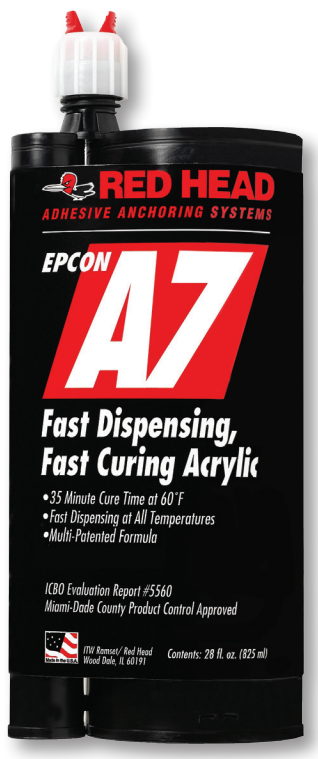
RED HEAD®
ADHESIVE ANCHORING SPECIALISTS

A7

Easy to Use— A7 Saves You Time and Money



A7-28

A102

DESCRIPTION/SUGGESTED SPECIFICATIONS*

Fast Dispensing, Fast Curing Acrylic Adhesive

The acrylic resin and hardening agent are completely mixed as they are simultaneously dispensed from the dual cartridge through a static mixing nozzle, directly into the anchor hole. A7 can be used with threaded rod or rebar (for fastening to hollow base materials, see page 50 and 53).

How Can An Adhesive Anchor Save You Money?

- Incredibly fast dispensing and rod installation times
- Significantly faster curing times
- Easy to use (no-heating) even at freezing cold temperatures
- Requires less adhesive

ADVANTAGES

- All weather formula
- No drip, no sag, easy clean up
- Fast & easy dispensing, even 28 ounce cartridge can be hand dispensed
- Fast curing time, 35 minutes at 60°F
- NSF 61 approved
- Rods are easier to insert into the hole with A7 compared with other adhesives
- Works in damp holes and underwater applications
- Requires less adhesive—can be used in 1/16" oversized or 1/8" oversized holes
- **One formula** for both **hollow** and **solid** base materials
- See page 53 for hollow application

Curing Times

MADE IN USA

BASE MATERIAL (F°/C°)	WORKING TIME	FULL CURE TIME
100°/ 38°	5 minutes	25 minutes
80°/ 27°	5.5 minutes	30 minutes
60°/ 16°	7 minutes	35 minutes
40°/ 4°	15 minutes	75 minutes
30°/ -1°	25 minutes	5 hours
20°/ -7°	35 minutes	6 hours
0°/ -18°	4 hours	24 hours

APPLICATIONS

Stadium Seating

The fast dispensing, fast curing properties of A7 made it ideal for installing over 70,000 seats in this NFL football stadium and many others.

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.

Scaffolding Attachment

Fast curing adhesive in 27.9 ounce cartridges kept this project moving upwards without delays.

FEATURES

ANCHORAGE TO SOLID CONCRETE

Threaded Rod (Carbon or Stainless Steel) or Rebar supplied by contractor; rod does not need to be chisel pointed

A7 adhesive completely fills area between rod and hole creating a stress free, high load anchorage

Pre-drilled hole in concrete; see performance tables for suggested hole sizes

APPROVALS/LISTINGS

ICC Evaluation Service, Inc. – #ER-5560

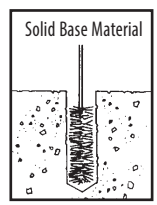
DOT Approvals

NSF Standard 61 Certified for Drinking Water Components

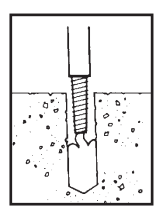
NSF Certified to ANSI/NSF 61

For the most current approvals/listings visit: www.itw-redhead.com

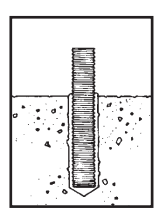
INSTALLATION STEPS



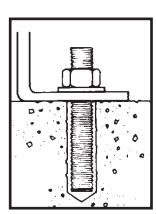
1. Drill 1/16" oversize diameter holes for 1/4"–1/2" diameter threaded rods and #3 rebar. Drill 1/8" oversize diameter holes for 5/8"–1-1/4" diameter threaded rods, #4 rebar, grout filled blocks and brick pinning. Clean out hole from bottom with forced air. Complete hole preparation with brush and repeat cleaning with forced air (leave no dust or slurry).



2. When starting new cartridge or new nozzle, dispense and discard enough adhesive until uniform light grey color is achieved. Insert the nozzle into the bottom of the hole and fill to 1/2 the hole depth.



3. Insert rod slowly by hand into the bottom of the hole with a slow twisting motion. This insures adhesive fills voids and crevices and uniformly coats the anchor rod.



4. See table for working times and curing times. After the suggested cure time is met, install and tighten fixture into place.

