



# AF35LVE CHEMICAL INJECTION SYSTEM

LOW VISCOSITY STRUCTURAL EPOXY



AF35LVE is a two-component, low viscosity epoxy designed for deep embedment of anchor rods in large diameter holes due to its zero shrinkage and longer working times.

Due to its ultra-low viscosity, AF35LVE flows freely when under pressure. The installation temperature range is between 40 °F and 110 °F (4 °C and 43 °C).

## APPLICATIONS & USES

- Non-shrink and moisture insensitive allows for installation in most applications
- 2:1 Mixed Ratio Epoxy
- Quick cure time
- Pull test in as low as 72 hours
- Blue color once cured
- Extended working time
- Diamond cored holes (roughened)
- Mixing nozzle included
- 2 year shelf life

## KEY BENEFITS

- Low viscosity
- Ability to inject epoxy after anchor is installed
- Tested specifically for tower modifications
- Saves installation time
- Field friendly

## MATERIAL SPECIFICATIONS

TABLE 1: MATERIAL SPECIFICATION APPROVALS

APPROVALS	
ASTM C8	Type I, II*, IV & V* Grade 1 Class C
AASHTO M235	

\*With exceptions

## AVAILABILITY

Allfasteners carries all epoxy, accessories and dispensing tools and are in stock.

## COLOR & RATIO

Part A (Resin): Clear, Part B (Hardener): Blue, Mixed: Blue; Mix ratio: 2:1 by volume.

## STORAGE & SHELF LIFE

24 months in unopened containers stored in dry conditions between 55 °F (13 °C) and 80 °F (27 °C).



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## INSTALLATION & COVERAGE

Manufacturer's Printed Installation Instructions (MPII) are available within this Technical Data Sheet (TDS). Due to occasional updates & revisions, always verify that you are using the most current version of the MPII. In order to achieve maximum results, proper installation is imperative.

## CLEAN UP

Always wear appropriate protective equipment such as safety glasses and gloves during cleanup. Clean uncured materials from tools and equipment with mild solvent. Cured material can only be removed mechanically.

## WORKING TIMES & CURE TIMES

**TABLE 3: WORKING TIMES & CURE TIMES**

BASE MATERIAL	MINIMUM WORKING TIME	FULL CURE TIME
°F (°C)		
40 (4)◇	50 mins	72 hours
75 (24)	30 mins	
110 (43)	20 mins	

\* Working times are approximate, may be linearly interpolated between listed temperatures and are based on cartridge & nozzle system performance.  
 ◇ If ambient temperature is expected to drop below 40 °F at any point during the 7 day cure window then full cure time should be doubled to 14 days. Performance of this material in base material temperatures below 40 °F has not been evaluated.

## LIMITATIONS & WARNINGS

- Do not thin with solvents, as this will prevent cure
- Product not designed to stop seeping or flowing water, however it may be applied in moist or damp environments as long as standing water is removed
- New concrete should be a minimum of 28 days old prior to application

## SAFETY

Please refer to the Safety Data Sheet (SDS) for AF35LVE published on our website or call for more information at 888.859.6060.

## SPECIFICATIONS

The epoxy repair material shall be a two component, 2:1 ratio, epoxy adhesive system. When cured 7 days and at a temperature of 60 °F (16 °C), the epoxy adhesive shall have a minimum compressive strength of 9,000 psi (62.1 MPa) per ASTM D695 and a minimum tensile strength of 5,000 psi (34.5 MPa) per ASTM D638. The epoxy adhesive shall be AF35LVE from AllFasteners, USA.



