

1. Product Name

Crackbond LR321G Injection Gel

2. Manufacturer

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3. Product Description

GENERAL DESCRIPTION

Crackbond LR321G Injection Gel is a multi-viscosity, two component, 2:1 ratio, 100% solids, high modulus, structural epoxy adhesive. It is a solvent free, low odor, high strength, moisture insensitive, medium viscosity (when mixed) epoxy system. **Crackbond LR321G** can be used at temperatures between 35°F - 110°F, providing contractors with a choice for injecting cracks in high and low temperature environments.

In addition, **Crackbond LR321G** has a gel like consistency, which is ideal for medium sized cracks. **Crackbond LR321G** is an excellent choice where a high strength adhesive with maximum field reliability is desired.

BASIC USE:

- Blind Side Crack Repairs (basement walls)
- Pre-stressed membrane repairs – bridges, reservoirs, dams, etc.
- Bonding agent for concrete, steel and wood structures

Crackbond LR321G is a unique thixotropic formula that is designed for use as an injection gel for cracks in wood and concrete structures that are fine to medium sized in width (1/32 – 3/8"). Its multi-viscosity properties enable it to flow as a liquid when dispensed through a mixer nozzle and act as a gel when idle. This makes it ideal for repairing blind side cracks (basement repairs).

This allows contractors to repair leaks in basements without the costly step of excavating the outside area of the basement wall.

It cures to a solid with no shrinkage, bonds to both surfaces of the crack, bonding the structure back to its original monolithic strength. This bond forms a permanent polymeric adhesion that cannot re-emulsify, and forms a moisture barrier that is resistant to chlorides, corrosion, water, grease, alkalis, salt and mild non-organic acids. **Crackbond LR321G** is moisture insensitive and will adhere to moist or damp surfaces (for maximum bond, it is better to work on dry surfaces).

LIMITATIONS: **Crackbond LR321G** is not intended for repairing cracks that are subject to movement. Repairs should be made to the cracked member to eliminate the causes of the cracking before injection is done.

Crackbond LR321G is not to be used in areas with standing or seeping water. Steps must be taken to eliminate any standing or flowing water before repairs are made.

COLOR

"A" Component (Resin): White
"B" Component (Hardener): Black
Mixed: Gray

SOLIDS: Weight: 100% Volume: 100%

SHELF LIFE: 24 Months

STORAGE STABILITY: Product must be stored in unopened containers at 40°F – 95°F.

SIZE/PACKAGING

Cartridge Sizes: **Crackbond LR321G** is available in:

- 16 oz cartridges; part number: A16-LR321G

The resin and hardener are uniformly dispensed from a dual component cartridge and mixed simultaneously through a mixing nozzle, providing installers with a self mix delivery system.

Bulk Sizes: **Crackbond LR321G** is available in bulk sizes:

- 1 gallon kit (102 fl. oz.); part number: BUG-LR321G
- 3 gallon kit; part number: B3G-LR321G
- 15 gallon kit; part number: B15G-LR321G
- 150 gallon kit; part number: B150G-LR321G

4. Technical Data

EPOXY SPECIFICATIONS

COMPONENT	COLOR	MIX RATIO	VISCOSITY	DENSITY	CHEMICAL MAKE-UP
"A" Component	White	2 parts by volume	140,000 cps	9.8 lbs/gal	100% epoxy resin
"B" Component	Black	1 part by volume	45,000 cps	8.6 lbs/gal	Modified polyamine hardener
Mixed	Gray	2:1 ratio by volume	4,500 cps	9.4 lbs/gal	100% true epoxy

CURE SCHEDULE / WORKING TIME*

CONCRETE TEMP.	CARTRIDGE	1 GALLON KIT	LOAD TIME**
90°F	20 minutes	3-5 minutes	36 hours
75°F	25 minutes	5-7 minutes	40 hours
60°F	30 minutes	7-8 minutes	44 hours
50°F	40 minutes	8-9 minutes	48 hours

*Working Time – Amount of time to work with mixed epoxy before gelling occurs.
**Load Time – Time to obtain standard load strength. Epoxy may continue to cure and gain chemical resistance for up to 7 days.

