop lengths consistent

**Retainer Lip**—to keep anchor flush with surface

**For use with threaded rods or headed bolts (supplied by contractor)**

## APPROVALS/LISTINGS

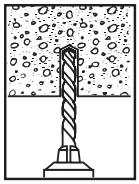
Meets or exceeds U.S. Government G.S.A. Specification A-A-55614 Type 1 (Formerly GSA: FF-S-325 Group VIII)

Multi-Set II Drop-in anchors may be covered by one or more of the following approvals/listings:

- Underwriters Laboratories
- Factory Mutual
- Caltrans

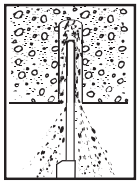
See Selection Chart next page.

## INSTALLATION STEPS



***To set anchor flush with surface:***

1. Drill hole to required embedment (see Table on page 82).



2. Clean hole with pressurized air.

3. Drive anchor flush with surface of concrete.

4. Expand anchor with setting tool provided (see chart on page 82). Anchor is properly expanded when shoulder of setting tool is flush with top of anchor.

## SELECTION CHART

### *Bits for RX-38 and RX-12 Short Drop-Ins*

| BIT NO. | DESCRIPTION | DRILLING DEPTH |
|---|---|---|
| DCX-138 | 3/8" Depth Charge Stop Drill (RX-38) | 3/4" |
| DCX-112 | 1/2" Depth Charge Stop Drill (RX-12) | 1" |

**DepthCharge™** *Stop Drill*

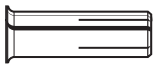
- Shoulder prevents over drilling. Less likely to hit reinforcing steel or post-tension cable in concrete
- No wasted time or energy drilling deeper than necessary
- Prevents anchor from dropping too far into hole below work surface

## SELECTION CHARTS

# Multi-Set II
## Drop-In Anchors

**PART NUMBER RTX-138**
For use with RX-38 only.

**PART NUMBER RTX-112**
For use with RX-12 only.

| USER TYPE / APPLICATION | BASE MATERIAL | DROP-IN ANCHOR TYPE | APPROVALS | PART NO. | SETTING TOOL PART NO.* | BOLT SIZE/ THREADS PER INCH | DRILL BIT DIAM. | | THREAD DEPTH | | EMBEDMENT MIN. HOLE DEPTH*** | | QTY/WT PER BOX qty / lbs. | QTY/ WT PER MASTER CARTON qty / lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | in. | (mm) | in. | (mm) | in. | (mm) | | |
| HVAC/Fire Sprinkler Plumber (Pipe-fitter) | Solid concrete/ lightweight fill deck | RM  | UL, FM | RM-38 | RT-138 | 3/8" / 16 | 1/2 | (12.7) | 1/2 | (12.7) | 1-5/8 | (41.3) | 50 / 3.4 | 500 / 36 |
| | | | UL, FM Caltrans | RM-12 | RT-112 | 1/2" / 13 | 5/8 | (15.9) | 3/4 | (19.1) | 2 | (50.8) | 50 / 5.8 | 400 / 49 |
| | | | UL, FM | RM-58 | RT-158 | 5/8" / 11 | 7/8 | (22.2) | 1 | (25.4) | 2-1/2 | (63.5) | 25 / 7.8 | 125 / 41 |
| | | | UL, FM Caltrans | RM-34 | RT-134 | 3/4" / 10 | 1 | (25.4) | 1-1/4 | (31.8) | 3-3/16 | (81.0) | 25 / 11.9 | 100 / 49 |
| | Hollow-core pre-cast or Post tension | RX  | FM | RX-38 | RTX-138 | 3/8" / 16 | 1/2 | (12.7) | 3/8 | (9.5) | 3/4 | (19.1) | 100 / 3.5 | 1000 / 36 |
| | | | N/A | RX-12 | RTX-112 | 1/2" / 13 | 5/8 | (15.9) | 1/2 | (12.7) | 1 | (25.4) | 50 / 3.0 | 500 / 31 |
| | Solid concrete/ lightweight fill deck | SRM** 18-8 S.S.  | N/A | SRM-14 | RT-114 | 1/4" / 20 | 3/8 | (9.5) | 3/8 | (9.5) | 1 | (25.4) | 100 / 2.7 | 1000 / 28 |
| | | | UL, FM | SRM-38 | RT-138 | 3/8" / 16 | 1/2 | (12.7) | 1/2 | (12.7) | 1-5/8 | (41.3) | 50 / 3.4 | 500 / 36 |
| | | | UL, FM | SRM-12 | RT-112 | 1/2" / 13 | 5/8 | (15.9) | 3/4 | (19.1) | 2 | (50.8) | 50 / 6.0 | 400 / 50 |
| | | | N/A | SRM-34 | RT-134 | 3/4" / 10 | 1 | (25.4) | 1-1/4 | (31.8) | 3-3/16 | (81.0) | 25 / 12.0 | 100 / 50 |
| Concrete Contractor, General Contractor | Solid concrete | CL Coil Threaded  | N/A | CL-12 | RT-112 | 1/2" / 6 | 5/8 | (15.9) | 3/4 | (19.1) | 2 | (50.8) | 50 / 5.7 | 400 / 47 |
| Concrete Cutting/Sawing Contractor/Misc. Metal | Solid concrete/ lightweight fill deck | RL (w/o lip)  | N/A | RL-14 | RT-114 | 1/4" / 20 | 3/8 | (9.5) | 3/8 | (9.5) | 1 | (25.4) | 100 / 2.6 | 1000 / 28 |
| | | | N/A | RL-38 | RT-138 | 3/8" / 16 | 1/2 | (12.7) | 1/2 | (12.7) | 1-5/8 | (41.3) | 50 / 3.4 | 500 / 36 |
| | | | N/A | RL-12 | RT-112 | 1/2" / 13 | 5/8 | (15.9) | 3/4 | (19.1) | 2 | (50.8) | 50 / 5.8 | 400 / 49 |
| | | | N/A | RL-58 | RT-158 | 5/8" / 11 | 7/8 | (22.2) | 1 | (25.4) | 2-1/2 | (63.5) | 25 / 7.8 | 125 / 41 |
| | | | N/A | RL-34 | RT-134 | 3/4" / 10 | 1 | (25.4) | 1-1/4 | (31.8) | 3-3/16 | (81.0) | 25 / 11.9 | 100 / 49 |

* 1 setting tool per master carton. ** For continuous extreme low temperature, use stainless steel. *** Embedment is equal to overall length of Drop-In Anchor

# RX-38 and RX-12
## Short Drop-In Kits

| PART NO. | DESCRIPTION | PART NO. | DESCRIPTION |
|---|---|---|---|
| **RX-38** | 3/8" drop-in | **RX-12** | 1/2" drop-in |
| **RTX-138** | Setting Tool for RX-38 | **RTX-112** | Setting Tool for RX-12 |
| **DCX-138** | Depth Charge Stop Drill – ½" | **DCX-112** | Depth Charge Stop Drill – ⅝" |

## PERFORMANCE TABLE

# Multi-Set II
### Drop-In Anchors

### Ultimate Tension and Shear Values (lbs/kN) in Solid Concrete*

| BOLT DIAM. | | DRILL BIT SIZE | | MIN. EMBEDMENT DEPTH | | ANCHOR TYPE | TENSION lbs. (kN) | | | | | | SHEAR lbs. (kN) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| in. | (mm) | in. | (mm) | in. | (mm) | | f'c = 2000 PSI | (13.8 MPa) | f'c = 4000 PSI | (27.6 MPa) | f'c = 6000 PSI | (41.4 MPa) | f'c ≥ 2000 PSI | (13.8 MPa) |
| 1/4 | (6.4) | 3/8 | (9.5) | 1 | (25.4) | RM, RL or CL-Carbon or SRM-18-8 S.S. or SSRM 316 S.S | 1,680 | (7.5) | 2,360 | (10.5) | 2,980 | (13.3) | 1,080 | (4.8) |
| 3/8 | (9.5) | 1/2 | (12.7) | 1-5/8 | (41.3) | | 2,980 | (13.3) | 3,800 | (16.9) | 6,240 | (27.8) | 3,160 | (14.1) |
| 1/2 | (12.7) | 5/8 | (15.9) | 2 | (50.8) | | 3,300 | (14.7) | 5,840 | (26.0) | 8,300 | (36.9) | 4,580 | (20.4) |
| 5/8 | (15.9) | 7/8 | (22.2) | 2-1/2 | (63.5) | | 5,500 | (24.5) | 8,640 | (38.4) | 11,020 | (49.0) | 7,440 | (33.1) |
| 3/4 | (19.1) | 1 | (25.4) | 3-3/16 | (81.0) | | 8,280 | (36.8) | 9,480 | (42.2) | 12,260 | (54.5) | 10,480 | (46.6) |

* To calculate the Allowable Load of the anchor, divide the Ultimate Load by 4.
* For continuous extreme low temperature applications, use stainless steel.