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## ORDERING INFORMATION

**TABLE 3: ORDERING INFORMATION**

PART #	DESCRIPTION	QTY/BOX
12AF35LVE	33oz. (340mL) Cartridge	10/Box

**TABLE 4: AF35LVE, DISPENSING TOOLS, MIXING NOZZLES & ACCESSORIES<sup>1</sup>**

PART #	12AF35LVE
PACKAGING SIZE	33oz. (340mL) Cartridge
CASE QTY	10
PALLET QTY	360
MANUAL DISPENSING TOOL	13AFEG330Z
PNEUMATIC DISPENSING TOOL	13PDTAF35LVE-33
BATTERY DISPENSING TOOL	13BDTAF35LVE-33
AF HOLE ROUGHENER	9HR-14, 9HR-20, 9HR-30
RECOMMENDED MIXING NOZZLE	Included

1. Call for bulk packaging availability and lead time.



13AFEG330Z-33



13PDTAF35LVE-33



13BDTAF35LVE-33



9HR-14, 9HR-20, 9HR-30



INCLUDED



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## PERFORMANCE SPECIFICATIONS

TABLE 5: AF35LVE PERFORMANCE TO ASTM C881-14<sup>1,2,3</sup>

PROPERTY	CURE TIME	ASTM STANDARD	UNITS	SAMPLE CONDITIONING TEMPERATURE 60°F (16°C)
				CLASS C
Gel Time - 60 Grams Mass <sup>4</sup>	–	C881	min.	27
Viscosity	–		cP	500
Pot Life <sup>5,6</sup>	–	–	min.	19
Compressive Yield Strength	7 Days	D695	psi (MPa)	10,150 (70.0)
Compressive Modulus			psi (MPa)	300,000 (2,068)
Tensile Strength		D638	psi (MPa)	7,230 (49.8)
Tensile Elongation			%	4.4
Bond Strength Hardened to Hardened Concrete	2 Days	C882	psi (MPa)	1,580 (10.9)
	14 Days		psi (MPa)	2,950 (20.3)
Bond Strength Fresh to Hardened Concrete	14 Days		psi (MPa)	1,720 (11.9)
Heat Deflection Temperature	7 Days	D648	°F (°C)	120 (48.9)
Water Absorption	14 Days	D570	%	0.3
Linear Coefficient of Shrinkage	48 Hours	D2566	%	0.0003

1. Results based on testing conducted on a representative lot(s) of product. Average results will vary according to the tolerances of the given property.
2. Full cure time is listed to obtain the give properties for each product characteristic.
3. Results may vary due to environmental factors such as temperature, moisture and type of substrate.
4. Gel time may be lower than the minimum required for ASTM C881.
5. Property not referenced in ASTM C881.
6. Pot life is measured as the workable and applicable time of 1.0 gallon (3.8 L) when mixed.





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## SURFACE PREPARATIONS

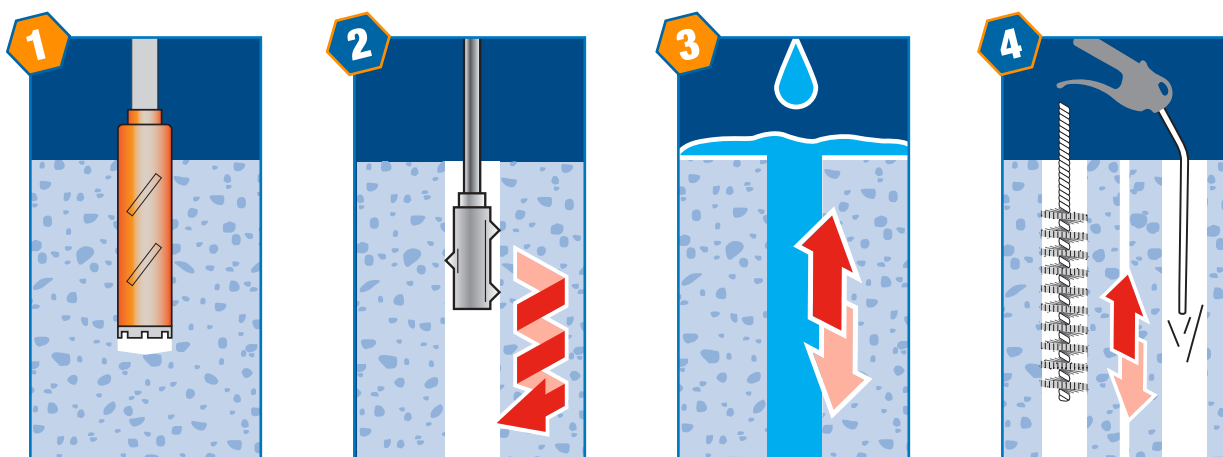


Surface preparation will be dependent upon the application of the product. Old concrete must be clean and profiled or textured. New concrete should be a minimum of 28 days old. All dirt, oil, debris, wax, grease or dust must be removed. Prepare the surface mechanically using an AllFasteners Hole Roughener to give the surface a roughened profile needed for the application. A roughened surface is imperative for good adhesion. Always be sure the bonding surfaces are prepared in advance before starting a new cartridge or mixing product. If at all possible, schedule dispensing to consume an entire cartridge at one time with no interruption of epoxy flow.