Technical Data

Shelf Life	2 years	
Storage Conditions	40°F – 95°F	
Color	Concrete Gray	
Temperature Range	35°F - 110°F	
Mixing Ratio A:B (Volume)	2:1 (2A:1B by volume)	
Consistency	Medium viscosity thixotropic Gel	
Viscosity	ASTM C881	4,500 cps
Compressive Strength – 7 days	ASTM D695	9000 psi
Bond Strength – 2 days	ASTM C882	1,250 psi
Water Absorption – 24 hours	ASTM D570	0.26%
Linear Shrinkage	ASTM D2566	0.002 cm/cm
Tensile Strength – 7 days	ASTM D638	5,000 psi
Elongation at Break – 7 days	ASTM D638	1.0%
Heat Deflection Temperature	ASTM D648	125°



The capping material is ground off after the crack is repaired.

This step is only necessary if cosmetics are a concern. If the face of the concrete is not exposed then this process is not necessary.

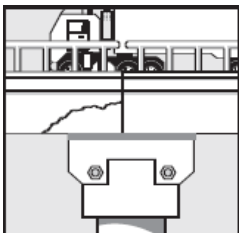
DEPARTMENT OF TRANSPORTATION APPROVALS

Crackbond LR321G is approved for use by the following Transportation Departments (DOT's):

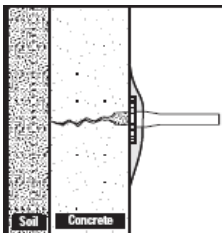
- **Georgia** QPL 15, Type II (bonding concrete (bonding hardened concrete to hardened concrete))
- **Tennessee** QPL 25 – pressure injected epoxy systems

TYPICAL APPLICATIONS

Load Bearing Structure



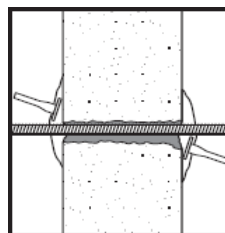
Blind-Side Crack Injection



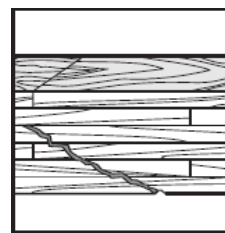
In plane Masonry



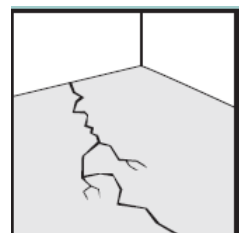
Tendon Through-bolt



Blue-Lam & Wood Injection



Gravity Fill On-Grade Slab Repair



The Crackbond Epoxy Crack Injection System is a unique, high quality, low cost method of structurally re-bonding cracked concrete and wood members. Because structural epoxy has excellent adhesion to concrete and wood surfaces, and has superior physical properties, epoxies are capable of restoring a cracked member to its pre-cracked strength. If properly installed, any new failure of the structure will typically occur in the concrete or wood, not within the epoxy.

Examine the Crack: Before repairs are attempted, the crack should be analyzed to determine the type of repair that is required. Cracks in concrete and wood members are classified as either active (moving) or dormant. Dormant cracks may occur from cure shrinkage, stabilized settlement, or one-time overload events such as earthquakes or floods. For dormant cracks in a structure that is to be rehabilitated, structural crack injection is recommended. By contrast, active cracks are those which are caused by inadequate design, seasonal heaving, temperature swings or repeated overloading. Since structural crack injection reintegrates the cracked member, preventing movement at the crack line, it would be necessary to install joints to redirect this movement if structural crack repair is desired.

Required Materials: The required materials are a capping epoxy (such as Miraclebond 1350, Crackbond CG300, CP1400 or CP3400), injection gel (**Crackbond LR321G**), injection ports, dispenser, wire brush, protective eye glasses, gloves, tongue depressors or putty knife and mixing nozzles (or injection kit).

