

DIVISION: 04 00 00—MASONRY
Section: 04 05 19.16—Masonry Anchors

REPORT HOLDER:

MITEK® INC.
16023 SWINGLEY RIDGE ROAD
CHESTERFIELD, MISSOURI 63017
(800) 328-5934
www.mitek-us.com
uspcustomerservice@mii.com

EVALUATION SUBJECT:

CIA-GEL 7000 EPOXY ANCHOR SYSTEM

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2018, 2015, 2012, 2009, and 2006 *International Building Code®* (IBC)
- 2018, 2015, 2012, 2009, and 2006 *International Residential Code®* (IRC)
- 2018, 2015, 2012, 2009, and 2006 *International Existing Building Code®* (IEBC)

For evaluation for compliance with codes adopted by Los Angeles Department of Building and Safety (LADBS), see [ESR-1702 LABC and LARC Supplement](#).

Properties evaluated:

Structural

2.0 USES

The CIA-Gel 7000 epoxy anchor system is used as anchorage to anchor building components to fully grouted CMU masonry walls and unreinforced brick masonry walls. The anchors in CMU masonry walls can resist static, wind, and earthquake loads as noted in Section 4.1.1 and 4.1.2 of this evaluation report. The anchors in unreinforced brick masonry walls are intended to resist short-term loads only imposed by wind or earthquake as noted in Section 4.1.1 and 4.1.3 of this report. The anchor system is an alternative to Section 8.1.3 (2016 or 2013 Edition) or Section 2.1.4 (2011, 2008 or 2005 edition) of TMS 402/ACI 530/ASCE 5, as applicable, as referenced in Section 2107 of the IBC. The anchor system is an alternative to Section A107.4 and Section A113.1 of the IEBC. The anchor system may also be used where an engineered design is submitted in accordance with Section R301.1.3 of the IRC.

3.0 DESCRIPTION

3.1 General:

The CIA-Gel 7000 adhesive anchors consist of CIA-Gel 7000 epoxy and a threaded steel rod, with a nut and washer, or a deformed steel reinforcing bar where applicable. For an installation in unreinforced brick masonry, it also includes a wire mesh screen tube, and a steel sleeve and plate washer, where applicable. The installations are described in Sections 4.1.2 and 4.1.3 of this report.

3.2 Materials:

3.2.1 CIA-Gel 7000 Adhesive: The CIA-Gel 7000 is a two-component structural epoxy adhesive that is packaged in equal-volume, side-by-side plastic cartridges or a universal type cartridge. Available cartridge sizes include total mixed volume of 8.3 ounces (250 mL) for GEL7-10 and 21.2 ounces (639 mL) for GEL7-22. The cartridges are sealed individually with D-shaped plugs and/or a screw-on cap, which may be reused after partial use of contents. The epoxy is mixed when dispensed through a spiral motionless mixer attached to the cartridge. The nozzle must be replaced after the adhesive working time has elapsed. The epoxy must be dispensed with either a manual or a pneumatically activated tool. The CIA-Gel 7000 epoxy adhesive components have a shelf life of two years when stored in a dry environment at a temperature of 70°F (21°C). The hardening times are noted in Table 3.

3.2.2 Threaded Rods: All thread rods must be carbon steel, manufactured from steel complying with ASTM A307, Grade C [$F_u = 60,000$ psi (400 MPa), minimum] or ASTM A193, Grade B7, [$F_u = 125,000$ psi (860 MPa), minimum]. Specifications and installation details for threaded rods are noted in Table 1.

3.2.3 Reinforcing Bars: Deformed reinforcement bars are manufactured from steel complying with ASTM A615, Grade 60. Specifications and installation details for reinforcing bars are noted in Table 2 in this report.

3.2.4 Hole Cleaning Equipment: Hole cleaning equipment consists of hole cleaning brushes and air nozzles. Air nozzles and brushes must reach the bottom of the drilled holes.

3.2.5 Screen Tubes: The wire mesh screen tubes are used in unreinforced brick masonry walls to confine the adhesive around the anchor and prevent it from running into voids. The mesh has been designed to allow the correct amount of epoxy to penetrate into the brick wall and to form a cohesive bond between the anchor and the screen tube and between the screen tube and the brick

wall. Refer to Figure 2 for the correct size (diameter and length) and MiTek Model number of the screen tube for the load combinations shown.

3.2.6 Steel Sleeve: The steel sleeves are used in unreinforced brick masonry walls to reinforce “through-bolt” anchor connections subjected to a combination of shear and tension forces. The sleeve has a $1^{3/16}$ -inch (21 mm) O.D., an $1^{1/16}$ -inch (17 mm) I.D., and is 8 inches (203 mm) in length and made from AISI 1010 steel. The sleeve is closed on the inserted end with a plastic cap. It is specifically intended to be used in conjunction with a $1^{5/16}$ -inch-by-8-inch (24 mm by 203 mm) wire mesh screen tube inserted inside. Refer to Figure 2, Configuration C for the MiTek Model number.

3.2.7 Steel Plate Washer: The plate washers are used in unreinforced brick masonry walls for “through-bolt” configuration only. Refer to Figure 2, Configuration C. The steel plate washers must be ASTM A36 steel, measuring 6 inches by 6 inches by $3/8$ inch thick (152 mm by 152 mm by 9.5 mm).

3.2.8 Fully Grouted CMU Masonry: Fully grouted CMU masonry must comply with Chapter 21 of the IBC. The compressive strength of masonry, f'_m , at 28 days must be a minimum of 1,500 psi (10.3 MPa) at the time of anchor installation. Fully grouted masonry systems must be constructed from the following materials:

3.2.8.1 Concrete Masonry Units (CMUs): CMUs must be minimum Grade N Type II, light-, medium-, or normal-weight conforming to ASTM C90. The minimum nominal size of the CMUs must be 8 inches wide by 8 inches high by 16 inches long.