**ROUGHENED HOLE EXAMPLE SHOWN.**

## HOLE PREPARATIONS

1. Drill hole to the required diameter & depth. Hole diameter shall be a 1/4" larger than the selected anchor rod diameter
2. A hole-roughening device shall be used when the hole has been cored using a diamond drill bit. This is an important step vital to the bond performance of the AF35LVE.
3. Flush hole with running water removing any slurry from hole. Vacuum water from hole.
4. Brush the hole with an appropriate sized nylon brush 2 times. Blow the hole clean with compressed air 2 times. This shall be completed with rotary percussive adapters and extensions. REPEAT Step 4.





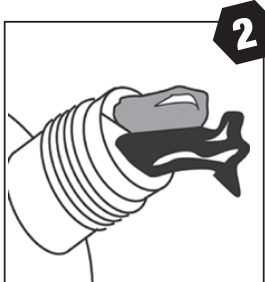
# AF35LVE CHEMICAL INJECTION SYSTEM

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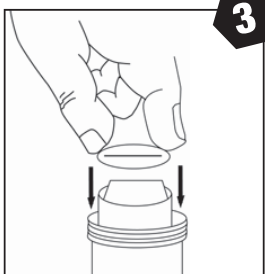
## CARTRIDGE PREPARATIONS



**CAUTION:** Check the expiration date on the cartridge to ensure it is not expired. **Do not use expired product!** Insert cartridge into the dispenser. Make sure it is properly positioned with the shoulder of the cartridge flush with the front top bracket of the dispenser. Point upward at about a 45° angle. Remove the plastic cap and plug from the top of the cartridge.

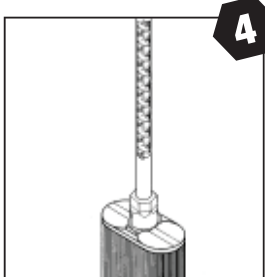


Continue to point the upward away from yourself and others while slowly applying pressure to dispenser moving any bubbles and product up through the cartridge until both products flow out evenly. The cartridge is now purged or balanced and ready for flow controller installation.



AF35LVE uses a flow controller located inside the threaded end of the mixing nozzle and secured by a plastic cap. Insert the flow controller to the top of the threaded end of the cartridge where product will dispense and ensure it is securely seated. Install the mixing nozzle onto cartridge. Holding the dispenser straight up, slowly apply pressure to the dispenser moving any bubbles and product up through the nozzle until product reaches the tip. Tilting only slightly, dispense this first full stroke of material into a disposable container. The cartridge is ready for use

AF35LVE: NOTE: No flow controller is required for AF35LVE. Attach the mixing nozzle and dispense the first full stroke of material into a disposable container. The cartridge is ready for use.



NOTE: Schedule dispensing to consume an entire cartridge at one time with no interruption of flow to prevent material from hardening in mixing nozzle. Replace the nozzle if problems occur while dispensing product as the product may have begun to cure in the nozzle which will affect the mix ratio. Never transfer a used nozzle to a new cartridge. Repeat the cartridge balancing steps after replacing the nozzle.

## PUMP & PNEUMATIC DISPENSING

DO NOT EXCEED 40 psi (0.28 MPa) PRESSURE TO THE PNEUMATIC DISPENSING TOOL OR INJECTION PUMP. An air pressure regulator MUST be used with a pneumatic dispenser. Start at a low setting and gradually increase pressure as needed until desired epoxy flow is achieved. Use maximum 40 psi (0.28 MPa) air pressure. Excessive pressure may result in cartridge plunger leakage.