## PERFORMANCE TABLE

# Multi-Set II
### Drop-In Anchors

### Ultimate Tension and Shear Values (lbs/kN) in Lightweight Concrete*

| BOLT DIAMETER | | DRILL BIT SIZE | | MINIMUM EMBEDMENT DEPTH | | ANCHOR TYPE | LIGHTWEIGHT CONCRETE f'c = 3000 PSI (20.7 MPa) | | | | LOWER FLUTE OF STEEL DECK WITH LIGHTWEIGHT CONCRETE FILL f'c = 3000 PSI (20.7 MPa) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | TENSION | | SHEAR | | TENSION | | SHEAR | |
| in. | (mm) | in. | (mm) | in. | (mm) | | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) |
| 3/8 | (9.5) | 1/2 | (12.7) | 1-5/8 | (39.7) | RM, RL or CL-Carbon or SRM-18-8 S.S or SSRM-316 S.S. | 2,035 | (9.1) | 1,895 | (8.4) | 3,340 | (14.9) | 4,420 | (19.6) |
| 1/2 | (12.7) | 5/8 | (15.9) | 2 | (50.8) | | 2,740 | (12.2) | 2,750 | (12.2) | 3,200 | (14.2) | 4,940 | (22.0) |
| 5/8 | (15.9) | 7/8 | (22.2) | 2-1/2 | (63.5) | | 4,240 | (18.9) | 4,465 | (19.9) | 5,960 | (26.5) | 5,840 | (26.0) |
| 3/4 | (19.1) | 1 | (25.4) | 3-3/16 | (81.0) | | 5,330 | (23.7) | 6,290 | (28.0) | 8,180 | (36.4) | 9,120 | (40.6) |

* To calculate the Allowable Load of the anchor, divide the Ultimate Load by 4.

## PERFORMANCE TABLE

# Multi-Set II
### Drop-In Anchors

### Recommended Edge and Spacing Distance Requirements*

| BOLT DIAMETER | | DRILL BIT SIZE | | EMBEDMENT DEPTH | | ANCHOR TYPE | EDGE DISTANCE REQUIRED TO OBTAIN MAX. WORKING LOAD | | MIN. EDGE DISTANCE AT WHICH LOAD FACTOR APPLIED =.80 FOR TENSION =.70 FOR SHEAR | | SPACING REQUIRED TO OBTAIN MAX. WORKING LOAD | | MIN. ALLWABLE SPACING BETWEEN ANCHORS LOAD FACTOR APPLIED =.80 FOR TENSION =.55 FOR SHEAR | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| in. | (mm) | in. | (mm) | in. | (mm) | | in. | (mm) | in. | (mm) | in. | (mm) | in. | (mm) |
| 1/4 | (6.4) | 3/8 | (9.5) | 1 | (25.4) | RM, RL or CL-Carbon or SRM-18-8 S.S. or SSRM-316 S.S. | 1-3/4 | (44.5) | 7/8 | (22.2) | 3-1/2 | (88.9) | 1-3/4 | (44.5) |
| 3/8 | (9.5) | 1/2 | (12.7) | 1-5/8 | (41.3) | | 2-7/8 | (73.0) | 1-7/16 | (36.5) | 5-11/16 | (144.5) | 2-7/8 | (73.0) |
| 1/2 | (12.7) | 5/8 | (15.9) | 2 | (50.8) | | 3-1/2 | (88.9) | 1-3/4 | (44.5) | 7 | (177.8) | 3-1/2 | (88.9) |
| 5/8 | (15.9) | 7/8 | (22.2) | 2-1/2 | (63.5) | | 4-3/8 | (111.1) | 2-3/16 | (55.6) | 8-3/4 | (222.3) | 4-3/8 | (111.1) |
| 3/4 | (19.1) | 1 | (25.4) | 3-3/16 | (81.0) | | 5-5/8 | (142.9) | 2-13/16 | (71.4) | 11-3/16 | (284.2) | 5-5/8 | (142.9) |

* The minimum concrete thickness for a Drop-In is 1-1/2 times the embedment depth - OR - the embedment depth plus three times the anchor diameter - whichever is greater.
* Spacing and edge distances shall be divided by 0.75 when anchors are placed in structural lightweight concrete. Linear interpolation may be used for intermediate spacing and edge distances.

## PERFORMANCE TABLE

### Multi-Set II Drop-In Anchors

### Ultimate Tension and Shear Values (lbs/kN) for RX-series (3/4" and 1" Embedment)*

| BOLT DIAMETER | | DRILL BIT SIZE | | EMBEDMENT | | 2500 PSI (17.2 MPa) CONCRETE | | | | 4000 PSI (27.6 MPa) CONCRETE | | | | HOLLOW CORE | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | TENSION | | SHEAR | | TENSION | | SHEAR | | TENSION | | SHEAR | |
| in. | (mm) | in. | (mm) | in. | (mm) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) |
| 3/8 | (9.5) | 1/2 | (12.7) | 3/4 | (19.1) | 1,571 | (7.0) | 2,295 | (10.2) | 1,987 | (8.8) | 2,903 | (12.9) | 1,908 | (8.5) | 2,401 | (10.7) |
| 1/2 | (12.7) | 5/8 | (15.9) | 1 | (25.4) | 2,113 | (9.4) | 2,585 | (11.5) | 2,673 | (11.9) | 3,270 | (14.5) | 2,462 | (11.0) | 2,401 | (10.7) |

* The tabulated values are for RX anchors installed at a minimum of 12 diameters on center and minimum edge distance of 6 diameters for 100 percent anchor efficiency. Spacing and edge distance may be reduced to 6 diameters spacing and 3 diameter edge distance provided the values are reduced 50 percent. Linear Interpolation may be used for intermediate spacings and edge margins.

* To calculate the Allowable Load of the anchor, divide the Ultimate Load by 4

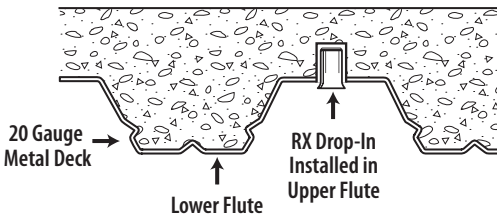
## PERFORMANCE TABLE

### Multi-Set II Drop-In Anchors

### Anchoring Overhead in 3,000 PSI Lightweight Concrete on Metal Deck*

| ANCHOR | DRILL HOLE DIAMETER | | EMBEDMENT | | 3000 PSI (20.7 MPa) CONCRETE | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | ULTIMATE TENSION LOAD | | ALLOWABLE WORKING LOAD | |
| | in. | (mm) | in. | (mm) | | lbs. | (kN) | lbs. | (kN) |
| RX-38 Drop-In | 1/2 | (12.7) | 3/4 | (19.1) | Upper Flute | 1,410 | (6.3) | 353 | (1.6) |
| | | | | | Lower Flute | 1,206 | (5.4) | 301 | (1.3) |

* To calculate the Allowable Load of the anchor, divide the Ultimate Load by 4




## Combined Tension and Shear Loading—for Multi-Set Anchors

**Allowable loads for anchors subjected to combined shear and tension forces are determined by the following equation:**

$$(Ps/Pt)^{5/3} + (Vs/Vt)^{5/3} \leq 1$$

**Ps = Applied tension load** **Vs = Applied shear load** **Pt = Allowable tension load** **Vt = Allowable shear load**

RED HEAD®
CONCRETE ANCHORING SPECIALISTS

# Dynabolt® Sleeve Anchors

## Versatile, Medium-Duty Sleeve Anchor

**Dynabolt Hex Nut Sleeve Anchor**

## DESCRIPTION/SUGGESTED SPECIFICATIONS

### Sleeve Type Anchors—

**SPECIFIED FOR ANCHORAGE INTO CONCRETE, GROUT-FILLED CONCRETE BLOCK, HOLLOW CONCRETE BLOCK AND BRICK**

Dynabolt Masonry Sleeve Anchor

Sleeve type anchors feature a split expansion sleeve over a threaded stud bolt body and integral expander, nut and washer.

Anchors are made of Plated Carbon Steel, or Type 304 Stainless Steel.

Anchors should be installed with carbide tipped hammer drill bits made in accordance to ANSI B212.15-1994.

Anchors are tested to ASTM E488 criteria.

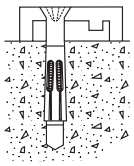
## ADVANTAGES

- Anchor diameter equals hole diameter
- Available in hex head and three other head styles
- Available 3/8 - 3/4" diameter up to 5" length
- Zinc plated carbon steel and 304 stainless steel
- Provides full 360° hole contact over large area and reduces concrete stress
- Heavy-loading capacity
- Preassembled for faster, easier installations
- Dynabolt can be installed through object to be fastened
- Sleeve design improves holding power
- No pre-spotting of holes necessary

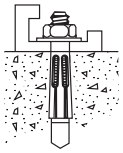
### Available Head Styles

**Full range of head style, corrosion protection, and sizes makes the Dynabolt Sleeve the right product for almost any application.**

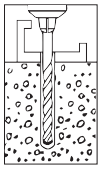
Phillips Flat Head **(FS)**



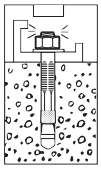
Hex Nut **(HN)**



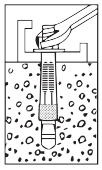
## INSTALLATION STEPS



1. Use a carbide tipped drill bit whose diameter is equal to the anchor. See Chart to determine proper size bit for anchor used. Dnll hole to any depth exceeding minimum embedment. Clean hole.



2. Insert assembled anchor through fixture and into hole so that washer or head is flush with materials to be fastened.



3. Expand anchor by tightening nut 2 to 3 full turns past the hand tight position, or the specified torque requirement.

## APPROVALS/LISTINGS

Meets or exceeds U.S. Government G.S.A. Specification A-A-1922A (Formerly GSA: FF-S-325 Group II, Type 3, Class 3)

Factory Mutual

## APPLICATIONS

Electrical junction boxes are common applications for the Dynabolt Sleeve anchor because it works well in solid concrete, concrete block, and brick. It is also available in several finished head styles.