3.2.8.2 Mortar: Mortar must be Type N (minimum) in accordance with Section 2103 of the IBC, Section R606.2.8 of the 2018 IRC, Section R606.2.7 of the 2015 IRC, or Section R607.1 of the 2012, 2009 and 2006 IRC, as applicable.

3.2.8.3 Grout: Grout must comply with 2018 and 2015 IBC Section 2103.3, or 2012 IBC Section 2103.13, 2009 or 2006 IBC Section 2103.12, 2018 IRC Section R606.2.12, 2015 IRC Section R606.2.11, or 2012, 2009 and 2006 IRC Section R609.1.1, as applicable. Alternatively, the grout must have a minimum compressive strength, when tested in accordance with ASTM C1019, equal to its specified strength, but not less than 2,000 psi (13.8 MPa).

3.2.9 Unreinforced Brick Masonry: The existing unreinforced brick masonry walls must have a minimum thickness of 13 inches (330 mm) (three wythes of brick). The average in-place mortar shear strength of the building's unreinforced masonry, determined in accordance with 2018 IBC Section A106.2.3 or 2015, 2012, 2009 or 2006 IBC Section A106.3.3, as applicable, must be no less than 50 psi (345 kPa) net.

4.0 DESIGN AND INSTALLATION

4.1 Design:

4.1.1 General: Allowable tension and shear values for threaded rods or reinforcing bars are listed in Tables 4, 5, and 7 in this report. The allowable tension load values noted in Table 4 must be adjusted for in-service temperatures in accordance with Figure 1, when anchors are installed in locations where the masonry temperatures may exceed 70°F (21°C). Anchors installed or cured at temperature below 40°F (4°C) are outside the scope of this report. Allowable loads for anchors subjected to combined shear and tension forces must be determined by the following equation:

$$\left(\frac{P_s}{P_t}\right)^n + \left(\frac{V_a}{V_t}\right)^n \leq 1.0$$

where:

- P_s = Applied service tensile load.
- P_t = Allowable service tensile load.
- V_a = Applied service shear load.
- V_t = Allowable service shear load.
- n = 1 for unreinforced brick masonry.
- n = $5/3$ for CMU masonry.

4.1.2 Installation in Fully Grouted CMU Masonry

Walls: Installation of the CIA-Gel 7000 Epoxy Anchor System must conform to the manufacturer's printed installation instructions (MPII) included in each unit package and reproduced in Figure 3 of this report. A hole is drilled to the specified depth with a handheld electro-pneumatic rotary hammer drill using carbide-tipped drill bits conforming to ANSI Specification B212.15-1994. The holes must be cleaned of dust and debris with a nylon brush and a jet of compressed air. The hole diameter, anchor embedment, spacing and edge distances must comply with Table 4 in this report. A mixing nozzle must be attached to the adhesive cartridge and the assembly placed into the hand or pneumatic injection tool. Before placement into the hole, a small amount of epoxy must be pumped out of the nozzle until a uniform gray material is achieved. Holes must be approximately half-filled with the mixed epoxy. The threaded rods must be inserted with a rotating motion until the anchor contacts the bottom of the hole. The adhesive must be level with the masonry surface after insertion of the rod or bar. Oil, scale, and rust must be removed from the threaded rod prior to installation. During anchor installation, the hole and surrounding location must be dry, and any standing water must be removed from the hole. Anchors must not be loaded until cure time has passed.

CIA-Gel 7000 adhesive may be installed in unreinforced, fully grouted CMU masonry walls, utilizing $3/8$ -inch-, $1/2$ -inch-, $5/8$ -inch- and $3/4$ -inch-diameter (9.5 mm, 12.7 mm, 15.9 mm and 19.1 mm) anchors designed to resist tension and shear loads. The anchors are threaded rods as described in Section 3.2.2. The existing unreinforced CMU masonry walls must have a minimum thickness of 8 inches (203 mm). Allowable loads, embedment depths, and end and edge distances are noted in Table 4.

4.1.3 Installation in Unreinforced Brick Masonry Walls:

4.1.3.1 General: Anchors installed in unreinforced masonry using the CIA-Gel 7000 adhesive must be designed to resist wind or seismic loads only. The existing unreinforced brick walls must have a minimum thickness of 13 inches [330 mm (3 wythes of brick)].

Three types of anchor assemblies can be used for retrofitting. The anchor assembly resisting shear load where the outside wall is inaccessible is the “shear” anchor (Configuration A). The assembly consists of a $3/4$ -inch-diameter (19.1 mm) ASTM A307 threaded rod or a No. 6, No. 5 or No. 4 reinforcing bar and a $1^{5/16}$ -inch-diameter-by-8-inch-long (23.8 mm by 203 mm) wire mesh screen tube. Figure 2 (Configuration A) provides details of an installed “shear” anchor.

The anchor assembly resisting tension and shear loads where the outside of the wall is not accessible is the “combination” anchor (Configuration B). The anchor must be installed in the wall at an angle of $22^{1/2}$ degrees to the

horizontal. The anchor consists of a $\frac{3}{4}$ -inch-diameter (19.1 mm) ASTM A307 prebent threaded rod used with a $\frac{15}{16}$ -inch-outer-diameter (23.8 mm) screen tube, 13 inches (330 mm) long and made of steel wire cloth. The threaded rod must be embedded a minimum of 13 inches (330 mm) at the $22\frac{1}{2}$ -degree angle. Figure 2 (Configuration B) of this report provides details of an installed “combination” anchor.

The anchor assembly for tension and shear applications where the outside of the wall is accessible is the “through-bolt” anchor (Configuration C). The assembly consists of $\frac{5}{8}$ -inch-diameter (15.9 mm) ASTM A307 threaded rod; a $\frac{13}{16}$ -inch-outside-diameter-by- $\frac{11}{16}$ -inch-inside diameter (20.6 mm by 17.5 mm) AISI 1010 steel sleeve, 8 inches (203 mm) in length; a $\frac{15}{16}$ -inch-diameter-by-8-inch-long (23.8 mm by 203 mm) wire mesh screen tube; and an ASTM A36 steel plate washer measuring 6 inches by 6 inches by $\frac{3}{8}$ inch (152 mm by 152 mm by 9.5 mm). The plate washer must be bolted to the opposite side of the wall. The steel sleeve has a plastic plug at one end to prevent leakage of adhesive during installation. Figure 2 (Configuration C) provides details of an installed “through-bolt” anchor.