A100 Dispenser (for A7-10, C6P-10, & S7-10)

A7–28 fl. oz. Ordering Information

PART NUMBER	DESCRIPTION	BOX QTY
 A7-28	27.9 Fluid Ounce Cartridge A7	4
 E55	Mixing Nozzle for A7-28 and G5-22 Cartridge Nozzle diameter fits 3/8" to 5/8" holes. (overall length of nozzle 14")	24
 A102	*Largest hand dispensable cartridge—still easy to dispense* Hand Dispenser for A7-28 Cartridge	1

PART NUMBER	DESCRIPTION	BOX QTY
E25-6	6-Foot Straight Tubing (Used when holes are deeper) (can cut to proper size) (.39 in I.D. x .43 in. O.D.)	6
 A200	Pneumatic Dispenser for A7-28 Cartridge	1

ESTIMATING TABLE

A7 — 28 Fluid Ounce Cartridge

Number of Anchoring Installations per Cartridge* Using Reinforcing Bar with A7 Adhesive in Solid Concrete

REBAR	DRILL HOLE DIA. INCHES	EMBEDMENT DEPTH IN INCHES (mm)														
		1 (25.4)	2 (50.8)	3 (76.2)	4 (101.6)	5 (127.0)	6 (152.4)	7 (177.8)	8 (203.2)	9 (228.6)	10 (254.0)	11 (279.4)	12 (304.8)	13 (330.2)	14 (355.6)	15 (381.0)
# 3	7/16	662.5	331.3	220.8	165.6	132.5	110.4	94.6	82.8	73.6	66.3	60.2	55.2	51.0	47.3	44.2
# 4	5/8	373.0	186.5	124.3	93.2	74.6	62.2	53.3	46.6	41.4	37.3	33.9	31.1	28.7	26.6	24.9
# 5	3/4	286.1	143.0	95.4	71.5	57.2	47.7	40.9	35.8	31.8	28.6	26.0	23.8	22.0	20.4	19.1
# 6	7/8	231.0	115.5	77.0	57.7	46.2	38.5	33.3	28.8	25.7	23.1	21.0	19.2	17.8	16.5	15.4
# 7	1	213.4	106.7	71.1	53.3	42.7	35.6	30.5	26.7	23.7	21.3	19.4	17.8	16.4	15.2	14.2
# 8	1-1/8	177.3	88.6	59.1	44.3	35.5	29.5	25.3	22.2	19.7	17.7	16.1	14.8	13.6	12.7	11.8
# 9	1-1/4	102.8	51.4	34.3	25.7	20.6	17.1	14.7	12.8	11.4	10.3	9.3	8.6	7.9	7.3	6.9
# 10	1-1/2	84.1	42.0	28.0	21.0	16.8	14.0	12.0	10.5	9.3	8.4	7.6	7.0	6.5	6.0	5.6
# 11	1-3/4	51.4	25.7	17.1	12.8	10.3	8.6	7.3	6.4	5.7	5.1	4.7	4.3	4.0	3.7	3.4

* The number of anchoring installations is based upon calculations of hole volumes using ANSI tolerance carbide tipped drill bits, the nominal areas of the reinforcing bars and the stress areas of the threaded rods. These estimates do not account for waste.

ESTIMATING TABLE

A7 — 28 Fluid Ounce Cartridge

Number of Anchoring Installations per Cartridge* Using Threaded Rod with A7 Adhesive in Solid Concrete

ROD In. (mm)	DRILL HOLE DIA. INCHES	EMBEDMENT DEPTH IN INCHES (mm)														
		1 (25.4)	2 (50.8)	3 (76.2)	4 (101.6)	5 (127.0)	6 (152.4)	7 (177.8)	8 (203.2)	9 (228.6)	10 (254.0)	11 (279.4)	12 (304.8)	13 (330.2)	14 (355.6)	15 (381.0)
1/4 (6.4)	5/16	915.5	457.7	305.2	228.9	183.1	152.8	130.8	114.4	101.7	91.5	83.2	76.3	70.4	65.4	61.0
3/8 (9.5)	7/16	530.0	265.0	176.7	132.5	106.0	88.3	75.7	66.3	58.9	53.0	48.2	44.2	40.8	37.9	35.3
1/2 (12.7)	9/16	381.4	190.7	127.1	95.4	76.3	63.6	54.5	47.7	42.4	38.1	34.7	31.8	29.3	27.2	25.4
5/8 (15.9)	11/16 3/4	273.6 195.6	136.8 97.8	91.2 65.1	68.4 48.8	54.7 39.0	45.6 32.5	39.1 27.9	34.2 24.4	30.4 21.7	27.4 19.5	24.9 17.7	22.8 16.3	21.0 15.0	19.5 13.9	18.2 13.0
3/4 (19.1)	13/16 7/8	192.9 154.4	96.5 77.2	64.3 51.5	48.2 38.6	38.6 30.9	32.2 25.7	27.6 22.1	24.1 19.3	21.4 17.2	19.3 15.4	17.5 14.0	16.1 12.9	14.8 11.9	13.8 11.0	12.9 10.3
7/8 (22.2)	15/16 1	185.1 128.0	92.6 64.0	61.7 42.8	46.3 32.0	37.0 25.6	30.9 21.4	26.8 18.3	23.1 16.0	20.6 14.2	18.5 12.8	16.8 11.6	15.4 10.7	14.2 9.9	13.2 9.2	12.3 8.5
1 (25.4)	1 -1/16 1 -1/8	158.3 105.2	79.2 52.6	52.8 35.2	39.6 26.3	31.7 21.1	26.4 17.6	22.6 15.0	19.8 13.2	17.6 11.7	15.8 10.5	14.4 9.6	13.2 8.8	12.2 8.1	11.3 7.6	10.6 7.0
1-1/4 (31.8)	1 -5/16 1 -3/8	101.3 80.0	50.7 40.0	33.8 26.6	25.3 20.0	20.3 15.9	16.9 13.3	14.5 11.4	12.7 10.0	11.3 8.9	10.1 8.0	9.2 7.2	8.4 6.6	7.8 6.1	7.2 5.7	6.8 5.3