- Note: component "A" contains epoxy resin and is an irritant / sensitizer; component "B" contains amines and is a corrosive / sensitizer; prior to using **Crackbond LR321G**, consult the MSDS for proper handling instructions.
- Make certain the crack surface is cleaned and prepared in advance before starting a new cartridge.
- If at all possible, schedule dispensing to consume an entire cartridge at one time with no interruption of material flow.
- Always wear safety glasses and gloves when working with epoxy or cleaning and preparing cracks.



Note: **Crackbond LR321G** should be used with either the T58CBS or T5814C mixing nozzle to ensure proper mixing. These nozzles offer superior mixing performance over other nozzles.

System Requirements

Container Size:	Available Capping Materials			LR321G Packaging Options	
	9 oz	16 oz	Bulk	16 oz	Bulk
Product:	A9-MB1350	A16-CG300	BUG-CP1400 BUG-CP3400	A16-LR321G	BUG-LR321G B3G-LR321G B15G-LR321G B150G-LR321G
Dispenser (manual):	TM9HD	TM16HD	N/A	TM16HD	N/A
Dispenser (air):	N/A	TA16HD	Bulk Pump*	TA16HD	Bulk Pump*
Mixer Nozzle:	T58CBS	T58CBS	T58CBS	T58CBS or T5814C	T58CBS
Injection Port:	CRPORTSS or IJ-220			CRPORTSS or IJ-220	
Flow control:	N/A	N/A	N/A	N/A	N/A
Injection Tubing:	TUBE-ASSE (3/8" tubing kit)			TUBE-ASSE (3/8" tubing kit)	
Wire Brush:	A wire brush is required to clean the crack surface so that the capping material can bond to the concrete surface.				
Gloves:	Gloves are required to protect your skin from the epoxy materials.				
Tongue Depressors:	Tongue depressors are required to spread the capping material over the face of the crack and to mount the surface ports.				
*Bulk Pump:	*Please contact Adhesives Technology Corp. for recommended bulk pumps				
Minimum Substrate Temperature During Application	50° F. or warmer. Note: if below 50° F., we recommend warming the product and the concrete using a heater or heat gun and keep covered to maintain warmth. This will allow epoxy to penetrate deeper into crack. DO NOT USE DIRECT FLAME.				



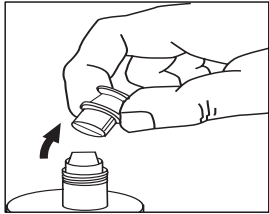
5. Installation Procedures - To achieve desired results, carefully follow these procedures!

Crack-Injection Instructions (Cartridge)

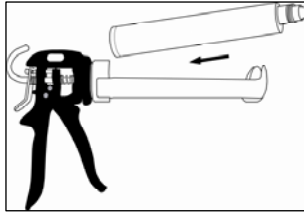
CRACK PREPARATION: (be sure to wear safety glasses and gloves when working with epoxy or cleaning and preparing cracks)

Clean the surface immediately surrounding the crack with a wire brush to achieve proper bond. Remove all dust, debris, oil and any other contaminants from the crack by blowing out with clean, oil-free compressed air. For best results crack must be dry at the time of injection. If water is seeping from crack, steps must be taken to stop the flow in order to achieve desired repair.

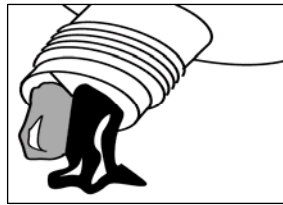
CARTRIDGE PREPARATION (Capping Material):



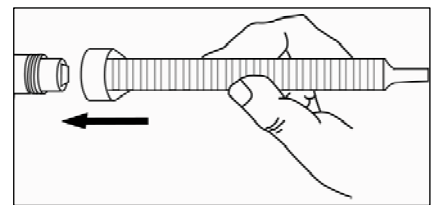
I. Unscrew plastic cap from threaded end of cartridge and remove plug.