4.1.3.2 Installation: Installation of the CIA-Gel 7000 Epoxy Anchor System must conform to the manufacturer’s printed instructions (MPII) included in each unit package and reproduced in Figure 3 of this report. One-inch-diameter (25.4 mm) holes must be drilled using standard carbide-tipped masonry drill bits which meet ANSI Specification B212.15-1994. A rotary drill, or rotary hammer drill set on “rotation only,” must be used to drill the holes.

Holes for the “combination” anchors (Figure 2, Configuration B in this report) must be drilled 13 inches (330 mm) deep at a $22\frac{1}{2}$ -degree angle. Holes for the “through-bolt” anchors (Figure 2, Configuration C) and the “shear” anchors (Figure 2, Configuration A) must be drilled perpendicular to the wall. For the “through-bolt” anchors, the holes must be drilled completely through the wall. For “shear” anchors, the holes must be drilled 8 inches (203 mm) deep. The holes must be cleaned using a nylon brush and a jet of compressed air. An extension nozzle must be used to reach the back of the hole with compressed air.

Screen tubes must be completely filled with CIA-Gel 7000 epoxy and placed into the drilled holes. A $\frac{3}{4}$ -inch-diameter (19.1 mm) threaded rod for the “combination” anchors and “shear” anchors, and $\frac{13}{16}$ -inch-diameter (21 mm) steel sleeves for the “through-bolt” anchors, must be slowly pushed into the screen tube, while being rotated continuously. The anchors or steel sleeves must be allowed to cure for the times listed in Table 3 before anchors are loaded. Bolt-up time refers to that period of cure after which hardware may be placed and nuts snug tightened. Care must be taken not to overtighten nuts nor to induce tension in the bolts. Design loads may not be applied until minimum cure time has been reached.

For the through-bolted anchor, a 1-inch-diameter (25.4 mm), 8-inch-deep (203 mm) hole must be drilled and cleaned as noted above. A $\frac{13}{16}$ -inch-outside-diameter (21 mm) steel sleeve must be pushed into an adhesive-filled screen in a manner similar to that for the rod. After curing, a $\frac{5}{8}$ -inch-diameter hole must be drilled through the bottom of the sleeve and through the remainder of the masonry wall. Drilling must be continued until the entire wall is penetrated. The $\frac{5}{8}$ -inch-diameter (15.9 mm) rod must be inserted and fitted with a plate and nut to complete

the through-bolted anchor connection. See Figure 2, Configuration C, for additional details.

4.1.3.3 Conditions of Acceptance: Conditions of acceptance for threaded rods and reinforcing bars in unreinforced brick masonry must be as follows:

4.1.3.3.1 Threaded Rods in Tension and Shear for “Combination” Anchors or “Through-bolt” Anchors (See Table 7):

- Installation of threaded rods must comply with Sections 4.1.3.1 and 4.1.3.2 of this report.
- Maximum allowable tension load for the $\frac{3}{4}$ -inch-diameter (19.1 mm) bent threaded rod or the $\frac{5}{8}$ -inch-diameter (15.9 mm) through-bolt is 1,200 pounds (5340 N), with no increase for lateral loading.
- The maximum allowable shear load for the $\frac{3}{4}$ -inch-diameter (19.1 mm) bent threaded rod is 1,000 pounds (4450 N) and for the $\frac{5}{8}$ -inch (15.9 mm) through-bolt is 750 pounds (3338 N), with no increase for lateral loading permitted.
- For the $\frac{3}{4}$ -inch-diameter (19.1 mm) bent threaded rod or the $\frac{5}{8}$ -inch-diameter (15.9 mm) through-bolt subjected to tension and shear, the allowable combined load must be determined using the equation in Section 4.1.1 in this report.
- Minimum wall thickness must be 13 inches [330 mm (three wythes of brick)].
- The allowable tension and shear are applicable only to anchors installed in walls where in-place shear tests indicate a minimum mortar strength of 50 psi (345 kPa) net in accordance with 2018 IEBC Section A106.2.3 or 2015, 2012, 2009 or 2006 IEBC Section A106.3.3 as applicable. Testing must be conducted in accordance with 2018 IEBC Section A106.2.3 or 2015, 2012, 2009 or 2006 IEBC Section A106.3.3 as applicable.

4.1.3.3.2 Threaded Rods or Reinforcing Bars in Shear Only (See Table 7):

- Installation of threaded rods and reinforcing bars intended to resist shear only must comply with Section 4.1.3.
- The allowable shear load for the $\frac{3}{4}$ -inch-diameter (19.1 mm) rod is 1,000 pounds (4450 N), and for the No. 6, No. 5 and No. 4 reinforcing bars the allowable shear loads are 1,000, 750 and 500 pounds (4450, 3338 and 2225 N), respectively. No increase for lateral loading is permitted with the above-noted loads.
- Minimum wall thickness must be 13 inches [339 mm (three wythes of brick)].
- Allowable shear value is applicable only to anchors installed in walls where in-place shear tests indicate a minimum mortar strength of 50 psi (345 kPa) net, in accordance with 2018 IEBC Section A106.2.3 or 2015, 2012, 2009 or 2006 IEBC Section A106.3.3 of the IEBC. Testing must be conducted in accordance with 2018 IEBC Section A106.2.3 or 2015, 2012, 2009 or 2006 IEBC Section A106.3.3 as applicable.

4.1.3.4 Miscellaneous: The CIA-Gel 7000 Adhesive Anchors installed in unreinforced brick masonry walls are intended for resisting short-term lateral loads only, such as wind or seismic loads. The anchors must be approved by the registered design professional and installed under special inspection in accordance with Section 4.4 in this report.

