

Chem-Bolt®



PROJECT SUBMITTAL

RE: COMPANY AND PRODUCT NAME CHANGES

To our valued customers:

Please be advised that our company's name has been changed from "The Rawlplug Company, Inc." to "Powers Fasteners, Inc." Our corporate address is as follows:

Powers Fasteners, Inc. 2 Powers Square New Rochelle, NY 10801

Phone: (914) 235-6300 Fax: (914) 576-6483

The product name changes noted below were made due to marketing considerations only. This letter certifies that the products themselves have not changed in any way and are identical to those sold under their former name. Please use this information to update your records.

Product - New Name	Formerly Known As
Power-Bolt	Rawl-Bolt
Power-Stud	Rawl-Stud
DRIVE	Rawl DRIVE
Fiberplug	Rawlplug
Polly	Rawly
Power-Fast Epoxy Injection Gel	Foil-Fast Epoxy Injection Gel
Hammer-Capsule	Rawl Hammer-Capsule
Chem-Fast II	Rawl Chem-Fast
Powerlite	Rawlite

Should you have any questions or require further information, please feel free to contact our

Customer Service Department at (914) 235-6300. Thank you for your interest in Powers Fasteners.



PROJECT SUBMITTAL

Chem-Bolt® Anchoring System

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Anchoring into Solid Concrete Base Material

A Unique Pre-assembled Two-part Mechanical-Adhesive System

Fully Threaded Anchor with a Finished Hex Head

For Use in Conjunction with Power-Fast or AC PLUS Adhesives

Available in Carbon Steel and Type 304 Stainless Steel



Size Range: 1/4" diameter x 1-1/2" to 3/4" diameter x 10"

POWERS FASTENERS, INC.

Product Description

General Information

Engineering Data

Estimating Charts

System Components and Accessories

Specifications

PRODUCT CHARACTERISTICS

Various DOT Approvals

Vibration Resistant and Removable

Reusable in the Same Anchor Hole

Ultra-high Load Values

A Fast-setting, High Performance System

Can be Applied Over a Wide Temperature Range

Special Inserts Not Required

PROJECT SUBMITTAL

PRODUCT SUBMITTAL / SUBSTITUTION REQUEST

TO:

PROJECT:

SPECIFIED ITEM:

Section

Page

Paragraph

Description

PRODUCT SUBMITTAL / SUBSTITUTION REQUESTED :

The attached submittal package includes the product description, specifications, drawings, and performance data for use in the evaluation of the request.

SUBMITTED BY:

Name:

Signature:

Company:

Address:

Date:

Telephone:

Fax:

FOR USE BY THE ARCHITECT AND/OR ENGINEER

Approved **Approved as Noted** **Not Approved**

(Please briefly explain why the product was not approved.)

By:

Date:

Remarks:

PROJECT SUBMITTAL



Chem-Bolt®

PRODUCT DESCRIPTION

The Chem-Bolt anchor is a revolutionary breakthrough in adhesive anchoring technology. This unique, patented product combines features typically associated with expansion type anchors, with the high load capacity and vibration resistance of adhesive anchors. Designed for use with injection type adhesive systems, the Chem-Bolt allows a fixture to be installed using a finished head anchoring device which can be tightened or advanced after the adhesive has cured. The need for costly steel inserts is eliminated when the Chem-Bolt anchor is used.

Chem-Bolt anchors are supplied in 1/4", 3/8", 1/2", 5/8", and 3/4" diameters, in several lengths. Grade 2 and Grade 5 zinc plated carbon steel assemblies are offered along with Type 304 stainless steel. A different color cap differentiates and identifies the materials. Once the Chem-Bolt is installed and the adhesive has cured, a proprietary release agent or coating between the threads and the adhesive allows the anchor to be removed. The coating in combination with the specially designed cap also allows the Chem-Bolt to advance.