* The number of anchoring installations is based upon calculations of hole volumes using ANSI tolerance carbide tipped drill bits, the nominal areas of the reinforcing bars and the stress areas of the threaded rods. These estimates do not account for waste.

A7–10 fl. oz. Ordering Information

PART NUMBER	DESCRIPTION	BOX QTY
 A7-10	9.3 Fluid Ounce Cartridge with Nozzle	6
 A24S	Mixing Nozzle for A7-10 Cartridge Nozzle diameter fits 3/8" to 5/8" holes (overall length of nozzle 6-3/8")	24
 A100	Hand Dispenser Designed for A7-10 Cartridge Contractor Quality 26:1 Thrust Ratio	1

Refer to page 56 for ordering information on brushes , hole plugs, and extension tubing for deep holes.

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

SUGGESTED SPECIFICATIONS

ACRYLIC ADHESIVE:

High Strength ACRYLIC ADHESIVE: USA Made, ARRA Certified

1. Two component methyl methacrylate adhesive, non-sag paste, moisture insensitive when cured, dark gray in color, and quick gel and cure times.
2. Meets NSF Standard 61, certified for use in conjunction with drinking water systems.
3. Works in wet, damp, submerged holes.
4. Shelf life: Best if used within 18 months.
5. All weather, cure time (35 min. at 60°F).
6. Dispenses easier and faster.
7. Dispenses and cures faster in cold weather, but works in hot weather.
8. Pumpable at 0°F without preheating.
9. Formula for use in solid and hollow base materials.
10. Suitable for oversized and diamond cored holes with increased depths.
11. Quick insertion time = less labor cost.

ESTIMATING TABLES

A7 10 Fluid Ounce Cartridge

Number of Anchoring Installations per Cartridge* Using Reinforcing Bar and Threaded Rod with A7 Adhesive in Solid Concrete

REBAR	DRILL HOLE DIA. INCHES	EMBEDMENT DEPTH IN INCHES (mm)			
		2 (50.8)	4 (101.6)	6 (152.4)	8 (203.2)
# 3	7/16	110	55	37	27
# 4	5/8	63	31	20	14
# 5	3/4	48	24	16	11
# 6	7/8	39	18	13	9
# 7	1	35	18	11	9
# 8	1-1/8	29	14	9	7

* The number of anchoring installations is based upon calculations of hole volumes using ANSI tolerance carbide tipped drill bits, the nominal areas of the reinforcing bars and the stress areas of the threaded rods. These estimates do not account for waste.

ROD In (mm)	DRILL HOLE DIA. INCHES	EMBEDMENT DEPTH IN INCHES (mm)				
		2 (50.8)	4 (101.6)	6 (152.4)	8 (203.2)	10 (254.0)
3/8 (9.5)	7/16	88	44	28	22	18
1/2 (12.7)	9/16	65	31	22	16	13
5/8 (15.9)	11/16 3/4	46 33	22 16	14 11	11 7	9 6.5
3/4 (19.1)	13/16 7/8	33 26	16 13	11 9	7 7	7 5
7/8 (22.2)	15/16 1	31 22	14 11	11 7	7 5	6 4.5
1 (25.4)	1-1/16 1-1/8	26 18	13 9	9 5	7 3	5.5 3.5

A7–8 fl. oz. Ordering Information

PART NUMBER	DESCRIPTION	BOX QTY
 A7-8	*Fits Hilti® P2000 dispensing tools* 8 Fluid Ounce Cartridge A7	12
 A24S	Mixing Nozzle for A7-8 Cartridge Nozzle diameter fits 3/8" to 5/8" holes (overall length of nozzle 6-3/8")	24
 A101	Heavy Duty Hand Dispenser for A7-8 Cartridge	1

Refer to page 56 for ordering information on brushes , hole plugs, and extension tubing for deep holes.