The anchor edge distances and vertical and horizontal spacings for the three types of anchor assemblies described in Section 4.1.3.1, must comply with Table 6.

4.2 Special Inspection:

4.2.1 Installation in Fully Grouted CMU Masonry Walls: Adhesive anchor installations require periodic special inspection in accordance with Sections 1704 and 1705 of the IBC, which are also applicable for installations under the IRC. The approved special inspector must be on the jobsite initially during anchor installation to verify anchor type, anchor dimensions, adhesive identification and expiration date, masonry type and strength, anchor diameter and steel grade, compliance of drill bit with this report, hole diameter and location, cleanliness of hole and anchor, adhesive application, anchor embedment, and verification that anchor installation is in accordance with the manufacturer's printed installation instructions (MPII) and this report. The manufacturer's instructions must be included in each package.

The special inspector must verify the initial installations of each type and size of adhesive anchor by construction personnel on site.

Subsequent installations of the same anchor type and size by the same construction personnel are permitted to be performed in the absence of the special inspector. Any change in the anchor product being installed or the personnel performing the installation requires an initial inspection. For ongoing installations over an extended period, the special inspector must make regular inspections to confirm correct handling and installation of the product.

4.2.2 Special Inspection Requirements for Installation in Unreinforced Brick Masonry Walls (IEBC):

Periodic inspection and direct-tension tests and calibrated torque wrench tests must be performed in accordance with Section A107.4 of the IEBC. In lieu of testing and periodic inspection, the IEBC permits continuous special inspection during installation of bolts resisting shear forces only.

4.3 Field Test Requirements for Installation in Unreinforced Brick Masonry Walls:

- a. Tests for in-place mortar shear strength of the building must be done in accordance with 2018 IEBC Section A106.2.3 or 2015, 2012, 2009, 2006 IEBC Section A106.3.3, as applicable. In-place mortar shear strength testing shall indicate a minimum mortar strength of 50 psi (345 kPa).
- b. Anchors resisting tension forces or a combination of tension and shear forces must be tested in accordance with Section A107.4 of the IEBC. The test report must include:
 1. Test location(s)
 2. Brick/mortar condition
 3. Bolt movement/elongation
 4. Embedment depth and masonry wall thickness
 5. Applied load, loading procedure, load increments, and rate of loading.

5.0 CONDITIONS OF USE

The anchoring systems described in this report are suitable alternatives to what is specified in those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 The allowable tension and shear values in Table 4 must be multiplied by a factor of 0.65 for o freezing and thawing conditions.

- 5.2 The anchors must be installed in accordance with this report and the manufacturer's published installation instructions. The anchor size, minimum embedment depths, spacing, and edge distances must conform to what is shown in the applicable tables in this report. In case of conflict between this report and the manufacturer's published installation instructions, this report governs.

- 5.3 Prior to installation, calculations and details verifying compliance with the applicable code and this report must be submitted to the building official. The calculations must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

- 5.4 Because an ICC-ES acceptance criteria for adhesive and undercut anchors subjected to fatigue or shock loading is unavailable at this time, the use of these anchors under these conditions is beyond the scope of this report.

- 5.5 Anchors are not permitted to support fire-resistance-rated construction. Where not otherwise prohibited by the code, anchors are permitted for installation in fire-resistance-rated construction provided that at least one of the following conditions is fulfilled:

- Anchors are used to resist wind or seismic forces only.
- Anchors that support gravity load-bearing structural elements are within a fire-resistance-rated envelope or a fire-resistance-rated membrane, are protected by approved fire-resistance-rated materials, or have been evaluated for resistance to fire exposure in accordance with recognized standards.
- Anchors are used to support nonstructural elements.

- 5.6 Because an ICC-ES acceptance criteria for anchors in cracked masonry is unavailable at this time, the use of anchors is limited to installation in uncracked masonry. Cracking occurs when $f_t > f_r$ due to service loads or deformations.

- 5.7 Grouted CMU Masonry under the IBC or the IRC: The adhesive anchors described in Section 4.1.2 are capable of resisting seismic and wind loads. When using the basic load combinations in accordance with IBC Section 1605.3.1, allowable loads are not permitted to be increased for seismic or wind loading. When using the alternative basic load combinations in 2009 and 2006 IBC Section 1605.3.2 that include seismic or wind loads, the allowable shear and tension loads in Table 4 for anchors are permitted to be increased by $33\frac{1}{3}$ percent, or the alternative basic load combinations may be reduced by a factor of 0.75. For the 2018, 2015 and 2012 IBC, the allowable loads or load combinations are not permitted to be adjusted.

- 5.8 Adhesive anchors may be used to resist tension and shear forces in wall installations only if consideration is given to the effects of elevated temperature conditions on anchor performance. Figure 1 shows load reductions for elevated temperatures.

- 5.9 The use of the CIA-Gel 7000 adhesive anchors in conjunction with carbon steel threaded rods and/or reinforcing bars is limited to interior dry exposure only.

- 5.10 Special inspection in accordance with Section 4.2 must be provided for all adhesive anchor installations.

5.11 For CIA-Gel 7000 adhesive anchors, during anchor installation, the hole and surrounding location must be dry. Damp or wet masonry, including the presence of standing water, is not permitted.

5.12 The CIA-Gel 7000 adhesive anchors are manufactured in Pompano Beach, Florida, under a quality control program with inspections by ICC-ES.

5.13 CIA-Gel 7000 epoxy anchors must not be used to resist pull-out loads in overhead installations.

6.0 EVIDENCE SUBMITTED

In addition to a quality control manual, the following evidence was submitted:

6.1 CIA-Gel 7000 Anchors:

Data in accordance with the ICC-ES Acceptance Criteria for Adhesive Anchors in Masonry Elements (AC58), dated March 2018, including reports of seismic tension and shear tests, freezing and thawing tests, creep tests, and in-service temperature tests.