This unique, patented cap also provides an additional level of vibration resistance. As the anchor is inserted into the adhesive, the hollow tip of the cap provides an air pocket into which the bolt can be advanced once the adhesive is cured. Typically, a removable application has required the use of an internally threaded steel insert sleeve. Using this method, a large hole diameter is required to accommodate the insert, the insert is expensive, and must be left in the base material, which can cause corrosion problems. Use of the Chem-Bolt anchor solves this problem. The proprietary release agent allows the threaded bolt to be easily removed. When a Powers injection adhesive is used, the cured adhesive leaves threads formed from the epoxy completely intact within the anchor hole. The Chem-Bolt can be re-threaded into the anchor hole from which it was removed and still achieve its allowable working load capacity.

CHEM-BOLT SIZES

Chem-Bolt anchors are packaged pre-assembled with a patented, specially designed nylon cap (tip), washers, and a proprietary release agent (coating). The cap is color coded to indicate the type of steel.

GRADE 2 CHEM-BOLT ANCHOR (BLUE CAP)

CAT. NO.	PRODUCT DESCRIPTION	HOLE SIZE	THREAD LENGTH	STD. BOX	STD. CTN.	WT./100
8942*	1/4" x 1-1/2"	5/16"	1-1/4"	100	500	2.5
8943*	1/4" x 2"	5/16"	1-3/4"	100	500	4.0
8947*	1/4" x 3"	5/16"	2-3/4"	100	500	5.0
8950*	3/8" x 4"	7/16"	3-3/4"	50	250	13.5
8952*	3/8" x 6"	7/16"	5-3/4"	50	200	19.0
8960*	1/2" x 4"	9/16"	3-3/4"	25	100	27.5
8962*	1/2" x 6"	9/16"	5-3/4"	25	100	37.0
8964*	1/2" x 8"	9/16"	7-3/4"	25	75	46.5
8970*	5/8" x 6"	3/4"	5-3/4"	25	75	60.0
8972*	5/8" x 8"	3/4"	7-3/4"	25	75	76.0
8974*	5/8" x 10"	3/4"	9-3/4"	25	75	89.0
8980*	3/4" x 6"	7/8"	5-3/4"	10	30	91.5
8984*	3/4" x 8"	7/8"	7-3/4"	10	30	116.5
8986*	3/4" x 10"	7/8"	9-3/4"	10	30	133.0

* Discontinued item once current stock exhausted.

GRADE 5 CHEM-BOLT ANCHOR (YELLOW CAP)

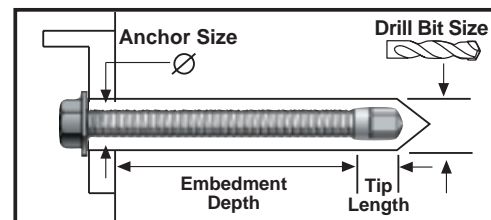
CAT. NO.	PRODUCT DESCRIPTION	HOLE SIZE	THREAD LENGTH	STD. BOX	STD. CTN.	WT./100
8861	1/4" x 1-1/2"	5/16"	1-1/4"	100	500	2.5
8862	1/4" x 2"	5/16"	1-3/4"	100	500	4.0
8863	1/4" x 3"	5/16"	2-3/4"	100	500	5.0
8864	3/8" x 4"	7/16"	3-3/4"	50	250	13.5
8865	3/8" x 6"	7/16"	5-3/4"	50	200	19.0
8866	1/2" x 4"	9/16"	3-3/4"	25	100	27.5
8867	1/2" x 6"	9/16"	5-3/4"	25	100	37.0
8868	1/2" x 8"	9/16"	7-3/4"	25	75	46.5
8860	5/8" x 4"	3/4"	5-3/4"	25	100	50.0
8869	5/8" x 6"	3/4"	5-3/4"	25	75	60.0
8870	5/8" x 8"	3/4"	7-3/4"	25	75	76.0
8871	5/8" x 10"	3/4"	9-3/4"	25	75	89.0
8872	3/4" x 6"	7/8"	5-3/4"	10	30	91.5
8873	3/4" x 8"	7/8"	7-3/4"	10	30	116.5
8874	3/4" x 10"	7/8"	9-3/4"	10	30	133.0

TYPE 304 STAINLESS STEEL CHEM-BOLT ANCHOR (GREEN CAP)