ESTIMATING TABLE

A7 8 Fluid Ounce Cartridge

Number of Anchoring Installations per Cartridge* Using Reinforcing Bar with A7 Adhesive in Solid Concrete

REBAR	DRILL HOLE DIA. INCHES	EMBEDMENT DEPTH IN INCHES (mm)														
		1 (25.4)	2 (50.8)	3 (76.2)	4 (101.6)	5 (127.0)	6 (152.4)	7 (177.8)	8 (203.2)	9 (228.6)	10 (254.0)	11 (279.4)	12 (304.8)	13 (330.2)	14 (355.6)	15 (381.0)
# 3	7/16	187.8	93.9	62.6	46.9	37.6	31.3	26.8	23.5	20.9	18.8	17.1	15.6	14.4	13.4	12.5
# 4	5/8	105.7	52.9	35.2	26.4	21.1	17.6	15.1	13.2	11.7	10.6	9.6	8.8	8.1	7.6	7.0
# 5	3/4	81.1	40.5	27.0	20.3	16.2	13.5	11.6	10.1	9.0	8.1	7.4	6.8	6.2	5.8	5.4
# 6	7/8	65.5	32.7	21.8	16.4	13.1	10.9	9.4	8.2	7.3	6.5	6.0	5.5	5.0	4.7	4.4
# 7	1	60.5	30.2	20.2	15.1	12.1	10.1	8.6	7.6	6.7	6.0	5.5	5.0	4.7	4.3	4.0
# 8	1-1/8	50.2	25.1	16.7	12.6	10.0	8.4	7.2	6.3	5.6	5.0	4.6	4.2	3.9	3.6	3.3
# 9	1-1/4	29.1	14.6	9.7	7.3	5.8	4.9	4.2	3.6	3.2	2.9	2.6	2.4	2.2	2.1	1.9
# 10	1-1/2	23.8	11.9	7.9	6.0	4.8	4.0	3.4	3.0	2.6	2.4	2.2	2.0	1.8	1.7	1.6
# 11	1-3/4	14.6	7.3	4.9	3.6	2.9	2.4	2.1	1.8	1.6	1.5	1.3	1.2	1.1	1.0	1.0

* The number of anchoring installations is based upon calculations of hole volumes using ANSI tolerance carbide tipped drill bits, the nominal areas of the reinforcing bars and the stress areas of the threaded rods. These estimates do not account for waste.

ESTIMATING TABLE

A7 8 Fluid Ounce Cartridge

Number of Anchoring Installations per Cartridge* Using Threaded Rod with A7 Adhesive in Solid Concrete

ROD In. (mm)	DRILL HOLE DIA. INCHES	EMBEDMENT DEPTH IN INCHES (mm)														
		1 (25.4)	2 (50.8)	3 (76.2)	4 (101.6)	5 (127.0)	6 (152.4)	7 (177.8)	8 (203.2)	9 (228.6)	10 (254.0)	11 (279.4)	12 (304.8)	13 (330.2)	14 (355.6)	15 (381.0)
1/4 (6.4)	5/16	259.5	129.7	86.5	64.9	51.9	43.2	37.1	32.4	28.8	25.9	23.6	21.6	20.0	18.5	17.3
3/8 (9.5)	7/16	150.2	75.1	50.1	37.6	30.0	25.0	21.5	18.8	16.7	15.0	13.7	12.5	11.6	10.7	10.0
1/2 (12.7)	9/16	108.1	54.1	36.0	27.0	21.6	18.0	15.4	13.5	12.0	10.8	9.8	9.0	8.3	7.7	7.2
5/8 (15.9)	11/16 3/4	77.6 55.4	38.8 27.7	25.9 18.4	19.4 13.8	15.5 11.1	12.9 9.2	11.1 7.9	9.7 6.9	8.6 6.1	7.8 5.5	7.1 5.0	6.5 4.6	6.0 4.3	5.5 4.0	5.2 3.7
3/4 (19.1)	13/16 7/8	54.7 43.6	27.3 21.8	18.2 14.6	13.7 10.9	10.9 8.8	9.1 7.3	7.8 6.3	6.8 5.5	6.1 4.9	5.5 4.4	5.0 4.0	4.6 3.6	4.2 3.4	3.9 3.1	3.6 2.9
7/8 (22.2)	15/16 1	52.5 36.4	26.2 18.2	17.5 12.2	13.1 9.1	10.5 7.3	8.7 6.1	7.5 5.2	6.6 4.5	5.8 4.0	5.2 3.6	4.8 3.3	4.4 3.0	4.0 2.8	3.7 2.6	3.5 2.4
1 (25.4)	1 -1/16 1 -1/8	44.9 34.4	22.4 17.2	15.0 12.0	11.2 8.6	9.0 7.5	7.5 6.0	6.4 5.0	5.6 4.3	5.0 3.7	4.5 3.3	4.1 3.0	3.7 2.7	3.5 2.5	3.2 2.3	3.0 2.1
1-1/4 (31.8)	1 -5/16 1 -3/8	28.7 22.4	14.4 11.2	9.6 7.6	7.2 5.6	5.7 4.5	4.8 3.8	4.1 3.2	3.6 2.8	3.2 2.5	2.9 2.3	2.6 2.1	2.4 1.9	2.2 1.7	2.1 1.6	1.9 1.5

* The number of anchoring installations is based upon calculations of hole volumes using ANSI tolerance carbide tipped drill bits, the nominal areas of the reinforcing bars and the stress areas of the threaded rods. These estimates do not account for waste.