6.2 CIA-Gel 7000 Anchors in Unreinforced Masonry:

Data in accordance with the ICC-ES Acceptance Criteria for Unreinforced Masonry Anchors (AC60), dated December 2009 (editorially revised October 2018).

7.0 IDENTIFICATION

7.1 The CIA-Gel 7000 must be identified by a label on the cartridge displaying the name and address of the manufacturer (MiTek), the words "CIA-Gel 7000," general installation instructions, the expiration date, the lot number and the evaluation report number (ESR-1702). Steel sleeves and screen tubes are identified by a label on boxes displaying the name and address of the manufacturer (MiTek), and the size and quantity of the contents. Threaded rods and bars must be identified by material certification.

**TABLE 1—SPECIFICATION AND INSTALLATION DETAILS FOR
THREADED ROD INSTALLED WITH CIA-GEL 7000 ADHESIVE**

PARAMETER	ROD DIAMETER, d (inches)			
	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
d_o Nominal bit diameter (in.)	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$
A_s Tensile stress area (in. ²)	0.0775	0.142	0.226	0.334
A_b Nominal area of rod (in. ²)	0.1042	0.1867	0.2935	0.4246
T_{max} Maximum tightening torque (ft.-lbs.)	0	0	0	0

For SI: 1 inch = 25.4 mm, 1 in.² = 645 mm², 1 ft-lbf = 1356 N-mm.

**TABLE 2—SPECIFICATION AND INSTALLATION DETAILS FOR
REINFORCING BAR (REBAR) INSTALLED WITH CIA-GEL 7000 ADHESIVE**

PARAMETER	REBAR SIZE, d_r		
	#4	#5	#6
d_a Nominal rebar diameter (in.)	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
A_{br} Nominal area of rebar (in. ²)	0.20	0.31	0.44
d_o Nominal bit diameter hole size (in.)	$\frac{5}{8}$	$\frac{3}{4}$	1

For SI: 1 inch = 25.4 mm.

TABLE 3—RECOMMENDED HARDENING TIMES FOR CIA-GEL 7000 ADHESIVE

TEMPERATURE (°F) ¹	BOLT-UP TIME (hours) ²	CURE TIME (hours) ³
40-50	12	72
51-60	8	48
61-70	6	36
71-80	4	24
>80	4	24

For SI: 1°C = 0.555(°F - 32).

¹Installation in substrates colder than 40°F is beyond the scope of this report since data has not been submitted for such applications.

²Section 4.1.3.2, third paragraph, explains bolt-up time.

³Minimum cure time is the time required for the adhesive to achieve full strength.

TABLE 4—ALLOWABLE TENSION AND SHEAR LOADS FOR THREADED ROD INSTALLED IN FULLY-GROUTED NORMAL-WEIGHT CMU MASONRY USING CIA-GEL 7000 (pounds)^{1,2,3,4}

ROD DIAMETER (inch)	DRILL DIAMETER (inch)	EMBEDMENT, h_{ef} (inches)	SPACING, s (inches)	EDGE DISTANCE, c (inches)	TENSION		SHEAR CELL (pounds)
					Cell (pounds)	Joint (pounds)	
$3/8$	$1/2$	$3 1/2$	$6 3/4$	$3 3/8$	1255	790	1170
$1/2$	$5/8$	$4 1/4$	9	4 1/2	1610	1060	1880
$5/8$	$3/4$	$4 7/8$	11 1/4	5 5/8	1980	1360	2270
$3/4$	$7/8$	$6 1/2$	13 1/2	6 3/4	1910	1200	2975

For SI: 1 inch = 25.4 mm, 1 lbf = 4.45 N, $1^{\circ}\text{C} = 0.555(^{\circ}\text{F} - 32)$.

¹Allowable load must be the lesser of bond or steel strength. See Table 5 for steel strength values.

²The tabulated values are for anchors installed at the specified spacing (s) and edge (c) distances. Linear interpolation may be used for intermediate spacings.

³The CIA-Gel 7000 experiences a reduction in capacity with increased ambient temperatures. The temperature load factors noted in Figure 1 must be applied to the tension and shear values when anchors are installed in locations where the masonry temperatures may exceed 70°F.

⁴The allowable loads are based on a factor of safety of 5.

TABLE 5—ALLOWABLE TENSION AND SHEAR LOADS FOR THREADED ROD BASED ON STEEL STRENGTH

ROD DIAMETER (inch)	STEEL STRENGTH IN TENSION (pounds)		STEEL STRENGTH IN SHEAR (pounds)	
	ASTM A307	ASTM A193 GR B7	ASTM A307	ASTM A193 GR B7
$3/8$	2185	4580	1125	2350
$1/2$	3885	8210	2000	4170
$5/8$	6070	12910	3125	6520
$3/4$	8740	18680	4500	9390

For SI: 1 inch = 25.4mm, 1psi = 6.89 kPa, 1 lbf = 4.45 N.

TABLE 6—MINIMUM SPACING AND EDGE DISTANCE FOR CIA-GEL 7000 ADHESIVE ANCHORS IN UNREINFORCED BRICK MASONRY (inches)

ANCHOR TYPE	MINIMUM VERTICAL SPACING	MINIMUM HORIZONTAL SPACING	MINIMUM EDGE DISTANCE
All types ¹	16	16	16

For SI: 1 inch = 25.4 mm.

¹"All types" refers to the three types of anchor assemblies described in Section 4.1.3 and Figure 2 of this report.