CAT. NO.	PRODUCT DESCRIPTION	HOLE SIZE	THREAD LENGTH	STD. BOX	STD. CTN.	WT./100
8890*	1/4" x 1-1/2"	5/16"	1-1/4"	100	500	2.5
8891*	1/4" x 2"	5/16"	1-3/4"	100	500	4.0
8892*	1/4" x 3"	5/16"	2-3/4"	100	500	5.0
8893*	3/8" x 4"	7/16"	3-3/4"	50	250	13.5
8894*	3/8" x 6"	7/16"	5-3/4"	50	200	19.0
8895*	1/2" x 4"	9/16"	3-3/4"	25	100	27.5
8896*	1/2" x 6"	9/16"	5-3/4"	25	100	37.0
8897*	1/2" x 8"	9/16"	7-3/4"	25	75	46.5
8898*	5/8" x 6"	3/4"	5-3/4"	25	75	60.0
8901*	5/8" x 8"	3/4"	7-3/4"	25	75	76.0
8902*	5/8" x 10"	3/4"	9-3/4"	25	75	89.0
8903*	3/4" x 6"	7/8"	5-3/4"	10	30	91.5
8904*	3/4" x 8"	7/8"	7-3/4"	10	30	116.5
8905*	3/4" x 10"	7/8"	9-3/4"	10	30	133.0

* Discontinued item once current stock exhausted.

INSTALLATION SPECIFICATIONS



ANCHOR SIZE	1/4"	3/8"	1/2"	5/8"	3/4"
Recommended					
ANSI Drill Bit Size	5/16"	7/16"	9/16"	3/4"	7/8"
*Minimum					
Fixture Clearance Hole	5/16"	7/16"	9/16"	11/16"	13/16"
UNC Thread Size	1/4 - 20	3/8 - 16	1/2 - 13	5/8 - 11	3/4 - 10
Head Height	5/32"	15/64"	5/16"	25/64"	15/32"
Washer O.D. - Carbon	5/8"	1"	1-3/8"	1-3/4"	2"
Washer O.D. - SS	5/8"	13/16"	1-1/16"	1-3/4"	2"
Cap Tip Length	1/4"	3/8"	1/2"	5/8"	3/4"
Maximum Torque (ft.-lb.)	3	10	15	30	50

*Minimum fixture hole should be increased to accommodate the recommended drill bit if "through fixture" drilling is desired.

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MATERIAL SPECIFICATIONS

ANCHOR COMPONENT	COMPONENT MATERIAL		
	GRADE 2 CHEM-BOLT	GRADE 5 CHEM-BOLT	304 SS CHEM-BOLT
Bolt	Grade 2	Grade 5	Type 304 SS
Washer	Carbon Steel	Carbon Steel	Type 18-8 SS
Cap	Nylon	Nylon	Nylon
Plating	ASTM B 633, SCI, Type III (Fe/Zn 5)		N/A

PERFORMANCE DATA

STEEL STRENGTHS

For reference purposes the values listed in the following table are expected minimum capacities. The strengths listed on carbon steel values are based on SAE J429 as published by the Society of Automotive Engineers (SAE) and stainless steel values are based on the minimum strengths listed in the American Society of Testing and Materials (ASTM) Standard F 593.

GRADE DESIGNATION	NOMINAL PRODUCT SIZE (IN.)	YIELD STRENGTH 0.2% OFFSET (PSI)	ULTIMATE TENSILE STRENGTH (PSI)
Grade 1	1/4 thru 1-1/2	36,000	60,000
Grade 2	*1/4 thru 3/4	57,000	74,000
SAE Grade 5	1/4 thru 1	92,000	120,000
Type 304 SS	1/4 thru 1-12	30,000	75,000

* According to SAE, Grade 2 requirements for sizes 1/4" thru 3/4" apply only to bolts 6" and shorter in length. For bolts longer than 6", Grade 1 requirements apply.