The Dynabolt Sleeve anchor works well in hollow materials like brick and block. It is available in zinc-plated carbon steel and 304 stainless steel.

## SELECTION CHART

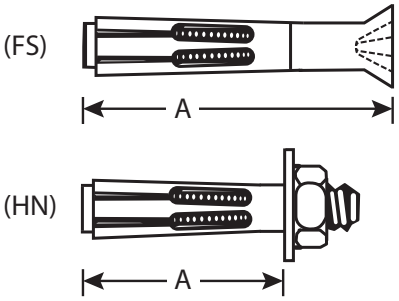
# Dynabolt
### Carbon Steel w/Zinc Plating

| HEAD STYLE | PART NO. | ANCHOR DIA. & DRILL BIT SIZE | EFFECTIVE ANCHOR LENGTH* | | BOLT DIA. / THREADS PER INCH | MIN. EMBEDMENT | | MAX. THICKNESS OF MATERIAL TO BE FASTENED | | QTY/WT PER BOX qty / lbs. | QTY/WT PER MASTER CTN qty / lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | in. | (mm) | | in. | (mm) | in. | (mm) | | |
| | HN-3817 | 3/8" | 1-7/8 | (47.6) | 5/16" / 18 | 1-1/2 | (38.1) | 3/8 | (9.5) | 50 / 3.5 | 500 / 36 |
| | HN-3830 | | 3 | (76.2) | 5/16" / 18 | 1-1/2 | (38.1) | 1-1/2 | (38.1) | 50 / 4.9 | 400 / 40 |
| | HN-1222 | 1/2" | 2-1/4 | (57.2) | 3/8" / 16 | 1-7/8 | (47.6) | 3/8 | (9.5) | 25 / 3.3 | 250 / 34 |
| | HN-1230 | | 3 | (76.2) | 3/8" / 16 | 1-7/8 | (47.6) | 1-1/8 | (28.6) | 25 / 4.0 | 200 / 33 |
| | HN-1240 | | 4 | (101.6) | 3/8" / 16 | 1-7/8 | (47.6) | 2-1/8 | (54.0) | 25 / 5.3 | 200 / 44 |
| | HN-5842 | 5/8" | 4-1/4 | (108.0) | 1/2" / 13 | 2 | (50.8) | 2-1/4 | (57.2) | 10 / 3.9 | 100/ / 41 |
| Phillips Flat Head | FS-3840 | 3/8" (head dia. .722) | 4 | (101.6) | 5/16" / 18 | 1-1/2 | (38.1) | 2-1/2 | (63.5) | 50 / 5.3 | 400 / 44 |
| | FS-3850 | | 5 | (127.0) | 5/16" / 18 | 1-1/2 | (38.1) | 3-1/2 | (88.9) | 50 / 5.6 | 300 / 40 |

Phillips flat head uses a standard 80°– 82° counter sink.

**Typical Applications**—Shelf ledgers, electrical boxes, conduit
**Environment**—Interior (non-corrosive)
**Level of Corrosion**—Low

*Effective Anchor Length




## SELECTION CHART

# Dynabolt
### 304 Stainless Steel

| HEAD STYLE | PART NO. | ANCHOR DIA. & DRILL BIT SIZE | EFFECTIVE ANCHOR LENGTH | | BOLT DIA. / THREADS PER INCH | MIN. EMBEDMENT | | MAX. THICKNESS OF MATERIAL TO BE FASTENED | | QTY/WT PER BOX qty / lbs. | QTY/WT PER MASTER CTN qty / lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | in. | (mm) | | in. | (mm) | in. | (mm) | | |
| Phillips Flat Head | SFS-3840 | 3/8" | 4 | (101.6) | 5/16" / 18 | 1-1/2 | (38.1) | 2-1/2 | (63.5) | 50 / 5.3 | 400 / 44 |

Flat head uses a standard 80°–82° counter sink.
For continuous extreme low temperature applications, use stainless steel.

**Typical Applications**—Cladding and Brick Ties
**Environment**—Slight to moderate degree of pollution
**Level of Corrosion**—Medium

## PERFORMANCE TABLE

**Dynabolt Sleeve Anchors**

### Ultimate Tension and Shear Values in Solid Concrete (lbs/kN)*

| ANCHOR DIAMETER | | INSTALLATION TORQUE | | BOLT DIAMETER | | MINIMUM EMBEDMENT DEPTH | | ANCHOR TYPE (STEEL) | f'c = 2000 PSI (13.8 MPa) | | | | f'c = 3000 PSI (20.7 MPa) | | | | f'c = 4000 PSI (27.6 MPa) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | TENSION | | SHEAR | | TENSION | | SHEAR | | TENSION | | SHEAR | |
| in. | (mm) | ft. lbs. | (Nm) | in. | (mm) | in. | (mm) | | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) |
| 1/4 | (6.4) | 3.5 | (4.7) | 3/16 | (4.8) | 1-1/8 | (28.6) | Carbon or Stainless | 1,200 | (5.3) | 1,215 | (5.4) | 1,325 | (5.9) | 1,215 | (5.4) | 1,450 | (6.4) | 1,215 | (5.4) |
| 5/16 | (7.9) | 8 | (10.8) | 1/4 | (6.4) | 1-1/4 | (31.8) | | 1,400 | (6.2) | 2,040 | (9.1) | 1,920 | (8.5) | 2,220 | (9.9) | 2,600 | (11.6) | 2,400 | (10.7) |
| 3/8 | (9.5) | 14 | (19.0) | 5/16 | (7.9) | 1-1/2 | (38.1) | | 1,620 | (7.2) | 2,560 | (11.4) | 2,240 | (10.0) | 2,800 | (12.5) | 3,100 | (13.8) | 3,040 | (13.5) |
| 1/2 | (12.7) | 20 | (27.1) | 3/8 | (9.5) | 1-7/8 | (47.6) | | 2,220 | (9.9) | 3,250 | (14.5) | 3,140 | (14.0) | 4,000 | (17.8) | 4,400 | (19.6) | 4,500 | (20.0) |
| 5/8 | (15.9) | 48 | (65.1) | 1/2 | (12.7) | 2 | (50.8) | | 3,080 | (13.7) | 6,440 | (28.6) | 4,400 | (19.6) | 7,240 | (32.2) | 6,120 | (27.2) | 8,080 | (35.9) |
| 3/4 | (19.1) | 90 | (122.0) | 5/8 | (15.9) | 2-1/4 | (57.2) | | 4,200 | (18.7) | 10,200 | (45.4) | 6,060 | (27.0) | 11,600 | (51.6) | 8,900 | (39.6) | 13,100 | (58.3) |

* For continuous extreme low temperature applications, use stainless steel.
* To calculate the Allowable Load of the anchor, divide the Ultimate Load by 4.

## PERFORMANCE TABLE

**Dynabolt Sleeve Anchors**

### Ultimate Tension and Shear Values in Lightweight Concrete (lbs/kN)*

| ANCHOR DIAMETER | | INSTALLATION TORQUE | | BOLT DIAMETER | | MINIMUM EMBEDMENT DEPTH | | ANCHOR TYPE (STEEL) | f'c = 4000 PSI (27.6 MPa) | | | | f'c = 6000 PSI (41.4 MPa) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | TENSION | | SHEAR | | TENSION | | SHEAR | |
| in. | (mm) | ft. lbs. | (Nm) | in. | (mm) | in. | (mm) | | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) |
| 1/4 | (6.4) | 3.5 | (4.7) | 3/16 | (4.8) | 1-1/8 | (28.6) | Carbon or Stainless | 870 | (3.9) | 730 | (3.2) | 1,066 | (4.7) | 894 | (4.0) |
| 5/16 | (7.9) | 8 | (10.8) | 1/4 | (6.4) | 1-1/4 | (31.8) | | 1,260 | (5.6) | 1,680 | (7.5) | 1,440 | (6.4) | 2,220 | (9.9) |
| 3/8 | (9.5) | 14 | (19.0) | 5/16 | (7.9) | 1-1/2 | (38.1) | | 1,620 | (7.2) | 2,300 | (10.2) | 2,240 | (10.0) | 2,800 | (12.5) |
| 1/2 | (12.7) | 25 | (33.9) | 3/8 | (9.5) | 1-7/8 | (47.6) | | 2,600 | (11.6) | 2,400 | (10.7) | 3,160 | (14.1) | 2,400 | (10.7) |
| 5/8 | (15.9) | 48 | (65.1) | 1/2 | (12.7) | 2 | (50.8) | | 3,240 | (14.4) | 5,600 | (24.9) | 4,300 | (19.1) | 7,840 | (34.9) |
| 3/4 | (19.1) | 90 | (122.0) | 5/8 | (15.9) | 2-1/4 | (57.2) | | 3,640 | (16.2) | 8,640 | (38.4) | 5,800 | (25.8) | 12,480 | (55.5) |

* To calculate the Allowable Load of the anchor, divide the Ultimate Load by 4.