A7–5 fl. oz. Ordering Information

PART NUMBER	DESCRIPTION	BOX QTY
 A7-5	5 Fluid Ounce Cartridge A7	12
 A500	Reusable Plastic Dispenser	12
 A500 KIT	Convenient Dispensing Kit Packaged in a Solid Plastic Shell with (1) A500 Plastic Dispenser (1) A7-5 Cartridge and (1) A24 Nozzle Nozzle diameter fits 3/8″ to 5/8″ holes	8

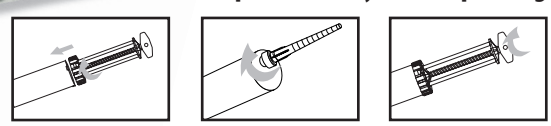
PART NUMBER	DESCRIPTION	BOX QTY
 A7-5	5 Fluid Ounce Cartridge A7	12
 A501 KIT	Convenient Dispensing Kit Packaged in a Solid Plastic Shell with (1) A501 Plastic Dispenser (1) A7-5 Cartridge and (1) A24 Nozzle Nozzle diameter fits 3/8″ to 5/8″ holes	8

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

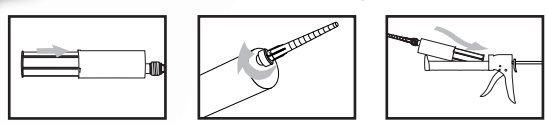


1. Twist-lock dispenser onto cartridge.
2. Thread nozzle onto cartridge.
3. Turn lever in order to dispense adhesive.

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.

EASY PACKAGING!

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

A500 Kit

A501 Kit

ESTIMATING TABLES

A7 5 Fluid Ounce Cartridge

Number of Anchoring Installations per Cartridge* Using Reinforcing Bar and Threaded Rod with A7 Adhesive in Solid Concrete

REBAR	DRILL HOLE DIA. INCHES	EMBEDMENT DEPTH IN INCHES (mm)			
		2 (50.8)	4 (101.6)	6 (152.4)	8 (203.2)
# 3	7/16	60	30	20	15
# 4	5/8	34	17	11	8
# 5	3/4	26	13	9	6
# 6	7/8	21	10	7	5
# 7	1	19	10	6	5
# 8	1-1/8	16	8	5	4

* The number of anchoring installations is based upon calculations of hole volumes using ANSI tolerance carbide tipped drill bits, the nominal areas of the reinforcing bars and the stress areas of the threaded rods. These estimates do not account for waste.

ROD In (mm)	DRILL HOLE DIA. INCHES	EMBEDMENT DEPTH IN INCHES (mm)			
		2 (50.8)	4 (101.6)	6 (152.4)	8 (203.2)
3/8 (9.5)	7/16	48	24	16	12
1/2 (12.7)	9/16	35	17	12	9
5/8 (15.9)	11/16 3/4	25 18	12 9	8 6	6 4
3/4 (19.1)	13/16 7/8	18 14	9 7	6 5	4 4
7/8 (22.2)	15/16 1	17 12	8 6	6 4	4 3
1 (25.4)	1-1/16 1-1/8	14 10	7 5	5 3	4 2

PERFORMANCE TABLE

A7 Acrylic Adhesive

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

THREADED ROD DIA. In. (mm)	DRILL HOLE DIAMETER In. (mm)	MAX. CLAMPING FORCE AFTER PROPER CURE Ft.-Lbs. (Nm)	EMBEDMENT IN CONCRETE In. (mm)	2000 PSI (13.8 MPa) CONCRETE		4000 PSI (27.6 MPa) CONCRETE	
				ULTIMATE TENSION Lbs. (kN)	ULTIMATE SHEAR Lbs. (kN)	ULTIMATE TENSION Lbs. (kN)	ULTIMATE SHEAR Lbs. (kN)
3/8 (9.5)	7/16 (11.1)	13 - 18 (17-24)	1-1/2 (38.1)	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)	22 - 25 (29-33)	2 (50.8)	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)	11/16 (17.5) or 3/4 (19.1)	55 - 80 (74-108)	2-1/2 (63.5)	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)	13/16 (20.6) or 7/8 (22.2)	106 - 160 (143-216)	3 (76.2)	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)	15/16 (23.8) or 1 (25.4)	185 - 250 (250-338)	3-1/2 (88.9)	N/A	N/A	13,650 (60.7)	20,920 (92.9)
			7-7/8 (200.0)	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)	1-1/16 (27.0) or 1-1/8 (28.6)	276 - 330 (374-447)	4 (101.6)	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)	1-5/16 (33.3) or 1-3/8 (34.9)	370 - 660 (501-894)	5 (127.0)	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 installations under static loading should not exceed 25% capacity or the allowable load of the anchor rod. Divide 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 Acrylic Adhesive

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

THREADED ROD DIA. In. (mm)	DRILL HOLE DIAMETER In. (mm)	MIN. EMBEDMENT DEPTH In. (mm)	ALLOWABLE TENSION LOAD BASED ON ADHESIVE BOND STRENGTH		ALLOWABLE TENSION LOAD BASED ON STEEL STRENGTH		
			2000 PSI (13.8 MPa) CONCRETE Lbs. (kN)	4000 PSI (27.6 MPa) CONCRETE Lbs. (kN)	ASTM A307 (SAE 1018) Lbs. (kN)	ASTM A193 GR. B7 (SAE 4140) Lbs. (kN)	ASTM F593 AISI 304 SS Lbs. (kN)
3/8 (9.5)	7/16 (11.1)	1-1/2 (38.1)	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	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)	11/16 (17.5) or 3/4 (19.1)	2-1/2 (63.5)	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)	13/16 (20.6) or 7/8 (22.2)	3 (76.2)	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)	15/16 (23.8) or 1 (25.4)	3-1/2 (88.9)	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	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)	1-1/16 (27.0) or 1-1/8 (28.6)	4 (101.6)	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)	1-5/16 (33.3) or 1-3/8 (34.9)	5 (127.0)	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.