The allowable steel strengths for Chem-Bolt are calculated as follows using the stresses from the previous table. The method used to calculate the value is the American Institute of Steel Construction (AISC) Manual of Steel Construction, Allowable Stress Design. Using this method, the allowable tensile stress, F_t , and the allowable shear stress, F_v , are calculated as follows:

$$F_t = 0.33 \times F_u$$

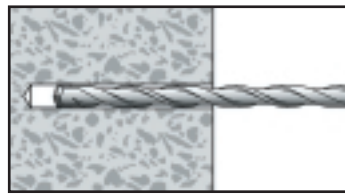
$$F_v = 0.17 \times F_u$$

Where F_u = minimum specified ultimate tensile strength for the steel material. This stress is then applied to the gross nominal area of the threaded section to calculate the load in pounds. This method has been used to calculate the allowable steel strengths for Chem-Bolt. Typical dimensions for UNC thread series are listed in the following table.

DIMENSIONS FOR UNC COARSE THREAD SERIES

NOMINAL THREAD SIZE (IN.)	THREADS PER INCH	BASIC MAJOR DIAMETER (IN.)	GROSS NOMINAL AREA (SQ. IN.)	TENSILE STRESS AREA (SQ. IN.)
1/4	20	0.2500	0.0491	0.0318
3/8	16	0.3750	0.1104	0.0775
1/2	13	0.5000	0.1963	0.1419
5/8	11	0.6250	0.3070	0.2260
3/4	10	0.7500	0.4420	0.3340

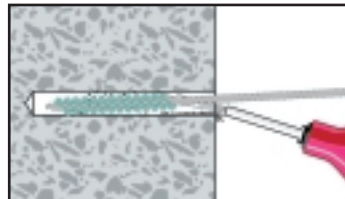
INSTALLATION GUIDELINES - SOLID BASE MATERIALS



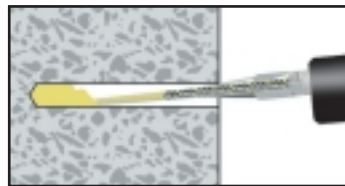
Drill a hole to the size and embedment required. The tolerances of the drill bit used should meet the requirements of ANSI Standard B212.15.

Starting from the bottom or back of the anchor hole, blow clean with **compressed air**, brush the hole with a nylon brush, and blow it clean again.

Vacuuming only is not sufficient. Blow out bulbs generally do not provide enough dust removal for most drilled anchor holes. Holes should be clean and sound. They may be dry or damp, but should be free of standing water or frost.

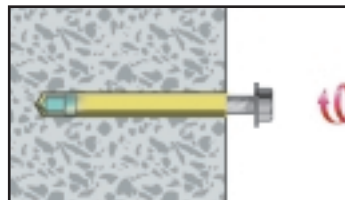


Prior to dispensing into the anchor hole, visually inspect that the adhesive components are uniformly mixed. Fill the hole approximately half way with



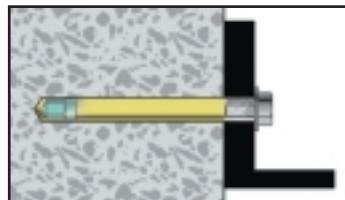
adhesive starting from the bottom or back of the anchor hole. Slowly withdraw the static mixing nozzle as the hole fills to avoid creating air pockets.

Push the Chem-Bolt into the anchor hole while turning slightly to ensure positive distribution of the adhesive. Be sure the Chem-Bolt is fully seated at the bottom of the hole and that some adhesive has flowed from the top of the



hole. Wipe away the excess wet adhesive from the top of the anchor hole. Allow the adhesive to cure for the specified time. Do not disturb Chem-Bolt until it is fully cured.

After the adhesive is fully cured, completely remove the Chem-Bolt by turning counterclockwise and breaking the bond between the adhesive and the bolt. Place the fixture over the anchor hole and replace the Chem-Bolt by threading it back into the internal threads that have been formed in the cured adhesive. When



advancing the Chem-Bolt and seating the hex head against the fixture's surface, be sure not to exceed the maximum torque range published for the Chem-Bolt anchor.

In addition to these procedures, be sure to follow the instructions for the specific Powers adhesive product used. To ensure proper performance, the Chem-Bolt should be installed used recommended Powers Adhesive products only.