## PERFORMANCE TABLE

**Dynabolt Sleeve Anchors**

### Ultimate Tension and Shear Values in Concrete Masonry Units (lbs/kN)*

| ANCHOR DIAMETER | | INSTALLATION TORQUE | | BOLT DIAMETER | | MINIMUM EMBEDMENT DEPTH | | ANCHOR TYPE (STEEL) | LIGHTWEIGHT | | | | | | | | MEDIUM WEIGHT | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | HOLLOW CORE | | | | GROUT FILLED | | | | HOLLOW CORE | | | | GROUT FILLED | | | |
| | | | | | | | | | TENSION | | SHEAR | | TENSION | | SHEAR | | TENSION | | SHEAR | | TENSION | | SHEAR | |
| in. | (mm) | ft. lbs. | (Nm) | in. | (mm) | in. | (mm) | | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) |
| 1/4 | (6.4) | 3.5 | (4.7) | 3/16 | (4.8) | 1-1/8 | (28.6) | Carbon | 1,120 | (5.0) | 1,215 | (5.4) | 1,120 | (5.0) | 1,215 | (5.4) | 1,120 | (5.0) | 1,215 | (5.4) | 1,120 | (5.0) | 1,215 | (5.4) |
| | | | | | | | | Stainless | 640 | (2.8) | 1,620 | (7.2) | 640 | (2.8) | 1,620 | (7.2) | 640 | (2.8) | 1,620 | (7.2) | 640 | (2.8) | 1,620 | (7.2) |
| 3/8 | (9.5) | 15 | (20.3) | 5/16 | (7.9) | 1-1/2 | (38.1) | Carbon | 1,360 | (6.0) | 2,560 | (11.4) | 1,360 | (6.0) | 2,560 | (11.4) | 1,360 | (6.0) | 2,560 | (11.4) | 1,360 | (6.0) | 2,560 | (11.4) |
| | | | | | | | | Stainless | 1,160 | (5.2) | 2,560 | (11.4) | 1,160 | (5.2) | 2,560 | (11.4) | 1,160 | (5.2) | 2,560 | (11.4) | 1,160 | (5.2) | 2,560 | (11.4) |
| 1/2 | (12.7) | 25 | (33.9) | 3/8 | (9.5) | 1-7/8 | (47.6) | Carbon | N/A | | N/A | | 2,200 | (9.9) | 3,500 | (15.6) | N/A | | N/A | | 2,200 | (9.9) | 3,500 | (15.6) |
| | | | | | | | | Stainless | N/A | | N/A | | 2,100 | (9.3) | 3,500 | (15.6) | N/A | | N/A | | 2,100 | (9.3) | 3,500 | (15.6) |
| 5/8 | (15.9) | 55 | (74.6) | 1/2 | (12.7) | 2 | (50.8) | Carbon | N/A | | N/A | | 3,080 | (13.7) | 6,440 | (28.6) | N/A | | N/A | | 3,080 | (13.7) | 6,440 | (28.6) |
| | | | | | | | | Stainless | N/A | | N/A | | 3,080 | (13.7) | 6,440 | (28.6) | N/A | | N/A | | 2,820 | (12.5) | 6,440 | (28.6) |
| 3/4 | (19.1) | 90 | (122.0) | 5/8 | (15.9) | 2-1/2 | (63.5) | Carbon | N/A | | N/A | | 4,200 | (18.7) | 10,200 | (45.4) | N/A | | N/A | | 4,200 | (18.7) | 10,200 | (45.4) |

* To calculate the Allowable Load of the anchor, divide the Ultimate Load by 4. **The tabulated values are for anchors installed in a minimum of 12 diameters on center and a minimum edge distance of 6 diameters for 100 percent anchor efficiency. Spacing and edge distance may be reduced to 6 diameter spacing and 3 diameter edge distance, provided the values are reduced 50 percent. Linear interpolation may be used for intermediate spacings and edge distances.**

**Note: N/A is defined as Not Advisable.**

### Combined Tension and Shear Loading—for Dynabolt Anchors

**Allowable loads for anchors subjected to combined shear and tension forces are determined by the following equation:**

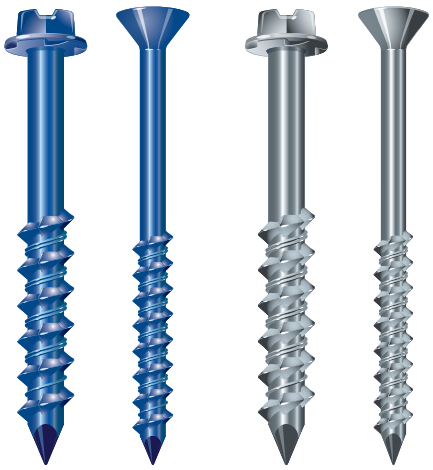
$$(Ps/Pt) + (Vs/Vt) \leq 1$$

**Ps = Applied tension load  Vs = Applied shear load  Pt = Allowable tension load  Vt = Allowable shear load**

# Tapcon®
## Concrete and Masonry Anchors

THE ORIGINAL Tapcon®

Advanced Threadform Technology™
Easier to install–less torque required!



Blue Climaseal™ 410 Stainless Steel

## DESCRIPTION/SUGGESTED SPECIFICATIONS

### Tapcon Anchors—

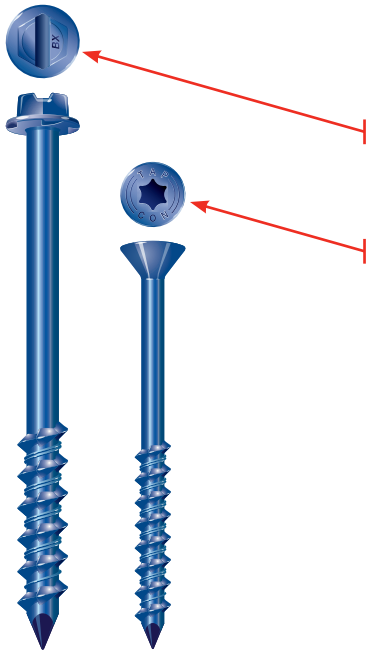
**SPECIFIED FOR ANCHORAGE INTO CONCRETE, BRICK OR BLOCK**

The "original masonry" anchor that cuts its own threads into concrete, brick, or block. Maximum performance is achieved because the Tapcon Anchor, the Condrive Installation Tool, and the carbide-tipped Tapcon Drill Bits are designed to work as a system. It is essential to use the Condrive tool and the correct drill bit to assure consistent anchor performance.

## ADVANTAGES

- Works in all masonry base materials.
- Fast and easy—3 anchors per minute.
- No hole spotting or inserts required.
- Removable.
- Slotted hex and star drive head styles
- Extended corrosion protection—Blue Climaseal™.
- Available in 410 Stainless Steel.
- Pressure treated wood compatible

### Tapcon Anchors



**Blue Climaseal™** provides extended corrosion protection

**Available in 410 Stainless Steel** (see photo on left)

**Hex Head** style on Tapcon Anchors is available for majority of fixture anchoring needs
Patented underhead ribs prevent head snap

**Star Drive Flat Head** style is available when flush seating is necessary in countersink applications

**Advanced Threadform** cuts into concrete and masonry for reduced installation torque and increased pullout performance

**Lengths** of Tapcon Anchors range from 1-1/4" to 3-1/4" in 3/16" and up to 6" in 1/4" diameters

**Nail-Type Point** guides the anchor into the pre-drilled hole. Excellent for wood to concrete applications



## CORROSION RESISTANCE

**Carbon Steel with Blue Climaseal™ Salt Spray Results (ASTM B117)**

720 Hours - 10% or less rust

**410 Stainless Steel with Silver Climashield™ Salt Spray Results (ASTM B117)**

1,600 Hours - 5% or less rust

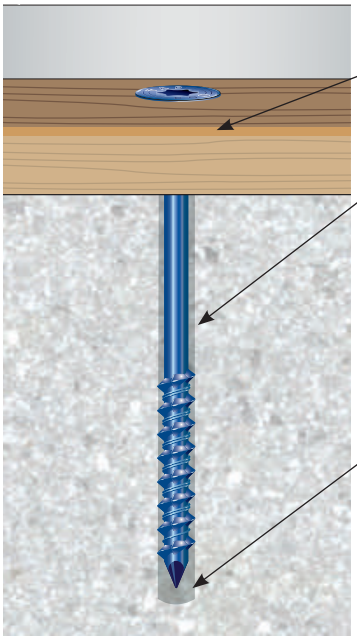
## APPLICATIONS

The Tapcon Anchor is especially well suited for window and door frames because it performs well in block, is available in a flat head style, and is fast to install.

Many horizontal or "wall" applications are attached with Tapcon Anchor because it is removable and works well in block and brick.

The picture shows the Condrive Installation Kit in action. The kit makes for fast and easy change over from drill bit to driver and controls the driving torque to prevent thread stripping and head snapping in hard base materials.

## FEATURES



**Fixture Thickness**—determine the fixture thickness to be anchored

**Anchor Embedment**—with a minimum recommended embedment of 1", the correct Tapcon anchor choice can be made. Hole depth must be a minimum **1/4" deeper** than the anchor embedment to allow for displaced material

**Hole Diameter**—proper hole diameter is very important to insure consistent performance and maximum pullout strength. **3/16" anchors require 5/32" diameter Tapcon bits, and 1/4" anchors require 3/16" diameter Tapcon bits**

## APPROVAL/LISTINGS

**Blue Climaseal™**

ICC Evaluation Service, Inc. – ESR-1671
ICC Evaluation Service, Inc. – ESR-2202
Miami-Dade County NOA 21-0201.06
Florida Building Code

**410 Stainless Steel**

Miami-Dade County NOA 21-0201.05
Florida Building Code

**For the most current approvals/listings visit: www.itwredhead.com**

## INSTALLATION STEPS

**Read installation instructions before using!**

**WARNING:** If there are any questions concerning proper installation, applications or appropriate use of this product, please call our Technical Services Department at 1-800-848-5611. Failure to follow these instructions can result in serious personal injury.