TABLE 7—ALLOWABLE LOAD CAPACITIES FOR THREADED RODS AND/OR REINFORCING BARS FOR CIA-GEL 7000 ADHESIVE ANCHOR SYSTEM INSTALLED IN UNREINFORCED BRICK MASONRY^{1,2}

CONFIGURATION A - SHEAR ANCHOR OR REBAR DOWEL				
Anchor Rod Diameter or Rebar Size	Minimum Embedment (inches)	Minimum Wall Thickness (inches)	Allowable Tension Load (lbs)	Allowable Shear Load (lbs)
$3/4$	8	13	-	1,000
No. 4	8	13	-	500
No. 5	8	13	-	750
No. 6	8	13	-	1,000
CONFIGURATION B - 22° COMBINATION ANCHOR				
Anchor Rod Diameter (inch)	Minimum Embedment	Minimum Wall Thickness (inches)	Allowable Tension Load ³ (lbs)	Allowable Shear Load (lbs)
$3/4$	Within 1 inch of opposite wall surface	13	1,200	1,000
CONFIGURATION C - THROUGH-BOLT ANCHOR				
Anchor Rod Dia. (inch)	Minimum Steel Sleeve Embedment	Minimum Wall Thickness (inches)	Allowable Tension Load (lbs)	Allowable Shear Load (lbs)
$5/8$	8-inch from interior wall surface	13	1,200	750

For SI: 1 inch = 25.4 mm, 1 lbf = 4.45 N, 1 foot-pound = 1.356 N-m, 1 psi = 6.89 Pa.

¹Allowable load values are applicable only to anchors where in-place shear tests indicate minimum mortar strength of 50 psi, net.

²No increase for lateral loading, such as loading induced by wind or earthquake, is permitted.

³Anchors must be tested in accordance with IEBC Section A107.4.

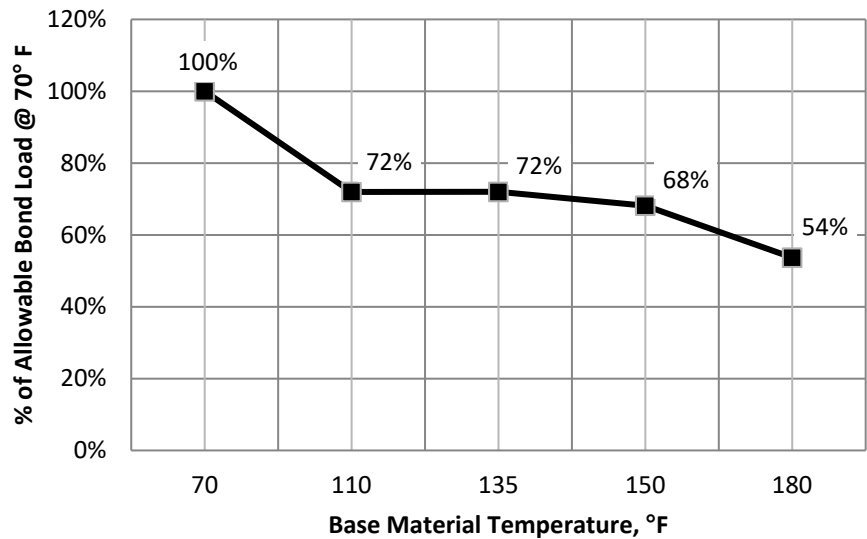


FIGURE 1—LOAD CAPACITY (TENSION AND SHEAR) BASED ON IN-SERVICE TEMPERATURE

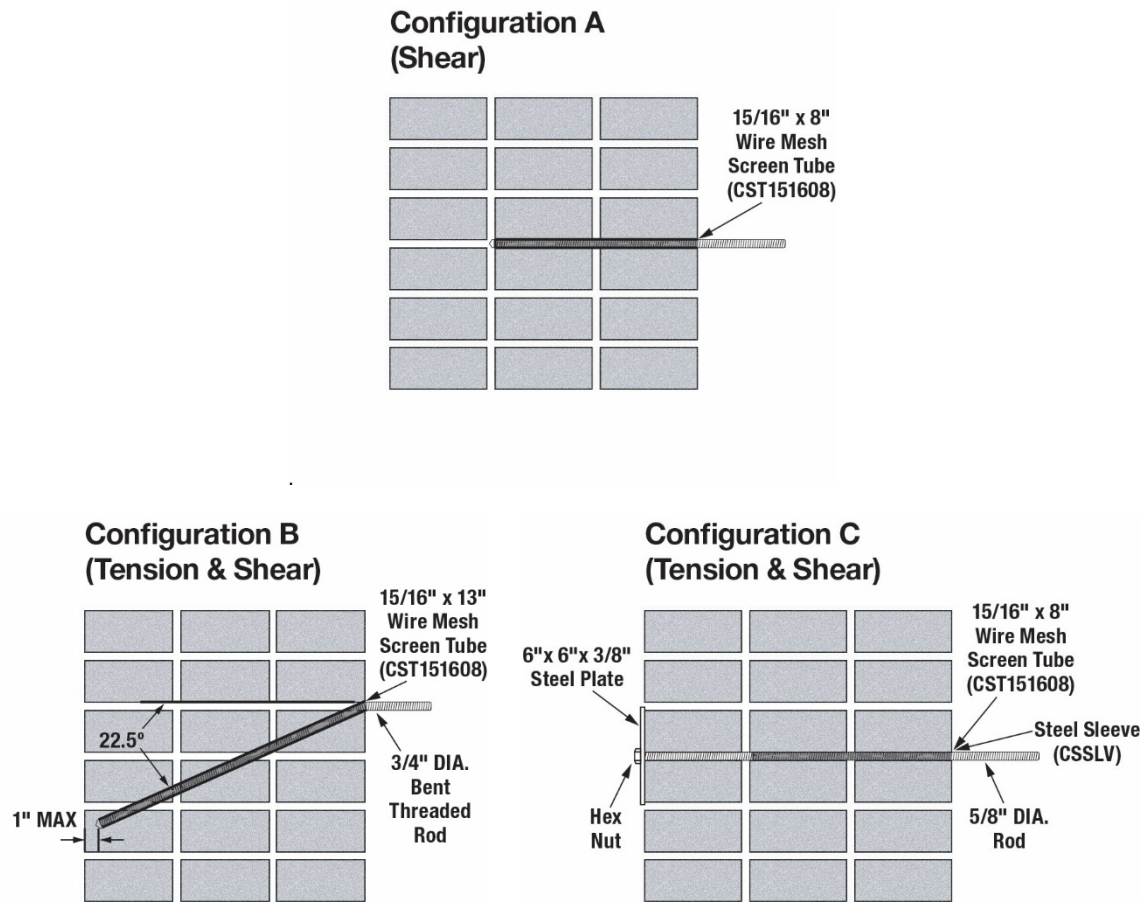


FIGURE 2—ANCHOR INSTALLATIONS FOR UNREINFORCED BRICK MASONRY
(Refer to Section 4.1.3 for details concerning design and installation of anchors in unreinforced brick masonry.)