PERFORMANCE TABLE

A7 Acrylic Adhesive — Allowable Shear Loads[1] for Threaded Rod Installed in Solid Concrete

THREADED ROD DIA. In. (mm)	DRILL HOLE DIAMETER In. (mm)	MIN. EMBEDMENT DEPTH In. (mm)	ALLOWABLE SHEAR LOAD BASED ON CONCRETE STRENGTH		ALLOWABLE SHEAR LOAD BASED ON STEEL STRENGTH		
			2000 PSI (13.8 MPa) CONCRETE Lbs. (kN)	4000 PSI (27.6 MPa) CONCRETE Lbs. (kN)	ASTM A307 (SAE 1018) Lbs. (kN)	ASTM A193 GR. B7 (SAE 4140) Lbs. (kN)	ASTM F593 AISI 304 SS Lbs. (kN)
3/8 (9.5)	7/16 (11.1)	1-1/2 (38.1)	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	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)	or 11/16 (17.5)	2-1/2 (63.5)	N/A	2,814 (12.5)	2,940 (13.1)	6,125 (27.2)	5,635 (25.1)
	or 3/4 (19.1)	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)	or 13/16 (20.6)	3 (76.2)	N/A	5,030 (22.4)	4,250 (18.9)	8,855 (39.4)	7,440 (33.1)
	or 7/8 (22.2)	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)	or 15/16 (23.8)	3-1/2 (88.9)	N/A	5,230 (23.3)	5,800 (25.8)	12,760 (56.8)	10,730 (47.7)
	or 1 (25.4)	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)	or 1-1/16 (27.0)	4 (101.6)	N/A	8,288 (36.9)	7,590 (33.8)	15,810 (70.3)	13,285 (59.1)
	or 1-1/8 (28.6)	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)	or 1-5/16 (33.3)	5 (127.0)	N/A	8,288 (36.9)	11,900 (52.9)	24,790 (100.3)	18,840 (83.8)
	or 1-3/8 (34.9)	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.

PERFORMANCE TABLE

A7 Acrylic Adhesive — Average Ultimate Tension and Shear Loads[1,2] for Threaded Rod Installed in Grout Filled Concrete Block

THREADED ROD DIA. In. (mm)	DRILL HOLE DIAMETER In. (mm)	EMBEDMENT DEPTH In. (mm)	ANCHOR LOCATION	ULTIMATE TENSION Lbs. (kN)	ULTIMATE SHEAR Lbs. (kN)
1/2 (12.7)	5/8 (15.9)	4-1/4 (108.0)	GROUTED CELL	5,170 (23.0)	8,500 (37.8)
5/8 (15.9)	3/4 (19.1)	5 (127.0)	GROUTED CELL	6,320 (28.1)	10,850 (48.3)
3/4 (19.1)	7/8 (22.2)	6-5/8 (168.3)	GROUTED CELL	10,910 (48.5)	17,075 (76.0)

1 Allowable working loads for the single installations should not exceed 25% (an industry standard) capacity or the allowable load of the anchor rod. Loads based upon testing with ASTM A193, Grade B7 rods.

2 The tabulated values are for anchors installed at minimum 12 inch edge distance and minimum 8 inch spacing.

3 For hollow walls, see umbrella and screen section.

PERFORMANCE TABLE

A7 Acrylic Adhesive — Average Ultimate Tension and Shear Loads[1] for Threaded Rod Installed in Grouted[2] Brick Masonry Constructed of Solid Red Brick Units

THREADED ROD DIA. In. (mm)	DRILL HOLE DIAMETER In. (mm)	EMBEDMENT DEPTH In. (mm)	ANCHOR LOCATION	ULTIMATE TENSION Lbs. (kN)	ULTIMATE SHEAR Lbs. (kN)
1/4 (6.4)	3/8 (9.5)	3-1/2 (88.9)	CENTER OF	2,130 (9.5)	1,165 (5.2)
		6 (152.4)	BRICK FACE	3,575 (15.9)	1,550 (6.9)
3/8 (9.5)	1/2 (12.7)	3-1/2 (88.9)	CENTER OF	2,130 (9.5)	4,150 (18.5)
		6 (152.4)	BRICK FACE	8,875 (39.5)	6,950 (30.9)
1/2 (12.7)	5/8 (15.9)	3-1/2 (88.9)	CENTER OF	2,130 (9.5)	3,090 (13.7)
		6 (152.4)	BRICK FACE	12,155 (54.1)	7,910 (35.2)

1 Allowable working loads for the single installations should not exceed 25% (an industry standard) capacity or the allowable load of the anchor rod. Loads based upon testing with ASTM A193, Grade B7 rods.