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CHEM-BOLT ALLOWABLE LOAD CAPACITIES

The allowable load capacities for the Chem-Bolt and various Powers adhesive products are listed in this section for comparison purposes. The overall hole depth drilled should be equal to the embedment depth listed plus the tip length of the cap. Refer to the technical information on the specific Powers adhesive being used for complete details on the adhesive material. The bond strengths used in the following tables are based on applying a minimum safety factor of 4 to the ultimate load capacities for the Powers adhesive listed. The allowable steel strengths are based on the values listed in the previous section.

To ensure proper performance of the Chem-Bolt anchor, the adhesive used shall be as recommended and supplied by Powers Fasteners. Product technical data and warranty is not applicable if the recommended Powers adhesive is not used.

ALLOWABLE TENSION - CHEM-BOLT AND AC100 PLUS / ACS.5 PLUS										
ANCHOR SIZE (IN)	DRILL BIT (IN)	EMBED. DEPTH (IN)	ALLOWABLE BOND STRENGTH				ALLOWABLE STEEL STRENGTH			
			2,000 PSI (LBS)	3,000 PSI (LBS)	4,000 PSI (LBS)	5,000 PSI (LBS)	GRADE 1 (LBS)	GRADE 2 (LBS)	GRADE 5 (LBS)	304 SS (LBS)
3/8	7/16	1-3/4	840	950	1,060	1,630	2,180	2,685	4,355	3,630
3/8	7/16	3-1/2	2,025	2,405	2,780	2,835	2,180	2,685	4,355	3,630
3/8	7/16	5-1/4	2,720	2,855	2,995	3,215	2,180	2,685	4,355	3,630
1/2	9/16	2-1/8	1,335	1,510	1,680	1,855	3,880	4,785	7,760	6,470
1/2	9/16	4-1/4	3,020	3,335	3,655	3,970	3,880	4,785	7,760	6,470
1/2	9/16	6-3/8	3,725	4,390	5,060	5,415	3,880	4,785	7,760	6,470
5/8	3/4	2-1/2	1,505	2,035	2,570	3,105	6,080	7,495	12,155	10,130
5/8	3/4	5	3,350	4,625	5,905	6,070	6,080	7,495	12,155	10,130
5/8	3/4	7-1/2	4,685	6,055	7,425	7,540	6,080	7,495	12,155	10,130
3/4	7/8	3-3/8	3,075	3,665	4,250	4,840	8,790	10,795	17,500	12,400
3/4	7/8	6-5/8	4,780	6,120	7,460	7,585	8,790	10,795	17,500	12,400
3/4	7/8	9-3/4	6,490	8,245	10,000	10,910	8,790	10,795	17,500	12,400

ALLOWABLE SHEAR - CHEM-BOLT AND AC100 PLUS / ACS.5 PLUS							
ANCHOR SIZE (IN)	DRILL BIT (IN)	EMBED. DEPTH (IN)	ALL BOND STR. > 2,000 PSI (LBS)	ALLOWABLE STEEL STRENGTH			
				GRADE 1 (LBS)	GRADE 2 (LBS)	GRADE 5 (LBS)	304 SS (LBS)
3/8	7/16	1-3/4	1,155	1,120	1,385	2,245	1,870
3/8	7/16	3-1/2	1,740	1,120	1,385	2,245	1,870
3/8	7/16	5-1/4	1,740	1,120	1,385	2,245	1,870
1/2	9/16	2-1/8	2,045	1,200	2,465	3,990	3,330
1/2	9/16	4-1/4	2,650	1,200	2,465	3,990	3,330
1/2	9/16	6-3/8	2,725	1,200	2,465	3,990	3,330
5/8	3/4	2-1/2	2,275	3,130	3,860	6,260	5,210
5/8	3/4	5	4,405	3,130	3,860	6,260	5,210
5/8	3/4	7-1/2	4,940	3,130	3,860	6,260	5,210
3/4	7/8	3-3/8	3,930	4,510	5,560	9,015	6,390
3/4	7/8	6-5/8	6,295	4,510	5,560	9,015	6,390
3/4	7/8	9-3/4	6,385	4,510	5,560	9,015	6,390