1. **Select proper fastener – diameter / head style / length.**
   a) **Use selection chart to choose proper length.**
2. **Drill Hole – use selection chart to determine drill bit length and depth of hole.**
   a) **Use 5⁄32" diameter Tapcon bit for 3⁄16" dia. Tapcon Anchor. Use 3⁄16" diameter Tapcon bit for 1⁄4" dia. Tapcon Anchor.**
   b) **Drill hole minimum 1⁄4" deeper than Tapcon Anchor to be embedded.**
   Minimum anchor embedment: 1"
   Maximum anchor embedment: 1¾"
3. **Drive Anchor using rotary (spin mode) drill.**

**WARNING:** Failure to wear safety glasses with side shields can result in serious personal injury. Always wear ANSI compliant eye protection (ANSI Z87.1-2003).

**WARNING:** Using the wrong size drill bit will affect performance values and may cause failure.

### Drive Styles

3/16" Hex uses 1/4" diameter drive socket
1/4" Hex uses 5/16" drive socket

3/16" Star uses T25 drive bit
1/4" Star uses T30 drive bit

## SELECTION CHART

### Tapcon® Anchors with Blue Climaseal

Diameter . . . . . 3/16" and 1/4" Thread Form . . . . . Advanced Threadform Technology™
Point Type . . . . . Nail Finish . . . . . Blue Climaseal™
All boxes of Tapcon anchors come packaged with matching carbide-tipped bit. Tapcon is packaged 100 pieces per box and 500 pieces per master carton except 3205407 and 3203407V2 (400 in master carton).

| FIXTURE THICKNESS INCHES | RECOMMENDED TAPCON LENGTH | | PART NO. 3/16" HEX HEAD | PART NO. 1/4" HEX HEAD | PART NO. 3/16" FLAT HEAD | PART NO. 1/4" FLAT HEAD | BIT LENGTH | | STRAIGHT SHANK BITS FOR 3/16" TAPCON PART NO. | STRAIGHT SHANK BITS FOR 1/4" TAPCON PART NO. |
|---|---|---|---|---|---|---|---|---|---|---|
| | in. | (mm) | | | | | in. | (mm) | | |
| 0" – 1/4" | 1-1/4 | (31.8) | 3139407 | 3153407 | 3169407V2 | 3183407V2 | 3-1/2 | (88.9) | – | 3098910 |
| 1/4" – 3/4" | 1-3/4 | (44.5) | 3141407 | 3155407 | 3171407V2 | 3185407V2 | 3-1/2 | (88.9) | – | 3098910 |
| 3/4" – 1-1/4" | 2-1/4 | (57.2) | 3143407 | 3157407 | 3173407V2 | 3187407V2 | 4-1/2 | (114.3) | 3096910 | 3099910 |
| 1-1/4 " – 1-3/4" | 2-3/4 | (69.9) | 3145407 | 3159407 | 3175407V2 | 3189407V2 | 4-1/2 | (114.3) | 3096910 | 3099910 |
| 1-3/4" – 2-1/4" | 3-1/4 | (82.6) | 3147407 | 3161407 | 3177407V2 | 3191407V2 | 5-1/2 | (139.7) | 3097910 | 3100910 |
| 2-1/4" – 2-3/4" | 3-3/4 | (95.3) | – | 3163407 | – | 3193407V2 | 5-1/2 | (139.7) | 3097910 | 3100910 |
| 2-1/2" – 3" | 4 | (101.6) | – | 3165407 | – | 3195407V2 | 5-1/2 | (139.7) | 3097910 | 3100910 |
| 3-1/2" – 4" | 5 | (127.0) | – | 3167407 | – | 3197407V2 | 6-1/2 | (165.1) | – | – |
| 4-1/2" – 5" | 6 | (152.4) | – | 3205407 | – | 3203407V2 | 7-1/2 | (190.5) | – | – |

Additional Tapcon bits are available 10 per tube.

## SELECTION CHART

### Tapcon® 410 SS Anchor

Diameter . . . . . 3/16" and 1/4" Thread Form . . . . Original Notched Hi-Lo™
Point Type . . . . Nail Finish . . . . . 410 Stainless Steel with Silver Climashield™
All boxes of Tapcon anchors come packaged with matching carbide-tipped bit. Tapcon is packaged 100 pieces per box and 500 pieces per master carton.

| FIXTURE THICKNESS INCHES | RECOMMENDED TAPCON LENGTH | | PART NO. 1/4" HEX HEAD | PART NO. 3/16" FLAT HEAD | PART NO. 1/4" FLAT HEAD | BIT LENGTH | | STRAIGHT SHANK BITS FOR 3/16" TAPCON PART NO. | STRAIGHT SHANK BITS FOR 1/4" TAPCON PART NO. |
|---|---|---|---|---|---|---|---|---|---|
| | in. | (mm) | | | | in. | (mm) | | |
| 0" – 1/4" | 1-1/4 | (31.8) | 3367907 | – | 3373907 | 3-1/2 | (88.9) | – | 3098910 |
| 1/4" – 3/4" | 1-3/4) | (44.5) | 3368907 | 3418907 | 3374907 | 3-1/2 | (88.9) | – | 3098910 |
| 3/4" – 1-1/4" | 2-1/4 | (57.2) | 3369907 | 3419907 | 3375907 | 4-1/2 | (114.3) | 3096910 | 3099910 |
| 1-1/4 – 1-3/4" | 2-3/4 | (69.9 | 3370907 | 3420907 | 3376907 | 4-1/2 | (114.3) | 3096910 | 3099910 |
| 1-3/4" – 2-1/4" | 3-1/4 | (82.6) | 3371907 | – | 3377907 | 5-1/2 | (139.7) | 3097910 | 3100910 |
| 2-1/4" – 2-3/4" | 3-3/4 | (95.3) | 3372907 | – | 3378907 | 5-1/2 | (139.7) | 3097910 | 3100910 |
| 2-1/2" – 3" | 4 | (101.6) | – | – | – | 5-1/2 | (139.7) | – | 3100910 |
| 3-1/2" – 4" | 5 | (127.0) | 3460907 | – | – | 6-1/2 | (165.1) | – | – |
| 4-1/2" – 5" | 6 | (152.4) | – | – | – | 7-1/2 | (190.5) | – | – |

### Tapcon® SDS Bits

| PART NUMBER | DESCRIPTION |
|---|---|
| 3311910 | 7" (SDS Rotohammer Bits for use with 3/16" Tapcon) |
| 7901060 | 5" (SDS Rotohammer Bits for use with 1/4" Tapcon) |

All SDS bits are sold individually.

## PERFORMANCE TABLE

### Tapcon® Anchors

### Ultimate Tension and Shear Values (lbs/kN) in Solid Concrete

| ANCHOR DIA. | | MIN. DEPTH OF EMBEDMENT | | f'c = 2000 PSI (13.8 MPa) | | | | f'c = 3000 PSI (20.7 MPa) | | | | f'c = 4000 PSI (27.6 MPa) | | | | f'c = 5000 PSI (34.5 MPa) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | TENSION | | SHEAR | | TENSION | | SHEAR | | TENSION | | SHEAR | | TENSION | | SHEAR | |
| in. | (mm) | in. | (mm) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) |
| 3/16 | (4.8) | 1 | (25.4) | 600 | (2.7) | 720 | (3.2) | 625 | (2.8) | 720 | (3.2) | 650 | (2.9) | 720 | (3.2) | 800 | (3.6) | 860 | (3.8) |
| | | 1-1/4 | (31.8) | 845 | (3.7) | 720 | (3.2) | 858 | (3.8) | 720 | (3.2) | 870 | (3.9) | 720 | (3.2) | 1,010 | (4.5) | 860 | (3.8) |
| | | 1-1/2 | (38.1) | 1,090 | (4.8) | 860 | (3.8) | 1,090 | (4.8) | 860 | (3.8) | 1,090 | (4.8) | 860 | (3.8) | 1,220 | (5.4) | 860 | (3.8) |
| | | 1-3/4 | (44.5) | 1,450 | (6.5) | 870 | (3.9) | 1,455 | (6.5) | 870 | (3.9) | 1,460 | (6.5) | 990 | (4.4) | 1,730 | (7.7) | 990 | (4.4) |
| 1/4 | (6.4) | 1 | (25.4) | 750 | (3.3) | 900 | (4.0) | 775 | (3.4) | 900 | (4.0) | 800 | (3.6) | 1,360 | (6.1) | 950 | (4.2) | 1,440 | (6.4) |
| | | 1-1/4 | (31.8) | 1,050 | (4.7) | 900 | (4.0) | 1,160 | (5.2) | 900 | (4.0) | 1,270 | (5.6) | 1,360 | (6.1) | 1,515 | (6.7) | 1,440 | (6.4) |
| | | 1-1/2 | (38.1) | 1,380 | (6.1) | 1,200 | (5.3) | 1,600 | (7.2) | 1,200 | (5.3) | 1,820 | (8.1) | 1,380 | (6.1) | 2,170 | (9.7) | 1,670 | (7.4) |
| | | 1-3/4 | (44.5) | 2,020 | (9.0) | 1,670 | (7.4) | 2,200 | (9.8) | 1,670 | (7.4) | 2,380 | (10.6) | 1,670 | (7.4) | 2,770 | (12.3) | 1,670 | (7.4) |

Safe working loads for single installation under static loading should not exceed 25% of the ultimate load capacity.