II. Place cartridge into dispenser.



III. Dispense a small amount of material into a disposable container until both materials flow from cartridge.



IV. Attach mixing nozzle to cartridge and dispense a small amount of material until uniform color is achieved.



Capping cracks



Securing ports

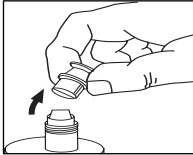
V. Place and secure injection ports with the Capping Gel material (Miraclebond 1350), taking care not to leave any pin-holes. Port spacing should be approximately 6 – 12 inches apart (typically the width of the concrete member). **Do not allow the epoxy to block the passage between the port and the crack face.**

VI. Place additional Miraclebond 1350 between the ports making sure the entire face of the crack is sealed off and ports are securely fastened to the concrete. If the crack is evident and accessible on the back side of the concrete member seal with capping gel.

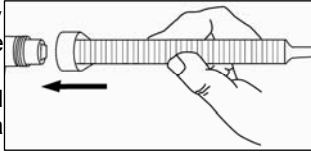
VII. Allow the capping material to cure before injecting crack (at least 2 hours at 75°F. if using the Miraclebond 1350).

INJECTING THE CRACK:

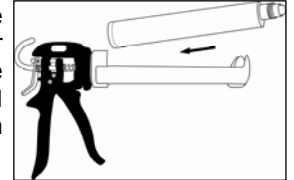
VIII. Using the LR321Gel (injection material), unscrew plastic cap from threaded end of cartridge and remove plug.



IX. Immediately attach the mixer nozzle and thread in a clockwise direction.



X. Place cartridge into dispenser and dispense enough material until uniform color is achieved.



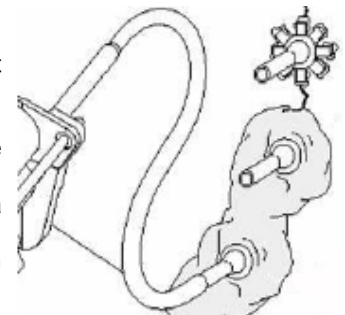
XI. Attach the 3/8" tubing assembly (TUBE-ASSE) to the barbed end of nozzle.

XII. Attach other end of tubing to the bottom injection port. Inject epoxy into port until you either get flow from adjacent port or until epoxy stops flowing. Plug the port you were injecting into and attach tubing to adjacent port. Continue procedure until complete.

XIII. Leave the tubing attached to the last port on each crack for 30 seconds under pressure to assure crack is completely filled.

XIV. Allow Injection resin to cure (at least 24 hours). Ports and capping material can be removed with a chisel and/or grinder.

Note: Some cracks may take more time to inject, especially hair-line cracks. Cracks may be smaller in width (or larger) than they appear from the surface.



DISPENSING AND INJECTION TIPS: DO NOT EXCEED 35 psi AIR PRESSURE TO THE PNEUMATIC DISPENSING TOOL

- PNEUMATIC DISPENSER: Must be used with an air pressure regulator. Start at a low setting and gradually increase pressure as needed until desired epoxy flow. Do not exceed 35 psi air pressure. Excessive pressure may result in cartridge plunger leakage.
- For hairline (or fine cracks) use either Crackbond LR321 injection resin or Crackbond SLV302 Super Low Viscosity Injection Resin.
- Do not dispense epoxy through gelled mixer nozzle. If epoxy gels in nozzle, replace nozzle before continuing.



Bulk Mix and Application Instructions

Note: component "A" contains epoxy resin and is an irritant / sensitizer; component "B" contains amines and is a corrosive / sensitizer; prior to using the **Crackbond LR321G**, please consult the material safety data sheet for proper handling instructions.

I. Surface Preparation:

Concrete and Steel: Surfaces must be sound and cleaned so there is no dust, dirt, grease, wax, oil or any other contaminants. Surfaces may be damp (or dry) however there should be no standing water. Surfaces may be prepared by shot blasting or other equivalent mechanical means.

II. Mixing Instructions:

Thoroughly stir each component before mixing them together.

BUG packaging (102 fluid oz kits): Pour the contents of the "B" component pail (hardener) into the "A" component pail (resin).