ALLOWABLE TENSION - CHEM-BOLT AND POWER-FAST EPOXY											
ANCHOR SIZE (IN)	DRILL BIT (IN)	EMBED. DEPTH (IN)	ALLOWABLE BOND STRENGTH					ALLOWABLE STEEL STRENGTH			
			2,000 PSI (LBS)	3,000 PSI (LBS)	4,000 PSI (LBS)	5,000 PSI (LBS)	6,000 PSI (LBS)	GRADE 1 (LBS)	GRADE 2 (LBS)	GRADE 5 (LBS)	304 SS (LBS)
1/4	5/16	1	350	375	400	475	555	970	1,200	1,940	1,210
1/4	5/16	2	590	665	740	920	1,105	970	1,200	1,940	1,210
1/4	5/16	3	965	1,040	1,120	1,340	1,560	970	1,200	1,940	1,210
3/8	7/16	1-1/2	865	980	1,110	1,300	1,390	2,180	2,685	4,355	3,630
3/8	7/16	1-7/8	1,170	1,335	1,475	1,665	1,780	2,180	2,685	4,355	3,630
3/8	7/16	2-1/4	1,475	1,690	1,845	2,030	2,170	2,180	2,685	4,355	3,630
3/8	7/16	2-5/8	1,780	2,045	2,210	2,350	2,510	2,180	2,685	4,355	3,630
3/8	7/16	3	2,085	2,405	2,575	2,765	2,955	2,180	2,685	4,355	3,630
3/8	7/16	3-3/8	2,390	2,760	2,945	3,130	3,345	2,180	2,685	4,355	3,630
3/8	7/16	3-3/4	2,610	2,985	3,125	3,285	3,515	2,180	2,685	4,355	3,630
3/8	7/16	4-1/8	2,835	3,210	3,305	3,440	3,680	2,180	2,685	4,355	3,630
3/8	7/16	4-1/2	3,055	3,440	3,485	3,600	3,845	2,180	2,685	4,355	3,630
3/8	7/16	4-7/8	3,275	3,665	3,665	3,755	4,015	2,180	2,685	4,355	3,630
3/8	7/16	5-1/4	3,500	3,845	3,890	3,910	4,180	2,180	2,685	4,355	3,630
1/2	9/16	2	1,200	1,810	2,705	3,615	3,805	3,880	4,785	7,760	6,470
1/2	9/16	2-1/2	1,610	2,125	3,105	3,980	4,190	3,880	4,785	7,760	6,470
1/2	9/16	3	2,015	2,445	3,510	4,345	4,575	3,880	4,785	7,760	6,470
1/2	9/16	3-1/2	2,425	2,765	3,910	4,710	4,915	3,880	4,785	7,760	6,470
1/2	9/16	4	2,835	3,080	4,310	5,075	5,255	3,880	4,785	7,760	6,470
1/2	9/16	4-1/2	3,245	3,630	4,715	5,440	5,595	3,880	4,785	7,760	6,470
1/2	9/16	5	3,640	3,940	5,095	5,775	5,940	3,880	4,785	7,760	6,470
1/2	9/16	5-1/2	4,035	4,475	5,470	6,115	6,290	3,880	4,785	7,760	6,470
1/2	9/16	6	4,430	5,015	5,850	6,450	6,635	3,880	4,785	7,760	6,470
1/2	9/16	6-1/2	4,825	5,555	6,230	6,790	6,980	3,880	4,785	7,760	6,470
1/2	9/16	7	5,220	6,095	6,610	7,125	7,325	3,880	4,785	7,760	6,470
5/8	3/4	2-1/2	1,725	2,070	2,350	2,625	3,225	6,080	7,495	12,155	10,130
5/8	3/4	3-1/8	2,345	2,765	3,050	3,330	4,035	6,080	7,495	12,155	10,130
5/8	3/4	3-3/4	2,970	3,465	3,750	4,035	4,840	6,080	7,495	12,155	10,130
5/8	3/4	4-3/8	3,590	4,165	4,450	4,735	5,895	6,080	7,495	12,155	10,130
5/8	3/4	5	4,210	4,860	5,150	5,440	6,955	6,080	7,495	12,155	10,130
5/8	3/4	5-5/8	4,835	5,560	5,850	6,145	8,010	6,080	7,495	12,155	10,130
5/8	3/4	6-1/4	5,410	6,050	6,515	6,830	8,565	6,080	7,495	12,155	10,130
5/8	3/4	6-7/8	5,980	6,540	7,155	7,515	9,125	6,080	7,495	12,155	10,130
5/8	3/4	7-1/2	6,555	7,030	7,855	8,200	9,680	6,080	7,495	12,155	10,130
5/8	3/4	8-1/8	7,130	7,520	8,520	8,885	10,490	6,080	7,495	12,155	10,130
5/8	3/4	8-3/4	7,705	8,620	9,190	9,570	11,300	6,080	7,495	12,155	10,130
3/4	7/8	3	2,400	3,050	3,710	4,360	4,825	8,790	10,795	17,500	12,400
3/4	7/8	3-3/4	3,325	4,115	4,845	5,640	6,245	8,790	10,795	17,500	12,400
3/4	7/8	4-1/2	4,255	5,180	5,980	6,925	7,660	8,790	10,795	17,500	12,400
3/4	7/8	5-1/4	5,185	6,240	7,110	8,205	9,080	8,790	10,795	17,500	12,400
3/4	7/8	6	6,110	7,305	8,245	9,490	10,500	8,790	10,795	17,500	12,400
3/4	7/8	6-3/4	7,040	8,370	9,380	10,770	11,920	8,790	10,795	17,500	12,400
3/4	7/8	7-1/2	7,620	8,970	9,890	11,105	12,290	8,790	10,795	17,500	12,400
3/4	7/8	8-1/4	8,200	9,575	10,395	11,440	12,660	8,790	10,795	17,500	12,400
3/4	7/8	9	8,780	10,175	10,905	11,780	13,030	8,790	10,795	17,500	12,400
3/4	7/8	9-3/4	9,360	10,780	11,410	12,115	13,405	8,790	10,795	17,500	12,400