## PERFORMANCE TABLE

### Tapcon Anchors — Ultimate Tension and Shear Values (lbs/kN) in Hollow Block

| ANCHOR DIAMETER | | ANCHOR EMBEDMENT | | LIGHTWEIGHT BLOCK | | | | MEDIUM WEIGHT BLOCK | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | TENSION | | SHEAR | | TENSION | | SHEAR | |
| in. | (mm) | in. | (mm) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) |
| 3/16 | (4.8) | 1 | (25.4) | 220 | (1.0) | 400 | (1.8) | 340 | (1.5) | 730 | (3.2) |
| 1/4 | (6.4) | 1 | (25.4) | 250 | (1.1) | 620 | (2.8) | 500 | (2.2) | 1,000 | (4.4) |

Safe working loads for single installation under static loading should not exceed 25% of the ultimate load capacity.
**NOTE:** 3/16" Tapcon requires 5/32" bit, 1/4" Tapcon requires 3/16" bit.

## PERFORMANCE TABLE

### Tapcon® Anchors — Allowable Edge and Spacing Distances

| PARAMETER | ANCHOR DIAMETER in. | ANCHOR DIAMETER (mm) | NORMAL WEIGHT CONCRETE: FULL CAPACITY (Critical Distance Inches) | NORMAL WEIGHT CONCRETE: REDUCED CAPACITY (Minimal Distance Inches) | NORMAL WEIGHT CONCRETE: LOAD REDUCTION FACTOR | CONCRETE MASONRY UNITS (CMU): FULL CAPACITY (Critical Distance Inches) | CONCRETE MASONRY UNITS (CMU): REDUCED CAPACITY (Minimal Distance Inches) | CONCRETE MASONRY UNITS (CMU): LOAD REDUCTION FACTOR |
|---|---|---|---|---|---|---|---|---|
| Spacing Between Anchors - Tension | 3/16<br>1/4 | (4.8)<br>(6.4) | 3<br>4 | 1-1/2<br>2 | 0.73<br>0.66 | 3<br>4 | 1-1/2<br>2 | 1.00<br>0.84 |
| Spacing Between Anchors - Shear | 3/16<br>1/4 | (4.8)<br>(6.4) | 3<br>4 | 1-1/2<br>2 | 0.83<br>0.82 | 3<br>4 | 1-1/2<br>2 | 1.00<br>0.81 |
| Edge Distance - Tension | 3/16<br>1/4 | (4.8)<br>(6.4) | 1-7/8<br>2-1/2 | 1<br>1-1/4 | 0.83<br>0.82 | 4<br>4 | 2<br>2 | 0.91<br>0.88 |
| Edge Distance - Shear | 3/16<br>1/4 | (4.8)<br>(6.4) | 2-1/4<br>3 | 1-1/8<br>1-1/2 | 0.70<br>0.59 | 4<br>4 | 2<br>2 | 0.93<br>0.80 |

For SI: 1 inch = 25.4 mm

# Tapcon® Condrive Tool Kit

## DESCRIPTION/SUGGESTED SPECIFICATIONS

### Condrive Installation Tool—

**SPECIFIED FOR ANCHORAGE INTO CONCRETE, BRICK OR BLOCK**

The key to Tapcon's fast and easy installation is the multi-purpose Condrive Installation Tool. The drive sleeve, along with the hex head and phillips sockets provide the installer with the flexibility necessary for the complete variety of Tapcon applications (tool does not include drill bit).

Condrive® Tool - A multi-purpose tool designed for installation of Tapcon hex head and Phillips flat head anchors up to 3-3/4" long. If driving hex head Tapcon, driver will automatically disengage. The Condrive Tool has a reusable plastic case.

Condrive Tools are designed to specifically install Tapcon Anchors and to fit standard hammer drills.




Part No. 3103910
(Does not include drill bit)

## APPLICATIONS

The picture shows the Condrive Installation Kit in action. The kit makes for fast and easy change over from drill bit to driver and controls the driving torque to prevent thread stripping and head snapping in hard base materials.

## ADVANTAGES

- Fast change from drilling to driving
- Eliminates need to change out chucks and bits
- Eliminates need for two tools
- Special nut driver is recessed for torque control to reduce head breakage

| Condrive Tool Kit Parts (sold only as a kit) | |
|---|---|
| A | Drill Adapter |
| B | Sleeve |
| C | 3/16" Socket |
| D | 1/4" Socket |
| E | Phillips/Star Socket |
| F | Hex Key |
| G | T25 Star Drive Bit |
| H | T30 Star Drive Bit |
| I | #2 Phillips Drive Bit |
| J | #3 Phillips Drive Bit |

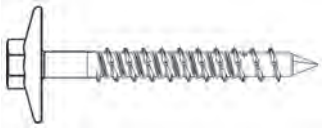
RED HEAD®
CONCRETE ANCHORING SPECIALISTS

# Tapcon®
## Maxi-Set Anchors

White UltraShield  UltraShield

## DESCRIPTION/SUGGESTED SPECIFICATIONS

**FOR TAPCON APPLICATIONS THAT REQUIRE MORE ANCHOR BEARING SURFACE.**



## ADVANTAGES

- Same reliable performance and speed of installation as regular Tapcon.
- Large 5/8" diameter flange provides more bearing surface and increases pullover resistance. High 5/16" hex head adds driving stability.
- UltraShield™ and White UltraShield™ long-life finish deliver excellent corrosion resistance.

## CORROSION RESISTANCE

| Salt Spray Test (ASTM B117) | UltraShield | White UltraShield |
|---|---|---|
| | 1100 Hrs 10% or less red rust | 1500 Hrs 10% or less red rust |

## APPROVAL/LISTINGS

ICC Evaluation Service, Inc. – #ESR-1671

Miami-Dade County – NOA 21-0201.06

**For the most current approvals/listings visit: www.itwredhead.com**

## INSTALLATION STEPS

**Read installation instructions before using!**

**WARNING:** If there are any questions concerning proper installation, applications or appropriate use of this product, please call our Technical Services Department at 1-800-848-5611. Failure to follow these instructions can result in serious personal injury.

1. **Select proper fastener – diameter / head style / length.**
   a) **Use selection chart to choose proper length.**
2. **Drill Hole – use selection chart to determine drill bit length and depth of hole.**
   a) **Use 3⁄16" diameter Tapcon bit.**
   b) **Drill hole minimum ¼" deeper than Tapcon Anchor to be embedded.**
   Minimum anchor embedment: 1"
   Maximum anchor embedment: 1¾"
3. **Drive anchor using 5/16" socket.**

**WARNING:** Failure to wear safety glasses with side shields can result in serious personal injury. Always wear ANSI compliant eye protection (ANSI Z87.1-2003).

**WARNING:** Using the wrong size drill bit will affect performance values and may cause failure.

## APPLICATIONS

Shutters - protective and decorative

Screened porch and pool enclosures.

Various sheet metal flashings.

Decorative wrought iron.

Wood nailers and plywood attachment.

## SELECTION CHART

**Tapcon®**
**Maxi-Set Anchors**

Diameter . . . . . 1/4" Thread Form . . . . Advanced Threadform Technology™
Point Type. . . . . Nail Finish . . . . . UltraShield™ or *White UltraShield™
Head Style. . . . . 5/16" across flats hex with 5/8" diameter flange.

| RECOMMENDED TAPCON LENGTH | | PART NO. 1/4" HEX HEAD | FINISH | BIT LENGTH | | STRAIGHT SHANK BITS FOR 1/4" TAPCON PART NO. |
|---|---|---|---|---|---|---|
| in. | (mm) | | | in. | (mm) | |
| 1-3/4 | (44.5) | 3294000 | Ultra Shield | 3-1/2 | (88.9) | 3098910 |
| 1-3/4 | (44.5) | 3383100 | White Ultra Shield | 3-1/2 | (88.9) | 3098910 |
| 2-1/4 | (57.2) | 3384100 | White Ultra Shield | 4-1/2 | (114.3) | 3099910 |
| 3-1/4 | (82.6) | 3409100 | White Ultra Shield | 5-1/2 | (139.7) | 3100910 |

Maxi-Sets are packed 1,000 pieces per master carton except 3409100 is packed 750 pieces.