B3G, B15G & B150G packaging: These kits are packaged for pump applications or to be mixed in a third party mixing container. Mix only the amount of material that can be used before the pot life expires. Proportion parts by volume at a 2:1 ratio (2 parts of component "A" and 1 part of component "B") into a clean pail. Be sure that components are mixed at an exact 2:1 ratio by volume.

Mix thoroughly with a low speed drill (400 – 600 rpm) with a mix paddle attachment (i.e. a jiffy mixer). Carefully scrape the sides and the bottom of the container while mixing. Keep the paddle below the surface of the material to avoid entrapping air. Proper mixing will take at least 3 minutes and when well mixed the material will be free of streaks or lumps.

Pump: Use a pump that is set up for 2:1 ratio by volume. Follow pump manufacturers instructions.

III. Application:

Bonding fresh concrete to hardened concrete: Using a brush, roller or airless sprayer, apply an even coat of the mixed **Crackbond LR321G** to the clean and prepared concrete surface. While the epoxy is still tacky, place fresh concrete over the top of the mixed epoxy.

Bonding hardened concrete to hardened concrete: Using a brush, roller or airless sprayer, apply an even coat of the mixed **Crackbond LR321G** to the clean and prepared concrete surface. Make sure to fill all gaps between the mating concrete surfaces.



Vertical Anchoring: Drill hole into concrete (1/16" – 1/4" diameter larger than the threaded rod or rebar). Typical embedment depth is 9 – 15 bar diameters (9D - 15D). Fill the anchor hole to about 2/3 full with the **Crackbond LR321G** epoxy. While the epoxy is still wet, place the threaded rod or rebar into the anchor hole while turning clockwise. Do not disturb or bolt-up until minimum bolt up time has passed.

Gravity Feed Crack Injection: Clean and blow out the crack, removing all dust, dirt, grease, wax, oil or any other contaminants. Dispense the **Crackbond LR321G** directly over the face of the crack/concrete surface and allow the product to feed into the crack. Continue adding the epoxy until the crack is completely filled.



CRACK-INJECTION USAGE ESTIMATING GUIDE

Approximate Coverage Rates in Linear Feet

Crack Width (inches)	Concrete Thickness (inches)	Crack Kit	Crack-Injection Material			Capping Gel for Capping Crack				
			6.1 fluid oz cartridge	9 fluid oz cartridge	16 fluid oz cartridge	9 fluid oz cartridge	16 fluid oz cartridge	22 fluid oz cartridge	33 fluid oz cartridge	53 fluid oz cartridge
1/400 or 0.0025	4	275.2	91.7	129.3	240.6	6.9	12.8	17.0	26.4	63.8
	6	183.5	61.2	86.2	160.4					
	8	137.6	45.9	64.7	120.3					
	10	110.1	36.7	51.7	96.3					
1/200 or 0.005	4	137.6	45.9	64.7	120.3	6.9	12.8	16.9	26.3	63.7
	6	91.7	30.6	43.1	80.2					
	8	68.8	22.9	32.3	60.2					
	10	55.0	18.3	25.9	48.1					
1/64 or 0.0156	4	44.0	14.7	20.7	38.5	6.8	12.6	16.7	26.1	63.0
	6	29.4	9.8	13.8	25.7					
	8	22.0	7.3	10.3	19.3					
	10	17.6	5.9	8.3	15.4					
1/32 or 0.03125	4	22.0	7.3	10.3	19.3	6.7	12.4	16.5	25.7	62.1
	6	14.7	4.9	6.9	12.8					
	8	11.0	3.7	5.2	9.6					
	10	8.8	2.9	4.1	7.7					
1/16 or 0.0625	4	11.0	3.7	5.2	9.6	6.5	12.1	16.0	24.9	60.2
	6	7.3	2.4	3.4	6.4					
	8	5.5	1.8	2.6	4.8					
	10	4.4	1.5	2.1	3.9					
1/8 or 0.125	4	5.5	1.8	2.6	4.8	6.1	11.4	15.1	23.5	56.9
	6	3.7	1.2	1.7	3.2					
	8	2.8	0.9	1.3	2.4					
	10	2.2	0.7	1.0	1.9					
3/16 or 0.1875	4	3.7	1.2	1.7	3.2	5.8	10.8	14.3	22.3	53.9
	6	2.4	0.8	1.1	2.1					
	8	1.8	0.6	0.9	1.6					
	10	1.5	0.5	0.7	1.3					
1/4 or 0.25	4	2.8	0.9	1.3	2.4	5.5	10.3	13.6	21.2	51.2
	6	1.8	0.6	0.9	1.6					
	8	1.4	0.5	0.6	1.2					
	10	1.1	0.4	0.5	1.0					
5/16 or 0.3125	4	2.2	0.7	1.0	1.9	5.3	9.8	13.0	20.2	48.8
	6	1.5	0.5	0.7	1.3					
	8	1.1	0.4	0.5	1.0					
	10	0.9	0.3	0.4	0.8					
3/8 or 0.375	4	1.8	0.6	0.9	1.6	5.0	9.3	12.4	19.3	46.5
	6	1.2	0.4	0.6	1.1					
	8	0.9	0.3	0.4	0.8					
	10	0.7	0.2	0.3	0.6					
7/16 or 0.4375	4	1.6	0.5	0.7	1.4	4.8	8.9	11.8	18.4	44.5
	6	1.0	0.3	0.5	0.9					
	8	0.8	0.3	0.4	0.7					
	10	0.6	0.2	0.3	0.6					
1/2 or 0.5	4	1.4	0.5	0.6	1.2	4.6	8.6	11.3	17.6	42.7
	6	0.9	0.3	0.4	0.8					
	8	0.7	0.2	0.3	0.6					
	10	0.6	0.2	0.3	0.5					