PROJECT SUBMITTAL

ALLOWABLE SHEAR - CHEM-BOLT AND POWER-FAST EPOXY							
ANCHOR SIZE (IN)	DRILL BIT (IN)	EMBED. DEPTH (IN)	ALL BOND STR. > 2,000 PSI (LBS)	ALLOWABLE STEEL STRENGTH			
				GRADE 1 (LBS)	GRADE 2 (LBS)	GRADE 5 (LBS)	304 SS (LBS)
1/4	5/16	1	615	500	615	1,000	625
1/4	5/16	2	615	500	615	1,000	625
1/4	5/16	3	615	500	615	1,000	625
3/8	7/16	1-1/2	1,150	1,120	1,385	2,245	1,870
3/8	7/16	1-7/8	1,220	1,120	1,385	2,245	1,870
3/8	7/16	2-1/4	1,290	1,120	1,385	2,245	1,870
3/8	7/16	2-5/8	1,360	1,120	1,385	2,245	1,870
3/8	7/16	3	1,430	1,120	1,385	2,245	1,870
3/8	7/16	3-3/8	1,500	1,120	1,385	2,245	1,870
1/2	9/16	2	1,700	1,200	2,465	3,990	3,330
1/2	9/16	2-1/2	2,000	1,200	2,465	3,990	3,330
1/2	9/16	3	2,300	1,200	2,465	3,990	3,330
1/2	9/16	3-1/2	2,600	1,200	2,465	3,990	3,330
1/2	9/16	4	2,900	1,200	2,465	3,990	3,330
1/2	9/16	4-1/2	3,200	1,200	2,465	3,990	3,330
5/8	3/4	2-1/2	2,400	3,130	3,860	6,260	5,210
5/8	3/4	3-1/8	3,060	3,130	3,860	6,260	5,210
5/8	3/4	3-3/4	3,720	3,130	3,860	6,260	5,210
5/8	3/4	4-3/8	4,380	3,130	3,860	6,260	5,210
5/8	3/4	5	5,040	3,130	3,860	6,260	5,210
5/8	3/4	5-5/8	5,700	3,130	3,860	6,260	5,210
3/4	7/8	3	3,600	4,510	5,560	9,015	6,390
3/4	7/8	3-3/4	4,160	4,510	5,560	9,015	6,390
3/4	7/8	4-1/2	4,720	4,510	5,560	9,015	6,390
3/4	7/8	5-1/4	5,280	4,510	5,560	9,015	6,390
3/4	7/8	6	5,840	4,510	5,560	9,015	6,390
3/4	7/8	6-3/4	6,400	4,510	5,560	9,015	6,390