2 Void between brick wythes was grouted solid; therefore the use of screens was not necessary.

PERFORMANCE TABLE

A7 Acrylic Adhesive — Average Ultimate Tension Loads[1,2,3] for Reinforcing Bar Installed in Solid Concrete

REINFORCING BAR DIA. In. (mm)	EMBEDMENT IN CONCRETE In. (mm)	2000 PSI (13.8 MPa) CONCRETE ULTIMATE TENSION Lbs. (kN)	4000 PSI (27.6 MPa) CONCRETE ULTIMATE TENSION Lbs. (kN)	ULTIMATE TENSILE AND YIELD STRENGTH GRADE 60 REBAR	
				MINIMUM YIELD STRENGTH Lbs. (kN)	MINIMUM ULTIMATE TENSILE STRENGTH 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	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	57,221 (254.5)	60,000 (266.9)	90,000 (400.4)
	13-1/2 (342.9)	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 installations 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.

PERFORMANCE TABLE

A7 Acrylic Adhesive — Recommended Edge Distance Requirements for Shear Loads Installed in Solid Concrete

ANCHOR DIAMETER In. (mm)	EMBEDMENT DEPTH In. (mm)	CRITICAL EDGE DISTANCE In. (mm) 100% LOAD CAPACITY)	INTERPOLATED EDGE DISTANCE In. (mm) (80% LOAD CAPACITY)	INTERPOLATED EDGE DISTANCE In. (mm) (50% LOAD CAPACITY)	MINIMUM EDGE DISTANCE In. (mm) (10% LOAD CAPACITY)
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)

Combined Tension and Shear Loading—for A7 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

PERFORMANCE TABLE

A7 Acrylic Adhesive

Recommended Edge Distance Requirements for Tension Loads Installed in Solid Concrete

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

PERFORMANCE TABLE

A7 Acrylic Adhesive

Recommended Spacing Requirements for Tension Loads Installed in Concrete, Lightweight Concrete and Hollow Block

ANCHOR DIAMETER In. (mm)	EMBEDMENT DEPTH In. (mm)	CRITICAL SPACING In. (mm) (100% LOAD CAPACITY)	INTERPOLATED SPACING In. (mm) (90% LOAD CAPACITY)	MINIMUM SPACING In. (mm) (80% LOAD CAPACITY)
3/8 (9.5)	3-3/8 (85.7) 4-1/2 (114.3)	4-3/16 (106.4) 5-5/8 (142.9)	2-1/2 (63.5) 3-3/8 (85.7)	13/16 (20.6) 1-1/8 (28.6)
1/2 (12.7)	4-1/2 (114.3) 6 (152.4)	5-5/8 (142.9) 7-1/2 (190.5)	3-3/8 (85.7) 4-1/2 (114.3)	1-1/8 (28.6) 1-1/2 (38.1)
5/8 (15.9)	5-5/8 (142.9) 7-1/2 (190.5)	7 (177.8) 9-3/8 (238.1)	4-3/16 (106.4) 5-5/8 (142.9)	1-3/8 (34.9) 1-7/8 (47.6)
3/4 (19.1)	6-3/4 (171.5) 9 (228.6)	8-7/16 (214.3) 11-1/4 (285.8)	5 (127.0) 6-3/4 (171.5)	1-5/8 (41.3) 2-1/4 (57.2)
1 (25.4)	9 (228.6) 12 (304.8)	11-1/4 (285.8) 15 (381.0)	6-3/4 (171.5) 9 (228.6)	2-1/4 (57.2) 3 (76.2)
1-1/4 (31.8)	11-1/4 (285.8) 15 (381.0)	14-1/16 (357.2) 18-3/4 (476.3)	8-1/2 (215.9) 11-1/4 (285.8)	2-7/8 (73.0) 3-3/4 (95.3)

A7 Adhesive Edge/Spacing Distance Load Factor Summary for Installation of Threaded Rod and Reinforcing Bar [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

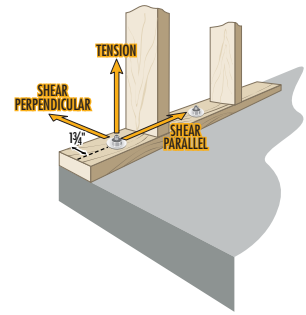
LOAD FACTOR	DISTANCE FROM ANOTHER ANCHOR
Critical Spacing—Tension	
100% Tension Load →	1.25 x Anchor Embedment
Minimum Spacing—Tension	
80% Tension Load →	0.25 x Anchor Embedment
Critical Spacing—Shear	
100% Shear Load →	1.25 x Anchor Embedment
Minimum Spacing—Shear	
25% Shear Load →	0.25 x Anchor Embedment

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.