## SELECTION CHART

**Tapcon**
**SDS Bits**

| PART NO. | DESCRIPTION |
|---|---|
| 3311910 | 7" (SDS Rotohammer Bits for use with 3/16" Tapcon) |
| 7901060 | 5" (SDS Rotohammer Bits for use with 1/4" Tapcon) |

## PERFORMANCE TABLE

**Tapcon®**
**Maxi-Set Anchors**

***Ultimate Tension and Shear Values (lbs/kN) in Solid Concrete***

| ANCHOR DIAMETER | | MIN. DEPTH OF EMBEDMENT | | f'c = 2000 PSI (13.8 MPa) | | | | f'c = 3000 PSI (20.7 MPa) | | | | f'c = 4000 PSI (27.6 MPa) | | | | f'c = 5000 PSI (34.5 MPa) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | TENSION | | SHEAR | | TENSION | | SHEAR | | TENSION | | SHEAR | | TENSION | | SHEAR | |
| in. | (mm) | in. | (mm) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) |
| 1/4 | (6.4) | 1 | (25.4) | 750 | (3.3) | 900 | (4.0) | 775 | (3.4) | 900 | (4.0) | 800 | (3.6) | 1,360 | (6.1) | 950 | (4.2) | 1,440 | (6.4) |
| | | 1-1/4 | (31.8) | 1,050 | (4.7) | 900 | (4.0) | 1,160 | (5.2) | 900 | (4.0) | 1,270 | (5.6) | 1,360 | (6.1) | 1,515 | (6.7) | 1,440 | (6.4) |
| | | 1-1/2 | (38.1) | 1,380 | (6.1) | 1,200 | (5.3) | 1,600 | (7.2) | 1,200 | (5.3) | 1,820 | (8.1) | 1,380 | (6.1) | 2,170 | (9.7) | 1,670 | (7.4) |
| | | 1-3/4 | (44.5) | 2,020 | (9.0) | 1,670 | (7.4) | 2,200 | (9.8) | 1,670 | (7.4) | 2,380 | (10.6) | 1,670 | (7.4) | 2,770 | (12.3) | 1,670 | (7.4) |

Allowable working loads for the single installation under static loading should not exceed 25% capacity of the Ultimate Load. To calculate the Allowable Load, divide the Ultimate Load by 4.

## PERFORMANCE TABLE

**Tapcon®**
**Maxi-Set Anchors**

***Ultimate Tension and Shear Values (lbs/kN) in Hollow Block***

| ANCHOR DIAMETER | | ANCHOR EMBEDMENT | | LIGHTWEIGHT BLOCK | | | | MEDIUM WEIGHT BLOCK | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | TENSION | | SHEAR | | TENSION | | SHEAR | |
| in. | (mm) | in. | (mm) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) |
| 1/4 | (6.4) | 1 | (25.4) | 250 | (1.1) | 620 | (2.8) | 500 | (2.2) | 1,000 | (4.4) |

Allowable working loads for the single installation under static loading should not exceed 25% capacity of the Ultimate Load. To calculate the Allowable Load, divide the Ultimate Load by 4.
**NOTE:** 3/16" Tapcon requires 5/32" bit, 1/4" Tapcon requires 3/16" bit.

## PERFORMANCE TABLE

**Tapcon®**
**Maxi-Set Anchors**

***Allowable Edge and Spacing Distances***

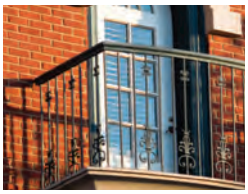
| PARAMETER | ANCHOR DIAMETER | | NORMAL WEIGHT CONCRETE | | | CONCRETE MASONRY UNITS (CMU) | | |
|---|---|---|---|---|---|---|---|---|
| | in. | (mm) | FULL CAPACITY (Critical Distance Inches) | REDUCED CAPACITY (Minimal Distance Inches) | LOAD REDUCTION FACTOR | FULL CAPACITY (Critical Distance Inches) | REDUCED CAPACITY (Minimal Distance Inches) | LOAD REDUCTION FACTOR |
| Spacing Between Anchors - Tension | 1/4 | (6.4) | 4 | 2 | 0.66 | 4 | 2 | 0.84 |
| Spacing Between Anchors - Shear | 1/4 | (6.4) | 4 | 2 | 0.82 | 4 | 2 | 0.81 |
| Edge Distance - Tension | 1/4 | (6.4) | 2-1/2 | 1-1/4 | 0.82 | 4 | 2 | 0.88 |
| Edge Distance -Shear | 1/4 | (6.4) | 3 | 1-1/2 | 0.59 | 4 | 2 | 0.80 |

For SI: 1 inch = 25.4 mm

RED HEAD®
CONCRETE ANCHORING SPECIALISTS

# Tapcon®
## SCOTS Anchors

## APPLICATIONS



Shutters - protective and decorative

Screened porch and pool enclosures

Aluminum fixtures

Railings

Metal roofing

Flexible flashings

## DESCRIPTION/SUGGESTED SPECIFICATIONS

**PREMIUM CONCRETE ANCHOR THAT COMBINES THE CORROSION PROTECTION OF STAINLESS STEEL WITH THE PERFORMANCE OF TAPCON ANCHORS.**

## ADVANTAGES

- **300 Series Stainless Steel head and Carbon Steel body.**
- Integral washer design provides more bearing surface.
- Rubber EPDM sealing washer "locks-out" moisture from building interior.
- Head paint available in white or bronze (extra charge).
- Delivers the same holding performance as Tapcon anchors with Blue Climaseal™.
- Reduces replacement of "weathered" fasteners.

## CORROSION RESISTANCE

| **300 Series Stainless Steel SCOTS Cap Salt Spray Results (ASTM B117)** | **Carbon Steel with Ultrashield™ Salt Spray Results (ASTM B117)** |
|---|---|
| Never Rusts | 1,100 Hours - 10% or less rust |

## APPROVAL/LISTINGS

ICC Evaluation Service, Inc. – ESR-1671

Miami-Dade County – NOA 21-0201.06

**For the most current approvals/listings visit: www.itwredhead.com**

## INSTALLATION STEPS

**Read installation instructions before using!**

**WARNING:** If there are any questions concerning proper installation, applications or appropriate use of this product, please call our Technical Services Department at 1-800-848-5611. Failure to follow these instructions can result in serious personal injury.

1. **Select proper fastener – diameter / head style / length.**
   a) **Use selection chart to choose proper length.**
2. **Drill Hole – use selection chart to determine drill bit length and depth of hole.**
   a) **Use 3⁄16" diameter Tapcon bit.**
   b) **Drill hole minimum ¼" deeper than Tapcon Anchor to be embedded.**
   Minimum anchor embedment: 1"
   Maximum anchor embedment: 1¾"
3. **Drive anchor using 5/16" socket.**

**WARNING:** Failure to wear safety glasses with side shields can result in serious personal injury. Always wear ANSI compliant eye protection (ANSI Z87.1-2003).

**WARNING:** Using the wrong size drill bit will affect performance values and may cause failure.

## SELECTION CHART

**Tapcon®**
**SCOTS Anchors**

Diameter..... 1/4" Thread Form..... Advanced Threadform Technology™
Point Type..... Nail Finish..... Silver Climaseal™
Head Style..... 5/16" HWH (300 Series Stainless)

| RECOMMENDED TAPCON LENGTH in. | (mm) | PART NO. 1/4" HEX HEAD | BIT LENGTH in. | (mm) | PART NO. STRAIGHT SHANK BITS FOR 1/4" TAPCON |
|---|---|---|---|---|---|
| 1-3/4 | (44.5) | 3358407 | 3-1/2 | (88.9) | 3098910 |

SCOTS are packed 1,000 pieces per master, 100 pieces per inner.

## SELECTION CHART

**Tapcon®**
**SDS Bits**

| PART NO. | DESCRIPTION |
|---|---|
| 3311910 | 7" (SDS Rotohammer Bits for use with 3/16" Tapcon) |
| 7901060 | 5" (SDS Rotohammer Bits for use with 1/4" Tapcon) |

## PERFORMANCE TABLE

**Tapcon®**
**SCOTS Anchors**

***Ultimate Tension and Shear Values (lbs/kN) in Solid Concrete***

| ANCHOR DIAMETER in. | (mm) | MIN. DEPTH OF EMBEDMENT in. | (mm) | f'c = 2000 PSI (13.8 MPa) TENSION lbs. | (kN) | SHEAR lbs. | (kN) | f'c = 3000 PSI (20.7 MPa) TENSION lbs. | (kN) | SHEAR lbs. | (kN) | f'c = 4000 PSI (27.6 MPa) TENSION lbs. | (kN) | SHEAR lbs. | (kN) | f'c = 5000 PSI (34.5 MPa) TENSION lbs. | (kN) | SHEAR lbs. | (kN) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/4 | (6.4) | 1 | (25.4) | 750 | (3.3) | 900 | (4.0) | 775 | (3.4) | 900 | (4.0) | 800 | (3.6) | 1,360 | (6.1) | 950 | (4.2) | 1,440 | (6.4) |
| | | 1-1/4 | (31.8) | 1,050 | (4.7) | 900 | (4.0) | 1,160 | (5.2) | 900 | (4.0) | 1,270 | (5.6) | 1,360 | (6.1) | 1,515 | (6.7) | 1,440 | (6.4) |
| | | 1-1/2 | (38.1) | 1,380 | (6.1) | 1,200 | (5.3) | 1,600 | (7.2) | 1,200 | (5.3) | 1,820 | (8.1) | 1,380 | (6.1) | 2,170 | (9.7) | 1,670 | (7.4) |
| | | 1-3/4 | (44.5) | 2,020 | (9.0) | 1,670 | (7.4) | 2,200 | (9.8) | 1,670 | (7.4) | 2,380 | (10.6) | 1,670 | (7.4) | 2,770 | (12.3) | 1,670 | (7.4) |

Allowable working loads for the single installation under static loading should not exceed 25% capacity of the Ultimate Load. To calculate the Allowable Load, divide the Ultimate Load by 4.