CIA-GEL 7000

MPII INSTALLATION INSTRUCTIONS

Before commencing installation ensure the installer is equipped with appropriate personal protection equipment, SDS Hammer Drill, Air Lance, Hole Cleaning Brush, good quality dispensing tool – either manual or power operated, adhesive cartridge with mixing nozzle.

Important: check the expiration date on the cartridge (do not use expired material) and that the cartridge has been stored in its original packaging, the correct way up, in dry conditions (@ 70°F) out of direct sunlight.

Solid Substrate Installation Method

1. Using the SDS Hammer Drill in rotary hammer mode for drilling, with a carbide tipped drill bit conforming to ANSI B212.15-1994 of the appropriate size, drill the hole to the specified hole diameter and depth per Table 4 of ESR-1702.

2. Select the correct Air Lance, insert to the bottom of the hole and depress the trigger for 2 seconds. The compressed air must be clean – free from water and oil – and at a minimum pressure of 90 psi (6 bar).

Perform the blowing operation twice

3. Select the correct size Hole Cleaning Brush. Ensure that the brush is in good condition and the correct diameter. Insert the brush to the bottom of the hole, using a brush extension if needed to reach the bottom of the hole and withdraw with a twisting motion. There should be positive interaction between the steel bristles of the brush and the sides of the drilled hole.

Perform the brushing operation twice.

4. Repeat 2 (blowing operation) twice.

5. Repeat 3 (brushing operation) twice.

6. Repeat 2 (blowing operation) twice.

7. Select the appropriate static mixer nozzle, checking that the mixing elements are present and correct (**do not modify the mixer**). Attach mixer nozzle to the cartridge. Check the Dispensing Tool is in good working order. Place the cartridge into the dispensing tool.

Note: The 7C-XLMN nozzle is in two sections. One section contains the mixing elements and the other section is an extension piece. Connect the extension piece to the mixing section by pushing the two sections firmly together until a positive engagement is felt.

Note: CIA-GEL 7000 may only be installed between the temperatures of 40°F and 110°F. The product must be conditioned to a minimum of 60°F. For gel and cure time data, refer to Table 3 in ESR-1702.

8. Extrude some resin to waste until an even-colored mixture is extruded. The cartridge is now ready for use.

9. Insert the mixing nozzle to the bottom of the hole. Extrude the resin and slowly withdraw the nozzle from the hole. **Ensure no air voids are created** as the nozzle is withdrawn. Inject resin until the hole is approximately $\frac{3}{4}$ full and remove the nozzle from the hole.

10. Select the steel anchor element ensuring it is free from oil or other contaminants, and mark with the required embedment depth. Insert the steel element into the hole using a back and forth twisting motion to ensure complete cover, until it reaches the bottom of the hole. Excess resin will be expelled from the hole evenly around the steel element and there shall be no gaps between the anchor element and the wall of the drilled hole.

11. Clean any excess resin from around the mouth of the hole.

12. Do not disturb the anchor until at least the minimum cure time has elapsed. Refer to Table 3 in ESR-1702 to determine the appropriate cure time.

13. Position the fixture and tighten the anchor.

Do not over-torque the anchor as this could adversely affect its performance.

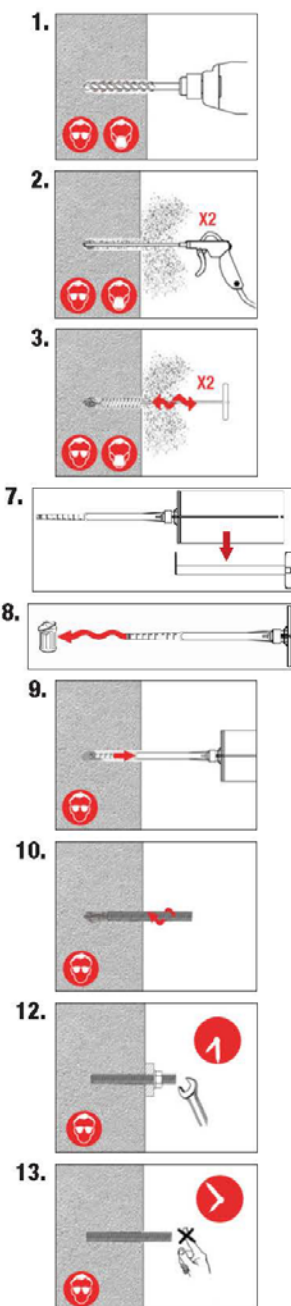


FIGURE 3—MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS



CIA-GEL 7000

MPII INSTALLATION INSTRUCTIONS

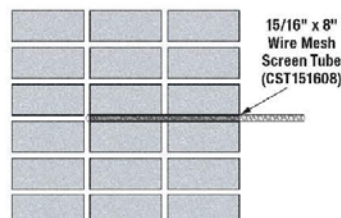
Unreinforced Brick Masonry Wall Installation Method

Drill and clean holes in accordance with the procedure described in steps 1 to 7 above (Solid Substrate Installation Method). EXCEPT: the drill shall be switched to rotary mode only (no impact).

A.) Use of Wall Anchor for Shear only

1. Drill a one-inch diameter (25.4 mm) by 8 inch (203 mm) deep hole for shear anchors perpendicular to the wall. An extension nozzle must be used to reach the back of the hole with compressed air. The hole must then be cleaned of dust and debris with a nylon brush and blown again with compressed air.
2. Extrude some resin to waste until an even-colored mixture is extruded, the cartridge is now ready for use.
3. Fill the screen tube completely with CIA-Gel 7000 epoxy and then place fully into the drilled hole.
4. Insert the threaded anchor into the screen tube and follow steps 10 to 13 above.