Allow injection resin to cure for at least 48 hours.



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## ADHESIVE DESIGN TABLE

**TABLE 6: ADHESIVE DESIGN TABLE**

THREADED ROD DIAMETER (in.)	ROD MATERIAL	STEEL STRENGTH YIELD/ULTIMATE $F_y/F_u$ (ksi)		STEEL STRESS AREA (in. <sup>2</sup> )	STEEL YIELD STRENGTH MIN. (kips)	AF35LVE CHARACTERISTIC BOND STRENGTH (psi) <sup>1,2,3,4,5</sup>	DRILL HOLE SIZE (in.)			
1.00	ASTM A193 Grade B7	105	125	0.606	64	1,762	1.25			
1.25				0.969	102		1.50			
1.50				1.405	148		1.75			
1.75							1.900	200	1,717	2.200
2.00						2.500	263	2.25		
2.25						3.250	341	2.50		

1. Anchorages performed in core drilled roughened holes prepared in accordance with Allfasteners AF35LVE installation instructions.
2. Based upon tested population with cleaning method normalized at 30" tests condition in nominal 4,000 psi dry, uncracked concrete.
3. For 3,000 psi concrete, reduce the bond strength by a factor of 0.94 or 6%. Linear interpolations may be used for intermediate strengths up to 4,000 psi strength concrete.
4. Concrete and reinforcement assumed to be of sufficient strength and placement to preclude concrete failure, splitting or cracking.
5. Final loads used for design are to be calculated based upon the specific design conditions for the particular application and are the responsibility of the EOR.

## WARRANTY

Allfasteners warrants the AF35LVE Epoxy shall be of good quality and conform to the specifications in force on the date of manufacture when stored, installed, and used in accordance with and as directed in the technical literature (TDS) ("Specifications"). The AF35LVE Epoxy is designed and tested to be used for deep embedment's for installing large diameter anchor rods for the tower modification industry.

The AF35LVE Epoxy has been tested per the details as outlined in the TDS. If defects of the product are discovered due to the material properties of the AF35LVE Epoxy, Allfasteners shall warranty the product which shall be limited to the replacement of the product.

Allfasteners shall not be liable for any injury, loss, damage, claim, liability, or cost arising out of or related to the use of the AF35LVE Epoxy sold by Allfasteners in any way that is not in accordance with the Specifications.

For the warranty set forth in this letter to be effective, the AF hole roughener (9HR-14) is a necessary requirement for the hole preparation and achieving the bond strength requirements.

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**TABLE 1: DIMENSIONAL DATA**

<b>SIZE RANGE</b>	1/2" through 4"
<b>MATERIAL</b>	Carbon steel; 304 (11SS) and 316 (11SX) stainless steel available on request.
<b>FINISH</b>	Plain finish, electro-galvanized finish, copper epoxy coating; hot dip galvanized available on request
<b>SERVICE</b>	Designed for the suspension of non-insulated, stationary pipelines.
<b>MAX. TEMPERATURE</b>	Plain 650° F, Galvanized and Epoxy 450° F
<b>APPROVALS</b>	U.L.-U.L.C. listed (sizes 2 1/2"-8") and FM approved (3/4"-8"). Complies with Federal Specification WW-H-171-E (Type# 1), A-A-1192A (Type# 1) and Manufacturers Standardization Society MSS SP-58 and SP-69 (Type# 1).
<b>INSTALLATION</b>	Hanger load nut above the clevis must be tightened securely to assure proper hanger performance.
<b>ADJUSTMENT</b>	Vertical adjustment is provided, varying with the size of clevis. Tighten upper nut after adjustment.
<b>FEATURES</b>	An economical attachment for light duty service.
<b>ORDERING</b>	Specify part number
<b>NOTES</b>	Upper lock nut must be tightened securely to assure proper hanger performance. Stainless steel hangers are recommended for applications where protection from corrosive environments is needed.
<b>CAUTION</b>	Hangers and supports shall be sized to fit the outside diameter of the pipe or tubing. When an oversize clevis is used, a pipe spacer or multi spacer should be placed over clevis bolt to ensure that the lower U-strap will not move in on the bolt.