* According to SAE, Grade 2 requirements for sizes 1/4" through 3/4" apply only to bolts 6" and shorter in length. For bolts longer than 6", Grade 1 requirements apply.

ALLOWABLE TENSION - CHEM-BOLT AND POWER-BOND											
ANCHOR SIZE (IN)	DRILL BIT (IN)	EMBED. DEPTH (IN)	ALLOWABLE BOND STRENGTH				ALLOWABLE STEEL STRENGTH				
			2,000 PSI (LBS)	3,000 PSI (LBS)	4,000 PSI (LBS)	5,000 PSI (LBS)	6,000 PSI (LBS)	GRADE 1 (LBS)	GRADE 2 (LBS)	GRADE 5 (LBS)	304 SS (LBS)
3/8	7/16	3-3/8	1,855	2,770	2,835	2,905	2,970	2,180	2,685	4,355	3,630
1/2	9/16	4-1/2	2,305	3,205	3,585	3,765	3,945	3,880	4,785	7,760	6,470
5/8	3/4	5-5/8	3,835	4,960	5,725	6,150	6,575	6,080	7,495	12,155	10,130
3/4	7/8	6-3/4	5,180	8,075	8,150	8,285	8,420	8,790	10,795	17,500	12,400

ALLOWABLE SHEAR - CHEM-BOLT AND POWER-BOND							
ANCHOR SIZE (IN)	DRILL BIT (IN)	EMBED. DEPTH (IN)	ALL BOND STR. > 2,000 PSI (LBS)	ALLOWABLE STEEL STRENGTH			
				GRADE 1 (LBS)	GRADE 2 (LBS)	GRADE 5 (LBS)	304 SS (LBS)
3/8	7/16	3-3/8	1,225	1,120	1,385	2,245	1,870
1/2	9/16	4-1/2	2,390	1,200	2,465	3,990	3,330
5/8	3/4	5-5/8	3,965	3,130	3,860	6,260	5,210
3/4	7/8	6-3/4	7,120	4,510	5,560	9,015	6,390

*According to SAE, Grade 2 requirements for sizes 1/4" thru 3/4" apply only to bolts 6" and shorter in length. For bolts longer than 6", Grade 1 requirements apply.

CHEM-BOLT SUGGESTED SPECIFICATION

Anchor hardware shall consist of a fully threaded hex head bolt which is pre-assembled with a release coating and a hex shaped nylon cap on the working end. The cap shall be designed to allow the anchor to be tightened or advanced once the adhesive has set and shall have a lower portion, which is hexagonal in shape to lock the mating threads of the bolt into the cap. Caps shall be color coded to identify the grade or type of steel used. The bolt provided as part of the anchor assembly shall be manufactured from _____ material meeting the requirements of _____. The anchor hardware shall be the Chem-Bolt Anchor as dimensioned and supplied by Powers Fasteners, Inc.

Anchor holes shall be drilled with a carbide tipped drill bit meeting the requirements of ANSI Standard B212.15 and shall be as approved by the manufacturer of the hardware system. The adhesive used shall be an injection type system, _____ as supplied by the hardware manufacturer. Only dispensing tools and dispensing accessories as approved by the manufacturer for the specific product shall be used. Manufacturer installation instructions shall be followed. The adhesive and anchor hardware components shall be installed according to adhesive manufacturer's instructions. The injection type adhesive system used shall be _____ as supplied by Powers Fasteners, Inc.

TYPICAL APPLICATIONS

- Any application requiring a finished hex head
- Removable Barriers
- Hand Rails
- Racking
- Vibrating Equipment and Machinery
- Seating Installations

APPROVALS AND LISTINGS

ICBO ES Evaluation Report No. 4514