## PERFORMANCE TABLE

**Tapcon®**
**SCOTS Anchors**

***Ultimate Tension and Shear Values (lbs/kN) in Hollow Concrete Masonry Units***

| ANCHOR DIAMETER in. | (mm) | ANCHOR EMBEDMENT in. | (mm) | LIGHTWEIGHT BLOCK TENSION lbs. | (kN) | SHEAR lbs. | (kN) | MEDIUM WEIGHT BLOCK TENSION lbs. | (kN) | SHEAR lbs. | (kN) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/4 | (6.4) | 1 | (25.4) | 250 | (1.1) | 620 | (2.8) | 500 | (2.2) | 1,000 | (4.4) |

Allowable working loads for the single installation under static loading should not exceed 25% capacity of the Ultimate Load. To calculate the Allowable Load, divide the Ultimate Load by 4.
**NOTE:** 3/16" Tapcon requires 5/32" bit, 1/4" Tapcon requires 3/16" bit.

## PERFORMANCE TABLE

**Tapcon®**
**SCOTS Anchors**

***Allowable Edge and Spacing Distances***

| PARAMETER | ANCHOR DIAMETER in. | (mm) | NORMAL WEIGHT CONCRETE FULL CAPACITY (Critical Distance Inches) | REDUCED CAPACITY (Minimal Distance Inches) | LOAD REDUCTION FACTOR | CONCRETE MASONRY UNITS (CMU) FULL CAPACITY (Critical Distance Inches) | REDUCED CAPACITY (Minimal Distance Inches) | LOAD REDUCTION FACTOR |
|---|---|---|---|---|---|---|---|---|
| Spacing Between Anchors - Tension | 1/4 | (6.4) | 4 | 2 | 0.66 | 4 | 2 | 0.84 |
| Spacing Between Anchors - Shear | 1/4 | (6.4) | 4 | 2 | 0.82 | 4 | 2 | 0.81 |
| Edge Distance - Tension | 1/4 | (6.4) | 2-1/2 | 1-1/4 | 0.82 | 4 | 2 | 0.88 |
| Edge Distance -Shear | 1/4 | (6.4) | 3 | 1-1/2 | 0.59 | 4 | 2 | 0.80 |

For SI: 1 inch = 25.4 mm

# Tapcon®
## XL Anchors

**UltraShield**

## DESCRIPTION/SUGGESTED SPECIFICATIONS

**EXTRA LARGE TAPCON FOR EXTRA LARGE CHALLENGES!**

## ADVANTAGES

- Internal TORX® T-40 drive assures easy installation.
- High button head resists cam-out during installation.
- Corrosion protection of UltraShield™ to combat aggressive environments.
- Available in silver.
- Delivers over 3,000 lbs. holding power in concrete.
- Alternative to sleeve anchors.

**Use 1/4" Tapcon Drill Bit**

## CORROSION RESISTANCE

| Salt Spray Test (ASTM B117) | UltraShield |
|---|---|
| | 1100 Hrs 10% or less rust |

## APPROVAL

Miami-Dade County – NOA 21-0201.05

## INSTALLATION STEPS

**Read installation instructions before using!**

**WARNING:** If there are any questions concerning proper installation, applications or appropriate use of this product, please call our Technical Services Department at 1-800-848-5611. Failure to follow these instructions can result in serious personal injury.

1. **Drill Hole minimum ¼" deeper than Tapcon Anchor to be embedded.**
   Minimum anchor embedment: 1"
   Maximum anchor embedment: 1¾"
2. **Drive anchor using T-40 Torx® Drive**

**WARNING:** Failure to wear safety glasses with side shields can result in serious personal injury. Always wear ANSI compliant eye protection (ANSI Z87.1-2003).

**WARNING:** Using the wrong size drill bit will affect performance values and may cause failure.

## APPLICATIONS

Shutters - protective and decorative

Screened porch and pool enclosures.

Railings

Mounted electrical equipment

Sill plates

## SELECTION CHART

**Tapcon®**
**XL Anchors**

Diameter..... 5/16" Thread Form.....Reverse Hi-Lo®
Point Type.... Nail Finish.....UltraShield™
Head Style.... High button with TORX T-40 Drive

| RECOMMENDED TAPCON LENGTH | | PART NO. | FINISH |
|---|---|---|---|
| in. | (mm) | | |
| 2-1/4 | (57.2) | 3395902 | Ultra Shield |

XLs are packed 100 pieces per master carton.

## PERFORMANCE TABLE

**Tapcon®**
**XL Anchors**

### Ultimate Tension and Shear Values (lbs/kN) in Solid Concrete

| ANCHOR DIAMETER | | MIN. DEPTH OF EMBEDMENT | | EDGE DISTANCE | | f'c = 3000 PSI (20.7 MPa) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | TENSION | | SHEAR | |
| in. | (mm) | in. | (mm) | in. | (mm) | lbs. | (kN) | lbs. | (kN) |
| 5/16 | (7.9) | 1-1/4 | (31.8) | 1-9/16 | (39.7) | 1,050 | (4.7) | 1,330 | (5.9) |
| | | | | 2-3/16 | (55.6) | 1,205 | (5.4) | 1,725 | (7.7) |
| | | 1-3/4 | (44.5) | 1-9/16 | (39.7) | 2,020 | (9.0) | 1,530 | (6.8) |
| | | | | 2-3/16 | (55.6) | 2,250 | (10.0) | 2,505 | (11.1) |
| | | 2-1/4 | (57.2) | 1-9/16 | (39.7) | 2,850 | (12.7) | 1,955 | (8.9) |
| | | | | 2-3/16 | (55.6) | 3,120 | (13.9) | 3,250 | (14.4) |

Allowable working loads for the single installation under static loading should not exceed 25% capacity of the Ultimate Load. To calculate the Allowable Load, divide the Ultimate load by 4
Pilot hole diameter – Use 1/4" ANSI spec carbide tipped drill bit. Drill 1/4" longer than necessary embedment.
Recommended center to center distance of 3-3/4" is required for 100% efficiency and 1-7/8" for 50% efficiency.

## PERFORMANCE TABLE

**Tapcon®**
**XL Anchors**

### Ultimate Tension and Shear Values in Concrete Masonry Units

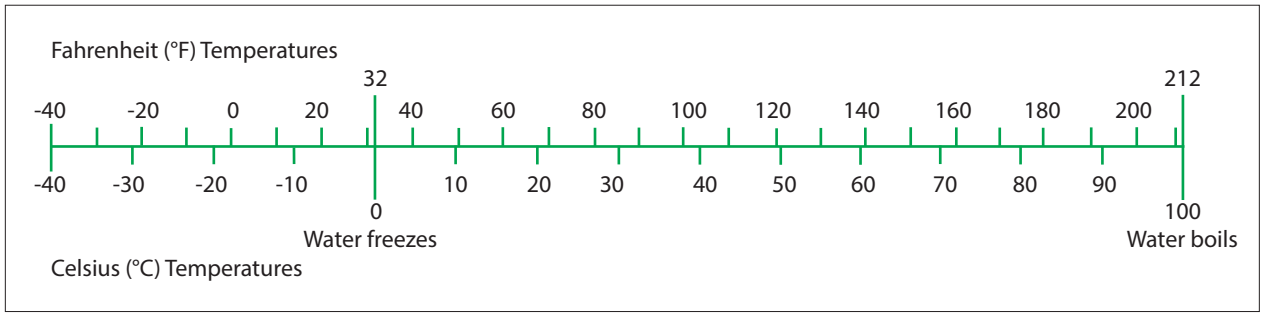
| ANCHOR DIAMETER | | MINIMUM DEPTH OF EMBEDMENT | | EDGE DISTANCE | HOLLOW BLOCK[1] | | | | GROUT-FILLED BLOCK[2] | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | TENSION | | SHEAR | | TENSION | | SHEAR | |
| in. | (mm) | in. | (mm) | in. | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) | lbs. | (kN) |
| 5/16 | (7.9) | 1-1/4 | (31.8) | 4 | 1,045 | (4.6) | 2,280 | (10.1) | 1,045 | (4.6) | 2,280 | (10.1) |
| | | 1-3/4 | (44.5) | 4 | NOT RECOMMENDED | | NOT RECOMMENDED | | 1,950 | (8.7) | 2,825 | (12.6) |
| | | 2-1/4 | (57.2) | 4 | NOT RECOMMENDED | | NOT RECOMMENDED | | 3,770 | (16.8) | 3,140 | (14.0) |

Allowable working loads for the single installation under static loading should not exceed 25% capacity of the Ultimate Load. To calculate the Allowable Load, divide the Ultimate load by 4
1. CMU = 1,600 PSI minimum compressive strength.
2. CMU = 1,600 PSI minimum compressive strength with 2,000 PSI grout.
Embedment is through 1-1/4" face shell of hollow block.

## Notes

## Conversion Table (soft)

| | | | | | |
|---|---|---|---|---|---|
| 6.35 mm | = | 1/4" | 50 mm | = | 2" |
| 9.5 mm | = | 3/8" | 98 mm | = | 3-7/8" |
| 10 mm | = | 3/8" | 100 mm | = | 4" |
| 12 mm | = | 1/2" | 130 mm | = | 5-1/8" |
| 16 mm | = | 5/8" | 153 mm | = | 6" |
| 20 mm | = | 3/4" | 156 mm | = | 6-1/8" |
| 22 mm | = | 7/8" | 178 mm | = | 7" |
| 24 mm | = | 1" | 183 mm | = | 7-1/4" |
| 25 mm | = | 1" | 190 mm | = | 7-1/2" |
| 30 mm | = | 1-3/16" | 200 mm | = | 7-7/8" |
| 35 mm | = | 1-3/8" | 213 mm | = | 8-3/8" |
| 40 mm | = | 1-1/2" | 250 mm | = | 9-7/8" |



RED HEAD®

CONCRETE ANCHORING SPECIALISTS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