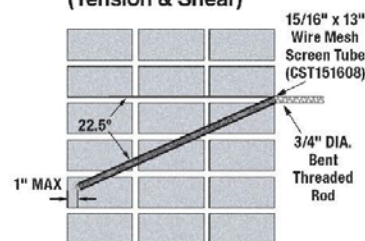
Configuration A (Shear)



B.) Use of Wall Anchor for Tension and Shear (exterior side not accessible)

1. Drill a one-inch diameter (25.4 mm) by 13 inch (330 mm) deep hole at a 22 - 1/2 degree angle. The angled hole is to be drilled in the vertical plane only. The hole must be drilled a minimum of 13" deep and must extend to within one inch of the outer face without going all the way through the wall. An extension nozzle must be used to reach the back of the hole with compressed air. The hole must then be cleaned of dust and debris with a nylon brush and blown again with compressed air.
2. Extrude some resin to waste until an even-colored mixture is extruded, the cartridge is now ready for use.
3. Fill the screen tube completely with CIA-Gel 7000 epoxy and then place fully into the drilled hole.
4. Insert the threaded anchor into the screen tube and follow steps 10 to 13 above.

Configuration B (Tension & Shear)



C.) Use of Wall Anchor for Tension and Shear (exterior side is accessible)

1. Drill a one-inch diameter (25.4 mm) by 8 inch (203 mm) deep hole perpendicular to the wall. An extension nozzle must be used to completely clean the hole with compressed air. The hole must then be cleaned of dust and debris with a nylon brush and blown again with compressed air.
2. Fill the screen tube completely with CIA-Gel 7000 epoxy and then place fully into the drilled hole.
3. A 13/16-inch-outside-diameter (21 mm) steel sleeve must be slowly pushed and continuously rotated into an adhesive-filled 15/16-inch-diameter by 8" long (23.8 mm by 203 mm) wire mesh screen tube. After curing per Table 3 of ESR-1702, a 5/8 inch-diameter hole must be drilled through the bottom of the steel sleeve and through the remainder of the wall, until the wall is fully penetrated.
4. The 5/8-inch diameter (15.9 mm) rod must be inserted through the steel sleeve and wall and fitted with the plate and nut to complete the through bolted anchor connection.
5. Position the fixture and tighten the anchor.

Configuration C (Tension & Shear)



DIVISION: 04 00 00—MASONRY
Section: 04 05 19.16—Masonry Anchors

REPORT HOLDER:

MITEK® INC.

EVALUATION SUBJECT:

CIA-GEL 7000 EPOXY ANCHOR SYSTEM

1.0 REPORT PURPOSE AND SCOPE**Purpose:**

The purpose of this evaluation report supplement is to indicate that the CIA-Gel 7000 epoxy anchor system, described in ICC-ES evaluation report [ESR-1702](#), has also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

Applicable code editions:

- 2017 *City of Los Angeles Building Code* (LABC)
- 2017 *City of Los Angeles Residential Code* (LARC)
- 2017 *City of Los Angeles Existing Building Code* (LAEBC)

2.0 CONCLUSIONS

The CIA-Gel 7000 epoxy anchor system, described in Sections 2.0 through 7.0 of the evaluation report [ESR-1702](#), complies with the LABC Chapter 21 and 88, LAEBC Appendix A Chapter A1, and the LARC, and is subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The CIA-Gel 7000 epoxy anchor system described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report [ESR-1702](#).
- The design, installation, conditions of use and identification of the anchors are in accordance with the 2015 *International Building Code*® (2015 IBC) and the 2015 *International Existing Building Code*® (2015 IEBC) provisions noted in the evaluation report [ESR-1702](#).
- The design, installation, testing and inspection are in accordance with additional requirements of LABC Chapters 16, 17, 21, 88 and LAEBC Appendix A Chapter A1, as applicable, including LABC Sections 1704, 1705, 2107, and LAEBC Sections A106, A107 and A108.
- Under the LARC, an engineered design in accordance with LARC Section R301.1.3 and additional requirements noted in this supplement must be submitted.
- The allowable strength and design strength values listed in the evaluation report and tables are for the connection of anchors to the masonry. The connection between the anchors and the connected members must be checked for capacity (which may govern).

This supplement expires concurrently with the evaluation report, reissued June 2020 and revised July 2020.

DIVISION: 03 00 00—CONCRETE
Section: 03 16 00—Concrete Anchors

REPORT HOLDER:

MITEK® INC.

EVALUATION SUBJECT:

CIA-GEL 7000 EPOXY ANCHOR SYSTEM

1.0 REPORT PURPOSE AND SCOPE**Purpose:**

The purpose of this evaluation report supplement is to indicate that the CIA-Gel 7000 epoxy anchor system, described in ICC-ES evaluation report ESR-1702, has also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2020 and 2017 *Florida Building Code—Building*
- 2020 and 2017 *Florida Building Code—Residential*

2.0 CONCLUSIONS

The CIA-Gel 7000 epoxy anchor system, described in Sections 2.0 through 7.0 of ICC-ES evaluation report ESR-1702, complies with the *Florida Building Code—Building* and the *Florida Building Code—Residential*, provided the design requirements are determined in accordance with the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable. The installation requirements noted in the ICC-ES evaluation report ESR-1702 for the 2018 and 2015 *International Building Code*® meet the requirements of the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable.

Use of the CIA-Gel 7000 epoxy anchor system for use in dry, interior locations has also been found to be in compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* and the *Florida Building Code—Residential*.

For products falling under Florida Rule 61G20-3, verification that the report holder's quality assurance program is audited by a quality assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official when the report holder does not possess an approval by the Commission).

This supplement expires concurrently with the evaluation report, reissued June 2020 and revised July 2020.