Note: Capping gel estimates are based on a cap thickness of 3/16" and a 1-inch width.

Note: The above chart is an approximate and may vary depending on waste, concrete and user technique.



Sample Specification – Injection material shall be a two component, 2:1 ratio, 100% solids epoxy system supplied in a dual component, side by side cartridge and dispensed through a static mixing nozzle supplied by the manufacturer. The injection material must have a minimum compressive strength of 9,000 psi, a minimum heat deflection temperature of 125°F and a minimum tensile strength of 5,000 psi. Adhesive shall be **Crackbond LR321G** manufactured by Adhesives Technology Corp., Pompano Beach, Florida.

BUILDING CODES

Installation of **Crackbond LR321G** must comply with applicable local, state and national code requirements.

SITE CONDITIONS

Material shall be delivered in original unopened containers and stored in a dry environment at a temperature between 40° and 95°F.

PRECAUTIONS

- Wear safety glasses
- Avoid prolonged contact with skin.
- Keep out of reach of children
- Do not take internally
- If Ingested seek medical attention immediately.
- Eye contact. Flush with water for at least 15 minutes. Call a physician immediately.

5. Availability and Cost

AVAILABILITY

Crackbond LR321G is available through select distributors who can provide you with all of your construction needs. Please contact Adhesives Technology Corp. at (800) 892-1880 for a distributor near you.

COST

Cost information is available from your local distributor.

6. Warranty

All warranties of the product listed herein, in the corresponding ATC catalog, and in any other current literature, expressed or implied, including warranties of merchantability and fitness for a particular purpose are specifically and expressly excluded, with the following exception: At its sole discretion, ATC will repair or replace any product which it considers to be defective in material or workmanship, excepting normal wear and tear within sixty (60) days from the date of purchase from ATC. ATC shall not be liable for any injury, loss or damage, direct, indirect, incidental or consequential or arising out of use of, misuse of, negligence, accident or inability to use any ATC product.

7. Technical Services

For technical support contact Adhesives Technology Corp. at (800) 892-1880.

8. Maintenance

None required.

9. Filing System

Additional product information and specifications are available either on line at www.atc.ws or contact Adhesives Technology at (800) 892-1880 to get copies mailed to you.

ON THE JOB WITH CRACKBOND PRODUCTS



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