RED HEAD®
ADHESIVE ANCHORING SPECIALISTS

A7 Adhesive for Sill Plate Attachments



PERFORMANCE TABLE

A7 Acrylic Adhesive — Average Ultimate Tension and Shear[1,2,3] for Threaded Rods in Solid Concrete Floors and Stemwalls at 1-3/4" Edge Distance

ANCHOR DIAMETER	DRILL HOLE DIAMETER In. (mm)	EMBEDMENT In. (mm)	2000PSI (13.8 MPa) CONCRETE		
			SHEAR LOAD DIRECTION	ULTIMATE TENSION Lbs. (kN)	ULTIMATE SHEAR Lbs. (kN)
1/2 (12.7)	9/16 (14.3)	4-1/2 (114.3)	Perpendicular	9,180 (40.8)	1,760 (7.8)
			Parallel	9,180 (40.8)	7,240 (32.2)
5/8 (15.9)	11/16 (17.5) or 3/4 (19.1)	5-5/8 (142.9)	Perpendicular	13,620 (60.6)	2,540 (11.3)
			Parallel	13,620 (60.6)	8,778 (39.0)
		10 (254.0)	Perpendicular	20,700 (92.1)	2,540 (11.3)
			Parallel	20,700 (92.1)	8,799 (39.1)
3/4 (19.1)	13/16 (20.6) or 7/8 (22.2)	6-3/4 (171.4)	Perpendicular	15,080 (67.1)	2,080 (9.2)
7/8 (22.2)	15/16 (23.8) or 1 (25.4)	15 (381.0)	Perpendicular	29,940 (133.2)	2,080 (9.2)
			Parallel	29,940 (133.2)	7,101 (31.6)

1 Allowable working loads for the single installations 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 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.

A7 Acrylic Adhesive — Allowable Tension Loads[1] at 1-3/4" Edge Distance for Threaded Rods in Solid Concrete Floors and Stemwalls

ANCHOR DIAMETER In. (mm)	DRILL HOLE DIAMETER In. (mm)	EMBEDMENT DEPTH In. (mm)	ALLOWABLE TENSION LOAD BASED ON ADHESIVE BOND STRENGTH	ALLOWABLE TENSION LOAD BASED ON STEEL STRENGTH		
			2000 PSI (13.8 MPa) CONCRETE Lbs. (kN)	ASTM A307 (SAE 1018) Lbs. (kN)	ASTM A193 GR. B7 (SAE 4140) Lbs. (kN)	ASTM F593 AISI 304 SS Lbs. (kN)
1/2 (12.7)	9/16 (14.3)	4-1/2 (114.3)	2,295 (10.2)	3,730 (16.6)	7,780 (34.6)	7,155 (31.8)
5/8 (15.9)	11/16 (17.5)	5-5/8 (142.9)	3,405 (10.7)	5,870 (26.1)	12,230 (54.4)	11,250 (50.0)
	or 3/4 (19.1)	10 (254.0)	5,175 (23.0)	5,870 (26.1)	12,230 (54.4)	11,250 (50.0)
3/4 (19.1)	13/16 (20.6) or 7/8 (22.2)	6-3/4 (171.4)	3,770 (16.8)	8,490 (37.8)	17,690 (78.7)	14,860 (66.1)
7/8 (22.2)	15/16 (23.8) or 1 (25.4)	15 (381.0)	7,485 (33.3)	11,600 (51.6)	25,510 (113.5)	20,835 (92.7)

1 Use lower value of either bond or steel strength for allowable tensile load.
2 Linear interpolation may be used for intermediate spacing and edge distances.

A7 Acrylic Adhesive — Allowable Shear Loads[1] at 1-3/4" Edge Distance for Threaded Rods in Solid Concrete Floors and Stemwalls

ANCHOR DIAMETER In. (mm)	DRILL HOLE DIAMETER In. (mm)	EMBEDMENT DEPTH In. (mm)	SHEAR LOAD DIRECTION	ALLOWABLE SHEAR LOADS BASED ON CONCRETE STRENGTH	ALLOWABLE SHEAR LOAD BASED ON STEEL STRENGTH		
				2000 PSI (13.8 MPa) CONCRETE Lbs. (kN)	ASTM A307 (SAE 1018) Lbs. (kN)	ASTM A193 GR. B7 (SAE 4140) Lbs. (kN)	ASTM F593 AISI 304 SS Lbs. (kN)
1/2 (12.7)	9/16 (14.3)	4-1/2 (114.3)	Perpendicular	440 (1.9)	1,870 (8.3)	3,895 (17.3)	3,585 (15.9)
			Parallel	1,810 (8.0)	1,870 (8.3)	3,895 (17.3)	3,585 (15.9)
5/8 (15.9)	11/16 (17.5) or 3/4 (19.1)	5-5/8 (142.9)	Perpendicular	635 (2.8)	2,940 (13.1)	6,125 (27.2)	5,635 (25.1)
			Parallel	2,195 (9.8)	2,940 (13.1)	6,125 (27.2)	5,635 (25.1)
		10 (254.0)	Perpendicular	635 (2.8)	2,940 (13.1)	6,125 (27.2)	5,635 (25.1)
			Parallel	2,200 (9.8)	2,940 (13.1)	6,125 (27.2)	5,635 (25.1)
3/4 (19.1)	13/16 (20.6) or 7/8 (22.2)	6-3/4 (171.4)	Perpendicular	600 (2.7)	4,250 (18.9)	8,855 (39.4)	7,440 (33.1)
7/8 (22.2)	15/16 (23.8) or 1 (25.4)	15 (381.0)	Perpendicular	520 (2.3)	5,800 (25.8)	12,760 (56.8)	10,730 (47.7)
			Parallel	1,775 (7.9)	5,800 (25.8)	12,760 (56.8)	10,730 (47.7)

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